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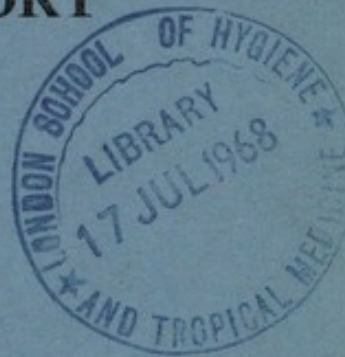


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COLONY AND PROTECTORATE OF KENYA

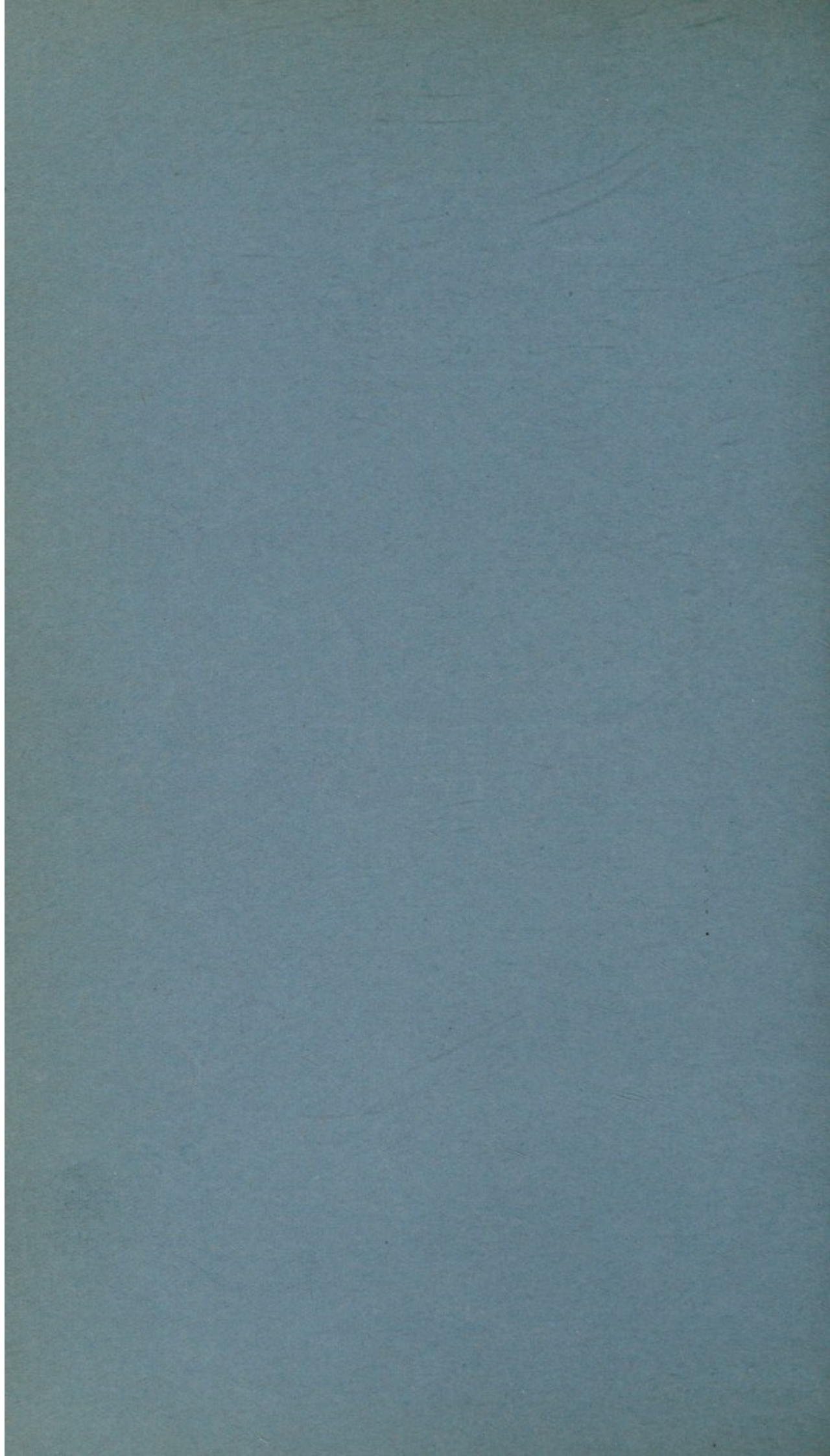
MEDICAL DEPARTMENT
ANNUAL REPORT
1954



1955

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MEDICAL DEPARTMENT ANNUAL REPORT, 1954

THE MINISTER FOR LOCAL GOVERNMENT,

HEALTH AND HOUSING, NAIROBI

SIR,

I have the honour to submit for the information of His Excellency the Governor, and for transmission to the Right Honourable the Secretary of State for the Colonies, the Medical Report on the Health and Sanitary Conditions of the Colony and Protectorate of Kenya for the year 1954, together with the Returns, etc., appended thereto.

I have the honour to be,

Sir,

Your obedient servant,

T. FARMWORTH ANDERSON,

Director of Medical Services.

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MEDICAL DEPARTMENT ANNUAL REPORT, 1954

INTRODUCTION

In the year 1954 progress has been made in many directions along the lines of formulated policy. There have, however, been setbacks due in large part to the Emergency. Where progress has been impossible, existing services have been consolidated.

The year has been notable for an unprecedented outbreak of typhoid which has affected all the major districts in the Colony. It was particularly unfortunate that typhoid had assumed epidemic proportions in the Central Province just at the time when large numbers of Kikuyu and allied tribes were taken into custody and concentrated in detention camps. As these operations, and particularly Operation "Anvil" which led to the detention of large numbers of Kikuyu in Nairobi, occurred at a time when the epidemic of typhoid in Nairobi and the surrounding area had reached its peak, it resulted in a fairly high incidence of the disease in most of the detention camps, particularly the larger ones. The condition was aggravated by the fact that for operational reasons it was necessary to open these camps before they were completed. The arrangements for combating these outbreaks in collaboration with the prison authorities, resulted in a considerable decrease in the incidence of typhoid in camps. By the end of the year it was evident that the situation had been brought under control.

The Emergency has continued to colour and adversely affect almost every activity of the Department throughout the Colony. The financial stringency resulting from the Emergency has caused a serious slowing down of the long-term development programme which had been envisaged. As this financial shortage shows every sign of being continued, it would appear the programme of expansion for the future will have to be even more severely curtailed.

The great expansion of certain departments, notably Police, Prisons and Administration, has thrown a great strain on qualified medical staff already adversely affected by difficulties in recruiting. It has only been possible to meet our commitments in providing medical services to Government servants by engaging practitioners locally wherever possible, either on a full-time or part-time sessional basis. By the end of the year this source had unfortunately ceased to exist. In the prisons, services have only been maintained by making the fullest use of detained medical staff. On the whole, such people have worked well, as they have been relieved of the necessity of working as labourers and because they have seen that there is a possibility of rehabilitating themselves through hard work and of eventually regaining their freedom. Indeed, a few members of our staff who have been detained have already been released.

In the Kikuyu districts and in the Embu and Meru districts, inhabited by the tribes involved in the *Mau Mau* rebellion, there has been a considerable improvement in the overall situation during the year, largely as a result of the control which the forces of law and order have been able to maintain over the population. One innovation affecting these districts which has had a profound effect, not only on the lives of individuals but on public health, has been the compulsory aggregation of the population into villages. This was started early in the year for purely operational reasons, either to afford means of protection from the terrorists by building villages in close proximity to a fortified post, or as a punitive measure to bring under control the population of certain locations which were known to be actively aiding and abetting the terrorists.

The Medical Department was quick to realize the implications in the field of public health of this major revolution in the lives of the people and every effort was made to persuade the authorities to site the villages in accordance with principles of public health and to build houses to a reasonable sanitary standard. In the early stages our efforts in this direction were, to a large extent, frustrated by the urgency of the military situation and a shortage of trained staff, and many villages were built which could in no way be considered to conform to sanitary standards and which were in many cases a menace to public health. As the urgency of the situation began to abate, it has become increasingly possible to ensure that villages are built under medical supervision. Indeed, it is pleasing to be able to report that some of these villages may now be considered to be model villages where sanitary facilities and certain amenities are provided. It is to be hoped that this practical demonstration will result in popularizing the idea of village life to the extent that, when the Emergency is ended, the best characteristics of such villages may be retained and they may continue permanently in modified form.

Towards the latter half of the year the improvement in the general situation led to increased confidence amongst the people and more freedom for the medical staff to move around the district, and in many districts armed escorts for medical staff became unnecessary. The improvement in the situation is reflected in the figures for hospital attendances and particularly in the increased use which is now being made of maternity wards in the affected areas. Restrictions on travel, however, still prevent many people from reaching hospital.

Improvement in the general situation did not occur to the same extent in the European farming areas where the control of a scattered population is more difficult, but in these areas district medical services are less well developed. Consequently, there was less obvious interference with medical work.

The provision of rural health centres has been continued throughout the year but the staff situation has necessitated a great slowing down of the development of these important services. However, those which have already been started have continued to render increasingly valuable service and there can be no doubt that this policy is proving to be not only successful from the departmental point of view but extremely popular with the people who are served.

STAFF

During 1954, three Senior Medical Officers, two Specialists and two Medical Officers gave notice of resignation or were transferred and 13 new Medical Officers were appointed. The position, however, remains critical owing to the large amount of extra medical and administrative work entailed by the Emergency and the difficulty experienced in engaging "emergency" Medical Officers. At the end of the year two Specialist posts and ten Medical Officer posts were vacant.

The detention, for political reasons, of trained African staff continued throughout the year and the losses could not be made good by the training schools. This is not surprising when it is considered that the training for the higher grades of medical auxiliaries takes three, and in some cases four, years, moreover subsequent practical experience after training is essential for those who are required to undertake the full responsibility of independent charge.

It is difficult to understand how men drawn from the better educated members of the tribes concerned and who have received three or four years' training entirely at Government expense could sacrifice their self respect, their

prospects and their liberty not only by contributing financial and political support to a movement so destructive and bestial as *Mau Mau*, but by active participation in plots to murder their fellow Africans who were wise enough to resist participation in the *Mau Mau* movement.

It is particularly in the ranks of the more senior members of the African staff that the loss to the Department as a whole was most acutely felt. This shortage of trained staff has affected all districts and not only those particularly affected by the Emergency, as trained personnel from other districts have had to be drafted to fill both the vacancies of those detained and the new posts necessary in prisons and detention camps.

Housing of staff remains extremely difficult and this is accentuated by heavy recruitment to other departments, especially the Police, Prisons and Administration.

No new African Medical Officers qualified this year but seven already in the service obtained local registration either by examination or by interview by the Board of Assessors.

Four European Health Inspectors left on transfer and no new recruits have been obtained although one temporary Health Inspector has been taken on. There remain three vacancies with little immediate prospect of filling these posts.

QUEEN ELIZABETH'S OVERSEA NURSING SERVICE

During the year three new Nursing Sisters were appointed, one left on retirement, two resigned on marriage, and two were transferred to other territories. At the end of the year there were 56 vacancies on the permanent staff but the engagement of temporary staff locally against these vacancies made it possible to carry on the work of the Department with comparatively little disturbance.

FINANCE

As a result of the introduction of the Consolidated Fund System, the responsibility for accounting for expenditure and the collection of revenue was transferred from the Treasury to the Medical Department.

With the introduction of this new system, it was decided to change the financial year from the calendar year to the period 1st July to 30th June. In order to effect the changeover, estimates of revenue and expenditure were made for the half-year period 1st January, 1954, to 30th June, 1954.

The total expenditure of the Medical Department, excluding Development expenditure for the half-year 1954 amounted to £682,313 as compared with £621,902 for half the cost of the year 1953. The increases in expenditure were due to increased costs and a general expansion of medical services.

The sum spent on capital projects in the Development Plan amounted to approximately £220,000 in 1954. Further details of this expenditure are given in a subsequent paragraph.

The following is a comparison of expenditure under the main sub-heads for the half-year period 1954 and against the same period for the year 1953:—

	1953	1954
	£	£
Personal Emoluments	345,307	363,985
Travelling Expenses	25,490	25,509
Medical and Surgical Stores and Equip- ment	112,219	112,148
Maintenance and Upkeep of Medical Establishments	68,333	69,463
Miscellaneous	49,429	52,636
Non-recurrent (Purchase of Transport, Capital Grants, etc.)	21,124	58,662
	<hr/> 621,902	<hr/> 682,303

TRAINING

The new block of classrooms and offices of the Medical Training School, Nairobi, was opened by His Excellency the Governor on 23rd February, 1954. This has proved to be a very great boon as formerly all instruction was carried out in temporary buildings.

It is becoming increasingly evident that the present arrangement whereby different grades are trained in different places should be terminated as soon as possible. At present Hospital Assistants and Nurses are being trained at the Medical Training School, Laboratory Assistants obtain their training at the Laboratory, the Sanitation trainees including Health Inspectors, are housed in temporary buildings some miles from Nairobi at Jeanes School, and Radiographers are trained at Kisumu. It is a matter of great importance and urgency that all medical training should be carried out in the same site at an enlarged and improved Medical Training Centre. We have in fact come to regard this as the highest priority affecting the public health of the country. (It is unfortunate that at the time of writing, no funds are in sight for this essential project as such development funds as remain are fully allocated to other purposes.)

The numbers of the various grades in training at the end of the year were as follows:—

Hospital Assistants	120
Compounders	11
Laboratory Assistants	7
Kenya Registered Nurses	12
Assistant Nurses (Female)	29
Radiographers	4
Health Inspectors	22
Health Assistants	48

Health Assistants carry out only a part of their training at the Hygiene School. The numbers of the various grades qualifying during the year were as follows:—

Medical Staff—

Hospital Assistants	..	..	..	..	29
Compounders	..	..	..	..	10
Laboratory Assistants	..	..	..	..	5
Orthopædic Assistants	..	..	..	..	9
Radiographers	..	..	..	..	4

Sanitation Staff—

Health Inspectors	..	..	..	..	3
Health Assistants	..	..	..	..	27

As usual, there were a number of resignations and dismissals during the year. The total number dismissed for various reasons was 27. In addition to these, it is necessary to record further losses which were directly due to the Emergency, 13 Learners being detained for implication in the *Mau Mau* movement.

During the previous year three Asian girls had been accepted for training to the standard of Kenya Registered Nurse, which is a qualification equivalent to that of State Registered Nurse in the United Kingdom, and during 1954 five additional Asian girls were taken in for training to this standard. For the first time two African girls who had taken the School Certificate started their training for Kenya Registered Nurse standard.

A number of girls also entered the School for training as Assistant Nurses Grade I and II. Unfortunately, as accommodation is very limited, not more than 12 African girls could be taken for training in 1954. With the opening of the new African Nurses' Home in 1955, this state of affairs will be very greatly improved and the training of English-speaking girls as nurses, which commenced three years ago, will be greatly expanded. This will be possible as the number of English-speaking girls now applying for admission to the Nursing Training School is increasing every year.

About three years ago the training of Male Dressers (i.e. Assistant Nurses, Grade II), started in certain District Hospitals. This system has now been consolidated and 22 Government Hospitals and 9 Mission Hospitals are now approved by the Nurses' and Midwives' Council of Kenya as Grade II Training Schools. This is a major advance as, until recently, the lower grades of Male Nurses in the Medical Department did not obtain a systematic training. The various hospitals at which training is carried out vary considerably as regards the success of their candidates. This is not surprising, as many of the Nursing Sisters who are responsible for training have had no previous teaching experience. During the year, 112 candidates took the final examination for Grade II Nurses, of whom 72 were successful. The training of African girls as Grade II Assistant Nurses has hitherto been carried out solely in Nairobi, but arrangements have been made to start the training of girls in two hospitals which have now been provided with proper and secure accommodation. The two hospitals concerned are Nakuru and Nyeri.

Two small Midwifery Training Schools have now been opened at Government Hospitals at Fort Hall and at Kisumu.

Training of Health Visitors

This was continued at Kisumu and a new Health Visitors' Training School was opened at Embu to serve the Central Province. The numbers so far under training are small, 10 at Kisumu and 12 at Embu. Every endeavour is being made to increase the number of girls who are trained in this grade as they are urgently needed to staff the Rural Health Centres.

The training of Health Visitors has progressed slowly. It is a new idea for the African and will take a little time to become as popular as nursing and midwifery have proved to be.

Girls in all grades of training are doing very well and except for a few who have been dismissed for disciplinary reasons, they have proved themselves to be good nurses. This is especially true in the case of Asian and African girls training to the Kenya Registered Nurse standard who have shown outstanding keenness and enthusiasm, especially in their ward work.

BUILDINGS

Considerable progress was made in new buildings under the Development Plan, though not as much as could be desired as the prior demands for Emergency buildings inevitably resulted in departmental projects being put back. Nevertheless, the approximate sum of £220,000 was spent. A list of the work undertaken and completed is given below. Against each item a sum is indicated showing the estimated expenditure during the year.

	£
Kisumu Operating Theatre	1,260
Kisumu T.B. Ward	5,000
Kisumu Water-borne Sanitation	1,500
Nyeri Surgical Ward	4,000
Nyeri Stores	700
Staff Housing, General	4,500
Kisii Ward Extension	5,000
Kabarnet Ward Extension	5,000
Thomson's Falls Extension	5,000
Kitale and Kisumu Completion of Asian Wards	1,500
Maralal Hospital	3,000
Naivasha Hospital	2,000
Leprosarium Itesio still under construction	10,000
Tuberculosis Institute and Infectious Diseases Hospital, Mombasa (Alterations and New Buildings; Nurses Home completion)	8,000
King George VI Hospital (Completion Mary Griffin Home; Mortuary and Autopsy Room; Completion of Kitchen)	38,000
Nairobi Medical Stores Extension	10,000
Nairobi Infectious Diseases Hospital Phase I Completion and Commencement of Phase II	50,000
Mombasa General Hospital Completion of Admission Block	50,000

Health Centres—

Chief Health Centres at Embu, Fort Hall, Machakos, Meru and Kitui completed	10,000
Kiambu Waruhui Memorial Main Health Centre	4,500
Locational Health Centres at Iguhu and Kangema completed	2,000
(Gatundu and Ahero Locational Health Centres were built from African District Council Funds)	

HOSPITALS**European Services**

The European community have taken over the financial and management responsibilities of all European Hospitals with the exception of Kisumu. Half the capital costs for approved buildings are met by the community and half by the Government, i.e. on a £1 for £1 basis. Recurrent costs are covered by the fees charged and by donations.

The European Hospital Fund resulting from a graduated levy on income, permits reimbursements, at the present time Sh. 35 per day, towards the cost of hospital fees. Grants are also made from this fund to assist in the cost of home nursing.

The new European Hospital in Nairobi, consisting of 100 beds, was opened in 1954 as part of the European Hospital Association's scheme, of which the Princess Elizabeth Hospital for Women, and the Maia Carberry Nursing Home were already in existence.

Medical treatment is not included in the above scheme. The cost of all such treatment is met by the individual patient unless under the terms of contract as in the case of Government officials and their families, they are entitled to free treatment.

Asian Services

The Asian community have plans for the building of two large hospitals in Nairobi and it is hoped that a fund similar to the European Hospital Fund will be initiated in 1955 in order to reduce the direct cost of hospital fees to the individual.

Asian wards have been built at Kitale and Kisumu, grants having been made by Government towards the capital cost.

At the present time all Asian Hospitals with the exception of the Pandya Memorial Clinic at Mombasa, the Lady Grigg Indian Maternity Home in Nairobi and a few private Nursing Homes are managed and supervised by the Medical Department.

African Services

A detailed report on the King George VI Hospital in Nairobi was made in the Annual Report for 1953. During the year an up-to-date kitchen and additional staff housing have been built and a Home for 100 African nurses has been commenced. The depletion of African staff referred to above has caused considerable difficulty especially on the surgical side where the detention of members of the theatre staff, which fell from 24 to 8 following Operation "Anvil" in April, reduced operating sessions both in length and number. It is to the credit of the remaining staff that operations performed in 1954 were only 120 less than in the previous year. Much operating was done from 7 p.m. onwards, sometimes continuing to 4 a.m.

The Blood Bank continued under the care of the Matron and an average of 30 pints per month were taken. The donors in the vast majority of cases were Africans.

Altogether, during the year 11,297 patients made use of the 660 beds in the hospital.

Recognition by the Royal College of Surgeons of England

The visitor from the College in 1954 was Sir Archibald MacIndoe, F.R.C.S. On his recommendation certain appointments have now been recognised for 10 years by the Royal College of Surgeons of England. These are: one post of Resident Surgical Officer to be held for a year, two posts of Senior, and two of Junior, House Surgeons, each to be held for a period of six months.

Provincial and District Hospitals

With funds made available by the Development Plan improvements and extensions were carried out to the fullest extent possible. Limitation was not so much the result of lack of funds as the physical incapacity of the Public Works Department and other contractors to build quickly enough. Shortage of staff precluded the opening of any new hospitals, but it was possible to post a European Medical Officer to Kabarnet.

The greatest credit is due to the staffs of provincial and district hospitals, especially in the Central Province for carrying out ever increasing duties under conditions which required a combination of the virtues of patience and fortitude, and an ability to improvise and to decide which of the numerous matters calling for attention were the most important. Despite the difficulties experienced and the defection of certain members of the staff the morale throughout the Department was high.

The following quotation from the report of the Senior Medical Officer, Nairobi, illustrates the improvement during the year:—

"In June of this year a Kikuyu Resistance Group began to form round a Kikuyu doctor. They quietly collected round themselves men who could be trusted, and gradually information came in to them. By September they felt sufficiently sure of themselves to come into the open. A meeting was arranged with the District Commissioner and it was decided that part of this group should form a screening team in order to screen the remainder of the Kikuyu, Embu and Meru staff. A Chief came to live in the hospital quarters in order to give the screening authority and to see fair play. The screening went very well and more and more information came in covering activities from points as far away in distance as Nanyuki and Nakuru and in time as the Waruhiu murder. Many dangerous men, some the least suspected originally, were detained whilst no action was taken against others who gave sufficient accurate information. By the end of the year it was true to say that all *Mau Mau* activities amongst the Staff had come pretty well to an end. There were, however, many men who had confessed and had given a lot of useful information it is necessary to see how they will behave and a constant watch will be kept. During these screening activities and in the period leading up to them the resistance group created a more effective type of home guard than was possible earlier in the year. Not an incident took place in the lines without their being aware of it; frequently they had prior information."

Welfare Activities

Wherever possible a football team was formed, and in the bigger towns these teams competed in league competitions. In Nairobi there were two inter-departmental competitions, a league for the MacLennan Cup and a Knock Out Competition for the Jones Ball. The Medical Training School held its own league competitions for the Japhet Dibo Cup.

It is regretted that security considerations rendered it impossible to hold the Annual Departmental Athletic Sports.

In the smaller up-country stations it was difficult to organize more than simple pastimes such as badminton and tenniquoits, but in Nairobi with its large staff population in the vicinity of the King George VI Hospital much more was possible.

The school for children of the staff was well supported and, with the assistance of the Director of Co-operatives, a Staff Co-operative Shop experienced a successful year and finished the year with a substantial credit balance.

The Gardens Cup for the hospital gardens and grounds which had showed the most improvement during the year was awarded to Kisii District Hospital.

The Kenya African Medical Staff Union continued to do useful work and its committee are steadily showing a greater sense of responsibility and an appreciation of their proper function.

SPECIAL HOSPITALS

Mathari Mental Hospital, Nairobi

The Emergency has caused a number of changes in the African graded and ungraded staff during 1954. Police activity resulted in 4 graded and 19 ungraded male staff being detained. One ungraded male was convicted of having ammunition in his house. Nevertheless, with the recruitment of new staff, although untrained, supervision and treatment of all races has not been relaxed.

Number of Patients Treated.—The total number of patients treated in 1954 was 1,207 (1,147 in 1953). There were 542 admissions (536 in 1953), of these 53 were Europeans (28 male and 25 female), 42 Asians (22 male and 20 female), 477 Africans (300 male, 147 female), 12 per cent were voluntary, 25 per cent temporary and 63 per cent on Reception Orders.

Discharges.—429 patients were discharged during the year (401 in 1953); of these, 40 were Europeans (22 male and 18 female), 39 Asians (22 male and 17 female) and 350 Africans (247 male and 103 female).

Deaths.—55 patients died in 1954 (127 in 1953); 2 European males, 2 Asian males, 1 Asian female, 39 African males, and 11 African females.

This is the lowest death rate on record and is partially due to a natural fluctuation as a result of the heavy death rate during 1953 and partly due to the absence of a long period of cold, wet weather in the middle of the year.

Accommodation.—In spite of the high discharge rate, this very low death rate resulted in overcrowding towards the end of the year. Natural expansion of numbers has used up the extra accommodation provided by the three new buildings erected in 1951.

In December, a start was made on the new building for European females but, owing to labour difficulties, this is progressing very slowly.

Physical Health.—Pellagra cases showed a slight increase over 1953, more so in cases that have been resident for a number of years.

Cases of Bacillary dysentery showed a slight decrease during the year, 13 in 1953 and 10 in 1954.

A marked decrease in tuberculosis will be noted from the following:—

	1954	1953	1952	1951	1950	1949	1948
Cases ..	10	25	12	14	37	16	23
Deaths ..	7	22	5	13	34	10	19

No typhoid cases were notified as against nine cases in 1953.

GENERAL CONDUCT OF PATIENTS

There was a reduction in the total number of casualties of 10 per cent sustained by patients during the year. Four cases of fractures resulted either through accident or assault by other patients. On only four occasions were staff subjected to assault by patients. There were no suicidal attempts.

Restraint or seclusion were not employed during the year, use being made of modern drugs and narcotics.

Attempts to abscond by patients totalled 27, of these only two African males succeeded.

PATIENTS' OCCUPATION, RECREATION AND WELFARE

An average of 60 per cent males and 54 per cent females were occupied either in occupational therapy or the essential work of the hospital. This is about the average for the preceding years.

Gifts from the various communities were received during the year and the visit of the Mayor of Nairobi at Christmas was appreciated.

Football continues to be played by the patients and staff, and great interest is taken by the patients when league teams visit Mathari.

THERAPEUTICS

Electro-Convulsion Treatment.—This treatment was used on a large scale, often with scoline. The following table shows the number of patients treated and results obtained:—

	EUROPEAN		ASIAN		AFRICAN		OUT-PATIENTS	TOTAL
	M.	F.	M.	F.	M.	F.		
1954								
No. Treated ..	7	8	8	10	183	84	23	323
Discharged ..	7	6	6	7	73	29	—	128

Twenty-eight more patients received treatment than in 1953 and 24 more were discharged.

Insulin.—Thirty-five patients underwent Insulin Therapy during the year 1954. This is an increase of 30 over 1953.

A number of patients were treated with sub-coma insulin with good results. It seems to be the best treatment available for the thin, anxious type.

Neuro-Syphilis.—Eight neuro-syphilitics were admitted during 1954. Of these, five died and three were discharged. All received large amounts of penicillin. The three discharged were African males.

Prefrontal Leucotomy.—Fifteen cases were operated on in 1954. Of these, seven patients appeared to show no marked change; seven showed improvement and still remain in hospital and one died. One of these cases was operated on by total ablation of the prefrontal areas. One case operated on in 1952 and in 1953 was discharged in 1954 and entrusted to relatives.

Nearly all showed at least some improvement, particularly in regard to distressing symptoms such as coprophagia and destruction of clothing.

Infectious Diseases Hospital, Nairobi

The present hospital was built over forty years ago and then was considered to be ideally sited, being some four miles from the centre of Nairobi, and surrounded by open plains. To-day it finds itself in the centre of the newly developed industrial area and astride of the new arterial road to the Coast.

This is the last year of its life and by the end of 1955 it will be transferred to its new site near the King George VI Hospital and the very valuable land on which it stands will be freed for the industrial development which has been planned.

Itesio Leprosarium

Steady progress has been made since this institution was started in 1950. Situated near the Uganda border it draws its patients mainly from the North and Central Nyanza districts and has enabled the old leper camp at Kakamega to be closed.

There is now accommodation for 280 in-patients who, when they are fit enough, work on the farm which is being developed. Out-patient attendances which numbered 2,000 in July, subsequently fell by 750 in December, due to the provision of a leprosy clinic by the Uganda Government on the other side of the border for treatment of cases in that area of the Protectorate.

The East Africa High Commission has selected Itesio as the site of its Leprosy Research Station which is at present under construction.

Port Reitz Chest Hospital

Hospital Work

(a) The official number of beds in this hospital during 1953 was 102, although this number was exceeded throughout the year. During 1954, the official bed state was increased to 127, although usually more than 140 patients were in hospital throughout the year.

(b) The number of in-patient days were as under:—

				<i>Total No. of In-patient days</i>	<i>Average per month</i>
1954	..	..	..	51,029	4,253
1953	..	..	..	41,457	3,455
1952	..	..	..	41,223	3,435

(c) The out-patient attendances for screening and refills for artificial pneumothorax and pneumoperitoneum:—

	<i>Total No. of Out-patient Attendances</i>	<i>Average Attendance per month</i>
1954	2,988	239
1953	2,339	195

(d) During 1954, 354 proven cases of tuberculosis were discharged, having been in hospital for more than a month. This figure does not include five deaths which occurred within a few days of admission, four cases discharged as hopeless after less than one month's treatment, five who absconded and 16 who were discharged with no evidence of tuberculosis.

The 354 patients discharged can be classified as follows:—

Group A—

Discharged quiescent and continuing collapse therapy at Port Reitz Chest Hospital as out-patients	158
Discharged quiescent for routine follow up at Port Reitz Chest Hospital but continuing collapse therapy at other hospitals	56
Discharged quiescent and attending Port Reitz Chest Hospital for check up only	22
Discharged quiescent and attending other hospitals for check up only	7
Discharged quiescent previously, but relapsed, readmitted and discharged quiescent again and continuing collapse therapy	14
Reassessed and found fit	37

Group B—

Discharged quiescent or improved but not followed up, i.e. patients discharged to other territories, Tanganyika, Uganda, Zanzibar, India, etc.	4
Transferred to a surgical unit, Nairobi or Mombasa	13
Discharged after adhesion section only, i.e. cases from Infectious Diseases Hospital, Nairobi	6

Group C—

Deaths	4
Repatriated hopeless	17
Discharged at own request	4
Discharged quiescent previously, but relapsed, readmitted and discharged hopeless	6
Absconded or un-co-operative	6
TOTAL	354

Out of 354 patients discharged during 1954:—

Group A—

	<i>Per cent</i>
294 are now not infectious, are quiescent and fit for work and may be considered as successes	83.0

Group B—

The outcome with regard to these 23 cases is not known	6.5
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Group C—

These 37 cases must be considered failures 10.5

(e) Analysis of admissions by tribes:—

Asians	107
Africans—Coast	116
Teita	51
Mkamba	58
Kikuyu	33
Jaluo	11
Kisii	3
Pokoma	18
Others	4
TOTAL	401

The present policy is for District Medical Officers to refer cases or suspected cases of pulmonary tuberculosis to the Port Reitz Chest Hospital for investigation and assessment. Patients considered suitable for treatment are either admitted direct to the Hospital or are put on the waiting-list, and returned to their district hospital for two months in-patient treatment by chemotherapy and postural retention when indicated; after this period in the district hospital they are transferred to Port Reitz Chest Hospital for the appropriate treatment. By instituting this system of primary treatment at district hospitals it has been possible to reduce the average length of stay in Port Reitz Chest Hospital from six to four months, thus permitting a larger intake of patients.

Operations were performed as under:—

Phrenic Crush	185
Phrenic Evulsion	64
Phrenic Cut	2
Thoracoscopy	67

ANALYSIS OF ALL CASES DISCHARGED FROM PORT REITZ CHEST HOSPITAL

The fate of all cases discharged from this hospital since its inception in 1951 have been traced. When Port Reitz Chest Hospital opened in February, 1951, 66 Africans with pulmonary tuberculosis, lying in the Infectious Diseases Hospital, Mombasa, were transferred here: these were mostly far advanced bilateral cases and many were beyond all hope of successful treatment. Since then, however, a certain amount of selection of cases has been exercised.

The first admissions on 20th February, 1951, were mostly hopeless cases who were transferred to Port Reitz Chest Hospital from the Infectious Diseases Hospital—30 of these were subject to a controlled trial of thiacetazone which was continued for six months. Thiacetazone was, in fact, the only drug available for the first half of the year; P.A.S., isoniazid and streptomycin were available in small quantities towards the end of 1951, but more liberally during 1952.

In considering the fate of these patients, only those who stayed in hospital for at least one month and only those in whom the sputum was found to contain A.F.B. are included. In the former case, patients who ran away or who were found un-co-operative were discharged, and those who died less than one month from admission are excluded, and in the later, those cases where the diagnosis must be doubtful unless supported by the findings of the positive sputum.

Of the 66 far advanced cases who were originally admitted to the hospital, 54 remained after one month. The present status of these is that three are still invalids, 32 have died or have been discharged as hopeless, and 16 are quiescent, at work and attending as out-patients for surveillance and treatment, while three have disappeared or been transferred out of Kenya; nine have, at some time, been readmitted with a relapse. In only 28 per cent, in fact, is treatment known to have succeeded.

If these cases are abstracted from the 1951 admissions, 115 cases remain. Of these, 35 were Indians, Goans, Arabs, Somalis and a few Seychellois. In the case of these, special circumstances obtain. It has often been necessary to admit far advanced and indeed hopeless cases, from the public health point of view, while very often the more hopeful cases on discharge from this hospital leave the district for other parts of East Africa or their own native lands. Because of this the results for this group of people are extremely bad. They may be analysed as follows:—

	No. of Admissions	Dead or Discharged Hopeless	Relapsed	Invalids	Attending O.P.s Well and at Work	Disappeared or transferred out of Kenya
Indians, Goans, Arabs, Somalis and Seychellois:						
1951 ..	35	5 (14%)	2	—	14 (40%)	16 (46%)
1952 ..	33	5 (15%)	1	2 (6%)	15 (46%)	11 (33%)
1953 ..	52	5 (10%)	1	2 (4%)	29 (55%)	16 (31%)
1954 ..	42	8 (19%)	2	2 (5%)	25 (60%)	7 (16%)
Africans:						
1951 ..	80	13 (16%)	14	1 (1%)	50 (63%)	16 (20%)
1952 ..	123	10 (8%)	13	1 (1%)	79 (64%)	33 (27%)
1953 ..	88	11 (13%)	6	5 (6%)	54 (61%)	18 (20%)
1954 ..	103	4 (4%)	3	4 (4%)	87 (85%)	8 (7%)

The number of African cases lost is, of course, most unsatisfactory. These are almost all cases which, having attended as out-patients either at Port Reitz Chest Hospital or elsewhere for some time, have then simply disappeared. A few have been transferred from Kenya on discharge from hospital and have not been followed up. Many of these patients are Kikuyu, and no doubt the present Emergency has a lot to do with their disappearance. The number has certainly increased since the State of Emergency was declared.

The Tuberculosis Conference under Professor Heaf in December recommended a chest unit for Nairobi and a smaller chest unit for Mombasa later. The number of chest cases coming to Nairobi suggests that this will be necessary within about a year.

SPECIALIST SERVICES

The following are extracts from Specialists' reports:—

SURGICAL SPECIALIST

"The following are some of the major operations which were performed during the last two months of the year without morbidity or mortality:—

One mitral valvotomy.

One enucleation of hydatid cysts of lung.

One lobectomy for bronchiectasis.

One oesophagectomy for carcinoma.

One thoracotomy for inoperable carcinoma of oesophagus.

Two thoracoplasties for lung T.B.
 One enucleation of liver hydatid.
 Two thyroidectomies.
 Two severe gunshot wounds of abdomen.
 One pyelolithotomy.
 Four acute gangrenous appendicectomies.
 One gastrectomy for gastric ulcer.
 One excision of ectopic kidney.
 Two resections of large gut.
 One resection of small gut (for typhoid perforation)."

SPECIALIST ANÆSTHETIST

"At the request of the Somaliland Government a Somali was accepted for six months' instruction in anæsthetics.

The number of African anæsthetics was reduced during the year due to the Emergency but the amount of operating was similarly reduced. Recently, however, the amount of operating has tended to return to normal and a situation has arisen where some operating lists have had to be cancelled or curtailed due to lack of anæsthetists. As cardiac and thoracic surgery advances, the need for more staff will become even more apparent.

No changes were made in the standard techniques. A thiopentone, nitrous oxide, relaxant and pethidine sequence was used for most cases. In a small number of anæsthetics the diethazine derivatives were used.

During the year four positive pressure respirators were obtained. For three months these machines were in use during the treatment of combined bulbar-spinal poliomyelitis. During this period extra calls were made on the anæsthetists."

EAR, NOSE AND THROAT AND SURGICAL SPECIALIST

"There have been no outstanding developments in the department during 1954, but the work has grown steadily as far as European and Asian patients are concerned. This has more than offset the decline in African patients which has resulted from the Emergency. A major factor in the increase of non-African patients has been the expansion of Government responsibilities caused by the greatly increased Police, Prisons and allied Departments.

The Nairobi City Council have sent two of their staff to be trained in the treatment of common diseases of the ear, nose and throat, and they are now doing useful work at the location clinics. By treating cases there it is easier for the patients to attend regularly, and also pressure on the Medical Department is relieved.

The Ear, Nose and Throat Specialist has made regular visits to Mombasa where an increasing number of European officials and their dependents are coming forward for operation.

The in-patient beds under the care of the Ear, Nose and Throat Specialist are also used for neuro-surgical and facio-maxillary cases. Head injuries caused both by gunshot wounds and by road accidents are common and constitute a considerable part of the work in these wards. The value of nursing the deeply unconscious patient in the prone position has been amply demonstrated as a prevention of chest complications."

GYNÆCOLOGY AND OBSTETRICS

"*Fistulæ*.—The King George VI Hospital continues to act as a centre for the treatment of vaginal fistulæ, and the following results were obtained over the years 1952–54 inclusive:—

Vesico-vaginal Fistulæ.—69 cases treated as follows:—

Local Repair	.. ..	67 (94.3 per cent)
Transplantation of Ureters	4 (5.7 per cent)	—these include 2 cases of failed local repair

The local repair details were:—

No.	Failed	Improved	Cured	Deaths
67	8 (11.9 per cent)	14 (20.9 per cent)	45 (67.1 per cent)	Nil

'Improved' implies healing of the fistula site, but some stress incontinence of urine remains. These figures are an improvement on any other published results so far as is known.

Infertility.—Three cases of tubo-uterine implantation employing polythene tubing have been performed.

Family Planning.—A limited number of Africans are beginning to seek advice on family planning, and it is expected that more and more will do so in the future. Meanwhile, pamphlets have been prepared, and in three out-stations Medical Officers have applied for advice and equipment."

DERMATOLOGY

"Attendances at the African clinic fell off appreciably at the time of Operation 'Anvil' but towards the end of the year recovered almost to normal figures.

No points of particular clinical interest have been noted apart from post kala azar dermal leishmanoid. A small number of cases have been treated by a combination of cortisone and the orthodox anti-kala azar treatment. There appears to be no doubt that the use of cortisone expedites recovery from the skin lesions but there is a tendency to relapse. The principal interest in this is the public health aspect of such cases as foci for the dissemination of kala azar. If such is considered to be of significance, then the cost and minor hazards of cortisone may well be justified in the treatment of such cases."

HEALTH CENTRES

During the year the policy of developing health centres had to be severely curtailed as, owing to the Emergency, the African staff was reduced in number and at the same time had to undertake additional Emergency commitments. Only six new health centres were opened during the year, namely at Gatundu, Iguhu, Bondo, Siaya, Ahero and Kangema. At the end of the year a total of seventeen locational health centres were in operation.

The work of these health centres continued to show excellent results. Most of them can now be considered in a very real sense to be projections of the district hospital where preventive, promotive and curative work is carried out by the African staff working together as a team.

It is the future policy of the Medical Department to develop additional rural health centres as soon as trained staff and the necessary finance become available.

During the year the first of the new vehicles provided by U.N.I.C.E.F. for use at health centres arrived, and these have proved to be most useful as they link the health centres with the district hospitals and have enabled district work to be more closely co-ordinated with the district medical administration. The supply of motor-cycles and bicycles donated by U.N.I.C.E.F. was also received towards the latter part of the year and will be distributed early in the new year to African staff working in these centres.

Consideration has been given to co-ordinating more closely the work of mission dispensaries in the districts with the African District Council organizations so as to avoid competition and to provide the best possible service for the district population, irrespective of the agency responsible for the service.

PRISONS, PRISON CAMPS AND DETENTION CAMPS

The Medical Adviser to the Labour Department was seconded to control the Emergency Camps on 10th May, 1954. On 1st November, 1954, his duties were handed over to the newly appointed Senior Medical Officer in charge of Prisons and Detention Camps.

General

During the early days, camp siting and construction went ahead without medical advice and without planned environmental hygiene owing to the prior demands and urgency of the security need. The principle of using the many detained trained medical staff could not be implemented for security reasons, and a Colony-wide search for civilian staff was necessary. At the end of the year, the earlier problems had been solved and medical organization was becoming increasingly efficient.

(1) CAMPS

By the end of the year, a satisfactory set plan had been produced and its implementation greatly eased problems of camp construction.

Much variation in structure was met with, from huts of mud and poles with grass roofs to aluminium "A" frames. Those built of local material have stood up to the weather and use in most cases, though the prisoners at Sakwa spend most of their time rebuilding.

The original area per man was 30 square feet: this was later reduced to 20. In any case, this space is not used in a regular pattern for the detainees tend to crowd up to one end of the hut at night.

Overcrowding was not a problem except temporarily in certain camps in the Fort Hall district. This did not give rise to outbreaks of communicable diseases.

At the end of the year, it was evident that it was unwise to construct camps to hold more than 2,000. Epidemiologically, the incidence rate of disease rose rapidly in populations of over this figure despite the case that environmental hygiene was as good or better in larger camps. Experience suggests that the largest camp should be for 1,500. Small works camps of 500 were found to have a very low incidence of sickness.

Further integral problems of camp construction and management will be noted later.

(2) STAFF

The problem of staffing the multitude of camps remains difficult. It appeared at first as though the civilian hospitals would have to be denuded of staff to the detriment of the loyal African. A call-up of men from all provinces had to be put into force to staff Mackinnon Road and Manyani. It became apparent, however, that the arrested and detained medical staff were anxious to continue work and, in fact, many came forward without hesitation. In some cases, their position in hospitals and medical inspection rooms was abused and the medical station became the post office for the Camp *Mau Mau* committees, and the medical staff contact men between cells. The difficulties were gradually overcome and, by the end of the year, the detained staff were doing much of the work, although it was still necessary to utilize the services of non-detained medical staff.

(3) WATER SUPPLY

Satisfactory supplies were installed from boreholes and rivers to all camps, though there was difficulty with the reticulation systems, especially at Manyani.

The aim is to install a safe, chlorinated water supply to every camp.

(4) COOKING METHODS

Individual cooking in works camps led to dirt and squalor, and it was realized that communal cooking was the method of choice, although it involved extra expenditure. This principle was, therefore, recommended to the Commissioner of Prisons who concurred.

(5) SANITATION

It was originally hoped that camps would have pit latrines, but this proved impracticable in all save those on the forest slopes of Mount Kenya and upon other high ground. Bucket latrines had to be introduced and involved much extra expense and supervision.

Great difficulties were experienced in obtaining sufficient buckets and the poor quality of the local products was soon very evident. Much work has to be done to tighten up and make safe the night soil disposal areas and urinals have been installed.

(6) DIET

The basic diet with additions for degrees of work at coast and up-country levels was worked out by the Government Biochemist and has, to date, proved adequate and ample to maintain health. There have been outbreaks of pellagra in several camps due, it is thought, to a breakdown in the internal economy of the camp. Scurvy appeared at South Yatta and Mwana but was quickly brought under control. Ariboflavinosis was detected at Embakasi Airport Camp.

The vegetable oil issue to prisoners has come under scrutiny and the Commissioner of Prisons advised that only fortified oil containing at least 4,000 i.u. of vitamin A to the ounce be issued.

(7) DISEASE INCIDENCE

A system of weekly notification of the main diseases has been introduced, although the accuracy of these returns is dependent upon the medical calibre of the dresser; they form a basis for inquiries should they notify abnormal figures and give warning of possible outbreaks of disease.

The general incidence of disease has been 71 per thousand over a period of four months. The camps that show remarkably little incidence are the works camps of 500 (or usually less) men.

(8) DISEASES IN DETAIL

Pulmonary Tuberculosis.—At the close of the year pulmonary tuberculosis had not shown the high attack rate that might have been expected. Diagnosis on purely clinical grounds with subsequent notification in weekly returns has given a false figure; many of these cases have subsequently been proven negative.

The principle has been laid down that "grey" detainees with pulmonary tuberculosis should, if security allows, be sent back to their reserve. So far, a very few cases have been repatriated.

Typhoid Fever.—Outbreaks of typhoid fever have occurred in Manyani and Mackinnon Road. A few sporadic cases have appeared in Embakasi, Athi River and Kamiti, but have not been followed by outbreaks.

The Manyani outbreak, starting as it did from arrests of sub-clinical cases and of cases incubating the disease from the Nairobi area, began in epidemic form in September and in the week ending 31st October 51 cases were admitted. There was a gradual decline of intake towards the end of the year and the disease was being brought under control.

A total of 101 cases were admitted in December as against 147 in November. The total admissions for typhoid up to 31st December was 1,151 and the total deaths 115.

Mackinnon Road had a mild outbreak of typhoid in July which peaked with the admission of 20 cases in one week. There was a decline in the attack rate and in mid-September only three or four cases were being dealt with each week. On 12th September, 1,200 men were transferred from Manyani to Mackinnon Road and three weeks from this date, a large outbreak started with rapidly rising incidence and 30 to 40 cases were occurring each week in October.

Admissions to hospital at Mackinnon Road were:—

September	..	..	..	..	..	7
October	..	..	..	..	..	54
November	..	..	..	..	..	123
December	..	..	..	..	..	90

By the end of the year there was evidence that the disease was coming under control.

One or two salient points may be mentioned:—

- (i) All inmates had been vaccinated with T.A.B. or "T". It is difficult to assess the effect this had on the outbreak, but it is considered that even though it had not prevented infection in all cases, many patients have had a modified form of the disease with a much lower mortality.
- (ii) The warder staff were not immune, and their attack rate reached proportions as high as that of the detainees.
- (iii) The effect of this outbreak was to freeze all movement of detainees.
- (iv) That camps as large as Mackinnon Road, with 8,000, and Manyani, with 17,000, required careful control and the maintenance of a high standard of sanitation.

Dysentery and Diarrhoea.—Dysentery and diarrhoea have been common on the opening of new camps and after the movement of batches from one camp to another. There were sharp outbreaks in the four large camps. Diarrhoea has occurred twice as frequently as dysentery.

Malaria.—Cases have not occurred in any number though the figures in weekly returns have been increased by a mass of "clinical malaria" cases. 1,795 cases of malaria were reported over 18 weeks in October, but only 7.5 per cent of slides from 294 samples proved positive. A low incidence of 3.3 per cent was obtained from a sample check at Manyani. Control has been exercised by residual spraying by gammexane and by the destruction of local breeding grounds. Malaria suppressives are only being used in the four Nyanza camps.

Other Diseases.—There has been surprisingly little occurrence of other diseases in the camps up to date.

COMMUNICABLE DISEASES

As in previous years, there was no serious outbreak of any of the six convention diseases in the Colony. The position with regard to most communicable diseases is substantially the same, where variation has occurred it is recorded below.

Malaria

1954 was an average year for rainfall and the number of cases of malaria reported from all stations was consequently within the average range. The fact that there has been no preoccupation with the control of large malaria epidemics has allowed our organization to promote schemes of active malaria control with a view to reducing its incidence in certain specified districts.

One of the most important districts where epidemic malaria occurs is in the Nandi African Land Unit. Bordering this unit is the Turbo/Kipkarren area and the Nandi Hills farming area. To the north is Eldoret, which being a municipality, is able to afford an efficient malaria control within its boundaries.

In 1953, epidemic malaria was controlled by means of a complete dosing of the whole population of the Nandi and Turbo/Kipkarren areas with Daraprim. By careful organization it was possible to administer to the whole population an appropriate dose of Daraprim at a carefully timed interval before the onset of the rains. The object was to clear the blood of the population of gametocytes. As the mosquito population increases following the rains, it would remain uninfected owing to the absence of gametocytes in the human population. Last year it was reported that Daraprim had a most beneficial effect in subduing epidemic malaria in Nandi. In 1954 our experience was repeated. The cost of this method of control for a population of roughly 100,000 was under £2,000.

It is unfortunate that this cheap and effective control cannot be considered as a permanent measure as there is the risk of creating a strain of malaria insusceptible to Daraprim, if this drug is administered year after year. Plans were therefore made in 1954 to institute a more permanent scheme of control involving the spraying of all homesteads with dieldrin. The Department received much help and technical advice from the World Health Organization and the promise of supplies and material aid from the United Nations International Children's Emergency Fund.

In 1955, therefore, malaria control in this area will be done by dieldrin-spraying in place of mass dosing with Daraprim.

Onchocerciasis

We feel that during the year the final blow against onchocerciasis has been struck, as a complete eradication scheme was mounted in the North Nyanza district of the Nyanza Province. The Southern Nyanza and Kericho districts have already been dealt with. The Entomologist in Nyanza reports as follows:—

"The highlight of the year, so far as the Nyanza Division is concerned, was the eradication campaign directed against *S. neavei* in the Kakamega/Kaimosi area. Little research work remained to be done and most of our activities were directed towards checking the distribution of the crab (*P. niloticus*) and completing the few remaining surveys in the Elgon district.

It is now nearly seven years since the first attempt to eradicate *S. neavei* was made. It was a failure as the flies reappeared within a year. Ever since then this problem has occupied our thoughts, and to a great extent our time. It was with something like relief when we were able to decide that eradication was possible in 1954.

Most of the surveys were completed in previous years and all that remained to be done was to get sufficient D.D.T. emulsion, extra supervisory staff and more transport. The campaign was timed to commence in early September, but unavoidable delays retarded this until 20th September, 1954. However, the first three weeks of the month were profitably employed in cutting new tracks and bridge building in order to facilitate the dosing of isolated tributaries on the eastern bank of the River Isioka—efforts which paid high dividends eventually.

One hundred and seventy rivers and streams were treated every two weeks for a period of three months with D.D.T. at the rate of 0.5 parts per million parts of water. The area concerned is approximately 2,000 square miles in extent and the total number of riverine miles treated each cycle was in the region of 1,000.

Intensive adult catches made during November and December in previously densely infested rivers and streams were negative. These catches will be carried on at regular intervals during the next three years.

Previously infested foci in the Kericho and Kisii districts were visited during the year for the purpose of adult (*S. neavei*) catches. Kisii was visited twice, in February and August, and Kericho once in August. Intensive catches were carried out during these visits and were made in previously highly infested areas with negative results. These results are regarded with great satisfaction and are considered to be extremely promising as it is now two years since the last fly was caught."

Trypanosomiasis

Although no severe epidemics occurred during the year, new cases of sleeping sickness continue to be reported. One hundred and thirty-nine cases occurred in South Nyanza and 72 in Central Nyanza. The incidence in Sakwa shows an increase—58 cases as compared with 18 for 1953. The incidence in the Kibigori, Koru and Muhoroni areas remain about the same as for 1953.

Some rather extensive bush clearings are carried out during the year by the Department of Tsetse Fly Survey and Control in the Sakwa and Samia areas, while in the Nyando Valley *G. palpalis* has been virtually eliminated by the use of D.D.T.

A worrying situation has been slowly developing in the Central Nyanza district with regard to sleeping sickness. It appears that a more virulent type of trypanosome may have established itself there, and that *G. pallidipes* may be incriminated as a vector. Fortunately, the human population is not very large, but there are the potentialities for spread to other more important areas. Plans are in operation to make a complete scientific investigation of the problem in conjunction with the Veterinary Department and the East African Tsetse and Trypanosomiasis Research and Reclamation Organization.

Tuberculosis

Nearly every individual Medical Officer in his annual report has expressed great concern over the prevalence of tuberculosis in his district. Even though, it is impossible to quote exact statistics for the incidence of tuberculosis, it is quite clear that urgent and effective measures will have to be taken for the control of this disease. Without any question of doubt, tuberculosis is contracted in the towns and taken out to the African rural areas. It cannot spread with such facility here but it is becoming evident that the number of infected cases leaving the towns is so large that they are transmitting the disease to the women and adolescents living in the countryside who have never visited the town.

The problem is pressing not only in Kenya but in the other East African territories. Consequently, a conference was called towards the end of the year which was attended by Professor Heaf and by representatives of all the East African territories interested in the disease and who could usefully contribute to the discussion. A plan of operations had been prepared for Kenya and was discussed at this conference. Approval without any radical modification was given to the scheme. Briefly, the scheme envisages the active search for open cases of tuberculosis both in the towns and country and their careful disposal in circumstances where they are least likely to spread their infection. Cases when found will be treated with the greatest vigour in hospital beds especially set aside for the purpose. The number of beds will not, however, be sufficient to allow of a prolonged course of treatment for all the cases that it is thought will be discovered. Hence, it has been decided that during the short period of hospitalization, every case will be given the most effective treatment known to the profession. Thereafter, it is proposed to send the cases home under the care of the district public health organization for a continuation of treatment and care, using isoniazid and P.A.S.

In 1954, therefore, much preparation for the proposed scheme had to be completed. The chief requirement was the provision of some 300 extra beds specially designed for the treatment of tuberculosis. These will be distributed in Mombasa and at the new Infectious Diseases Hospital in Nairobi, and, to a lesser extent in the provincial hospitals. An extra ward will have to be built at Nyeri, at Nakuru and at Kisumu. By the end of the year the latter two wards were nearly ready for occupation. Some few extra isolation beds had to be provided at district hospitals as well.

The provision of these beds has and will involve the Kenya Government in some substantial expense, but a very much greater expenditure of money and effort is needed before the complete tuberculosis scheme can be commenced. We are still short of tuberculosis clinics in the municipalities, and radiographic apparatus in hospitals. Furthermore, when the scheme is in operation, a large expenditure will be incurred on the provision of drugs both for in-patient and out-patient treatment. Over and above this, a completely equipped and staffed tuberculosis bureau is needed in order to control the movement of the cases.

It seems that it would not be possible to embark upon immediate expenditure for all that is described above, but the World Health Organization and United Nations International Children's Emergency Fund are willing and anxious to give all the assistance they can in their power. It is expected that the World Health Organization will be able to provide certain technical and special staff for a period of a few years in order to help the Department in its coming task.

It is also hoped and expected that the United Nations International Children's Emergency Fund will be able to supply a substantial amount of radiographic and other special equipment, not excluding the provision of transport.

By the end of the year matters had reached a stage when the complete scheme had been put down on paper and a rough estimate of costing had been made. It now remains for the Government, the municipalities, the African District Councils and the two international organizations mentioned above to agree to the scheme and find the means whereby it can be put into operation. It is essential that the tuberculosis scheme should at least be commenced in 1955, because the essence of the present method of control is to remove an infected case away from the town where he caught the disease, into the countryside where he has a better chance of recovering. He must be removed from the town as it is here that he is most dangerous owing to his ability to infect many of his fellows who are living in circumstances which are often favourable for the spread of the disease.

As the economic development of Kenya proceeds according to plan there will be greatly increased urbanization of the population who will completely sever their links with the countryside. Therefore, if there is delay, the scheme will become unworkable, as its essence is the safe disposal of the cases by returning them to their present homes in the rural areas.

Typhoid

It has always been considered that typhoid is endemic amongst the African population and that whatever cases were diagnosed only represented a small proportion of the cases occurring, since the African, as often as not, only suffered mildly from the disease and failed to present himself for medical treatment. The normal notified incidence of the disease was once about 10 per week throughout the whole Colony. There were small peaks of incidence round about the rainy seasons in April to July and September to November. At the peaks 20 to 30 notifications per week were expected.

In 1953 the position gradually changed as the early figures for March were well above 30 per week, and did not fall as the rains finished in July. Sometime before a sharp epidemic of typhoid was experienced in Naivasha where 150 Africans contracted the disease within the space of a fortnight. The cause of the epidemic was discovered in some infected buttermilk which the farm employees had been drinking to the deprivation of the rightful consumers—the pigs. The buttermilk must have been a dilute culture of *S. typhosus* and the outbreak served to show that the African needed an overwhelming dose of infection before he really succumbed to the disease.

In the latter part of 1953 the incidence did not drop as the dry weather came. A slow climb occurred and there were seldom less than 20 cases per week. The position was noted and a circular was sent out to all medical officers of health warning them of the dangers and asking whether they could give any explanation for the increased incidence in all areas of the country.

Following this period, localized epidemics became commonplace. First an epidemic started at the coast in which about three times the normal numbers of cases were reported each week. The next epidemic occurred at the other end of the Colony in Nyanza. The Rift Valley Province was the next area affected by spread from the neighbouring Kikuyu reserve. At the beginning of 1954 Nairobi became affected and a special T.A.B. inoculation campaign was put into operation in Nairobi City and in the surrounding African areas.

By April, 1954, 40 cases per week of typhoid fever were being reported, mostly from Nairobi and its surrounds.

Then followed Operation "Anvil" in which 20,000 Kikuyu from Nairobi were removed into special camps. Not only was the human population concentrated but the bulk of the typhoid carriers were brought in as well. We ascribe most of our troubles to this fact.

After Operation "Anvil" conditions in Nairobi naturally improved, but there was a further increase in incidence throughout the Colony reaching a peak of 60 notifications a week in May. This high rate of notification continued almost at the same level right to the end of the year.

From our experience of the last year, it seems that the African can exist in a typhoid carrier state for a long time in which it is difficult to determine whether he is a carrier in the normal sense of the term, or an early ambulatory case. Perhaps the latter alternative is most correct. This fits in with our previous conception of the disease in which the African suffering only apparently slightly from the disease needed an overwhelming dose before he really succumbed. We now know that not only may he need a large infective dose, but that his carrier state may break down into overt disease when his normal routine of life is disturbed, as happens in "Emergencies".

Investigations were carried out during the year into the Vi phage types of bacilli found in cultures from cases. Cultures were sent to Colindale and at least seven separate strains were discovered. The implications of these findings are now being investigated, especially with regard to the choice of the most suitable strain of bacillus from which we should make our anti-typhoid vaccine.

Poliomyelitis

The outbreak which was reported as having commenced towards the end of 1953 continued in 1954. By the time the year ended, 134 Europeans, 60 Asians and 290 Africans had been notified as suffering from paralytic poliomyelitis. Although the overall incidence was not very high, the incidence amongst Europeans was abnormally great, reaching a rate of approximately 250 per 100,000. This figure approaches the record figures for incidence of this disease which are round about 258 per 100,000. The strain involved was Type I (Brunhilde). Very stringent measures were taken to control the outbreak with possibly some success, for it was noted that although the disease occurred frequently in European adults and infants there were only three cases occurring amongst European children of boarding school age. The precepts on which the precautionary measures were based was that poliomyelitis was transmitted by faecal contamination of foodstuffs and utensils by the hands and other recognized means. The disease had passed through the country by the end of the year in a slow and regular march. The peak of incidence occurred first in the coastal area and was followed in the Nairobi area. Then the disease became more severe in the Rift Valley Province and was

later reflected by an outbreak on the western side of the Rift and in Nyanza. The disease then passed into Uganda. A detailed analysis of the outbreak is now being undertaken and it is expected that some most interesting conclusions can be drawn which may qualify for a later publication. In each area full quarantine measures were adopted to prevent the spread of infection.

Schistosomiasis

Schistosomiasis still remains a difficult disease to control for lack of a really efficient specific remedy which can be given orally and safely. The position has been complicated by doubts raised in our minds concerning the incrimination of the important vectors of both the mansoni and hæmatobium infections. A research worker visited us and investigated problems of taxonomy and bionomics of the local snail population under a scholarship from the Royal Society. Much information was collected, but as more and more knowledge was gained on the subject, so too did doubts arise with regard to preconceived notions on the vectors of the disease. It is felt that more research needs to be done along these lines for it is certain that there will be considerably more trouble with schistosomiasis as the new irrigation areas planned under the development schemes come into operation.

Several school children in Nairobi itself have contracted a mansoni infection through playing in the streams running through the city. This would indicate that very much care will have to be taken in controlling the new irrigation areas, even if they lie at an altitude of up to 6,000 feet. At the moment, an attempt can be made to prevent persons infected with schistosomiasis entering new irrigation areas and so infecting the snail population which will certainly be present in the permanent canals.

A possible method of control of snails in dams could be achieved by introducing snail-eating fish. This project, however, has had a setback for it has been discovered that the snail-eating fish cannot entirely clear a dam of snails. In addition to this, it is now recognized that the snails themselves are an essential link in the "life cycle" in the dam water and that they have a useful role to play in improving the fertility of the waters. It, therefore, will be extremely difficult to decide upon the balance between the risk of infection from schistosomiasis and the risk of rendering large areas of water less capable of supporting a useful and edible fish population. Quite clearly, the answer to this problem lies in enclosing the dams to protect them from contamination and arranging for the water supply therefrom to be piped through a properly protected system. This scheme has been constantly advocated by the Medical Department ever since dams have been constructed in large numbers in this country.

Kala Azar

The figures for kala azar incidence in the Kitui district for the year 1954 indicate that the epidemic is virtually at an end. The main peak of disease incidence in 1953 was followed by smaller peaks on a decremental scale indicating that there was some cyclical cause for the transmission of the disease. The small peaks of incidence were closely related to the rainy seasons and occurred some six or seven months after the previous rains. It has not been possible to determine why the epidemic has come to an end, though presumably this is due to natural causes and to the fact that a large proportion of the population has now been infected and recovered. As the number of cases became smaller it was decided to close the field hospitals at Tseikuru and Nuu. Cases were received into the enlarged Dispensary Hospital at Mivukoni where treatment was supervised by an African Medical Assistant.

Much experience has been gained from the epidemic. It can be recorded again that diamidines are relatively ineffective in the treatment of African kala azar. The best treatment was found to be with pentavalent antimonials, but even so, a large proportion of the cases relapsed and had to be further treated. The Medical Specialist made a survey of the population towards the end of the year and discovered many relapsed cases and one or two cases of dermal leishmaniasis.

Far-reaching entomological investigations have been carried out, the results of which have been reported in the medical Press. Many new species of sand-flies were discovered. Two new species considered to be the most likely to act as vectors have been named *P. garnhami* and *P. van somereni*. Further research showed that the latter species is the most likely to be the true vector of the human disease. This species appears and is prevalent for very short periods and breeds in ant hills. It is only to be caught at certain times of the year, strictly related to the onset of the rains, which may account for the cyclical incidence of kala azar in the human population.

Leprosy

Slow progress has been made in the building of the Leprosarium at Itesio by reason of material shortages, staff shortages and the isolation of the site. Medical work at the partially built Leprosarium has, however, been heavy and there are more than 3,000 out-patients registered at the Institute. At the same time, more than 150 in-patients were housed in temporary dwellings on the site of the new Leprosarium. Good work is obviously being done as the Medical Officer in charge reports that fewer cases are now being seen who live close to Itesio. It will be necessary later to institute a series of satellite dispensaries in order that more distant cases can be more conveniently treated. The High Commission, through the East African Committee of Medical Research and with the assistance of B.E.L.R.A., have started to build a small leprosy research station at Itesio, in conjunction with the Leprosarium. Progress on these buildings is also being held up for the same reasons that have led to delay in the main project.

Medical officers are now sending in encouraging reports on the value of sulphones in the treatment of leprosy. When this drug first came out all medical officers were encouraged to set up special leprosy clinics in their districts. Now, as the result of three years' experience, it is confidently expected that the prevalence of leprosy will be considerably modified by the use of sulphones. The one bar to complete control is the difficulty in maintaining contact with the patient for a sufficiently long time to ensure that cure is certain. The way that this can best be achieved will be through the services of African auxiliary medical personnel who are employees of African District Councils. The Medical Department is doing all it can to encourage an increased establishment of this class of person by financial assistance where possible and the provision of fuller training facilities.

PUBLIC HEALTH AND ENVIRONMENTAL SANITATION

General and Staff

There has been no alteration in the long experienced staff shortage, especially of European Health Inspectors. Further commitments made extra calls on their services as Emergency developments took place in the Central Province, particularly in connexion with the programme for the building of villages. In addition, many works camps have been built in the Central Province and there have been extra calls from the new County Councils for secondment of our European staff to their services.

There are far too few Assistant Health Inspectors to undertake the work which needs to be done. Local authorities have now become accustomed to the employment of Assistant Health Inspectors and the demand for their services is ever increasing.

It was confidently expected that at least another 12 locally-trained Assistant Health Inspectors would pass out from training at the end of the year. The Examining Board, however, decided that the pass standard should be raised and only three Assistant Health Inspectors succeeded in passing the annual examination. The Examining Board are undoubtedly correct in taking the long-term view by insisting upon a higher standard which, in its turn, postulates a higher standard of basic education for those entering for training. This will allow of a greater advantage being taken of the technical instruction they receive and will, it is hoped, produce graduates from the Health Inspectors Training School with a higher sense of responsibility and initiative.

Training of African Health Assistants for Municipalities and African District Councils continued during the year on a block system, and 60 trainees were passed through the school. This record was achieved in the face of much difficulty, as the accommodation at the Jeanes School is strictly limited and will soon become so dilapidated as to be unusable. It is planned to remove the school from Kabete and rebuild it in Nairobi in conjunction with the Central Medical Training School. Plans for extension are now ready.

African District Councils

The work of the African District Councils has progressed well during the year and the only bar to faster progress is shortage of staff. Notwithstanding the Emergency, new locational health centres are being built at Sossiot in the Kericho district, and Nambare in North Nyanza. The Emergency has prevented the building of a locational health centre at Kiamatugu in Embu. The inability to build locational health centres in the disturbed areas has not prevented progress in propagating the principles of environmental and home hygiene. A new class of Health Officer has been created, called the Home Visitor. The need for Home Visitors has arisen as a result of the concentration of the population in the villages. It has become obvious to all that Africans, the women and children especially, now congregated in the villages, know little about home and personal hygiene. This may not have mattered much when they were scattered about the countryside, but it is impossible for them to live in concentrated communities and maintain any degree of health if they follow their old habits. With the help of the British Red Cross Society and St. John Ambulance, European Health Visitors have been engaged to work in each of the affected districts; transport has been provided for them through the good office of U.N.I.C.E.F. The few European Health Visitors can do little in the many villages that are now in being, and they have, therefore, concentrated on training certain selected girls from the villages in matters of home and personal hygiene. African girls for training as Home Visitors are brought into the District Hospital at Embu and Nyeri and are given a few weeks' training in the hospital itself. Thereafter, they accompany the Health Visitors on their rounds for another few weeks and are then considered sufficiently trained and instructed to be posted to work in the selected villages from whence they were chosen. Their work is to instruct the mothers and children in simple hygienic practice in the home and constitutes the basic education of the mother and the young child to which we attach much importance. The experiment has been so successful that we consider the establishment of Home Visitors could well be a feature of permanent organization of the Medical Department and African District Council services.

It is difficult to describe in brief the numerous changes that have taken place in the Central Province as a result of village development, but the following figures give some idea of the social revolution that has taken place. There are 55 villages in the Meru district, 119 in Embu, 121 in Nyeri, 124 in Fort Hall and 82 in the Kiambu district. Many of the villages have been built at great speed and many mistakes have been made. It is becoming a pressing problem to the Medical Department, but with our limited staff the utmost is being done to ensure that all villages are designed to a layout which we consider is suitable. It is felt that no matter what urgency there is, the houses should each stand upon their own plot and, if possible, be served by a private latrine. In many instances it has not yet been possible to build proper food stores, nor install an entirely satisfactory water supply. These matters, however, are the constant preoccupation of our staff, and the administration responsible for the building of the villages has now the time to turn to these matters of health interest as the next consideration to that of security.

If it were possible to lay out a village and build the houses according to ideals, the Medical Department would welcome the concentration of the population in villages, for it is very much easier to afford medical attention and aid to a concentrated population. The ascertainment of illness is facilitated and, at times, a surprising degree of morbidity has been encountered, which, if occurring in scattered peasant holdings, might have passed unnoticed. One of the dangers of concentrating the community in present circumstances is the difficulty of providing sufficiently effective latrines. Consequently, the threat of typhoid and dysentery is always imminent. It is clear that an entirely different principle of conservancy will have to be adopted in certain villages where there is an insufficient depth of soil for pit latrines and an insufficient amount of water for any system of water conservancy. Experiments have been conducted by the Health Education Division of the department to determine whether it is possible to design a suitable type of aqua privy which could be adopted for domestic use. Some encouraging observations on this new system have been made.

Municipalities

There has been no change in the Public Health Administration in the Municipalities during the year and their routine work has steadily progressed. In Nairobi the security operations at the beginning of the year put a great strain on the Public Health Department as many of the conservancy staff were detained. As, however, an equal proportion of the general population were also removed from the Municipality, matters soon settled down to a stable state again. The difficulties encountered by Nairobi have, however, underlined the dangers of undue reliance on a bucket system of sanitation and urgent steps are now being taken in the city for a wholesale conversion to water-borne sanitation. It is to be noted that, notwithstanding the difficulties in Nairobi, a large programme of building of new African housing was undertaken and this programme will continue for the next few years.

In Mombasa an Indian Health Centre was to be opened and the Municipal Board have now undertaken the responsibility of supplying some dispensary services to the population. Kisauni Dispensary was opened during the year.

The Nakuru Municipal Council also decided to take over the responsibility of maintaining dispensary services and came to an agreement with the East African Railways and Harbours, and the Medical Department for the running of their first dispensary in the railway location. A maternity ward was built and opened as also was a new day nursery. There has been much housing development of an interesting nature in Nakuru. Kitale Municipal Board has also strenuously attacked the problem of building more houses for Africans, and a new municipal housing scheme was also opened at Kisumu.



Medical Training School, Nairobi: New Tuition Block.



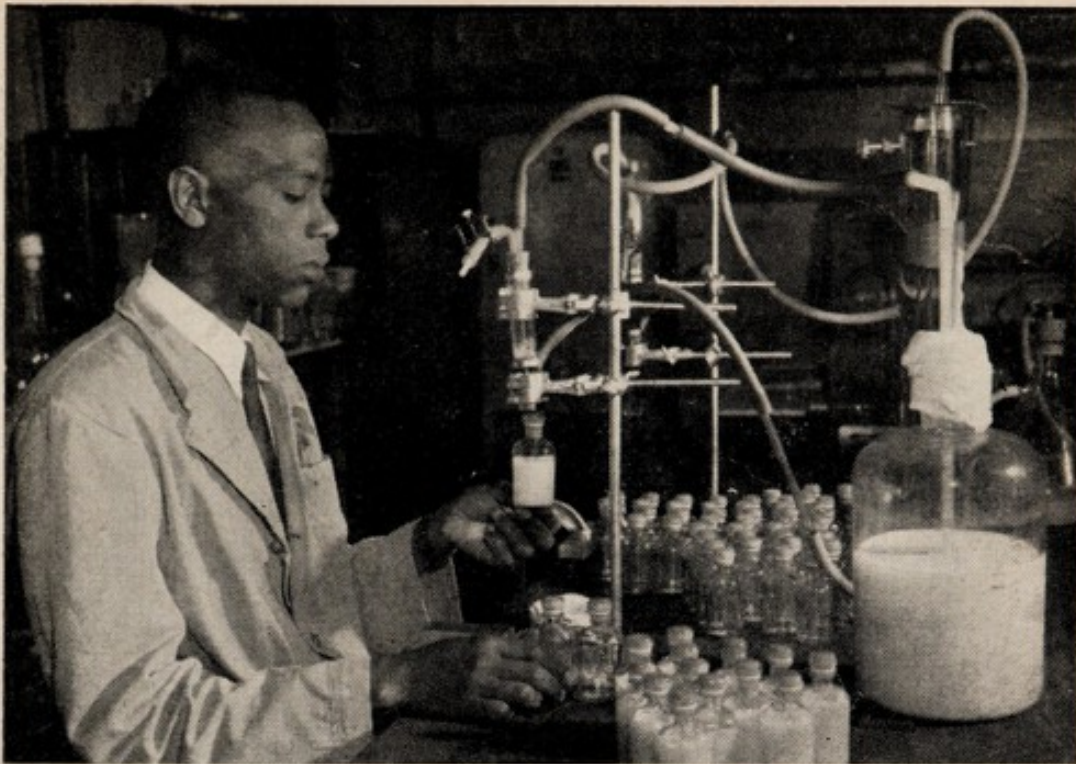
Kisumu hospital staff housing: some typical flats.



Kisumu Hospital: student radiographers in training.



Mobile unit for treatment of eye diseases.



Vaccine preparation. A laboratory assistant at work.



The eradication of Onchocerciasis. Dosing a stream with D.D.T. Emulsion.



Health Education: a few of the visual aids made in the division.



Mary Griffin Home for Nurses: a corner of the common room.

It is worthy of mention that the municipal milk scheme at Kisumu, after a trial of three years, can now be deemed to be a complete success. No other milk than pasteurized milk or that ultimately supplied from the municipal milk depot may be sold within the Municipality. This means, in effect, that all the Kisumu milk supplies pass through their depot. The town is now assured of a stable, safe and clean milk supply. It has been possible to reduce the price of milk to the consumers whilst, at the same time, the depot has made a profit which will soon pay off all loan charges and allow of a reserve to be accumulated.

County Councils

The Nakuru and Naivasha County Councils both declared themselves to be Public Health Authorities during the year. In these areas there was much work to be done with regard to the proper establishment of forest villages in the remoter part of their districts. Their very remoteness rendered it difficult to supervise them properly, and they were potential foci of disease, notably typhoid and plague.

The same difficulties with regard to the establishment of villages in the disturbed areas were experienced with the forest villages, but now that the immediate urgency is over it will be possible to ensure that they achieve proper standards of construction, water supply and hygiene. A great majority of the public health supervisory staff was loaned to these County Councils by the Government. Both County Councils are determined to expand their activities and have plans in hand for the establishment of a chain of dispensaries and full ambulance services. The Naivasha County Council is to build a maternity ward at Naivasha and at least three dispensaries in the coming year. A similar number of dispensaries are to be built by the Nakuru County Council.

The Nairobi County Council did not become a Public Health Authority in the year but was prepared to declare itself so in 1955. Much ground work, however, was covered by Medical Department staff in preparing plans for dispensaries, health centres and ambulance services in the County Council area. The Aberdare County Council was formed during the year but did not become a Public Health Authority. The odd result of this was that Nanyuki Township, which is within the County Council and which was in itself a small Public Health Authority, passed its responsibility for the maintenance of public health back to the Central Government. The reason for this was to maintain uniformity, as it was not possible for the whole of the Aberdare County Council immediately to follow Nanyuki's good example. The smaller unit had, therefore, to come into line with the larger.

District Councils

The Trans Nzoia and Uasin Gishu and the Nyanza District Councils have not yet formed themselves into County Councils. The maintenance of public health in these areas is still the responsibility of the Medical Department, but it is hoped that they will become County Councils in due course. They would then be able, as a result of their corporate status, to raise loans for the expansion of the public health services in their districts.

Housing

The Director of Medical Services continued to be represented on the Central Housing Board and on the Technical Sub-Committee of the Central Housing Board. This representation has resulted in a considerable amount of responsibility being placed on the Department, but it is clearly necessary that it should be so represented on both the main Board and its Technical Sub-Committee. Owing to the present and overwhelming demands for economy in building there is a

very great temptation to lower the standards of construction in order to achieve an economy which will balance the ever rising costs. It is essential that there should be a representative on this Board whose prime interest is not economy but who is concerned in the maintenance of health and of fit standards. The provision of certain standards of amenity in housing of whatever sort is a most important matter. A house cannot become a home unless the owner and his family can live comfortably in it and enjoy the surroundings.

Most people, and the Africans are no exception, have a fundamental ambition to be proud of their homes, if conditions render this incapable of achievement, the result is apathy, disinterest and a loss of self respect. The efficiency of the worker and the health and happiness of his family are at stake if the amenities in house design are sacrificed to too large an extent to the exact calculations of the accountant.

In other words, the saving of a few cents per square foot must be balanced against the resulting sociological drawbacks. Unsatisfactory sub-standard housing will cease to be an asset when the severe housing shortage has been overcome as such houses will no longer be rentable.

Much has been spoken about African overcrowding in the cities and townships but reports indicate a most severe overcrowding in Asian housing. The problem here seems not to be a matter of finding large sums of capital for rebuilding, but rather of finding suitable sites with proper services, where private enterprise, with the aid of the Building Societies, can build a sufficiency of housing for the Asian population. Nevertheless, building costs are so high at the moment that it is still difficult to afford sufficient accommodation for Asians at rents which the majority are prepared to pay.

European housing is inadequate, especially around Nairobi. Here, again, the problem is rather one of lag in site development in relation to the increasing numbers requiring accommodation. The result is that the unhoused European tries to find somewhere outside Nairobi where he can live. Many small houses, under the guise of guest-houses, have been built in conjunction with already existing dwellings in the peri-urban areas. These guest-houses are subsequently let, a practice which is strictly in contravention to the Public Health Division of Lands Ordinance.

Matters are now righting themselves with the opening up of several developed estates within Nairobi and by the Preparatory Authority's permitting controlled heavier density housing outside Nairobi.

Health Education

The Division of Health Education is one of the newest buds from the Medical Department organization, and as such is showing all the natural vigour and growth associated with a bud.

The work during the year was substantially carried out by the Officer in Charge of Health Education, with few funds but many demands for his services. He has succeeded in his work beyond expectations, and one can do little better than to quote an extract from *East Africa and Rhodesia* of Thursday, 21st April, 1955, on the work of the Health Education Division:—

ENTHUSIAST

To the little group of writers of official documents who decline to supply facts to the stodgy normal pattern must be added the name of Mr. Alan C. Holmes, whose first report on Kenya's Health Education Office, created in the middle of 1953, will nevertheless give less widespread pleasure than it

should do, for this short and interesting record is cyclostyled and not printed. It is, however, illustrated by many excellent photographs, which really have been chosen to tell a story. Given three rooms, a workshop, a storeroom filled with junk, three African carpenters, a few incompetent clerks, a long list of requirements and £500, Mr. Holmes was told to get on with the job. He promptly recognized the need to acquire the "attributes of a first-class cadger", considers that he is now fully qualified, and has done his best to "develop the physical advantages of an octopus, and duly found it quite possible to develop films, work on the original for a poster, answer a telephone 100 yards away, instruct his staff, and, of course, have morning tea, all more or less at one and the same time". Yet, the results appear a good deal more satisfactory than those of some Government departments which would figure high in any list of the overstaffed. Here is an enthusiast, a worker, a tactful inducer of co-operation from many quarters, and an ingenious experimenter.

TWO NEW GAMES

Take, for example, the following passages from the report: "The writer then dreamed up the idea of using 'kid stuff' as a means of putting ideas across. The first try-out was an adaptation of 'Snakes and Ladders', using medical and health precepts as hazards and encouragements. Thus 'attending ante-natal clinics' at the foot of a ladder sends the player up and forward to 'healthy babies', while 'flies on food' at the head of snake sends him down and back to 'dysentery and diarrhoea'—crude but effective. The second game, dubbed by the writer 'Safari', is a version of the dice-throwing, move-up-a-square game. On a suitably coloured background of African country a road allowing the player to make a *safari* from his own village to the village of 'Good Health'. On the way he meets many hazards and encouragements. He stops for food and kills all flies; this moves him forward, as does helping a friend to build a good house or protect a water supply. Urinating in a dam or staying in a hut with no light or ventilation send him back several squares. These games sell at 50 cents a copy; 45,000 have been purchased by the Literature Bureau for sale in the three territories". Can anyone give me a parallel example from any other department in East or Central Africa? I shall look forward to reading the next annual report of this pioneer, who deserves to have the services of the printer, not of an office duplicating machine.

Food Supplies

There were bumper crops in the Colony during the year and there should have been no need whatsoever for any food shortages. As a result of the Emergency, however, large masses of the population necessarily had to resettle themselves in other areas, which later led to local shortages of food in parts of the Central Province. The Provincial Medical Officer was extremely active in discovering these local centres of food shortage. Relief measures were immediately started through the district administration and welfare services. Much dried beef and dried milk was supplied in addition to the extra cereal allocations. The problem continues but the machinery for relief is now working more smoothly. In this connexion one again welcomes and acknowledges the institution of the Veterinary Department Field Abattoirs that supplied the dried beef, and U.N.I.C.E.F. who supplied generous quantities of dried milk.

Elsewhere there were no major infringements of the food laws nor were there any notable outbreaks of food poisoning.

Small outbreaks of dysentery do, however, occur in hotels, institutions and in homes. Almost invariably a carrier is detected amongst the kitchen staff. This is not surprising as, on occasion, some 50 per cent of the kitchen staff have been found to be harbouring some pathogen or other. The only immediate remedy for this state of affairs is to maintain the utmost vigilance and cleanliness in the kitchen.

Water Supplies

The Department has been considerably helped in its efforts to control the purity of water supplies by the provisions of the Water Resources Ordinance. This Ordinance sets up a Board to control all types of water supplies. It has now surveyed many of the smaller types of water undertakings and inspectors ensure that proper standards are maintained. The results of this are that many unsatisfactory minor water installations on small housing estates have now been considerably improved and there is a reasonable guarantee that the supply is at all times safe and pure.

Much of the water in Kenya is from deep boreholes which yield a water containing undesirable quantities of fluorine. The Hydraulic Division of the Public Works Department set itself the problem of designing a satisfactory and cheap method of removing fluorine from domestic water supplies. It was necessary that the method should be simple and applicable to individual households. After much research, a technique has been discovered using magnesite and ammonium chloride. As these two materials are in free supply and cheap, there is nothing, therefore, to prevent the adoption of this process in all affected places. The method is soon to be publicized.

MEDICAL STORES

Supply from overseas was prompt and most satisfactory for the interim six-month financial period, January to June, 1954. With the introduction of this interim period some doubt was felt that full supply of indents could be effected in six months, but the overseas agents acted promptly and full supply was made.

Stocks at the Medical Stores have greatly improved and, despite increased requests from Emergency camps, no difficulties were experienced in meeting requests in full.

Storage space is inadequate but extensions to the stores are under way and it is hoped that these extensions will be completed in the first half of next year.

Stores handling continues to increase and during the year 3,836 individual requests for stores were fulfilled and 3,000 receipt vouchers and despatch warrants prepared.

Stores expenditure for the six-month financial period amounted to £112,147.

Sterile Preparation Unit

Demands on this unit, situated at the King George VI Hospital Dispensary, are on the increase. The unit supplies intravenous, intramuscular and hypodermic injections, and transfusion and adjuncts, for distribution to all Medical Department stations.

During the year, 23,655 bottles of 540 ml. size of perfusion fluids and 17,811 bottles of smaller size intramuscular and hypodermic preparations were manufactured.

BOARDS AND STATUTORY BODIES

Pharmacy and Poisons Board

Four meetings of the Board were held. Much of the business of the Board is now conducted by the Pharmacists Sub-Committee, which had numerous meetings.

In the early part of the year the drafting of the new Pharmacy and Poisons Ordinance was finalized in consultation with the Boards of the other East African Territories. Unfortunately, it has not yet been possible to draw up the new Ordinance in its final form. It is hoped, however, that it will be presented to Legislative Council early in 1955. The aim of the new Ordinance is to achieve as far as possible uniform legislation regarding pharmacy and poisons in all three East African Territories.

The Inspector of Drugs continued his activities and inspections during the year, which have had a most marked effect in checking illegal practices. There were 66 successful court prosecutions and convictions under the Dangerous Drugs and Pharmacy and Poisons Ordinances during the year.

Nurses and Midwives Council of Kenya

The year 1954 has been one of steady progress and consolidation in the Council. Five plenary meetings were held. The Council has appointed five sub-committees to deal with finance, discipline, training, registration, and examinations, all of which were active during the year.

The following registrations were effected during the year:—

State Registered Nurses	..	..	..	..	..	76
State Certified Midwives	..	..	..	..	..	30
Mental Nurses	..	..	..	..	..	3
Sick Children's Nurses	..	..	..	..	..	5
Trained Fever Nurses	..	..	..	..	..	2
Grade I Assistant Nurses	..	..	..	..	..	60
Grade II Assistant Nurses	..	..	..	..	..	114
Assistant Midwives	..	..	..	..	..	145

The Council is responsible for all examinations of nurses and midwives, and examinations were held in February, April, August and October. The results were as follows:—

Kenya Registered Nurses Preliminary Examination

Three candidates took the examination—all passed.

Assistant Nurse Grade I Final Examination

Thirty-six candidates took the examination—35 passed.

Assistant Nurses Grade I Preliminary Examination

Forty-six candidates took the examination—43 passed.

Assistant Nurse Grade II Examination

One hundred and twelve took the examination—72 passed.

Assistant Midwives' Examination

Seventy-six candidates took the examination—43 passed.

Joint Advisory Council—Kenya Branch of St. John Ambulance Association and British Red Cross Society

Quarterly meetings of this Council were held under the Chairmanship of the Director of Medical Services. This Council provides a useful forum for representatives of the two organizations to discuss mutual problems and to effect such integration and co-ordination as may be required. Such co-ordination is particularly important at a time of Emergency such as the present, when both organizations are asked to carry out important duties in connexion with first-aid and child welfare.

The British Empire Society for the Blind Mobile Clinic

The Kenya Branch of the Society continued the survey of eye diseases and the incidence of blindness throughout the year under the general supervision and management of the Medical Department.

The unit spent approximately three weeks each month in the various districts visited. During the fourth week the Ophthalmologist in charge returned to Nairobi to engage in his private practice.

The unit carried out a great deal of useful work in each place visited, Medical Officers and other members of the staff were given special facilities for learning operative techniques and the up-to-date treatment of eye conditions. It has been found in practice that both trachoma and acute conjunctivitis, which are common in most districts visited, can be treated most rapidly and effectively with 3 per cent aureomycin ointment. This is now becoming the standard treatment in all African areas.

The itinerary of the unit was as follows:—

January.—South Nyanza district. Over 600 cases were seen. Forty-six operations were undertaken, including 20 cataracts. Over 1,000 children were examined in the schools.

Owing to a breakdown in the vehicles and the onset of the rains, no further work was undertaken until May.

May.—The unit toured Central Nyanza, where 900 patients were examined and 73 cataract operations were performed. Eighty-six blind people were seen and were classified as to suitability for training. Some 3,000 children in schools were examined.

June.—North Nyanza was visited. One hundred and fifty operations were performed and a large number of children in schools were examined for trachoma.

July, August and September.—The unit carried out a tour of the coastal districts, where the incidence of trachoma was found to be very much lower than in most parts of the country. Consequently, the complications from eye disease were less than encountered elsewhere.

October and November.—Kilifi and Teita districts were visited. The same routine was followed as elsewhere and much useful work was done.

Division of Insect-borne Diseases

The Senior Parasitologist was absent on vacation leave from July to November. On 1st November, 1954, the contract of the Parasitologist expired and by the end of the year he had not been replaced.

FIELD INVESTIGATIONS AND RESEARCH

Malaria, Mosquitoes, Control Measures

A village known as Kakuyuni near Malindi was sprayed with dieldrin (40 mgs. per sq. ft.) between the 6th, and 9th of April. Subsequent space-spraying results are as follows:—

Month	No. of huts	No. of Mosquitoes	Species
May ..	48	17	15 <i>Culicine</i> sp. 2 <i>gambiae</i>
June ..	52	71	54 <i>Culicine</i> sp. 17 <i>gambiae</i>
July ..	52	18	17 <i>Culicine</i> sp. 1 <i>gambiae</i>

Unfortunately, the pre-treatment figures were mislaid. Considerable reduction in the hut resting mosquito population probably resulted, but was not as marked as expected. This was probably because dieldrin is less repellent than D.D.T. On several occasions after the spraying, *A. aegypti* larvæ were found in containers in the houses suggesting this species is less sensitive to dieldrin than D.D.T. The Kakuyuni experiment was inconclusive because of the exceptionally dry weather towards the end of 1954; only small numbers of mosquitoes were obtained even in adjacent untreated villages.

Human bait catches were carried out in houses at Kakuyuni on a number of occasions after the dieldrin spraying. Quite large numbers of *T. mansonoides* (*africanus* and *uniformis*) were caught biting between 7 and 11 p.m.

At Gede in April an *Aedes* sp. resembling *A. fryeri* was found breeding in brackish water. In June, adult mosquitoes having four banded palps were bred from larvæ in brackish water; they are probably *A. gambiae* and not *melas*.

At Ganda, many *Ae. aegypti* adults were caught biting human bait. In May, adult *Ae. woodi* were at last induced to lay eggs. Larvæ hatched from these resembled those of *Ae. simpsoni* and *Ae. subargutus*, but were distinguished from larvæ of the latter species by the pecten spines which are different. Adult *Ae. albicosta* were caught in bush catches; a description of the larva will soon be published.

No *Ae. aegypti* larvæ have appeared in bamboo pots placed alongside houses in Mambrui. In September, large number of *Ae. aegypti* larvæ (collected at Ganda) were placed in these pots. All had disappeared a month later. No adults were ever found.

Numbers of *A. gambiae* were found breeding in brackish water with a high salt content at Jomvu: all adults were typical, none having four-banded palps. *Ae. albocephalus* and *C. sitiens* were also found breeding in brackish water near Jomvu.

Severe infestations of *C. fatigans* were noted and remedied at Voi and Malindi.

The Special Camps at Hindi, Manyani and Mackinnon Road were visited on a number of occasions and advice given on the control of mosquito breeding. *A. gambiae* were found breeding at Manyani.

The mass administration of Daraprim was repeated at South and North Nandi and again followed by a marked fall in the parasite rates, particularly in North Nandi. The following figures for 1953 and 1954 show the effect on the parasite rates:—

	1953 Per cent		1954 Per cent
<i>Tiriki Control Area—</i>			
At the time of dosing ..	37	At the time of dosing ..	24
Two weeks later ..	39	Two weeks later ..	44
Six weeks later ..	42	Four weeks later ..	33
Ten weeks later ..	55	Nine weeks later ..	45
Twenty-four weeks later	25	Fourteen weeks later ..	26
<i>South Nandi—</i>			
At the time of dosing ..	22	At the time of dosing ..	3
Two weeks later ..	1.9	Two weeks later ..	—
Six weeks later ..	3.35	Four weeks later ..	5
Ten weeks later ..	9	Nine weeks later ..	9
Twenty-four weeks later	4	Fourteen weeks later ..	7
<i>North Nandi—</i>			
At the time of dosing ..	7	At the time of dosing ..	11
Four weeks later ..	5	Four weeks later ..	1
Twenty-four weeks later	6	Eight weeks later ..	3
		Fourteen weeks later ..	7

During 1954, entomological data was collected at several catching stations in Nandi in preparation for the dieldrin spraying which is to start early in 1955. Results will be given in a separate report.

Plague.—There was a suspected case of plague from the Nubian village near Kisumu on 16th March, 1954; this was never confirmed. Several dead *Rattus* were found in the vicinity and their spleens were rubbed on abrasions on guinea pigs; no infections resulted and *P. pestis* was not isolated.

Kala Azar.—This investigation has now continued for nearly two years. The results are summarized below:—

(1) Over 5,000 sandflies have been examined and many hundreds dissected; 15 species were encountered, of which eight are new. The common known species are *P. clydei*, *P. antennatus*, *P. bedfordi*, *P. schwetzi*, *P. kirki* and *P. squamipleuris*.

Sandflies' habitats include gerbil burrows, termite hills, tree-holes, clefts in rocks, holes in earthy banks and wells. Only a few were usually present in huts and other buildings.

(2) Three species are known to bite man in the Kitui district; these are *P. kirki* and two new species of *sergentomyia* (provisionally designated *P. (Ser) sp. nov. 1* and *2*) which appear in large numbers in the ventilation shafts of termite hills after the rains.

(3) *Phlebotomus (Sergentomyia) sp. nov. 2* which bites man near termite hills and is the only one of the anthrophilic species found naturally infected with the "anterior" leptomonads, is regarded as the most likely vector of the epidemic. However, attempts to infect specimens in the laboratory have failed and the leptomonads found in "wild caught" specimens have not yet been identified.

(4) *P. clydei*, which infests gerbil burrows in the Kitui area, has also been found infected with "anterior" leptomonads; there are almost certainly derived from a lacertid lizard *Latastia longicaudata revoili* (Vaillant), which inhabits empty gerbil burrows and is naturally infected with a *Leishmania*. *P. clydei* has not been caught biting man in Kenya. Two out of four specimens fed on an infected hamster, developed "anterior" infections.

(5) A new species of *Phlebotomus*, fairly closely related to the *P. major* group, has been found in small numbers in huts, latrines and termitaries; its habits resemble those of *P. orientalis* which seems absent from the Kitui district.

(6) Sandflies have never been caught biting in houses or other buildings. The species predominating in native huts are *P. bedfordi*, *P. antennatus* and *P. schwetzi* which feed on geckoes.

(7) Of blood smears tested by the precipitin tests, 104 *P. clydei*, 40 *P. antennatus*, 44 *P. bedfordi*, 14 *P. schwetzi* and 12 *squamipleuris* were negative for human blood. Forty-three smears of *P. clydei* contained gerbil blood. One of 18 *P. kirki*, two of 16 *P. (Ser.) sp. nov.* 1 and eight of 37 *P. (Ser.) sp. nov.* 2 were positive for human blood. A smear from a single specimen of the new phlebotomus related to the *P. major* group was negative for human blood.

(8) Spleen smears from over 330 gerbils (*Dipodillus* and *Taterillus* sp.) and 30 mongooses (*Helogale undulata rufula*) were negative for *Leishmania*. However, two hamsters, one inoculated with the pooled organs of several *Taterillus* and pygmy gerbils, and the other with emulsified spleen of three mongooses, became infected, numerous *Leishmania* being present in spleen smears. Whether this proves that these two species of animals act as reservoirs round Kitui is not yet known; there is some evidence that cross infection may have occurred in the laboratory.

(9) Gland smears from over 100 dogs and spleen smears from 30 jackals were negative for *Leishmania*. Other animals examined included an aardwolf (*Proteles* sp.), ground squirrels, (*Xerus rutilus saturatus* and *Euxerus erythropus microdon*) genet cats (*Genetta genetta*), ichneumons (*Ichneumia albicauda*), naked rats (*Heterocephalus* sp.), monkeys (*Cercopithecus aethiops*), bush babies (*Galago senegalensis braccatus*), elephant shrews (*Elephantulus rufescens*), rock hyraxes (*Heterohyrax* sp.), porcupines (*Hystrix* sp.) and spiny mice (*Acomys* sp.) spleen smears were negative.

Another small outbreak of kala azar has been reported near Marigat in the Baringo country.

Relapsing Fever and Ticks.—A number of huts were sprayed with gammexane P.520 at Kwale and Tiwi. The floors were sprayed and the walls to a height of 12–18 in. Ticks disappeared from the huts a few weeks after the first spraying, but began to reappear three months later. A second spraying kept the huts free of ticks for a further seven or eight months, ticks then reappearing in about 6 per cent of the huts. Several applications of the insecticide are more effective than one and all huts should be treated in an infested area. The technique employed was first used in British Somaliland where relapsing fever has been virtually abolished.

Over 300 *O. savignyi* collected near Wajir have been emulsified and inoculated into white rats with negative results; this is of interest, as at one time the tick was regarded as an important vector of relapsing fever in British Somaliland. So far, there is no authentic record of *O. savignyi* being found infected in nature although it is quite easy to infect in the laboratory.

About 48 *O. moubata* from a porcupine burrow in the Kitui kala azar area were emulsified and inoculated into white rats with negative results. Two tick stomach contents were shown to contain porcupine blood by the precipitin test.

Thirty stomach smears of *A. brumpti* were tested by Dr. Weitz of the Lister Institute. Seven reacted with porcupine antiserum but all were negative for hyrax (*Heterohyrax* sp.) gerbil and rat.

Trypanosomiasis.—There are signs of an increase in sleeping sickness in the Nyanza Province, and *T. rhodesiense* has been recovered from a patient from Kadimu near Lake Kanyaboli. This is alarming and it is essential to discover whether the parasite is being transmitted by *G. palpalis* or *pallidipes*. A number of isolations in rates should be made from patients in the infected areas to discover the extent of the outbreak and to ascertain whether *T. rhodesiense* and *gambiense* co-exist. Methods effective in controlling *G. palpalis* (e.g. spraying riverine bush with D.D.T.) will prove ineffective against *G. pallidipes*.

Early in 1953, the bush alongside the lower reaches of the Gori and Kuja rivers was sprayed with D.D.T. against *G. palpalis*. Catches fell from 4,500 to 120 per month. The fly population has again increased as the following figures show:—

	Jan.	Feb.	March	April	May	June
1954	475	730	762	628	642	894

Onchocerciasis.—The dosing operations in the Kakamega area began on 2nd September, 1954, and were completed about 24th December, 1954. The Rivers Nzoia, Lsumu, Sasala, Isioka, Firadzi, Edzawa I and II, Yala, Mujinga, Chubrok and Kibosi together with their tributaries were treated five times at fortnightly intervals. The area concerned is about 2,000 square miles; it is bounded by Kimilili-Bungoma in the North, the Nandi escarpment in the East, by Yala-Mumias in the west, and the Southern Nandi Escarpment (7 miles north of Kisumu) in the south. One hundred and seventy rivers and streams have been treated. All streams and rivers were checked at intervals. No *S. neavei* adults have been caught during intensive searches made since the treatment, but at least a year must elapse before it is known whether the campaign has been successful or not.

Miscellaneous Observations.—Sera from monkeys caught at Kisii and Kericho have been sent to Entebbe for the mouse protection test. So far, no results have been received. An attempt is being made in collaboration with Professor Garnham to discover the tissue forms of *Plasmodium brodeni*.

MEDICAL RESEARCH LABORATORY

The Acting Assistant Director of Laboratory Services reports, *inter alia*, as follows:—

General

From early in the year, staffing difficulties were increased by the detention of 12 of the graded Laboratory Assistants, under the Emergency Regulations. Only two were released, and returned to duty. One loyal Kikuyu member of the staff sustained fatal injuries in a motor accident. In the laboratory itself, 16 out of a total of 33 Kikuyu menial staff has been detained. All had been in the service for many years, and it has been found difficult to replace those detained, who had experience as attendants. It has been necessary to reduce the staff in some out-stations, to replace those detained, and to withhold or curtail accumulative leave in some instances. Enforcement of the Emergency Regulations, and increased demand for stores and vaccines have created much extra work for all staff.

Vaccine and Media Section

(a) VACCINE SECTION

Some difficulty was experienced in meeting the demands for supplies of T.A.B. vaccine, but they were met, and it was very rarely that there was a delay in the despatch of supplies.

The T.A.B. vaccine made is that known as the alcoholized vaccine; that is, a vaccine in which the typhoid organism is killed with the alcohol and preserved with the alcohol. This vaccine was developed by Professor Felix of the Public Health Laboratory at Colindale, who found that the Vi antigen, which he believes to be essential for protection, and which is present in most strains of the typhoid bacillus, was preserved when the organism was killed and preserved in alcohol, but was damaged if killed by other reagents such as phenol. He contends that if the Vi antigen is damaged, less protection is given by the vaccine. Some doubt was cast on the efficiency of this vaccine, because of the epidemic of typhoid which occurred in Manyani during the year, and we were eventually persuaded to prepare other types of vaccine. This was done with some difficulty, but the vaccine was never used in Manyani. It is interesting to note that the epidemic there, was brought under control without it. It is undoubtedly the opinion of the majority of bacteriologists that all typhoid vaccines give some protection, but that if the patient is exposed to an overwhelming dose of the typhoid bacillus, this can overcome his immunity no matter how good it may be.

A list of the vaccines produced, the amount prepared and issued and the revenue from this department is given below.

The value of products prepared at current Kenya Government prices:—

	£
Vaccine Lymph	16,500
Typhoid Vaccine	14,340
Anti-rabies Vaccine	1,130
Plague Vaccine	1,008
Diagnostic Suspensions	508
TOTAL ..	33,486

The prices are below commercial ones; if bought in England, the vaccine prepared during the year would have cost £68,750.

Amounts of Vaccines Produced and Issued, 1954

	<i>Prepared</i>	<i>Issued to Kenya</i>	<i>Sold to other Territories</i>	<i>Total Issues</i>
Vaccine Lymph (doses) ..	5,500,000	1,860,369	984,350	2,844,719
T.A.B. (alcoholized) (m.l.)	343,000	234,200	56,660	290,860
T.A.B. (phenolized) (m.l.)	135,000	95,850	nil	95,850
Anti-Rabic Vaccine (m.l.)	67,820	36,000	26,820	62,820
Plague Vaccine (m.l.) ..	50,400	13,350	3,550	16,900
Diagnostic suspensions ..	169,500	—	—	—

Revenue Derived from Other E.A. Territories

Country	Vaccine Lymph	T.A.B. Vaccine	Anti-Rabic Vaccine	Plague Vaccine	Total
	£	£	£	£	£
Tanganyika	1,443	702	31	69	2,245
Uganda	1,350	906	48	2	2,306
Zanzibar	87	5	—	—	92
Nyasaland	—	74	349	—	423
B. Somaliland	7	—	10	—	17
E.A. Command, etc. ..	66	—	9	—	75
	<hr/> £2,953	<hr/> £1,687	<hr/> £447	<hr/> £71	<hr/> £5,158

(b) IMPORTED VACCINES

There was a greatly increased demand for anti-tetanus serum and anti-venene throughout the year. Ample stocks were maintained and all demands were met. In spite of the increased demand, there was no increase in the overall cost as the prices of some vaccines had been greatly reduced.

(c) MEDIA

The following types and quantities of media were made indicating the scope and volume of bacteriological work performed:—

Pure P3 broth	135 litres
Used for making—	
Tetrathionate	118 batches
20 per cent P3 broth for vaccines	55 litres
10 per cent P3 broth	88 litres
10 per cent P 3 agar slopes	62 litres
10 per cent P3 agar deeps	44 litres
20 per cent P3 Roux flasks for vaccines ..	1,346 flasks
Agar slopes with broth	280 tubes
Beef extract agar	116 litres
Used for making—	
Horse blood agar plates	1,313 plates
Sheep blood agar plates	5,372 plates
Blood agar slopes	928 slopes
Chocolate agar plates	519 plates
Glucose agar base	6 litres
Used for making—	
Glucose agar deeps	333 deeps
Hartley's broth	145 litres
Used for making—	
6.8 broth for Brucella	146 bottles
7.2 broth for typhoid	3,305 bottles
MacConkey agar base	38 litres
Used for making—	
MacConkey plates	3,581 plates
MacConkey fluid base (double strength) ..	84 litres
MacConkey fluid base (single strength) ..	24 litres

Used for making—

Water sets for laboratory	.. .. .	794 sets
Water sets for up-country	.. .. .	94 sets
Desoxycholate citrate agar base	.. .. .	163 litres

Used for making—

D.C.A. plates	.. .. .	12,977 plates
Loeffler's serum slopes	.. .. .	610 slopes
Sabouraud's slopes	.. .. .	117 slopes
Sugar sets	.. .. .	104 litres
Hiss's serum sugars	.. .. .	120 sets
Pneumococcal glucose broth	.. .. .	6.3 litres
Robertson's cooked meat medium	.. .. .	1,190 tubes
Liver agar	.. .. .	7 litres
Selenite (double strength)	.. .. .	10 litres
Selenite (single strength)	.. .. .	82 litres
Lowenstein-Jensen medium	.. .. .	1,605 slopes
Christensen's medium	.. .. .	6,405 slopes
Sterile distilled water	.. .. .	25 baskets
		(in 10 ml. amounts)
		32 litres
Sterile saline	.. .. .	(in 400 ml. amounts)
		125 litres
		(in 400 ml. amounts)
Sterile saline	.. .. .	55 baskets
		(in 5 ml. amounts)
		39 baskets
Sterile saline	.. .. .	(in 10 ml. amounts)
		1,089 bottles
		1,145 swabs
Glycerine swabs	.. .. .	216 swabs
Throat swabs in serum	.. .. .	55 swabs
Smallpox swabs	.. .. .	5,593 bottles
Liquoid for blood culture	.. .. .	437 plates
Downie plates	.. .. .	493 bottles
N.N.N. medium	.. .. .	50 plates
Bordet-Gengou plates	.. .. .	514 bottles
Ringer's solution	.. .. .	(in 9 ml. amounts)
		102 bottles
		(in 120 ml. amounts)
Agar for agar-lined tubes	.. .. .	12 litres
Dorset's egg medium	.. .. .	5 batches
Simmon's ammon. agar	}	Small amounts only
Stuart's medium		
Tripsin		
Amylopsin		
Sugars for Candida		
Peptone Water		
Thyoglycollate medium		
Wilson & Blair's medium		
Dubo's medium		
Glycerol egg medium		
Glucose phosphate		
Koser's citrate		

Altogether, 97 different kinds of media were prepared.

From October onwards, the typhoid outbreak necessitated the making of unusually large amounts of the routine media, such as D.C.A. and tetrathionate. The R.A.M.C. gave valuable help at this time in dealing with the situation. Below is a comparison between the amounts of media made in April and November, April being an average month.

Medium	April	November
D.C.A. Base	9.7 litres	23.28 litres
D.C.A. Plates	827 plates	1,529 plates
Tetrathionate	6 batches	22 batches
MacConkey Plates ..	241 plates	405 plates
Hartley's Broth ..	6 litres	21.7 litres
7.2 Broth	287 bottles	444 bottles
Roux Flasks	60 flasks	268 flasks

In order to cater for the extra work, as reflected by these figures, more space, more apparatus and the services of more staff had urgently to be placed at the disposal of this Section.

Bacteriological Section

14,949 specimens were examined, of which 12,280 were from African cases and the majority of these from King George VI Hospital. 1,589 specimens of sputum were examined and 262 of these contained tubercle bacilli. 4,289 stools specimens were examined and *S. typhi* were isolated from 289 of them. *Sh. flexneri* were isolated from 524, *Sh. sonnei* from 53, *Sh. schmitzi* from 80, *Sh. manchester* from 12, *Sh. sachs* from 6 and *Sh. boydi* from 4. Atypical types of dysentery organisms were isolated from 121 specimens and unclassified *Salmonella* organisms from 94. *S. typhi* was isolated on 520 occasions from 2,150 blood cultures and eleven times from urine.

Five hundred and five samples of urine were received of which 119 contained *B. coli* and 651 specimens of cerebrospinal fluid were examined. The majority of the latter were from cases of pneumococcal meningitis or from meningitis due to the *H. influenzae*, but towards the end of the year a number were received in which the meningococcus was found. The typhoid epidemic put a great strain on the section, one which it was unable to withstand and eventually it was found necessary to get the Food Laboratory to undertake all examination of specimens received from detention camps and prison hospitals.

As well as the above examinations, this section dealt with many other examinations, such as pus from gunshot wound infections, pus from burns, throat swabs, eye swabs, swabs from the diagnosis of venereal disease, and pus from boils for which vaccines were made on a number of occasions. 3,691 Widal examinations were done.

The staff of this section has, for the past two years, been African only; there has been no European Technologist. The Bacteriologist has endeavoured to supervise the work done, but the task was overwhelming and towards the end of the year an Assistant Bacteriologist was brought in to help. While the African staff has done very well, there is no doubt that more supervision is required if the standard of the work is to be improved.

Public Health Section and Food Laboratory

The work in this department has chiefly consisted of the examination of water supplies and of samples of mineral water. Most of these have been done for Nairobi City Health authority. The food and health inspectors of the latter authority and of the Nairobi County Council have frequently sought advice, a bacteriologist has paid many visits with them to hotels and restaurants where cases of dysentery or outbreaks of food poisoning have occurred. These outbreaks have been investigated bacteriologically and on many occasions it has been possible to trace the source of the outbreaks and bring them under control.

Two such outbreaks will illustrate this: the first was an outbreak of dysentery due to *Sh. sonnei* which occurred amongst persons who had attended a wedding breakfast celebration. The organism was isolated from the patients and from the cook who prepared the food. It would probably have been possible to isolate it from the food also but, unfortunately, this had been destroyed before our assistance was sought. Continual outbreaks of dysentery in an hotel on the outskirts of Nairobi were traced to the waiters in the hotel dining-room, eight of whom were found to be carriers of the organism responsible for the disease.

This Department also examined many samples of food both tinned and fresh and gave assistance to the Army when they suspected that sausages were responsible for outbreaks of dysentery amongst the troops.

The test known as the Vi test is now used extensively to find carriers or non-carriers of the typhoid bacillus, and before the epidemic of typhoid occurred we used it to place Vi negative persons in the kitchens of Langata camps and other detention camps. We were unable to do sufficient tests and place non-carrier cooks in all camps before the epidemic occurred and in many cases where we had done this the cooks were changed without our knowledge after we had tested them. Later, the test was used by the Medical Officer at Manyani to sort out the carriers from the non-carriers amongst the convalescent cases.

During these investigations a large percentage of positive Vi tests were found but it was impossible to prove that these cases were definite carriers of typhoid by stool culture, because stool cultures could not be done successfully when the camps were hundreds of miles from the Laboratory.

This section took over all the diagnostic work on blood and sera samples sent from Manyani and other detention camps and prison hospitals and 341 positive typhoid blood cultures were obtained out of 1,225 samples of blood sent. 788 Widal examinations were done.

On the outbreak of the epidemics at Manyani we received assistance from two Army Technologists and it would not have been possible for us to deal with all this work without their help.

Vi phage typing is now used universally as an epidemiological measure. A number of typhoid strains were collected from typhoid cases at Manyani and Mackinnon Road detention camps and from places throughout the Kikuyu reserve including Nairobi. Five different types were found in Manyani camp and these were found throughout the Kikuyu reserve and in Nairobi. The inference was that there had been five epidemics at Manyani and that they had their original source in Nairobi or parts of the Kikuyu reserve. Different types were found in different compounds at Manyani.

Schedule of Work Performed

Water samples examined	..	..	..	..	379
Mineral water samples examined	..	..	..	..	241
Dairy utensils examined	..	..	..	..	68
Food examinations	..	..	..	..	16

Carrier and Typhoid Investigations in Detention Camps

	<i>Manyani</i>	<i>Langata</i>	<i>Mackinnon Rd.</i>	<i>Kamiti</i>
Specimens	1,952	758	191	85
Vi Agg.	1,578	141	—	—
Total Tests	3,530	899	191	85

	<i>Embakasi</i>	<i>Thika Detention Camp</i>	<i>Yata Camp</i>
Specimens	25	33	81
Vi Agg.	—	33	—
Total Tests	25	66	81

Hospitals Including Athi River Camp

Specimens	..	..	..	..	597
Vi Agg.	..	..	..	..	242
Total Tests	..	..	..	..	839

Pathological Section*(a) GENERAL PATHOLOGY*

This section was in charge of a pathologist who examined and reported on 2,047 biopsy specimens during the year.

The following numbers of tests were done:—

Kahn tests	..	..	..	..	..	23,730
Ide tests	..	..	..	..	..	31
Friedman tests	..	..	..	..	..	521
Prothrombin time tests	..	..	..	..	..	184
Blood groups—						
European	..	..	..	..	..	358
Asian	..	..	..	..	..	203
African	..	..	..	..	..	1,079
Coombs test	..	..	..	..	..	37

(b) BIOCHEMISTRY

Staff.—The Laboratory Technologist went on long leave on 23rd July and on 1st December embarked upon a special three months' course in chromatography at Cambridge, by arrangement between this Department and the Superintendent of the Low Temperature Research Station of the Department of Scientific and Industrial Research.

Routine Examinations.—The scope of these was somewhat increased in comparison with previous years, firstly owing to the large numbers of dinitro-orthocresol determinations required in connexion with Desert Locust Campaign air-spraying activities, and secondly because of the necessity for investigation and control of suspected vitamin deficiencies, especially in prison and detention camps. This involved numerous estimation of ascorbic acid, pyruvic acid and vitamin A in blood; in addition, a considerable number of estimations of ascorbic acid and vitamin A in foodstuffs were made.

The overall number of examinations made on pathological specimens were as follows:—

Urine	..	..	..	..	..	..	2,128
Blood	..	..	..	..	..	..	1,638
Cerebrospinal fluid	..	..	..	..	..	..	1,843
Fæces	..	..	..	..	..	..	228
Physiological Efficiency tests	..	..	..	..	..	..	314
Miscellaneous	..	..	..	..	..	..	78

(c) PARASITOLOGY

This section deals with hæmatological investigations in addition to parasitology. The examinations done during the year included:—

Blood counts	..	..	..	..	..	..	8,950
Stool examinations for parasites	..	..	..	..	..	..	8,874
Blood slides for parasites	..	..	..	..	..	..	8,656
Miscellaneous	..	..	..	..	..	..	250

Material from cases of kala azar, both from hospitals and from field surveys, was examined. Attempts were made to perfect the cultural methods for *E. histolytica*, and in the hæmatological section, minor improvements in techniques were made on the advice of Dr. Foy.

Dr. Foy and Dr. Kondi, of the Wellcome Trust continued their researches into anæmia occurring in Africans in Kenya. For the first time, radioactive isotopes were used in Kenya during their investigations.

(d) THE BLOOD BANKS

The blood banks of Kenya are run by the Kenya Red Cross Society. The Medical Research Laboratory help them by maintaining and sterilizing their equipment. The equipment consists of the needles and tubing which comprise the apparatus used for taking blood from the donors and for giving blood to patients. Many "sets" of this equipment have to be kept in order and there must always be sufficient for the banks to use on bleeding days and a reserve kept in order for emergencies. Glucose solution has to be prepared and M.R.C. transfusion bottles containing it sterilized and an adequate stock kept for the banks and for emergencies.

Duplicate samples of all blood taken from the banks are kept at the laboratory and tests for syphilis and for malaria must be done before the blood can be used.

Three blood-grouping tests are done on all samples of blood before the blood bank is allowed to issue it for use. Rh. grouping tests are also done. Sera for the latter tests are imported, those for the former are prepared in the laboratory.

Equipment for the blood banks at Mombasa and Nakuru are also prepared by us for the Kenya Red Cross Society. Six hundred and two samples of blood for the European blood bank were tested during the year and 253 samples for the Asian blood bank. A similar number of transfusion bottles and taking and giving sets were prepared. This means a great amount of extra work for the staff of the Laboratory, and if the Red Cross is to open a third blood bank we will find it difficult to help with it with the present staff and facilities.

Buildings and Equipment.—Alterations, necessitated by the new Media Section and other Emergency work, have been carried out and, in this connexion, the help received from the Public Works Department, Buller Camp Depot and the Government Electrical Engineer's Department has been much appreciated.

VISITORS

The following visitors from overseas were shown various aspects of the Department's work:—

Dr. M. Bandart, Director of Medical Services, Ruanda Urundi, Belgian Congo.

Dr. H. Collumbine, B.Sc., M.O. Physiologist.

Dr. C. A. Egger, U.N.I.C.E.F.

Dr. F. Hawking, Member of Tsetse Fly and Trypanosomiasis Committee and Colonial Medical Research Council.

Professor F. R. G. Heaf, Adviser in Tuberculosis, Colonial Office.

Dr. Holm, Adviser in Tuberculosis, World Health Organization.

Dr. W. A. McIntosh, Division of Medicine, Rockefeller Foundation.

Sir Archibald McIndoe, F.R.C.S., visitor on behalf of Royal College of Surgeons.

Sir Philip Manson Bahr.

Dr. Pizzi, World Health Organization.

Professor H. J. Seddon, C.M.G., F.R.C.S., Nuffield Consultant in Orthopædics.

Dr. D. Thomson, Tuberculosis Section of World Health Organization.

Professor A. Topping, M.D., M.R.C.P., D.P.H., Dean of the London School of Tropical Medicine.

Dr. Cecily Williams, Consultant Pædiatrician and Nuffield Visitor.

His Excellency Monsieur Chauvet, Governor General of French Equatorial Africa.

Lord Mulverton.

Miss Joan Whittington, Director of the Overseas Branch of the British Red Cross Society.

Dr. K. D. Young, Tuberculosis Specialist, Zanzibar.

Dr. A. C. Howard, Director of Medical Services, Zanzibar.

Dr. Le Roux, Helminthologist, London School of Tropical Medicine.

ARTICLES PUBLISHED

Articles published by members of the Medical Department during 1954:—

ANG'AWA, J. O. W., AND FENDALL, N. R. E.—“Clinical Trials of Azacrin in East Africa.” (*J. Trop. Med.*, vol. 57, p. 59.)

AVERY JONES, S.—“Resistance of *P. falciparum* and *P. malaria* to Pyrimethamine (Daraprim) following mass treatment with this drug.” A preliminary note. (*E.A.M.J.*, vol. 31, p. 47.)

BARTON, W. L.—“A case of Filariasis.” (*E.A.M.J.*, vol. 31, p. 478.)

——— “*Filaria bancrofti* as a cause of Hæmaturia” (*E.A.M.J.*, vol. 31, p. 477.)

BRAIMBRIDGE, C. V.—“Address to the Annual Conference of the Association of Surgeons of East Africa.” (*E.A.M.J.*, vol. 31, p. 205.)

CARTER, F. STEPHEN.—“Primary Tuberculosis in African Children.” (*Arch. Dis. Child.*, vol. 29, p. 213.)

——— “Primary Tuberculosis in African Children and the value of Isoniazid in treatment.” (*E.A.M.J.*, vol. 31, p. 265.)

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RETURN OF DISEASES—OUT-PATIENTS, 1954—(Contd.)

CODE	DISEASE	EUROPEAN			ASIAN		AFRICAN	
		Male	Female	Total	Male	Female	Male	Total
131 135 N.O.S. 036-138	Tinea Scabies Other Infective and Parasitic Diseases	20 — 24	27 — 34	47 — 58	23 59 691	26 122 —	1,907 19,476 9,074	3,011 32,588 13,293
140-205 210-239	NEW GROWTHS Malignant Neoplasms Benign and other Neoplasms	6 11	8 16	14 27	— 4	— 1	247 484	427 727
241 286-6 290-293 N.O.S. 240-299	ALLERGIC METABOLIC AND BLOOD DISEASES Asthma Kwashiorkor Anemia Other Allergic, Endocrine, Metabolic and Nutritional Diseases	21 — 6 59	28 1 36 92	49 1 42 151	117 — 67 44	30 — 32 48	2,282 1,591 1,891 1,654	3,419 3,229 3,035 2,791
300-326 353 N.O.S. 330-369	DISEASES OF NERVOUS SYSTEM AND SENSE ORGANS Mental Disorder Epilepsy Other Diseases of the Nervous System and Sense Organs	9 3 130	20 2 189	29 5 319	1 4 41	— — 17	200 257 1,770	293 366 4,605
370 373 389 N.O.S. 371-388 390-398	DISEASE OF EYE AND EAR Conjunctivitis and Ophthalmia Stye Blindness Other Diseases of Eye (not Trachoma) Diseases of Ear and Mastoid Process	81 12 2 28 196	83 12 2 28 188	164 24 4 56 384	255 16 — 57 121	83 9 — 18 45	21,908 1,687 362 6,010 14,660	37,520 3,409 480 7,908 23,824
400-447 450-468	CIRCULATORY DISEASES Diseases of the Heart Other Circulatory Diseases	25 45	11 74	36 119	5 29	6 7	136 558	239 861

RETURN OF DISEASES—OUT-PATIENTS, 1954—(Contd.)

CODE	DISEASE	EUROPEAN			ASIAN			AFRICAN		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
	ILL-DEFINED DISEASES AND INJURIES									
760-776	Neonatal Diseases	—	15	15	291	71	362	—	1,479	1,479
788-8	Pyrexia of Unknown Origin	138	169	307	95	18	113	65,316	33,882	99,198
N.O.S.										
780-795	All Other Ill-defined Causes of Morbidity	358	356	714	273	19	292	2,031	1,262	3,293
N.800-N.839	Fractures and Dislocations	80	36	116	20	28	48	2,352	1,020	3,372
N.840-N.848	Sprains	115	58	173	77	20	97	8,790	2,950	11,740
N.930-N.936	Foreign Bodies	108	8	116	27	8	35	3,182	1,648	4,830
N.940-N.949	Burns and Scalds	14	4	18	43	25	68	9,013	4,792	13,805
N.960-N.979	Poisoning	7	3	10	—	3	3	355	1,822	2,177
N.O.S.										
N.850-N.999	Other Injuries and Wounds	184	89	273	610	125	735	67,717	24,342	92,059
Y.00-Y.18	Examination	1,046	392	1,438	546	51	597	26,117	5,157	31,274
	TOTAL	5,901	5,924	11,825	8,890	3,008	11,898	777,580	445,027	1,222,607

RETURN OF DISEASES—IN-PATIENTS, 1954

List No.	CODE	DISEASES	EUROPEAN				ASIAN				AFRICAN			
			ADMISSION		Total Deaths	Total	ADMISSION		Total Deaths	Total	ADMISSION		Total Deaths	Total
			Male	Female			Male	Female			Male	Female		
A.		GENERAL INFECTIOUS AND PARASITIC DISEASES												
1	001-008	Respiratory Tuberculosis	7	3	10	—	98	44	142	11	2,086	1,137	3,223	441
2	010	Tuberculosis of Meninges and Central Nervous System	—	—	—	—	—	—	—	—	64	53	117	65
3	011	Tuberculosis of Intestines, Peritoneum and Mesenteric Glands	—	1	1	—	4	—	4	1	149	127	276	32
4	012, 013	Tuberculosis of Bones and Joints	—	1	1	—	3	—	3	1	386	152	538	39
5	014-019	Tuberculosis—All other Forms	—	—	—	—	5	—	5	—	436	224	660	39
6	020	Congenital Syphilis	—	—	—	—	—	—	—	—	127	103	230	17
7	021-0, 021-1	Primary Syphilis	—	—	—	—	—	—	—	—	208	223	431	2
8	021-2-021-4	Secondary Syphilis	—	—	—	—	1	—	1	—	430	412	842	4
9	024	Tabes Dorsalis	—	—	—	—	—	—	—	—	60	13	73	—
10	025	General Paralysis of Insane	—	—	—	—	1	—	1	—	9	8	17	2
11	022, 023	Cardio Vascular Syphilis	—	—	—	—	—	—	—	—	9	4	13	5
12	026-029	All other Syphilis	—	—	—	—	2	—	2	—	169	77	246	12
13	030, 031	Gonorrhœa, Genito-Urinary	—	—	—	—	2	—	2	—	807	460	1,267	—
14	033	Gonococcal Infection of Eye	—	—	—	—	2	—	2	—	71	58	129	—
15	032, 034, 035	Other Gonococcal Infections	—	—	4	—	3	1	4	—	316	152	468	—
16	040	Typhoid Fever	3	1	—	—	13	—	13	—	2,426	759	3,185	393
17	041, 042	Salmonella Infections	—	—	—	—	—	3	3	—	22	26	48	5
18	043	Cholera	—	—	—	—	—	—	—	—	—	—	—	—
19	044	Brucellosis	1	1	2	—	—	—	—	—	75	24	99	2
20	045	Bacillary Dysentery	5	5	10	—	12	4	16	—	2,065	714	2,779	176
21	046	Amoebiasis	8	3	11	—	12	3	15	—	887	661	1,548	20
22	047, 048	Other unspecified Dysentery	1	1	2	—	5	3	8	—	893	719	1,612	57
23	050	Scarlet Fever	—	—	—	—	—	—	—	—	6	22	28	—
24	051	Streptococcal Sore Throat	1	1	2	—	1	8	9	—	170	94	264	2
25	052	Erysipelas	—	—	—	—	—	—	—	—	—	—	—	—
26	053	Septicæmia and Pyæmia	—	—	—	—	1	1	2	—	20	19	39	28
27	055	Diphtheria	—	—	—	—	1	1	2	—	23	45	68	12
28	056	Whooping-cough	—	1	4	—	8	2	10	—	1,317	1,456	2,773	195
29	057	Meningococcal Infections	3	—	—	—	—	—	—	—	118	51	169	67
30	058	Plague	—	—	—	—	—	—	—	—	5	4	9	5
31	060	Leprosy	—	—	—	—	2	1	3	—	172	55	227	3
32	061	Tetanus	—	—	—	—	1	4	5	—	213	129	342	80
33	062	Anthrax	—	—	—	—	—	—	—	—	291	231	522	88

RETURN OF DISEASES—IN-PATIENTS, 1954—(Contd.)

List No.	CODE	DISEASES	EUROPEAN			ASIAN			AFRICAN		
			ADMISSION		Total Deaths	ADMISSION		Total Deaths	ADMISSION		Total Deaths
			Male	Female		Male	Female		Male	Female	
A.	080	Acute Poliomyelitis	47	35	72	28	21	1	169	169	338
28	082	Acute Infectious Encephalitis	1	—	1	—	1	—	23	13	36
29	081, 083	Late Effects Poliomyelitis and Infectious Encephalitis	—	—	—	3	7	—	45	19	64
30	084	Varicella Major	—	—	—	—	—	—	—	—	—
31	084	Varicella Minor	—	—	—	—	—	—	11	3	14
32	085	Measles	—	—	—	7	4	—	1,624	1,335	2,959
33	091	Yellow Fever	—	—	—	—	—	—	109	66	175
34	092	Infectious Hepatitis	10	2	12	3	4	—	—	—	—
35	094	Rabies	—	—	—	—	—	—	—	—	—
36	100	Louse-borne Epidemic Typhus	—	—	—	—	—	—	2	1	3
36	101	Flea-borne Epidemic Typhus	—	—	—	—	—	—	—	—	—
36	104	Tick-borne Typhus	9	2	11	—	—	—	1	—	1
N.O.S.											
36	102-108	Other Rickettsial Diseases	—	—	—	—	—	—	—	—	—
37	110	B.T. Malaria	2	3	5	4	1	—	83	68	151
37	111	Q.t. Malaria	4	1	5	5	—	—	176	203	379
37	112	S.T. Malaria	27	15	42	51	28	2	3,880	2,757	6,637
37	115	Blackwater Fever	—	—	—	2	—	1	5	13	18
N.O.S.											
37	113-117	Other Forms of Malaria	8	4	12	121	83	3	6,514	3,992	10,506
38	123-0	Schistosomiasis (Haematobium)	—	—	—	10	—	—	691	312	1,003
38	123-1	Schistosomiasis (Mansoni)	—	—	—	2	2	—	236	115	351
38	123-2	Schistosomiasis (Japonicum)	—	—	—	—	—	—	—	—	—
38	123-3	Other Unspecified Schistosomiasis	—	—	—	2	6	—	49	12	61
39	125	Hydatid Disease	—	—	—	—	—	—	18	9	27
40	127	Onchocerciasis	—	—	—	—	—	—	4	1	5
40	127	Loiasis	—	—	—	—	—	—	—	—	—
40	127	Filariasis (Elephantiasis)	—	—	—	2	—	—	117	34	151
40	127	Other Filariasis	—	—	—	—	—	—	8	17	25
41	129	Ankylostomiasis	—	—	—	3	2	—	673	540	1,213
42	126	Tapeworm and other Cestode Infection	10	3	13	—	—	—	677	451	1,144
42	130-0	Ascariasis	—	—	—	5	2	—	442	519	961
42	130-3	Guinea-worm	—	—	—	1	1	—	7	—	7
N.O.S.											
42	124-130	Other Diseases due to Helminths	—	—	—	—	—	—	25	56	81
43	036	Chancroid	—	—	—	—	—	—	5	—	5
43	037	Lymphogranuloma Venereum	—	—	—	2	1	—	21	3	24

RETURN OF DISEASES—IN-PATIENTS, 1954—(Contd.)

LIST No.	CODE	DISEASES	EUROPEAN			ASIAN			AFRICAN		
			ADMISSION		Total Deaths	ADMISSION		Total Deaths	ADMISSION		Total Deaths
			Male	Female		Male	Female		Male	Female	
A.	038	Granuloma Inguinale	—	—	—	—	—	—	36	13	49
43	039	Other Unspecified Venereal Diseases ..	—	—	—	—	—	—	53	25	78
43	049	Food Poisoning, Infective and Toxic (excepting Salmonella Infections) ..	—	—	—	—	—	—	50	18	68
43	071-0	Relapsing Fever (Louse-borne) ..	—	—	—	—	2	—	26	13	39
43	071-1	Relapsing Fever (Tick-borne) ..	—	—	—	—	—	—	118	85	203
43	072	Weil's Diseases ..	—	—	—	—	2	—	10	13	23
43	073	Yaws ..	—	—	—	—	—	—	272	116	388
43	086	Rubella ..	—	—	—	—	—	—	9	—	9
43	087	Chicken-pox ..	—	—	—	—	—	—	667	286	963
43	088	Herpes Zoster ..	—	—	—	—	—	—	38	22	60
43	089	Mumps ..	—	—	—	—	—	—	597	184	781
43	090	Dengue ..	—	—	—	—	—	—	2	6	8
43	095	Trachoma ..	—	—	—	—	—	—	329	309	638
43	096-7	Sandfly Fever ..	—	—	—	—	—	—	4	—	4
43	120	Leishmaniasis ..	—	—	—	—	—	—	108	44	152
43	121-0	Trypanosomiasis (Gambiense) ..	—	—	—	—	2	—	18	—	18
43	121-0	Trypanosomiasis (Rhodesiense) ..	—	—	—	—	—	—	69	80	140
43	121-2	Other Unspecified Trypanosomiasis ..	—	—	—	—	—	—	89	57	146
43	131	Dermatophytosis (Tinea) ..	—	—	—	—	—	—	68	69	137
43	135	Scabies ..	—	—	—	—	3	2	631	675	1,306
43	054-055 N.O.S.	Other Infectious and Protozoal Diseases	5	2	—	—	—	—	60	130	190
43	132-138	Other Parasitic Diseases	—	—	—	—	2	—	52	80	132
44	140-143	NEW GROWTHS	—	—	—	—	—	—	—	—	—
45	150	Malignant Neoplasm of Mouth and Pharynx ..	—	—	—	—	—	—	25	18	43
46	151	Malignant Neoplasm of Oesophagus ..	—	—	—	—	—	—	11	4	15
47	152, 153	Malignant Neoplasm of Stomach ..	—	—	—	—	—	—	18	11	29
48	154	Malignant Neoplasm of Intestine ..	—	—	—	—	2	—	9	7	16
49	161	Malignant Neoplasm of Rectum ..	—	—	—	—	3	—	5	8	13
50	162, 163	Malignant Neoplasm of Larynx ..	—	—	—	—	1	—	5	3	8
51	170	Malignant Neoplasm of Trachea, Bronchus and Lung not Specified as Secondary ..	—	—	—	—	—	—	—	—	—
		Malignant Neoplasm of Breast ..	—	2	—	3	1	4	1	2	3
			—	—	1	4	3	7	1	31	32

RETURN OF DISEASES—IN-PATIENTS, 1954—(Contd.)

LIST No.	CODE	DISEASES	EUROPEAN			ASIAN			AFRICAN		
			ADMISSION		Total Deaths	ADMISSION		Total Deaths	ADMISSION		Total Deaths
			Male	Female		Male	Female		Male	Female	
A.											
52	171	Malignant Neoplasm of Cervix Uteri ..	—	—	—	—	2	—	—	42	5
53	172-174	Malignant Neoplasm of other Un- specified Parts of Uterus ..	—	—	—	—	5	—	—	93	2
54	177	Malignant Neoplasm of Prostate ..	—	—	—	2	—	—	18	—	3
55	190, 191	Malignant Neoplasm of Skin ..	—	—	—	1	9	—	41	28	2
56	196, 197	Malignant Neoplasm of Bone and Con- nected Tissue ..	—	—	—	2	2	—	33	25	10
57	155	Malignant Neoplasm of Liver and Bile Passages (Primary) ..	—	—	—	8	1	1	53	19	21
57	N.O.S. 156-199	Malignant Neoplasm of all other and Unspecified Sites ..	1	—	1	3	3	—	216	92	29
58	204	Leukemia and Aleukæmia ..	—	—	—	6	—	—	35	6	5
59	200-203, 205	Lymphosarcoma and other Neoplasm of Lymphatic and Hematopoietic Systems ..	—	—	—	—	—	—	70	49	7
60	210-239	Benign Neoplasms and Unspecified Neoplasms ..	3	3	6	3	—	—	128	189	11
		ALLERGIC, METABOLIC AND BLOOD DISEASES									
61	250, 251	Non-toxic Goitre ..	—	—	—	—	—	—	3	38	2
62	252	Thyrototoxicosis ..	1	—	1	—	—	—	2	—	—
63	260	Diabetes Mellitus ..	—	—	—	28	12	1	84	24	9
64	280	Beri-beri ..	—	—	—	2	—	—	3	1	4
64	281	Pellagra ..	—	—	—	—	—	—	283	106	5
64	282	Scurvy ..	—	—	—	—	—	—	67	43	10
64	286'6	Kwashiorkor ..	—	—	—	—	2	—	524	443	284
64	283-286	Other Deficiency States ..	—	—	—	2	1	3	197	165	67
65	290	Pernicious and other Hyperchromic Anemias ..	—	—	—	1	1	—	—	32	3
65	291	Iron Deficiency Anemias ..	—	—	—	6	3	—	106	142	42
65	292, 293	Other Anemias ..	—	4	4	24	14	—	308	280	54
66	241	Asthma ..	1	1	2	23	5	—	544	256	10
66	N.O.S. 240-299	Other Allergic, Endocrine, Metabolic and Blood Diseases ..	2	3	5	13	6	—	130	135	11

RETURN OF DISEASES—IN-PATIENTS, 1954—(Contd.)

List No.	CODE	DISEASES	EUROPEAN			ASIAN			AFRICAN		
			ADMISSION		Total Deaths	ADMISSION		Total Deaths	ADMISSION		Total Deaths
			Male	Female		Male	Female		Male	Female	
A.		DISEASES OF NERVOUS SYSTEM AND SENSE ORGANS									
67	300-309	Psychoses	1	3	4	4	—	1	64	38	2
68	310-324, 326	Psychoneuroses and Disorders of Personality	—	2	2	3	—	—	72	44	3
59	325	Mental Deficiency	1	—	1	1	—	—	227	124	—
70	330-334	Vascular Lesions Affecting Central Nervous System	—	—	—	4	—	—	69	39	8
71	340-0	Meningitis due to H. Influenza	—	—	—	—	—	—	18	4	8
71	340-1	Meningitis due to Pneumococcus	—	—	—	—	—	—	97	95	79
71	340-2	Meningitis due to Other Organisms except Tuberculous and Syphilitic	1	1	2	—	—	—	170	137	84
71	340	Meningitis (except Meningococcal and Tuberculous)	—	—	—	2	3	—	86	30	38
72	345	Multiple Sclerosis	—	—	—	1	—	—	2	2	—
73	353	Epilepsy	—	—	—	3	—	—	145	54	17
74	370-379	Inflammatory Diseases of Eye	—	—	—	12	6	—	711	495	2
75	385	Cataract	—	—	—	38	10	—	226	103	8
76	387	Glaucoma	—	—	—	—	—	—	15	7	1
77	390	Otitis Externa	—	—	—	6	1	—	98	44	17
77	391-383	Otitis Media and Mastoiditis	2	1	3	—	1	—	325	221	19
77	394	Other Inflammatory Diseases of Ear	—	—	—	4	—	—	92	133	3
78	N.O.S. 341-369-395-398	All other Diseases of Nervous System, Sense Organs and Auditory System	1	3	4	9	5	—	153	97	21
78	N.O.S. 380-389	All other Diseases and Conditions of Eye	—	—	—	15	2	—	492	417	1
79	400-401	CIRCULATORY DISEASES									
79	402	Rheumatic Fever	1	—	1	7	2	—	238	221	13
80	410-416	Chorea	—	—	—	—	—	—	18	4	2
81	420-422	Chronic Rheumatic Heart Disease	—	—	—	2	1	1	71	45	21
82	430-434	Arteriosclerotic and Degenerative Heart Disease	2	—	2	5	—	—	31	12	19
		Other Diseases of Heart	3	1	4	31	10	9	172	119	97

RETURN OF DISEASES—IN-PATIENTS, 1954—(Contd.)

LIST No.	CODE	DISEASES	EUROPEAN			ASIAN			AFRICAN		
			ADMISSION		Total Deaths	ADMISSION		Total Deaths	ADMISSION		Total Deaths
			Male	Female		Male	Female		Male	Female	
A.	440-443	Hypertension with Heart Disease ..	1	1	1	3	—	3	19	5	24
83	444-447	Hypertension without Mention of Heart Diseases of Arteries ..	1	1	—	7	6	13	12	2	14
84	450-456	Other Diseases of Circulatory System ..	5	10	—	—	1	1	14	3	17
85	460-468		3	2	—	19	6	25	259	70	329
86											
		RESPIRATORY DISEASES									
87	470-475	Acute Upper Respiratory Infections ..	12	14	—	23	16	39	802	586	1,388
88	480-483	Influenza ..	10	3	—	13	6	19	409	308	717
89	490	Lobar Pneumonia ..	3	1	—	35	21	56	5,912	3,086	8,998
90	491	Bronchopneumonia ..	7	2	—	18	4	22	4,246	4,244	8,490
91	492, 493	Primary Atypical, other and Unspecified Pneumonia ..	3	1	—	10	—	10	852	423	1,475
92	500	Acute Bronchitis ..	8	4	—	29	9	38	3,604	2,779	6,383
93	501, 502	Bronchitis, Chronic and Unqualified ..	—	3	—	20	10	30	1,277	855	2,132
94	510	Hypertrophy of Tonsils and Adenoids ..	19	15	—	104	35	139	559	441	1,000
95	518, 521	Empyema and Abscess of Lung ..	1	1	—	9	—	9	36	27	63
96	519	Pleurisy (other than Tuberculous) ..	1	—	—	1	—	1	260	204	464
97	523	Pneumoconiosis ..	—	—	—	7	—	7	21	22	43
	N.O.S.										
97	511-527	All other Respiratory Diseases ..	3	—	—	14	3	17	293	163	456
		ALIMENTARY DISEASES									
98	530	Dental Caries ..	8	5	—	18	4	22	138	107	245
98	531-535	All other Diseases of Teeth and Supporting Structures ..	1	—	—	3	1	4	238	119	357
99	540	Ulcer of Stomach ..	5	1	—	—	—	—	33	16	49
100	541	Ulcer of Duodenum ..	13	6	—	11	1	12	64	8	72
101	543	Gastritis and Duodenitis ..	5	3	—	16	5	21	200	182	382
102	550-553	Appendicitis ..	17	16	—	79	49	128	120	49	169
103	560, 561, 570	Intestinal Obstruction and Hernia ..	15	6	—	44	3	47	694	138	832
104	571-0	Gastro-Enteritis and Colitis between Four Weeks and Two Years ..	4	8	—	22	6	28	1,439	1,233	2,672
104	571-1	Gastro-Enteritis and Colitis, Ages Two Years and Over ..	6	3	—	25	8	33	1,710	1,367	3,077
104	572	Chronic Enteritis and Ulcerative Colitis ..	3	—	—	5	2	7	191	190	381
105	581	Cirrhosis of Liver ..	—	—	—	4	—	4	191	70	261

RETURN OF DISEASES—IN-PATIENTS, 1954—(Contd.)

LIST No.	CODE	DISEASES	EUROPEAN			ASIAN			AFRICAN		
			ADMISSION		Total Deaths	ADMISSION		Total Deaths	ADMISSION		Total Deaths
			Male	Female		Male	Female		Male	Female	
A. 106 107	584, 585 536-587	Cholelithiasis and Cholecystitis .. Other Diseases of Digestive System ..	7 6	9 6	16 12	6 57	2 11	— —	157 1,113	104 940	5 50
108 108 110	590 591-599 600	GENITO-URINARY DISEASES Acute Nephritis .. Chronic, other and Unspecified Nephritis .. Infections of Kidney (other than Tuberculous) ..	— 1 —	— — —	— 1 —	14 3	4 1	— —	100 106	69 102	31 50
111 112 113 114 114	602, 604 610 620, 621 613 634	Calculi of Urinary System .. Hyperplasia of Prostate .. Diseases of Breast (not Neoplastic) .. Hydrocele .. Disorders of Menstruation ..	5 5 1 — —	5 — — — 3	10 5 1 — 3	11 12 9 23 —	3 1 2 — 32	2 1 — — —	60 18 73 8 194	119 3 — 257 824	4 1 3 7 —
114	N.O.S. 601-617	Other Diseases of Genito-Urinary System and Male Genital Organs ..	3	—	3	82	—	4	769	—	9
114	N.O.S. 622-637	Other Diseases of Uterus and Female Genital Organs ..	—	26	26	—	72	1	—	1,633	12
115	640-641, 681, 682, 684	DISEASES OF PREGNANCY PUERPERIUM Sepsis of Pregnancy, Childbirth and the Puerperium ..	—	—	—	—	4	—	—	138	16
116 117	642, 652, 685, 686 643, 644	Toxaemias of Pregnancy and the Puerperium .. Haemorrhage of Pregnancy and Childbirth ..	— —	— —	— —	— —	7 —	— —	— —	94 —	9 —
118 119 120 120	650 650 660 N.O.S. 645-689	Abortion without Mention of Sepsis or Toxaemia .. Abortion with Sepsis .. Delivery without Complication .. Other Complications of Pregnancy, Childbirth and Puerperium ..	— — — —	3 3 30 14	3 3 30 14	— — — —	18 13 155 58	— — — —	— — — —	1,687 376 9,177 1,868	6 8 — 98

RETURN OF DISEASES—IN-PATIENTS, 1954—(Contd.)

LIST No.	CODE	DISEASES	EUROPEAN			ASIAN			AFRICAN		
			ADMISSION		Total Deaths	ADMISSION		Total Deaths	ADMISSION		Total Deaths
			Male	Female		Male	Female		Male	Female	
A.											
136	794	ILL-DEFINED DISEASES									
137	788-8	Senility without Mention of Psychosis ..	—	—	—	—	1	—	72	42	38
137	793	Pyrexia of Unknown Origin ..	24	21	1	17	23	—	1,204	1,408	58
137		Observation, without Need for Further Medical Care ..	21	15	—	13	3	—	637	1,503	24
137	N.O.S. 780-795	All other Ill-defined Causes of Morbidity	14	12	—	7	1	1	1,513	3,398	14
A.N.											
138	N.800-N.804	INJURIES									
139	N.805-N.809	Fracture of Skull ..	2	—	—	13	2	3	238	25	66
140	N.810-N.829	Fracture of Spine and Trunk ..	1	—	—	7	1	—	230	77	21
141	N.830-N.839	Fracture of Limbs ..	10	3	—	73	53	—	2,573	650	31
142	N.840-N.848	Dislocation without Fracture ..	2	1	—	9	2	—	424	99	8
143	N.850-N.856	Sprains and Strains of Joints and Adjacent Muscle ..	3	—	—	17	6	—	692	333	—
144	N.860-N.869	Head Injury (excluding Fracture) ..	1	—	—	25	—	—	601	134	26
145	N.870-N.908	Internal Injury of Chest, Abdomen and Pelvis ..	—	1	—	16	8	—	554	195	79
146	N.910-N.929	Laceration and Open Wounds ..	6	2	—	104	42	—	5,246	1,672	103
147	N.930-N.936	Superficial Injury, Contusion and Crushing with Intact Skin Surface ..	3	—	—	46	16	1	1,886	746	22
148	N.940-N.949	Effects of Foreign Body Entering through Orifice ..	2	1	—	10	—	—	497	245	7
149	N.960-N.979	Burns ..	5	—	—	23	9	—	1,127	676	5
150	N.980-N.999	Effects of Poisons ..	3	—	1	3	2	1	263	343	131
		All other and Unspecified Effects of External Causes ..	4	—	—	102	41	—	1,489	216	84
		TOTAL ..	496	396	12	2,109	1,093	73	93,765	77,031	7,865
				892			3,202		170,796		

RETURN OF ACCIDENTS (COMBINED) IN- AND OUT-PATIENTS, 1954

Code	List	ACCIDENTS	EUROPEAN		ASIAN		AFRICAN	
			Cases	Deaths	Cases	Deaths	Cases	Deaths
E.810-E.835	AE.138	Motor vehicle accidents	36	1	76	6	874	39
E.800-E.802	AE.139	Other transport accidents	3	—	40	1	1,206	10
E.840-E.866	AE.140	Accidental poisoning	—	—	—	—	68	4
E.870-E.895	AE.141	Accidental falls	33	—	111	—	5,083	18
E.900-E.904	AE.142	Accident caused by machinery	16	1	89	1	807	3
E.912	AE.143	Accident caused by fire and explosion of combustible material	—	—	4	—	2,305	40
E.916	AE.144	Accident caused by hot substance, corrosive liquid, steam and radiation	10	—	48	1	1,297	11
E.917, E.918	AE.145	Accident caused by fire-arm	3	1	3	—	355	25
E.919	AE.146	Accidental drowning and submersion	—	—	—	—	3	2
E.929	AE.147	Foreign body entering eye and adnexa	12	—	72	—	386	—
E.920	AE.147	Foreign body entering other orifice	1	—	4	—	826	3
E.923	AE.147	Accidents caused by bites and stings of venomous animals and insects	30	—	15	—	909	—
E.927	AE.147	Other accidents caused by animals	4	—	—	—	601	3
E.928	AE.147	All other accidental causes	27	—	183	—	26,255	13
N.O.S.	AE.148	Homicide and injury purposely inflicted by other persons (not in war)	—	—	22	1	1,249	77
E.910-E.979	AE.149	Injury resulting from operations of war	—	—	—	—	246	9
E.980-E.985	AE.150							
E.990-E.999	AE.150							
		TOTAL	175	3	667	9	42,470	257

