Annual report of the Department of Public Health / Union of South Africa.

UNION OF SOUTH AFRICA

ANNUAL REPORT

OF THE

Department of Public Health

YEAR ENDED 30th JUNE, 1930

PUBLISHED BY AUTHORITY

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DEPARTMENT OF PUBLIC HEALTH.

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Department of Public Health.

REPORT FOR THE YEAR ENDED 30TH JUNE, 1930.

To the Honourable the Minister of Public Health,
Pretoria.

I have the honour to submit the Report of the Department of Public Health for the year ended 30th June, 1930.

I.—INTRODUCTORY.

The most noteworthy occurrences and events during the year have been a considerable prevalence of plague in the northern districts of the Orange Free State, mainly amongst natives on farms, a small outbreak of the same disease in a native location at Uitenhage, an extensive though not very virulent prevalence of malaria in Natal, the coming into force on 1st April, 1930, of the Food, Drugs and Disinfectants Act, No. 13 of 1929, and the regulations thereunder, the establishment at Port Elizabeth of a branch laboratory for routine diagnostic services of the South African Institute for Medical Research, and the visits of Sir Malcolm Watson, Principal of Malaria Control of the Ross Institute, London, and Dr. R. G. Cochrane, Secretary of the British Empire Leprosy Relief Association, London, in connection with malaria and leprosy respectively.

Last Annual Report contained a summarized statement of the outstanding and urgent needs of the Union in the domain of public health and welfare. That statement still applies, except that malaria research is now being actively prosecuted, and that in regard to the housing of the poor and the improvement or removal of slums or unhealthy areas in the large centres a notable step forward has been made by the provision by Government of £500,000 for loan to local authorities and utility companies for such purposes at a specially low rate of interest.

Experience during the year in connection with plague, malaria and other matters has emphasized the difficulties which arise owing to the absence of constituted local authorities throughout the rural areas, and in some of the smaller urbanized areas, outside the Cape Province, and the urgent need for the establishment of suitable local government institutions in all such areas.

II.—VITAL STATISTICS.

It will be seen that for the calendar year 1929, and according to the unaudited figures, the birth rate was higher than it was during 1927 and 1928, the crude death rate was the lowest since 1925, the infantile mortality was the lowest so far recorded, and the survival rate was higher than it has been since 1925. The only unsatisfactory feature of the table is the maternal mortality rate, which is higher than it was during the preceding three years and certainly very excessive.

The following table summarizes the salient features of the vital statistics of the European population for each calendar year since 1920:—

TABLE A.—UNION OF SOUTH AFRICA: SUMMARY OF VITAL STATISTICS OF EUROPEAN POPULATION, 1920-1929.

Calendar Year.	European Population (estimated).	Birth Rate per 1,000 of Population.	Death Rate per 1,000 of Population.		Death Rate per 100,000 of Population from				Percentage of Total Deaths, the Cause of which was Medically Certified.	Infantile Mortality Rate (Deaths of Infants under One Year per 1,000 Live Births Registered).	Maternal Mortality Rate (Deaths of Mothers in connection with Pregnancy or Childbirth per 1,000 Live Births Registered.)	Survival Rate or Rate of Natural Increase. (Excess of Births over Deaths per 1,000 of Population).
			Actual or Crude.	Standardized.*	Diseases of Heart and Circulatory System.	Pneumonia and Bronchitis.	Cancer.	Tuberculosis (all forms).§				
1920.....	1,499,911	28·97	11·09	12·15	95·67†	113·87†	58·94†	46·00†	79·78	90·07	4·10†	17·88
1921.....	1,519,488‡	28·44	10·41	11·43	102·91	136·15	69·09	58·26	80·76	77·09	4·94	18·03
1922.....	1,556,241	27·52	9·48	10·41	97·99	127·24	70·88	47·74	82·96	72·91	5·21	18·04
1923.....	1,579,733	26·70	9·77	10·65	108·50	120·72	78·94	46·46	82·77	74·42	5·22	16·93
1924.....	1,610,774	26·29	9·62	10·44	123·92	123·79	76·36	51·59	84·74	73·73	4·75	16·67
1925.....	1,637,472	26·51	9·39	10·15	128·86	97·04	72·86	52·70	86·45	68·39	5·62	17·12
1926.....	1,676,660‡	26·16	9·59	10·28	127·21	113·44	71·18	53·41	87·76	64·82	4·56	16·57
1927.....	1,708,955	25·95	9·73	10·34	122·76	110·42	73·20	50·50	89·93	70·62	4·80	16·22
1928.....	1,738,937	25·77	10·15	10·69	133·53	127·72	77·52	50·95	89·93	70·49	4·98	15·62
1929‖.....	1,767,719	26·15	9·51	$	127·06	104·03	77·39	45·43	90·17	64·19	5·26	16·64

* The rate which would have obtained had the age and sex distribution of the population been the same as that of England and Wales at the 1901 census, the standard usually taken for international comparisons.
† Medically certified deaths only. Rates for subsequent years calculated on total deaths registered.
‡ Actual (per census).
§ Includes Miners' Phthisis combined with Pulmonary Tuberculosis.
‖ All preliminary figures.
$ Figures not yet available.

The last published report on the vital statistics of the Union by the Director of Census and Statistics is that for 1928; the following extracts and comparisons with other countries are of special interest:—

Area of the Union: 471,917 square miles.

Population, 1928 (estimated on basis of census enumerations of 1921 and 1926): European, 1,738,937; Bantu, 5,277,023; Asiatic, 183,771; mixed and other coloured, 577,852; total, 7,777,583.

Birth Rate: European, per 1,000 of population, 25.8.

Other Countries: Lithuania, 28.8; Italy, 26.1; Hungary, 25.6; Southern Rhodesia, 24.6; Canada, 24.5; Australia, 21.3; U.S.A., 20.4; Scotland, 19.8; New Zealand, 19.6; Germany, 18.6; France, 18.2; England and Wales, 16.2.

Death Rate: European per 1,000 of population, "crude," 10.15; "standardized" (i.e. corrected for age and sex distribution so as to correspond with the international "standard" population in these respects), 10.69. This rate decreased up to 1925; since then there has been a slight rise.

Other Countries: New Zealand, 8.5; Australia, 9.5; Southern Rhodesia, 10.6; Canada, 11.3; U.S.A., 11.4; Germany, 11.6; England and Wales, 11.7; Scotland, 13.3; Italy, 15.6; France, 16.5; Hungary, 17.1.

Infant Mortality Rate (i.e. deaths of European infants under one year per 1,000 births): 1928, 70.49. This rate has markedly improved since the date of Union; in 1911 it was 96. It has risen slightly since 1926.

Other Countries: New Zealand, 36; Norway, 48; Holland, 52; Australia, 53; Switzerland, 54; Sweden, 62; U.S.A., 64; England and Wales, 69; Southern Rhodesia, 72; France, 83; Scotland, 86; Germany, 89; Canada, 90; Italy, 120; Lithuania, 146; Hungary, 180.

Survival Rate or Rate of Natural Increase (i.e. excess of European births over deaths per 1,000 of the European population per annum): 15.6. This rate is also falling slowly, but is still higher than that of any other country except Egypt (17.1) and Poland (15.9).

Other Countries: Southern Rhodesia, 14.0; Holland, 13.7; Canada, 13.2; Lithuania, 13.2; Australia, 11.8; New Zealand, 11.1; Italy, 10.5; U.S.A., 9.0; Hungary, 8.5; Germany, 7.0; Scotland, 6.5; England and Wales, 5.0; France, 1.7.

As regards non-Europeans, the available vital statistics of the Union are very incomplete. Notification of births and deaths is compulsory only in urban areas, and in many of these, owing to the large proportion of non-European male adults temporarily resident as labourers and to other circumstances, computations of death rates and similar statistics are useless or misleading.

For the Union as a whole, the only reliable figures available for the non-European population are those of the decennial census enumerations, the last of which took place in 1921, when the figures were as follows: Bantu, 4,697,813; Asiatic, 165,731; mixed and other coloured, 545,548; total, 5,409,092.

The estimated non-European population of the Union at 30th June, 1930, based on the 1921 census and the previous rates of natural increase, were as follows:— Bantu, 5,438,663; Asiatic, 188,847; mixed and other coloured, 587,540; total, 6,215,050.

III. ADMINISTRATIVE MATTERS.

1. *Staff.*—The accompanying chart shows the organization and functions of the Department and its principal personnel as at 30th June, 1930.

The principal changes during the year were:—

Dr. L. Fourie, transferred from the post of Medical Officer to the South-West African Administration to that of Assistant Health Officer, with headquarters at Kingwilliamstown; Dr. G. D. Laing, Assistant Health Officer, resigned on his appointment as Medical Officer of Health to the Pretoria Municipality, being replaced by Dr. F. O. Fehrsen, previously District Surgeon, Capetown; Dr. B. Sampson, appointed to act as Pathologist, Durban Laboratory, during Dr. D. H. S. Annecke's secondment to malaria duty; Dr. J. D. Wicht, Assistant Pathologist, Capetown, resigned, being temporarily replaced by Dr. F. A. Donnelly; Dr. P. Allan resumed duty as Medical Superintendent Tuberculosis Sanatorium, Nelspoort, after three years' secondment to the South African Institute for Medical Research, replacing Dr. S. S. Hewitt, who had acted during his absence; Dr. G. H. W. de Labat, Medical Officer, Pretoria Leper Institution, retired on the grounds of ill-health; Dr. H. J. F. Wood, Assistant Medical Officer, Robben Island Leper Institution, transferred to the Pretoria Leper Institution, being temporarily replaced by Dr. H. Clain.

CHART OF DEPARTMENT OF PUBLIC HEALTH *as at 30th June, 1930.*

Minister of Public Health (HON. D. F. MALAN).

Council of Public Health: Minister (Chairman.); Secretary and Chief Health Officer (Deputy Chairman); Mrs. S. B. Broers; Messrs. W. J. O'Brien, M.P., and L. C. Serrurier; Drs. C. Porter, K. Bremer, M.P., H. J. Steyn, and Sir Spencer Lister.

Leprosy Advisory Committee: Secretary and Chief Health Officer (Chairman); Sir Spencer Lister; Professors A. W. Falconer and O. K. Williamson; Drs. A. Pijper, F. C. Willmot, G. W. Robertson, A. J. Orenstein, K. Bremer, M.P., and G. A. Park Ross.

Secretary and Chief Health Officer (Dr. J. A. Mitchell).

Head Office Establishment:

2 Assistant Health Officers. (Sir E. N. Thornton† and Dr. W. A. Murray).
1 Chief Clerk (A. de V. Brunt).
1 Accountant (L. J. Hatch).
2 Principal Clerks. (C. N. Millard and A. Stuart).
2 Senior Clerks, 31 Clerks, Typists, etc.

Sections.

Assistant Health Officers (Detached).	Inspection and Field Staff.	Pathological Laboratories.	Port Health Officers.	District Surgeons.	Housing.	Leprosy Institutions.	Venereal Diseases Hospitals.	Malaria.	Tuberculosis.	Epidemic and Infectious Diseases (Plague, Typhus, Smallpox, etc.), and Vaccination.	Food and Drugs Adulteration; Habit-forming Drugs.	Local Authorities.	Other Bodies.
Capetown: (Dr. F. C. Willmot) Durban: (Dr. G. A. Park Ross)	Three Assistant Health Officers: (Drs. A. J. van der Spuy, E. H. Cluver, L. Fourie and F. O. Fehrsen). Five Inspectors (4 plague and 1 typhus).	Capetown, and Vaccine Institute, Rosebank: (Dr. W. F. Rhodes, ‡ Dr. F. A. Donnolly, assistant). Durban: (‡ Dr. B. Sampson). *South African Institute for Medical Research, Johannesburg.	Capetown: (Dr. J. M. Bosman). Durban: (Dr. G. A. Batchelor). Port Elizabeth: (Dr. H. W. A. Kay). East London: (Dr. R. V. S. Stevenson). Simonstown: (Dr. A. B. Bull). Knysna: (Dr. T. B. Newman). Mossel Bay: (Dr. F. T. Waldron). Port St. Johns: (Dr. T. M. Querney).	8 Whole-time. 3 Whole-time. (jointly). 308 Part-time. 319 Total.	Central Board—Sir E. N. Thornton (Chairman), Sir J. G. van Boeschoten, Messrs. F. W. Jameson, J. L. Hall, R. S. Gordon (Member & Secretary)	Pretoria: (Drs. J. W. de Vos, J. J. du Pre le Roux and H. J. F. Wood). Robben Island: (J. H. Alexander, and Dr. H. Clain). Emjanyana: (J. A. Macdonald, and Dr. A. R. Davison). Mkambati: (H. C. Bellew and Dr. F. S. Drewe). Amatikulu: (F. J. Roach and Dr. G. D. Stoute). Bochem: (J. H. Franz and Dr. H. C. Franz).	Rietfontein, Johannesburg: (Dr. J. Daneel). Kingwilliamstown *Bochem. *Ellm. *Jane Furse Memorial. Several smaller hospitals.	‡Dr. D. H. S. Annecke, Inspectors and Assistants.	Nelspoort Sanatorium: (Dr. P. Allan). *Holy Cross Medical Mission.	Field Staff. District Surgeons. Local Authorities. Magistrates, etc.	Inspectors, Customs, Police, etc. Chemical work done in chemical laboratories of Department of Agriculture at Capetown & Johannesburg.	222 Municipalities. 91 Village Management Boards. 36 Local Boards. 33 Village Councils. 30 Health Committees. 10 Local Administration and Health Boards. 90 Divisional Councils. 1 Health Board. 147 Magistrates. 4 Mining Commissioners. 664 Total.	South African Medical Council. South African Pharmacy Board. Rand Water Board.

* Receives Grant-in-Aid. † Is also Director of Medical Services (Defence). ‡ Temporary.

2. *Council of Public Health.*—A meeting of the Council was held at Pretoria on the 13th and 14th November, 1929.

Resolutions passed and more important matters discussed were as follows:—

(1) That in the opinion of this Council public health progress will be retarded until the control of public health, school medical inspection and medical poor relief is organized in any given area under one local authority, and for the whole Union under one central administration.

(2) This Council desires to endorse the views expressed in the resolution of the Medical Association of South Africa and in the various resolutions passed by the Council itself at previous meetings regarding the need for the reorganization and simplification and co-ordination under unified control of the administration of public health, school medical inspection, medical poor relief, and cognate matters.

(3) This Council endorses previous resolutions of the Council that the education of the public with regard to health matters is essential for progress and recommends that largely increased funds and resources be made available for this purpose.

(4) In view of conditions in the Union, this Council, after careful consideration of all the circumstances, is of opinion that the minimum period of training for nurses to be specified under the new Medical, Dental and Pharmacy Act, should not exceed three years in the larger hospitals, and three-and-a-half years in the smaller hospitals.

(5) In view of the conditions at present existing in the Union, this Council, after careful consideration of all the circumstances, is of opinion that under the new Medical, Dental and Pharmacy Act the qualifying number of confinements for pupil midwives should not exceed twenty labours attended and watched and ten personally delivered.

Amongst the other matters discussed were the following:—

(*a*) *International health matters:* Paris International Sanitary Convention, 1926—Port health administration: fumigation of ships; measures in connection with aircraft arriving from overseas.

(*b*) Adulteration and misdescription of food, drugs and disinfectants—Legislative measures and system of administration and enforcement.

(*c*) Smallpox and vaccination—"Conscientious objectors"—Enforcement of vaccination regulations.

(*d*) Housing and improvement of unhealthy areas.

(*e*) Child and maternity welfare; nurses and midwives; maternity homes.

(*f*) Bilharziasis; cancer; enteric fever; goitre; leprosy; malaria; plague; rabies; tuberculosis; typhus fever; venereal disease.

3. *Legislation affecting Public Health.*—The only legislation more or less directly affecting public health enacted during the year was the Natives (Urban Areas) Act, 1923, Amendment Act, No. 25 of 1930, which extends or makes more workable or effective a number of the provisions of the principal Act. This Act should greatly strengthen the hands of urban local authorities in dealing with and controlling natives within their areas from both the public health and general standpoints.

4. *District Surgeons.*—During the year the Leydsdorp district surgeoncy was resuscitated and additional district surgeoncies established at Joubertina (Cape); Blaauwberg, Delareyville, Delmas, Hartebeestfontein, Hendrina (Transvaal); Magut (Natal); Edenville, Hertzogville, Odendaalsrust, Orangeville, Paul Roux, and Villiers (Orange Free State).

TABLE B.—DISTRICT SURGEONCIES AND ADDITIONAL DISTRICT SURGEONCIES AS AT 30TH JUNE, 1930.

Province.	Whole-time.	Whole-time, but jointly with local authority or public body.	Part-time.		Total.
			On inclusive annual salary.	On annual salary with certain supplementary fees and allowances.	
Cape	3	3	6	137	149
Natal	3	—	1	39	43
Transvaal	2	—	16	51	69
Orange Free State	—	—	11	47	58
UNION	8	3	34	274	319

The eight whole-time officers are those at Capetown, Durban (3), East London, Port Elizabeth, and Pretoria (2); the three whole-time officers appointed jointly with local authorities or public bodies are those at Grahamstown, Queenstown and Wynberg. Of the 34 officers on inclusive annual salary, 25 are detached additional district surgeons.

In November, 1929, all part-time district surgeons were notified that in future the age limit for such appointments will be 60, except where in a particular case the Minister is satisfied that there are circumstances which render extension desirable in the public interest.

In December, 1929, following on representations by the District Surgeons' Group of the South African Medical Association (B.M.A.), the revision of the form of Agreement between the Government and part-time district surgeons (which has been in use since 1920) was decided on, and other Government Departments, Provincial Administrations, magistrates, and others concerned were circularized on the subject. The revision has not yet been completed.

In February, 1930, a very successful and useful post-graduate course for district surgeons was organized by the Witwatersrand University, in consultation and co-operation with the Committee of the District Surgeons' Group of the South African Medical Association (B.M.A.) and this Department—the latter agreeing, in respect of district surgeons attending the course to facilitate the granting of leave, supply rail warrants to and from Johannesburg, and pay the fees (£5. 5s. each) for the course; also to arrange for special lectures and demonstrations at the Rietfontein Venereal Diseases Hospital and the Pretoria Leper Institution. Fifty-one district surgeons attended.

5. *Local Authorities and their Health Staffs.*—Table C shows the numbers of the various classes of local authorities under the Public Health Act as at 30th June, 1930. Nine local authorities, namely, the Bloemfontein, Capetown, Durban, East London, Johannesburg, Pietermaritzburg, Port Elizabeth, and Pretoria Municipalities, and the Divisional Council of the Cape have whole-time medical officers of health. The Kimberley Board of Health, jointly with the Kimberley Municipality, has a medical officer who devotes some of his time to laboratory work at the Kimberley Hospital, but does no private practice. At Grahamstown and Queenstown there are officers who act as health officers to the municipal and divisional councils and carry out the duties of district surgeons, but do no other medical work. There are several other areas to which this system might usefully be extended.

On the 30th June, 1929, there were 77 local authorities, namely, 34 in the Cape, 8 in Natal, 10 in the Orange Free State, and 25 in the Transvaal employing certificated sanitary inspectors or/and health visitors devoting the whole of their time to sanitary work. The total numbers of such persons are: Sanitary inspectors, 190; health visitors, 16.

TABLE C.—LOCAL AUTHORITIES UNDER THE PUBLIC HEALTH ACT (1919), AS AT 30TH JUNE, 1930.

Province.	Municipalities.	Village Management Boards.	Local Boards.	Village Councils.	Health Committees.	Local Administration & Health Boards.	Magistrates.	Divisional Councils.	Board of Health.	Mining Commissioners.	Total.
Cape.....	128	84	20	—	—	—	29	90	1	1	353
Natal.....	9	—	16	—	—	10	44	—	—	—	79
Transvaal.....	24	—	—	33	30	—	39	—	—	2	128
Orange Free State	61	7	—	—	—	—	35	—	—	1	104
UNION.....	222	91	36	33	30	10	147	90	1	4	664

IV.—WORK OF THE DEPARTMENT.

1. *Inspections, Investigations, and Field Work.*—The following is a summary of these activities of the medical officers of the Department during the year:—

TABLE D.—FIELD INSPECTIONS AND INVESTIGATIONS BY MEDICAL OFFICERS OF THE DEPARTMENT OF PUBLIC HEALTH DURING THE YEAR ENDED 30TH JUNE, 1930.

Particulars.	J. A. Mitchell.	†Sir E. N. Thornton.	F. C. Willmot.	G. A. Park Ross.	W. A. Murray.	‖ E. H. Cluver.	A. J. van der Spuy.	L. Fourie.	W. F. Rhodes.	D. H. S. Annecke.	F. O. Fehrsen.	Total.
Systematic General Inspections of Local Authority Area	—	—	5	3	2	22	—	5	1	—	19	57
Mines	—	—	—	—	—	65*	1	—	—	—	—	66
Factories and Works (including "Offensive Trade" premises)	—	—	3	44	—	1	1	—	—	—	—	49
General and Chronic Sick Hospitals under Provincial Administration	—	5	6	2	—	—	52	—	—	—	—	65
Mental Hospitals and Other Institutions under Department of Interior	—	—	—	4	—	—	—	—	—	—	—	4
Leper Institutions, Venereal Diseases Hospitals, Tuberculosis Sanatoria, etc.	23	—	5	2	—	2	—	—	1	—	1	34
Prisons, Reformatories and other Institutions	—	—	—	1	—	3	—	—	—	—	—	4
Schools and Orphanages	—	—	—	4	—	—	—	—	—	—	1	5
Nursing and Maternity Homes and Private Hospitals	1	—	—	8	—	4	22	2	—	—	—	37
Water Supplies	—	—	1	4	1	2	1	2	—	—	—	11
Drainage and Sewerage	2	2	1	10	—	1	2	—	—	—	—	18
Housing (including Industrial Housing) and Overcrowding, Nuisances and Insanitary Conditions	7	6	6	39	—	—	2	—	—	—	—	60
Departmental Enquiries under Public Health or other Act	—	—	—	—	—	—	1	—	—	—	—	1
Formidable Epidemic Diseases: Plague, Smallpox, Typhus, etc.	1	4	—	7	1	38	1	23	2	—	—	77
Other Communicable or Preventable Diseases	5	—	—	31	128§	36	—	—	2	359‡	—	561
Other Inspections, Investigations and Field Work	6	36	7	4	6	32	7	5	—	—	1	104
TOTAL	45	53	34	163	138	206	90	37	6	359	22	1,153
Distances Travelled (approximate) in connection with Inspections, Investigations, etc.—												
Rail	8,986	4,500	6,500	594	5,200	3,432	15,464	6,629	1,600	—	1,031	53,936
Road	1,676	1,100	2,800	8,709	3,000	7,592	189	3,880	—	5,740	530	35,216
TOTAL	10,662	5,600	9,300	9,303	8,200	11,024	15,653	10,509	1,600	5,740	1,561	89,152
Days Absent from Office in connection with Inspections, Investigations, etc.	51	48	32	113	62	228	82	95	14	74	30	829

† Seconded to Uganda Government for Plague investigation during period 1/6/30 to 18/8/30.

§ Includes 125 in connection with Malaria.

‖ Absent in Europe on vacation leave from 5/4/30 to 13/7/30, during which period attended, as representing the Union Department of Public Health, the Congresses of the Royal Institute of Public Health, at Portsmouth, and the Royal Sanitary Institute, at Margate. A so, under the auspices of the League of Nations, made a comparative study of Health Organisation and Industrial Hygiene in Egypt, Italy, France and England.

* Includes 30 compounds, 2 locations, 15 hospitals, 14 dressing stations, 4 underground inspections.

‡ In connection with Malaria in Natal and Zululand; also toured Transvaal Malaria Districts in April, and visited Northern Rhodesia in May in connection with Malaria.

2. *Addresses, Published Papers, and Special Investigations by Members of the Staff :—*

Sir E. N. Thornton, *Assistant Health Officer*—
"Notes on Amputations from the Artificial Limb Standpoint." Address, Pretoria Branch of Medical Association of South Africa, 11th July, 1929.
"Knowledge is Power." Address, Health and Baby Week, Middelburg (Transvaal), 1st March, 1930.
"Essential Public Health Needs." Address, Health and Baby Week, Brakpan, 28th April, 1930.

Dr. W. A. Murray, *Assistant Health Officer*—
"Bilharzia, Malaria, Leprosy, Typhoid." Address, Grace Dieu Mission Training College, 8th July, 1929.
"Bilharzia." Address, Nelspruit Town Hall, 29th July, 1929.
"Prevention of Insanitation." Address, Transvaal Municipal Congress, Vereeniging, 30th September, 1929.
"Insect-borne Diseases." Address, Demonstration Train, Brits, 2nd October, 1929.
"Hygiene of the Native Home." Address, Alexandra Township, Johannesburg (Natives), 29th October, 1929.
"Insect-borne Diseases." Address, Afrikaans Association, Pretoria, 14th February, 1930.

Dr. E. H. Cluver, *Assistant Health Officer*—
"Pellagra among the Maize-eating Natives of the Union of South Africa." (*British Medical Journal*, 26th October, 1929.)
"Disease in the Transkeian Native Territories." (*British Medical Journal*, 28th December, 1929.)
"The Plague Menace in the Union." Address, Humansdorp, 19th October, 1929.

3. *Health Publicity and Educative Work.*—The following pamphlets and leaflets have been prepared, published, and distributed by the Department to date. Pamphlets or leaflets of which revised editions have been published are omitted from the list:—

"Senecio Disease." (Warning notice.) No. 166 (Health).
"Food and Health." No. 194 (Health).
"Directions for the Prevention and Treatment of Malaria." No. 198 (Health).
"Anthrax." No. 239 (Health).
"Venereal Diseases: Their Prevention and Treatment." No. 248 (Health).
"Instructions to Persons suffering from Gonorrhœa." No. 249 (Health).
"Instructions to Persons suffering from Syphilis." No. 250 (Health).
"Poisoning by 'Stinkblaar' or Thorn Apple (*Datura stramonium* and *Datura tatula*)." (Warning notice.) No. 256 (Health).
"Sleeping Sickness." (Warning notice.) No. 262 (Health).
"Smallpox: Duties and Powers of Local Authorities under Public Health Act, and procedure to be followed in dealing with outbreaks." No. 276 (Health).
"Directions for the Performance of Public Vaccination." No. 279 (Health).
"How to Prevent Consumption." No. 284 (Health).
"Directions for Consumptive Persons." No. 285 (Health).
"Dagga Smoking and its Evils." No. 289 (Health).
"Plague: A Brief Account of its Symptoms, Clinical Diagnosis, Morbid Anatomy, and Treatment." (Drs. D. C. Rees and J. A. Mitchell.) No. 293 (Health).
"Measures against Plague." No. 306 (Health).
"Plague: Its Control, Eradication, and Prevention." No. 316 (Health).
"Plague and its Cause and Prevention." No. 317 (Health).
"Rodents: Description, Habits, and Methods of Destruction." (W. Powell.) No. 321 (Health).
"Fly-proof Latrines for Coloured Persons." (Dr. G. A. Park Ross.) No. 334 (Health).
"Houseflies: Their Life-history, Destruction, and Prevention, and their influence on Sanitation and Health." No. 335 (Health).
"Bilharzia (Human Redwater) Disease." No. 339 (Health).
"Snake-bite and its Treatment." No. 348 (Health).
"Tuberculosis: Summary of Causes and Preventive Measures." No. 352 (Health).
"First Measures in Malarial Prevention for Farmers and Settlers," together with illustrated wall-poster; "Danger of Mosquitoes." (Drs. G. G. Hay and G. A. Park Ross.) Published jointly with the South African Red Cross Society (Transvaal). No. 356 (Health).
"Instructions to Native Patients suffering from Syphilis or Gonorrhœa." (In Zulu, Sixosa, Sesuto, and Sechuana.) No. 358 (Health).
"Malaria Catechism." No. 360 (Health).
"Influenza." No. 363 (Health).
"Typhoid or Enteric Fever: Its Causes, Spread, and Prevention in South Africa." No. 365 (Health).
"Care of the Teeth and Prevention of Dental Disease in Children." No. 368 (Health)
"Leprosy in the Transkei." No. 372 (Health).
"Catechism about Typhoid or Enteric Fever." No. 378 (Health).
"The Teeth: How to Prevent Decay." No. 379 (Health).
"Plague Danger in Cape and South-western Districts: Measures and Procedure in Event of Outbreak." No. 380 (Health).
"The Cause and Prevention of Simple Goitre." No. 394 (Health).
"Typhus or Louse Fever." No. 417 (Health).

The following cinema films have been purchased by the Department and are available to local authorities and public bodies for exhibition purposes:—

"Whatsoever a Man Soweth" (venereal disease).
"The Enemy within our Gates" (rats).
"The Rat Menace."
"Swat that Fly."
"Fly Danger."
"Your Mouth."
"The Story of John McNeil" (tuberculosis).
"The War on the Mosquito."
"How to Live Long and Well."
"One Scar or Many" (vaccination).
"In His Father's Footsteps" (insanitary farm-typhoid).
"The Long versus the Short Haul" (dirty milk).
"Bringing it Home" (child welfare).
"Bilharziasis."

A new and up-to-date Dutch film on malaria has been ordered from Holland, and is expected to arrive shortly.

A set of small models, specially made for the Department by a health inspector, who is also a clever handyman, is stocked by the Department's health officers at Pretoria, Capetown, and Durban for loan to local authorities and other bodies for demonstrations during "health weeks" and on similar occasions, and for illustrating lectures on hygiene. Each set includes a model for illustrating—

(1) methods of rodent-proofing buildings;
(2) an "open-air" room for home segregation of a tubercular patient;
(3) Baber's maggot-traps;
(4) Russell's modified maggot-trap;
(5) Russell's modified box fly-trap;
(6) Squatting closet for native use.

The Department has purchased an up-to-date epidiascope with portable electric generator for its propagandist campaign—also three magic-lanterns. Lantern-slides are now on order. It is hoped to increase educative work in connection with the campaigns against malaria, plague, bilharzia, and fly-borne disease and general insanitation, so as to ensure the co-operation of an enlightened public.

4. *Laboratories and Medical Research.*

TABLE E.—PATHOLOGICAL LABORATORIES: ANALYSES AND EXAMINATIONS, YEAR ENDED 30TH JUNE, 1930.

Particulars.	Laboratories.		South African Institute for Medical Research.
	Capetown.	Durban.	
Specimens Examined for—			
Government Departments—			
Agriculture	22	—	—
Customs and Excise	36	—	14
Defence	250	124	1,734
Interior (Mental Hospitals, etc.)	582	1,332	255
Justice	—	219	1,374
Justice (Prisons)	498	451	400
Mines and Industries (including Miners' Phthisis)	4	—	25,246
Posts and Telegraphs	125	—	—
Public Health (including Leper Institutions)	6,973	4,671	28,782
Public Works	—	1	
South African Railways and Harbours	157	195	-
Other Government Work	354	312	580
General Hospitals (Provincial)	1,237	15,364	25,773
Local Authorities	13,558	2,956	3,556
Medical Practitioners	8,343	12,158	11,412
Department of Education (Provincial)	—	802	—
Other Governments or Administrations	27	—	52
Others	4	1	1,724
TOTAL	32,170	38,586	100,902
Manufactures and Issues—			
Autogenous Vaccines c.c.	432	1,350	52,400
Bacterial Vaccines (stock) c.c.	—	—	939,725
Tuberculin Dilutions c.c.	—	—	245
Sera (various) c.c.	—	—	327,781
Anti-rabic Vaccine c.c.	22,000	—	—
Bulgarian Milk Cultures bottles	—	—	363
Insulin tubes.	—	—	3,610
Chaulmoogra Oil Preparations litres	122	—	—
Smallpox Vaccine—Calf Lymph (prepared at Vaccine Institute, Rosebank) tubes	1,380,000	—	—
Attendances at Courts of Justice by Members of Staff	2	31	7
Total Days' Absence entailed by such attendances	5	33	22

* A large proportion of this work was in connection with the Addington Hospital, Durban, and is done in conjunction with Dr. F. R. Johnstone, bacteriologist to the hospital.

Medical Research.—(*a*) *Tuberculosis.*—The comprehensive scheme of investigation organized by the Tuberculosis Research Committee referred to in last two Annual Reports has been completed. These investigations, which were directed by Professor Lyle Cummins, Professor of Tuberculosis at the Welsh National School of Medicine, covered a very wide field. The disease was studied among natives employed industrially, and their home conditions, both within and outside the Union, were investigated. Much valuable data were collected, and will be published in the report which is being published by the South African Institute for Medical Research, and will appear shortly. In his general review of tuberculosis on the gold mines given at the last meeting he attended, Professor Cummins urged the great need for more co-ordination of health work on the Witwatersrand and expansion of medical services in the native territories.

(*b*) *Sunlight Survey of South Africa.*—The systematic investigation mentioned in last Annual Report—jointly with the Department of Physiology of the Witwatersrand University—is being continued and has already yielded interesting results. A preliminary report of the investigations was read by Mr. W. B. Osborn, of the Department of Physiology, Witwatersrand University, at the meeting of the British Association in Johannesburg in July, 1929, and was published in the *South African Journal of Science* in December, 1929. Mr. Osborn summarizes the conclusions so far reached as follows:—

> "The clearness of the atmosphere, the high altitude of most of the land, and the nearness of South Africa to the equator indicate that the sunlight received by this country is rich in chemical or ultra-violet rays. Actual determinations by means of the acetone-methylene blue actinometer confirm this hypothesis. The smoky European cities are noted for their deficiency in ultra-violet light. The intensity of these rays is very much greater than at seaside resorts in England, and, in all but the least favourable spots, the intensity is far greater than that of the Alpine health resort, Davos.
>
> For most conditions, a great quantity of infra-red or heat radiation is a disadvantage, though for some diseases, such as certain forms of rheumatism, it appears to be an advantage. For most types of pulmonary tuberculosis, a dry, bracing climate is desirable, but for some forms of tuberculosis of the throat a more humid climate is preferable.
>
> South Africa offers a relatively very wide range—the dry, cool bracing air of Belfast; the relatively humid, cool, bracing weather of the uplands of Natal, as exemplified by Mistley (near Seven Oaks); the warm summers of Johannesburg and Capetown; the warm winters of Durban, and the hot dry licmate of the Karroo. 'Although it lies between the fairly low latitudes, 22° to 35° south, its climate is cooler than that met with in similar latitudes in the Northern Hemisphere. Actually, the various parts of the sub-continent have a mean annual temperature corresponding to that found in Europe 7° to 10° further from the Equator.' (Year Book of the Union of South Africa.)
>
> Hourly measurements show that the intensity of ultra-violet light increases from dawn to mid-day, and then decreases until sunset."

(*c*) *Poor White Research.*—Since June, 1929, the members of the Research Committee have continued their investigations in various parts of the Union wherever indigent Europeans have been driven away by economic or other causes or have congregated for the purpose of seeking a livelihood.

Many facts of great scientific interest as well as of practical importance have been elicited, and will be embodied in the report of the Research Committee, which is expected to appear early in 1931.

(*d*) *Food Poisoning from B. Aertrycke Infection.*—An interesting and suggestive report has been submitted by Dr. Sampson, Acting Government Pathologist, Durban, regarding an outbreak of disease amongst natives in the Richmond District of Natal. The outbreak comprised some 40 cases of serious illness, mostly in young adults and children, and was at first regarded as probably enteric fever. Investigation showed, however, that all those affected had eaten meat from an animal which had died of East Coast fever a few hours before, and that the causal organism was *B. Aertrycke*, of Nocard. Dr. Sampson considers that this organism is carried in the intestines of certain birds of South Africa, that their excreta, by deposition or falling on the veld, contaminate the grass, and that the infection may thus be conveyed to sheep, cattle, or possibly pigs; if the affected animal dies of East Coast fever or other slow, wasting disease, the infection may become widely disseminated throughout its tissues before death and its flesh may thus become highly toxic—though without any abnormal appearance or odour. Further investigation of the matter is very desirable.

5. *Port Health Administration.*—The following table summarizes health work at the ports of the Union during the year:—

TABLE F.—PORTS OF THE UNION: HEALTH MEASURES DURING THE YEAR ENDED 30TH JUNE, 1930.

Particulars.	Capetown.	Durban.	Port Elizabeth.	East London.	Mossel Bay.	Knysna.	Port St. Johns.	Simonstown.	Port Nolloth.	Total.
Vessels dealt with	1,053	1,482	947	744	265	39	25	94	104	4,684
Cases of infectious or communicable diseases dealt with	290	247	—	3	—	—	—	—	—	540
No. of Vessels involved	95	97	—	1	—	—	—	—	—	193
Disinfections—										
Vessels	33	5	— *	1	—	—	—	—	—	39
Second-hand clothing and other articles	1,723	722*	5,141	—	—	—	—	—	—	7,586
Bales of mixed articles	1	51	25	—	—	—	—	—	—	77
Deratizations under International Sanitary Convention—										
No. of Vessels Deratized and Certificates Issued	4	65	—	—	—	—	—	—	—	69
No. of Exemption Certificates Issued	10	42	—	—	—	—	—	—	—	52
Rats Destroyed on Vessels and on Shore	2,947	4,529	4,042	945	43	—	—	—	—	12,506

* In addition, the personal effects of 2,225 Indian and Coloured passengers were disinfected.

Considerable quantities of foodstuffs were condemned and destroyed on grounds of unfitness for human consumption, chiefly tinned fish, game, salt pork, butter, cheese, fruit and vegetables.

Cases of *smallpox* occurred on the following vessels:—

" Karoa " arrived Durban, 18.9.29 from Bombay; landed one case at Zanzibar on 6.9.29 and another at Lourenco Marques on 16.9.29 (both Indian deck passengers).

" Karoa " arrived Durban, 13.11.29 from Bombay; landed a case in an Indian deck passenger at Zanzibar on 1.11.29.

" Khandalla " arrived Durban, 11.12.29 from Bombay; landed a case in an Indian second-class passenger at Zanzibar on 29.11.29.

" Karoa " arrived Durban 8.1.30 with 10 Indian deck passengers transhipped from " Ellora," from which vessel an Indian deck passenger suffering from smallpox had been landed at Mombasa on 30.12.29.

" Karagola " arrived Durban 22.1.30 from Bombay; landed 4 cases in Indian deck passengers at Zanzibar on 11.1.30.

" Khandalla " arrived Durban 5.2.30 from Bombay; landed case in an Indian member of crew at Beira on 1.2.30.

" Karapara " arrived Durban 19.2.30 from Bombay; landed case in Indian deck passenger at Lourenco Marques on 17.2.30.

" Karagola " arrived Durban 19.3.30 from Bombay; landed case in Indian deck passenger at Zanzibar on 8.3.30.

" Khandalla " arrived Durban 2.4.30 from Bombay; landed 5 cases (all Indians) at East Coast ports—2 (members of crew) at Mombasa on 21.3.30, 2 (member of crew and deck passenger) at Zanzibar on 23.3.30, and one deck passenger at Lourenco Marques on 30.3.30.

" Umvuma " arrived Capetown on 3.10.29 from London with 5 cases amongst Indian members of crew.

In the case of each of these vessels, the passengers and crew were medically examined, vaccinated where necessary, and the contacts either landed under medical surveillance or detained and isolated in an isolation hospital or quarantine station until the expiration of the incubation period after last exposure to infection.

One of the contacts landed from the " Khandalla " on 2.4.30 developed mild smallpox on 14.4.30 whilst in the Salisbury Island Quarantine Station.

Cases of *influenza* were reported on the following:—

" Karoa " arrived Durban 10.7.29 from Bombay; 2 cases during voyage; both convalescent on arrival.

" Euripides " arrived Durban 6.9.29 from Freemantle; 6 cases during voyage; 2 still ill on arrival.

Cases of *measles* were reported on the " Manila Maru," " Karachi Maru," " Hawaii Maru," " Hakata Maru," and " Santos Maru," all from Far Eastern ports.

Anti-rodent measures in ports and port areas as indicated in last Report, have been continued.

Psittacosis.—During the past year cases and outbreaks of this disease in man were reported in many countries. The " carrier " of the infection in most instances was the South American parrot, but instances of infection in grey African parrots have also been reported. Severe mortality from an apparently epidemic disease of dysenteric nature is known to have occurred in consignments of grey parrots brought from the West Coast of Africa to Union ports. So far no case or suspected case of the disease in man has been reported in the Union. In order to safeguard against the introduction of the infection, a Proclamation (No. 105 of 1930) was issued prohibiting the introduction into the Union of birds of the parrot family (Psittacidae) except for scientific or educational purposes and under permit issued by the Department. The Proclamation is not interpreted as applying to budgerigars, lovebirds and other members of the family or sub-family, Psittaculidae.

6. *Health Supervision of Aircraft.*—During the year the regulations framed in consultation with the Civil Air Board and referred to in last Annual Report, were made under Section 3 (1) (*f*) of the Aviation Act, No. 16 of 1923, and promulgated under Government Notice No. 1412 of 1929. These regulations, in conjunction with the existing provisions of the Public Health Acts and Regulations, have so far been adequate for the small amount of aerial traffic entering or leaving the Union, but with the anticipated early increase of that traffic and the establishment of a regular service to Europe *via* the Great Lakes, East Africa and Egypt, the position will require review. The whole question of the health and sanitary control of aerial navigation has for some time past been receiving the consideration of the Office International d'Hygiene Publique (with which the Department

has been in consultation on the subject) with a view to the framing of an international code of uniform regulations under the International Sanitary Convention, or a special International Agreement. A special committee of the "Office" is now engaged in framing such a code which, it is understood, will be submitted to the Governments signatory to the Convention for criticism, suggestions and remarks before approval by the Executive of the "Office."

7. *Adulteration of Food and Drugs.*—The following table shows the action taken in this connection during the year:—

TABLE G.—ADULTERATION OF FOOD AND DRUGS, YEAR ENDED 30TH JUNE, 1930.

Place.	Samples Taken.	Samples Analysed or Examined.	Samples Found Inferior, Deficient or Adulterated.	Prosecutions.	Convictions.	Remarks.
Ports of Union.....	178	173	31	—	—	29 importers warned, and 2 consignments excluded.
Cape Province.....	1,691	1,686	269	15	13	A large percentage of offences, especially first offences, are dealt with by warning notices.
Natal Province.....	3	3	—	—	—	
Transvaal Province.....	779	779	45	—	—	
Orange Free State Province.....	134	134	10	9	4	
UNION.....	2,785	2,775	355	24	17	

The foregoing figures include analyses made under the old laws on behalf of local authorities in the Transvaal; no particulars of the action taken thereon have been furnished to the Department.

The Food, Drugs and Disinfectants Act, No. 13 of 1929, and the regulations made thereunder came into force on 1st April, 1930 (Proclamation No. 62 and Government Notice No. 575 of 1930). In the framing of the regulations the Chambers of Commerce, South African Federated Chamber of Industries and other bodies concerned were freely consulted and gave valuable information and assistance. Manufacturers, importers and retailers almost without exception appeared to realize that the new law was for their benefit and protection as well as for that of consumers and the public, and co-operated in every way possible. The Department, on its part, has given very careful and sympathetic consideration to the representations of trade bodies and individual persons or firms and, in the matter of revision of labels and otherwise,. has endeavoured to minimize dislocation and expense to those concerned and to allow reasonable time for compliance with the new labelling and other requirements, always provided that the essential requirements of the Act and regulations were met or arrangements made for compliance without undue delay. Although no prosecutions under the Act were instituted before the end of the Annual Report period, a large number of warning notices and letters calling attention to defaults in labelling and so forth were issued, marked improvement in labelling and otherwise was already noticeable and the manufacture or importation of a number of spurious or adulterated food articles had been discontinued. Twenty municipalities—comprising all the larger ones except Capetown—have applied for and been granted by the Minister authority under Section 2 (3) of the Act to carry out and enforce within their areas the provisions of the Act and regulations in respect of perishable articles and also flour, meal, bread and other food articles not packed or sold in sealed packages. The administration and enforcement of the Act in respect of other articles will, in accordance with an understanding arrived at between the Government and the commercial and manufacturing interests when the Bill was before Parliament, remain with the Government, but it is hoped that local authorities will actively co-operate and assist. Each of the authorities auhorized under the section mentioned will, in accordance with other provisions of the same section, be entitled to the examination or analysis free of charge in a Government laboratory, of a number of samples annually, calculated on the basis of four samples per thousand of the European population at last census.

Apart from Durban, the Borough Council of which employs two chemists (who have been appointed by the Minister to be analysts under the Act while so employed), all the analytical work under the Act is—by arrangement

with the Department of Agriculture—carried out in the Government Chemical Laboratories at Capetown and Johannesburg, the examination of disinfectants and similar work being done in this Department's Pathological Laboratories at Capetown and Durban. Four inspectors are employed by the Department, primarily for the purposes of the Act—one headquartered at Pretoria, two at Capetown and one at Durban—their work also comprising enforcement duties in connection with vaccination.

The immediate direction and control of measures under the Act in the Cape Province and at the ports of the Union, including Durban and the inland Customs "ports of entry," is carried out by the Assistant Health Officer for the Union stationed at Capetown, for whom the Act has entailed an immense increase of work; the directive and administrative work for the other three Provinces is done by the Secretary for Public Health and the head office staff. The Municipality of Johannesburg, in addition to undertaking the enforcement of the Act in respect of perishable and other articles under Section 2 (3), has very kindly agreed to make its inspectors available to assist this Department in enforcing the provisions in respect of food articles sold in sealed packages and other manufactured products.

The Department of Customs and Excise in respect of imported articles and the Police throughout the Union are giving invaluable assistance in carrying out and enforcing the provisions of the Act.

8. *Health of Natives on the Witwatersrand Gold Mines.*—Systematic investigation of health conditions among the native mining population on the Witwatersrand gold mines was again made. The high standard of hygienic efficiency is being maintained on most of the mines. The recommendations made by the Department after the previous survey had in most cases been carried out or were in process of being carried out.

Two mine hospitals previously found to be very unsatisfactory had been improved. One had been largely rebuilt; the accommodation is now adequate and the equipment and buildings suitable. At the other, conditions are still far from satisfactory, but owing to the probable short life of the mine, extensive structural alterations are impracticable.

Extensive structural improvements have been made in many of the mine compounds. The attention of other mines was drawn to structural and other faults still requiring attention. In all cases the co-operation of the mine management concerned was forthcoming and attention was immediately given to the required improvements. Unsatisfactory wooden bunks which provide free harbourage for vermin still exist in many compounds. Wherever the life of the mine warrants it, the Department is pressing for the elimination of these and their replacement by the much more hygienic partitioned concrete bunks.

Compound kitchens are carefully supervized with a view to eliminating the possibility of contamination of food supplies by flies and other means.

The diet of the natives was found in general to be satisfactory. On a few mines scurvy is still unnecessarily prevalent. This is only partially due to the sub-scorbutic state in which many of the natives arrive on the Reef. Overcooking of the vegetables was still found to be a not uncommon fault. Some of the mines were still not issuing the anti-scorbutic ration of germinated beans. Following representations made by the Department, steps were taken by the industry to ensure germinated beans forming a portion of the ration on all mines.

The mines previously found defaulting with regard to the composition of the bread ration (which must consist of not less than 64 percent. of wheaten flour and not more than 36 per cent. of mealie meal) are now complying with the regulations.

Heat apoplexy appears to be on the increase; this is to be expected from the increasing rock temperatures as greater depths are being mined. On mines where the condition has been occurring very frequently, elaborate precautionary measures are being taken.

Compound dressing stations were in all cases found to be satisfactorily conducted and equipped. They are a very important factor in the fight against sepsis. At most compounds police boys are stationed at the compound gates when the labourers are coming off shift with a view to detecting minor injuries. These are immediately cleansed and dressed at the compound dressing station. This procedure is not objected to by the natives as it seldom means losing a shift.

The unhygienic custom of natives from Portuguese territory of enclosing their bunks completely in curtains was commented on during the previous survey and its prohibition recommended. This prohibition has now been carried out with almost complete success. This is particularly gratifying in view of the fact that many compound managers had feared grave disturbance among the natives concerned if the abolition of these curtains was enforced. The success is probably to be attributed in considerable measure to the fact that it was enforced simultaneously throughout the mines.

V.—INFECTIOUS, COMMUNICABLE, AND PREVENTABLE DISEASES.

1. *Notifications.*—The following table shows the notifications of infectious diseases by medical practitioners during the year, the totals for the previous year being inserted for comparison. It is to be noted that many cases of such diseases, especially in natives, are never seen by a medical man, and consequently are not notified:—

TABLE H.—NOTIFICATIONS OF DISEASES BY MEDICAL PRACTITIONERS DURING THE YEARS ENDED 30TH JUNE, 1929, AND 30TH JUNE, 1930.

Disease.	Year Ended 30th June, 1929.	Year Ended 30th June, 1930.											
	Union.	Union.	Cape Province, excluding Transkei.		Transkei.		Natal.		Orange Free State.		Transvaal.	
	Total.		European.	Non-European.	European.	Non-European.	European.	Non-European.	European.	Non-European.	European.	Non-European.
Anthrax	38	40	11	6	1	—	—	2	10	3	3	4
Diphtheria	1,419	1,434	491	219	11	—	98	27	160	67	333	97
Encephalitis, Infective	39	18	2	2	1	—	—	—	5	4	3	1
Enteric or Typhoid Fever	4,963	3,775	751	752	12	20	145	290	152	171	496	986
Erysipelas	272	243	71	45	—	—	17	4	12	1	70	23
Glanders	—	—	—	—	—	—	—	—	—	—	—	—
Leprosy	99	98	3	28	—	3	—	19	—	5	—	40
Malta Fever	6	8	6	2	—	—	—	—	—	—	—	—
Meningitis, Epidemic Cerebro-spinal	747	669	126	200	2	1	2	3	9	9	47	210
Ophthalmia, Gonorrhœal	36	61	11	30	—	—	1	4	1	9	1	5
Ophthalmia Neonatorum	261	240	61	134	1	—	1	4	6	8	13	12
Plague (for complete list of cases and deaths, see Table L.)	7	29	—	18	—	—	—	—	—	11	—	—
Poliomyelitis, Acute	22	30	18	6	1	—	2	—	1	—	—	2
Puerperal Fever, including Puerperal Sepsis	306	329	60	107	—	1	12	26	11	10	67	35
Rabies	5	1	—	—	—	—	—	—	—	—	1	—
Scarlatina or Scarlet Fever	2,996	1,637	571	39	5	—	121	3	123	5	772	7
Smallpox [for complete list of cases and deaths, see Table N (ii)]	26	41	—	6	19	—	—	1	—	6	4	4
Trachoma	43	83	20	58	—	—	—	3	2	—	—	—
Tuberculosis	6,261	6,305	443	2,904	9	528	166	530	35	109	40	1,511
Typhus Fever (for complete list of cases and deaths, see Table O)	1,146	1,312	30	393	—	778	33	17	2	51	5	3
* Lead Poisoning	—	10	3	5	—	—	1	—	—	—	1	—
TOTALS	18,692	16,303	2,678	5,035	62	1,333	538	933	529	469	1,856	2,879

* Declared a notifiable disease throughout the Union as from 1st October, 1929.

Malaria.—During last season, at the request of the local authorities concerned, first cases of malaria in the same dwelling or premises, were made notifiable under Section 18 (2) (*d*) of Act No. 36 of 1919 in Pietermaritzburg and Durban, and nine Health Boards in the peri-Durban area. A total of 550 European and 616 non-European cases of the disease were notified up to 30th June, 1930.

2. *Ankylostomiasis (Hookworm Disease).*—The recommendations contained in the Report of the Special Committee appointed by the Minister of Mines and Industries, published in last Annual Report, have since been put into effect by the affected mines, with encouraging results, at any rate as far as European miners are concerned. During the year under review only 168 European miners were found infected and applied for compensation, the number during the previous year being 224.

The decrease is even greater than the foregoing figures indicate, because as a result of Committee's report, special search was made in mines in which the disease had not been previously suspected, and a good many old-standing cases discovered. On the other hand, in several large mines in which the soil had previously been heavily infested, but where the measures recommended are now being fully carried out, it is now impossible to find infested soil, so that new infections are no longer taking place.

It may be confidently expected that the rapid decrease in incidence of infection will continue, but much will depend on the vigilance and care of the mine managements in maintaining anti-hookworm measures and especially the lavish use of common salt on mine floors. It must be remembered that between 50,000 and 100,000 infected East Coast natives arrive on the mines annually. Mass treatment with carbon tetrachloride was found too dangerous when originally tried two years ago. This drug is dangerous in that toxic impurities may occur in it. This danger is obviated in Egypt, where the drug is very extensively used, by first testing every consignment on dogs. Controlled in this way the drug is found to be entirely safe.

3. *Bilharziasis (Schistosomiasis).*—As foreshadowed in last year's report, "camps" were held during the school vacations under the aegis of the Transvaal Bilharzia Committee at Nelspruit and White River, Ohrigstad, Groot Marico, and Piet Retief. These were most successful—a very high percentage of the children being discharged cured. The local public in each case expressed their appreciation of the services rendered. Stress was laid by the medical officer in charge of each camp on the necessity for local provision of bilharzia-free swimming places for the children in order to prevent reinfection. At most of the centres the Department's bilharzia film was shown during the "camp" to drive home the lesson of prevention.

An unsuccessful attempt was made to organize a "camp" in the Northern Transvaal for native children suffering from the disease. Another attempt will be made during the coming year.

The Natal Education Department is conferring with this Department with a view to the establishment of a similar organization in that Province.

At the suggestion of the Department, the new drug "Fouadin" was tried in the treatment of this disease, but the results have not been uniformly satisfactory. A further test, with closer adherence to the instructions issued by manufacturers, will be arranged. Antimony tartrate still remains the most effective as well as the cheapest drug for treating the disease, but the introduction of a cheap and effective remedy which would be more easily administered and never give rise to any ill-effects would be a notable advance.

4. *Diphtheria.*—Notifications of diphtheria for the present year totalled 1,434, being about the same number as last year. About one-half of this number (710) occurred in Cape Province. In Capetown, cases occurred throughout the year, and a total of 232 (162 European and 70 non-European) were dealt with, with a mortality of 30.

Further Schick tests were carried out during the year at Capetown, a total of 2,202 persons being so tested, practically one-half of whom (1,092) were found to give a positive reaction (i.e. as being susceptible to diphtheria). Of the positives, 614 were given three protective injections each in most cases (1,736 injections in all); 114 of these have since been re-tested, showing 17 to 15 per cent. still susceptible, but about 85 per cent. immune. As such artificial immunity has been found to last for 7 to 10 years, and probably for life, the benefit of such immunization is very great.

A few unfortunate fatalities have occurred in other countries following protective inoculation. Investigation has shown these to have been due either to the presence of free toxin or the absence of anti-septic from the toxin-antitoxin mixture and contamination of the mixture with septic organisms. Nothing of this nature has so far occurred in South Africa, where only anatoxin (Ramon) or toxoid mixtures are in use.

These tests show that approximately half the children tested were susceptible to diphtheria and would be liable to contract the disease if exposed to infection; also that by this method of protective inoculation the great majority of susceptible children can be immunized against this dangerous disease.

5. *Enteric or Typhoid Fever.*—It is pleasing to record that the decline in incidence of notified cases of enteric fever continues, 3,775 cases having been notified during the year under review as against 4,963 during the previous year—a fall of 1,188.

As usual, excessive incidence occurred rather in smaller urban centres than in the cities or larger towns. Furthermore, the character of the outbreaks usually points to slow and progressive spread of the infection associated with fly conveyance, rather than to the "explosive" type associated with water-borne or milk-borne outbreaks.

Although no large or serious outbreaks were reported during the year, an excessive number of cases occurred in several towns and districts in the Union. Attention is drawn to the following table which shows, in addition to the actual number of cases notified during the year, the rate of typhoid incidence in the different centres in relation to the local population in each case. The centres which head the list therefore gain an unenviable notoriety, as the prevalence of typhoid is usually an indication of the degree of insanitation.

TABLE J.—ENTERIC OR TYPHOID FEVER: NOTIFICATIONS AND INCIDENCE IN CERTAIN LOCAL AUTHORITY AREAS DURING THE YEAR ENDED 30TH JUNE, 1930 (ARRANGED IN ORDER OF INCIDENCE RATE)—EXCLUDING CASES RETURNED AS "IMPORTED."

Place.	Notifications.			Incidence per 1,000 of Population.		
	European.	Non-European.	Total.	European.	Non-European.	All Races.
Bonnievale.....V.M.B.	1	11	12	2·24	93·22	21·28
Brandvlei.....V.M.B.	12	1	13	28·57	4·17	19·70
Alice.....M.	—	38	38	—	22·62	15·78
Adelaide.....M.	14	23	37	12·52	16·63	14·79
Nigel.....M.	2	38	40	2·23	17·19	12·87
Steytlerville.....M.	3	8	11	4·38	12·86	8·42
Uniondale.....M.	5	5	10	7·15	6·90	7·02
Steynsburg.....M.	7	8	15	5·05	9·93	6·85
Molteno.....M.	1	13	14	0·82	10·75	5·77
Boksburg.....M.	32	155	187	2·64	0·06	4·97
Kroonstad.....M.	10	34	44	2·02	6·74	4·40
Parys.....M.	14	—	14	5·27	—	4·40
Volksrust.....M.	6	9	15	2·53	8·19	4·32
Worcester.....M.	20	17	37	4·72	3·58	4·12
Korsten.....V.M.B.	6	28	34	3·18	4·32	4·06
Heilbron.....M.	2	10	12	1·27	6·51	3·86
Springs.....M.	16	52	68	2·98	3·49	3·35
Ermelo.....M.	14	—	14	5·86	—	3·31
Ladysmith, Natal.....M.	14	9	23	3·95	2·53	3·24
Germiston.....M.	31	102	133	1·87	3·83	3·08
Paarl.....M.	33	6	39	4·94	0·89	2·91
Oudtshoorn.....M.	11	20	31	1·95	3·87	2·87
Roodepoort-Maraisburg..M.	10	59	69	1·39	3·48	2·86
Krugersdorp.....M.	27	35	62	2·40	3·21	2·80
Burghersdorp.....M.	3	7	10	1·58	4·04	2·75
Malmesbury.....M.	3	8	11	1·27	4·37	2·63
Aliwal North.....M.	2	13	15	0·76	3·38	2·31
Brakpan.....M.	20	40	60	2·37	2·28	2·31
Cradock.....M.	9	6	15	2·65	1·70	2·16
Uitenhage.....M.	10	21	31	1·23	3·28	2·13
George.....M.	7	5	12	1·85	2·66	2·12
Somerset East.....M.	7	4	11	2·90	1·38	2·07
Pretoria.....M.	62	50	112	1·39	1·76	1·53
Johannesburg.....M.	*123	*337	460	0·68	2·32	1·41
Graaff-Reinet.....M.	5	8	13	1·09	1·68	1·39
Randfontein.....M.	8	21	29	2·45	1·15	1·35
Innesdale.....V.C.	12	1	13	1·69	0·35	1·30
*Port Elizabeth.....M.	57	18	75	1·73	0·66	1·25
Kingwilliamstown.....M.	4	7	11	0·62	1·88	1·08
*Capetown.....M.	*121	*137	258	0·92	1·08	1·00
Benoni.....M.	4	43	47	0·27	1·30	0·98
*Bloemfontein.....M.	22	18	40	1·02	0·69	0·84
Queenstown.....M.	4	6	10	0·66	0·79	0·73
Kimberley.....B. of H	14	12	26	0·86	0·56	0·69
Durban.....M.	36	25	61	0·62	0·45	0·54
Pietermaritzburg.....M.	11	7	18	0·55	0·38	0·47

M. = Municipality. V.M.B. = Village Management Board.
V.C. = Village Council. B. of H. = Board of Health.

* Rates calculated on population as at census, May, 1926; others calculated on European population as at census, May, 1926, and non-European population as at census, May, 1921.

During the past year considerable advances have been made in laboratory methods of diagnosis of typhoid fever. For many years past much dissatisfaction has been expressed by practitioners on receiving, in a large percentage of cases, " negative " Widal reports on blood specimens of patients showing definite clinical symptoms of typhoid fever. Recent research by many workers has brought to light new facts, upon which the technique of the " Widal " test has been much improved, so as to show a far larger percentage of " positive " reactions.

Few country practitioners appear to utilize another easy method of blood examination, namely, that of blood culture in sterile ox-bile, which is especially useful for diagnosis during the first week or nine days of illness. The medium is supplied, on request to the laboratory concerned, in small rubber-capped bottles. The required quantity of blood can be drawn with an ordinary hypodermic syringe from the patient's vein, or even by means of a finger-prick.

A polyvalent concentrated anti-typhoid serum for prophylactic and therapeutic use in the enteric fevers, is prepared and issued by the South African Institute for Medical Research. It is stated to possess both antitoxic and antibacterial properties, and very encouraging results have been found to follow its clinical use.

Immunization, by means of pills containing anti-typhoid vaccine, against typhoid infection (Besredka's method) continued to be widely used during the year, with very satisfactory results. The use of these pills is specially indicated when it is desired to limit outbreaks while investigation into their causes and remedial sanitary measures are being carried out; their use is also convenient and economical in areas remote from medical aid.

6. *Influenza.*—During the year prevalences were reported from several centres, mostly of mild type, but in a few instances of fairly severe type with tendency to lung complications. No severe and extensive outbreak occurred.

A vigilant outlook for the disease was maintained at the ports.

All local authorities have been notified of the precautions that should be taken in the event of any outbreak of the disease occurring.

7. *Leprosy.*—The subjoined tables show the measures taken during the year and the position at its close. It will be seen that admissions during the year numbered 686, including 14 European and 24 mixed coloured—an increase of 127 admissions of natives as compared with the previous year. The average period between onset and admission is being steadily reduced. These facts indicate that progress is being made in reducing the large accumulation of undiscovered cases in the native areas and in speeding-up removals, but this process will inevitably take some years and meanwhile the annual admissions will increase. Several depots for temporary detention pending removal to an institution have already been completed, and it is hoped that the scheme of such depots at convenient centres in the native areas—and of removals by motor ambulance—will be completed by the end of next year; a further increase of admissions of natives during next year is therefore anticipated. Motor ambulance removals in Tembuland commenced during April last and practically all the available patients in that area were in the Emjanyana Leper Institution by the end of June.

The publicity tour of the Kentani District by a party of five non-infective patients from Emjanyana selected by the patients' committee was carried out in July and August, 1929, on the lines indicated in last report. The tour went off very satisfactorily, the party was well received, 22 meetings were held and there were good attendances. There have since been five voluntary admissions from this district; it is stated, however, that had a motor ambulance been in attendance at the time, 15 or 20 cases might have been removed. It is intended to repeat the experiment—now that facilities for prompt removal are available. The number of voluntary admissions from most districts is steadily increasing, but the proportion of these, and especially of early cases, is still disappointing.

The great majority of the inmates of the leper institutions are now under anti-leprotic treatment of one form or another. During the year Dr. Franz was appointed to the joint post of District Surgeon for the Blaauwberg area of the Pietersburg District and Medical Officer to the Bochem Leper Institution and the Hospital for Venereal Diseases there. Dr. Wildish relinquished the post of Visiting Medical Officer to the Amatikulu Leper Institution and was replaced by Dr. Stoute, District Surgeon, Gingindhlovu, whose place of residence is much nearer, so that he will be able to devote

more time than his predecessor to treatment work at the institution—where a modern hospital building with dressing room and adjuncts has recently been completed and is at present being equipped and furnished.

A most regrettable occurrence during the year was the development of leprosy by an assistant medical officer of one of the institutions. He had been employed on institution leprosy work continuously since 20.11.1919, and in January or February, 1929, had pricked his left forefinger (through a rubber glove) whilst performing an operation on a patient suffering from leprosy of highly infective type. The first symptom of the disease developed on the injured forefinger. The disease at first developed rapidly, but later slowed up under active treatment and now appears quiescent. It is not of infective type and there are good grounds for hoping that it will soon become arrested. The officer has retired from his post, Parliament has made provision for compensation, and arrangements are being made for his home segregation until he can be released from restrictions as an " arrested " case.

The charts and some of the tables attached give particulars of admissions, discharges, etc., of leprosy patients during recent years. It will be seen that as regards both European and mixed coloured the progress made and present position are very encouraging. European patients in institutions are now down to 94, and mixed coloured patients to 112; there is good reason to hope that within another couple of decades only occasional and sporadic cases of leprosy will have to be dealt with. It must be remembered that leprosy is a very slow and chronic disease with a long incubation period —sometimes as long as 12 to 15 or even 20 years—so that quick results cannot be expected. As regards natives the position is much less satisfactory; there is still a large number—probably 1,500 or 2,000—of unreported and undiscovered cases at large in the native or mainly native districts, and in various stages of the disease; until these or the great majority of them have been got under care and treatment and effective arrangements made for the early discovery, care and treatment of fresh cases, the eradication of the disease cannot be said to be in sight. Arrangements are being made to ensure the careful medical examination (including the taking of smears or materials for laboratory examination) of all close contacts at time of discovery, and for their re-examination, where practicable, during the second year and again during the fifth year thereafter.

In view of the small number of patients remaining in the Robben Island Leper Institution, the excessive cost of maintenance, and the fact that the climate and conditions of the island are unfavourable for leprosy patients, it has been decided to remove the remaining patients to the West Fort Institution at Pretoria and to close down the Robben Island Institution at the end of March, 1931. Active steps are being taken accordingly—including the provision of special accommodation for the mixed coloured patients and special facilities for relatives or friends coming a long distance to visit patients at the Pretoria Institution.

Dr. R. G. Cochrane, Secretary of the British Empire Leprosy Relief Association, made a tour of the Union on the invitation of the Government in June and July, 1930, visited most of the leper institutions and investigated the whole problem of leprosy, so far as was possible in the time at his disposal. Thereafter he attended a meeting of the Leprosy Advisory Committee at Pretoria, at which the problem was discussed in all its aspects and the following resolutions passed:—

> " This Committee, having considered the facts in regard to the present policy of leprosy control in the Union and the views expressed by Dr. Cochrane, and having also given careful consideration to the views of Sir Leonard Rogers, especially those expressed in his memorandum attached to the letter from the Chairman of the Executive Committee, British Empire Leprosy Relief Association, dated 17th January, 1930, resolves:—
>
> 1. That segregation of lepers is the only sound and scientific policy having regard to the circumstances in South Africa.
>
> 2. That in view of the present lack of a specifically curative drug, the importance of proper diet, bathing, exercise, and environment in effecting arrest or cure of the disease, and the sparsity of population in the native areas in which leprosy is most prevalent, out-patient treatment in clinics cannot, under present conditions, be advised for South Africa.

3. That the problem of leprosy is fortunately not acute in South Africa, and is only one of the many other public health problems which, in addition to the measures already in operation, can best be dealt with by educative measures and as part of a general campaign against infectious and preventable diseases under a well-organized system of district nurses, rural health visitors, and sanitary personnel, native and European, working under medical direction and supervision. The Committee further considers that nothing should be done to place special emphasis on leprosy, and that it should be treated merely as one of the endemic infectious diseases of the country."

"This Committee considers it of the utmost importance, in the present state of knowledge in regard to the administration, control, and treatment of leprosy, that the Secretary for Public Health attend the Congress on Tropical Medicine at Bangkok and the Round Table Conference on Leprosy at Manila and Culion, Philippine Islands, to be convened by the Leonard Wood Memorial."

"This Committee is of the opinion that, on medical grounds and apart altogether from economic considerations, the Robben Island Leper Institution should be closed down at the earliest date practicable."

"This Committee considers that systematic research work in leprosy should be organized and maintained at the West Fort Institution, Pretoria, and that all necessary facilities therefor should be provided."

Dr. Cochrane subsequently furnished a very useful and suggestive report of his tour and investigations in the Union to his Association; this report is published—with his kind permission—as Annexure "A" hereto.

TABLE K (i).—LEPER INSTITUTIONS: ADMISSIONS DURING THE YEAR ENDED 30TH JUNE, 1930.

Institution.	First Admissions.								Re-admissions.								Transfers from other Institutions.								Total.		
	European.		Native.		Mixed Coloured.		Asiatic.		European.		Native.		Mixed Coloured.		Asiatic.		European.		Native.		Mixed Coloured.		Asiatic.				
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Persons.
Robben Island...	1	—	1	—	4	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	—	7	5	12
Pretoria.....	10	3	125	78	8	8	1	1	1	—	10	5	1	—	—	—	2	—	9	—	—	—	—	—	167	95	262
Mkambati.....	—	—	21	2	—	—	—	—	—	—	7	4	—	—	—	—	—	—	6	—	—	—	—	—	34	30	64
Emjanyana.....	—	—	100	87	—	—	—	—	—	—	13	7	—	—	—	—	—	—	20	1	—	—	—	—	133	95	228
Amatikulu.....	—	—	62	23	—	—	3	—	—	—	8	3	—	—	—	—	—	—	—	—	—	—	—	—	73	26	99
Bochem.....	—	—	7	11	—	—	—	—	—	—	1	2	—	—	—	—	—	—	—	—	—	—	—	—	8	13	21
TOTAL.....	11	3	316	225	12	12	4	1	1	—	39	21	1	—	—	—	2	—	35	1	1	1	—	—	422	264	686

TABLE K (ii).—LEPER INSTITUTIONS: DEATHS OF PATIENTS DURING THE YEAR ENDED 30TH JUNE, 1930.

Institution.	European.		Native.		Mixed Coloured.		Asiatic.		Total.		
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Persons.
Robben Island	2	1	—	2	13	8	—	—	15	11	26
Pretoria	10	3	38	23	3	2	1	—	52	28	80
Mkambati	—	—	17	12	—	—	—	—	17	12	29
Emjanyana	—	—	33	26	—	—	—	—	33	26	59
Amatikulu	—	—	42	17	—	—	1	—	43	17	60
Bochem	—	—	9	2	—	—	—	—	9	2	11
TOTAL	12	4	139	82	16	10	2	—	169	96	265

TABLE K (iii).—LEPER INSTITUTIONS: DISCHARGES, ESCAPES, TRANSFERS, ETC., DURING THE YEAR ENDED 30TH JUNE, 1930.

Institution.	Probationally Discharged as "Arrested and Non-Infective."									Discharged as Non-Leprous.									Escaped.									Transferred to Other Institutions.								
	E.*		N.		M.C.		A.		Total.	E.		N.		M.C.		A.		Total.	E.		N.		M.C.		A.		Total.	E.		N.		M.C.		A.		Total.
	M.	F.	M.	F.	M.	F.	M.	F.		M.	F.	M.	F.	M.	F.	M.	F.		M.	F.	M.	F.	M.	F.	M.	F.		M.	F.	M.	F.	M.	F.	M.	F.	
Robben Island	1	—	—	—	6	6	—	—	13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	2
Pretoria	5	4	47	36	3	—	—	—	95	—	—	8	9	1	1	1	—	20	—	—	4	—	1	—	—	—	5	—	—	40	2	—	—	—	—	42
Mkambati	—	—	24	8	—	—	—	—	32	—	—	—	1	—	—	—	—	1	—	—	3	3	—	—	—	—	6	—	—	—	—	—	—	—	—	—
Emjanyana	—	—	68	42	—	—	—	—	110	—	—	—	1	—	—	—	—	1	—	—	13	—	—	—	—	—	13	—	—	1	1	—	—	—	—	2
Amatikulu	—	—	24	36	—	—	—	—	60	—	—	2	1	—	—	—	—	3	—	—	12	2	—	—	—	—	14	—	—	10	—	—	—	—	—	10
Bochem	—	—	4	7	—	—	—	—	11	—	—	—	1	—	—	—	—	1	—	—	1	2	—	—	—	—	3	—	—	—	—	—	—	—	—	—
TOTAL	6	4	167	129	9	6	—	—	321	—	—	10	13	1	1	1	—	26	—	—	33	7	1	—	—	—	41	2	—	51	3	—	—	—	—	56

*E. = European. N. = Native. M.C. = Mixed Coloured. A. = Asiatic.

TABLE K (iv).—LEPROSY: PATIENTS PROBATIONALLY DISCHARGED FROM INSTITUTIONS OR CLASSIFIED AS "ARRESTED AND NON-INFECTIVE," AND NUMBER OF SUCH PATIENTS SINCE RE-ADMITTED AS RECRUDESCENT.

	Probationally Discharged from Institution.					Classified as "Arrested and Non-infective" but remaining at Institutions at end of year.					Probationally Discharged Patients who have been re-admitted to Institutions as recrudescent.				
	European.	Native.	Mixed Coloured.	Asiatic.	Total.	European.	Native.	Mixed Coloured.	Asiatic.	Total.	European.	Native.	Mixed Coloured.	Asiatic.	Total.
Year ended 30th June, 1923.....	11	468	23	1	503	3	40	—	—	43	—	8	—	—	8
Year ended 30th June, 1924.....	6	217	29	2	254	1	10	—	—	11	—	2	—	—	2
Year ended 30th June, 1925.....	6	94	5	—	105	—	10	—	—	10	—	2	—	—	2
Year ended 30th June, 1926.....	3	62	5	—	70	1	28	1	—	30	1	4	—	—	5
Year ended 30th June, 1927.....	2	166	3	—	171	—	59	2	—	61	4	12	2	—	18
Year ended 30th June, 1928.....	3	217	5	—	225	—	57	5	—	62	1	23	1	1	26
Year ended 30th June, 1929.....	10	236	7	—	253	6	137	7	—	150	—	19	2	—	21
Year ended 30th June, 1930.....	10	296	15	—	321	4	63	3	—	70	—	33	—	—	33
TOTAL.....	51	1,756	92	3	1,902						6	103	5	1	115

TABLE K (v).—LEPER INSTITUTIONS: PATIENTS THEREIN ON 30TH JUNE, 1930.

Institution.	European.		Native.		Mixed Coloured.		Asiatic.		Total.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Persons.
Robben Island	6	5	6	4	68	33	—	—	80	42	122
Pretoria	57	26	500	347	3	8	2	1	562	382	944
Mkambati	—	—	127	103	—	—	—	—	127	103	230
Emjanyana	—	—	335	221	—	—	—	—	335	221	556
Amatikulu	—	—	196	121	—	—	5	—	201	121	322
Bochem	—	—	55	50	—	—	—	—	55	50	105
TOTAL	63	31	1,219	846	71	41	7	1	1,360	919	2,279

TABLE K (vi).—LEPROSY: CASES REMAINING IN THEIR OWN HOMES ON 30TH JUNE, 1930.

	Certified and Awaiting Removal to Leper Institution.	Home Segregated.	Probationally Discharged from Leper Institutions.		Total.
			Still under Surveillance.	Released from Surveillance.	
Cape (Province proper)	4	1	176	106	287
Transkei	20	5	342	134	501
Transvaal	3	1	293	133	430
Natal	35	2	317	82	436
Orange Free State	—	—	66	22	88
UNION	62	9	1,194	477	1,742

Table K (vii).—Certified Cases of Leprosy (excluding Transfers and Re-admissions) Removed to Leper Institutions during the Twenty-Year Period 1910 to 1929 inclusive.

Area.	Race.	1910.		1911.		1912.		1913.		1914.		1915.		1916		1917.		1918.		1919.		1920.		1921.		1922.		1923.		1924.		1925.		1926.		1927.		1928.		1929.		Total.		Grand Total.
	*	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
Cape.....	E.....	2	1	5	1	7	1	1	1	3	2	3	1	6	2	1	3	1	2	7	2	2	2	2	3	—	1	1	1	1	1	2	—	3	1	—	2	1	1	49	29	78
	M.C.....	14	13	12	10	12	8	12	7	15	7	14	6	17	5	15	6	5	3	8	7	6	4	12	3	12	4	9	5	7	8	2	1	9	3	8	1	3	2	6	4	198	197	395
	N.....	2	—	1	—	—	—	2	—	—	—	3	1	1	—	5	—	3	1	3	—	1	—	3	1	—	—	3	—	—	—	1	—	—	—	1	—	—	1	—	—	30	4	34
	A.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	1
	Total...	18	14	18	11	19	9	15	8	18	9	20	8	24	7	22	9	9	6	18	9	9	6	17	7	12	5	13	6	8	9	4	2	11	3	12	2	3	5	8	5	278	140	418
	Combined Totals..	32		29		28		23		27		28		31		31		15		27		15		24		17		19		17		6		14		14		8		13		418		—
Transkei.....	E.....	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	1	—	—	—	—	—	—	—	3	—	3
	M.C.....	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	1	—	—	—	—	2	2	4
	N.....	41	48	25	17	79	77	27	29	32	25	28	12	99	74	54	9	65	30	26	19	34	37	33	34	51	56	51	43	70	64	94	61	74	48	90	65	112	65	76	65	1,161	878	2,039
	A.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Total...	42	48	26	17	79	77	27	29	32	25	28	12	100	74	54	9	65	30	26	19	34	37	33	34	52	56	51	43	70	64	95	61	74	49	90	65	112	65	76	66	1,166	880	2,046
	Combined Totals..	90		43		156		56		57		40		174		63		95		45		71		67		108		94		134		156		123		155		177		142		2,046		—
Ciskei	E.....	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—	—	—	—	—	1	—	—	—	—	—	—	—	1	—	3	—	3
	M.C.....	—	—	3	2	3	1	1	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	1	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	8	7	15
	N.....	15	22	15	20	16	15	12	14	8	3	25	6	20	5	18	14	6	11	10	15	32	25	8	6	26	16	18	18	6	8	28	12	20	12	26	7	19	13	13	15	341	257	598
	A.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Total...	15	22	18	22	19	16	14	14	8	3	25	6	20	5	18	15	6	11	10	15	32	25	9	8	26	16	18	18	6	8	29	12	20	12	26	7	19	13	14	16	352	264	616
	Combined Totals..	37		40		35		28		11		31		25		33		17		25		57		17		42		36		14		41		32		33		32		30		616		—
Other Districts.. (Cape Province)	E.....	2	2	2	—	—	1	2	1	1	1	—	—	2	2	1	—	1	—	—	—	1	—	—	—	2	1	3	—	1	1	—	—	—	—	—	—	—	1	1	—	19	10	29
	M.C.....	8	5	11	4	8	5	7	2	6	—	2	—	5	4	1	3	3	—	—	—	2	1	2	1	3	3	3	1	2	2	1	—	—	1	—	2	3	—	—	66	35	101
	N.....	20	13	14	6	9	8	6	3	12	4	16	1	9	5	21	12	15	2	11	4	2	5	8	9	7	8	9	7	6	1	9	6	7	4	6	3	3	—	10	5	200	106	306
	A.....	—	—	1	—	—	—	1	—	—	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	—	4
	Total...	30	20	28	10	17	14	16	6	19	5	18	1	17	11	24	15	19	2	11	4	5	6	10	10	12	12	15	8	9	4	10	6	7	5	6	3	5	4	11	5	289	151	440
	Combined Totals..	50		38		31		22		24		19		28		39		21		15		11		20		24		23		13		16		12		9		9		16		440		—

* E. = European M.C. = Mixed Coloured. N. = Native. A. Asiatic.

Cape Area.—Bredasdorp, Caledon, Calitzdorp, Ceres, Clanwilliam, George, Hopefield, Knysna, Ladismith, Malmesbury, Montagu, Mossel Bay, Oudtshoorn, Paarl, Piquetberg, Port Nolloth, Riversdale, Robertson, Simonstown, Somerset West, Stellenbosch, Swellendam, Tulbagh, Van Rhynsdorp, Wellington, Wynberg, Worcester.

Ciskei.—Cathcart, East London, Fort Beaufort, Glen Grey (Lady Frere), Keiskamma Hoek, Kingwilliamstown, Komgha, Peddie, Queenstown, Stockenstroom, Stutterheim, Victoria East.

TABLE K (vii)—*Continued.*

Area.	Race.	1910.		1911.		1912.		1913.		1914.		1915.		1916.		1917.		1918.		1919.		1920.		1921.		1922.		1923.		1924.		1925.		1926.		1927.		1928.		1929.		Total.		Grand Total.
		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
Transvaal.....	E.....	6	3	7	4	7	2	6	4	8	3	9	5	4	4	6	1	3	3	4	5	5	3	4	6	7	3	9	4	7	2	7	3	3	2	4	—	5	2	4	3	115	62	177
	M.C.....	1	—	—	—	—	—	2	1	—	—	4	2	—	—	—	—	—	—	1	—	1	1	4	—	2	1	3	1	1	1	1	1	—	3	—	1	1	—	2	5	23	15	38
	N.....	192	63	132	40	167	74	139	19	119	32	168	67	108	36	130	36	122	50	93	21	71	35	108	44	132	69	97	50	94	47	89	30	80	52	97	43	105	51	94	58	2,337	917	3,254
	A.....	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	1	—	2	—	—	—	—	—	—	—	—	—	—	—	1	—	6	—	6
	TOTAL...	200	66	139	44	174	76	147	24	127	35	181	74	112	40	136	37	125	53	99	26	77	39	116	50	142	72	111	54	102	50	97	34	83	57	101	44	111	53	101	66	2,481	994	3,475
	COMBINED TOTALS..	266		183		250		171		162		255		152		173		178		125		116		166		214		165		152		131		140		145		164		167		3,475		—
Orange Free State	E.....	—	—	—	—	2	1	1	1	2	—	2	—	3	—	1	—	—	2	1	2	1	1	3	—	2	1	—	1	1	—	1	—	—	1	3	3	—	2	3	—	26	15	41
	M.C.....	—	—	—	1	—	—	3	—	—	—	—	—	1	—	—	—	—	—	2	—	2	—	—	1	—	—	1	1	—	—	—	—	—	1	—	1	—	1	—	—	9	5	14
	N.....	—	—	3	2	18	3	19	12	14	5	22	7	21	14	24	8	20	8	11	7	23	11	13	16	31	10	18	16	14	8	12	3	27	21	12	22	21	18	21	12	344	203	547
	A.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	TOTAL...	—	—	3	3	20	4	23	13	16	5	24	7	25	14	25	8	20	10	14	9	26	12	16	17	33	11	19	18	15	8	13	3	27	22	15	26	21	21	24	12	379	223	602
	COMBINED TOTALS..	—		6		24		36		21		31		39		33		30		23		38		33		44		37		23		16		49		41		42		36		602		—
Natal.....	E.....	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—	—	—	2	—	1	7	5	6
	M.C.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	3	—	1	—	—	—	—	—	—	7	—	7
	N.....	1	1	1	1	2	1	1	—	2	—	16	3	16	7	15	5	44	32	68	34	50	28	43	25	70	56	56	28	51	37	56	30	37	34	66	43	51	22	47	26	693	413	1,106
	A.....	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	2	—	1	1	—	—	—	—	—	1	—	1	—	2	—	1	—	—	1	11	3	14
	TOTAL...	1	1	1	1	3	1	1	—	2	—	16	4	16	7	15	6	44	33	69	35	51	28	45	25	71	57	57	28	51	38	58	30	41	34	69	43	52	22	49	28	712	421	1,133
	COMBINED TOTALS..	2		2		4		1		2		20		23		21		77		104		79		70		128		85		89		88		75		112		74		77		1,133		—
Zululand.....	E.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	M.C.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	N.....	—	—	—	—	—	—	—	—	—	—	1	1	2	4	—	—	—	1	15	6	2	—	10	7	4	4	4	5	5	1	3	—	2	4	9	4	10	8	5	5	72	50	122
	A.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	TOTAL...	—	—	—	—	—	—	—	—	—	—	1	1	2	4	—	—	—	1	15	6	2	—	10	7	4	4	4	5	5	1	3	—	2	4	9	4	10	8	5	5	72	50	122
	COMBINED TOTALS..	—		—		—		—		—		2		6		—		1		21		2		17		8		9		6		3		6		13		18		10		122		—
	GRAND TOTALS..	306	171	233	108	331	197	243	94	222	82	313	113	316	162	294	99	288	146	262	123	236	153	256	158	352	233	288	180	266	182	309	148	265	186	328	194	333	191	288	203	5,729	3,123	8,852
	COMBINED GRAND TOTALS..	477		341		528		337		304		426		478		393		434		385		389		414		585		468		448		457		451		522		524		491		8,852		—

CHART K (*a*).—CERTIFIED CASES OF LEPROSY, EUROPEAN, MIXED COLOURED, AND ASIATIC, REMOVED TO LEPER INSTITUTIONS DURING THE TWENTY-YEAR PERIOD 1910 TO 1929 INCLUSIVE.

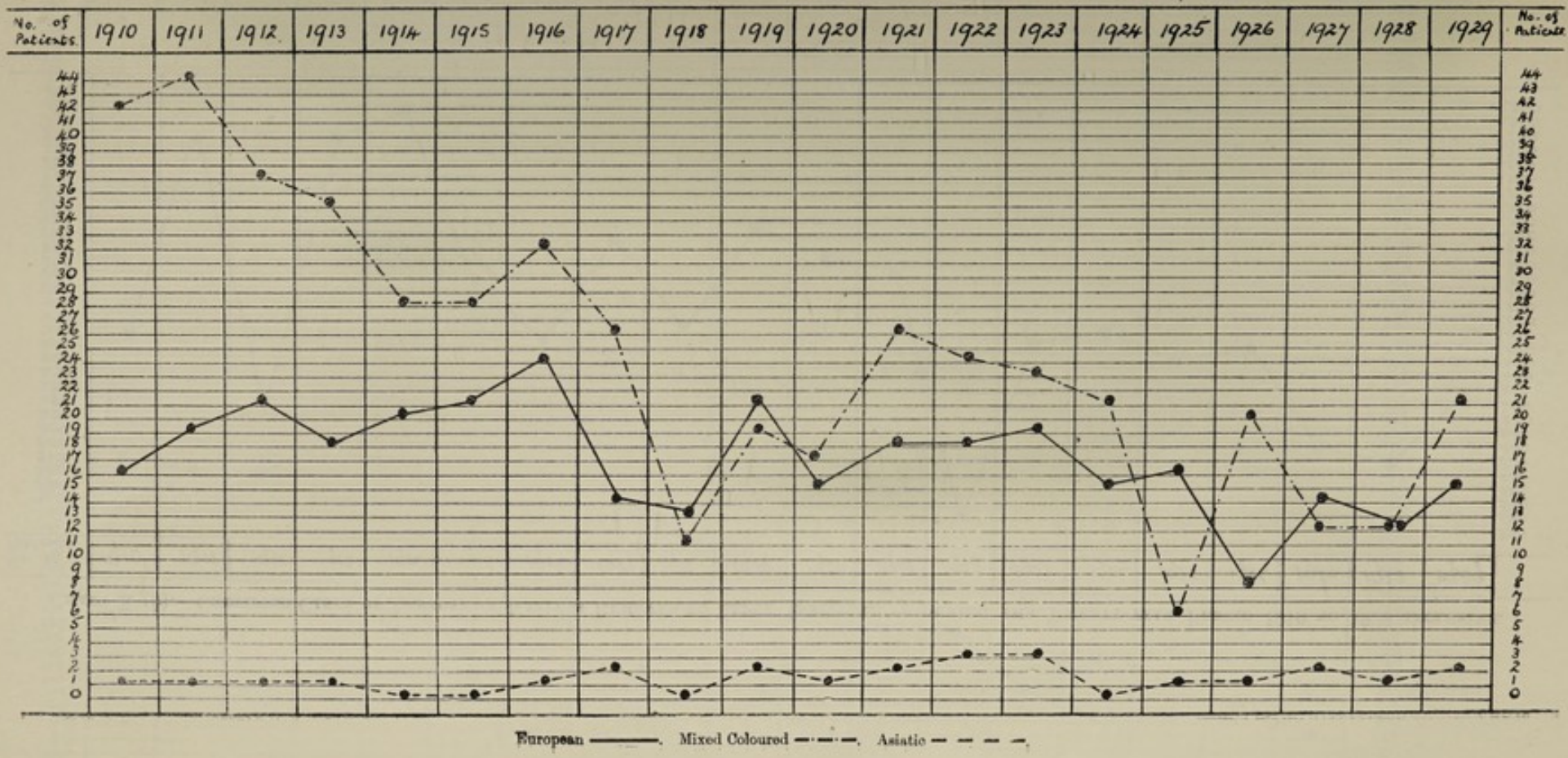


CHART K (*b*).—CERTIFIED CASES OF LEPROSY IN NATIVES REMOVED TO LEPER INSTITUTIONS DURING THE TWENTY-YEAR PERIOD 1910 TO 1929 INCLUSIVE.

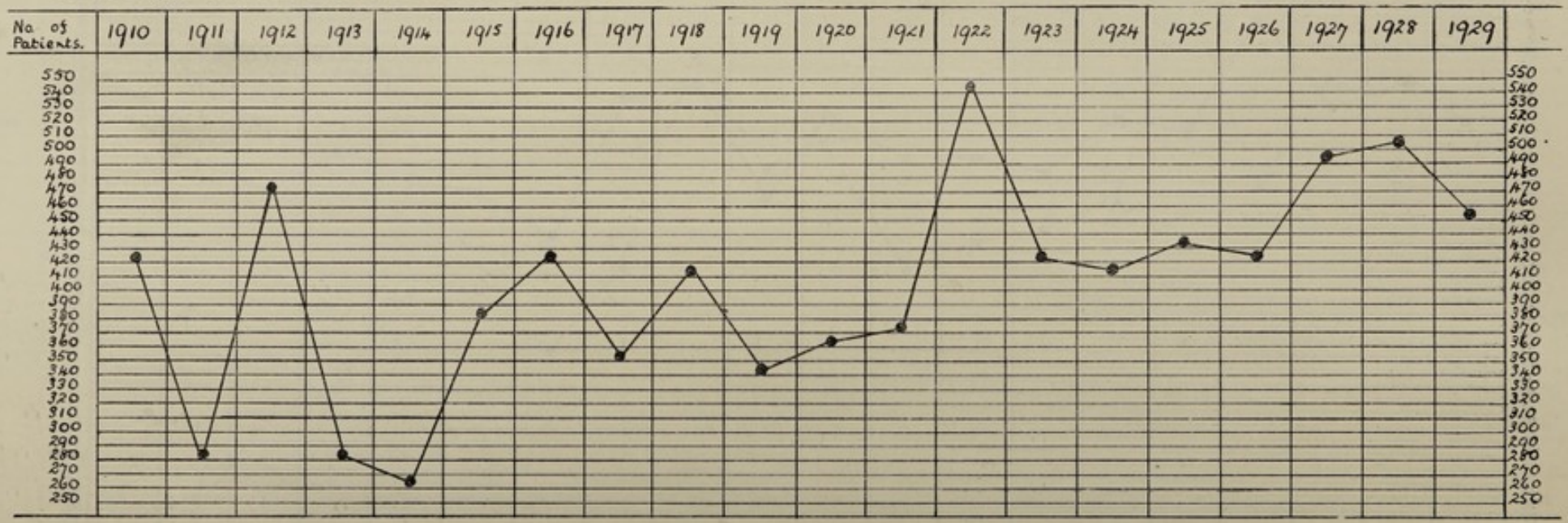
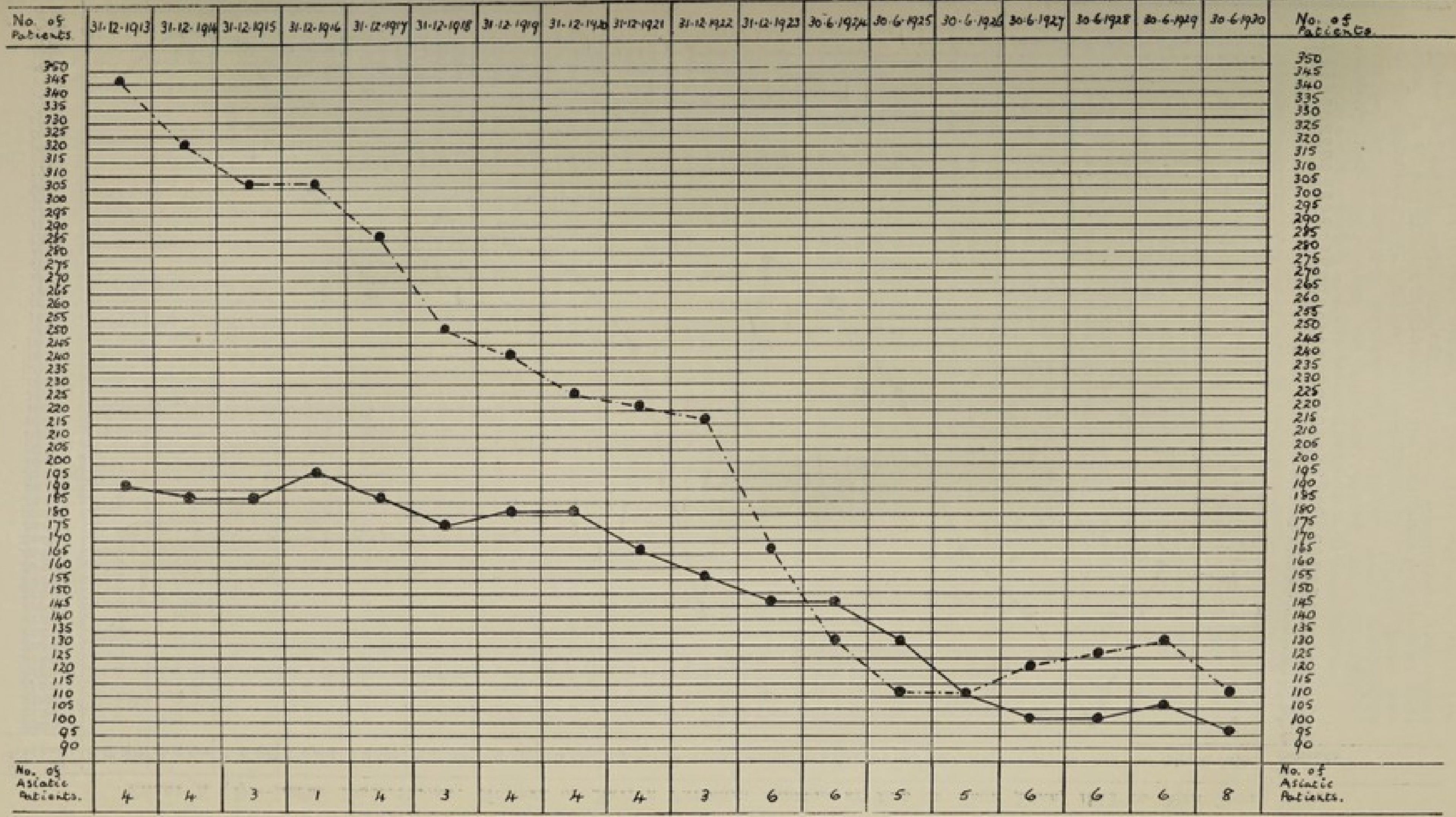
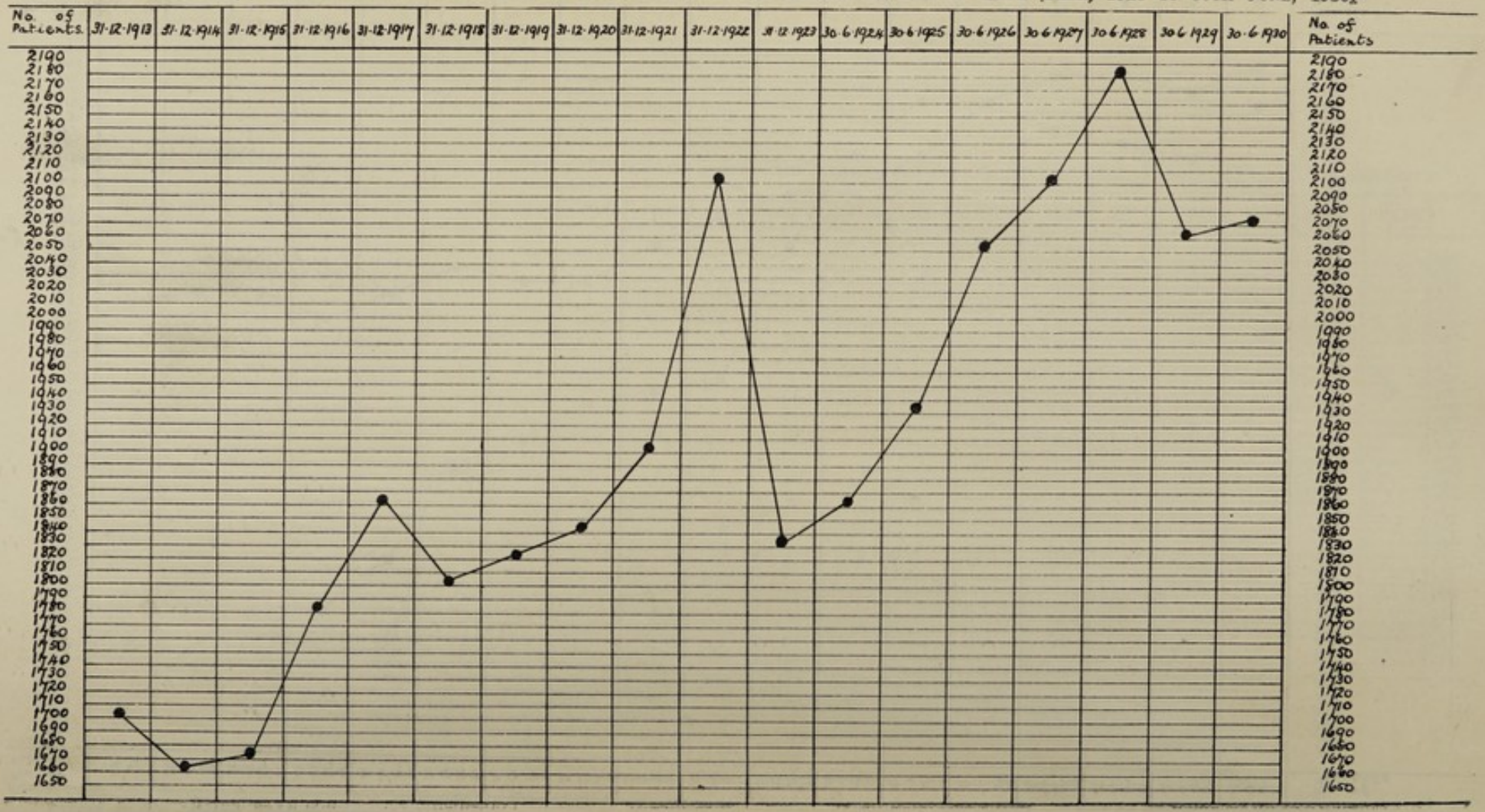


CHART K (c).—LEPER INSTITUTIONS: NUMBER OF EUROPEAN AND MIXED COLOURED PATIENTS THEREIN AT END OF EACH YEAR, 1913 TO 30TH JUNE, 1930.



European ———. Mixed Coloured —·—·—.

CHART K (*d*).—LEPER INSTITUTIONS: NUMBER OF NATIVE PATIENTS THEREIN AT END OF EACH YEAR, 1913 TO 30TH JUNE, 1930.



8. *Malaria—Transvaal.*—During the year there was no epidemic prevalence beyond the usual seasonal incidence in the northern and eastern areas. In all magistracies in these areas the usual arrangements were made for the distribution of quinine, and sub-depots in outlying parts were arranged for. Emergency arrangements for special medical and nursing assistance were also planned, but fortunately proved unnecessary, district surgeons and the normal agencies being able to meet all requirements.

Natal.—In last Annual Report particulars were given of a severe epidemic occurring in a fairly circumscribed area in the coastal districts of Zululand and Northern Natal between the Umhlatuzi and the Umhloti Rivers, and extending some distance up the Tugela Valley. During the past summer (1929-30) a more widespread, but less virulent, prevalence took place, extending as far south as Umzinto and even beyond; north-west to Weenen and Ladysmith, and spreading up the river valleys between the Umgeni and the Umhlatuzi. It was noteworthy that the infection was carried, mainly by infected native labourers, even to fairly high altitude (3,000 feet and over), where isolated outbreaks occurred as far south as Harding (South Natal), Flagstaff and Libode (Transkei). No epidemic prevalence occurred north of the Umfolosi River. The total mortality, so far as can be ascertained, was about 1,653, as compared with 2,758 during the previous year. The area and population affected were about four times as great as during the previous season.

Both the benign and malignant types of parasite were involved, the latter predominating in the northern and the former in the southern areas.

Owing to the lesser virulence, to the lessons of last year's epidemic, and to the greater energy and foresight displayed by employers of labour, there was far less labour dislocation during the present year than during the previous one.

The wider spread during the past summer was mainly due to the numerous foci of infection remaining from last year's epidemic, the return of numerous infected natives to their homes, the very favourable rains, and other climatic conditions promoting rapid multiplication of mosquitoes, and the ignorance and conservatism of the native population which prevented many of them from availing themselves of quinine and other medicines made available.

A specially trained staff, consisting of a medical officer, four European inspectors and about 20 native assistants, was organized, under the direction of the Assistant Health Officer for the Union stationed in Natal, to make malarial surveys and carry out educative and advisory work. The medical officer and health inspectors inspected all the local authority areas involved, as well as sugar-mills and plantations, advising the authorities or owners of the dangers and the steps which should be taken. After the general survey had been completed, a health inspector was placed in each area to supervise the anti-malarial (including anti-larval) work and other preventive and palliative measures, including the distribution of quinine and other remedies. The native assistants worked in close co-operation with them and proved very useful. These had previously received an intensive course of training from the malaria medical officer in the rough diagnosis of malaria, the recognition of mosquito carriers and their larvae, and methods of destroying these. In their special districts their duties were to visit all sections, keep in close touch with the native population, investigate suspected outbreaks and report to the magistrate, getting the diagnosis confirmed if necessary and distributing remedies. They also visited native schools and missions, giving information regarding malaria and demonstrating anti-larval methods. Many chiefs and headmen were keenly interested and gave these assistants every support, but others were indifferent or even hostile.

The native assistants also proved valuable in sifting native rumours and supplying those responsible with reliable information as to the position from time to time. All were educated young Zulus and were soon able to make accurate spleen examinations, take temperatures, identify anopheles mosquitoes and larvae, hunt for breeding places and apply anti-larval methods (oiling, spraying with paris green, etc.), besides being able to furnish written reports of their activities.

Quinine distributing sub-depots were formed at police posts, missions, stores, and dipping tanks. Very useful assistance was given by magistrates, native commissioners, and other officers of the Department of Native Affairs. Special mention should be made of the Inspector of Native Reserves and Locations, Eshowe, who undertook the general supervision and payment of the wages of the native assistants.

Paris green (diluted with 99 parts of a fine phosphate powder) was used on a fairly large scale as a larvicide with good results. In some places spraying with spent engine-oil mixed with paraffin oil, or sawdust or cane-waste ("bagasse") soaked in spent oil, proved both useful and economical.

In some urban areas efficient measures were taken by the local authority to protect the residents, but in others the response to the urgent advice of the Department's malarial officers was disappointing. In areas where there are as yet no local authorities—such as Tongaat and neighbourhood, Umzinto, and the watering places along the Natal South Coast—the difficulties of securing the effective and systematic carrying-out of anti-mosquito and anti-malarial measures proved very great, or even insuperable. This experience has illustrated anew the urgent necessity for the extension of local Government institutions to such areas.

The Railway Administration organized a system of control and supervision by the appointment of sanitary officers to take charge of anti-mosquito measures on both sides of the line, and to see that officials, staffs, and construction gangs in infected localities were efficiently looked after and treated with quinine.

General.—During May last, Sir Malcolm Watson, Principal of Malaria Control, Ross Institute, London, visited Northern Rhodesia to investigate and report and advise on malaria on the Roan Antelope and associated mines. On the invitation of the Union Government he kindly arranged to spend a month or so in the Union on his return from Rhodesia and to make a tour through the bad malarial districts. While still in Rhodesia he suggested to the management of the Copper Companies that a medical officer and an engineer might be sent by the Union Government for a week or so to study the anti-malarial work being carried out there. This was done and the Department wishes to record its appreciation of the kind invitation of the mine managements concerned. During June, Sir Malcolm Watson, accompanied by Dr. Annecke, who had been seconded for anti-malarial work in the Union, and Mr. de Meillon, Entomologist to the South African Institute for Medical Research, made a tour of the malarial areas of the Transvaal, Zululand and Natal and thereafter furnished the Minister with a valuable report of his observations. With his kind permission this report is printed as Annexure B hereto. During his tour he gave several public lectures on the control of malaria and made very encouraging statements on the possibility of such control provided the anti-malarial campaign was conducted vigorously and on sound lines based on further scientific research.

In his report and public statements Sir Malcolm laid stress on the necessity for further careful investigation work, both as regards malaria-carrying mosquitoes, their breeding grounds and bionomics generally, and the study of the disease in the human population of local areas by means of " spleen surveys," as an indispensable preliminary to any sound scheme of combating malaria on broad lines. He also emphasized that mosquito control and eradication are matters for the owners of the land concerned, and that the essential functions of the Government are to investigate, advise and assist generally. The Government has suitably expressed to Sir Malcolm Watson its appreciation of the great assistance he has rendered to the Union. After consideration of his report and in view of numerous representations made to the Department indicating the existence of a good deal of misunderstanding and misapprehension as to the administrative position and anti-malaria measures generally, a memorandum on the subject was drawn up by the Department and published by authority of the Minister. This memorandum is printed as Annexure C to this report.

The Government has succeeded in securing the services of Professor N. H. Swellengrebel of the Amsterdam University, and member of the Malaria Committee of the Health Organization of the League of Nations, to make a careful and detailed study of the problem of malaria and its control in the Transvaal and Natal and to advise and assist in the framing of a scientific and practical anti-malarial policy for the Union. He is due to arrive at the end of October, 1930, and it is expected that his investigations will continue until April, 1931.

9. *Meningitis*: *Epidemic Cerebro-Spinal.*—Notifications of cases of cerebro-spinal meningitis for the year totalled 609 as against 747 last year. Of this number, 423 or 70 per cent. occurred in natives. The greatest prevalence occurred, as during the previous year, in the Cape Peninsula and on the Reef, where the same direct and contributory causes mentioned in last Report have been responsible.

A sharp outbreak involving 14 Europeans with 8 deaths occurred in the Van Rhynsdorp district. The source of the infection was obscure, but the outbreak commenced in a labour relief camp in the district and subsequently spread to a farm area of approximately 30 miles square. Overcrowding, ignorance of the principles of hygiene and disregard of medical advice contributed largely to the spread.

10. *Pellagra.*—No cases of this disease were reported from prisons or other institutions during the year. A few sporadic cases have occurred

among the general population. The Department has drawn up carefully balanced ration scales with sufficient vitamin content for its own and other institutions.

Recent research suggests that two factors are concerned in the causation of pellagra—a vitamin deficiency and a toxic principle. The vitamin deficiency can most easily be made good, and this is done in the official diet scales.

11. *Plague. Plague in Rodents.*—Surveys during the year have shown generally heavy infestation with veld rodents. The greater part of the Northern Transvaal was found heavily infested with Lobengula gerbilles and other species. The districts of Hopetown, Britstown and Victoria West showed great increase in rodents, especially gerbilles, also in Van Rhynsdorp and Clanwilliam districts. Heavy rodent mortality occurred in the districts of Vredefort, Heilbron, Petrus Steyn, Frankfort, Senekal, Vereeniging, Carnarvon, Richmond, Beaufort West, Prieska, Barkly East, and Uitenhage. These occurrences were for the most part due to plague infection and were associated with human cases of the disease. In the district of Beaufort West the mortality was found to be caused by " De Aar disease " in Namaqua gerbilles. As usual the Lobengula gerbille was the chief plague carrier, but at Uitenhage, striped, multimammate and house mice only were found present and infected. Hares were the chief agents in the spread of infection over portions of the veld where the soil was unsuitable for gerbille burrows.

Plague in Human Beings.—A total of 145 cases with 89 deaths was reported during the year. The great majority of the outbreaks was preceded by and could be traced to local veld rodent infection.

TABLE L.—PLAGUE CASES AND DEATHS IN THE UNION DURING THE YEAR ENDED 30TH JUNE, 1930.

Province.	Number of Districts in which Outbreaks Occurred.	European.		Coloured or Native.		Total.	
		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Cape	8	8	8	30	19	38	27
Natal	—	—	—	—	—	—	—
Transvaal	7	8	4	88	54	96	58
Orange Free State	1	1	1	10	3	11	4
UNION	16	17	13	128	76	145	89

The principal outbreaks were those at Uitenhage, Heilbron and Danielskuil.

Uitenhage.—Veld rodent infection became active about July, 1929, in the Coega Valley, where six years before a similar epizootic had occurred and caused several deaths in man. Human carriers (coloured) conveyed the infection to various farms in the district and to the Doornhoek municipal location, Uitenhage. During October, November and December, 15 coloured or native cases with 8 deaths occurred in that location, many of these having been infected from other human cases. Striped and multimammate mice were found in large numbers in and around the location, and extensive clearing of prickly pear, aloes and bushy scrub had to be carried out before the rodents and the infection were completely eradicated. Owing to the primitive and dilapidated nature of many of the huts, the complete destruction of fleas and infection therein proved a difficult and tedious matter.

Northern Free State.—In October a case of bubonic plague occurred in a native child in the Parys district. Rodent plague was found to be active in the district at the time and spread to the adjoining district of Heilbron where field rodents (gerbilles and multimammate mice) were especially numerous owing to the copious and early rains. On many farms, hares and domestic rodents were also very numerous. An extensive epizootic followed throughout the whole district, spreading also to the adjoining areas of Petrus Steyn, Frankfort and Kopjes and causing in all, 107 human cases of which 84, or 79 per cent., were of bubonic, 16, or 15 per cent., septicaemic, and 9, or 7 per cent., pneumonic type.

Deverminization of plague-infected farm premises and articles by spraying with paraffin emulsion followed by fumigation with cyanogas dust, gave very satisfactory results. In a few instances recurrences took place, but there were circumstances suggesting the probability of re-infection from outside. In all cases isolation of the patients and quarantine of contacts with the administration of anti-plague vaccine were carried out.

An active publicity campaign was undertaken by the Department's plague officers with gratifying results. Lectures and field demonstrations were given at every opportunity in the town and district in connection with meetings of farmers' associations and at schools. Eventually all the farmers in the Heilbron district were organized into groups or " circles " of about half-a-dozen neighbours who co-operated in clearing their own and each others farms of rodents. In many " circles " cyanogas pumps and dust were purchased jointly by the group and used in turn. After a month or two, 80 per cent. of all the farmers were reported to have cleared their homesteads and farm buildings and large portions of their farms of rodents. Special assistance was given to needy farmers. The Executive Committee of the Heilbron Farmers' Association intends to resuscitate this excellent organization during the coming summer, and the movement has spread to other districts in the Orange Free State.

During the epidemic the local Railway officials rendered valuable assistance to the Department and to local authorities by permitting the chief railway rat-catcher to train local men as ratcatchers for local authorities and otherwise to co-operate with the rodent officers of the Department.

Unfortunately permanent anti-rodent measures in most urban local authority areas by means of rodent proofing of stores and business premises, still fall far short of what is necessary. Temporary measures, such as gassing or poisoning of rodents in stores or stacks or on the commonage, are spasmodic and have only a temporary effect.

Barkly West.—An outbreak of pneumonic type occurred in the area of the Danielskuil Village Management Board where seven Europeans died of the disease between the 5th December and 7th January. As frequently happens in such outbreaks the true nature of the disease in the first cases was not recognized or suspected so that unfortunate delay occurred before the facts were reported to the Department. Officers of the Department were then immediately sent to deal with the outbreak, which was promptly suppressed. Investigation showed that the first patient was probably infected from a dead hare which he found and cut open on the veld. The later cases were all relatives or immediate contacts of this lad, and infection was direct in each case—mostly through kissing the sick. Signs of infection in hares and other veld rodents were found in the neighbourhood.

" De Aar Disease."—Suspicious mortality in Namaqua gerbilles occurred in the Beaufort West district in January, 1930. This was at first thought to be due to plague, but proved after prolonged laboratory investigation to be " De Aar Disease " (see last Annual Report). Unfortunately this epizootic was not very serious or extensive. Attempts were made later to start similar epizootics in selected areas in the Northern Cape—by capturing veld rodents, inoculating them with cultures by the method of scarification and immediately returning them to their burrows. One or two carcasses of scarified animals were subsequently found but no signs of spread was discoverable. Natural epizootics of this disease appear to occur only during the warm weather, whereas cold frosty weather set in soon after the foregoing attempts were made, so that the results are inconclusive. It is hoped to repeat the attempts under more favourable weather conditions during next summer.

12. *Rabies.*—It was stated in last Annual Report that the long suspected endemic occurrence of rabies among veld carnivores had been confirmed by laboratory examination. During the past year two further deaths from this disease occurred—both being of European males, one in the Carnarvon district and the other in the Bethal district. The latter case was confirmed by *post mortem* laboratory examination. In seven rabid animals *post mortem* examination of nervous tissue proved the presence of rabies. These animal cases occurred on farms in the districts of Vryburg (genet cat), Boshof (yellow mongoose), Bloemfontein (yellow mongoose), Brandfort (yellow mongoose), Middelburg, Cape (one yellow mongoose and one suricat), Carnarvon (suricat).

Five persons bitten by rabid animals were treated with anti-rabic vaccine. In none of them did symptoms of rabies develop. A campaign for the destruction of the yellow mongoose or " rooi meerkat "—which appears to be mainly responsible for the persistence and conveyance of the infection—in the affected districts in the Southern Transvaal, Orange Free State and Northern Cape has been undertaken by the Veterinary Division of the Department of Agriculture.

13. *Scarlet Fever.*—Notifications of cases of scarlet fever for the year numbered 1,637, a decrease of 1,359 or 45.4 per cent. as compared with last year's figures. In scrutinizing the returns, the figures recorded in some of the largest towns (e.g., Johannesburg and Capetown) during the year would appear very high (viz., 457 and 283 respectively), but on comparing

them with the white population (for the disease is rarely seen in the coloured races) the percentage rates reveal the true incidence, namely, 0.25 and 0.2 respectively, as compared with the total European rate for the Union, which is approximately 0.09 per cent. The disease is one of urban rather than of rural populations. With reference to the Dick test to find out which children are susceptible to scarlet fever, and the use of protective serum to immunize those susceptible to the disease, no further steps appear to have been taken in the Union during the past year.

14. *Smallpox and Vaccination.*—During the year 72 cases of smallpox with one death—that of an unvaccinated non-European—occurred, involving in all 17 magisterial districts. The largest outbreak was at Kokstad, where 19 European and 1 non-European cases occurred, all being of mild type. In all these outbreaks vaccination of all contacts and persons in the infected locality, coupled with measures of isolation and disinfection, were promptly effective.

As a result of active enforcement of the law making vaccination compulsory (Act No. 36 of 1919) coupled with the provisions for the exemption of conscientious objectors (Act No. 15 of 1928) the vaccination returns for the year, given in the subjoined tables, are much more satisfactory than those for previous years. The proportion of vaccinations to births has greatly increased, and numbers of unvaccinated children of 3 or 4 years of age and upwards have now been vaccinated. Public vaccinations during the year numbered 548,000 as compared with 388,500 in 1928-29 and 286,000 in 1927-28. Exemptions on conscientious grounds during the year numbered 504. The machinery for systematic enforcement is working smoothly and efficiently, and steady progress is being made in dealing with the accumulation of unvaccinated children which existed when Act No. 15 of 1928 came into force. Difficulty frequently arises in tracing defaulters, owing to the frequency with which members of urban communities change their addresses.

The following tables show the occurrences of smallpox and public vaccinations performed during the year:—

TABLE M (i).—SMALLPOX: CASES AND DEATHS REPORTED DURING THE YEAR ENDED 30TH JUNE, 1930.

Province.	Number of Districts in which Outbreaks Occurred.	European.		Non-European.		Total.	
		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Cape	5	20	—	25	—	45	—
Natal	2	—	—	2	—	2	—
Orange Free State	2	—	—	8	—	8	—
Transvaal	8	1	1	13	—	17	1
UNION	17	21	1	48	—	72	1

TABLE M (ii).—STATE AS TO VACCINATION OF CASES OF SMALLPOX REPORTED DURING THE YEAR ENDED 30TH JUNE, 1930.

Particulars.	European.		Non-European.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
*Previously Vaccinated	20	—	21	—	41	—
Unvaccinated	4	1	27	—	31	1
TOTAL	24	1	48	—	72	1

* In most cases many years previously.

Table M (iii).—Public Vaccinations during the Year Ended 30th June, 1930.

Province.	Number of Centres at which Public Vaccinations were held.		Number of Visits of Public Vaccinators to Centres.		Numbers Vaccinated.				Total.
					Europeans.		Non-Europeans.		
	Urban.	Rural.	Urban.	Rural.	Primary.	Re-Vaccination.	Primary.	Re-Vaccination.	
Cape	197	1,879	1,206	2,012	24,950	1,030	119,395	72,763	218,138
Transvaal	90	544	1,931	640	26,448	4,966	112,163	119,807	263,384
Natal	49	367	327	382	1,698	1,093	32,446	3,309	38,546
Orange Free State	56	264	983	269	9,548	544	16,873	953	27,928
Total	392	3,054	4,447	3,303	62,644	7,643	280,877	196,832	547,996

TABLE M (IV).—VACCINATION OF INFANTS AND CHILDREN IN THE CLASSES OF THE POPULATION WHICH REGISTER BIRTHS, YEAR ENDED 30TH JUNE, 1930.
(THESE FIGURES DO NOT INCLUDE RE-VACCINATION OF 12-YEAR-OLD CHILDREN.)

Particulars.	Cape.		Transvaal.		Natal.			Orange Free State.	Union.
	Cape District.	Remainder of Province.	Rand Area.	Remainder of Province.	Durban.	Pietermaritzburg.	Remainder of Province.		
Births Entered in Vaccination Register	11,572	32,679	8,745	11,315	2,028	558	1,780	5,254	70,931
Successfully Vaccinated	8,996	9,316	4,601	3,522	1,168	480	1,851	1,976	31,910
Insusceptible to Vaccination	6	7	34	11	40	9	35	3	145
Vaccination Postponed owing to Illness	144	203	194	135	327	112	469	134	1,718
Previously had Smallpox	2	—	1	—	—	1	—	—	4
Deaths of Infants under Two Years Registered	2,931	2,605	739	629	193	57	202	205	7,561
Exempted under Section 10, Act 15 of 1928	35	172	74	64	67	5	51	41	504
Ratio Percentage of Vaccinations Registered to Births Registered during the Year (after allowing for deaths of infants under two years)	104·1	31·0	57·5	33·0	63·7	95·8	117·3	39·1	50·4

TABLE M (v).—RE-VACCINATION OF TWELVE-YEAR-OLD EUROPEAN CHILDREN IN NATAL, YEAR ENDED 30TH JUNE, 1930.

Particulars.	Durban.	Pietermaritzburg.	Remainder of Province.	Total.
Registrations of twelve-year-old European children	1,100	434	1,365	2,899
Successfully vaccinated	735	295	960	1,990
Insusceptible to vaccination	64	54	80	198
Vaccination postponed owing to illness	45	19	59	123
Previously had smallpox	—	1	—	1
Ratio percentage of vaccinations to twelve-year-old registrations	66·8	68·0	70·3	69·0

15. *Tuberculosis.*—The number of cases of this disease during the year was 6,305. This figure, however, gives little indication of the prevalence of disease in the Union, as a large proportion of the cases particularly among the non-European population are not notified.

Nothing further has been done regarding tuberculosis in dairy cattle. The Department of Agriculture promises to arrange a consultation with this Department on the subject at an early date.

Nelspoort Sanatorium.—The following table summarizes the work of the institution during the year:—

TABLE N.—ADMISSIONS, DISCHARGES, AND DEATHS DURING THE YEAR ENDED 30TH JUNE, 1930.

	Total.	European.			Non-European.		
		Male.	Female.	Total.	Male.	Female.	Total.
In Sanatorium on 1st July, 1929	90	35	28	63	16	11	27
Admitted during year	261	103	84	187	44	30	74
TOTAL	351	138	112	250	60	41	101
Died during year	6	4	—	4	—	2	2
Discharged during year	264	104	85	189	43	32	75
TOTAL	270	108	85	193	43	34	77
In Sanatorium on 30th June, 1930	81	30	27	57	17	7	24

The patients admitted during the year were in the following stages of the disease:—

Race.	*Stage I.*	*Stage II.*	*Stage III.*
European	29.0 per cent.	55.0 per cent.	16.0 per cent.
Non-European	39.2 per cent.	44.6 per cent.	16.2 per cent.

Of the 261 admissions during the year, 199 were free, half their cost being paid by the local authority and half from the Department's vote, 28 were part-paying or contributing, and 34 were full-paying patients.

The average stay of patients in the institution was: Europeans, 105 days; non-European, 101 days.

Of the 264 patients discharged, 63 were noted as "much improved," 142 as "improved," and 59 as "stationary."

16. *Typhus Fever.*—The following table shows the cases and deaths reported during the year:—

TABLE O.—TYPHUS FEVER: CASES AND DEATHS REPORTED DURING THE YEAR ENDED 30TH JUNE, 1930.

Province.	Number of Districts in which Outbreaks Occurred.	European.		Non-European.		Total.	
		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Cape	58	34	3	1,530	165	1,564	168
Natal	12	33	—	24	1	57	1
Orange Free State	13	2	—	147	40	149	40
Transvaal	5	5	2	7	1	12	3
UNION	88	74	5	1,708	207	1,782	212

The table shows an increase of some 300 cases and 19 deaths as compared with the previous year, and there is no doubt that many cases and deaths go unreported. The wearing off of immunity which was suggested last year as the probable reason for the increase in the native territories is doubtless the main reason for this further increase. The prevalence has been most in the native territories of the Cape Province. A survey was made of this area by an assistant health officer. An important factor was found to be the increasing poverty of the natives resulting mainly from prolonged and repeated droughts and over-population. It is noteworthy that prevalence is greatest in those districts which are very thickly populated and the inhabitants very poor. Glen Grey is the most striking instance. The number of cases reported from that district was 339; the previous year it was 205. The children were noticeably suffering from the effects of malnutrition, and the population in general was found to be more verminous than in more prosperous districts.

The problem of typhus in the native territories is largely an economic one. The disease will tend to tail off and disappear with agricultural development and corresponding improved nutrition and better conditions of living. The impoverished native offers little resistance to the disease because of malnutrition, and the poorer he is the more infested in general is his body with the insect vector of the disease, the louse.

With the increase of the disease in native districts, the danger to European districts or communities adjoining native districts has also increased. Several typhus outbreaks in the Queenstown District were traced to Glen Grey, and a severe outbreak in the Maclear District was similarly traced to the neighbouring native districts of Tsolo and Qumbu.

17. *Venereal Diseases.*—The following table summarizes the work done in connection with venereal diseases by district surgeons, local authorities, and institutions during the year:—

Table P.—Venereal Diseases: Cases Treated and Attendances, Year Ended 30th June, 1930.

Locality.	In Hospital.						Outdoor Attendances.						Grand Total.
	Syphilis.		Gonorrhoea and Other Venereal Diseases.		Total.		Syphilis.		Gonorrhoea and Other Venereal Diseases.		Total.		
	European.	Non-European.	European.	Non-European.	European.	Non-European.	European.	Non-European.	European.	Non-European.	European.	Non-European.	
(1) *By District Surgeons.*													
Cape	9	926	6	140	15	1,066	1,088	7,111	1,082	1,350	2,170*	8,461*	11,712
Natal	10	345	11	109	21	454	44	1,510	40	186	84*	1,696*	2,255
Transvaal	13	352	21	30	34	382	204	5,688	81	208	285*	5,896*	6,597
Orange Free State	—	171	—	—	—	171	185	4,558	134	962	319*	5,520*	6,010
(2) *At Institutions.*													
Barberton	—	255	—	1	—	256	—	—	—	—	—	—	256
Belfast	—	—	—	—	—	—	2	4	—	—	2	4	6
Bethlehem	—	12	—	1	—	13	2	—	—	—	2	—	15
Bloemfontein	5	160	6	43	11	203	92	300	258	11	350	311	875
Boshem	—	707	—	18	—	725	—	3,216	—	292	—	3,508	4,233
Burghersdorp	—	—	—	—	—	—	2	50	—	—	2	50	52
Capetown	36	95	50	40	86	135	5,095	9,072	5,681	2,972	10,776	12,044	23,041
Colesberg	—	8	—	—	—	8	—	—	—	—	—	—	8
Cradock	—	184	—	—	—	184	—	—	—	—	—	—	184
Durban	37	618	43	97	80	715	986	914	3,126	1,338	4,112	2,252	7,159
East London	—	—	—	—	—	—	259	1,023	370	412	629	1,435	2,064
Elim	3	860	—	21	3	881	—	208	—	—	—	208	1,092
Johannesburg	—	—	—	—	—	—	4,573	—	4,204	—	8,777	—	8,777
Kimberley	9	213	1	21	10	234	5	1,131	24	61	29	1,192	1,465
Kingwilliamstown	1	149	1	4	2	153	14	27	3	—	17	27	199
Kroonstad	—	—	—	—	—	—	—	686	—	—	—	686	686
Krugersdorp	6	6	—	2	6	8	11	126	2	26	13	152	179
Kuruman	—	31	—	—	—	31	—	433	—	—	—	433	464
Marianhill	—	4	—	—	—	4	—	81	—	—	—	81	85
Mphalele	—	49	—	—	—	49	—	577	—	—	—	577	626
Olifantshoek	—	—	—	—	—	—	29	225	5	—	34	225	259
Oudtshoorn	—	—	—	—	—	—	31	239	—	—	31	239	270
Pretoria	—	—	—	—	—	—	925	4,192	280	107	1,205	4,299	5,504
Port Elizabeth	8	62	14	25	22	87	906	3,306	1,798	1,487	2,704	4,793	7,606
Potchefstroom	—	—	—	—	—	—	65	2,730	—	—	65	2,730	2,795
Port St. Johns	—	1	—	1	—	2	—	124	—	8	—	132	134
Pietermaritzburg	—	34	—	—	—	34	138	837	94	250	232	1,087	1,353
Rietfontein	101	2,248	174	639	275	2,887	4,173	8,369	—	—	4,173	8,369	15,704
Sekukuniland (Jane Furse Memorial)	—	170	—	1	—	171	51	4,809	—	—	51	4,809	5,031
Stellenbosch	—	9	—	—	—	9	—	643	—	—	—	643	652
Swellendam	—	50	—	7	—	57	—	—	—	—	—	—	57
Uitenhage	—	24	—	—	—	24	26	1,282	—	—	26	1,282	1,332
Victoria West	—	6	—	—	—	6	—	10	—	—	—	10	16
Vryburg	—	108	—	1	—	109	—	292	—	—	—	292	401
Total	238	7,857	327	1,201	565	9,058	18,906	63,773	17,182	9,670	36,088	73,443	119,154

* Individual patients, each of whom attends three times on an average.

The expenditure on free issues of anti-syphilitic drugs during the year amounted to £6,619—an increase of £142 as compared with the previous year. The number of cases treated during the year has increased considerably all over the Union. But for the exercise by the Department of rigid economy and its careful scrutiny of all requisitions, the expenditure would have also greatly increased. Some medical officers in charge of venereal clinics and some district surgeons still requisition for large quantities of potassium iodide, which is a very expensive drug, and one which, although a useful adjuvant to treatment in certain types of case, has no direct curative action on the disease. The Department is also endeavouring to encourage the use of cheaper remedies of proved efficacy, such as mercury ointment, instead of the very expensive preparations for injection. Some years ago the Department organized a system under which suitable anti-syphilitic remedies—chiefly dilute mercurial ointment—could be supplied free of charge by Government to farmers, employers of labour, school teachers, and other responsible persons for distribution to infected natives, with full instructions for use in the local native language and both official languages. The scheme works well and effectively where farmers or employers of native labour take an interest in its working and in the welfare of their employees.

The increase in numbers treated during the past year is no doubt largely due to better recognition, by the races and classes of the population chiefly affected, of the value of modern methods of treatment, but there is reason to believe that it is partly due to increased prevalence, especially amongst the urbanized and de-tribalized class of natives. This spread is promoted by the greater facilities for travel, the increase of urbanized and de-tribalized natives and the slackening or absence of moral restrictions amongst them. Effective treatment is often very difficult with such natives, and also with the mixed coloured; when serious disablement or disfigurement improves or disappears under treatment, they usually cease to come for treatment. A large percentage of such patients is almost or entirely " a-moral " and many are without any feelings of shame or common decency. They will often freely admit to repeated exposure to infection, or even perhaps to incest; re-infections after a period of prolonged, troublesome, and expensive treatment are not uncommon. In some of the large municipalities where a great amount of treatment work has been done for years past, there is little or no evidence of any permanent reduction of the volume of disease—sometimes the circumstances are such as even to raise suspicion as to whether the provision of free and convenient treatment facilities does not sometimes tend to encourage exposure to infection and consequent spread —and the questions arise whether the State is getting value for the money spent and whether the present methods of dealing with these diseases are the best possible. The Department is giving further consideraion to these aspects of the problem.

Requests are frequently made by voluntary societies or local authorities for the institution by Government of a system of compulsory periodical medical examination of all natives in domestic service, including native female servants. This Department and the Department of Native Affairs are convinced from experience—as are also certain local authorities which have made attempts in this direction—that the enforcement of medical examination of native females would arouse intense antagonism and resistance amongst the native population. Further, to be effective such examinations would have to be repeated at frequent intervals and the system would prove very costly. Although it is admittedly repugnant and undesirable to employ infected natives as domestic servants or in handling food, the actual danger of spread of the disease in these ways is very slight and cases of infection extremely rare. The risks of spread to children by infected native nursemaids is, however, undoubted, and parents are fully justified—and indeed in duty bound—to do everything possible to guard against this danger.

It is recommended that where a local authority considers action of this kind desirable it should arrange, in consultation and co-operation with householders in its area, to organize and maintain a clinic to which native female domestics could be sent by their employers for examination and treatment if necessary—preferably by a woman medical practitioner. Matrons of native hostels established under the Natives (Urban Areas) Act and similar institutions should also be utilized in the campaign against venereal disease in native females, and the powers of that Act and also those of the Public Health Act exercised where necessary for dealing with those found infected, but tactful methods and friendly persuasion—coupled with free and suitable facilities for voluntary treatment—will in most cases yield the best results.

VI.—GENERAL.

Sanitation—(a) River Pollution.—A deputation from the Municipal Association of the Cape Province recently waited on the Minister and requested that a Board for the Prevention of River Pollution, similar to that functioning in England, be appointed by the Government to investigate and advise regarding the pollution of public streams by sewage, factory effluents, clothes washing, bathing, etc. The Minister, however, pointed out that the establishment and maintenance of such a board of experts would entail considerable expense which would not be justifiable at present, and suggested as an alternative the appointment of committees of representatives of municipal and divisional councils and other bodies interested which could engage experts to investigate and advise on particular local problems in consultation and co-operation with the Government Departments concerned.

(*b*) *Purification of Swimming-bath Water.*—The attention of local authorities in areas where swimming baths exist has recently been drawn to the dangers to the health of bathers when the bath-water is allowed to become impure. Experience and investigation in Britain and elsewhere have shown that bathers run considerable risk of contracting diseases, chiefly of the ear, nose, or throat, from bathing in dirty or polluted water. Similarly skin infections such as scabies and ringworm may be spread by the use of dirty towels, costumes, etc. Advice was also given as to methods of purification and other safeguards. The necessity of guarding against bilharzia infection in endemic areas and methods of doing so were emphasized.

(*c*) *Septic Tanks.*—Many urban local authorities have experienced difficulty with regard to applications from residents desirous of installing septic tanks on their premises, and requests for advice on the subject are frequently received. The attitude of this Department is that, whereas a water-carriage sewerage system is admittedly far preferable to the pail or pit disposal method, no local authority should sanction the installation of septic tanks unless the local and general conditions are entirely favourable and every precaution is taken to obviate nuisance. The proposed site, type, and size of tank, number of persons using the system, size of premises (with site plan), character of surface and subsoil, distance from existing wells and boreholes, as well as proposed site and method of disposal of effluent are all matters which need careful consideration in each individual application, and often require a personal visit and inspection by an experienced health officer. This Department is always pleased to advise local authorities which need advice on these and similar matters.

(*d*) *Rural Pleasure Resorts.*—At the last Congress of the Transvaal Municipal Association, a resolution was passed calling on the Department to take steps to remedy the insanitation at rural pleasure resorts, and to protect the health of the visiting public.

The Department is not staffed or organized to undertake executive work of this nature. It is, however, prepared to assist as far as may be possible where specific instances of nuisance or dangerous insanitation are reported to it. In the Cape Province the sanitary control of rural pleasure resorts would fall under the divisional councils, but in the other Provinces there are no constituted rural local authorities. The only permanent and effective remedy is the extension of suitable local government institutions throughout the Union.

2. *Housing.*—Full details of the working of the Housing Act, No. 35 of 1920, from the date of its commencement are given in the report of the Central Housing Board for the calendar year 1929, which was laid in typescript on the Tables of Parliament. A summary of the position as at the 30th June, 1930, is given in the following table:—

TABLE Q.—HOUSING ACT, No. 35 OF 1920: WORKING FROM PROMULGATION (16TH AUGUST, 1920) TO 30TH JUNE, 1930.

Province.	Loan Applications Approved.			Loan Issues.	Number of Houses.					
	European.	Non-European.	Total.		Completed.	Under construction.	Approved, but not yet commenced.	Total.	Total for European occupation.	Total for non-European occupation.
	£	£	£	£						
Cape	1,073,998	547,567	1,621,565	1,416,460	4,887	140	736	5,763	1,692 (*a*)	4,071 (*b*)
Natal	483,093	70,584	553,677	536,490	658	29	—	687	458	229 (*c*)
Orange Free State	445,551	22,560	468,111	433,719	1,017	302	419	1,738	498	1,240 (*d*)
Transvaal	738,808	197,439	936,247	931,751	2,650	30	5	2,685	906	1,779 (*e*)
UNION	2,741,450	838,150	3,579,600	3,318,420 (*f*)	9,212	501	1,160	10,873	3,554	7,319

(*a*) Includes a hostel to accommodate 86 persons.

(*b*) Includes 1,247 single rooms in blocks and 60 flats in four blocks.

(*c*) Includes 3 barracks and 16 single rooms in blocks.

(*d*) Includes 24 single rooms in blocks, the balance of 1,216 representing the approximate number of dwellings to be built out of a total loan of £21,465 made to three local authorities for use exclusively in purchasing materials to be advanced to coloured persons and natives building their own homes.

(*e*) Includes 295 single rooms in blocks, 3 compounds and 3 hostels.

(*f*) Includes £461,450 re-issued out of repaid capital.

During the 1929 Session of Parliament, the question of housing and more especially the housing of the poorer sections of the community and the removal or improvement of overcrowding and insanitary housing conditions was the subject of a lengthy debate. It was urged that while a great deal had been done under the Housig Act of 1920 and the system of loan issues by Government thereunder to meet the needs of a large section of the community, including the skilled artizan, comparatively little had been done for the poorer sections where the breadwinner earned 10s. down to 5s. a day, or even less, and that very little progress had been made, especially in some of the largest centres in reducing overcrowding and improving insanitary housing conditions.

The Minister undertook to carefully consider the matter during the recess and to bring up considered proposals during the 1930 Session of Parliament.

One suggestion was that a special board or committee of inquiry should be appointed to go into the whole matter, but after consideration and discussion with the officers of the Department and the Central Housing Board, the Minister came to the conclusion that as the Housing Committee of 1920 had gone very carefully and comprehensively into the question, and as all the essential facts were either known or easily obtainable, it was not necessary to incur the expense and possibly the delay which would be entailed by the appointment of a committee or commission, but that the preferable plan would be for the Minister to frame proposals and to submit them to a meeting of representatives of all concerned before definitely adopting them.

The plan mentioned was followed and a scheme was drawn up in consultation with the Treasury and discussed at a meeting convened by the Minister of representatives of the Provincial Administrations, local authorities and other bodies concerned, which was held at Capetown on the 18th February, 1930, and was attended by some 60 representatives.

As an outcome of that meeting at which comments and suggestions of the delegates were invited, and after further consultation with the Treasury, the Minister made a full statement in Parliament on the 12th March, 1930, outlining the Government's proposals for assisting local authorities in dealing with bad and insufficient housing among the very poor and the improvement of unhealthy areas.

Broadly, the proposals provide for the setting aside by Government of a sum of £500,000 on which interest will be charged at the rate of 3 per cent. per annum—the money to be provided in instalments spread over a period of three years of which a first instalment of £100,000 has been made available during 1930-31—for making advances in terms of the Housing Act to local authorities for carrying out sub-economic schemes subject to special conditions as summarized hereunder, namely:—

(*a*) That money under the scheme be made available for the building of houses by local authorities solely for letting purposes;

(*b*) that before such scheme is approved the Administrator of the Province and the Central Housing Board must satisfy themselves that the scheme is likely to involve a loss, and that the estimated loss for the period of the loan would involve a loss to the local authority at least equal to the loss entailed to the Government in lending the money at 3 per cent.;

(*c*) that it be a condition of such advances that the prescribed rentals should not be increased without the sanction of the Administrator and the Central Housing Board and that should conditions alter so that the dwellings are used by persons who can afford an economic rental and if the rentals are increased accordingly, then the balance of the loan outstanding would bear interest at 5 per cent. for the remainder of the period of the loan;

(*d*) that such advances be repayable within a period not exceeding 40 years, as may be approved by the Administrator on the recommendation of the Central Housing Board, and that the redemption moneys be immediately repaid to the Treasury and not be available for re-issue for housing loans;

(*e*) that it be a condition of every such advance that the local authority will *pari passu* with the carrying out of the scheme of new construction, actively proceed with measures for the reduction and prevention of overcrowding, the repair or the closure and demolition of dilapidated and insanitary and unfit dwellings and the improvement and removal of slums or unhealthy areas.

The local authorities at the larger centres, where the insanitary and overcrowded conditions which the scheme aims at ameliorating mainly exist, were accordingly furnished under circular letter dated 7th May, 1930, with full particulars of the Government's proposals, and informed at the same time that it would be a condition precedent to the granting of every loan under the scheme that the local authority make a satisfactory and detailed survey of the housing conditions of its area, and submit a report thereon classifying all poor class or " borderland " dwellings into categories showing—

(1) dwellings which can be made fit and satisfactory for human occupation without material alteration;

(2) dwellings which can be made fit and satisfactory for human occupation, but only after more or less extensive reconstruction or " reconditioning "—as by knocking two rooms into one, or two houses into one so as to provide for proper ventilation and lighting;

(3) dwellings which cannot be made reasonably fit for human habitation and which should be closed and demolished;

(4) particulars of any insanitary areas; and

(5) the number of families living under overcrowded and insanitary conditions for whom alternative accommodation has to be provided under new housing schemes.

It was made clear also to local authorities that loans under the scheme are intended to be used mainly for alleviating the housing conditions of the poorer classes of European and coloured persons and not for facilitating the working of the natives (urban areas) Act No. 21 of 1923.

The Capetown Citizens' Housing League and its Utility Company made strong representations urging that the Government be empowered to deal direct with such companies instead of through the local authority as provided in the Housing Act under which all such loans are made through the local authority which in fact underwrites them. The Treasury, however, was unable to agree to the proposal and accordingly applications by utility companies for loans are only entertained subject to compliance with the procedure and conditions specified in the Housing Act and on the recommendation of the local authority of the area concerned.

Local authorities have been further advised in connection with the 3 per cent. loan proposals that it has been decided not to lay down or to communicate to the applying local authority any specific total allocation based on the needs of the particular area, but that the Central Housing Board will confine its recommendations to actual proposals put forward for carrying out definite schemes. A number of such schemes are now under preparation and it has been urged upon the local authorities to proceed in the matter with all possible dispatch in order that an early commencement may be made with the carrying out of the scheme.

New legislation has not been necessary for giving effect to the Government's 3 per cent. loan scheme herein discussed. The question of the introduction of legislation providing powers for the expropriation by local authorities of slum or insanitary areas at site value or on some other special basis was raised, but the conclusion was come to that there is no present necessity for this for the reason that there are very few, if any, areas calling for general demolition and new lay-out, and that local authorities already have wide powers for dealing with individual unfit dwellings. Should, however, this necessity become apparent at a later stage of the housing campaign the matter can be re-considered.

The £500,000 bearing interest at 3 per cent. which has been set aside for sub-economic housing is in addition to, but quite separate from, the additional £1,000,000 of new money carrying interest at 5 per cent. which was approved for issue under the Housing Act under a four years' building programme commenced in 1928-29 for assisting the housing of persons of very limited means, including artizans, shop assistants and others earning low wages or salaries. It may be mentioned that the whole of this amount has already been allocated though some £724,000 still remains unissued.

Taking the larger centres which shared in the allocation of the £1,000,000 of new money, the following particulars indicate as at 30th June, 1930, the extent to which the local authorities had drawn on their respective allotments:—

Local Authority.	Allotted out of £1,000,000.	Loan Applications Approved.	Sum Actually Drawn.
	£	£	£
Capetown Municipality	600,000	250,450	165,000
Port Elizabeth Municipality	175,000	125,000	66,150
Durban Municipality	105,000	50,431*	38,232
Bloemfontein Municipality	30,000	42,000†	19,200
Uitenhage Municipality	15,000	15,000	14,534

* Includes £15,000 out of repaid capital.
† Includes £12,000 out of repaid capital.

Although the Capetown Municipality has been disappointingly slow in taking up its allotment, allowance must be made for the set-back which the Council's housing programme received when in June, 1928, after three months' deliberation, the Administrator turned down the Council's proposed scheme for coloured persons at Nieuwe Molen involving an estimated expenditure of £131,000.

In considering the position at Durban, it is to be remembered that out of the Council's allotment, £50,000 is earmarked for Indian housing. There is nothing to indicate at present that the Council intends proceeding in the near future with the development of the proposed Indian village at Cato Manor. The question is bound up with the extension of the Borough boundaries and the matter will be raised afresh when the Boundary Commission appointed in 1929 by the Provincial Council submits its report.

As a matter of importance in connection with native housing mention is to be made of the provision in the Industrial Conciliation Amendment Act No. 24 of 1930 under which the Minister of Labour is empowered, by notice in the *Gazette*, to exclude the operation of the Industrial Agreement for the Building Industry in connection with the erection of location houses for natives. Previously the National Industrial Council of the Building Industry was prepared to consider specific applications made by local authorities for the exemption of native housing from the operation of the Building Agreement, and in practice this resulted in all applications for exemption being referred by the Industrial Council at Johannesburg to the various district committees concerned for their recommendations. The latter arrangement did not, however, prove very satisfactory as apart from the circumlocution it entailed there was also the possibility of difficulties arising by way of protracted negotiations and differential treatment at the various centres.

3. *Town Planning.*—The machinery for supervising and controlling town planning and the laying-out of new townships appears to be working fairly satisfactorily in the Cape, Transvaal, and Orange Free State, but nothing has so far been done to set up any such machinery in Natal. As a result of the delay or neglect to do so, the position in many localities, and more especially at the seaside resorts along the Natal coast, has been seriously and permanently prejudiced. Reference was made in last report to a committee appointed by the Administrator in 1928 to inquire into and report on the establishment of some form of local government for these localities, but except at Empangeni, where it is understood steps in this direction are being taken, nothing appears to have been done. The absence of any form of local government in many urbanized areas in Natal, and in the rural areas of all the Provinces other than the Cape, entails very serious difficulties in dealing with outbreaks or prevalences of infectious or preventable diseases and other matters.

4. *Child Welfare.*—The South African National Council for Child Welfare reports a very successful year. The Triennial Congress of the Council took place last October at Durban. It was opened by H.R.H. Princess Alice, who, as always, evinced keen interest in the work of the Congress and encouraged its members in the good work. The attendance of delegates was large, and a number of resolutions on subjects of importance

were taken for submission to the heads of various Government Departments. A deputation afterwards met the Minister of Public Health and Education, and placed these resolutions before him.

Prior to the Congress the Council was advised of a munificent gift of £4,000 from H.E. the Governor-General and H.R.H. Princess Alice towards the work of the South African National Council for Child Welfare. This is another proof of their deep interest in the work of the child welfare organizations. A part of this sum has been invested to form the nucleus of a fund for the support of a rural nurse—under the Council—whose duties shall include touring in districts where no rural child welfare work has been started, in order to organize local societies.

During the year 13 new child welfare societies were affiliated to the Council, the total now being 81.

A satisfactory basis for co-operation between the two central bodies, the Federale Raad vir Moederkuns en Kindersorg and the South African National Council for Child Welfare, has been attained. At the Durban Congress and again in February last two committees representing these bodies met and agreed upon the establishment of a joint committee, and the conditions under which they would co-operate. The joint committee will deal only with matters specially referred to it by either of the two parent bodies. Matters such as new legislation, financial, and other appeals to Government Departments, closer co-operation between the constituent societies in local areas, etc., will be referred to it. This will no doubt prove a notable advance in the child welfare organization of the Union.

Excellent educative work has been done by the organizing secretary and two nurse-lecturers during the year.

Reports from the Lady Buxton Home and Mothercraft Training Centre show a year of steady progress. Some fifteen nurses have been trained in mothercraft during the year. Since its inception, 50 Athlone nurses have been certificated, and during the past year 11 Good Hope Nursery nurses were trained.

The Department has continued its annual grants of £1,000 each to the Lady Buxton Home at Capetown and the Moedersbond Hospital at Pretoria. The latter institution has hitherto been carrying on its work under very difficult conditions as regards accommodation, but has now decided to erect a new hospital building in Pretoria on a suitable and convenient site granted by the Government.

Registration of births and deaths and infantile mortality rates for European infants in each Province during the past year and the preceding ten years are shown in the following table:—

TABLE R.—EUROPEAN INFANTS: BIRTHS AND DEATHS UNDER ONE YEAR REGISTERED AND INFANTILE MORTALITY RATE, I.E. DEATH RATE PER 1,000 BIRTHS, 1919-1929.

Year.	Cape.			Natal.			Transvaal.			Orange Free State.			Union.		
	Total European Births Registered.	Deaths of European Children under One Year.	Death-rate per 1,000 Births.	Total European Births Registered.	Deaths of European Children under One Year.	Death-rate per 1,000 Births.	Total European Births Registered.	Deaths of European Children under One Year.	Death-rate per 1,000 Births.	Total European Births Registered.	Deaths of European Children under One Year.	Death-rate per 1,000 Births.	Total European Births Registered.	Deaths of European Children under One Year.	Death-rate per 1,000 Births.
1919	16,749	1,351	80·66	2,910	191	65·64	15,338	1,326	86·45	4,727	382	80·81	39,724	3,250	81·81
1920	18,425	1,654	89·77	3,256	235	72·17	16,768	1,576	93·99	4,996	448	89·67	43,445	3,913	90·07
1921	18,062	1,382	76·51	3,370	203	60·24	16,582	1,374	82·86	5,288	379	71·67	43,302	3,338	77·09
1922	18,248	1,294	70·91	3,294	180	54·64	16,370	1,292	78·92	4,920	357	72·56	42,832	3,123	72·91
1923	18,296	1,353	73·95	3,229	197	61·01	15,619	1,261	80·74	5,037	328	65·12	42,181	3,139	74·42
1924	18,730	1,296	69·19	3,410	273	80·06	15,287	1,171	76·60	4,919	382	77·66	42,346	3,122	73·73
1925	18,366	1,343	73·12	3,569	206	58·71	16,348	1,059	64·78	5,188	361	69·58	43,411	2,969	68·39
1926	18,675	1,196	64·04	3,588	189	52·68	16,304	1,186	72·74	5,309	273	51·42	43,876	2,844	64·82
1927	18,537	1,293	69·75	3,435	166	48·32	17,050	1,359	79·71	5,325	314	58·97	44,347	3,132	70·63
1928	18,032	1,240	68·77	3,514	184	52·36	17,949	1,370	76·33	5,318	365	68·63	44,813	3,159	70·49
1929*	19,009	1,169	61·50	3,650	177	48·49	18,227	1,341	73·57	5,334	280	52·49	46,220	2,967	64·19

* Preliminary Figures.

5. *Opium and other Habit-forming Drugs.*—In co-operation with the Police, Commissioner of Customs and Excise, and Postmaster-General, the enforcement of the regulations regarding opium, dagga, and other habit-forming drugs has been actively continued during the year. The following table shows the prosecutions and convictions:—

TABLE S.—SHOWING PROSECUTIONS AND CONVICTIONS UNDER LAWS RELATING TO HABIT-FORMING DRUGS DURING THE PERIOD 1ST JULY, 1929, TO 30TH JUNE, 1930.

Province.	European.		Native.		Asiatic.		Other Coloured.		Total.	
	Prosecutions.	Convictions.	Prosecutions.	Convictions.	Prosecutions.	Convictions.	Prosecutions.	Convictions.	Prosecutions.	Convictions.
Cape	20	17	628	584	11	8	918	889	1,577	1,498
Natal	3	3	1,767	1,692	38	36	16	15	1,824	1,746
Transvaal	32	30	1,385	1,338	27	13	85	83	1,529	1,464
Orange Free State	8	8	298	289	—	—	51	47	357	344
UNION	63	58	4,078	3,903	76	57	1,070	1,034	5,287	5,052

Of the total of 5,287 prosecutions, 5,283 were in respect of dagga and 4 of opium; 20 oz. 120 gr. of opium and large quantities of dagga were seized and confiscated.

The total quantities of these drugs authorized to be imported into the Union during the year ended 30th June, 1930, were: Opium, 815 lb. 10 oz. 353 gr.; morphine, 79 lb. 8 oz. 60 gr.; cocaine, 91 lb. 11 oz. 263 gr.; heroin, 26 lb. 10 oz.; *Cannabis indica*, 29 lb. 1 oz. 287 gr.

The following exports of habit-forming drugs from the Union were authorized during the year ended 30th June, 1930: Opium, 2 lb. 8 oz.; morphine, 3 lb. 10 oz. 108 gr.; cocaine, 2 oz. 111 gr.

A permit for the export of 6,360 lb. of African guaza (dagga) to London was issued to a farmer in the Koster area, Rustenburg District, Transvaal, and his permit for the cultivation of dagga for export purposes was renewed for the calendar year 1930.

Apart from dagga-smoking by natives and coloured persons and opium-smoking by a few Chinese addicts, the illicit use of habit-forming drugs in the Union is comparatively trifling.

6. *Medical, Dental and Pharmacy Matters.*—The new Act is working well and smoothly. It transpired during the early part of the year that several registered chemists and druggists—chiefly in one particular area of the Union—were carrying on a very extensive system of distributing amongst natives in the Union and neighbouring territories, and mainly through the post, leaflets and pamphlets in native languages and dialects, advertising love philtres, and alleged remedies for impotence, sterility, menstrual disorders, venereal disease, etc., and that a large "mail order" business of this kind was being carried on. The matter was investigated and at the instance of this Department several prosecutions were instituted under Section 65 of Act No. 36 of 1919, and convictions obtained. The matter was also referred to the Postmaster-General, with a view to action under Section 25 of Act No. 10 of 1911, and to the South African Pharmacy Board, which thereafter issued a warning notice on the subject under Chapter IV of Act No. 13 of 1928. These measures have resulted in a great reduction or discontinuance of this very reprehensible practice.

Another objectionable practice which is being extensively carried on is the advertisement through the post—mainly by oversea firms—of contraceptives and similar articles. The question of framing and promoting a Public Morality Bill prohibiting this and regulating and restricting the importation or sale of such articles, also for prohibiting the importation, advertisement, transmission through the post, exposure or sale of objectionable or obscene literature, prints or photographs, should be considered.

Certain complaints and difficulties arose during the year regarding the administration of Chapter V of Act No. 13 of 1928, regarding the keeping and sale of poisons—especially by general dealers. The Department, in consultation with the Department of Justice and the South African Pharmacy Board, is preparing a memorandum on the subject for distribution.

7. *Nurses and Midwives.*—The position regarding these remains much as described in last report, and the serious shortage continues. The South African Medical Council declined to reduce the period of training or, in the case of pupil midwives, the number of confinements to be attended, required by the "Rules" submitted for the Minister's approval under Act No. 13 of 1928, and the "Rules" have not yet been so approved. This matter is to be further considered by the Council of Public Health at its forthcoming meeting. Efforts by the Department at Johannesburg and Capetown to secure co-operation between the local bodies and interests concerned, with a view to the utilization of district midwifery material for training purposes and thus obtaining a greater annual output of trained midwives, have not yet borne fruit. The Natal Provincial Administration has suggested that the Minister call a conference of representatives of the South African Medical Council, the four Provincial Administrations, and any other bodies specially concerned to consider the whole question, and the Minister has agreed to do so, provided these bodies concur and agree to bear their own costs; correspondence regarding the proposal is proceeding.

The Pretoria Municipal area has, on the recommendation of the South African Medical Council, been declared a "prescribed area" for midwives under Section 39 (*b*) of Act No. 13 of 1928 (Proclamation No. 23 of 1930).

Draft regulations applicable to both registered and unregistered midwives, framed under Section 18 (*b*) of the Public Health Amendment Act, No. 15 of 1928, have been framed by the Department, circulated to local authorities and other bodies concerned, revised in the light of the criticisms and suggestions received, and will be further considered by the Council of Public Health at its next meeting.

8. *Nursing and Maternity Homes.*—The system of registration and inspection described in previous reports has been continued. The following table summarizes the work done during the year:—

TABLE T.—NURSING AND MATERNITY HOMES: INSPECTIONS DURING THE YEAR ENDED 30TH JUNE, 1930.

Place.	Total Number.	Number Inspected.	
		By Medical Officer of Local Authority.	By Government Health Officer.
Cape Province—			
Capetown	27	—	—
East London	8	8	—
Port Elizabeth	8	8	—
Elsewhere	71	—	8
Natal Province—			
Durban	24	19	—
Pietermaritzburg	8	—	—
Elsewhere	22	—	2
Transvaal Province—			
Johannesburg	28	28	—
Pretoria	10	—	—
Elsewhere	53	—	5
Orange Free State—			
Bloemfontein	3	—	—
Elsewhere	26	—	3
UNION	288	63	18

Arrangements have recently been made which will, it is hoped, result in a larger proportion of the homes being inspected each year. Steps are also being taken to ensure better compliance with the regulations, especially as regards registration with the Department before any home is opened and the proper keeping of registers of patients in the form prescribed. Hitherto there has been much negligence on the part of proprietors of homes in these respects and warnings have proved of little effect. The intention is that in future defaulters will be prosecuted without delay. During the year the "Hygienic Sanatorium," Bloemspruit, near Bloemfontein, was, by order of the Minister, removed from the register and closed down on the ground of unsatisfactory construction.

9. *Inyangas or Native Herbalists in Natal and Zululand.*—The position regarding these, and the policy which is being followed in administering Section 98 (2) of Act No. 13 of 1928, are detailed in last Report. At the

end of June, 1930, the number licensed was 1,001—a decrease of 351 as compared with the number at the end of June, 1929. The issue of four new licences was authorized by the Minister under special circumstances during the year.

10. *Sanitary Inspectors, Health Visitors, etc.*—During the year 29 sanitary inspectors, 7 meat and food inspectors, and 1 health visitor and school nurse passed the respective examinations of the Joint Board of the Union Government and the Royal Sanitary Institute.

Registers for sanitary or health inspectors and members of allied callings, also for dental mechanicians, have not yet been established by the South African Medical Council under Section 32 of Act No. 13 of 1928.

Local authorities were notified by departmental circular (No. 9 of 1930) that approval for part-refund by Government of salaries of health visitors appointed after 1st July, 1930, will be conditional on the appointees holding the qualifications of trained nurse and midwife and also of health visitor and school nurse.

11. *General Hospitals.*—The system of annual inspection on behalf of the Provincial Administrations of the State-aided hospitals and kindred institutions in the Cape Province, Orange Free State, and the Transvaal was continued during the year. The hospitals on the Reef and in Pretoria were inspected by the members of the Hospital Advisory Council, while fifty-two hospitals and aided charitable institutions were visited and reported on by Dr. Van der Spuy, Assistant Health Officer in this Department. In last Annual Report the unsatisfactory position of the general hospitals in the Union outside the Transvaal was commented upon. While some progress has been made towards meeting the shortage of beds and generally improving the condition of the institutions under the control of the Provincial Administrations, much remains to be done if the recommendation of the Hospital Survey Committee are to be carried out to any extent in the near future.

In the Cape Province building operations in connection with the new Central Hospitals at Capetown and at East London have not yet been commenced, though tenders are about to be called for. Of the larger works nearing completion, mention might be made of the new Maternity Hospital, Capetown, the non-European block of the Victoria Hospital, Wynberg, the remodelling of Grey's Hospital, Kingwilliamstown, and extensions to the Frontier Hospital, Queenstown.

During the year new hospitals were opened at Matatiele and at George, while plans were passed for extensions to the Provincial Hospital, Port Elizabeth, the Sir Henry Elliott Hospital, Umtata, and a number of smaller institutions. Schemes for the erection of hospitals at Calvinia, De Aar, and Middelburg have also been started.

In the Orange Free State, work on the new Central Hospital, Bloemfontein, the new Bethlehem Hospital, and on extensions to the Northern Free State Hospital, Kroonstad, is making steady progress, while a small hospital was completed and opened at Clocolan.

In Natal the work of re-constructing the Addington Hospital is proceeding, but otherwise the hospital position in that Province remains unchanged.

The Transvaal hospitals have completed a year's working under Ordinance No. 18 of 1928. Generally speaking, the Ordinance is working well. New hospitals were completed and opened at Ventersdorp and Amersfoort, while work on the construction of the new Pretoria and Witbank Hospitals is proceeding; plans have been prepared for a hospital at Volksrust.

Chronic Sick Hospitals.—The very unsatisfactory position in regard to chronic sick hospitals in the Union was commented upon in last Annual Report. The scheme for providing a new institution on the Cape Flats has made no further progress, and the Provincial Administration is still considering the question of purchasing the Alexandra Hospital from the Department of the Interior. It is to be hoped that the matter will be settled and the disgraceful existing institution vacated as soon as possible.

The position in the other three Provinces remains unchanged.

12. *Vaccines, Sera, Pathogenic Cultures, etc.*—Nine permits under the regulations made under Sections 36 and 134 of Act No. 36 of 1919, were issued during the year, all being to bacteriologists conducting laboratories.

The South African Medical Council has framed and submitted a series of regulations under Section 83 of the Medical, Dental, and Pharmacy Act, No. 13 of 1928, but difficulties have arisen regarding arrangements for the carrying-out of laboratory testing work in connection therewith. Until satisfactory arrangements for this work have been made and necessary funds provided, the regulations cannot be promulgated.

13. *Cancer.*—Considerable funds have been raised in all four Provinces for the purchase of radium for the treatment of cancer. Applications for assistance in the matter have been made to the Government—which has, however, decided that the provision of radium and of arrangements and facilities for its use are—under the present laws—matters for the Provincial Administrations and hospital authorities.

14. *Goitre.*—As a result of further inquiries directed to district surgeons, it was found that, apart from the valleys of the Coega River and its tributaries in the Uniondale District, other isolated groups of cases of simple goitre exist, usually in mountain valleys such as the upper reaches of the Bushman's River, Natal, the Kei River in the Eastern Province, and the mountain valleys about George.

Requests have been received from several district surgeons for copies of the Department's leaflet on simple goitre, and for packets of concentrated "iodised salt" for use by pauper patients. It is proposed to ask for reports from district surgeons of the affected districts on the effect of use of iodised salt in their areas.

The co-operation of the Chemical Division of the Department of Agriculture and of the Transvaal University College, Pretoria, has been obtained to carry out an investigation into some of the possible local causes of this condition. Samples of soil and water and of foodstuffs grown in the goitrous valleys draining into the Coega River, have been secured and are being analysed with reference to their iodine content and other relevant data, and it is hoped that useful results will emerge.

15. *Dietetics.*—The dietaries in use in the various institutions under the Department's administration have been revised and brought into line with modern knowledge. The scales are now not only adequate, but carefully balanced, and provision is made for a sufficiency of vitamins. A daily ration of fruit is provided when available, otherwise a ration of raw orange-juice is issued in substitution.

Diet scales of prisons and other Government institutions have also been scrutinized and advice given where these are found unsuitable. Dieting of mine natives was also carefully investigated, and steps taken to effect improvement where necessary.

The Department's pamphlet [No. 194 (Health)] on "Food and Health" was revised and brought up to date during the year. The section on vitamins was re-written so as to make our present knowledge on this important subject readily available to non-technical readers. Other important sections deal with the feeding of infants and children.

16. *Railway Water Supplies.*—During the year the supervision of railway water supplies was continued. Samples of water are periodically taken from railway coaches and submitted to bacteriological examination. Where they are found unsatisfactory, the South African Railways and Harbours Administration is notified, so that steps may be taken to remedy matters. In addition, assistant health officers in their routine field-work make inspections of the sources and methods of purification of railway water supplies. This system of supervision is working satisfactorily, and, with the active co-operation of the Railway Administration, the health of the travelling public is being suitably guarded against the possibility of water-borne infection.

17. *Official Uniforms: Rational Clothing.*—The position remains as stated in last Annual Report. As far as can be ascertained, nothing has been done by any of the Departments concerned.

I have the honour to be, Sir,

Your obedient servant,

J. ALEXANDER MITCHELL,

Secretary for Public Health and Chief Health Officer.

Department of Public Health,
Union Buildings,
Pretoria, 24th September, 1930.

ANNEXURE "A."

REPORT ON LEPROSY IN THE UNION OF SOUTH AFRICA.

I arrived in Pretoria from Northern Rhodesia on Wednesday, 18th June, 1930, where Dr. Mitchell, Secretary for Public Health, met me. I should like to state at the outset my deep appreciation of the kindness and courtesy extended to me by Dr. Mitchell during my stay of three weeks in the Union. I was especially grateful to him for accompanying me on my tour of the institutions, for this afforded me an opportunity of thoroughly discussing the leprosy situation in South Africa which might not otherwise have occurred.

Before leaving Pretoria, I had the privilege of meeting the Hon. the Minister of Public Health, Dr. D. F. Malan, and also of visiting the South African Institute for Medical Research, and meeting and having conversations with the Director and some of the workers in that institution.

I also paid a visit to the West Fort Institution at Pretoria. This institution is situated a few miles outside Pretoria, and is the largest leper settlement in the Union, accommodating over 900 patients. The leprosarium is divided into three sections, European, coloured and native. The staff consists of a superintendent, who is a medical man, two medical officers, a matron and three nursing sisters. I consider that this leprosy hospital is organized and managed on very efficient lines. The treatment which is being carried out is up to date, and the results are good. Dr. du Pré le Roux informed me that the percentage which were discharged was over 10 per cent.; this compares favourably with the average discharge rate in the institutions in India. An equally suggestive factor is that, as a result of modern methods of treatment, over 50 per cent. of all patients improve to so great an extent that they are able to be employed in some useful occupation.

A great deal of very useful medical work is done in the institution, and the medical staff is fully alive to the value of all-round treatment. I was much impressed with the facilities available, and with the enthusiasm and efficiency of the workers. Unfortunately recently one of the assistant medical officers developed the disease, and as this is the eighth contact case which has developed among the staff since the Pretoria Institution was founded, and the ninth contact case in the Union Leprosaria, the attitude of the authorities and staff of the institution cannot help but be influenced by such happenings.

While at Pretoria I was able to discuss medical questions with the officers of West Fort Leper Settlement; their views and my own are in substantial agreement. In one or two matters we disagreed, and the difference of opinion was largely due to our different clinical experience. I hope to enlarge on this aspect later, because I feel sure that the misunderstandings which have arisen from time to time are largely due to the varying type of clinical case which is most frequently seen in the Union, as compared with certain other countries.

The majority of the cases examined were infective cases. In a certain number of instances, although the lesions were not of the highly contagious order, yet their nasal secretions were very definitely positive. This was a fact which was impressed on me very strongly in my short visit to the Union, and I shall dwell on it again. There were about ninety European patients isolated in the Pretoria institution. Leprosy among the Europeans, as I shall be pointing out, occurs most frequently among the poorer class. It is the exception for an individual who is living under good social conditions to contract the disease, although this does occur occasionally. Not only do the Europeans who live under stringent financial conditions more readily acquire the disease, but leprosy develops more rapidly, and therefore they tend to pass immediately, or at least very quickly, into the highly contagious stage. It is for these reasons that it is important that they should be segregated. In addition, present public opinion would not tolerate a known leper to be at large in the vicinity of a large town. Until the public have been educated it is better, for the patient's sake, that he should find a home in a leprosarium rather than be isolated in his own home under adverse conditions. Under special circumstances home segregation is allowed, but there are few cases, able, or capable, of isolating themselves efficiently in their own homes. I shall be dealing with this whole problem at the close of this report. Sufficient is it for me to state at this point that the conditions under which the Europeans live are excellent, and they are given every comfort, in fact I feel sometimes they are the " spoilt children " of the

Government, and as such are a difficult administrative problem. As soon as the authorities reasonably can, patients are discharged to their own homes. Not only are the patients themselves cared for, but their dependents are given allowances. This would not happen if they were under "home segregation," and considering in most cases their poverty, it is much better in every way that they should be under care and a certain amount of restraint.

On 21st June I left with Dr. Mitchell for a tour of the institutions in the Cape Province, Transkei and Zululand. On our way we broke our journey at Bloemfontein in order to make a side trip to Maseru and visit the Botsabelo institution in Basutoland. I shall not refer to this visit here as I shall be writing a report on the situation in that colony.

We arrived at Emjanyana, the largest institution in the Transkei, on 25th June. This institution, like that of Pretoria, is under the management of a superintendent, who in this case is a layman, with a medical officer, a matron and two nursing sisters, also seven trained native nurses. The patients are entirely native, and there were over 500 under isolation. The institution was well kept up and the ordinary, as well as the hospital accommodation, was very good.

Attached to all the large institutions of the Union is a farm which supplies much of the produce and meat necessary for the lepers.* The agricultural facilities at Emjanyana are good and the lepers benefit greatly thereby. The diet ration in all the institutions is excellent; while the meat ration has recently been cut down it is still rather high.

The medical work at Emjanyana is of a high order, and Dr. Davison, the medical officer, is doing an excellent piece of work. The treatment is being carried out in a thorough fashion, and experiments with shock-producing drugs, combined with hydnocarpus oil, are being undertaken, with promising results. Experiments are also being carried out with massive doses of Alepol, as much as 50 c.cs. of 10 per cent. Alepol having been given intramuscularly at one time. The results here are also encouraging, although the pain factor is inceased considerably, and therefore is a handicap as a routine method. Little is heard outside the Union of the excellent institutional work which is done, and it affords me pleasure to make this known in some small measure.

The results of treatment are satisfactory, as shown by the discharge rate of over 20 per cent. of all cases. Considering that all cases are in the skin stage of the disease, many of them advanced, these results compare favourably with any institution in the world. It is unfortunate that so few cases enter the institution under from 2 to 6 years or more after the onset of the disease. I shall deal with this question later. I had the privilege of discussing the general as well as the medical situation at some length with both the superintendent and medical officer, and my opinions will be expressed at the end of this report. Dr. Fourie, Assistant Health Officer of the Union and late P.M.O., South-West Africa, joined the party at Emjanyana, and we had the pleasure of his help in our conversations.

I left Emjanyana by car on 27th June, accompanied by Drs. Mitchell, Fourie, and Davison, and arrived at Mkambati on the 29th. Mkambati is the institution for Pondoland. As we motored through the Transkei the sparseness of the population was impressed upon one. One travelled long distances only seeing half-a-dozen natives. The kraals were scattered, sometimes miles apart. This all adds very considerably to the difficulty of bringing ordinary medical relief to the people, and still more is this the case when one is considering leprosy prevention methods, examination of contacts, early cases, etc.

We arrived at Mkambati on 29th June; Mkambati is situated at the mouth of the Umzimkaba river, and like all the other institutions in the Union, has an area of land sufficient for housing all the lepers which come to the settlement, and part of the land is cultivated and the remainder used for cattle ranching. This institution is organized on native lines, and the patients number about 250. Up till recently the conditions in the institution were not entirely satisfactory. Since the Health Department took over the leper institution in 1924, things have improved very much. The lepers, although still rather far away, have been moved to kraals nearer to the hospital and dressing station, and a missionary doctor—Dr. Drewe—from the Holy Cross Mission (S.P.G.) near Flagstaff, paid by the Government, visits three times a week. In addition a nursing sister, supplied by the same mission, also paid by Government, is in residence in the leper settlement. The medical work of this institution is very good, and I was glad to see the insistence on baths and massage. These were carried out so efficiently that the skins of the patients were as healthy as I have seen anywhere. The

* Part of the lands at all our institutions are set apart for and worked by the patients. Government supplies seed, manure, etc., and buys the produce from the patients at market rates for use at the Institution. Similar arrangements obtain regarding poultry. (Note by Secretary for Public Health.)

hospital accommodation is provided for by a central building in which there is a large dressing room, an operating theatre, and also a room for laboratory and other investigations. There are two well built rondavels with cement floors intended to be used as hospital wards. These have been completed only recently and have not yet been used; they are excellent for the purpose. The kraals in which the patients were housed were rather poor, and some improvement in the way of light and ventilation might be considered in the future.

Dr. Davison and I spent the whole of the afternoon of the 30th of June discussing with Dr. Drewe various problems of pathology and treatment. It was a great pleasure to find so much enthusiasm displayed, and I feel sure that this institution will become more and more efficient in the future.

From Mkambati we proceeded to Durban, arriving there on 2nd July. We visited the detention camp at Salisbury Island, where lepers are sent prior to their transference to the Amatikulu institution. If cases are found to be non-infective and arrested, these are forthwith sent back to their homes, and only the infective and active cases transferred to Amatikulu. There is a similar system in connection with the other institutions.

On the 3rd July, accompanied by Dr. Park Ross, Assistant Health Officer for the Union, we visited the leper settlement at Amatikulu, some 80 miles north of Durban. The Amatikulu leper settlement, with its 12 square miles of land, is the leprosy institution for the whole of Natal and Zululand, and has at present close on 400 patients. As at Mkambati, the lepers live in native houses. Because the Zulu house is dome-shape, and a different type of grass is used, the houses are much better ventilated than those seen at Mkambati. The settlement is very scattered, and it takes some little time to tour round the institution. Up to recently there has been no accommodation for those cases which needed hospitalization. A hospital block, however, has just been finished, as has also the nurse's house. This should add considerably to the attractiveness of the home. As this is the only home for the Zululand natives, it is essential that treatment should be as effective as possible. Considering the circumstances in the Union, the chief means, if not the only means, for combating the leprosy problem will have to be institutional treatment. Unless the results of such treatment are good, any method of attracting cases to come voluntarily for treatment must fail. Until recently, treatment arrangements at Amatikulu have not been entirely satisfactory, the visiting medical officer having to come from Eshowe, some 35 miles distant, but within the last few months Dr. Stoute, the District Surgeon at Gingindhlovu, which is only a few miles off, has taken over the leprosy treatment. Up to now the drug chiefly used has been tartar emetic, or some other antimony compound, but all modern methods of treatment are now in use. It is to be hoped that, from now on, as a result of improved treatment, more lepers will be discharged, and thus earlier cases will gradually come for treatment and isolation. At Emjanyana and Mkambati those lepers who are not highly dangerous are allowed leave of absence. The patients' advisory board are responsible for the working of this system, and half-a-dozen inmates are chosen at a time. These go out under escort, the escort being provided merely to ensure that the patients reach their kraals; once there, the escort returns to the institution. No further batch of patients are allowed leave until all the former number have returned. This system has meant that relatives see for themselves the improvement in the patients, and realize that cases are not incarcerated for life. In addition to this, from time to time a band of the chief men, or elders, of the institution, who are suitable cases, are sent round the district as educative and propaganda agents. No cases are kept in the institutions in South Africa if it is at all possible to discharge them, and they are discharged as soon as they have become non-infective for a reasonable time; in most cases this is about a year after active signs have disappeared.

With regard to children born in the institutions in the Union, these are separated at birth, and the crêches in Pretoria and Emjanyana are models of their kind. The children are kept until two years of age and then sent to relatives. At Amatikulu, until a proper crêche system has been adopted, it would probably be better to allow children to remain with their parents until about two years of age. I am aware that the ideal is to separate children at birth, but unless there are proper crêche facilities the chances of survival are very meagre. Our Indian experience tends to show that very few, if any, contract the disease if they are separated at two years of age. It is better to take the slightly increased risk of infection than send a child out to almost certain death. When a nursing sister has been appointed, and a crêche established, then children should be separated at birth.

I left Pretoria for Capetown on Monday, 7th July. Before leaving Pretoria, I had the privilege of meeting the Leprosy Advisory Committee of the Union and discussing the whole situation with them. The minutes of this meeting will be forwarded in due course.

On the 10th of July, I intended to visit Robben Island, but the weather was too stormy to allow of the boat making the passage. However, as this settlement is to be abandoned, the visit would have been of interest mainly from the historic point of view. It is considered, as leprosy is definitely on the wane in the Cape Province, and as Robben Island is a decidedly unhealthy situation, it is better both from the health, as well as from the administrative points of view, to move the lepers to a more accessible place. A large number of lepers have already been moved to Pretoria, and when further accommodation is built the remaining hundred odd lepers will be transferred.

Much attention has recently been focussed on the general leprosy policy of the Union. I was very glad therefore to have this opportunity of seeing for myself the situation. I am very grateful to the Committee for allowing me to accept Dr. Mitchell's kind invitation to visit the Union and discuss leprosy matters with him.

My tour throughout the continent of Africa has impressed upon me the fact that the problem varies enormously in each country, and therefore it is hardly possible to make statements concerning the control of the disease unless the country in question has been visited. Much stress has recently been placed on the "soil" in the development of leprosy. In the sister disease, tuberculosis, the people of a country are sometimes referred to as being highly tuberculized, meaning that a certain amount of racial resistance has been acquired as a result of being subjected to the infection over long periods. I believe a similar process may be seen in leprosy, and a community be referred to as highly "leprolized." This process appears to be well illustrated in the continent of Africa. For example, in South Sudan in certain areas such as those bordering French Equatorial Africa, the disease is seen in a milder form than that bordering the Belgian Congo. This is suggestive when one realizes that in the latter the disease is apparently spreading. Again, tradition has it that the origin of leprosy is to be found at the source of the Nile, and it is in Central Africa that a larger number of early non-infective cases occur than in the areas further south. These statements are only put forward as suggestions for the reason of the type of case which occurs most frequently in the Union—that is, the infective case—for it is known that leprosy was introduced about the middle of the eighteenth century probably from two sources: by the Bantu from the north and by the foreign invaders from the coast.

In each country then, climatic, dietetic, and racial conditions all play a part in determining whether the type of disease is severe or not, and while diet, I believe, is responsible for the presence of large foci throughout Africa, I believe in South Africa the racial resistance to leprosy is not so high as elsewhere—that is, the community is not so highly "leprolized." The scarcity of the early non-infective cases has been impressed upon me considerably. It can be argued, with a certain amount of justification, that because of compulsory segregation early cases exist, but are not discovered. Such an argument, however, is to a certain extent invalidated for the following reasons:—

(1) If early cases of the type common in India were at all common, a certain number would be almost certain to be discovered among the large number of native labourers examined carefully for employment in the mines, etc.

(2) It is almost inconceivable that workers in leprosy over the past decade would never discover such early cases sometimes if they had existed, yet the concensus of opinion, both among the new and old workers, is that the really early case, as seen in India and Central Africa, is so rare that it can be said to be practically non-existent.

Not only does the early non-infective case appear to be rare, but the incidence of nasal infection, as shown in positive nasal smears, appears to be exceedingly high. In India not only does primary nasal infection appear not to occur, but it has almost become an axiom that if smears from the nose are found to be positive, bacilli will in all probability be present in some skin lesion elsewhere. In South Africa, however, there is a large amount of evidence suggesting that a patient may have few, if any, other signs of leprosy, yet smears from the nose may contain large numbers of acid-fast bacilli. If, as is apparently the case, the contagious type of the disease is more common, it means that the great majority of lepers who declare themselves, or who are discovered, are a danger to the community. Whether the early non-infective case exists in any appreciable number, which it apparently does not, could only be determined by prolonged field research. The present knowledge of the type of disease therefore gives support to the policy of segregation now in force. All authorities are agreed

that, where possible, infective lepers should be segregated. South Africa is a country where infective lepers are apparently in the great majority, and where there is a medical service which cannot adequately cater for the native needs of the territory. Also the natives are so widely scattered that, taking the whole Dominion, there are under 20 persons to the square mile, and in many districts there are under 3 persons to the square mile, thus making it impossible to institute out-patient work in the ordinary sense of the term. When viewed in the light of these facts, one cannot but support the present leprosy policy pursued by the Government.

Coming down to the actual leper problem, this can be divided into (*a*) European and coloured, and (*b*) the native problem.

(*a*) *European and Coloured.*—Fortunately this is rapidly decreasing, as shown by the number of cases segregated each year over the past twenty years, dropping from over forty in 1910 to fourteen in 1928. Few cases now remain for long undiscovered.

Leprosy among Europeans occurs chiefly in those who unfortunately suffer under stringent financial straits and live in an unhygienic way, and therefore contract the disease through lowered resistance produced by such conditions. It must be remembered that the disease in Europeans of the type referred to is liable to advance very rapidly, and the homes from which patients come make it impossible for them adequately to segregate themselves. Also if such patients were to avail themselves of home segregation, public opinion would be so against them that it would be impossible for them, in a great number of instances, to live anywhere near to a large town or group of people. Under such circumstances one is bound to conclude that the most practical method is one which segregates all discovered cases of leprosy, either in an institution or else under proper home conditions. This method is being carried out in Norway with great success, and as conditions in the large towns of the Union are somewhat similar, it should, as is happening, be equally succesful. It would, in the majority of cases, be impossible for local doctors to treat leprosy, for once this were found out the doctor would from that time lose all his private practice. I am certain that if the present method is continued, leprosy will speedily diminish. It is already not a major problem, and in a few years' time will reach, as far as these communities are concerned, an almost vanishing point.

Under such a system cases of hardship are bound to arise occasionally from time to time, but as the Government are very generous towards the dependents of lepers, there is little likelihood of real destitution. The better type of patient realizes the value of institutional treatment; it is the agitator and malcontent who ouside the institution is not intelligent enough to take proper precautions, that cause a certain amount of embarrassment to the authorities, and give a false impression of the hardships the sufferers endure. I was very impressed with the way the European and coloured lepers are treated, and consider that the present policy is perfectly justified. Once a European or any leper is no longer a danger to the community, he is discharged. Frequently the authorities have considerable difficulty to persuade municipalities and others to have an arrested case back in the district, and sometimes it is necessary for the Department to threaten legal action.

Until an enlightened public opinion arises in the country, there is no justification in relaxing the present segregation methods as far as the European community is concerned. Any health propaganda organized by the Education Department through such agencies as schools, boy scouts, etc., should include talks on the chief endemic diseases, including leprosy, and so endeavour to dispel some of the medievalism which undoubtedly exists. I do not know how far such propaganda is exploited.

(*b*) *The Native Problem.*—This is a more serious one, though compared with the problems of syphilis, tuberculosis and malaria, of minor significance, as far as the Union is concerned. Leprosy always occurs in patches, and the factors which favour high incidence are (1) social, (2) dietetic, (3) presence of other diseases in the community, e.g. syphilis, intestinal disease, chronic infections of all sorts. Because of the sparseness of the population, the lack of an adequate native health service, and the unfamiliarity of the dispensary system generally, it is at present impossible to treat lepers except under institutional treatment. How then is the problem to be controlled? There are no short cuts and only by the process of propaganda, education and organization of a native health service will the native be taught to view seriously not only this but any chronic disease. Education of the native through the headman, through schools, etc., will gradually convince him that something can be done for his lepers. There is a system of native typhus visitors; this system should be extended to all endemic diseases. If a health visitor service manned by natives trained in the elements of treatment and first aid were placed in native villages, it would not be long before the inhabitants would be educated sufficiently in regard to such diseases as

leprosy, typhus, syphilis, etc. Health visitors should not be used as spies to notify lepers, but as education agencies to teach the native to declare disease early before it is beyond treatment. Leprosy has too often been singled out for special treatment. The solution of the problem lies in the proper understanding of leprosy in its relation to other endemic diseases.

As the leper institutions discharge a greater number of cases as "arrested," as is happening each year, so will the natives realize that an institution is not a prison for life, but a sanatorium out of which healthy and non-infective patients return to their homes.

As each year passes there is undoubtedly a greater number of voluntary admissions into the institutions of the Union. Further, the whole tendency of the Government is towards the gradual relaxation of compulsory measures. It would not be a right policy to withdraw the present Leprosy Repression Acts, for not only are they useful in cases discovered that are highly infective, but if withdrawn would tend to give the impression among the natives that leprosy was not being taken seriously. Where compulsion has been in existence for decades that policy can only be gradually modified as time and conditions become favourable.

It is admitted that the weak point in the present scheme is that cases are only discovered or present themselves for treatment after having had the disease some years. This can only be overcome by the gradual convincing of the native population through their headmen, that something can be done for lepers. While I do not advise that any of the present leprosy regulations should be withdrawn, I think it would only retard the march of progress which has definitely set in if any further measures were enforced, or if any attempt at the "rounding up" of lepers were tried. Any regulation increasing the tendency to hunt out lepers, other than those employed at present, would only result in further hiding of the disease.

There is no royal road to leprosy control, and as far as the Union is concerned one must rely on measures already indicated, viz.:—

(1) Systematic teaching and propaganda in schools, among headmen, and native parliaments, where they exist.

(2) Development of a health visitors service.

(3) Field investigation. There is a considerable opportunity to undertake field research, and until more is known regarding the type of the disease, its distribution and incidence, one cannot indicate further measures. For instance, lepers occasionally have to be moved hundreds of miles to the nearest institution. Only investigation on the field can determine whether any other centres for treatment are necessary. I consider the present centres are probably sufficient, for, to many primitive natives, ten or twenty miles from their kraal is as good as 200.

(4) Present methods of discharging patients as soon as possible, and of giving others leave, all serve an excellent purpose.

I should like at this point to make a few further remarks concerning out-patient dispensary treatment. I feel certain that the time has not come when such a system could be organized. Whether it would be of any value ultimately, considering the sparseness of the population, is open to serious doubts. Out of over three thousand patients attending annually the S.P.G. Mission at Flagstaff, no really early leprosy cases of the non-infective type so common in India have been discovered. As stated elsewhere, it is probable that cases of this type occur so seldom that there is little justification for setting up the machinery for out-patient leper work. Not only that, the areas where cases are most numerous are inadequately staffed medically, and therefore such dispensaries could not be supervized properly. Again, the need for such dispensaries could only be gauged after field investigation. Such investigation would not be easy, and unless organized carefully and prepared for a long time beforehand, might fail altogether. If large numbers of cases were examined, and the population had any suspicion that lepers were being looked for, none would be discovered. The accumulative evidence, therefore, is that the Union Government have not at present sufficient justification for launching out in the organization of out-patient clinics.

Finally, there is another weakness, which to my mind is far greater than any other drawbacks to Union leprosy schemes, and that is that the Health Department tends to lose its leprosy officers just as they are getting an excellent understanding of the disease. The reason for this is the lack of sufficient emoluments. Good men cannot be expected to stay in a service which involves being stationed in places miles away from possibility of ordinary intercourse, both social and professional, unless there is a sufficient monetary encouragement. Such men will naturally tend to drift into the other departments of the Health Service where the prospects are better.

I would respectfully suggest then that the Medical Officer in the Institution at Pretoria should be looked upon as the Senior Officer in the Leprosy Service, and should that post be vacant it would be considered a promotion to be offered such a post. The duty of the senior man would be to conduct, as to a certain extent is being done, post graduate classes and train medical men and others in the diagnosis and treatment of the disease. In addition, he should be encouraged to do research work and be sent to other countries such as India and the Philippine Islands, so that he might gain a more extensive insight into the disease, and methods of combating it in other countries. In this way such an officer at Pretoria would be able to give valuable advice to the Government on general preventive methods in the field of leprosy. It is not my duty to suggest details of emoluments, but I feel sure if further encouragement were given to the medical officers doing leprosy work, they would be encouraged to continue the excellent work which is already being done.

In conclusion, I should like once again to emphasize the fact that there are no short cuts to the elimination of leprosy. I feel sure as education proceeds, as general public health and preventive measures for native areas become more complete, the disease will gradually be brought under control. Among certain backward and primitive people the disease will linger on, but in the main it will become less of a menace. Further, as the problem is further investigated by the officers of the Union modification of the existing policies will suggest themselves, and then rigid compulsion will slowly take a less prominent aspect in the general scheme.

My visit to the Union was most instructive and helpful, and I trust I have made some little contribution towards the solution of this problem.

Robert G. Cochrane, M.D., M.R.C.P., D.T.M. & H.
Secretary, British Empire Leprosy Relief Association.

London, 21st August, 1930.

ANNEXURE "B."

The Honourable the Minister of Public Health,
Union Government of South Africa,
Union Buildings,
Pretoria.

Sir,

I have the honour to forward herewith some observations on what I have seen during my visit to the Union.

In order that my conclusions may be understood, I submit as the first part of these memoranda, a copy of the conclusions that I reached during my investigations in Malaya. [These conclusions were published on pages 361-366 of my "Prevention of Malaria in the Federated Malay States" (1920).]

Mosquito Reduction.

1. From a malarial standpoint, the Malay Peninsula can be divided into several zones which may conveniently be distinguished as, the Mangrove Zone, the coastal plain, the coastal hills, the inland plain, and the inland hills.

2. These zones may be malarial naturally, or may become so through the operations of man.

3. The part of the Mangrove Zone covered daily by the tide contains no anopheles and is non-malarial. When the forest is felled and the tidal flow obstructed, it may become intensely malarial from the appearance of *A. ludlowi*, which has been proved to be a natural carrier of malaria, and is probably the most important carrier in the Mangrove Zone.

4. The part of the Mangrove Zone covered only by the spring tides is naturally malarial from the presence of *A. umbrosus*, which has been proved to be a natural carrier of malaria. Clearing the forest allows *A. ludlowi* to enter this portion of the zone also.

5. Both *A. ludlowi* and *A. umbrosus* are eliminated by clean weeded drains and good drainage and many examples of how good agriculture abolished these mosquitoes and their malaria from the Mangrove Zone can be given.

6. The coastal plain is malarial from the presence of *A. umbrosus* in its virgin jungle.

7. Hundreds of square miles of flat land in the coastal plain of Malaya have been freed from malaria by simply draining and felling the jungle, and cultivating the land.

8. The disappearance of malaria from the coastal plain coincides with the disappearance of *A. umbrosus*, which breeds in pools in undrained jungle, but cannot breed in open drains when kept free from weeds, and with a current of water. There are probably other reasons connected with the quality of the water in well-drained land.

9. Ten years ago the cost of these rural anti-malarial measures in Malaya was about £3 sterling an acre, being £2 to drain, and £1 to fell the heavy virgin jungle. This expenditure is, at the same time, the first step in agriculture, and the land has then acquired a considerably increased value. To-day the cost of draining and felling is about 70 per cent. higher. When an estate is newly opened, it is possible for the medical officer to select non-malarial sites, and the cost of controlling malaria is, of course—*nil*.

10. In the low coastal hills next to the coastal plain, malaria is prevalent when the ravines are under jungle owing to the presence of *A. umbrosus* in large numbers.

11. Clearing and draining of these ravines free them from *A. umbrosus*, but does not free the land from malaria.

12. Malaria persists in the coastal hills after the ravines have been cleared and drained and after *A. umbrosus* has disappeared, from the appearance of *A. maculatus*.

13. *A. maculatus* does not live in ravines covered by heavy jungle but appears only after the shade has been removed. The cleaner the water, and the better drained the ravine, the more suitable the ravine becomes for *A. maculatus*.

14. The utmost care and cleanliness from an agricultural point of view continued over a period of years, fails to eliminate *A. maculatus* and its malaria.

15. *A. maculatus* can be completely abolished from ravines by subsoil drainage, or spraying with suitable oils and its malaria disappears with it.

16. The inland plains are poorly represented in Malaya. They are healthy like the coastal plains when opened but *A. aconitus*, if present in streams of running water, must be controlled.

17. The Inland Hills are non-malarial when under virgin jungle, because *A. umbrosus* does not exist in the ravines. They differ in this respect from the coastal hills.

18. The inland hills become intensely malarial when the ravines are opened, becauses *A. maculatus* appears. In this respect they are like the coastal hills.

19. Subsoil drainage, and oiling which control *A. maculatus* in the coastal hills are equally suitable in the inland hills. In the future it will probably be found more economical in many places to allow the ravines to revert to jungle. In opening land in this zone in the future, malaria can be avoided by refraining from felling the jungle in the ravine. This will cost nothing.

Rice Fields.

20. Rice fields on the coastal plain are practically free from malaria. The anopheles found are *A. rossi*, *A. kochi*, *A. sinensis*, *A. barbirostris*, and maybe, *A. fuliginosus*.

21. Rice fields in narrow valleys are usually, in my experience, malarial. The anopheles found are *A. rossi*, *A. kochi*, *A. sinensis*, *A. barbirostris*, *A. fuliginosus* and *A. aconitus* has been proved a natural carrier of malaria.

22. Further research will almost certainly show how the malaria of rice fields in valleys can be controlled by altering the composition of the water—by polluting it; which will be a great boon not only to the Malays, who cultivate the rice, but to others, by increasing the food production of the country.

Quinine.

23. Quinine given regularly reduces the sick rate and death rate of those exposed to malaria.

24. Doses of less than 6 grains daily are of little value where malaria is intense—say where the spleen rate is over 60.

25. Where malaria is intense, and the population consists of immigrants, take 10-grain doses on six days out of the seven, and 20-grain doses when suffering from pyrexia or not at work on account of ill-health; between 20 and 30 per cent. of those taking the drug will be found with parasites in their peripheral blood.

26. The use of quinine can, therefore, never result in the abolition of malaria, nor make any material reduction in the liability to infection in an intensely malarial locality.

27. In twenty years' experience I have seen quinine given systematically for long periods in many intensely malarial places but in no place have I seen any material reduction in liability to infection due to quinine alone; most newcomers have become infected, and have died or become immune.

28. Quinine systematically given probably assists the infected to acquire a natural immunity. Where there is no re-infection ten to twenty grains in solution for three months is an almost certain cure for the people of most races—Malayalees appear to be an exception. Rest in bed on four successive Sundays assists quinine to stop relapses. In women there is a special necessity for quinine at menstrual periods. Abortion and the very fatal malarial anaemia of pregnancy can often be prevented by the continuous use of quinine in doses of from ten to twenty grains daily throughout pregnancy. Abortion is produced, not by quinine, but by the malaria.

Screening.

29. The attempt to discover a satisfactory screened coolie line ended in an inconclusive experiment, as I was unable to supervize it to its termination.

30. Screened bungalows for Europeans have proved of great value.

31. Screened hospitals give a real protection in patients; mosquito curtains in hospitals for Asiatics are practically valueless, and are more expensive than screening.

The Labour Problem.

Much is said about the difficulty there will be in the future of obtaining labour for F.M.S. It is stated that the F.M.S. will never be able to attract from India all the coolies required, and that the estates will have to depend on Chinese labourers.

I confess I am an optimist on this subject, and have no fear for the future, if a wise medical policy be adopted by this country. For a number of years now, I have watched many estates, and as a result have come to these conclusions.

32. Until the recent difficulties with shortage of rice and adverse Indian exchange, few healthy estates have failed to obtain all the coolies required; some years there may be a shortage, but in most years more are recruited than are required. This applies not only to old estates, but also to new estates like " EE," which in its third year imported more labour from India than any other estate in the F.M.S. The chief difficulty of healthy estates is the preventing of crimping; that is, having their coolies enticed away by unhealthy estates.

33. Unhealthy estates are perfectly well known to the coolies both here and in India, and are generally avoided; not only have these estates difficulty in obtaining labour, but the annual loss of labour through death, discharge, etc-, is 30 to 50 per cent. greater than that on the healthy estates.

34. Chinese labour, being originally non-immune to malaria, suffers almost as much as Indian labour, when living permanently on the estate like Indian labour. It is only when the Chinese labourer can leave the estate when ill, that he survives to resume his work another day; he gradually acquires a natural immunity.

35. Chinese know which estates are unhealthy and the wages paid on unhealthy estates to Chinese are much higher than those paid to Tamils on healthy estates.

36. Healthy estates are not without interest in all others becoming healthy, since the unhealthy estates, by their attraction of higher wages, unsettle the coolies of the healthy estates and often attract their skilled tappers.

37. Were all estates healthy, more Indian labour would be attracted; it would be more efficient; and there would be more inducement for the coolies to make the F.M.S. their home.

38. Were the country inhabited by the Malays, and more particularly the rice-fields of valleys, made healthy, the Malay infantile death rate would be greatly reduced, and an abundant healthy Malay population supported by their ricefields would come into being. Java is a wonderful example of how a Malay race can expand.

39. In this way, even apart from the Chinese, this naturally rich country would obtain the labour force without which its development is impossible, " and I believe," as I wrote ten years ago, " that the labour problem is nothing but the malaria problem, and that the solution of the malaria problem will also be the solution of the labour problem. No estate can ever have an assured labour force where the women wail ' We cannot have children here, and the children we bring with us die.' Such is the cry on the unhealthy estates. ' It is vain to contend with the instinct of her who weeps for her children and will not be comforted.' It is because I believe we do now know how to save the children that I am an optimist for Malaya. This volume has shown how malaria has been driven from great tracts of country, and how the development of the country under the British has been a boon, not only to the native but to the foreigner also. Already irrigation and drainage have not only assured them of their crops, and given them wealth beyond anything they had known, but have given them freedom from their most deadly disease over wide areas. It remains but to extend these benefits. And although some details have still to be learned, I think that working on Ross's discovery, and on the method advocated by him, we may confidently hope to drive the disease completely from the land."

It will be seen from the conclusions that the whole problem of malaria control was dependent, absolutely and entirely, on a proper understanding of the habits and habitat of the particular species of anopheles, which carried the disease in the particular zone under consideration.

It was revolutionary to discover that the measure which was completely successful in one zone would lead to grave aggravation of the disease in another. My observations also showed that places which to the uninformed, whether layman or medical man, would appear most dangerous (I speak particularly now of foul-looking swamps) were in reality perfectly harmless and entirely free from malaria. A very striking example of this is seen from the plan and photographs on pages 200-201 of my " Prevention of Malaria."

Another conclusion which was reached in Malaya was that if mosquitoes were controlled for a distance of half a mile from habitations that these habitations would be free from malaria.

Malaria control in Malaya consisted at times of removing jungle, and at other times of strictly preserving it. At times the most economic course was to remove the buildings to a new site. No one single method was adopted. Such a course would have been quite impossible; would, in fact, have been flying in the face of nature in the most literal sense in view of the difference of the habits of the various mosquitoes.

During the course of our investigations, we elicited the fact that in the different zones which are described, the health was by no means uniformly good or uniformly bad; that the health of any particular group of buildings, as estimated by the spleen rate, varied inversely with the distance that the buildings were from the breeding places of the dangerous mosquitoes. It was possible in the most intensely malarial areas to have places which were entirely free from the disease; and in zones, which were healthy on the whole, it was possible to find very malarious spots.

My investigations in the Union were directed to discovering if there were the same differences in the various zones in the Union as in Malaya.

I tried to discover as far as was possible at the time at my disposal places which were healthy and places which were unhealthy.

My investigations were limited generally to three areas. One which included Munnik and Tzaneen; the second the Nelspruit area and the third the Natal Coast.

Munnik and Tzaneen.

Munnik is situated at about 4,000 feet above sea level.

I examined at Ramagoep's Kraal 59 children of whom 3, or 5 per cent., had enlarged spleens.

At an adjoining kraal a little further away from the stream which flows past, I examined 53 children with a spleen rate of 1.9.

It is evident from these figures, therefore, that malaria reaches up to the 4,000 feet level on the veld. Further investigation is required to determine the exact carrier of the disease, but investigations were made at Dr. Montgomery's farm and the following anopheles were discovered:—

A. squamosus;

A. maculipalpis;

A. mauritianus;

and in addition a larva at present unidentified.

Anopheles maculipalpis is a known carrier in India, but it must not be assumed that it is necessarily responsible for the disease at Munnik.

At Tzaneen I visited the Government school and examined 31 children, of whom 15, or 48 per cent., had enlarged spleens.

In the town location, I examined 22 children, of whom 15, or 68 per cent., had enlarged spleens.

It is evident from this that malaria is severe in Tzaneen.

A day was spent in visiting Mohlaba's Location. In the kraals near to Letaba Station, on a ridge between the main river and a small side stream, 81 per cent., or 22 children, were found with enlarged spleens; and in the Government school on the location 19 children had a spleen rate of 84 per cent.

I was unable to visit the proposed white settlements on the farms "Toul" and "Lorraine." It is possible that these colonies will be a success; but before finally deciding on their site, it seems to me essential that a careful mosquito and malarial survey be made of the district.

A colony of non-immune white people placed in an area with a high spleen rate, such as I saw in Mohlaba's Location or in Tzaneen, would suffer severely from malaria; the death rate would be high, and it is certain that practically 80 per cent. of the people would go down with the disease. It is only people of high stamina and good spirit who are prepared to fight through such conditions; and I understand that these are not the distinguishing characteristics of the colonists whom it is proposed to put there.

Anti-malarial work has been started in Tzaneen. A small valley, formerly an extensive swamp, has been drained and the water concentrated. No larvacide is being applied, and this drain was breeding extensively throughout its length. The following mosquitoes were found in this drain and some side drains:—

A. costalis;

A. transvaalensis.

In the main river four species were found, namely:—

A. mauritianus;

A. natalensis;

A. theleri.

A. longipalpis.

Tzaneen illustrates the urgent need for further entomological and malarial knowledge of mosquitoes. It is quite possible that the mosquitoes breeding in the main river are harmless. If this is so, it is obvious that the great mass of water within the township will not require to be controlled. If, on the other hand, the last four mosquitoes mentioned, or any of them, prove to be carriers of malaria, the malarial problem at Tzaneen will be vastly more complicated and it may be beyond the financial resources of the community to control the disease. If this is so, it will be seen that a grave mistake has been made in choosing the present town site.

My recommendation for Tzaneen is that a careful malaria and entomological survey be made by Dr. Annecke and Mr. de Meillon on lines which I shall detail later in these memoranda.

Nelspruit Area.

I examined in the senior school at Nelspruit 31 children, of whom 3 had enlarged spleens. Of the 3 only 1 lived at Nelspruit town.

At the junior school, 14 children were examined, 1 of whom had an enlarged spleen. This pupil lived at Karino.

It will thus be seen that the upper part of Nelspruit town is singularly free from malaria.

Lower down near to the river in the native location, 81 children were examined of whom 16, or 19 per cent., had enlarged spleens.

On Mr. Hall's estate, a very striking difference was found between the children who lived on the higher part of the estate and those who lived on the lower. On the lower part, 24 children were examined with a spleen rate of 50 per cent. On the upper part, 25 children were examined with a spleen rate of nothing. The distance between these two groups of habitations was approximately half-a-mile. It illustrates what I have insisted on over and over again that the distance between the best and the worst sites need only be half-a-mile.

On Mr. Hall's estate a small number of anopheles were found in the irrigation furrow—

A. natalensis;
A. mauritianus;

but as the current was strong and the sides clean and free from grass, I do not anticipate that any serious danger exists in this furrow. It takes many mosquitoes to cause an epidemic, and the number which will come from a furrow like this is infinitesimal compared with the number which was found in a very extensive seepage immediately below Mr. Hall's house, where *A. mauritianus* and *A. marshalli* were found, but where I have little doubt other species will be found as soon as the water is sweetened up by the rains.

Running through Mr. Hall's estate is a deep natural channel which, I understand, is called a donga in this country. It is full of thick grass and reeds. In it was found with difficulty *A. mauritianus*. During the rains, it is possible that other species may appear and that these other species may be carriers of malaria. At the present moment our knowledge is simply that *A. mauritianus*, which is a non-malarial carrying mosquito, is present.

No advice can be given as to whether this donga constitutes a danger or not. In the absence of further entomological knowledge, it would be most dangerous, and possibly disastrous, to recommend the cleaning up of such a donga. Mistakes of this kind led to grave loss of life in Malaya and I would most earnestly recommend the Union Government to place its entomological and malarial knowledge on a sound scientific footing before it initiates any campaign for the control of malaria on unextensive or even a small scale.

Our visit to Nelspruit showed that while there were many unhealthy sites, healthy sites were to be obtained.

I recommend that a careful investigation may be made by Dr. Annecke and Mr. De Meillon of the whole valley from Kaapmuiden up to the high veld and spreading on both sides of the valley for one or two miles as may be found desirable. In this way what one may call a malarial section of the country is made and I have little doubht that it will give important information about malaria and the mosquitoes which are carrying the disease.

Mr. Hall and his family are people of energy and enterprise. They appreciate the financial loss which comes to them and to their employees from malaria.

I recommend that when further information has been obtained of the mosquitoes which carry malaria, and of the species which are harmless, that a plan for the control of malaria on this estate be prepared. In framing this plan, consideration must be had to the requirements of the estate. It may be that two centres of habitation are necessary, in which case two areas of half-a-mile in diameter are required. It may be that these two areas will overlap, in which case the total area to be controlled will be reduced.

It will then be possible to put before Mr. Hall a definite scheme for his approval. If he decides to adopt it, it is most desirable that the scheme be carried out under the supervision of Dr. Annecke and Mr. De Meillon, and that full information be obtained as to the efficiency of the control measures recommended and of the results obtained in the reduction of sickness.

Natal.

I am greatly indebted to Dr. Park Ross for the information which he placed at my disposal and for arranging for me to see so much of the coast line when I had explained to him exactly what I wanted to see.

In Natal I expected to see sugar-growing on low, alluvial land similar to what it grows in countries like British Guiana, Malaya, and parts of Java. I was a little surprised then to find it growing on hill land similar to the hill land described in my "Prevention of Malaria" in Chapter X onwards.

Passing through the sugar area beyond Umfolozi, we visited the Dukuduku forest, and found, out of 21 children, 38 per cent. with enlarged spleens. The only anopheles found was *A. mauritianus*. This was not surprising in view of the foulness of the water in the valley which we examined. *A. mauritianus* is, however, not a carrier of malaria, so it is evident that during the rains some other mosquito appears which transmits the disease.

On the way to Richard's Bay, we examined 59 children, of whom only one had a spleen which was just palpable and may or may not have been malaria.

Throughout the whole area extensive swamps exist. It is evident that in these swamps *A. mauritianus*, the only mosquito found, was not carrying malaria. This illustrates what I am very familiar with in other parts of the world—extensive areas of swamp which cause no malaria. It is obvious that a knowledge of this is of material importance in preparing schemes of malaria control. On such harmless swamps no money need be spent.

Another example of a healthy place was Felixton Sugar Mill. There I examined 115 children, of whom 11 had enlarged spleens. Of the 11, only 2 were permanent residents and the other 9 came from Gingindhlovu, Tinley Manor, and Darnall—all known to be malarious places. Part of the children lived down in the middle of the valley close to the river, and part on the side of the hill not far from a ravine which at first sight looks dangerous. Careful examination of this ravine should be made in order to see what species of mosquito lives in it, for it is obvious that whatever mosquitoes are living there are doing no harm.

At Eshowe Mission, I examined 36 children, of whom 2 had enlarged spleens. On inquiry we discovered that the 2 who had enlarged spleens had arrived only the night before and come from Inyezane about 800 feet lower.

It would appear, therefore, that Eshowe is above the malarial area; or, which is unlikely, the streams flowing in the valleys near the mission contain no dangerous anopheles. The factor controlling malaria in this case may be temperature, but further investigation is desirable.

At Mount Edgecombe estate, I examined at the sugar factory 91 children, of whom 8, or 9 per cent., had enlarged spleens. It will be seen that there is comparatively little malaria here, and the reason is presumably that the upper part of the stream flowing past the barracks has been dammed and thereby rendered harmless, while the lower part is polluted by the washing which takes place at the spillway of the dam. Such malaria as exists presumably comes from some small stream which springs up during the rains in one of the little side valleys. But obviously, if this were identified, it could easily be controlled and malaria would entirely disappear from the barracks.

At Ottowa, I examined 54 children, of whom 33, or 61 per cent., had enlarged spleens. This is in striking contrast to the Mount Edgecombe barracks and indicates a grave amount of malaria. I examined several of the women and found some of them suffering very severely from malaria.

At Blackburn a similar picture was seen. Fifty-two children were examined, and 35, or 70 percent., had enlarged spleens. In addition, 7 Africans were examined, of whom 3 had enlarged spleens.

I understand that there is some demand for Government taking action to clear malaria from the estates. In Malaya the policy of the Government was officially laid down that the State was responsible for the mosquitoes and malaria of State land, the railways for the malaria of the railway reserves, the private land owner for that of his own land and the small native land owner for that on his land. In the latter case the Government might provide the funds for carrying out the work, but it reserved to itself the right to recover this amount in the form of taxation.

It seems to me that the proper function in this matter is the Government to provide the necessary general scientific knowledge, but that its detailed application should be made by the estates themselves.

It is impossible for any Government to undertake the control of malaria over extensive areas of estate land.

The policy aimed at should be that anti-malarial measures should become a part of the routine medical and sanitary work of the estates, carried out under the supervision of the medical officers and managers of the estates, who could then be held personally responsible for the results obtained.

This is the system which prevails in Malaya and, I suggest, is the one that should be adopted here. How successful these measures have been in Malaya will be gathered from the following quotation from a speech by Sir Hugh Clifford:—

> "Returning to the Malay Peninsula, as I have recently done, after a prolonged absence spent in other more or less malarial portions of His Majesty's tropical dominions, I have been very greatly impressed by the efficient manner in which, during the past five and twenty years, the malarial problem has been dealt with in the Federated Malay States and throughout British Malaya generally. I have no hesitation in expressing the opinion which is, I think, borne out by all recorded data at our disposal at the present time, that the Malay Peninsula, as it was forty years ago, was by far the most malarious tropical country with which I have any personal acquaintance. Historians and medical experts are not yet fully agreed as to how far the anopheles mosquito, in unholy alliance with the malarial microbe, has been responsible for the successive downfall of the various civilizations and empires which have come into and have passed out of existence in the tropics during the, comparatively speaking, short period of recorded history; but it must be quite obvious to all who are acquainted with the conditions that prevailed in the Malay Peninsula during the concluding decades of the nineteenth and the opening years of the present century that developments, such as the rubber industry, which in so short a space of time has spread over so enormous an area, would have been totally impossible unless the danger of malarial infection had first been successfully combated. The record of the American engineers and physicians, who, by exercising a despotic and unresisted authority over the population of a very limited area on either bank of the Panama Canal, rendered that notorious death-trap a perfectly healthy locality for a very large labour force, sinks, in my judgment, into complete insignificance when compared with the practical achievements which have been effected during the last decade and a half in the Malay Peninsula. Here, owing to the big areas to be dealt with and to the large and scattered population inhabiting them, it was not possible to exercise the same minute scrutiny of domestic arrangements as that which the authorities at Panama were able to institute and the successful combating of malaria on the rubber estates has been achieved by the systematic dissemination of knowledge among those responsible for the sanitary conditions of their properties and their wholehearted co-operation with, and their reliance upon, the guidance of medical experts. A few months ago I visited the hydro-electrical works which are under construction on the Perak River, and I was immensely struck by the completeness of the measures which had been taken to free the area in question from any danger of malarial infection before operations were begun in earnest and, in all my long experience of tropical countries, I have never yet seen such close co-operation between the medical experts and the employers of labour as that which has, happily, been established in British Malaya."

The problem of malaria on the sugar estates on hill land may be regarded as almost identical with that of the rubber estates on hill land in Malaya, with, however, this important difference, that in Natal the estates are situated over 29° south of the Equator, whereas in Malaya they reach roughly from 7° north to practically the Equator; and the further difference that owing to climate and rainfall malaria in Malaya is prevalent during every month of the year, and the introduction of non-immune labour into the malarious estates leads at once to a severe outbreak of the disease. In Natal, on the other hand, on many of the sugar estates, malaria does not appear every year, and there may be periods of several years when it is practically entirely absent.

In spite of the difficult conditions which existed in Malaya, a careful examination of the entomological side of the problem led to measures which gave us complete control over the disease and reduced death rates, which frequently ran up to 300 to 1,000 per annum, to under 10 per 1,000.

I can see no difficulty whatever in completely stamping out the disease on the sugar estates of Natal if the necessary measures are taken to obtain this result. But I would strongly recommend, in order to reduce the cost of these measures to a minimum, that a very careful scientific investigation be made on the lines which I shall now describe.

I recommend that Dr. Annecke and Mr. de Meillon be selected to carry out a full investigation into the detailed distribution of malaria and of mosquitoes in the following areas:—

(*a*) From Munnik to Tzaneen and down into the valley of the Lower Letaba;

(*b*) from the high veld to Kaapmuiden;

(*c*) in certain selected areas in Natal such as the areas which I have described at Mount Edgecombe Estate, Felixtown, Amatikulu, Tinley Manor, Richard's Bay and Gingindhlovu.

These, however, are only general indications, and it is essential that any officers deputed to work of this kind must be given a free hand in order that they may follow any lines which appear to open out a line of useful research.

I often think that work such as this is like a blind man groping for a way through a wall; if he succeeds he gains his sight. There may be or may not be a gate. It may be the work of months or years till he has loosened and removed enough stones to make his way through.

It is essential, therefore, that the officers engaged in this research should not only be given great freedom as to the places in which they carry out their work, but that they should keep open minds as to the conclusions until their investigations have extended over a considerable area and over a considerable period of time.

It may be thought that nothing can be done during the non-malarial season. On the contrary this is the time when it is easiest to travel about and when spleen rates and the physical condition of the land can be most easily studied. When the rains come and travelling is more difficult, it is then possible to concentrate on certain areas for the more detailed studies of the various species of anopheles, with particular reference to the discovery of those species of anopheles which are carrying the disease.

I understand that the Railways are anxious that a complete survey should be made of their open lines in order that recommendations be made to control the disease. In my opinion it is not desirable to divert Dr. Annecke or Mr. de Meillon from the important research which I have outlined to special railway work at the moment. Even if they were available, it appears to me desirable that before such recommendations be made further information be obtained as to the species which are carrying the disease. I would repeat it is by no means the most dangerous looking places which are in reality the most dangerous. In fact, the most dangerous looking places are often perfectly harmless.

Perhaps I may be permitted to express the opinion which I have formed of the two officers, Dr. Annecke and Mr. de Meillon, who have accompanied me during my stay in the Union. I feel that in their hands this investigation will be carried out with the care and thoroughness which are necessary to bring it to a successful conclusion.

I would also like to draw the attention of Government to the fact that this investigation involves a considerable risk of their contracting malaria. It is essential that they be provided with efficient motor transport and other facilities for carrying out their work. Apart from the waste of valuable time of Government officers, the quicker they can complete this work the sooner it will be possible to utilize the result for the benefit of the public health.

I am writing to the managers of the mines in Rhodesia suggesting that Mr. de Meillon be invited to see the work which has been done there to control *anopheles costalis* and *A. funestus*, the two best known carriers of malaria in Africa. I feel sure that the work will be of great interest to Mr. de Meillon, and that a visit from him, with his very extensive knowledge of the mosquitoes of Africa, will be welcome and of value to the mines.

I should like to take this opportunity of thanking Dr. Mitchell for kindly arranging my tour and the necessary facilities for seeing so much of the country; also my old friend and fellow student, Dr. Montgomery and his wife; and Dr. Park Ross who so freely gave me of his extensive knowledge of the malaria of Natal. It has been my one regret that I have not been able to see more under his guidance, but that has been quite impossible.

I have the honour to be,

Sir,

Your obedient servant,

MALCOLM WATSON.

Durban, 1st July, 1930.

ANNEXURE "C."

MALARIA: ADMINISTRATIVE POSITION AND PREVENTIVE MEASURES.

MEMORANDUM BY THE DEPARTMENT OF PUBLIC HEALTH.

1. References in the press and elsewhere during the last malaria season and inquiries recently received from the Natal Agricultural Union, the South African Sugar Association, the Zululand Farmers' Union, and other bodies as to the plans and proposals of the Government regarding measures against malaria during the coming season, indicate that there is a good deal of misapprehension on the subject, and it seems desirable that the administrative position and the policy of the Government in regard to malaria should be clearly outlined.

2. Under the Public Health Laws of the Union, the duty of preventing mosquito-breeding and removing conditions favouring the multiplication or prevalence of mosquitoes and the occurrence or spread of malaria devolves on the owner or occupier of the land or premises, the position being exactly analogous to that in respect of rodents in connection with plague.

3. The same laws require local authorities to safeguard the public health and to take all necessary steps to that end, including the enforcement of any laws or regulations.

4. The functions of the Department of Public Health are detailed in Section 3 of the Public Health Act, No. 36 of 1919. Its essential duties are to inspect, investigate, advise, and co-ordinate in connection with the prevention or treatment of human disease, and it has been organized and staffed on this basis, and not for carrying out executive health duties except in respect of port health work. It is not entitled to spend money chargeable to its votes on matters outside the scope of its statutory functions.

5. The position in brief in respect of malaria is that owners and occupiers are responsible for carrying out measures against mosquitoes and malaria, local authorities for seeing that they do so, and for co-ordinating and assisting their efforts, and the Government for carrying out researches and investigations, and advising local authorities and all concerned. The provision of drugs and treatment facilities is a matter for the persons or the employers of labour concerned, or, in the case of indigents, for the Provincial Administration as poor relief authority.

6. During the last malarial season there were repeated expressions of disappointment regarding the inadequacy of the action taken and staff employed by the Government in malarial areas in Natal, the feeling apparently being that the Government should have employed a considerable army of malaria fighters, and itself undertaken the prevention or suppression of the disease; most of the inquiries recently made as to the Government's intentions and proposals during the coming season are obviously based on the same idea.

7. The Government has no intention of doing anything of this nature, or of relieving owners and occupiers, local authorities, or Provincial Administrations of any responsibilities or liabilities devolving on them. It is, however, actively carrying out investigation and publicity work, with a view to determining the best and most economical methods of dealing with the malaria danger and making this information known or available to all. During last malaria season it employed two medical officers and four or five inspectors with a considerable number of assistants—both European and native—on the coastal belt, not in directly carrying out measures and works for malaria prevention, but in making malaria and mosquito surveys and advising owners and occupiers and local authorities as to what should be done, and how it could best be done. Since then it has arranged for a preliminary investigation of the malaria problem by Sir Malcolm Watson, of the Ross Institute, one of the leading world authorities on the subject. Incidentally he has dealt with the question of respective responsibilities in public addresses during his tour and in his report to the Government. That report states:—

> "I understand that there is some demand for Government taking action to clear malaria from the estates. In Malaya, the policy of the Government was officially laid down that the State was responsible for the mosquitoes and malaria of State land, the railways for the malaria

of the railway reserves, the private land-owner for that of his own land, and the small native land-owner for that on his land. In the latter case, the Government might provide the funds for carrying out the work, but it reserved to itself the right to recover this amount in the form of taxation.

"It seems to me that the proper function in this matter is the Government to provide the necessary general scientific knowledge, but that its detailed application should be made by the estates themselves.

"It is impossible for any Government to undertake the control of malaria over extensive areas of estate land.

"The policy aimed at should be that anti-malarial measures should become a part of the routine medical and sanitary work of the estates, carried out under the supervision of the medical officers and managers of the estates, who could then be held personally responsible for the results obtained."

In a letter dated 11th July, 1930, he further states:—

"I hope I have made it clear to everyone that it is no part of the duty of Government to clear up the malaria on private land. It would be an impossible task for Government without an enormous staff, and it would get no thanks if it attempted this. Government can help with the scientific work, and possibly some experimental work—but that is all. . . ."

8. The Government has further arranged for a comprehensive survey and investigation of the whole problem by Professor Swellengrebel, the eminent Dutch malariologist and member of the Malaria Committee of the League of Nations, who will arrive in the Union about the end of October and continue his investigations until the latter part of next malarial season. It has already, in conjunction with the South African Institute for Medical Research, carried out a great deal of detailed investigation as regards the mosquito carriers of malaria in the Union and their breeding, feeding, and migrating habits, the varieties found in different localities and at different times of the year, the role played by each in regard to the persistence of infection and the spread of the disease during epidemic times, also the degree of chronic malaria infection of the inhabitants of various parts of the Union, and it has established a special section in the Department of Public Health, consisting of officers who will devote their whole time and attention to these and cognate matters. One of these officers, together with an engineering officer of the Irrigation Department, was recently sent to Northern Rhodesia to study preventive work under Sir Malcolm Watson and the expert anti-malaria engineers there.

9. In order to dispel any illusions and avoid risk of delay and perhaps disappointment later, brief reference may be made to the general question of the control of malaria and the objects and hoped-for results of research. We sometimes read or hear of the "eradication" of malaria in some particular locality—the Panama Canal zone or some tropical or sub-tropical town, mine, or estate. This term is apt to mislead the uninitiated; it is almost invariably used in a relative sense—meaning that the disease, as a result of vigilance and careful and continuous precautions, is being more or less completely prevented or kept at bay; when these precautions are relaxed or discontinued, malaria returns. It is true that by measures such as drainage of swamps and complete removal of all mosquito-breeding places in a particular area, malaria can sometimes—under very special conditions—be completely and permanently eradicated, but such measures are very expensive and of very limited application.

It is also true that malaria often tends to diminish and tail off in the course of general agricultural development, systematic cultivation and drainage, the increase of the inhabitants, and the improvement or "bonification" of their general conditions of life—apart from or in the absence of any particular anti-malaria measures; this has been going on in several areas of the Union, where the malaria position is very much better to-day than it was fifty years ago, but in the nature of things the process is usually a very slow one.

In the Union there are enormous tracts of malarial country, for the most part sparsely populated, favourable for mosquito-breeding as regards climate, temperature, and rainfall, and, except in a few local areas, the most that can reasonably be aimed at is limitation and control of malaria. It is essentially a question of cost and the practical application of knowledge of the disease, and of mosquitoes and their habits, and the best and cheapest methods of their prevention and destruction—acquired through scientific study and research. In the domain of malaria prevention there is no short cut, no royal road, no magic wand—and to wait for any of these would be like waiting for the millenium; something of this kind may possibly be discovered some day—but for the present the most that can reasonably be

expected from scientific research (and the problem differs in each country, and even in different parts of the same country) is guidance in framing and carrying out measures and precautions and in avoiding waste of effort and expenditure, and the devising of more effective and cheaper methods of mosquito prevention and destruction and more effective methods of treatment of cases and "carriers."

10. Throughout the malarial areas of Natal and the Transvaal, local authorities exist only in the municipalities and a few of the larger villages; elsewhere there is no local authority other than the magistrate—a state of matters which entails great difficulty in dealing with infectious and preventable diseases of all kinds. The Public Health Act of 1919 provides that where there is no constituted local authority, the magistrate shall act as such, but he has no health staff and no taxing or fee-charging powers so that any necessary measures have to be undertaken or directed by the Union Health Department, and the cost defrayed from Provincial or Union funds. It was never intended that under this arrangement the residents in such areas should be provided with all the amenities and facilities of local government without cost or responsibility to themselves; the intention was that it should serve as a makeshift pending the extension of local government institutions throughout the Union, and, broadly speaking, that only formidable epidemic diseases and other dangers to health threatening the Union as a whole should be dealt with under it. Malaria, though epidemic at times in malarial localities, is only a local disease and does not in any way threaten areas where there are no malaria-carrying mosquitoes. Inhabitants of malarial areas having no local authorities cannot expect the State to spend for their local benefit large sums of money derived from Provincial and Union taxation; it is up to them to carry out the duties of owners and occupiers and promote concerted and communal action by the establishment of local authorities. The Provincial Administrations have powers to promote and, where necessary, to enforce the establishment of local government institutions. Where there is no local authority the financial responsibilities which should be borne by the local authority devolve under the law on the Provincial Administration and the Provincial taxpayer.

11. For some years past large sums have been spent on the free distribution of quinine and other medicines for the treatment of indigent sufferers from malaria, more especially natives; supplies of quinine have also been made available at reasonable prices to all requiring it. Last season a number of trained native assistants was employed to distribute quinine and other remedies to sufferers, especially in the native reserves. The cost of all these measures, and of medical treatment of indigents, whether provided through district surgeons or otherwise, has to be met from Provincial funds. Quinine is not an effective preventive of malaria, but it is extremely useful for relieving symptoms during attack and preventing recurrences.

12. The plans and proposals of the Government, acting in consultation with the Provincial Administrations, for the coming malaria season—apart from the visit of Professor Swellengrebel—and active prosecution of malaria research are being planned, despite the present financial stringency, on lines similar to those of last year. Staff will be provided for giving advice and demonstrations, and carrying on publicity work. Notices will be sent to owners and occupiers requiring the carrying out of measures against mosquitoes and malaria, and if these are disregarded steps will be taken to prosecute defaulters. Efforts are being made to make anti-malarial oils and other larvicides, such as Paris Green, available at low prices and the Railways have already undertaken to carry anti-malarial oils at specially low rates. Leaflets and pamphlets will be issued and distributed regarding anti-malarial measures and the best means of preventing and treating attacks where personal medical advice is not available. It is hoped that all concerned will carry out their respective duties and actively co-operate in the combined campaign; it is only by working on these lines that success in controlling and limiting or preventing the disease can be attained.

Department of Public Health,

Pretoria, 3rd September, 1930.