

**Report of the Medical Officer of Health for the years 1922-23 and 1923-24,
and review (1902-25) of the public health conditions and progress of
Johannesburg.**

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Municipal Council of Johannesburg.

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BY

CHARLES PORTER M.D., LL.D., D.P.H.,
of Gray's Inn, Barrister-at-Law.

*Medical Officer of Health: Member, Public Health Council, Union of South
Africa: Hon. Cons. Medical Officer to the Rand Water Board: Medical
Officer under Native Labour Regulations, Johannesburg Mining
District: Lecturer in Public Health, Witwatersrand University.*

JOHANNESBURG,
July, 1925



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1925



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REPORT OF MEDICAL OFFICER OF HEALTH

FOR 1922-3 AND 1923-4. WITH REVIEW, 1902-25.

TO HIS WORSHIP THE MAYOR OF JOHANNESBURG

(MR. COUNCILLOR CHARLES WALTERS).

MR. MAYOR,—I beg to present my Final Report on the Health Conditions and Progress of Johannesburg. It deals particularly with the official years 1922-3 and 1923-4, but includes for purposes of comparison and record, references to happenings during the period January 1902—July 1925, which are reviewed in their respective connexions.

The main points to which your attention is invited are the following:—

1. That the present White death-rate (p. 4) from all causes (about 10 per 1,000, representing a reduction of 31 per cent. in 20 years), together with its splendid climate, entitles Johannesburg to rank amongst the healthiest cities of the world.
2. That Johannesburg's White infantile mortality (81 per 1,000 births) whilst leaving room for considerable improvement, is not appreciably higher than that of the Great Towns of England and Wales (p. 7).
3. That Johannesburg's maternal mortality, i.e., deaths of women in childbed (3·47 per 1,000 births) is much too high, being 38 per cent. greater than in England and Wales and more than double that in Amsterdam, where District Midwifery services are well organised (p. 9).
4. That the incidence of enteric or typhoid fever amongst Whites has decreased by no less than 87 per cent. in the past twenty years, a fact of which the Municipality and the Rand Water Board may well be proud, and that 'carriers' (White and Native) are a very important factor in its causation (pp. 25-6).
5. That White mortality from pneumonia (p. 11) has decreased by 40·9 per cent. in the past twenty years, the reduction amongst Natives being probably rather greater (p. 13). It is thought that the diminution of the former terrible dust-nuisance, by the 'making' and tarring of roads and streets, may be an important factor in this result, with, in addition, in the case of mine-natives, preventive inoculation with Sir Spencer Lister's sera.
6. That the work of the Miners' Phthisis Medical Bureau in the prevention of silicosis (p. 12) has succeeded and continues to succeed almost beyond expectation: and that surface and underground mines-sanitation (apart from dust-prevention and ventilation) are now on a very satisfactory basis (p. 14).
7. That whilst Diseases of the Heart are the principal cause of death amongst Whites in Johannesburg, the mortality-rate therefrom, standardised for age and sex distribution, is 105 per 100,000, compared with 163 in Capetown and 128·9 in Durban. Further, there is no physiological nor statistical evidence that an altitude of 6,000 feet materially affects the incidence of cardiac mortality (pp. 15-17).
8. That cancer-mortality amongst Whites has increased by 63 per cent. during the past twenty years (pp. 18-19).
9. That the relegation to locations, native villages, and municipal barracks of Natives hitherto living amongst the White population, and the abolition of the present slums, have become a practical proposition by the enforcement of the Natives (Urban Areas) Act of 1923, provided joint efforts of the Native Affairs Department and the Council are supported by the effective and continued co-operation of the Police: but not otherwise (pp. 54-6).

Generally, it is considered that Johannesburg, thanks to the foresight and ability of the late Lord Milner's nominated Council of 1901, and the successive efforts of the elected Councils which have followed it, possesses an efficient, up-to-

date Public Health organisation in regard to public water supply, disease prevention, child-welfare, control of milk supply, and disposal of refuse, including sewage. The further extension of the water-carriage system, as funds permit, is very desirable.

The single unsatisfactory feature of this review is the high rate of maternal mortality and the lack of any District Midwifery and Training Organisation. One ventures, however, to hope that, for the benefit of mothers particularly, and also for the welfare of our University, in which both the Council and the city are so directly and materially interested, this matter will receive that early and effective attention which it so unquestionably demands.

In conclusion, Mr. Mayor, I beg to record my best wishes for the success of future corporate or personal endeavour to maintain and improve the Health conditions of Johannesburg, an object to which I have directed my efforts during the past twenty-three years, in face at times, since 1905, of wearing difficulties and opposition of a nature such as I have neither experienced nor observed elsewhere. And for this reason, Sir, I particularly desire to express my keen personal appreciation of strong unvarying support and encouragement from, amongst others, the late Messrs. J. W. Quinn and Charles Chudleigh and from Mr. Councillor Hancock, as successive Chairmen of the Public Health Committee.

My recommendations are summarised at p. 59.

I am, Mr. Mayor,

Your obedient servant,

CHARLES PORTER.

Medical Officer of Health.

17th July, 1925.

M.O.H. 1922-3-4.

Climate.
Area.
Statistics.

MUNICIPALITY OF JOHANNESBURG.

SUMMARY OF STATISTICS, &c., 1922-3-4.

Latitude.—26 degrees 11 minutes 44 seconds South.*Longitude.*—1 hour 52 minutes 10 seconds East.*Mean Altitude.*—5,850 feet.

Climate.—Our climate is a beautiful reality, and does not consist of "samples." The days are bright and warm, the nights cool and, in winter, often very cold. The following averages of Johannesburg records for 16 years are kindly supplied by Dr. R. T. A. Innes, Union Astronomer:—Temperature: maximum, 69·8 degrees F.; minimum, 49·5 degrees F. Rainfall: 30·37 inches on 95 days. Relative Humidity: 65·5 at 8.30 a.m. Bright Sunshine: 8·9 hours daily.

Area.—The area of the Municipality of Johannesburg is 52,330 acres (*vide Government Gazette*, October, 1903); the extreme length, 11½ miles; extreme breadth, 9½ miles; extent of perimeter, 41½ miles.

Annual Rateable Value.—As assessed in accordance with Ordinance 43 of 1903, and representing "the full and fair price or sum which the same would realise if brought at the time of valuation to voluntary sale," was in 1919-20, £34,945,423.

In 1923-24, the valuation was: Land, £16,085,284; Buildings, £34,595,223.

The Town Council can impose a rate not exceeding 7d. in the £. The rate for 1923-24 was 7d. in the £ on land. Rate produced £486,950 19s. 10d. in 1923-24.

POPULATION.			Whites.	Natives.	Eurafricans.	Asiatics.	Total Persons.			
Government Census (3rd May, 1921)	134,413	122,565	11,014	5,409	293,401			
Estimated for 1922-24	160,000	121,344	10,904	5,355	297,603			
			1916-17	1917-18	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
MARRIAGE-RATE per 1,000 population (white) ...			23·16	21·75	23·51	28·53	26·91	22·89	21·2	21·21
BIRTH-RATE per 1,000 population (white) ...			29·30	29·80	29·66	28·92	27·30	27·93	25·13	25·16
DEATH- RATES (including non-residents).		White.		Natives.	Eurafricans.	Asiatics.	All Persons.			
		Gross.	* Corrected for Age and Sex distrib.							
1903-4 ...	17·2	—	—	32·4	19·5	23·9				
1904-5 ...	15·2	21·12	—	29·3	7·3	20·8				
1905-6 ...	17·5	24·3	—	32·4	11·3	22·9				
1906-7 ...	13·0	—	—	28·6	24·4	20·8				
1907-8 ...	12·6	—	—	29·3	24·1	21·0				
1908-9 ...	14·1	—	—	31·3	14·7	22·1				
1909-10 ...	11·3	12·9972	24·5	25·2	18·5	18·3				
1910-11 ...	13·3	15·2976	33·6	31·1	19·7	23·4				
1911-12 ...	11·6	13·3423	25·5	—	24·4	18·9				
1912-13 ...	10·52	12·10	27·63	—	23·21	18·68				
1913-14 ...	8·98	10·32	16·34	—	21·19	12·66				
1914-15 ...	10·84	†	18·00	—	28·11	14·39				
1915-16 ...	9·55	†	19·95	—	21·81	14·32				
1916-17 ...	12·04	†	16·73	—	23·21	14·69				
1917-18 ...	10·55	†	14·14	—	20·25	12·69				
** 1918-19 ...	16·06	†	26·94	—	38·15	21·94				
1919-20 ...	10·88	†	17·58	27·54	25·20	14·58				
1920-21 ...	11·07	†	17·90	33·86	21·07	14·96				
1921-22 ...	10·98	†	17·19	29·96	26·80	14·39				
1922-23 ...	10·06	†	16·43	29·25	20·72	13·55				
1923-24 ...	9·76	†	19·06	29·43	26·70	14·61				

* Factor for correction 1·1502. ** Year of Influenza Epidemic.

† No factor available since.

REPORT, 1st JULY 1922—30th JUNE, 1924.

POPULATION.

				CENSUS. 3rd May, 1921.	Estimated, 1922-24
WHITES	...	...	...	154,413	160,000
NATIVES	...	...	...	122,565	121,344
EURAFRICANS	...	...	...	11,014	10,904
ASIATICS	...	...	...	5,409	5,355
Totals	...	...	...	293,401	297,603

MARRIAGES.

For each of the two years 1922-23 and 1923-24 the marriage-rate was 21·2, as compared with 24·8 in the previous five years, and 15·2 for London in 1923.

BIRTHS.

For each of the two years 1922-23 and 1923-24 the birth-rate was 25·1 per 1,000, the number of births occurring in the Municipal Area being respectively 4,022 and 4,026. In 1924, the corresponding rate in Capetown was 21·9 and in Durban 18·1.

Illegitimate Births.—These numbered 256 for the two years, or 3·18 per cent. of all white births, as against 4·54 in England and Wales, 6·34 in Capetown, 2·72 in Durban and 3·5 in East London. The contrast between the Johannesburg and Capetown rates is notable and interesting.

The Native and Coloured births registered during 1922-24 numbered 3,531. But as the ratio of females to males in the native and coloured population is only about 1 to 5·5, it would merely mislead to strike a birth-rate.

DEATHS AND DEATH-RATES.

The deaths herein referred to are those of persons who died within the extended Municipal Area as defined by Proclamations 13 of 1902 and 46 of 1903.

RACE.	DEATHS.				DEATH-RATE per 1,000			
	Total.		Of Non-Residents.		Gross Recorded.		Excluding Non-Residents.	
	1922-3	1923-4	1922-3	1923-4	1922-3	1923-4	1922-3	1923-4
Whites	1,809	1,780	199	218	11·30	11·12	10·06	9·76
Natives	2,324	2,763	330	449	19·15	22·76	16·43	19·06
Eurafricans	348	353	29	32	31·91	32·37	29·25	29·43
Asiatics	111	145	—	2	20·72	27·07	20·72	26·70
All Persons	4,592	5,041	558	701	15·43	16·93	13·55	14·61

M.O.H. 1922-3-4.

Death-rates.

JOHANNESBURG GENERAL DEATH-RATES.

From time to time, for many years past, recklessly untrue statements in regard both to the "General Death-rate from All Causes at All Ages" and the "Infantile Mortality Rate" of Johannesburg have been made (especially at election times, when officials must keep silence) by persons who have obviously little desire to ascertain the facts.

It is, therefore, essential that the official records be stated very definitely.

The General Death-rate of Europeans from All Causes and at All Ages for each of 21 years, are summarised at foot of page 2. For Whites, it varied from 24.3 per 1,000 in 1904-5, to 9.76 per 1,000 in 1923-24. For the five years ended 30th June, 1908, this rate was 15 per 1,000 Whites. For the five years ended 30th June, 1924, it was 10.28, equal to a reduction of over 31 per cent. in 20 years.

From the appended figures it will be seen that Johannesburg, as regards its White population of over 160,000, ranks amongst the healthiest cities in the world:—

Greater London	12.0 (1924)	Durban (Whites)	9.29 (1923-24)
" 105 Great Towns " of Eng- land and Wales	12.3 "	Kimberley "	12.2 "
Paris	14.2 "	Bloemfontein "	7.3 "
Antwerp	10.3 "	Capetown "	9.87 "
Amsterdam	8.9 "	Pretoria "	7.48 "
Copenhagen	12.1 "	JOHANNESBURG—	1922-23 | 1923-24
Stockholm	10.9 "	Whites	10.06 | 9.76
Perth (W. Australia)	11.2 (1923)	Natives	17.41 | 20.11
New York	11.8 (1924)	Eurafricans	30.96 | 30.63
Chicago	11.2 "	Asiatics	19.16 | 19.24
East London (Whites)	9.1 (1923-24)	All Persons	13.88 | 14.76

Except in regard to South African Towns, these figures are taken from the Fourth Quarterly Returns of the Registrar-General for England and Wales for 1924.

For Infantile and Maternity Death-rates, see pp. 7, 8, 9.

CAUSES OF DEATH.

The causes of and ages at death and the local distribution are analysed in the usual Tables A to D for "Whites," "Natives," "Eurafricans" and "Asiatics" respectively. For reasons of economy, these voluminous tables have not, however, been printed, but are available for inspection.

FACTORS OF MORTALITY, 1920-22 and 1923-24.

M.O.H. 1922-34.

Factors of
Mortality.

DISEASE.		1920-22.		1923-24.		DISEASE.		1920-22.		1923-24.	
		Deaths.	Rates.	Deaths.	Rates.			Deaths.	Rates.	Deaths.	Rates.
Enteric Fever ...	W.	35	0.11	42	0.13	Organic Diseases of the Heart ...	W.	305	0.96	364	1.13
	N.	54	0.23	111	0.45		N.	78	0.33	112	0.46
	E.	5	0.22	5	0.22		E.	45	2.04	23	1.05
	A.	—	—	2	0.18		A.	11	1.01	19	1.77
Measles ...	W.	34	0.10	23	0.07	Acute Bronchitis	W.	97	0.30	72	0.22
	N.	48	0.20	23	0.09		N.	185	0.79	200	0.82
	E.	7	0.31	8	0.36		E.	90	4.08	60	2.75
	A.	1	0.09	2	0.18		A.	29	2.68	37	3.45
Scarlet Fever ...	W.	3	0.00	25	0.07	Chronic Bronchitis	W.	67	0.21	50	0.21
	N.	2	0.00	—	—		N.	19	0.08	31	0.12
	E.	1	0.04	—	—		E.	10	0.45	25	1.14
	A.	—	—	—	—		A.	15	1.38	12	1.12
Whooping Cough ...	W.	44	0.13	18	0.05	Pneumonia ...	W.	142	0.45	219	0.68
	N.	13	0.05	6	0.02		N.	527	2.26	663	2.73
	E.	4	0.18	2	0.09		E.	55	2.49	52	2.38
	A.	1	0.09	2	0.18		A.	28	2.58	26	2.42
Diphtheria and Croup ...	W.	31	0.09	30	0.09	Silicosis ...	W.	107	0.34	89	0.27
	N.	7	0.03	5	0.02		N.	50	0.21	40	0.16
	E.	—	—	—	—		E.	6	0.27	4	0.18
	A.	1	0.09	—	—		A.	1	0.09	—	—
Influenza ...	W.	152	0.48	38	0.11	Other Respiratory Diseases ...	W.	220	0.69	178	0.55
	N.	484	2.08	208	0.85		N.	372	1.59	346	1.42
	E.	14	0.63	4	0.18		E.	95	4.31	75	3.43
	A.	8	0.73	—	—		A.	28	2.58	16	1.49
Tuberculosis of Lungs ...	W.	111	0.35	121	0.37	Diarrhoea and Enteritis ...	W.	294	0.93	219	0.68
	N.	388	1.66	337	1.38		N.	346	1.48	508	2.09
	E.	38	1.72	28	1.23		E.	120	5.44	133	6.09
	A.	8	0.73	7	0.65		A.	48	4.43	42	3.92
Other forms of Tuberculosis ...	W.	15	0.04	19	0.05	Acute Nephritis and Bright's Disease ...	W.	89	0.28	111	0.34
	N.	153	0.66	146	0.60		N.	17	0.07	31	0.12
	E.	7	0.31	17	0.77		E.	8	0.36	9	0.41
	A.	2	0.18	2	0.18		A.	5	0.46	3	0.20
Cancer ...	W.	233	0.73	240	0.75	* Congenital Debility and Malformation ...	W.	270	0.85	256	0.80
	N.	27	0.11	20	0.08		N.	180	0.77	251	1.03
	E.	15	0.68	78	0.36		E.	51	2.31	69	3.16
	A.	4	0.36	7	0.65		A.	20	1.84	20	1.86
Meningitis ...	W.	45	0.14	92	0.28	Violent Deaths ...	W.	198	0.62	160	0.50
	N.	163	0.70	320	1.31		N.	396	1.69	422	1.73
	E.	7	0.31	11	0.50		E.	18	0.81	23	1.08
	A.	2	0.18	4	0.37		A.	7	0.64	9	0.84
Cerebral Haemorrhage and Softening ...	W.	120	0.38	105	0.32						
	N.	40	0.17	30	0.12						
	E.	6	0.27	4	0.18						
	A.	6	0.55	2	0.18						

* "Congenital Debility and Malformation" include congenital malformation, injuries and debility at birth, atelectasis, icterus neonatorum, atrophy, dentition, rickets.

The following observations are suggested by inspection of this Table:

1. That during 1922-23 and 1923-24 the Chief Factors of Mortality were:—

- (a) For Whites in 1922-23: Heart Diseases (186); diarrhoeal diseases (123); congenital debility (120); cancer (113); pneumonia (104); respiratory diseases (93); violent deaths (83); tuberculosis of lungs (64); nephritis (58); cerebral haemorrhage (57); meningitis (53); silicosis (48); acute bronchitis (40); chronic bronchitis (33); enteric fever (24); influenza (24); diphtheria (16); scarlet fever (13); and measles (12).

- (b) For Whites in 1923-24: Heart diseases (178); congenital debility (136); cancer (127); pneumonia (115); diarrhoeal diseases (96); respiratory diseases (86); violent deaths (77); tuberculosis of lungs (57); nephritis (53); cerebral hæmorrhage (48); silicosis (41); meningitis (39); chronic bronchitis (37); acute bronchitis (32); enteric fever (18); influenza (14); diphtheria (14); scarlet fever (12); and measles (11).
- (c) For Natives in 1922-23: Pneumonia (303); diarrhoeal diseases (249); violent deaths (194); respiratory diseases (162); tuberculosis of lungs (160); meningitis (121); congenital debility (114); influenza (97); acute bronchitis (91); other forms of tuberculosis (60); enteric fever (58); heart diseases (53); silicosis (19); cerebral hæmorrhage (19); nephritis (17); chronic bronchitis (12); measles (11); and cancer (11).
- (d) For Natives in 1923-24: Pneumonia (360); diarrhoeal diseases (259); violent deaths (228); meningitis (199); respiratory diseases (184); tuberculosis of lungs (177); congenital debility (137); influenza (111); acute bronchitis (109); other forms of tuberculosis (86); heart disease (59); enteric fever (53); silicosis (21); chronic bronchitis (19); nephritis (14); measles (12); and cerebral hæmorrhage (11).
- (e) For Eurafrians in 1922-23: Diarrhoeal diseases (68); other respiratory diseases (34); congenital debility (33); acute bronchitis (29); pneumonia (27); violent deaths (17); chronic bronchitis (14); tuberculosis of lungs (11); and heart diseases (10).
- (f) For Eurafrians in 1923-24: Diarrhoeal diseases (65); other respiratory diseases (41); congenital debility (36); acute bronchitis (31); pneumonia (25); tuberculosis of lungs (17); heart diseases (13); and chronic bronchitis (11).
- (g) For Asiatics in 1922-23: Diarrhoeal diseases (21); acute bronchitis (13); pneumonia (13); and congenital debility (10).
- (h) For Asiatics in 1923-24: Acute bronchitis (24); diarrhoeal diseases (21); pneumonia (13); heart diseases (10); and congenital debility (10).

2. That the comparison with 1920-22 is as follows:—

- (a) As regards Whites, organic diseases of heart claimed 364 deaths in 1922-24 as compared with 305 in 1920-22, the death-rate being 1.13 per 1,000 as against 0.96. Congenital debility showed a decrease of 14 for the two years, the rates being 0.85 and 0.80 per 1,000 respectively. Cancer increased from 233 to 240; pneumonia advanced from 142, or 0.45 per 1,000, to 219, or 0.68 per 1,000 for 1922-24; tuberculosis (all forms) increased from 126 to 140, or from 0.40 to 0.43 per 1,000; whilst bronchitis decreased from 0.51 to 0.43 per 1,000. Influenza dropped from 152 to 38, and other respiratory diseases fell from 220 to 178, or 0.69 to 0.55 per 1,000. Diarrhoeal diseases showed a decided drop of over 25 per cent., from 0.93 to 0.68 per 1,000. Decreases are also noted in violent deaths, cerebral hæmorrhage, silicosis, measles and whooping cough, whilst acute nephritis and Bright's disease, meningitis, enteric fever and scarlet fever show increases.
- (b) With regard to Natives, pneumonia accounted for 663 deaths, as against 527 in 1920-22, or an increase of 25 per cent.; diarrhoeal diseases increased 41 per cent., organic diseases of heart 43 per cent., congenital debility and malformation 33 per cent., meningitis 87 per cent., and enteric fever 95 per cent.; but in most other diseases decreases were noted.
- (c) With regard to Eurafrians, increases were noted with regard to congenital debility and malformation, diarrhoea and enteritis and chronic bronchitis, whilst organic diseases of heart, cancer, other respiratory diseases, tuberculosis of lungs and meningitis showed marked decreases.
- (d) As regards Asiatics, with the exception of acute bronchitis, enteric fever, cancer, meningitis and organic diseases of the heart, decreases were noted in most cases.

INFANTILE MORTALITY, AND MATERNITY AND CHILD WELFARE MEASURES.

M.O.H. 1922-3-4.

Infant
Mortality.

By the term "Infantile Mortality" is meant the number of deaths of infants under one year of age per each one thousand births during a given period, and, in the works of a former Registrar-General for England and Wales, infantile mortality has always been regarded as a valuable test for the "health of communities." Dr. G. D. Maynard pointed out, however, that recent biometric research indicates that the intelligence and sobriety of the mother are of greater importance than sanitary conditions.

The rate of WHITE INFANTILE MORTALITY, that is, of deaths of White Infants under one year of age, was 155 per 1,000 births in the 4 years ended 30th June, 1908: but in the 4 years ended 30th June, 1924, it was 90 (a reduction of 41 per cent.). For the year ended 30th June, 1923, it was 88·26, whilst for the year 1923-24 it was 81·2.

In the following Table the Johannesburg figure is contrasted with those for other South African cities, for the Union of South Africa, for London and the Great English County Boroughs, for certain Continental cities, and for the very healthy dominion of New Zealand with its temperate climate and prosperous and largely pastoral population. These figures show that Johannesburg does not suffer by comparison either with the majority of the larger South African towns nor with the long established county boroughs of England and Wales.

MORTALITY PER 1,000 BIRTHS AMONGST WHITE INFANTS UNDER 1 YEAR OF AGE, IN 1923.

Johannesburg	81·2	1923-4	Paris	80	1924
Pretoria	76·47		Antwerp	82	
Capetown	72·4		Amsterdam	34	
Durban	67·0		Copenhagen	77	
East London	88·0		Stockholm	50	
Port Elizabeth	101·0		Toronto (Canada)	148·9	
Union of South Africa	74·0		New Zealand	43·8	
England and Wales	75·0	1924			
London	69·0				
County Boroughs of					
England and Wales	80·0				

The continued defamation of Johannesburg as regards its White Infantile Mortality is, therefore, unjustified.

In the following tabulation of White Infantile Mortality in the various City Districts, the figures generally are too small to base any safe conclusion upon, with the possible exceptions of Nos. 2, 4, 7, 8, 9 and 13, which may have some qualified value. Some are good residential districts, others 'good in parts.'

INFANTILE MORTALITY.

	1920-22.			1922-24.		
	Births.	Deaths under 1 year.	Rate per 1,000 Births.	Births.	Deaths under 1 year.	Rate per 1,000 Births.
District 1.—Johannesburg Proper	507	31	61·14	229	23	100·43
" 2.—Braamfontein, Hospital Hill and Hillbrow	1,433	85	59·31	1,661	75	45·15
" 3.—Ferreiras, Marshalls and City and Suburban	72*	30*	416·66	65*	21*	323·07
" 4.—Newtown, Fordsburg and Mayfair	782	90	115·10	616	62	100·64
" 5.—Vrededorp and Locations	490	79	161·22	440	76	172·72
" 6.—Jeppes, Jeppes Extension, Belgravia, etc.	1,237	131	105·98	957	103	107·62
" 7.—Doornfontein, Troyeville, Kensington and Bezuidenhout Valley Districts	1,136	81	71·56	1,151	70	60·80
" 8.—Berea, Yeoville, Bellevue and North-Eastern Districts	703	30	42·67	661	34	51·43
" 9.—Richmond, Auckland Park, Parktown and North-Western Districts	615	83	134·95	636	70	110·09
" 10.—Paarlshoop and Western Mines	138*	18*	130·44	165*	18*	109·09
" 11.—Central Mines (Ferreira to City and Suburban)	116*	4*	34·48	77*	7*	90·90
" 12.—Prospect Township and Eastern Mines	181*	24*	132·59	220*	12*	54·54
" 13.—Ophirton, Booyens and Southern Districts	1,276	165	129·31	1,170	111	94·87
TOTALS	8,686	851	97·97	8,048	682	84·74

* These figures are too small to base any conclusion upon.

M.O.H. 1922-24.

Infant
Mortality.

The CAUSES OF WHITE INFANTILE MORTALITY were carefully analysed in 1906 (*vide* Medical Officer of Health's Report, 1904-6, p. 11 *et seq.*). The results, which have been endorsed by subsequent inquiry, showed them to be:—

- (1) Diarrhoeal Disorders and effects of malnutrition, including debility, low vitality, inanition, asthenia, marasmus, atrophy, and probably most cases of convulsions, are responsible for 62 per cent. of infant deaths. South African and Canadian rates are unenviably high in this respect, and New Zealand specially low.
- (2) Prematurity at Birth and Congenital Malformation cause 14 per cent. of infant deaths.
- (3) Respiratory Diseases, 2 to 3 per cent. of infant deaths.

NATIVE AND COLOURED INFANTILE MORTALITY.—This is enormously high and evidence is lacking of any tendency to lessen:—

		1922-23.	1923-24.
Natives and Eurafrians	...	571'12 215'83	565'12 249'19
Asiatics	...	198'11	205'88

The causes of this mortality amongst these races were examined and fully reported upon in the Medical Officer of Health's Report for 1909-11, pp. 13-21, and one has nothing to add to the conclusions then recorded, which were as follows:—

1. That in Johannesburg, and also in Pretoria, Capetown and Kimberley, the mortality amongst Native, Coloured and Asiatic infants is very much greater than amongst White infants.
2. That inasmuch as the registration of births is admittedly incomplete amongst these peoples, whilst the registration of deaths is fairly accurate, the published rates of their infantile mortality are probably materially higher than the true rates.
3. That 27 per cent. of all Coloured infant deaths occur in the first week, and 42 per cent. in the first month of life.
4. That, speaking generally, the principal causes of these deaths are, in the earlier months "prematurity and malformation, debility, low vitality and convulsions"; and (especially amongst Natives) "respiratory diseases"; whilst "diarrhoeal diseases" are very fatal in the later months. The relative importance of these factors is approximately as follows:—
5. That the mortality of Native, Coloured and Indian infants from tuberculosis is very small, and that the only epidemic diseases from which Native infants died appear to be whooping cough and diphtheria, Cape Coloured infants died from these two maladies and also from measles.
6. That though no figures are available, competent observers state that infantile mortality in general is much lower in the native kraals than in towns, presumably because in the kraals the infants are better cared for, can often get fresh milk, and never get condensed milk.
7. That Dr. Borde (Elim Hospital, Spelonken) reports a very high infantile mortality rate (500) for Transvaal Basutos, amongst whom inherited syphilis is very prevalent; and that amongst Christianised natives inflammation of the mother's breasts, resulting from friction by dirty clothing, is not an infrequent cause of infant-death, owing to interference with the maternal milk supply.
8. That, according to Dr. Mehliß, much of the excessive Native infantile mortality from diarrhoea in Johannesburg is due to feeding infants on cheap, inferior and often contaminated condensed milk, and that other special causes include inherited syphilis, poisoning by carbon monoxide gas from fires lit in ill-ventilated, smoke-filled dwellings, burns, general neglect, and want of medical attendance.
9. That experienced observers are also of opinion that a material proportion of Native and Coloured infants here are the offspring of prostitutes, are not wanted, and, though not deliberately killed, are not infrequently allowed to die.
10. That there is no evidence of deliberate infanticide; and that death from "overlying" and "injury" is apparently much less frequent amongst Natives than amongst Cape Coloured persons.
11. That, according to Dr. Murison (late Medical Officer of Health, Durban), Asiatics are much attached to their children; that their ideas of domestic and infant hygiene are not very enlightened; that their infant mortality is much lower than that amongst Natives, but still much higher than amongst Whites; that it is also much lower than in Indian towns like Bombay and Bangalore, where it is proposed to combat it by means of trained midwives and education of mothers.

MATERNAL MORTALITY.

This is the one black spot on the Health records of Johannesburg and, as will be seen from the subjoined figures, it is very black, and the fact that New Zealand is worse is no excuse for us.

DEATHS OF WOMEN IN CHILD-BED PER 1,000 BIRTHS.

M.O.W. 1922-34.

	Child-bed Fever.	Other Causes.	Total.
Amsterdam (1922)	—	—	2.0
England and Wales (1916-20)	1.59	2.29	3.88
New Zealand (1913-20)	—	—	6.45
Johannesburg (1916-17 to 1923-4)	1.28	3.09	4.37

(The Johannesburg rates are calculated on 156 deaths, of which 45 were due to "Child-bed Fever" and 111 to "Other Causes.")

The low rate in Amsterdam is "attributed mainly to the well-trained and well-organised midwifery services," which are entirely lacking in Johannesburg.

REGISTERED CAUSES OF MATERNAL MORTALITY IN JOHANNESBURG.

During the 10 years from 1st July, 1914-1924, 185 deaths occurred in association with maternity. In the following Table is set forth the mortality from "Sepsis" and from "Other Causes" respectively:—

	Puerperal Sepsis per 1,000 Births		Other Causes per 1,000 Births.		All Causes per 1,000 Births	
	Joh'burg.	E. & W.	Joh'burg.	E. & W.	Joh'burg.	E. & W.
1914-15 ...	1.46	1.63 (1914)	1.94	2.32 (1914)	3.40	3.95 (1914)
1915-16 ...	1.44	1.56 (1915)	2.16	2.38 (1915)	3.60	3.94 (1915)
1916-17 ...	1.45	1.47 (1916)	2.18	2.40 (1916)	3.63	3.87 (1916)
1917-18 ...	1.43	1.39 (1917)	2.85	2.27 (1917)	4.28	3.66 (1917)
1918-19 ...	0.71	1.35 (1918)	2.63	2.20 (1918)	3.35	3.55 (1918)
1919-20 ...	1.38	1.76 (1919)	4.38	2.36 (1919)	5.76	4.12 (1919)
1920-21 ...	1.42	1.87 (1920)	3.31	2.25 (1920)	4.73	4.12 (1920)
1921-22 ...	1.34	1.46 (1921)	2.90	2.25 (1921)	4.25	3.71 (1921)
1922-23 ...	1.47	1.46 (1922)	3.23	2.12 (1922)	4.72	3.58 (1922)
1923-24 ...	1.49	1.30 (1923)	4.96	2.30 (1923)	6.45	3.60 (1923)

PUERPERAL SEPTICÆMIA: DISINFECTION OF HANDS OF MIDWIVES, ETC.

Health Visitors are instructed to require every midwife who has been in contact with Puerperal Septicæmia to comply carefully, in the Health Visitors' presence, with the following procedure for disinfection of the hands:—

1. Cut the nails closely.
2. Scrub the hands and forearms, and especially the nails and fingers, with yellow soap and hot water for two minutes; and then rinse them with clean water.
3. Put some ether in a small cup, dip the finger nails in this ether, and then rub the hands and forearms all over with a swab dipped in the ether.
4. Soak the hands for two minutes in a solution (1 in 300) of Hycol.

MATERNITY AND CHILD WELFARE MEASURES.

The English official scheme is fully explained in the Medical Officer of Health's Report, 1919-20.

For some reason it does not seem to be known at all as widely as it ought to be that the Council possesses an active and well-organised Maternal and Child Welfare Department, the first step towards which was taken by the appointment of Health Visitors in 1911. Four Welfare Centres are now operating, namely, in the New Market Buildings (Newtown), in Vrededorp, in Turfontein and in Jeppes. The Market Buildings Centre is the largest, and here Municipal efforts are supplemented by the voluntary social work of the Women's National Service Fund, who issue food and medical comforts and material for layettes supplied by the Council, teach mothers how to make the articles required and provide them with teas supplied by ladies interested in the work.

The Council's Health Visitors look after expectant mothers, both at their homes and at the Welfare Centres, and arrange for medical advice and reception in hospital of those who need it. They visit promptly homes from which births

M.O.H. 1922-3-4.

Maternal
Mortality.
District
Midwifery
Nursing and
Training.
Pneumonia.

have been notified to the Medical Officer of Health as required by law and, where no medical practitioner or trained nurse is in attendance, in order to secure prompt and adequate attention for the mother and child. They inquire into cases of puerperal fever and keep in touch with all mothers till the children reach school age. The Council has, moreover, at the request of the General Hospital Board, recently provided accommodation at the Central Child Welfare Centre for the out-patient departments of the Queen Victoria Maternity Hospital, at which senior members of its medical staff attend twice weekly. It also avails itself of the skilled services of the Dental Clinic in Bok Street. Lastly, children of school age are looked after medically and dentally at the Provincial Council's fine modern School Clinic in Jeppe Street, which is a monument to the knowledge and devotion of Dr. Louis Leipoldt.

But whilst the prevention of Infantile Mortality has been, and is, receiving special and effective attention in Johannesburg, it is indeed regrettable that the same cannot be said in regard to our lamentably high Maternal Mortality. Realising that modern civilisation and the sentimental feelings of communities demand preventive measures against infantile mortality, one has in Johannesburg tried to keep them effective and well up to date. But very shrewd thinkers have sharply questioned the ultimate economic soundness of such efforts in an overcrowded world: and as regards obvious degenerates and diseased weaklings who are the weeds in the garden of infant life, one cannot help feeling that there is a considerable modicum of wisdom in the couplet—

"Thou shalt not kill, but need'st not strive
Unduly hard to keep alive,"

a remark which applies equally to the hopelessly insane and the incurable chronic adult sufferer.

DISTRICT MIDWIFERY NURSING AND TRAINING.

On the other hand, there can be no doubt whatever that the loss of a mother in child-bed is usually a far-reaching domestic tragedy of the very saddest kind. Apart, too, from such fatalities, the amount of unreported and often untreated injury and ill-health which results from pregnancy and labour is incalculable.

The chief exciting causes of such Maternal Mortality are the very serious lack of proper care and supervision during pregnancy, of trained nursing and skilled medical attendance during confinement, and of general after-care: and it is to such carefully organised public provision that the extraordinary low maternal mortality of Amsterdam is officially ascribed. Unfortunately, this provision is conspicuously lacking in Johannesburg. In 1919 the Municipal Council suggested action by the external department of the Queen Victoria Maternity Hospital in the matter of District Midwifery Nursing and Training of Midwives, and in 1923, largely owing to the efforts of ex-Councillors Hay, M.L.A., and Kroemer, offered the generous sum of £5,000 towards this work.

The deterrent action of the Provincial Council, which it is profitless to criticise, has wrecked this proposal, that body having disclaimed any responsibility, direct or indirect, for the training of district midwifery, and indeed for midwifery training of any kind except in regard to the nurses actually required for the Queen Victoria Maternity Hospital's work. But the Staff of the Queen Victoria Hospital is willing to assist professionally, and the University authorities will gladly co-operate if permitted to do so. The position has considerably worsened since the closing down last year of Miss Ellershaw's Maternity organisation: but it is hoped that within the next few months a district midwifery centre will be established in Vrededorp, to be followed by others as circumstances justify; and one trusts that the much-needed facilities these district centres may create for training medical students and pupil midwives in district midwifery will be made available for that purpose.

PNEUMONIA.

The term "Pneumonia" includes deaths due to croupous, fibrinous and traumatic pneumonia, inflammation of the lungs, pleuro-pneumonia, spleno-pneumonia and their synonyms. Appended are the death-rates per 1,000 for each of the four successive completed periods of 5 years since July, 1903, and in 1923-24, which, as regards Whites, shows a reduction of 40.9 per cent. in 20 years.

	1903—8	1908—13	1913—18	1918—23	1923—24	London and English Co. Boroughs
Whites ...	1.27	1.33	0.85	0.87	0.71	0.52
Natives ...	8.34	9.69	3.84	2.94	3.12	per 1,000 in 1923
All other Coloured	1.77	3.44	2.83	2.80	2.12	

Amongst "Whites" the remarkable lessening of the dust nuisance and the use of curative pneumonic sera are possibly material factors in this result. M.O.H. 1922-3-4.
Miners' Phthisis

The notable reduction of mortality amongst mine natives is specially referred to at p. 13.

MINERS' PHTHISIS (OR SILICOSIS) AND PNEUMONIA AMONGST MINE NATIVES.

297 deaths from Miners' Phthisis were registered in the two years 1922-3-4 (196 Whites, 90 Natives, 10 Euraficans and 1 Asiatic), but these figures cannot be regarded as accurately reflecting the mortality, because, no doubt, miners die elsewhere of Silicosis contracted here.

THE FIGHT AGAINST MINERS' PHTHISIS AND AGAINST THE SPECIAL LIABILITY OF NATIVE MINERS TO PNEUMONIA ON THE WITWATERSRAND FROM 1902-1924.

The mortality from Miners' Phthisis and Pneumonia amongst mine natives since the early days of the gold mining industry on the Witwatersrand has been of outstanding importance industrially and otherwise.

The following is a summary of the fight against these scourges during the past 60 years.

From early times it has been known that certain hard silicious dusts are peculiarly productive of lung disease amongst miners, one of the extreme cases commented on by Agricola, in A.D. 1556, in his *De Re Metallica*, being that of the miners in the Carpathian Mountains (between Hungary and Galicia), who suffered so severely that women could be found there who had married as many as seven husbands.

In England, as far back as 1864, the undue mortality from diseases of the lungs amongst metalliferous miners had been reported by the late Dr. Farr to a Royal Commission appointed in that year. The recommendations of this Commission were in the main carried out, but this undue mortality still persisted and seemed indeed to be associated with metalliferous mining in most parts of the world, becoming specially notable in Cornwall, where many of the sufferers were said to be returned Witwatersrand miners.

Dr. J. S. Haldane, F.R.S., with others, were, therefore, commissioned in 1903 to inquire into and report on the health of the tin-miners in Cornwall, with special reference to the injurious effects alleged to be produced by the state of ventilation in the mines, the dust arising from the use of rock-drills, and the introduction of impurities into the working places through the use of compressed air. They reported in 1904, recommending the prohibition of percussion rock-drills in hard stone, without satisfactory precautions for preventing the inhalation of dust; the enactment of special rules for minimising the inhalation of dust, and securing a suitable and cleanly excrement-removal service.

At this period, however, the mortality from silicosis was notoriously greater on the Witwatersrand than anywhere else, and in December, 1902, H.E. Lord Milner appointed the first Transvaal Miners' Phthisis Commission to inquire into the extent and cause of this condition and the measures necessary for combating it. In May, 1903, this Commission (which included the writer) recommended water-sprays and jets for minimising the dust produced by rock-drill and blasting operations, the adequate ventilation of the working places, the provision of an efficient scavenging system, and of suitably warmed and convenient change houses, and the non-use of low flash-point lubricants in the air cylinders of compressors.

In 1904, H.E. Lord Milner nominated a further Commission to investigate and report on the accommodation and air-space required in the compounds for Coloured employees of the Mines of the Witwatersrand district. The main result of its deliberations was the evolution of the Rand Mines type of hut in which the importance of adequate air-change, in contradistinction to cubic space allowance per head, was accorded fuller recognition than had previously been the case, such cubic space allowance being fixed at 200 cub. ft. per head, in view of the special facilities provided for free ventilation. With some modifications suggested by experience, this type of hut still enjoys official sanction.

In 1907, H.E. Lord Selborne gazetted the Mining Regulations Commission, to undertake a general revision of regulations with special reference, *inter alia*, to ventilation, underground sanitation and change houses. This Commission's inquiry covered nearly the whole range of mining hygiene, and its members, which included Mr. Justice Krause, K.C., the late Mr. Alex. Heyman and the writer, had the satisfaction of seeing effect given to most of their recommendations within a quite unusually short period.

Prominent amongst the expert medical and other witnesses who assisted these various Commissions with their considered experience and the results of their special study of this subject were the late Dr. Donald Macaulay, in association with Dr. Louis Irvine, now a very senior member of the expert medical staff which has made the work of the Miners' Phthisis Medical Bureau so widely known and appreciated. It is both a duty and a privilege, especially in a community where such services are so soon and rather callously forgotten, to recall the fine pioneer work of these two keen investigators in this and other important aspects of mining hygiene.

Early in the career of the first Government of our newly-formed Union, it passed the Miners' Phthisis Allowances Act, No. 34 of 1911, and at once appointed yet another "Miners' Phthisis Commission" to report on the extent to which the disease was prevalent, the degrees to, and the stages at which incapacitation occurred, and the necessary medical considerations to be borne in mind in connection with the statutory provision of compensation.

This Commission was followed, in 1912, by the creation of a standing advisory body—The Miners' Phthisis Prevention Committee—"to inquire into by experimental or other investigations and to report from time to time upon the improvement of the methods for the prevention of Miners' Phthisis in the Witwatersrand Gold Mines, and to advise upon the introduction of a systematic and uniform policy and the amendment of the Mining Regulations which may be necessary for combating the disease." This Commission submitted its final report in 1916.

The Miners' Phthisis Medical Bureau, and the Result of Systematic Medical Inspection of Gold Mines.

Lastly, on 1st August, 1916, the Miners' Phthisis Medical Bureau was instituted, its Chairman being Dr. W. Watkins Pitchford. Its main object and functions are:—

- (1) To examine all persons presenting themselves for employment on the scheduled mines and to determine those who are suitable for underground employment.
- (2) To examine all working miners at intervals of six months with the object of detecting the presence either of silicosis or of tuberculosis in such miners.
- (3) To examine all applicants for compensation on the ground of the presence of silicosis or tuberculosis and to determine in what stage, if any, of the former disease such applicants may be.
- (4) To supervise, in the cases of native mine employees, similar examinations which are actually conducted by the medical officers of the mines. No compensation, however, is granted to any native until he has been examined by the Medical Bureau.

The following brief account of the results of the working of the Bureau, and of the present position, was supplied by Dr. Pitchford, at the writer's suggestion, in 1922, for the information of the Mining Industry in Australia. It has kindly been brought up to date by Dr. Louis Irvine, and is of a very interesting and striking nature.

Since the passing of the Miners' Phthisis Act of 1916 and up to July, 1924, three cases only of silicosis have originated in men (whether previously miners or not) who have been passed as fit for underground work at the initial examination of the Bureau. During this period, 12,381 European men have received certificates of fitness to follow mining work, and 6,132 of these are known to have obtained underground employment. As the total number of European miners is about 14,000, and the average number actually engaged in underground work in scheduled mines during the year is only ten or eleven thousand, it is evident that a substantial proportion of the latter are men who hold the certificate of initial fitness.

All the cases of silicosis, whether complicated or not by tuberculosis, with the exception of the two mentioned which have originated amongst our miners since 1916 have, then, been in "old miners," i.e., men who, being in employment prior to 1916, were not required to pass the initial medical examination.

It is not contended that this relative freedom from silicosis of those who have been recruited since 1916 is entirely due to the exclusion of physically unsuitable men by the initial examination: for the continuous improvement in underground conditions of work, which has been going on since about the year 1911, must now be bearing fruit. Managements and men are at present unanimous in their efforts to carry out the dust-prevention regulations.

The prevention of dust, however, would not, by itself, suffice to prevent the spread of the disease, especially tuberculosis, amongst the miners. Our law requires every miner to be medically examined at least once in six months, in order to detect those who have developed tuberculosis. This enables the Medical Bureau to secure the prompt removal of every person who is tuberculous and thus to protect the other miners from infection. A man who has developed silicosis is also notified of the fact, so that, if he desires, he may make application for compensation. The great majority do so. But if a man develops tuberculosis, whether or not he also has silicosis, he is obliged to give up his occupation at once.

The number of working miners who have been found to be the subjects of silicosis complicated by tuberculosis for each year since 1917, has been 116, 120, 24, 17, 24, 19 and 20. This reduction is gratifying.

Pulmonary tuberculosis, without silicosis, is now considerably less common among our miners than it is among the male population of the industrial towns of England and Wales.

No case of silicosis in the secondary stage has originated amongst our employed miners since the year 1919.

The consolidating and amending Miners' Phthisis Compensation Act of 1919 introduced a new stage of silicosis which has to be legally recognised, viz., that

stage in which the physical signs of the disease first appear in their earliest detectable form. This stage is termed the "ante-primary" stage, because it refers to a condition antecedent to that previously known to all the miners as the "primary" stage. Its recognition obviously requires, not only that the miner should be examined by an expert, but also that the expert shall be able to refer to carefully kept records of previous examinations. In the first year in which the existence of this new stage was legally allowed for, 562 cases were certified; in the second year 219 cases, in the third year 254 cases, in the fourth year 255 cases, and in the fifth year 318 cases, all of them, with the exception of three in the fourth year, being, as already stated, in "old miners."

M.O.H. 1922-34.

Stages of
Miners' Phthisis.
Pneumonia.
Mining Hygiene.

It is agreed by all impartial observers that the work of the Medical Bureau is indispensable to continued progress. The value of its initial examinations has now become obvious to all, and the service which it renders the individual worker by keeping him periodically informed as to his health with respect to pulmonary disease, is greatly appreciated by the miners themselves.

It is necessary to point out, however, that the work of the Medical Bureau would not have been so successful were it not for the following conditions: The members of the Bureau devote their whole time to the work and are not allowed to engage in private practice; the Bureau is appointed and controlled solely by the Government—neither the employers nor the workers have any power of interference with its duties; and the examinations of the Bureau are always supported by standardised X-ray negatives of high technical quality.

Pneumonia Amongst Mine Natives.

Apart, however, from Miners' Phthisis, the very great mortality from pneumonia amongst native, and especially tropical native, mine-workers, gave rise to much misgiving, and in 1911-12 the problem was investigated on the Witwatersrand by Sir Almroth Wright, who reported in 1913 recommending anti-pneumococcal inoculation as the most promising preventive measure. His researches were continued by Sir Spencer Lister (Research Bacteriologist, S.A. Institute of Medical Research), who, after careful study of the various forms of pneumococcus found in association with the disease, produced a vaccine which, at a conservative estimate, has reduced this pneumonia mortality from 40 to 50 per cent., an achievement of which all his confrères are proud, and which has won well-deserved recognition.

Lastly, in December, 1913, at the suggestion of Mr. Samuel Evans (Chairman, Crown Mines) the late General Gorgas, known all over the world as the man who made work in the Panama Canal area possible from the health point of view, was invited by the Chamber of Mines to visit and report on the health conditions of our mines, especially in their relation to the prevalence of pneumonia amongst natives. His chief recommendations were the provision of a larger amount of floor space for each occupant of the compounds; also, where possible, their dispersion from large barracks into single huts and small rooms; and, secondly, the reorganisation and centralisation of the native hospital system.

Mining and Mines Sanitation.

From ancient writings and from the discovery of various almost prehistoric mine workings, we know that the recovery from the earth of its mineral treasures has engaged the activities of man from very early times. Ovid, at the commencement of the Christian era, complained that

"not only was the rich soil required to furnish corn and due substance, but men even descended into the entrails of the earth and they took up riches, those incentives to vice which the earth had hidden and removed to the Stygian shades: then destructive iron came forth, and gold more destructive than iron."

One can learn, too, something of the methods and difficulties of these ancients and of the precautions they adopted, from Agricola, the 16th century author of a quaint and delightful storehouse of ancient mining information entitled "De re Metallica." Speaking of the method of breaking rock in the mines by "fire-setting," he says:—

"While the heated veins and rock are giving forth a fetid vapour . . . the miners do not go down the mines lest the stench affect their health or actually kill them."

He also states that no one was permitted

"to break veins or rock by fire in shafts or tunnels where it is possible for the poisonous vapour and smoke to pass through into the neighbouring mines."

As regards mine ventilation, Pliny (A.D. 60) wrote:—

"In deep shafts, the occurrence of sulphurated or aluminous vapour is fatal to the diggers. The presence of this peril is shown if a lighted lamp let down into the shaft is extinguished. Apart from these evils, the air itself becomes noxious with depth, which can be remedied by constantly shaking linen cloths, thus setting the air in motion."

Agricola further tells us that

"Air is driven into the extremities of deep shafts and long tunnels by powerful blowing machines."

"Machines which the Greeks call 'Pneumatika' and the Latins 'Spiritalia'—though they do not give off any sound—which enable the miners to breathe easily and carry on their work."

Precautions against falling rock were also enforced, and Diphilus, a rich mine-owner in Athens, was denounced by Demosthenes and condemned to death for avariciously removing the supporting pillars from his silver mine, which by law he was strictly forbidden to do.

As regards the workers, we know that they were usually slaves. Xenophon, in his "Essay on the Revenue of Athens," about 400 B.C., advocated the working of the silver mines at Laurian, in Attica, by public slaves, that is, by slaves purchased by the State, and instanced the great profits made by private individuals who hired out slaves to mine-owners at one *obolus* per day. Very frequently, however, these slaves were prisoners-of-war, whose fate, with forced labour, insufficiency of food and horrible surroundings was indeed dreadful. For centuries, in later times, and in various countries from Sicily to Iceland and Poland to Siberia, the life of the mine-worker was too often synonymous with a living death, and we know that even in England till (as time goes) a comparatively recent date, his lot was indeed unenviable and apparently brutalising.

In England, during an official residence of some twelve years between 1891-1902, in or near mining districts in the North of England, one, of course, heard of miners' nystagmus (eye-tremble), of mine-gas explosions, and of the heavy mortality amongst the tin-miners of Cornwall. One saw, too, and read in official reports of miners' dwellings (especially perhaps in the County of Durham) overcrowded and wretched to a degree, but one never heard any mention whatever of the necessity of underground mining hygiene except in connection with an outbreak of enteric fever in the late nineties, ascribed to the drinking in a northern mining village of water pumped from a mine contaminated by infected underground workers. A serious outbreak of hookworm amongst the tin miners in Dolcoath, Cornwall, in 1901, seems to have marked the dawn of recognition in England of the necessity of freeing mines from faecal pollution, as had already been advocated in Belgium and Germany. Following investigation by Dr. J. S. Haldane, F.R.S., a service of underground pail-closets was established and strict orders issued for preventing excremental fouling. But for many years afterwards no serious general attempt was made to enforce this important aspect of mining hygiene in England, though it is understood that, comparatively recently, mine-owners have been invested under the Coal Miners Act of 1911 and the Mining Industries Act of 1920 (Ch. 50-10 and 11, Geo. V.) with this responsibility, as well as others, such as the provision of baths and of means for drying clothes. One is unaware, however, that any special responsibilities are imposed in regard to the purity of underground drinking water.

In Johannesburg, previous to 1903, the "mines" were outside the Municipality: mines-sanitation was practically non-existent, except in regard to matters in connection with ventilation, blasting and change-houses, which were dealt with by Government Regulations under Transvaal Law No. 12 of 1898. At that time no provision was made for disposal of excrement underground, and night-soil removal from the surface works was carried out, more or less perfunctorily, by private contract. In October, 1903, the extension of the Municipal Area brought in the mines and, as soon as possible thereafter, it was arranged between the mining authorities and the Council's representatives (Mr. Lionel Curtis and the writer) that all matters of surface sanitation, such as native quarters, housing, water supply and refuse-removal services, be controlled by the Municipality, through a specially selected mines sanitation inspector directly responsible to the Medical Officer of Health. As regards underground drinking-water supplies, excrement-disposal, etc., this inspector was placed under the directions of the Government Mining Engineer, but did not officially concern himself with the very technical problem of ventilation, and this arrangement has been found during the succeeding twenty years to be particularly satisfactory to all concerned, and especially appreciated by mine managers. The late Mr. Alexander Cowie, C.E., was the first mines sanitation inspector on the Witwatersrand, but soon required the services of three assistants. His work was uniformly excellent, tactful and most effective, and the following extracts from his first annual report (1904) are very interesting:—

"It is gratifying to be able to state, as regards surface arrangements, that recommendations and notices under the Public Health By-laws are almost invariably found on re-inspection to be complied with."

"The almost general provision of comfortable housing accommodation, of all necessary sanitary conveniences, and of systematic and approved scavenging arrangements, testifies to the fact that the requirements of good sanitation are far from being looked upon as a secondary consideration."

As regards underground sanitation, Mr. Cowie wrote:—

"Strict attention is paid to securing on each working level, at suitable sites, a sufficient number of sanitary conveniences, properly ventilated, lighted and disinfected. The maintenance of careful general scavenging throughout the

"workings is also called for. A detailed report is furnished after each inspection to the Inspector of Mines for the Johannesburg district, and a copy of each such report is forwarded by him, through the Mines Department, to the Mine Managers and to the Medical Officer of Health, Johannesburg, for information. Night-soil from the mines is brought to the surface in buckets with clamped water-tight covers, and their subsequent cleansing and disinfection are attended to by the Municipal Scavenging Department."

M.O.H. 1922-3-4.
Mining Hygiene.
Heart Disease.

The successive annual reports of the mines sanitation inspectors, as well as that for the two years ending June, 1924, record uninterrupted progress and the ready co-operation, without exception, of mine managers and those responsible to them. The surface conditions are now of a fairly high order, whilst underground there is little room for improvement.

The Teaching of Mining Hygiene.

In view of the importance of Mining Hygiene to this community and the exceptional facilities for its study which Johannesburg possesses, the Witwatersrand University, in conjunction with the Mining Industry, recently instituted, for the first time in mining history, a special course of training for mining officials of all classes as to housing, clothing, and diet of natives; sewage and refuse disposal in its widest meaning; mine ventilation; the administration of mine hospitals; the physical examination of native recruits; the work of the Miners' Phthisis Medical Bureau; the management of epidemic outbreaks; and the prevention of accidents. There can be no doubt that this very comprehensive and useful course will, as time goes on, prove of great practical benefit to mine workers, both White and Coloured.

Even from the foregoing somewhat hastily compiled résumé of the efforts by Government and by the Mining Industry during the last 20 years, not only to minimise and, if possible, to 'cut out' miners' phthisis and pneumonia as the most deadly factors in mining mortality, but generally to create a healthy environment amongst its mine workers, one submits that the Witwatersrand has to a large extent led the way in showing the world how such problems may be tackled with a large and promising measure of success. Those who have had even any small share in this work are rightly proud of it: and one recalls with pleasure and gratification the words in which the Right Hon. J. H. Thomas, M.P., Colonial Secretary of the late English Labour Government, after a morning spent during his recent visit, in examining the surface works and the conditions of white housing on one of our great mines, publicly stated that he had been immensely impressed by what he had seen, and by the fact that the conditions under which the workers lived were far better than anything that could, he feared, be hoped for in the Old Country.

With a personal knowledge of these conditions in both countries, the writer entirely accepts this statement.

HEART DISEASE.

In reviewing the mortality statistics for Johannesburg, the Medical Officer of Health was impressed by the fact that, for the past five years, heart disease has been the principal cause of White deaths: and as Johannesburg's altitude (about 5,900ft.) is popularly supposed to involve considerable strain on the heart, it seemed desirable to analyse the mortality for heart disease in Johannesburg, Capetown and Durban and to compare them with each other and with those for the Union of South Africa and for England and Wales. The figures for Johannesburg for the past five years were, therefore, collated, and corresponding data for Capetown and Durban, kindly contributed by Dr. T. Shadick Higgins and Dr. S. J. Clegg respectively. Data from the Union Census 1921, the Census Report 1923, and the Union Official Year Book, No. 6, 1924, were also available, and also the Reports of the Registrar-General for England and Wales.

At the request of the Medical Officer of Health, Dr. Eustace Cluver M.D., D.P.H., professor of Physiology in the University, and in that capacity specially interested in the question, kindly standardised the death-rates of the three cities, and undertook a careful critical comparison of the mortality figures specified. The result is as follows:—

Standardised Population.

"In Table I. are shown for the standardised population of Johannesburg, Capetown and Durban, the distribution of European Males and Females in twelve Age Groups for each 1,000 persons of Undistinguished Sex at All Ages.

M.O.H. 1922-3-4.

Table I.

Heart Disease.

Ages.	MALES.			FEMALES.			PERSONS.		
	Johan- nesburg.	Cape Town.	Durban.	Johan- nesburg.	Cape Town.	Durban.	Johan- nesburg.	Cape Town.	Durban.
0-4 ...	52.15	40.38	43.52	49.37	45.09	42.99	101.52	91.47	86.51
5-19 ...	154.59	155.16	138.12	154.06	153.67	132.78	308.65	308.83	270.90
20-29 ...	76.53	78.28	92.09	91.65	94.16	95.04	168.18	172.44	187.13
30-34 ...	37.64	32.34	39.74	39.23	37.29	41.39	76.87	69.63	81.13
35-39 ...	38.41	32.86	40.94	37.34	37.26	38.77	75.75	70.12	79.71
40-44 ...	43.28	36.93	45.57	33.25	33.45	36.30	76.53	70.38	81.87
45-49 ...	38.21	36.43	41.70	28.95	29.84	29.98	67.16	66.27	71.68
50-54 ...	28.31	26.91	28.93	20.43	22.93	22.76	48.74	49.84	51.69
55-59 ...	17.75	18.48	18.43	13.77	17.58	15.56	31.52	36.06	33.99
60-69 ...	18.76	21.54	19.80	14.42	21.90	19.43	33.18	43.44	39.23
70-79 ...	4.85	7.31	6.34	4.68	9.53	6.65	9.53	16.84	12.99
80+ ...	1.12	1.71	1.40	1.25	2.97	1.77	2.37	4.68	3.17
Total ...	511.60	494.33	516.58	488.40	505.67	483.42	1,000	1,000	1,000

Note.—All ages under 30 are included in three groups only, viz., 0-4, 5-19, and 20-29, because mortality from heart-disease under 30 is relatively negligible. From thence onward the grouping is shown only in five-yearly periods, but it is only after 40 that the bulk of such deaths occur.

Mortality from Heart Disease, July, 1919—June, 1924.

“ Unfortunately the classification, in the past, of deaths from Heart Disease has been unsatisfactory, and it has been found impossible to compare with any degree of accuracy the number of deaths from each of the different kinds of heart troubles. In any case, the numerical size of the figures is not sufficient to justify any generalisations.”

“ A Summary of Deaths from All Forms of Heart Disease during the five years, July, 1919 to June, 1924, in Johannesburg, Capetown and Durban, with similar figures for the Union of South Africa and for England and Wales is appended.

TABLE II.

(a) JOHANNESBURG.

	Certified Deaths.	Annual Rates per 100,000 of the Population.	Standardised for Age and Sex Distribution to the Standard Population of the Union (Census, 1921.)
1919-1920 ...	177	118.0	126.3
1920-1921 ...	157	101.3	108.4
1921-1922 ...	166	103.75	111.0
1922-1923 ...	130	81.25	86.9
1923-1924 ...	142	87.5	93.6
1919-1924 ...	772	98.1	105.0

(b) CAPETOWN.

1919-1920 ...	158	164.6	161.3
1920-1921 ...	201	201.0	197.0
1921-1922 ...	178	172.0	168.6
1922-1923 ...	170	158.3	155.6
1923-1924 ...	158	141.7	138.9
1919-1924 ...	865	166.3	163.0

(c) DURBAN.

1919-1920 ...	58	131.8	135.8
1920-1921 ...	51	112.3	115.7
1921-1922 ...	66	141.0	145.2
1922-1923 ...	61	123.7	127.4
1923-1924 ...	58	112.2	115.6
1919-1924 ...	294	125.1	128.9

Year.	(d) UNION OF SOUTH AFRICA.			(e) ENGLAND AND WALES.			M O H. 1922-3-4. Heart Disease. Altitude and Heart Disease.
	Certified Deaths.	Death-rate per 100,000.		Certified Deaths.	Death-rate per 100,000.		
1919-1920 ...	988 ...	66.84		48,853 ...	130.2		
1921 ...	1,068 ...	71.09		53,707 ...	141.8		
1922 ...	1,138 ..	74.54		59,837 ...	157.0		
1923 ...				56,886 ...	148.1		

Table II. reveals several points of interest.

- " (a) Johannesburg. Deaths from organic heart disease have, during the
 " five years July 1919 to June 1924 decreased absolutely, and also
 " relatively to the increasing population. In 1919-20 there were 177
 " deaths, but in none of the subsequent four years was that number
 " again reached. The successive yearly death-rates emphasise the
 " improvement more clearly because, though calculated on an increased
 " population, they show a most remarkable decline.
- " (b) Capetown. The total deaths amongst Whites has never fallen below
 " the 1919-20 figure (158), although the death-rate (141 per 100,000)
 " in 1923-4 was lower than that in 1919-20 (158), owing to the increase
 " in population."

One factor favouring the high mortality from heart disease in Capetown is the relatively large proportion of old people in its population: but this has been allowed for by standardising all three populations as in Table I. Another such factor is the admitted tendency of the infirm *who can afford it* (a relatively small number) to go to the coast. But even if 5 per cent. (an ample allowance) be added hereto to Johannesburg's rates, and 5 per cent. deducted from Capetown's, the result of the comparison is not materially altered.

- " (c) Durban—except for the somewhat higher rates in 1919-20 and 1921-22,
 " the figures do not show any considerable variation during the five-year
 " period under review.
- " (d) Union of South Africa. Mortality from heart disease is nearly 40 per
 " cent. less than in Johannesburg, and still less compared with Cape-
 " town and Durban.
- " (e) England and Wales. Fatal heart disease is nearly 40 per cent. greater
 " than in Johannesburg.

" Conclusion: That the respective heart disease mortality figures of
 " Johannesburg, Capetown and Durban lend no support to the view that an
 " altitude of 6,000 feet involves strain on the heart, and that these figures
 " compare favourably with those for England and Wales."

This question of altitude and heart disease was carefully considered by the Transvaal Mining Regulations Commission, 1910 (*Report*, pp. 107-8), and the evidence then available was to the same effect as that recorded in the preceding paragraph. Nothing has since transpired to modify that conclusion: indeed, there is material reason to believe that such an altitude is favourable to robust health. Thus the fine physique of the inhabitants of the high Andes Settlements (over 12,000 feet) and of the Alpine and Bulgarian mountaineers has often been commented upon. It would appear that a rarefied atmosphere stimulates the growth, both of blood-forming tissue and muscle (Cluver). Further, we have in Johannesburg the evidence of miners daily going down to and coming up from a 6,000 ft. level (*e.g.* in the Village Deep) in a period of about five minutes, who suffer no untoward effects. Lastly, the Director of Medical Services, Union Defence Force (Col. Sir Edward Thornton, K.B.E.) states (1st April 1925) that it was the considered opinion of the late Dr. G. D. Maynard (a cardiologist and eminent statistical specialist) that military heart cases treated by the Defence Department during the War period, did practically as well at Roberts Heights (about 6,000ft.) and Bloemfontein (about 4,600ft.) as at sea-level. It is also the considered belief of a number of military and pensions medical officers that altitude has had very little effect in relation to the numerous cases of Disordered Action of the heart caused by chronic malaria.

There would, therefore, appear to be no scientific ground for supposing that this altitude should result in a greater cardiac mortality than at the coast, and as a matter of fact, the deaths for five years (Table II.) amongst the carefully standardised populations, show that it does not.

M.O.H. 1922-3-4.

Diarrhoea.
Measles.
Cancer.

DIARRHOEAL DISEASES.

These maladies are the chief cause of death amongst young children, and the mortality therefrom is now expressed as the number of deaths which occur amongst children under 2 years of age per each 1,000 births.

For White children the rates in the four successive periods of five completed years since 1st July, 1903, are as follows, and show a steady decrease:—

1903-8:	1908-13:	1913-18:	1918-23:
70.9	50.4	41.6	33.2

The rate for 1923-4 was 23.8. But in the 105 Great Towns of England and Wales it averaged only 9.2 (Sunderland was 26), so that there is still wide scope for improvement.

For Eurafrican Coloured the rate for 1923-4 was 105.

For Indians it was 77.2, and for Natives 286.

MEASLES.

The death-rates per 1,000 were as follows:—

	1920-21	1921-22	1922-23	1923-24
Whites	0.19	0.62	0.07	0.06
Natives	0.29	0.10	0.09	0.10
Eurafricans	0.54	0.09	0.38	0.38
Asiatics	—	0.18	—	0.26
105 English Towns ...	0.08 (1921)	—	0.15 (1923)	0.18 (1924)

For the six years following 1st July, 1904, the White death-rate per 1,000 was 0.2. In 1910-11 it was 0.5. In 1912-13, 1914-15 it was 0.32 and in 1916-17, 0.34. Since then the highest figure has been 0.19 in 1920-21, and the lowest 0.2 in the following year.

Notification of Measles.—On the 23rd August 1910, for a period of two months, the first case of measles occurring on any premises within the Municipality was made notifiable, as well as any subsequent case arising on the same premises after the lapse of twenty-eight days from the notification of the last preceding case. Under this arrangement, 1,363 cases were reported. In every case disinfection of the infected premises and bedding was conscientiously carried out. These measures involved much additional work and an expenditure of over £400, without apparently producing the slightest effect on the course of the epidemic.

Preventive Vaccination.—In recent years, Italian workers, and especially Dr. R. Politzer, of the Clinic for Children's Diseases in Rome, claim that prophylactic vaccination with an organism (*Caronia's coccus*) associated with the disease has had most remarkable preventive results, and that inoculation with live cultures has been followed by an attenuated form of the disease, which confers immunity (*B.M.J.* 15/12/1923). Corroborative experience elsewhere is, however, desirable before fully admitting this claim.

CANCER or MALIGNANT DISEASE.

In view of the great and increasing amount of suffering and death due to Cancer in England and Wales, the Ministry of Health, in August 1924, issued a Memorandum to local authorities, in which the following facts were emphasised:—

- (1) That in cancer (unlike the ordinary acute infectious diseases) knowledge as to the fundamental principles of prevention is still far from complete.
- (2) That there is no specific cause producing immunity against cancer such as we have (in vaccination) against small-pox.
- (3) That there is no specific means of curing cancer analogous to quinine for malaria or arsenobenzol compounds for syphilis.
- (4) That increased cancer mortality is the common experience of civilisation: that in England and Wales, in the space of two generations, the recorded mortality has trebled, the rate per thousand being 1.01 in 1921: while in the twenty years ending 1921, deaths from all forms of cancer have increased by 20 per cent. except cancer of the womb, possibly because of the lowered birth-rate.

- (5) That in England and Wales the tendency is for deaths from cancer to occur later in life than formerly, and this change has been going on amongst females, for many years. The latest available returns show that the death-rate from cancer is not increasing for males up to 45 years of age, and for females up to 60. The most rapid increase is occurring in extreme old age.
- (6) That the cases of deaths of females (over males) from cancer is entirely due to malignant disease of the breast and generative organs; in most other parts of the body, a considerable excess is recorded for males.
- (7) That one certain fact about cancer is that it frequently follows on chronic and prolonged irritation, *e.g.*, of the lip by clay-pipe smoking; of the tongue by jagged tooth, or badly fitting tooth-plate, of the womb by chronic ulceration following confinement, and irritation of various parts of the body by trade processes. The preventive measure indicated is the removal of the source of the irritation. But this was known 50 years ago.

M.O.H. 1922-3-4.

Cancer.

Amongst Whites:

The cancer mortality rates for Johannesburg during each of the five yearly periods of the past twenty years are as follows:—

1903-8:	1908-13:	1913-18:	1918-23:
0.43	0.42	0.62	0.70

per 1,000, showing an increase of 63 per cent. in 1918-23, as against 1903-8. In 1923-4 it was 0.78.

The deaths from cancer during the two years 1922-3 and 1923-4 were 301 (including 61 non-residents), namely 168 males and 133 females. Of these, 293 (165 males and 128 females) occurred at ages over 35. Stated in terms of the 1921 census population (and including the 61 non-residents) the mortality for these two years was 1.09 for males and 0.99 for females, as against 1.20 for males and 1.32 for females in England and Wales in 1923. The combined cancer mortality for both sexes was 0.75 (or one in every thirteen deaths), as against 1.26 for England and Wales (or one in every nine deaths). But in considering these relative rates, regard must be had to the much smaller number of very old people in Johannesburg, in view of the fact that the rapid increase of cancer mortality in England is occurring in this class.

Amongst Natives:

Thirty-one deaths were recorded in 1922-3 and 1923-4, including those of 11 non-residents. The death-rate per 1,000 was 0.08. But it should be remembered that in Johannesburg the Native population consists mainly of young male adults, who remain here a comparatively short time: also, that the females number only about 1 to 5.5.

Location of Cancer.

The part of the body affected in 1,252 White deaths and 171 Native deaths registered during the decennium 1914-24, is shown in the following percentages of these numbers:—

Part Affected.	White.	Native.	Part Affected.	White.	Native.
Stomach	42.73	24.56	Heart	0.39	
Womb	13.41	4.09	Glands	0.31	
Head	12.14	2.92	Pelvis	0.15	
Liver	9.58	52.04	Penis	0.15	
Breast	6.62	1.74	Arm	0.15	
Bladder	5.75	6.43	Chest	0.15	
Lung	0.95	0.58	Groin	0.15	
Kidney	0.71		Back	0.07	
Bones	0.55	0.58	Spine	0.07	
Rectum	0.47		Eye		1.16
Leg	0.47		Unspecified ...	4.86	5.84

M.O.H. 1922-34.

Venereal
Disease.

VENEREAL DISEASE.

In the campaign against Venereal Diseases the two outstanding events of the period under review have been the publication of (a) the Report of the Venereal Diseases Committee, New Zealand Board of Health, and (b) the Report of Lord Trevethin's Commission appointed by the Minister of Health in England in 1922 to report on the best practical medical measures for preventing Venereal Diseases in civil communities.

The New Zealand Report emphasised three points, viz.:—

1. The inadequate realisation of parental responsibility in the matter of sex-instruction in children.
2. The desirability of a system of conditional notification of Venereal Diseases under which all cases are in the first instance notified by number only, but sufferers who persistently refuse to continue treatment till non-infectious are reported by name for detention and forcible treatment if necessary.
3. The necessity (as in Queensland) of making Venereal Disease a ground for annulment of a marriage contracted whilst one party is suffering from Venereal Disease in an infectious stage, provided that the other party was not informed of the fact prior to marriage.

The principal findings of Lord Trevethin's Commission were as follows:—

1. That skilful, thoroughly applied disinfection, immediately after exposure would, in the case of an individual man, almost certainly prove effectual, but that so far as the community at large is concerned no sufficient case has been made to justify the introduction at the public expense of a general system of facilities either for self-disinfection or skilled disinfection, and wherever there is a limited amount of public money available, we have no doubt that money spent on

(a) Treatment of disease;

(b) Continuous education of the community in regard to the nature and dangers of Venereal Disease and the importance of seeking prompt and skilled treatment; and

(c) The elimination of those conditions of life which tend to foster promiscuous intercourse and the spread of disease,

will be money better spent than any money expended on establishing a general system for affording facilities for disinfection.

2. That the law should be altered so as to permit properly qualified chemists to sell *ad hoc* disinfectants, provided such disinfectants are sold in a form approved, and with instructions for use approved by some competent authority.

3. That in the present state of public opinion any system of general compulsory notification of disease would tend to concealment and would prove a backward step: also that what is termed in Australia and New Zealand "conditional notification," would be more likely to deter than encourage continued attendance, and would also be difficult to enforce because there is at present no universally accepted standard of non-infectivity or cure. (This, however, is not entirely convincing, as there will be many cases about the infectivity of which no doubt can exist.)

4. That so far as conclusions can be drawn from the available figures of attendances at clinics, Venereal Disease is once more as it was before the War, substantially declining in England. The exact value of this statement is doubtful.

The question of Notification is admittedly very contentious; and whilst such cases may be fairly freely reported (in Tasmania, with a population of 210,000, 488 cases were certified in 1919-20), experience has shown that the practical difficulties of subsequent effective action are often very great. In South Africa we have under our Public Health Act machinery for dealing with venereals if the medical officer of health or the district surgeon knows or has reason to suspect that an individual is infected. But the medical officer of health not engaged in medical practice has practically no sources of information, for no one is authorised or required by the Act to report to him, except school principals in respect of suspected children. Further, medical men, except district surgeons, would possibly be accepting serious legal risk by disclosing their venereal cases; and even district surgeons can hardly be expected to report cases occurring in their private practice when there is no such obligation on their competitors to do so.

To meet this difficulty, the Secretary for Public Health has included the following draft section in the amending Public Health Bill now before Parliament:—

"Every medical practitioner who knows or has reason to believe that any person is suffering from a venereal disease in a communicable form and is not under treatment by a medical practitioner, or is not attending for medical treatment regularly and as prescribed by such medical practitioner, shall report to the medical officer of health of the local authority or to the district surgeon."

The Education of both adolescents and adults as to the Dangers of Venereal Disease.—No good is served by beating about the bush, nor, as Huxley said, in hiding such matters in the pious wrappings with which well-intentioned hands would envelop them. To moral exhortations on self-control and decency, there can be no objection; and one accords to the views of parents and others who rely upon them, the same tolerance as one expects for one's own conviction that moral precepts will in a great majority of cases shrivel up as naturally as tissue paper in a flame, when up against the imperious driving force of sex, which Nature itself has implanted in man perhaps as his strongest instinct, though its exercise is so liable to be terribly penalised, not only in both parties, but in their offspring. Sir Archibald Reid states (*Prevention of Venereal Disease*):—

"We have, then, this extraordinary position of affairs—Christian peoples, who are also the most civilised and enlightened of mankind, are, on the whole, especially zealous in training their children; hence their schools and colleges. They recognise more clearly than non-Christians that as the twig is bent so the tree grows. They are particularly zealous in the cause of sexual morality. But, governed by a convention, they leave the sexual training of their children altogether to other children; that is, to chance."

M.O.H. 1922-54.
Venereal
Disease.

Informed and intelligent maternal instruction is possibly the best agency of all, and, with lads, the father or discreet schoolmaster should take a hand, if only to acquit himself of the responsibility that will otherwise remain at his door. For lads of 15 years and upwards, a visit to a venereal ward is a first-class object lesson. For the public generally, there is no more impressive nor useful medium of instruction than a film such as "Whatsoever a Man Soweth"; and information as to immediate preventive treatment, though some may object to it on what they consider moral grounds, is the essential alternative to permitting individuals to contract devastating infection pending a millenium of sexual purity.

GONORRHOEAL OUTBREAK IN CHILDREN'S HOME.

On 26th January 1924, 17 girls between 6 and 10 years old, living in an exceptionally well-administered Home, were notified as suffering from gonorrhoeal vulvo vaginitis, confirmed by bacterial examination. Careful inquiry as to the only two admissions in January, revealed the fact that one of them (aged 11), admitted on the 11th of the month, was found on the 25th to be suffering from a profuse gonorrhoeal discharge. During her mother's absence in service she had been "running wild," and "had intimate relations with men and received money from them."

The Home possessed a sufficiency of small slipper baths, each child had her own towel, and one or more attendants were present during bathing. But, as the number of children was large, the possibility of "bathing in common" could not be excluded, and the very definite opinion was formed by the Medical Officer of Health that the infection was thus spread. Efficient steps were at once taken to prevent further infection, and the management and treatment of the outbreak were, by consent, entrusted to the Director (Dr. Gluckman) of the Municipal Venereal Diseases Clinic. Most of the sufferers responded readily to treatment; but the eradication of gonorrhoeal infection (especially in an institution) is usually a very tedious matter, and nine months passed before a consistent succession of negative bacterial reports justified a clean bill of health.

Such an outbreak is believed to be unique in Public Health records, and its lessons seem to be twofold:—

- (1) The careful examination in this respect of all new admissions.
- (2) That baths in barracks, boarding schools and institutions should be mainly of the hot-and-cold shower type (both for individual safety and for water-waste prevention), with only such provision of "slipper" and "parallel" baths as may be necessary for medical and surgical reasons.

RIETFOONTEIN LAZARETTO.

Appended is a return, kindly supplied by Dr. Mehliß, of the Johannesburg cases of syphilis and other venereal diseases treated at the Lazaretto during the official years 1918-24:—

Years.	Whites.	Coloured.
1918-19	289	1,074
1919-20	338	1,280
1920-21	210	1,466
1921-22	179	1,399
1922-23	214	1,313
1923-24	171	1,297

MUNICIPAL VENEREAL CLINIC.

This Clinic was opened in August 1920, being the first of its kind in South Africa, and is referred to in detail in 1919-20 Report.

The working cost for 1922-23 was £1,751 14s. 8d. and in 1923-24 £1,726 5s. 4d., including salaries. The refund from Government amounted to £1,210 17s. 0d. and £1,217 8s. 0d. respectively, and the Clinic has enjoyed the keen personal interest and sympathy of Dr. Mitchell, Secretary for Public Health.

The Director (Dr. H. Gluckman) has supplied the following report for July, 1922—30th June, 1924, to the Medical Officer of Health, who endorses a cordial acknowledgment, by the Director, of the ready help at all times of Dr. R. P. Mackenzie, C.M.G., Superintendent of the Hospital:—

M.O.H. 1922-24.

Venereal
Disease.*Report on the Working of the Venereal Clinic, 1922-24.*

1. Attendances of Patients.—The progressive increase recorded is the outstanding feature of the period under review. A comparison of the following figures for the last three years demonstrates this point.

(a) New Patients.

June 30th, 1921, to July 1st, 1922	...	...	947
June 30th, 1922, to July 1st, 1923	...	...	959
June 30th, 1923, to July 1st, 1924	...	...	1,216

This increase in new patients must not be taken as an indication of a higher Venereal Diseases rate in this area, but rather as a sign of a wider knowledge of the Venereal Clinic and its work.

(b) Total Attendances and Average Attendances per Patient.

	Total attendances.	Average attendances per patient.
June 30th, 1921, to July 1st, 1922	4,058	4.3
June 30th, 1922, to July 1st, 1923	6,028	6.3
June 30th, 1923, to July 1st, 1924	8,792	9.1

This increase in the total attendances and average attendances per patient is a favourable sign. The latter indicates that the individual suffering from a Venereal Disease is realising more fully the importance of continuing with treatment until free from infection.

2. Female Attendances (New Patients).—This continues to be unsatisfactory. When compared with the male attendance the proportion is as 6 : 1.

Attendances per Patient.—The average number of attendances per female patient during the period, however, shows an increase of 5 on the period 1921-1922. This is very satisfactory.

3. Ante-natal Treatment of Pregnant Women.—It has been shown that if syphilis is detected in the pregnant woman, treatment during pregnancy is remarkably successful in securing healthy offspring. This fact has been proved in the Johannesburg Municipal Venereal Clinic, where a number of pregnant women suffering from syphilis in its different stages have been subjected to vigorous modern anti-syphilitic treatment during their pregnancies. The results have been universally good. These patients are, as a rule, referred to the Clinic by the Municipal Health Visitors, whose keenness in this matter one takes pleasure in emphasising.

4. Education in Personal Prophylaxis.—The Trevethin Committee of Inquiry on Venereal Diseases recommend: "That from a purely medical point of view the instruction by Medical Officers of Venereal Diseases Clinics of male persons attending such Clinics in the preventive use of disinfectants would afford a useful means of educating the community." Attempts are being made to carry this recommendation into effect at the Johannesburg Clinic.

5. Patients from Krugersdorp.—Since January, 1923, when the Krugersdorp Municipality entered into the arrangement with the Johannesburg Municipality for the treatment of Krugersdorp patients at the Johannesburg Clinic, 64 new patients attended, the total number of attendances being 199.

6. Teaching of Medical Students.—Arrangements were completed in 1923 for utilising the great amount of clinical material offering at the Clinic for teaching purposes. Hitherto two courses of instruction in Venereal Diseases have been given to two lots of students. Clinical demonstrations of specially selected cases are given in the Out-patient Department of the General Hospital, and practical demonstrations in the technique of intravenous treatment in the Venereal Diseases Theatre.

7. Publications.—With your permission there were published in the 1923 August and September numbers of the *Medical Journal of South Africa* articles dealing in detail with the administrative and clinical aspects of the Clinic. These were illustrated by diagrams, photographs and charts.

8. Accommodation.—(a) Out-patients.—The increase in attendances referred to in this report, together with the fact that at each clinique a number of students are present, render the carrying out of the work in the three small rooms placed at our disposal extremely trying. Particularly is this the case during the hot summer months. It is hoped, therefore, that when plans for a new Out-patient Department are being considered the wants of the Venereal Clinic will not be overlooked.

(b) In-patients.—Although the patients suffering from Venereal Diseases who require in-patient treatment are few, nevertheless those who require admission are acutely ill and should be taken in immediately. The present arrangement, that of sending such patients to Rietfontein, is unsatisfactory on this account. Arrangements are under discussion with the Hospital administration whereby 10 to 12 beds would be set aside for Venereal patients. With this provision the Venereal Clinic would become an independent and complete unit.

HENRY GLUCKMAN

Director.

Statistical Report of Director for period 1st July, 1922 to 30th June, 1924.

M.O.H. 1922-34.

Venereal
Disease.
Ophthalmia
Neonatorum.

1.—SUMMARY.

OUT PATIENTS.		IN PATIENTS.		SPECIMENS.		SALVARSAN.	
No. of New Patients.	No. of Total Attendances.	No. of Patients.	No. of "Patient Days."	No. sent to Institute.	No. Examined at Clinic.	No. of Patients Treated with 606 or Substitutes.	No. of Doses Administered.
2,175	14,820	—	—	1,123	1,814	1,638	7,482

2.—ATTENDANCES AND DISEASES (OUT PATIENTS).

ATTENDANCES OF NEW PATIENTS.								ATTENDANCES OF OLD PATIENTS.							
Gonorrhœa.		Syphilis.		Soft Chancre.		Not V.D.		Gonorrhœa.		Syphilis.		Soft Chancre.		Not V.D.	
M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
1,167	101	474	149	40	1	203	40	5,342	733	5,940	2,475	142	3	165	15

3.—LABORATORY. NUMBER OF SPECIMENS EXAMINED AND RESULTS OF EXAMINATION.

CLINIC						INSTITUTE.										Total Number of Specimens Examined
Gonococci.		Spirochaetes.		Others.		Gonococci.		Spirochaetes.		Wasserman Test.						
+	-	+	-	+	-	+	-	+	-	+++	++	+	-	?		
568	738	109	155	119	125	17	52	6	2	122	86	120	707	11		
															2,937	

OPHTHALMIA NEONATORUM.

This is an inflammatory condition of the lining membrane (conjunctiva) of the eyes of new-born infants, accompanied by a purulent discharge commencing within 21 days from date of birth. In Johannesburg, the onset is usually about the third day. This disease is the cause of one-third of all cases in the Blind Schools in Great Britain. In Johannesburg, in 1922-24, the attacks numbered 7.57 per each 1,000 White births, as compared with 9.1 in England and Wales in 1922.

For Public Health purposes there are two varieties, viz., gonorrhœal and non-gonorrhœal. Figures as to 1922-23 and 1923-24 are appended:—

	All cases.	Gonorrhœal.	Non-Gonorrhœal.
Whites	61	30	31
Natives	3	3	—
Eurafricans	2	2	—
	<u>66</u>	<u>35</u>	<u>31</u>

In 53 per cent. of all cases of ophthalmia of the new-born the infection was gonorrhœal, as against 48.3 per cent. in 1921-2. In Liverpool in 1921, of 766 occurrences 137 were examined, of which 58, or 42 per cent., were gonorrhœal; in 1923, of 708 attacks, 58 were examined of which 15, or 25.8 per cent., were gonorrhœal.

Procedure.—There is no part of the Health Visitors' work in which the benefit which follows early and prompt action is more important, obvious, direct and certain than in preventing life-blindness in such cases. In each, a smear for bacterial examination is at once taken. In the meantime the eyes are carefully cleansed and irrigated with boracic solution, one drop of Argein (20 per cent. sol.) is instilled into each eye, and irrigation repeated every two hours during the day until the discharge ceases. If the case prove to be gonorrhœal, the parents are referred for examination and treatment to their own medical attendant, or to the Director of the Venereal Clinic. Difficulty is not unusually experienced in thus dealing with parents, but has hitherto been surmounted by the tact of the Health Visitors.

M.O.H. 1922-24.

Small-pox
Scarlet Fever.
Typhus.

NOTIFIABLE INFECTIOUS DISEASES.

During 1922-23 2,080 cases were notified, viz., 1,202 amongst Whites, 867 amongst Natives, 4 amongst Euraficans, and 7 amongst Asiatics, and in 1923-24 1,537 cases (680 Whites, 824 Natives, 28 Euraficans and 5 Asiatics). These occurrences are discussed elsewhere in this Report.

The procedure adopted in regard to notified infectious diseases, disinfection, etc., has been the same as recorded in previous years.

1,587 houses and 75,889 articles of clothing, bedding, etc., were disinfected.

SMALL-POX.

5 attacks were reported during the two years, of which 2 (untraced) were Whites and 3 Natives (2 imported).

VALUE OF VACCINATION.

The experience of the Witwatersrand, including Johannesburg, during the 1905-6 small-pox epidemic adduced striking and compelling mass-evidence of the preventive value of vaccination. The Europeans, and especially the "Coloured" (Malays, Indians and half-castes) were very indifferently protected by vaccination, which was not then compulsory amongst them: the Native workers (but not their women and children) were compulsorily vaccinated.

Chinese miners, who possessed no racial immunity against small-pox, had been vaccinated at the ports of embarkation, and any unsuccessful or doubtful "takers" were vaccinated again at Durban.

The following are the official figures:—

	Population.	(⁵) Small-pox cases.	Proportion of cases to population.
Europeans (¹)	116,670	149	1 in 783
Coloured (¹)	14,357	35	1 in 410
Natives	168,611	28	1 in 6,021
Males, 160,000 (²)			
Females, 8,611 (²)			
Chinese (⁴)	46,772	Nil.	Nil.

(¹) Census, 1904. (²) Native Affairs Department return. (³) Government Mining Engineer's return. (⁴) Chamber of Mines. (⁵) Medical Officer of Health's records.

The fact that not one single case occurred amongst the 46,772 well-vaccinated Chinese who worked alongside the Europeans and Natives is notably significant.

Again, at the Village Main Reef Mine, the White workers numbered some 308(³) and were mostly indifferently vaccinated: the natives averaged 2,233(³) and were well vaccinated. Ten cases occurred amongst the 308 White men, but none amongst the 2,233 Natives who worked with them.

SCARLET FEVER.

In 1922-23 there were 847 cases of this disease (5 being Natives and 2 Asiatics), and in 1923-24, 325 (1 being a Native and 4 Euraficans). The mortality-rate per 1,000 of White population was 0.81 and 0.07. The occurrence of 120 cases in July, 240 in August, 289 in September and 105 in October, 1922, being a continuance of an epidemic outbreak which began in May, 1922, which did not subside till November. It is noteworthy that since 1903, scarlet fever has become widely prevalent in Johannesburg at intervals of approximately five years.

Dick Test for Scarlet Fever: (B.M.J., 13/9/24, p. 475).—This is similar in principle to the Schick Test for Diphtheria, and is useful in diagnosis and for testing insusceptibility. The production of immunity against scarlet fever is alleged, but is not yet fully proved. If this is eventually satisfactorily demonstrated, it should prove of great value in preventing and combating scarlet fever outbreaks. Okell and Parish (*Lancet*, 4/4/25, p. 714) confirm its diagnostic usefulness.

Schultz and Carlton's "rash-blanching" test consists in the production of a circle of complete blanching half-an-inch to a few inches in diameter at the seat of injection of horse-serum immunised by means of *S. scarlatinae*. This blanching may aid in the differentiation of scarlet fever from similar rashes (*Lancet*, 16/5/1925, p. 1038.)

It appears quite possible that research work such as the foregoing may lead to methods of improved diagnosis and of producing immunity which may before long, materially reduce the heavy expenditure on isolation hospitals.

TYPHUS.

55 local and 24 imported Native cases were reported. In addition, this Department dealt by stringent de-lousing methods with a threatening outbreak at Alexandra Native Township in 1923.

Unrecognised Typhus.—In one of the large towns of the Union a considerable number of both European and Native cases sent into hospital as influenza or other maladies have proved on bacterial examination (Weil-Felix test) to be typhus. The Acting Director of the Institute for Medical Research states, however, that similar systematic examination affords no evidence that unsuspected cases of typhus are occurring on the Witwatersrand at the present time.

M.O.H. 1922-3-4.

Diphtheria.
Enteric.
Enteric carriers.

DIPHTHERITIC DISEASE, including MEMBRANOUS CROUP.

The occurrences of diphtheritic disease, 123 in 1922-23 (109 Whites, 13 Natives and 1 Eurafrikan) and 97 in 1923-24 (91 Whites and 6 Natives) were less numerous than in the previous year (158 in 1921-22) and the case mortality was 12·8 per cent. in 1922-23 and 17·4 per cent. in 1923-24, as against 13·4 per cent. in 1921-22.

ENTERIC OR TYPHOID FEVER.

Cases and Deaths from 1/7/22—30/6/24.

	Cases.	Deaths.
Whites	297	77
Natives and Eurafrikan	245	175
Asiatics	2	2
	<u>544</u>	<u>254</u>

Of these 544 cases, 51 White and 18 Native and Coloured were imported, chiefly from the Western Transvaal diamond diggings in the late summer months (January and February) of 1923. The mortality amongst Whites (excluding these imported cases) was 0·12 per 1,000 living.

The occurrence in July-August, 1922, of 24 cases amongst the customers of a very large dairy was attributed to the presence of a native carrier, whose detection proved a matter of considerable difficulty. With this exception there was no evidence of common cause or grouping.

ENTERIC OR TYPHOID CARRIERS.

The agency of the carrier, and especially of the Native carrier employed in dairies and kitchens, in spreading enteric in South Africa is very notable. Since 1907 eight well-marked outbreaks of this nature have been recorded, viz.:—

Date	Dairy	Cases	Carrier
December, 1907 ...	Booyens	31	Native
March, 1909 ...	Southern Suburbs	21	Native
January, 1913 ...	Waverley	21	Native
December, 1914 ...	Troyeville and Jeppes	30	Native and White
August, 1916 ...	Bezuidenhout	6	Native
August, 1920 ...	Bezuidenhout	10	Native
July, 1922 ...	Johannesburg Central	24	Native

The two outbreaks in Bezuidenhout were caused by the same native. When his condition was discovered in August 1916, he was repatriated to his kraal. A few months later he returned, and his engagement as cook-boy in a private house was duly followed by an outbreak of enteric therein. He was again repatriated, and again returned in August 1920, obtaining employment in another Bezuidenhout dairy, and caused a third outbreak.

In December 1914, the Medical Officer of Health (in another capacity) had to deal with an outbreak of nearly 60 cases amongst troops (chiefly 1st S.A. Mounted Rifles) at the Artillery Barracks, Pretoria. Water, food and milk supplies were similar to those of the rest of Pretoria, which was free from enteric, thus indicating some domestic source at the Barracks. All the regimental cooks and food handlers were at once Widaled, and amongst those who reacted were two native cooks, examination of whose urine and bowel discharges definitely proved that they were carriers. With their removal the outbreak in due time ceased.

Regulations *re* Carriers were made in May 1921, under section 36 of the Public Health Act, 1919, in consequence of the foregoing and similar outbreaks. These provide for the necessary examination and treatment of carriers, for their forcible detention if necessary, for their residence under medical surveillance in specified areas, and for preventing the handling by them of food or food-utensils to be used by others.

M.O.H. 1922-3-4.

Enteric
Mortality
then and now.
Erysipelas.
Cerebro-spinal
Meningitis.

In the case of each dairy-outbreak of this kind, the unfortunate licensee gave every possible assistance to this Department; and now, when enteric is reported on any premises, the native servants, especially those employed in the preparation or handling of food, are subjected to the Widal Test for detection of "carriers." Extra "score-card marks" are awarded to all dairies where this precaution is adopted as a matter of routine at time of engagement of all natives, and the test is repeated wherever there is the slightest suspicion of a milk-supply being involved.

INCIDENCE OF, AND MORTALITY FROM, ENTERIC FEVER, THEN AND NOW, 1903-1924.

In the five years ended 30th June, 1908, there were 62.6 cases and 6.4 deaths amongst every 10,000 Whites. In the five years ended 30th June, 1924, there were 8.1 cases and 1.14 deaths per 10,000 Whites, or a reduction of over 87 per cent. of cases and over 82 per cent. of deaths in 20 years.

As regards Natives, the period of highest incidence was in 1909-10 and 1910-11, in which there were 967 cases amongst an average population of about 95,000. This was followed by a rapid decline to about 35 cases in 1919-20 amongst a population of 120,000. In 1922-23, and in 1923-24, the incidence figures rose respectively to 129 and 110, the population being approximately the same.

This notable decline is believed to be due to the provision of our splendid public water supply, the more effective control of milk supplies and foodstuffs, improved direction by Mr. F. C. Gavin of the public cleansing services (including the regular creosoting of all closet pails), improved mines sanitation, the gradual extension of sewerage and water carriage, and measures against transmission of infection by human "carriers," by flies and possibly other causes.

One ventures to say that is a very remarkable record, reflecting great credit on the Municipality, the Rand Water Board, the Mine authorities, and, as regards the lowered mortality-rate, the medical profession generally.

ERYSIPELAS.

57 cases were reported, namely 28 Whites, 28 Natives (all mine boys) and 1 Asiatic, with 4 White and 2 Native deaths.

The notification of erysipelas does not appear to be of very obvious practical value, except from the purely statistical point of view, and that where a case of this infection exists in domestic association with a pregnant woman, opportunity of warning is afforded.

CEREBRO-SPINAL MENINGITIS.

This dreadful disease is the result of inflammation of the membranes of the brain and spinal cord.

The following figures show for the three years 1922-3-4 its seasonal incidence (the winter and early spring months—June to September), and the number of cases and of deaths for each race, with particulars as to age-distribution. In 1922 and 1923 its prevalence amongst Whites was unprecedented in Johannesburg, and in each of these two years the cases were two-and-a-half times as many as in 1924. The case-mortality was, however, considerably less in 1923, the respective figures being 66 per cent., 36 per cent. and 64 per cent.

Of the 67 White cases notified, 30 per cent. were under 5 years of age, another 35 per cent. were between the ages of 5 and 15 and, at all ages under 20, the percentage was 78.

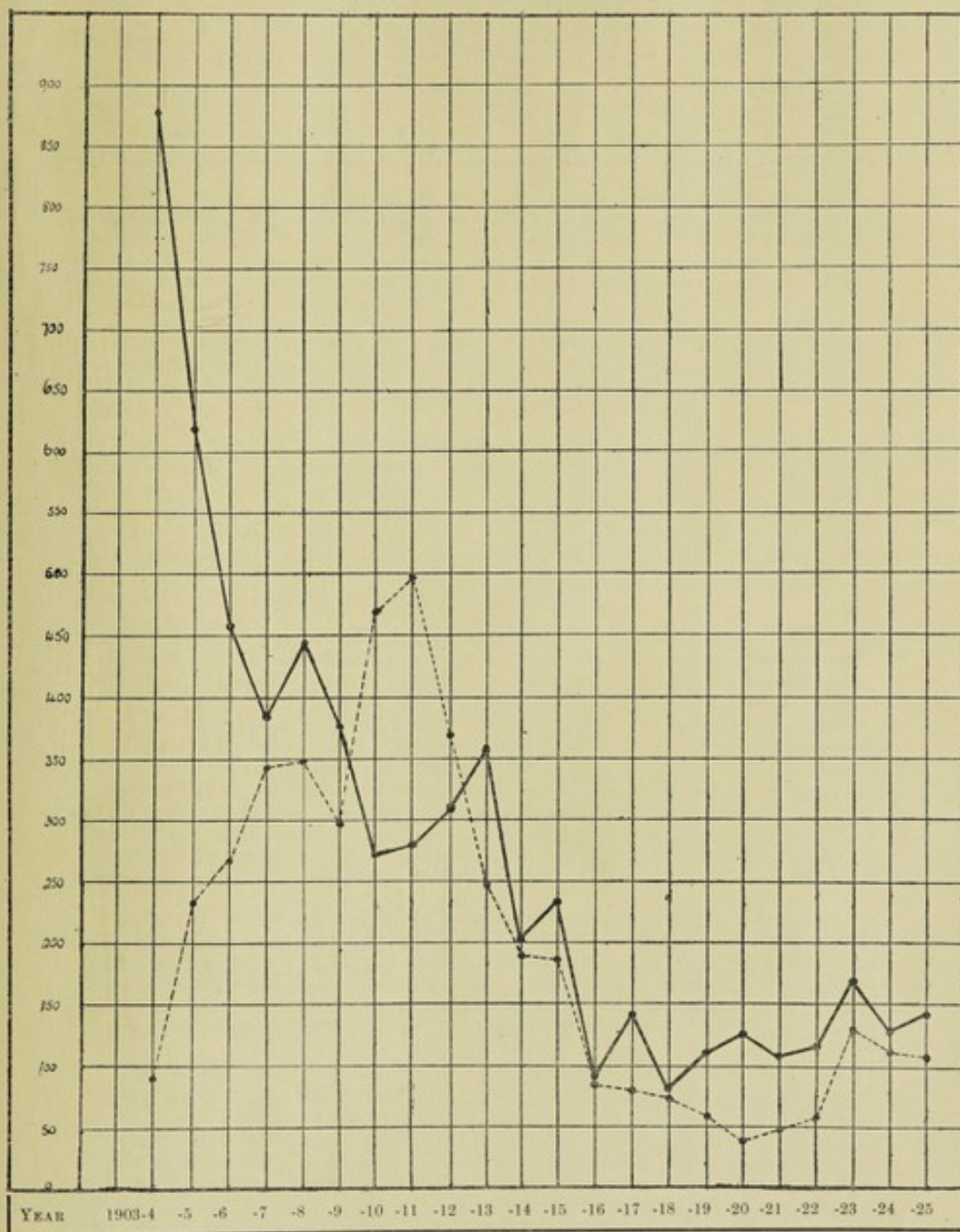
As regards White deaths, the most fatal periods were under 5 years of age—being 28.9 per cent. of all the deaths, and between 5 to 15 years, 36.8 per cent.

(a) CASES NOTIFIED AND AGE DISTRIBUTION.

	All Ages.	Under 5 Years.	5-10 Years.	10-15 Years.	15-20 Years.	20-25 Years.	25-30 Years.	30-35 Years.	Over 35 Years.
Whites ...	*67	20 or (29.8%)	11 or (16.4%)	13 or (19.4%)	9 or (13.4%)	5 or (7.4%)	4 or (5.9%)	1 or (1.4%)	4 or (5.9%)
Natives ...	23†	4	—	1	14	54	145	11	5
Eurafricans ...	9	3	2	2	2	—	—	—	—
Asiatics ...	2	1	—	—	1	—	—	—	—
Totals ...	*312	28	13	16	26	59	149	12	9

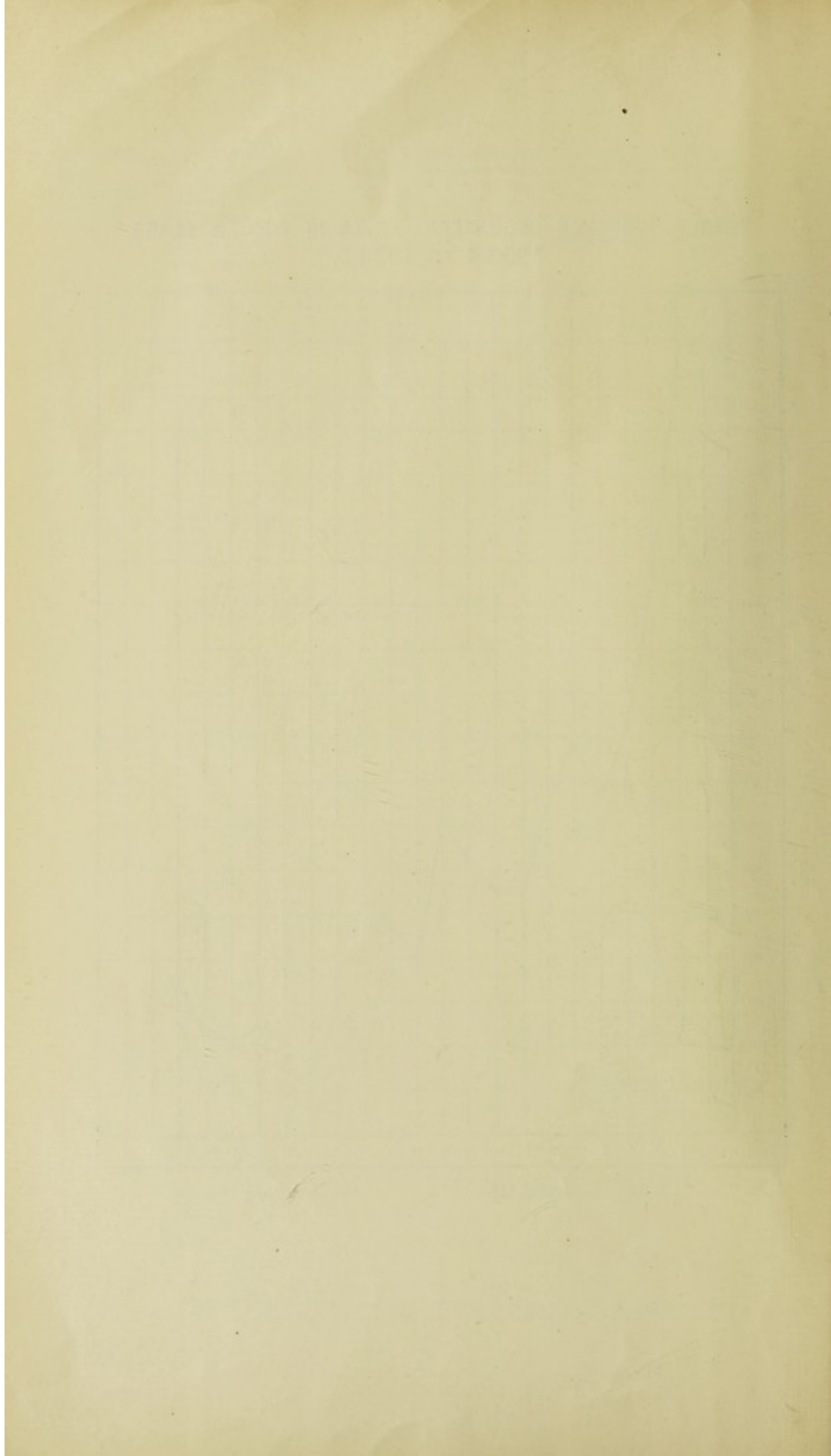
* In 5 other White cases the age is unknown.

YEARLY INCIDENCE OF ENTERIC FEVER IN THE 22 YEARS.
1903-4 TO 1924-5.



Whites—Continuous Line.

Natives—Dotted Line.



(b) DEATHS AND AGES AT DEATH.

M.O.H. 1922-34.

		All Ages.	Under 5 Years	5-15 Years.	15-25 Years.	25-35 Years.	35-45 Years.	45-65 Years.	65 and Up- wards.	Cerebro-spinal Meningitis.
Whites	... ..	38	11 or (28.9%)	14 or (36.8%)	7 or (18.4%)	2 or (5.3%)	—	4 or (10.5%)	—	
Natives	... ..	193	3	3	115	59	11	2	—	
Eurafricans	... ..	5	3	2	—	—	—	—	—	
Asiatics	... ..	2	1	—	1	—	—	—	—	
Totals	... ..	238	18	19	123	61	11	6	—	

While there is much that is obscure about cerebro-spinal meningitis, it is known that the essential infective agent is a minute germ (meningococcus) abundantly present in the spinal fluid of those attacked. It is also found both in sufferers and in healthy "carriers" (who may not have even been in known contact with the disease), in the throat at the back of the nasal passages, where it may persist for extended periods.

The incubation period is not definitely known. Some unusually careful observations during the epidemic amongst the bluejackets at Portsmouth in 1916-17 showed that most often it varied from 2 to 8 days, and might be much longer; on the other hand, it might be a matter of hours only.

There is little doubt that the meningococcus is transmitted and the disease mainly spread by "spray-infection" from person to person, that is, in minute droplets expelled by sufferers or carriers in speaking or coughing or sneezing. It is possibly also communicated by direct physical contact as in kissing, or by indirect contact as by the use in common of eating or drinking utensils, towels, handkerchiefs, etc. On the other hand, indirect infection from articles which have been in contact with a sufferer is very improbable, more especially as the organism rapidly perishes from cold outside the body.

It will thus be seen that healthy "carriers," in view of their larger number and freer access to members of the general community than actual sufferers have, are mainly responsible for the spread of the disease. Indeed, it is exceptional for an attack to be traceable to any known case, for the disease may be passed through a chain of healthy "carriers" before a susceptible person is reached. In a large majority of cases only one attack occurs in an invaded household. Direct association with the sick is therefore not a necessary factor in contracting cerebro-spinal meningitis; but when such association does occur, it probably increases the risk. Doctors and nurses are on rare occasions attacked, and the tragic death of the late Dr. Maynard (formerly Acting Assistant Medical Officer of Health, Johannesburg), who had been attending sufferers, was probably one of these unusual and lamentable occurrences.

Catarrhal conditions (colds), fatigue and crowded dormitories predispose to this disease and also favour its spread. The earliest symptoms are usually intense prostrating headache, vomiting and shivering, with pain and stiffness of the muscles of the neck and consequent drawing back of the head. Medical advice should be secured without delay and sufferers should be isolated so far as is practicable, whether in their homes or in hospital.

As regards prevention amongst a civil population, little can be done except perhaps by swabbing the throats of contacts to detect carriers, correcting conditions of overcrowding (which is often more easily said than accomplished), providing free ventilation of places of public resort and dwellings, and especially of bedrooms, *beds to be at least 3ft. apart*. Avoidance of close physical contact such as kissing, and lessening the risk of "spray-infection" by averting the face when speaking in close proximity to others and covering the mouth before coughing or sneezing are obvious common-sense measures. The use in common of handkerchiefs, towels, cups, saucers, etc., as well as of anything likely to interfere with the maintenance of good general health, should also be avoided.

As the result of the occurrence of two attacks amongst the inmates of a large school in 1923, all the pupils as well as all the White and Native staff (some 119 persons) had their throats swabbed by the Assistant Medical Officer of Health (Dr. Milne). A West's curved post-nasal swab was used. It was a somewhat risky and not an easy job. The result was entirely negative, this being also true in respect of some 25 contacts of other cases. Criticism would, however, have been invited by the omission of this precaution.

The experience of numerous severe naval and military outbreaks during the Great War is now available in the reports of the Medical Research Committees of the Privy Council and the National Health Insurance Department. Amongst disciplined and strictly circumscribed bodies of men measures are possible which are wholly impracticable in large civil communities. During the Portsmouth Naval epidemic in 1916-17, when every man was wanted, effort was focussed on the detection of "carriers" among recruits, and strenuous attempts made to prevent their introduction into the Navy, by swabbing the throat of every new entry at the depôts, amounting to many thousands during the year, and the consequent segregation of several hundreds of men in special isolation camps, in some cases for months. These isolated "carriers" were a further heavy tax on the resources of the Naval laboratories, as each one was examined weekly until demonstrated to be free from meningococci for three weeks.

One most curious result of isolation was that "one-third of the men became cured immediately upon entry, whatever the treatment applied to them might be," and, in the majority of such cases, "it appeared justifiable to regard the effect of the treatment as nil, and to assume that these men cleared up spontaneously."

As regards the use of various disinfectant applications to the throat, either as a spray or by placing the men in inhaling chambers, it was found "that none of the numerous methods of treatment have any conspicuous merit, nor had one any obvious advantage over another."

Severe overcrowding was, during the War, always accompanied by a proved carrier-rate of at least 20 per cent. of the men accommodated, and this percentage was adopted as the danger line in the War Office Memorandum on Cerebro-spinal Fever (March, 1917). A carrier-rate of this height invariably showed that the low mobilisation standard of floor space per man (40 sq. ft.) in barracks, had been infringed, and usually it was found that the beds in the unit were actually less than 1 foot apart. In such circumstances a carrier-rate of 20 per cent. (without waiting the occurrence of any actual cases of the disease) must be regarded as a signal for prompt and effective action to abolish overcrowding, to improve ventilation, and to increase the distance between the beds to at least 2½ feet. Indeed, overcrowding in sleeping quarters may be of dire consequence, and the distance between beds is of paramount importance.

In reference to the medical treatment of sufferers, it is only necessary to mention the withdrawal of a certain amount of the spinal fluid by "lumbar puncture," and the early injection of a suitable serum. As regards the latter, Sir Spencer Lister, Acting Director, S.A. Institute of Medical Research, states that from 1917-23 very good results were obtained from a serum similar to Flexner's (of the Rockefeller Institute), but prepared from a meningococcus found in 70 per cent. of the cases occurring during these years and known as Gordon's Type 1.

But in 1923 the responsible coccus changed, in many instances, to a type not corresponding with any of Gordon's 4 types, and in these cases the curative efficacy of the serum prepared from Type 1 was very materially less. This fact, as well as the absence of sufficient facilities for preparing serum from the new strains caused some temporary anxiety. This difficulty no longer exists, and serum from the new strains has since been considerably used, with good results, amongst Natives.

Sequelae of Cerebro-spinal Meningitis observed during the prevalence under notice were sometimes very severe. The Senior Physician to the General Hospital and the Children's Hospital, in reply to inquiry, states that these cases included the following, although, unfortunately, exact figures are not available:—

- (1) Marasmus of a grave and persistent type, leading, frequently, to death from exhaustion or intercurrent ailments (usually respiratory).
- (2) Secondary hydrocephalus, the result of inflammatory occlusion of the foramina and cisterns at the base of the brain.
- (3) Deafness and deaf-mutism in young children.
- (4) Various types of paralysis affecting the eye muscles (producing squint) and muscles of the extremities, with, in some cases, resulting contractures of the limbs.
- (5) Complete recovery of physical functions, but child left with mental defects ranging from impairment of intellect to idiocy.
- (6) Total blindness as a sequel to double optic neuritis.
- (7) Unilateral impairment of vision (or complete blindness in one eye) the result of ulcerative processes of one eyeball.

Lastly, drastic measures of isolation are not always necessary nor usually practicable. But such isolation as can reasonably be effected either in the home or hospital is desirable.

In view of the carrier-danger, a satisfactory bacterial verdict should be secured before convalescents resume their ordinary mode of life.

INFANTILE PARALYSIS. (Acute Poliomyelitis.)

M.O.H. 1922-3-4.

Infantile
Paralysis.
Plague.

No cases were reported. As regards method of spread, this disease is similar in certain respects to cerebro-spinal meningitis and encephalitis lethargica.

LEPROSY.

Two White, 9 Native, 1 Eurafrian and 2 Asiatic cases were notified in 1922-24. All cases notified or discovered since 1902 were infected before arrival in the Municipal Area.

Leprosy Administration (*Govt. Circular No. 25/1924 to Local Authorities*) is undergoing material change. Many lepers (chiefly Native) are segregated at Robben Island, Emjanyana and Pretoria, but there are possibly as many other undiscovered and at large. The heavy annual cost of these stations has been disproportionate to the relative importance of the disease, and nearly as much as that of dealing with all other human diseases put together. It is, therefore, proposed by the Leprosy Advisory Commission to take all possible means by inspection and education to secure discovery and notification of cases, and to segregate actively infective sufferers in one central leper settlement of such a nature that they will come early and voluntarily for treatment by the best methods. In suitable selected cases, home isolation under strict specified conditions, including medical supervision, will be permitted. The Leprosy Board will continue to examine periodically all leper patients and discharge those in which the disease is no longer active or infectious, subject to periodic medical and bacterial examination, and to certain conditions designed to obviate objections on the part of the public.

PLAGUE PREVENTION AND PRECAUTIONS.

No cases of plague occurred during the period under review.

All rodents found dead, all rodents obtained from railway trucks and a proportion of trapped rats are sent to the South African Institute for Medical Research for bacterial examination. During the two years of the 43,747 rats and 3,489 mice caught, 4,490, or 9.49 per cent., were so examined; none were plague-infected.

Early in 1924, owing to widespread plague infection of veld rodents in certain parts of the Free State and the western portion of the Transvaal nearly as far as Krugersdorp, the possibility of the spread of infection to Johannesburg and of plague occurrences therein, had to be faced. Such an infection was possible either from the western or Krugersdorp area, or from the east through the Alberton Valley (as an extension from Heidelberg and Frankfort) or at the Kazerne, through infected forage or other farm products brought from infected districts and unloaded there.

In order, therefore, to obtain early information of the commencement of such invasion, arrangements were made by the Medical Officer of Health, on the western side with the Langlaagte Mine (by courtesy of the Manager) and at the Council's Klipspruit and Western Native Township Locations to send in for bacterial examination rats caught there; while the City Deep Mine kindly undertook similar work on the eastern boundary. In addition, a staff of rat-catchers was organised to examine at the Kazerne all trucks offering harbourage to rats. The Railway Administration kindly offered every facility.

On the 28th March, 1924, two cases of plague occurred at the Farm Vlakfontein, about 12 miles south-west of Johannesburg. The district was quarantined by Government, and the Acting Assistant Medical Officer of Health, Johannesburg, conferred with Dr. Haydon, Assistant Union Health Officer (Transvaal), as to extensive further precautionary measures. All produce arriving in Johannesburg from the west was intercepted and closely examined at the Municipal Market. If any rats were found the forage was destroyed.

During the whole period of danger in 1924, many individual Natives finding their way into Johannesburg from various infected areas were stopped, de-loused and quarantined for 10 days.

The Council's "look-out" system is now well established, and the rat-catching staff has been from time to time increased. There are now 15 White men and 17 youths with numerous dogs so employed, their spare time being occupied in assisting the owners of stores in the neighbourhood of the Kazerne to get rid of their rats.

M.O.H. 1922-3-4.

Plague.
 Anthrax.
 Influenza.
 Encephalitis
 lethargica.

The existing accommodation for the considerable personnel and dogs of the rat-catching staff is insufficient and unsuitable, and the necessary provision for this expenditure will, no doubt, be included in the Estimates for 1925-6.

As regards the incoming of forage and the like by road, by far the greater portion is taken for sale to the Municipal Markets, where it is dealt with by the rat-catching staff. No special precautions are taken at present in reference to the small proportion which is delivered elsewhere. At present the risk from road-carried produce is not considered very material.

In March 1925, the Medical Officer of Health considered it desirable to secure an outside expert opinion as to the sufficiency of the foregoing measures from Mr. W. Powell, the Chief Rodent Inspector of the Union Health Department, whose services the Secretary for Public Health kindly placed at the Council's disposal for this purpose. Mr. Powell therefore kindly devoted the 18th and 19th March to this work, and was afforded every facility for seeing what had been done. He stated that plague infection has reached Standerton, both from the Frankfort district and from the Volksrust side, and is now extending eastwards along the Transvaal banks of the Vaal River. Between the Vaal River and the East Rand the country is generally open and sandy and teems with wild rodents right up to Springs commonage. The rodents in this sandy interspace are not at present infected, but there is apparently little to prevent the spread of infection amongst them as far as Springs within the next 12 months, and eventually as far as Middelburg. Veld rodent infection will also sooner or later, though possibly not within the next 12 months, have extended in a north-western direction from Vereeniging towards Johannesburg as far as Alberton; and when these infected gerbilles reach the neighbourhood of either Springs or Alberton, the transmission by them of plague infection to domestic rats along the Witwatersrand is obviously quite possible and indeed probable.

Mr. Powell considered the precautionary measures taken by the Council, and especially those at the Kazerne, all that is at present necessary, but suggested that one of the Kazerne rat-catchers be sent for special further training to a very expert Government rat-catcher employed on railway premises in various Free State towns. He also indicated from a hill on the Black Reef Road overlooking Alberton, a belt of land, measuring about four miles by four miles, on which, at a later stage (of which the Council will be advised), it will be desirable to maintain a close watch for infected rodents. He expressed his willingness to give one or more of the Council's rat-catchers the short necessary course of training for this purpose. The desirability of placing one or two trained rat-catchers at the disposal, on payment, of the occupiers of stores in the neighbourhood of the Kazerne who have difficulty in getting rid of their rats, was also considered.

A letter dated 27th March, 1925, has since been received from the Secretary for Public Health, forwarding a copy of Mr. Powell's report to him on the result of his inspection of the 18th inst. After referring in detail to the facts summarised by the Medical Officer of Health in the foregoing pages, Mr. Powell refers to the particular desire of the Medical Officer of Health that he (Mr. Powell) should criticise where he found the slightest loophole in the organisation and its working, expresses his satisfaction in regard thereto, and adds

"that with these precautions I do not see that Johannesburg is in danger of having any serious outbreaks of plague."

He emphasises, however, the desirability, especially as regards the commercial section of the community, of safeguarding themselves by ridding their premises of rats, employing, if necessary, the services of trained rat-catchers in Johannesburg, who would be only too pleased to undertake the work.

The Secretary for Public Health has informed the Medical Officer of Health that a copy of Mr. Powell's report has been sent to the other local authorities along the Reef. Mr. Powell's suggestion to smear traps with crushed rat-ovaries is being tried by the Assistant Medical Officer of Health. It attracts females chiefly.

ANTHRAX.

Two imported White cases occurred during the two years 1922-3-4.

INFLUENZA.

The number of registered deaths from influenza and influenzal pneumonia during the two years was 38 Whites and 362 Coloured persons.

ENCEPHALITIS LETHARGICA.

In Johannesburg, during the four years July 1920 to June 1924, 32 deaths (12 Whites and 20 Natives) occurred. Six of the White deaths were at ages between 1 and 5, whilst 16 of the Natives were between 25 and 45.

This obscure disease, so sinister as to its possible after-effects, is unfortunately often called "sleepy sickness," which is liable to confound it with

"sleeping sickness," an entirely different tropical disease conveyed by the tsetse fly. Encephalitis lethargica was first definitely recorded at Vienna in 1917, but it is now generally recognised, and during the last five years its occurrence has been world-wide. Its most common symptoms—squint, paralysis of accommodation and double vision, with progressive drowsiness and stupor—are due to lesions of the third nerve (which controls certain external muscles of the eye and the iris) as well as of other nerve centres at the base of the brain. But other brain areas may be affected, including the cortex, this lesion being probably responsible for very serious mental after-effects.

M.O.H. 1922-3-4.

Encephalitis
lethargica
Tuberculosis.

In England, since 1919, there has been an increasing annual prevalence (except in 1922), generally commencing about May.

In a Memorandum (May 1924) by the English Ministry of Health, it is stated that no visible associated organism has been found, and that infectivity from person to person is very low. Indeed, it appears to belong to that group of maladies, including cerebro-spinal meningitis and infantile paralysis, in which infection would seem sometimes to be conveyed by a long chain of apparently healthy carriers. The incubation period is unknown: the invasion period (often ascribed to influenza) is 7-21 days. The acute stage varies from a few days to seven or eight weeks, and may present a variety of complex nervous symptoms. The severest cases lie motionless in bed "like an expressionless waxen image"; but more commonly the patients are in a profound sleep, from which they may be aroused to answer questions or take food. Mortality varies from 20 to 50 per cent., death most usually resulting from respiratory paralysis in the third week.

No specific treatment is available, though withdrawal of cerebro-spinal fluid by lumbar puncture may afford transient or permanent relief. Good nursing is essential and a measure of isolation perhaps advisable.

The after-consequences of encephalitis lethargica are often exceedingly serious, and are due to permanent damage to the brain. They may be immediate or comparatively late in occurrence, and may include loss of moral sense, lying and thieving, spitefulness to other members of the family, shaking palsy (even in young children), muscular spasms, or paralyses. Whether these conditions are curable or progressive is a question of much medical and medico-legal importance, but it cannot at present be answered.

TUBERCULOSIS.

Appended is a statistical summary of the mortality from tuberculosis in Johannesburg for the two years 1922-23 and 1923-24:—

DEATH-RATE PER 1,000.

	PULMONARY PHTHISIS.		TUBERCULAR MENINGITIS.		OTHER FORMS OF TUBERCULOSIS.	
	1922-23	1923-24	1922-23	1923-24	1922-23	1923-24
Johannesburg—						
Whites ...	0.40	0.35	0.018	0.006	0.65	0.06
Natives ...	1.39	1.53	0.017	0.02	0.52	0.74
Eurafricans ..	1.06	1.62	—	—	0.77	0.85
Asiatics ...	0.17	0.86	—	—	0.34	—
	1919	1920	1919	1920	1919	1920
England and Wales ...	0.707	0.777	0.095	0.100	0.218	0.260

Compulsory Notification of Tuberculosis.—962 notifications were received during 1922-24, namely, in regard to 26 Whites, 934 Natives, 1 Eurafrian and 1 Asiatic.

Out-patient Treatment of Tuberculosis.—In 1923 a fine building then known as the Tuberculosis Clinic was erected in Bok Street, Johannesburg, at a cost of £10,000 which had been donated by the Red Cross and St. John Ambulance Associations. In the recorded opinions of the Chief Health Officer of the Union and of the Medical Officer of Health, Johannesburg, this provision was regarded as superfluous, because the facilities at the General Hospital could readily have

M.O.H. 1922-3-4.

Tuberculosis.

been suitably adapted for the purpose at a much smaller cost. The correctness of this view was admitted in September 1924, and the institution is now known as the Clinic for Diseases of the Chest. Whilst tuberculosis is still treated there, the building is now largely used to house a much needed Dental Clinic, as well as the Out-patients' Department of the Children's Hospital, which, in the circumstances, are services of much greater usefulness in Johannesburg.

Sanatorium Treatment.—Males only are received at Springkell Sanatorium, some 12 miles east of Johannesburg. Females (of whom few have applied) go to Nelspoort, C.P., as there is no provision for females at Springkell. The daily charge by Government is from 10s. 6d. to 12s. 6d. per head, but the only cases sent to either institution at the expense of the Municipality are those which are necessitous and have a minimum residence qualification of two years in Johannesburg.

The "Diaplyte Vaccine" Treatment of Tuberculosis.—In September 1923, Dr. Pringle, Superintendent of Springkell Sanatorium, was sent to London to acquaint himself with the details and methods of this treatment. On his return he selected six cases which were making little progress under the conditions of sanatorium life, and subjected them for two and a half months to Professor Dreyer's treatment. No material improvement resulted. This is, unfortunately, the experience elsewhere.

BACTERIOLOGICAL DIAGNOSIS.

The following are particulars of the specimens examined under this heading for the Town Council at the South African Institute for Medical Research during the years under review:—

Disease	Product.	Positive.	Negative.	Doubtful.
Typhoid	470	1,617	2
Tuberculosis	204	40	—
Diphtheria	633	1,957	11
Anthrax	1	—	—
Meningitis	326	251	—
Gonococcus	25	26	—
Leprosy	7	1	—
Typhus	48	72	—
		1,724	4,964	13

These figures do not include rats examined for suspected plague (*vide* p. 29.)

ISOLATION HOSPITALS.

Infectious cases amongst Whites (except small-pox and plague) are treated at the Municipal Fever Hospital, but most of the enteric cases go to the General Hospital. In the years 1922-3-4, 788 cases were admitted, including 486 of scarlet fever, 149 diphtheria, 62 measles, 49 enteric and 42 others.

There were no White cases of plague or small-pox. If there had been, they would have been sent to the Union Government's fine new Infectious Diseases Ward of 24 beds at the Rietfontein Lazaretto, seven miles east of Johannesburg.

Native infectious cases numbered 101, of which 64 were chicken-pox and measles. These were sent to the Union Government's new Native Ward of 32 beds at Rietfontein.

The Municipal Fever Hospital is near the south-east corner of Milner Park. It was taken over from the Provincial Government in 1921, at a cost of £30,000. It consists of an administrative block (including kitchen and accommodation for nurses), three pavilions (scarlet fever, diphtheria and measles), with a total of 59 beds, maids' quarters, discharging block, laundry, etc.

The provision of an "Observation and Special Treatment" block of 12 beds and of six extra bedrooms for nurses has become necessary. An unclimbable wall round the hospital site is also a necessity.

It is administered by the Superintendent and Board of the General Hospital on behalf of the Municipality, on the understanding embodied in the following letters:—

*From Medical Officer of Health to Superintendent, General Hospital,
8th October, 1923.*

M.O.H. 1923-24.

Fever Hospital.

"Fever Hospital, Accommodation and Treatment of Patients at."

"Confirming my conversation with you on the 2nd inst., it was admitted that inasmuch as most of the removals to Hospital are effected by the Municipality under the provisions of the Local Government Ordinance, 1912, relating to the preservation of Public Health, the ultimate responsibility as regards accommodation and treatment of such patients rests, as matters stand at present, with the Municipal Council.

"On the other hand, it is obvious that so long as the Hospital Board is agreeable to continue the administration of the Fever Hospital, the accommodation, treatment, supervision and discharge of patients and control of staff must be under the sole direction of the Hospital Board, subject to agreement with the Medical Officer of Health in regard to matters such as period of detention, methods of disinfection, etc.

"I have, therefore, to inquire whether your Board will, in order to make the position definitely clear and workable, afford the Council an official assurance of its recognition of this position and its full acceptance of the responsibilities attaching to and arising out of the accommodation, treatment and discharge of such patients by the Board's officials."

*From Superintendent of Johannesburg Hospital to Medical Officer of Health,
19th November, 1923.*

"I have the honour to inform you that your letter No. 4,473 of the 9th ultimo was considered by my Board at a meeting held on the 12th inst., when it was decided that you be informed that the Board approves and accepts the terms of your above-mentioned letter."

Admission.—White cases only (except plague and small-pox) are treated here at 12s. 6d. per head per day, admission being regulated by the following circular of 2nd February, 1925:—

1. Nurses in the service of the Johannesburg General Hospital Board who are medically certified to be suffering from Scarlet Fever, Measles or Diphtheria are to be removed to the Fever Hospital as free cases, at the request of the Superintendent or his Deputy, provided accommodation is available.
2. Applications for admission must not be made to the Fever Hospital and cannot be dealt with there.

All applications, whether for "free" or "paying" cases must be made as follows:—

During office hours, viz., weekdays 9 a.m.—1 p.m. and 2—5 p.m., Saturdays 9 a.m.—1 p.m., to Room 37, Town Hall, Telephone No. 5081 Central, Extn. 17.

After office hours to Disinfecting Station, Vrededorp (No. 83 Mayfair).

3. Urgent cases, such as Diphtheria or Scarlet Fever, medically certified as requiring immediate operative or other special hospital treatment, will be removed to the Fever Hospital as soon as practicable.

In all other cases (except General Hospital nurses) inquiry must first be made as to the general circumstances at patient's residence by the authorised official of the Medical Officer of Health's Department.

4. No "free" case is to be removed to the Fever Hospital if, in the opinion of the investigating official, reasonable facilities for isolation exist or can be created at the patient's dwelling, unless by medical request for necessary special treatment, which treatment should be stated.
5. Applications for admission for the purpose of special treatment and difficulties in regard to compliance with medical or other requests for immediate admission of "free" cases must be referred to the Medical Officer of Health or Assistant Medical Officer of Health, and if neither of these officials is available, to the Superintendent, General Hospital.
6. "Paying cases," in which there is no material Public Health or other special reason for removal, will only be admitted when such admission will not unduly restrict the necessary reserve accommodation for urgent cases. The official sanctioning removal will, if necessary, consult the Resident Medical Officer, Fever Hospital, on this point.
7. No "paying" case is to be removed till a written undertaking to pay has been furnished.
Undertakings for payment from persons other than the patients themselves or their parents or legal guardians must bear a shilling stamp, and all payment undertakings are to be handed to the Chief Clerk for careful filing.
8. No case from premises outside the Municipality is to be conveyed or admitted to the Fever Hospital without full previous payment, or a guarantee from Government or the Local Authority of the district for all expenses involved.
9. A notice *re* the risk of "Return Cases of Scarlet Fever" is to be served by the investigating officer on each Scarlet Fever patient or his guardian before the patient's removal.

M.O.H. 1922-3-4.
Fever Hospital.
Disinfecting.

10. The "Order for Admission" form is to be filled in by the Infectious Diseases Inspector in each case, and handed by the ambulance driver to the Fever Hospital authority.
11. The hours for removal of cases (whether "free" or "paying") to the Fever Hospital or to the General Hospital are:—
On Weekdays: 9 a.m.—1 p.m. and 2 p.m.—5 p.m. (except on Saturdays).
At other times, viz., on weekdays before 9 a.m. and after 5 p.m., on Saturdays after 1 p.m., and on Sundays and public holidays urgent cases such as Scarlet Fever or Diphtheria requiring operative or other special hospital treatment will be removed to the Fever Hospital, and cases of Cerebro-Spinal Meningitis to the General Hospital, without unnecessary delay; but other requests for removal cannot be complied with without reference to the Assistant Medical Officer of Health or, failing him, the Medical Officer of Health or, failing him, the Superintendent of the General Hospital.

CHARLES PORTER

Medical Officer of Health.

The cost to the Council in 1922-23 for maintenance of the Fever Hospital was £10,140 12s. 7d., and in 1923-4 £9,016 1s. 6d. Of this the sum of £9,389 was refunded by Government under the Public Health Act and £2,134 11s. 11d. was recovered from paying patients.

Except in regard to scarlet fever outbreaks in schools and institutions where very strict daily observation is exercised, and real isolation with (if necessary) immediate removal are practical, the preventive value of hospitalisation in scarlet fever is very questionable indeed.

DISINFECTING STATION.

This contains two large "Equifex" steam disinfectors, the efficiency of which is periodically tested bacterially by the S.A. Institute for Medical Research. One of these disinfectors was fitted in 1914 with Kister and Trautmann's apparatus (*Jl. R.S. Inst.*, 1914, p. 393) for generating formaldehyde, which, it is claimed, secures very efficient results when combined with current steam of a much lower temperature than that generally used, thus reducing risk of damage to articles disinfected. The high cost of formalin since 1914 has, however, ruled out its use.

Books, boots and other leather are disinfected in a small separate formalin chamber.

House-disinfection.—Spraying with hycol or similar coal-tar product, followed by free exposure to light and air, and finally scrubbing such surfaces as permit of it with soap and water, are the methods employed.

For delousing in outlying districts, the simple portable form of hot-air disinfectant devised by Dr. Park Ross (Assistant Health Officer, Union (Natal)) has proved very satisfactory.

DISINFECTANTS—CHOICE AND MISUSE OF.

(a) Choice of. Tenders are from time to time invited for the fluid disinfectant required for Municipal purposes, and the Medical Officer of Health's recommendation thereupon is based upon price in conjunction with the following considerations:—

- (1) "Martin-Schick" Carbolic Acid co-efficient.*
- (2) Uniformity in composition and non-sedimentation.
- (3) Solubility, or capacity of forming a fine emulsion with water, including hard water, and urine.
- (4) Nature of emulsifying agent, whether soapy or albuminous.
- (5) Innocuousness or relative non-poisonousness to humans and animals.
- (6) Non-corrosive and non-staining characteristics.

(b) Mis-use of. On 20th August, 1922, the Medical Officer of Health addressed the following minute to Heads of the Council's Departments:—

"Disinfectants: Use of."

"In view specially of the high price of disinfectants, I venture to invite your attention to the existence of much misunderstanding as to their real value and effects.

"Altogether exaggerated powers have, for many years, been attributed to the use of these substances, provided they smell strongly enough. As long ago as 1870, the late Sir John Simon, Chief Medical Officer of the English Local Government Board, protested against the self-deception and expense involved in the 'vain vaporisings, sprinklings and powderings' with 'disinfectants' to which so many people resort.

"It is extremely unlikely that any disinfectant, under the conditions in which, in practice, it can be ordinarily used, ever really disinfects organic material with which it is brought in contact. In the great majority of cases it acts only as

* *Jl. of Hygiene*, Vol. VIII., No. 5, Nov. 1908, p. 655.

"a deodorant, or, in other words, it merely cloaks smells which are Nature's warning of the presence of filth. This filth is removable by water, soap and 'elbow grease'—which are much cheaper and more effective than 'disinfectants.'"

M.O.H. 1922-34.

Cinema
eye-strain.

"It is, therefore, strongly recommended that the use of disinfectants in connection with the Council's work be restricted to conditions in which it is not practicable by energetic methods of ordinary cleanliness to remove unpleasant smells; and, in such cases, it should be understood that the result is merely deodorisation and not disinfection."

EYE-STRAIN IN CINEMA THEATRES.

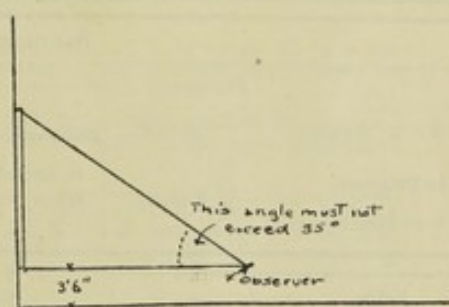
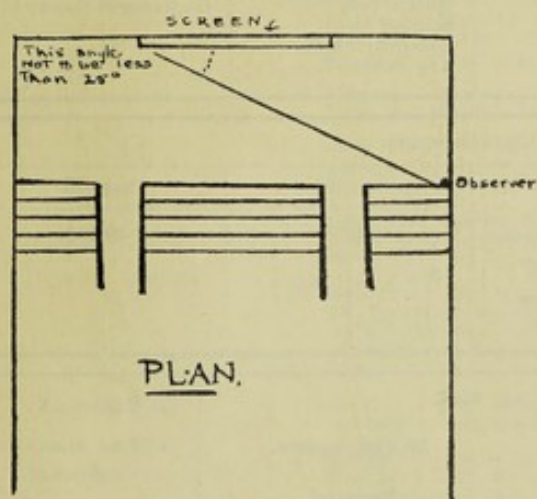
In 1920, a Committee highly representative of the cinema industry, physiologists, ophthalmologists and medical officers of health, investigated the causation of this occurrence, for the London County Council. They attributed it, first and mainly, to *unsuitability of the visual angle*; secondly, to *flicker*; and thirdly, to *film defects*. To these, the writer and the University Professor of Physiology (Dr. Cluver), after practical demonstration in 1922 by the manager of "The African Films Production" centre, would definitely add, *bad focussing in projection*. Lastly, the too rapid screening of films (i.e. exceeding 900—1,000 feet in 15 minutes), whilst it may not be a cause of eye-strain, if that term be restricted to the effects of overwork of the intrinsic and extrinsic muscular mechanism of the eye, is, to some people at any rate, a very definite cause of eye discomfort and fatigue.

Bad focussing, flicker, film-defects, and excessive screening-rate are unusual in Johannesburg.

As regards the *visual angle*, the recommendation of the London County Council's Committee has now been embodied in the following draft By-law, which has been accepted by "The African Theatres" and will, it is hoped, be gazetted at an early date:—

"In all places of entertainment where cinematograph displays form or are intended to form the whole or any portion of the entertainment, the angle of elevation of the centre point of top edge of screen at any point in the auditorium 3ft. 6in. above the floor shall not exceed 35 degrees, and the horizontal angle made by the screen and a line connecting the remote vertical edge of the screen and the seat in front row furthest therefrom shall not be less than 25 degrees.

"Provided, however, that nothing herein contained shall require the alteration of the seating arrangements of any building existing at the date of this By-law and in respect of which a certificate shall have been granted in accordance with Clause No. 1 hereof."



VENTILATION OF THEATRES, SCHOOLS, FACTORIES AND WORKSHOPS.

In September, 1921, the Medical Officer of Health and the University Professor of Physiology jointly reported, after careful investigation of the question, that carbon-dioxide gas as an index of air purity, hitherto recognised by the Council, is entirely unreliable as a test of efficient and comfortable ventilation. It is, therefore, satisfactory to record that on 13th March, 1924, the Municipal By-law imposing a limit of 10 parts of carbon-dioxide gas per 10,000 of air, was amended to provide that, after the expiry of suitable notice to remedy the ventilation of any such places, the kata-thermometer reading (which is an index of suitable temperature, movement and air moisture) must be below the following figures:—

M.O.H. 1922-4.

Kata standards.
Ambulances.
Nursing Homes.

For theatres, cinema halls, schools and places of public assembly:

Dry kata thermometer reading 5.

Wet kata thermometer reading 16.

For factories and workshops:

Dry kata thermometer reading 6.

Wet kata thermometer reading 18.

provided that in no case shall the dry kata thermometer figure indoors be required to be higher than 1.5 below that obtained in the open air immediately outside the building.

AMBULANCE EQUIPMENT.

There are four motor ambulances for Whites and Coloured. There is also one light-running four-wheeled canvas-covered American van for removing clothing, contacts, sitting-up patients, etc.

During the period under review, 27 White cases and 101 Coloured were removed to Rietfontein by the above transport, and 613 White cases to the Fever Hospital. In addition, 45 White patients were removed to the Johannesburg Hospital, 3 Whites to Chronic Sick Home, and 13 Whites to Springkell Sanatorium. A few cases were also removed from outside districts at the request of, and on payment by, the local authorities concerned.

The efficiency of the motor ambulances is now under report by the Town Engineer. Certain replacements will be necessary and an additional vehicle is required.

NURSING HOMES.

There were 27 registered Nursing Homes in 1922-23 and 28 in 1923-4.

In 1914 Johannesburg was, it is believed, the first community to adopt by-laws for Private Hospitals and Nursing Homes as to space, sanitary, water supply and mortuary requirements, and staff accommodation.

In 1922, Government published Regulations under the Public Health Act, 1919, s. 133 (2) as to registration, medical inspection and keeping of registers; and, at the request of the Secretary for Public Health, with the consent of the Public Health Committee, the Medical Officer of Health made an intimate personal inspection of these various Nursing Homes, the results of which were summarised and reported upon in detail under the following headings:—

Name, Address. Structure, (e.g., Material, storeys). Grounds.	(a) Registered Owner. (b) Licensee.	BEDS. Medical = M. Surgical = S. Maternity = M.W. Any excess = E.	Theatre = T. Confinement Room = C.
Sanitary Conveniences.			
Patients.		Staff.	Natives.
W.C.'s. Number	E.C.'s. Number.	Bed-pan Cleansing. In Slop-sink ? If not, where ?	Separate. W.C.'s ? E.C.'s ?
(a) In Bathroom.			
(b) Near Food Stores.			
Baths.		Nursing Staff.	
Fixed = F. Shower = S.		NUMBER.	ACCOMMODATION.
Patient. Staff.		Doubly Trained = T. Midwifery only = M. Probationers = P. Unqualified = U.	Nature of
		(a) Kitchen = K. (b) Food Store = S. Condition of.	
General Condition.			
Lighting.	Ventilation.	Repair.	Supervision and Cleanliness.
Laundry, where done ?			
Mortuary.			
Register, keeping of.			
Charges.			
Remarks.			

The following were the conclusions arrived at:—

M.O.H. 1922-34.

Nursing Homes.

The results of inspection were, in a few cases, very good, and, on the whole, rather surprisingly satisfactory. The replacement of the numerous small bungalow-houses by a few larger buildings of modern design and equipment might be preferable; but, like quality of cooking, nursing, attendance and tariffs, this is largely a question of demand, supply and competition, which can hardly be dealt with by regulation. But buildings used as nursing homes should certainly be in a state of good structural repair, possess a sufficiency of private open space or garden, be provided with water-carriage wherever practicable, and, without any exception, possess adequate and approved sluice or slopsink provision on each nursing floor. In the larger homes, sufficient and separate bathing and sanitary conveniences should be available for patients and staff; in no nursing home should a sanitary convenience be permitted in a bathroom, because of the witnessed tendency to rinse out emptied bed pans in the bath. Conveniences for natives should be separate. Licensees should be supplied with, and produce on demand, an authorised schedule of the number of beds permitted in each room; and it is suggested that they be relieved of the burden of unnecessary records, if only to induce them to keep their essential register with reasonable diligence and accuracy. To this end, it is recommended:—

- (1) That homes admitting only maternity cases be required to keep only the Infant Life Protection Act Register;
- (2) That those which receive general, or general and maternity, cases be responsible only for the register specified by the Public Health Act Regulations, which provides very fully for details of confinement cases;
- (3) That licensees be circularised very explicitly as to their responsibilities in this respect, and medical men as to the necessity of supplying diagnoses.

Standard of Nursing.—54 per cent. were fully trained, 15 per cent. in midwifery only, 9 per cent. probationers, and 23 per cent. untrained.

As a result of this inspection, the 1915 Municipal by-laws were revoked and replaced by the following:—

" 57. 1. No premises shall be licensed as a private hospital or nursing home if such premises are being used, or are intended to be used, for any other purpose: nor

- " (1) unless the buildings, including out-offices,
 - (a) are in good repair and in a cleanly and wholesome condition;
 - (b) possess a sufficient supply of good water, free from liability to pollution;
 - (c) are, where sewerage is available, connected therewith;
 - (d) have within the curtilage such garden area or open space as may in the circumstances be reasonable.

" (2) unless there be provided

- (a) not less than 100 square feet floor space and 1,200 cubic feet of free air-space for all infectious and serious operation cases, and not less than 75 square feet and 800 cubic feet of free air-space for all other cases;
- (b) adequate accommodation for nurses and attendants separate from the accommodation for patients;
- (c) water closets in the proportion of 1 to every 15 beds for patients or, when sewerage is not available, pail closets in the proportion of 1 to every 8 such beds;
- (d) where the number of beds for patients exceeds 10, separate closet accommodation for the staff in the same proportion as in par. (c) hereof.
- (e) upon every floor upon which patients will be accommodated, an approved slop-sink or 'sluice' with water-tap, flushing cistern, flushing rim and hot and cold water laid on, and arrangements for the satisfactory disposal of sewage therefrom;
- (f) separate closet accommodation for any native or natives resident or employed on the premises;
- (g) slipper-baths with hot and cold water laid on in the proportion of 1 bath for every 15 beds for patients, and, where the number of such beds exceed 15, separate bath accommodation for the staff; no closet or slop-sink or 'sluice' to be constructed or permitted to remain in any bathroom;
- (h) a suitable outside room in connection with such private hospital or nursing home for use as a mortuary chamber.

" 2. No licensee of a private hospital or nursing home shall fail to display prominently on the door of each room intended for the accommodation of patients the number permissible in such room in terms of sub-section 1 (2) hereof."

" 58. No licensee of a private hospital or nursing home shall himself or by his servant or agent contravene or fail to comply with or to maintain any of the conditions, provisions or requirements specified in By-law 57 hereof."

Nursing Homes (Registration) Bill, 1925 (England).—In February, 1925, Mr. Gerald Hurst, K.C., introduced an unopposed Bill, promoted by the College

M.O.H. 1922-34.

Markets and
Abattoirs.
Meat Inspection.

of Nursing, for the registration and inspection of nursing homes by County Councils or County Borough Councils. Registration could be refused if insanitary or insufficient accommodation, inadequacy of staff and, principally (from 1st January, 1930) the absence of a State registered nurse as matron or superintendent of nursing.

LIVE STOCK MARKET AND ABATTOIRS.

LIVESTOCK MARKET.—Opened 1st January, 1910. Handles approximately 1,000,000 to 1,250,000 animals per annum, valued at approximately from 4½ to 6 million pounds sterling, according to prices.

PUBLIC ABATTOIRS, opened in October, 1910, were designed by the Town Engineer (Mr. G. S. Burt Andrews, M.I.C.E.) in conference with the Medical Officer of Health and the then Municipal Veterinary Surgeon (Mr. J. Irvine Smith, M.R.C.V.S.), under whose particularly efficient control as Director they have since been administered. At first the Abattoirs were nominally a branch of the Department of the Medical Officer of Health, but in 1917 the Abattoirs and Live Stock Market were constituted a separate department. Approximately 500,000 animals are annually slaughtered herein, the daily capacity being cattle 1,250, sheep 6,000, pigs 750. The slaughter hall contains the very latest electrically operated plant, including circular meat saws, electric flayers, etc.

The amount of meat condemned during each of the two years reviewed was 600 tons.

MEAT INSPECTION REGULATIONS, 1924.

In 1923, a Commission under the chairmanship of Dr. L. Haydon, Assistant Health Officer, Union, was appointed by Government to frame regulations for the purpose of registration and control of slaughter houses, procedure and standards in regard to inspection of meat and animals, condemnation and disposal of animals, carcasses, etc., disposal of slaughter-house waste products and prevention of certain diseases conveyable to man by diseased meat (*vide* Government Notice No. 2,118 of 1924). The Commission included representatives of the Industry, a Parasite expert (Dr. Annie Porter, D.Sc.), with the Medical Officer of Health and Director of Abattoirs, Johannesburg.

Much effort was exercised to meet and, where necessary, reconcile the views of various classes of local authorities, and the Medical Officer of Health considers the regulations involved as effective as any of which he is aware. The examination and fate of measly carcasses (a matter of great financial importance) is fully provided for; and the following regulations in regard thereto are largely the outcome of Dr. Annie Porter's researches at the S.A. Institute for Medical Research as to the effect of freezing, in respect of which German laboratory claims failed in Johannesburg to meet confirmation.

Additional Examination of Measly Carcasses.

16. (1) Every meat inspector finding evidence of bladderworm disease ("measles") in a slaughtered animal during examination in accordance with regulations 12 and 13, shall further make the following additional examination thereof:—

Head.—Inspection incisions into inner and outer muscle of jaw.

Tongue.—Inspection of surface and incisions into the muscles of attachment and tongue proper.

Pluck.—Examination of heart and oesophagus.

Stomach and Intestines.—Examination of the outer surface of stomach and intestines.

Carcass.—The following inspection incisions shall be made into *each* side of the carcass:—

Muscles of shoulder behind the elbow	7 incisions.
Chuck	1 incision.
Brisket	1 incision.
Muscular diaphragm	2 incisions.
Fillet	3 incisions.

Apart from the foregoing, a large muscular surface exposed by the splitting of the carcass shall be examined and three incisions made into the pillars of the diaphragm.

(2) Every carcass found to be infected with bladderworm disease ("measles") shall, together with the viscera, be condemned as unfit for human consumption and destroyed or treated and disposed of so as not to endanger health, save where—

- during examination as aforesaid less than ten bladderworm cysts are disclosed; and
- the cysts are not widely distributed; and
- cold storage to the satisfaction and under the control or supervision of the local authority, and in which a temperature of or below *minus* ten degrees Centigrade is continuously maintained, is available; and
- the owner or his agent in charge of the carcass requests that it be placed in such cold storage, and furnishes a written undertaking to the satisfaction of the local authority to defray the cost of so doing.

- (3) If the conditions specified in sub-clause (2) hereof are complied with, but not otherwise, the carcass, after removal of all obviously diseased portions, may be placed and kept in such cold storage for at least eighty-four days, and may thereafter be examined and passed as fit for human consumption.

M.O.H. 1922-3-4.

By-product
Plant.
Cold Stores.
Transport of
Meat.
Fly-screening.

THE BY-PRODUCT PLANT is of the very latest design for treating condemned and waste material in addition to carcasses of dead animals collected from the town.

By-products manufactured consist of fertilisers and farm foods which are thoroughly sterilised and for which there is a large demand. These, in accordance with the Council's policy, are sold at cost price.

THE COLD STORES are constructed on the most up-to-date and modern lines for meat, fruit, butter and other farm produce, etc.

Ice is manufactured and sold at 2s. per 112 lb. block.

TRANSPORT AND HANDLING OF MEAT.

In England, new Public Health (Meat) Regulations were gazetted in December 1924, and their application is causing considerable controversy. Some of these regulations, *e.g.*, in regard to control of private slaughter-houses, marking or stamping of meat after official inspection, and the danger of contamination from gut-scraping and tripe dressing have long been eliminated here by the establishment and practice of our Municipal Abattoirs. In these alone, slaughtering and—in a separate building—gut-scraping and tripe dressing are permitted. Open "meat-stalls," fixed or movable, are almost unknown here. But questions of transport and handling, and of control of meat-shops and stores, are problems in common. In England, as here, wholesale meat porters must now wear "clean and washable head-coverings and overalls"; but for how many minutes will these washable coverings remain clean? Meat must not come in contact with the ground, and if conveyed in vehicles (including railway wagons, which must be clean inside) shall be adequately covered with clean cloth or other suitable material. No live animal is to be conveyed in the same vehicle with the meat.

The most effective transport of meat one has seen is that adopted in Adelaide (Australia), but the cost adds $\frac{1}{4}$ d. per lb. The meat porters there are furnished by the Abattoir authority with clean overalls daily: and all meat is conveyed from the Abattoirs to the shops in dust-proof, insulated motor vans.

The English regulations require that meat shops and stores be sanitary, counters and implements kept clean; and, finally, that meat be protected from splashed or wind-borne contamination and from flies. This latter regulation has existed for 20 years in Johannesburg, and its effective enforcement is exceedingly difficult in practice. Fly-screening a meat shop is rather a farce if doors are left constantly open; while, if effectively maintained, fly-screening often makes a shop a huge fly-trap. Glass covers and cases have not been tried, but, as Dr. Howarth (Medical Officer of Health, City of London) points out, the exposure of meat behind glass windows means that in hot weather the shop becomes unduly heated and the meat detrimentally affected.

In recent years we have advised that cut meat exposed for sale be covered with butter-muslin, that a suitable meat safe of wire gauze be provided for a reserve in the shop, and that as much as possible of the meat be kept in a cold chamber. It is not easy, however, to enforce this advice, and the problem itself is a very difficult one.

Dr. Howarth refers also to the practice one has seen in the large Australian cities—more especially in fish shops—of keeping the shop atmosphere cool by forcing a continuous trickling stream of ice-water (which can be re-cooled and re-used) down the inside of the shop windows. This method has not been tried in Johannesburg.

The handling of meat by customers is deprecated, but cannot easily be made the subject of effective regulation.

One is disposed to think that while every reasonable precaution is desirable in the transport and handling of meat, there may be a tendency to over-rate its real practical importance. Many people wipe, or even wash, their joints before cooking them, and, in any case, any surface contamination is sterilised in the process of cooking. Admittedly, however, the eating of "sterilised contamination" is not an inviting idea.

MUSHROOMS.

Mushrooms—Poisonous and Non-poisonous.

Some difficulty has been experienced in the practical inspection of mushrooms, and text-book differentiations have been found of very questionable value. Dr. E. M. Doidge, Division of Botany, Pretoria, says that "the only safe

M.O.H. 1922-34.

Mushrooms.
Bread
Wrapping.
Food Poisoning.

"course is to become familiar with a few edible species and to regard all others with suspicion." Young and MacArthur (Roy. Army Medical Coll.) say that "there is no general test—the only means of knowing whether a given fungus is poisonous or not is to have the species identified and ascertain its record in this respect." Usually such a procedure would be impracticable, and "we must be content to identify the common edible species and to discard all others."

The common edible mushroom found in pastures, *Psalliota campestris*, shows in conjunction four easily recognisable characters:—

- (1) The cap is white to buff in colour.
- (2) Except in the tiny 'button' stage, in which they may be white, the gills are salmon pink in colour, becoming with growth purplish brown.
- (3) The stem has a 'ring,' i.e., in the young stage there is a membrane joining the edge of the cap to the stem, and as growth proceeds this ruptures and hangs from the (upper part of) the stem as a ring.
- (4) The stem should have no sheath or ring round its base.

The above simple tests will eliminate all the poisonous species, but one must not assume that every mushroom lacking these three characters in conjunction is necessarily dangerous, though it may be so.

The popular beliefs that poisonous mushrooms in cooking will discolour a silver spoon, and that only edible mushrooms have alternately long and short striae markings on the gills are erroneous.—(R.A.M.C. J., Jan. 1925, p. 32.)

HYGIENIC BREAD WRAPPING.

This matter has been repeatedly raised in Johannesburg, and the practice is said to be usual in some parts of the States, but the ingredients of wrapped bread there include lard and milk, which are not in ordinary South African bread. The Medical Officer of Health considers that while theoretically there is more to be said for it than there is for meticulous care in the exposure and handling of meat which is afterwards superficially sterilised by cooking, whilst bread is not, the importance of both of these matters is somewhat unduly magnified.

On 21st July, 1921, in reply to an inquiry from the Government Health Department, New Zealand, the Medical Officer of Health expressed the view that wrapping of bread is unnecessary, given compliance with the by-law for protecting all bakery products by means of closed cases or vehicles when in course of conveyance through the streets.

In 1919 and in 1924, the Public Control Committee of the London County Council considered this matter. As against hygienic advantages and the retention of freshness, the following objections were urged:—

1. That the cost of paper and labour would add a halfpenny to the cost of the 4 lb. loaf.
2. That unless cooled for three hours before wrapping, which entails real practical difficulties of time and space, the bread tends to "rope" and become unsaleable.
3. That wrapping distinctly impairs the flavour of the bread.
4. That certain shapes of loaf do not lend themselves to wrapping.
5. That the paper very frequently becomes torn in packing and unpacking in the vans, unless packed on trays, which materially reduces the carrying capacity of the van.

The Committee, in view of all the facts, found themselves unable to recommend the Council to take action in the direction suggested.

FORMS OF FOOD POISONING AND THE ORGANISMS RESPONSIBLE.

Recent research has shown that there are two varieties of food poisoning, and also that the use of the term "ptomaine" poisoning is misleading and incorrect.

Type 1. Botulism.—In October, 1922, at Loch Maree, Scotland, the ingestion of wild duck paste at a picnic was followed in a number of cases by the very fatal form of food poisoning known as Botulism, caused by the *B. Botulinus*. These attacks were remarkable for the fact that the usual signs of food poisoning—vomiting, purging and abdominal pain and cramp—were absent, the symptoms being those of profound and early disturbance of the nervous system, such as various forms of paralytic impairment of vision, speech, etc. Thirst, loss of appetite and difficulty in swallowing were also common.

Type 2. Poisoning other than Botulism.—This is far more common, and most people have had some acquaintance with its chief symptoms, namely, early onset, vomiting, diarrhoea, severe abdominal pains and muscular cramps—all evidence of acute irritant poisoning.

The term "Ptomaine Poisoning" has long been widely regarded as synonymous with food poisoning generally, and particularly with irritant

poisoning, but apart from Botulism, practically all such outbreaks are due to the Salmonella group of organisms (see below) and not to ptomaines, which usually do not begin to appear in food until putrefaction has been in progress for a week. The use of the term 'ptomaine poisoning' is, therefore, incorrect, and even dangerous, for both Public Health and medico-legal reasons, because of the tendency to accept it as sufficiently explanatory of deaths which have occurred, and perhaps thereby to interfere with elucidation of the truth by inquiry, e.g., where criminal motives may be involved.

The 'Salmonella group of organisms' includes various types of the *B. paratyphosus*, *B. suispestifer*, *B. enteritidis* (sometimes called Gaertner) and *B. aertrycke*. The first two have comparatively little irritant action on the gastric mucous membrane, but appear to possess a power of more generally invading the body, as by the production of para-typhoid fever. *B. aertrycke* and *B. enteritidis*, on the other hand, uniformly cause acute gastro-enteritis of the food-poisoning type, and this action is not prevented by boiling the food in which these organisms are present. Indeed, evidence exists of the presence in these organisms of an irritant substance producing acute gastric inflammation: and such organisms, when heated to boiling point, are actually more irritant than when unheated.—(Privy Council (Medical Research) Report on Investigation of Salmonella Group with Special Reference to Food Poisoning—by W. G. Savage and P. B. White, 1925.)

In November, 1924, in Braamfontein, symptoms of irritant poisoning occurred amongst each of those members of two adjoining families who had partaken of a meal which included salad, brawn and kippers. Those who did not eat any of the brawn were unaffected. It was not possible to get any remnants of the portions of brawn actually sold to these people, but the same brawn had been supplied to a large number of other people, and a specimen taken the following day appeared to be perfectly wholesome and fresh. No organism of the meat-poisoning group was isolated and a biological test was carried out with negative results. It, therefore, seems likely that if the brawn eaten by these two families was responsible for the outbreak, it was due to contamination between the time of sale and that of consumption.

Two cases of irritant poisoning caused by eating slightly putrid kippers also came under notice, and the supplying firm was severely cautioned.

MUNICIPAL PRODUCE MARKETS.

These include a very fine closed building, opened in 1913, covering some 7,400 sq. yards. Farm produce, such as fruit, vegetables, poultry, butter and eggs are sold here wholesale and retail, also fish and meat.

In one of its spacious galleries, the Central Maternity and Child Welfare Centre is satisfactorily accommodated.

INSPECTION OF OTHER FOODSTUFFS.

The following goods were condemned by the Foods and Drugs Inspector: Fish, 82,320 lbs.; smoked fish, 2,619 lbs.; salt herrings, 7 cases and 1,757 lbs.; bacon, 1,350 lbs.; crayfish, 369; potted meats, 38 cases; potatoes, 176 bags; fish roe, 77 tins; fillets, 321 boxes; meat, 1,900 lbs.; anchovies, 900 tins; condensed milk, 1,276 tins; soles, 1,715 lbs.; sardines, 3 cases and 393 tins; sausages, 234 tins; fruit, 88 tins; polonies, 2 cases; hams, 1 case; shrimps, 50 lbs.; peaches, 2 cases; and desiccated coco-nut, 8 cases.

During the period under review he passed 2,039,966 lbs. of bacon, etc., and 14,218,558 lbs. of fish.

ANALYSIS OF FOOD, ETC., 1922-24.

Milk.—Appended is a tabulated summary of the results of analyses and prosecutions:—

	5 Years, 1917-22.	1922-23.	1923-24
Number of Samples taken ...	1,503	532	444
Number deficient Solids-not-Fat ...	123	54	22
Number deficient Fat ...	80	28	9
Number of Preservatives ...	4	7	2
Number of Prosecutions ...	107	69	19
Amount of Fines ...	£550	£254	£54/10/-

In addition to the 994 water examinations (see page 47), some 1,029 articles of food, etc., were examined during 1922-24 at the Government Laboratories, equal to 3·2 samples per annum per 1,000 of White population. Details are appended:—

M.O.H. 1922-24.
Food Poisoning.
Food Inspection.
Food Analysis.

M.O.H. 1922-3-4.

Milk Supply.

	Un-adulterated.	Adulterated or Impure.		Un-adulterated.	Adulterated or Impure.
Milk	866	110	Ice Cream ...	30	—
Sugar	2	—	Potted Meat ...	—	1
Butter	40	1	Coffee	47	1
Pepper	16	—	Chicory	1	—
Condensed Milk ...	3	1	Chloride of Lime	5	—
Mustard	1	—	Cocoa	10	—

MILK SUPPLY.

The immensely important question of the public milk supply has received close and continued attention during the past 24 years.

Licensed Premises within the Municipal Area.—There are 175 cowshed dairies, 4 pasteurized-milk depôts and 185 raw-milk shops. The estimated number of cows within the Municipal Area is about 4,100, and the estimated quantity of milk produced daily is about 6,000 gallons. Over 200 persons are also permitted to keep one cow for their private household use.

These premises are licensed and, as far as practicable, kept under observation by a special Town Dairies Inspector (Mr. George Bidwell) and, incidentally, by each district inspector.

Milk By-laws.—On 27th August, 1900, "Regulations for Dairies and Regulating Sale of Milk," signed by Major O'Meara, Acting Burgomaster, were published under Martial Law, and these were superseded in 1903 by Regulations on the lines of the Model Code of the English Local Government Board framed under a Proclamation of 1902.

But the grossly insanitary condition of cowsheds, the filthy storage methods practised chiefly by low-class and untaught Eastern Europeans in dirty and, on occasion, fever-stricken houses, the distribution in "any old" dirty bottles, stopped with dirtier paper and hawked in dirty apron-carriers, as well as the rapidly increasing quantity of milk coming from wholly unregulated outside farms, indicated the necessity of further powers. These were taken in the Local Government Ordinance, 1912, Section 72 (17), and empower the Council to prescribe the conditions subject to compliance with which any milk or milk products produced or prepared within or outside the Municipality may be introduced for use or sale within the Municipality, and to prohibit the introduction, sale or use within the Municipality of milk or milk products in respect of which such conditions are not complied with.

In 1915, a third Code of Milk By-laws was promulgated under these powers, as far as possible penalising many offensive conditions with which the Council had previously been unable to deal. Besides dealing with the usual features of modern milk by-laws in regard to licensing, construction of cowsheds, wholesome water supply, and prevention of the sale of tuberculous milk, this Code regulates the type of milk receptacles, including churns, which may be used, methods of cleansing, conveyance, etc. It also requires that "skimmed milk" shall be purveyed only from receptacles bearing conspicuously the words "Skimmed Milk" in $\frac{3}{4}$ in. block capital letters; hawking in the streets except from approved closed receptacles, as well as cleansing and re-filling of bottles elsewhere than in authorised places, are prohibited. In addition, it is provided that no person shall store or expose for sale or purvey milk which contains dirt visible to the normal eye or which can be detected by straining through a cotton-wool pad or disc; and any receptacle or other article which appears to an authorised officer of the Council to be dirty or unfit for use in the handling of milk may forthwith be seized, carried away and detained for the purpose of production in evidence.

Finally, the *introduction of milk from without the Municipality* is only allowed under yearly permits issued to farms which comply with the Council's requirements in regard to cow-stable accommodation and methods.

Permitted Outside Dairies.—The Outside Dairy Inspectors (Messrs. W. C. Watson and G. Christie) report as follows for the two years 1922-3-4:—

"Approximately 13,000 gallons of milk are received daily in Johannesburg from about 345 permitted farms

"783 applications for permits were dealt with, 690 of which were granted and 93 refused.

"General Progress.—A steady improvement continues in regard to methods of production of milk. Revised plans of approved and economical arrangement and construction of cowsheds, dairy premises generally, and methods of protection of farm water supplies, have been prepared and are issued gratuitously for the guidance of milk producers.

M.O.H. 1922-3-4.
Milk Supply.

"The dairy farms inspected are situated chiefly in the districts of Standerton, Heidelberg, Pretoria and Krugersdorp, and also in those of Wakkerstroom, Ermelo, Bethal, Witwatersrand, Pietersburg, Rustenburg and Potchefstroom in the Transvaal; Heilbron, Kroonstad and Wolvehoek in the O.F.S., and Charlestown, in Natal.

"Systematic inspection in regard to all permitted dairy premises has been continued, and has included advice as to construction and equipment of buildings, care of animals, and methods of production, including handling, cooling and dispatch of milk, the results being reported, where necessary, to the Medical Officer of Health, and we are glad to be able to record a continued improvement in dairying generally.

"Controlling of Supplies of Milk arriving in Johannesburg.—Quarterly visits to the different railway stations within this town have been made by your dairy inspectors for this purpose. It was ascertained that eight supplies from unpermitted sources were being introduced. Particulars were reported to the Medical Officer of Health, and further supplies were prohibited.

"Defective Milk Vessels.—Careful attention has been given to the condition of milk vessels used for conveying milk to Johannesburg. When defective vessels were found the owners were immediately required to have same repaired, retinned or replaced by new ones. Inspections were made and investigations carried out at retinning establishments to ascertain that only pure tin was used for retinning milk vessels.

"Adoption of Visible Dirt Test for Milk.—Your Inspectors carry out this test on the dairy premises visited, and find it an excellent method of demonstrating to the producer whether or not his method of handling milk is satisfactory.

"Widal Test.—Dairy farmers and their employees are encouraged to submit themselves to this test. The majority of dairymen outside the Municipal Area engaged in the retail trade have taken advantage of the facilities afforded by the Council and submitted their employees and themselves for examination."

Score-card System.—Practically all the licensed dairies are subjected to quarterly scoring, which reflects conditions as to cleanliness, efficiency of methods and health of humans and animals, but not as to the chemical or bacterial content of milk.

The score-card figures for a yearly average of about 160 premises, during the five years 1st July, 1919, to 30th June, 1924, show that the lowest average score has increased 66 per cent.: that for each of these years the highest figure was between 93 per cent. to 94 per cent., while the lowest increased from 25 per cent. to 35 per cent.: that the number of dairies scoring over 50 per cent. increased from 81 to 130: and that the average of all scores increased from 49 per cent. to 66 per cent.

Nineteen outside dairies in the immediate neighbourhood of Johannesburg were also scored and, being mostly of recent construction, all of them for the past four years have secured over 50 per cent. of marks, the maximum figure averaging about 94 per cent. and the minimum increasing from 41.4 to 57 per cent.

Milk depôts were scored on a somewhat different system, the average points increasing from 54 per cent. in 1920 to 70 per cent. in 1924. The lowest score increased from 29 per cent. to 45.7 per cent., whilst the average for one (Nel's Rust) was 95.5 per cent.

The standard of marking in cowshed dairies, milk shops and milk depôts is high, and the figures recorded show a marked and progressive improvement.

The *visible dirt test** was applied in connection both with scoring inspections and on other occasions, five prosecutions and convictions resulting, with fines varying from £5 to £10.

Representation has repeatedly been made that it is unfair, or at least very discouraging, that very low scorers, some of whom secured less than 35 per cent. of marks, should be allowed to compete with those who spend much time and trouble on the good or excellent equipment and methods which their scores connote. This complaint is not unreasonable, and it is considered that the time has now arrived when a producer or vendor who, after two warnings, fails to secure a minimum score of 50 per cent., should not have his licence renewed. There will, of course, be, as in all such advances, much outcry amongst delinquents: but those who cannot conduct their trade with the moderate efficiency which a score of 50 per cent. connotes, should not be allowed to do so at the consumer's risk.

In the meantime, *Certificates of Merit* are issued in the various classes to those who score over 90 per cent. in each official year, and the highest scorer in each class for three consecutive years receives a gold medal.

* Apparatus obtainable from Prize Medal Dairy Works, Pietermaritzburg. Price £4.

PURE UNTREATED MILK VS. PASTEURISED MILK.

Milk.

This very important question arose in most interesting form in February, 1924, from a request by the Superintendent of the General Hospital to advise as to the respective merits of a tender by a first-class milk supply company (Messrs. "Y") to supply the Hospital with pasteurised milk at 1s. 8d. per gallon, and that of a very progressive dairy farmer (Mr. "X") in the vicinity of Johannesburg to supply fresh, untreated milk at 2s. per gallon.

The contract conditions specified milk "fresh, sweet, whole and unseparated," containing not less than 3 per cent. of fat and not less than 8.5 per cent. of "solids-not-fat." The bacterial standard required was:—"Total blood heat" organisms per c.c. not to exceed 100,000 in winter and 250,000 in summer; "and B. Welchii test to be negative in 5.0 c.c."

It may be stated that in February, 1924, Mr. "X" held the existing contract on the foregoing conditions. Samples for chemical and bacterial examination by the Government Analyst's Department and the S.A. Institute for Medical Research were taken, usually monthly, but on irregular dates, by representatives of these Institutions. The results were somewhat surprising. The average "fat content" for the 11 occasions between January, 1923, to January, 1924, was no less than 4.49 per cent., that for "solids-not-fat" being 8.8 per cent. The presence of B. Welchii was not once detected in 5 c.c. in the 11 samples, and the counts for organisms per c.c. at 37° C. were as follows:—25,550, 9,100, 9,900, 7,000, 13,100, 60,000, 62,000, 15,200, 1,200, 319,000, 128,000.

The Medical Officer of Health's reply to the Hospital inquiry was as follows:—

My opinion is, as I understand, invited upon

- A.—The herds, and presumably also the premises and methods, of the dairy farms specified by Messrs. "Y" and also upon those of Mr. "X's" farm.
- B.—The Nielsen Process of Sterilisation.
- C.—The relative value of Nielsenised milk compared with Mr. "X's" milk as an article of hospital diet, especially for children.

A.—Herds, Premises and Methods.

- (1) Of the dairy farms specified by Messrs. "Y," all four possess good milk-producing herds, but in no one of them are the animals subjected to periodic tuberculin testing, which is a very important matter. In only one case are the buildings first class. In all of them the methods of handling are good. In none of them are the employees subjected to the very necessary Widal Test for enteric carriers. The score-card aggregate of these farms would vary from 70 per cent. to 75 per cent. The distance over which the milk has to be brought in by train varies from 27 to 35 miles.
- (2) Mr. "X's" farm possesses a good milk-producing herd of some 300 "mixed" or "grade" Frieslands, and, incidentally, the notably high average fat-content (4.49 per cent.) of their yield is a most remarkable answer to the defence so often put up that Frieslands necessarily produce thin milk.

All his animals are tested every 12 months for tuberculosis, and all his employees undergo the test for enteric carriers. His cow-stables are built in concrete to the model plans of this Department, his methods are excellent in every respect, and his score-card aggregate would be between 95 per cent. and 100 per cent. The distance over which "X's" milk is brought in by motor is 12 miles.

B.—The Nielsen Process of Sterilisation.

The validity of the claim that this process produces a sterile milk without chemical change greater than that resulting from ordinary pasteurising is admitted for the purposes of this Report. But apart from chemical change, there is what may be termed a vital change, for there is in milk a constituent known as Vitamine C, which is of essential nutritive importance, especially as regards the prevention of scurvy and rickets. Now, as the value of Vitamine C commences to be impaired at a temperature of 125° F., it is fair to assume that this value is materially affected by exposure to a temperature of "263° F. for a few seconds," which forms part of the Nielsen process, and which is 100° F. above the maximum temperature (150° F.) permitted by the 1923 Regulations of the English Ministry of Health for pasteurising milk. At the same time, it should be understood that Messrs. "Y" offer an alternative system (the Holder) of sterilisation at 145° F. for 30 minutes. But, if it can be avoided, it is very undesirable that the milk which forms so large a part of the diet of children and other invalids in hospital should have the value of its important Vitamine C impaired. It is also very inconvenient, and costs something, to have to rectify that impairment by adding fresh lemon juice or anything else. Lastly, milk sterilised by any heat process becomes less palatable, especially to invalids.

It is true that pasteurised milk is supplied to our Child Welfare Centre by Messrs. "Y," but this is because the total quantity of milk required is insufficient as a business proposition to obtain "certified" unpasteurised milk (see next page).

C.—The Relative Value of Nielsenised Milk and "X's" Milk for Hospital Diet. M.O.H. 1922-3-4.

Both in England and America, the highest class in the official grading of milk is that known as "certified milk," which is produced from tuberculin-tested herds by methods so excellent that the specified bacterial standard is not exceeded, and it is not, therefore, necessary to render the milk safe by heat sterilisation, thereby impairing its nutritive value, especially for children, and its taste.

It is considered that Mr. "X's" milk is very fairly comparable to "certified milk." As already stated, his herds are tested for tuberculosis once in 12 months: his buildings and methods are exceptionally good, and this statement is borne out by the fact that only once in the past 12 months, namely, on 4th December 1923, has the bacterial content of milk samples taken by the Hospital Authorities exceeded the specified limit, whilst on six occasions it was phenomenally low (see annexure "B"). Further, although Mr. "X's" contract with your Board specified only 3 per cent. of milk fat, his average "fat-content" for 11 months, between January, 1923, and January 1924, was no less than 4.49 per cent., which means that he was supplying the Hospital with 50 per cent. more of milk-fat than he was under any legal obligation to do.

Such a milk supply, bacterially and chemically controlled, is, in my judgment, very distinctly superior, both in nutritive value and taste, to milk sterilised by the Nielsen or any other process, though, as regards the high fat-content figure, Messrs. "Y" might quite possibly be prepared to guarantee an approximately similar standard, if your Board decided to accept sterilised milk. But, as a recent writer well says: "Let us have the cleanest milk possible from the healthiest cows, and let us concentrate on that rather than on methods of treating milk."

Whilst, therefore, satisfied that as regards the production of pasteurised milk Messrs. "Y's" methods are about as practically and scientifically perfect as they can be, I have no hesitation in recommending the acceptance of Mr. "X's" tender for non-pasteurised milk, even at his higher price, on the understanding that he continues to supply genuine whole milk.

Medical Officer of Health.

The Hospital Board accepted Mr. "X's" tender for fresh milk, and the average results of chemical analyses since have been 4.44 per cent. milk-fat and 8.55 per cent. solids-not-fat. The average bacterial count of blood-heat organisms per c.c. is 20,342 (the highest being 49,000 and the lowest 3,340), with B. Welchii absent in every case.

The facts in connection with this milk supply afford a most striking demonstration of what may be effected by highly intelligent, conscientious and business-like conformity with the Regulations and advice of this Department in regard to the various factors of clean and wholesome milk production.

The potent agency of milk infected by "enteric-carriers" in spreading enteric or typhoid fever has been referred to at p. 25.

WATER SUPPLY.

Water is supplied in bulk by the Rand Water Board to the Municipal Council. The Rand Water Board consists of members representing the Railway Administration, the Johannesburg, Germiston and other Reef Municipalities, and the Mining Industry. The Chairman is appointed by Government.

The Municipal Council controls the distribution of water throughout the City, and owns the reticulation, which is now 396.4 miles. The average daily consumption in 1922-3-4 was (apart from private wells) 4,172,000 gallons.

The sources of supply are four, viz.:—

- (a) From the Zuurbeekom Boreholes.—This water is partly dolomitic, partly from coal measures and sandstone, and the minimum reliable daily yield is about 5 million gallons. It is a particularly pure water, of quite moderate hardness (9.1).
- (b) From Klipriver Valley Wells.—These are 20 in number, each about 100 ft. in depth, and the water from several of them is dolomitic in character, the total hardness being about 25°. The water from other wells, where the dolomite is much fissured, is a mixture of dolomitic and infiltrated surface water. The yield from this source varies from 1½—5 million gallons per day, according to the seasonal rainfall.

- (c) From the Vaal River.—This splendid undertaking, together with the fine barrage across the river at Lindeque, designed by the late Mr. Wm. Ingham, M.I.C.E., supplies at present 5 million gallons per day from the intake at Vereeniging, but provision for pumping another 5 million gallons per day will be completed by the end of 1925; and the enabling Act permits of yet another 10 million gallons per day being taken from the river if necessary. Ordinarily this is a very good river water, but in the rainy season it becomes turbid, with a high total solids content of 90 per 100,000 or more, and with high figures for albuminoid ammonia and absorbed oxygen. After initial straining at the intake, it is pumped to the purification works, there treated with alum, passed through sedimentation tanks, in which it is delayed by means of baffles, then filtered through an installation of Patterson's gravity mechanical filters, and, finally, chlorinated (0.5 parts per million) and aerated.

The yield of these various sources (a), (b), (c) is pumped to the reservoirs at Zwartkopjes in the Klipriver Valley, the water from the Klipriver wells and Zuurbeekom is there chlorinated, and the mixture from all three sources is thereafter pumped to Johannesburg and the other Reef towns.

- (d) From Wells in Hospital Hill shale at Ellis Park and Natal Spruit in the City.—Yield about 100,000 gallons per day, supplied chiefly to the Berea Reservoir.

ZINC IN SHALLOW WELL-WATER AND IN 'MAREWU.'

In 1915, the Government Analyst (Dr. McCrae, Ph.D.) found 1.89 grs. of zinc and 0.02 grs. of iron per gallon in unpalatable water from shallow wells liable to contamination by effluent from gold-reduction works. Bacterially these samples were almost sterile. A month later a sample of thin fermented maize-gruel (marewu) made with this well-water, contained 1.7 grs. of zinc and 6.1 grs. of iron per pint. As in the cases recorded by Dr. Thresh in Essex (*Lancet*, 1915, Vol. II., p. 1098), no evidence was elicited of ill-health from the consumption of this water.

CHEMICAL AND BACTERIOLOGICAL EXAMINATIONS OF PUBLIC SUPPLY.

994 samples (245 chemical and 749 bacterial) were taken in the two years 1922-3-4 from the various sources, at different stages of purification, and as delivered. The results naturally varied slightly, but were, almost without exception, very good: and the keen eagerness of the late Chief Engineer (Mr. W. Ingham) and of his successor (Mr. C. E. Mason) to spare no effort to safeguard the supply and deliver it up to the highest standard of quality has been unremitting and most comforting to the writer, who desires to acknowledge most cordially their unfailing co-operation and courtesy during many years of official association.

In the following table is set forth, from the figures for many years, representative results of chemical analyses of the various sources of supply:—

REPRESENTATIVE RESULTS OF CHEMICAL ANALYSIS OF JOHANNESBURG WATER SAMPLES.
PARTS PER 100,000.

	Zaurebekom (Dolomite)	Vereeniging.		Wells in Klip River.			Rising Main of Com- posite Water of Zaurebekom, Klip River and Vaal River	Rising Main of Com- posite Water of Klip River and Vaal River (Present Supply)	Stalb St. Well (Shale)	Private Wells	
		Raw (Inner)	Rising Main	Western Section (Mixed Dolomite and Surface)	Southern Section (Dolomite)	Average				Shallow (Various)	Boreholes (Various)
Total Solids	12.16	89.2	18.01	22.0	55.6	38.8	40.45	22.24	18.0	9.73	8.3
Loss on Ignition	3.04									2.925	3.77
Chlorine	.4	1.7	.88	0.6	3.0	1.8	2.2	1.06	2.2	.4	1.0
Salphuric Oxide		1.85	.195	0.4	17.4	8.9	11.0	4.36	1.35		
Nitrates	nil	trace	trace	appreciable	trace	<i>Vide W. & S. Sect. results</i>	trace	trace	nil	nil	nil
Nitrites	nil	nil	nil	nil	nil	nil	trace	trace	trace	nil	nil
Saline (free Ammonia)	.0002	.0095	.0023	.0010	.0010	.0010	.0010	.0010	.0060	.0015	.0005
Albuminoid Ammonia	.0003	.0020	.0076	.0015	.0020	.0017	.0035	.0014	.0025	.0033	.0012
Oxygen Absorbed, 4 hrs. at 27° C.	.007	.695	.718	.005	.055	.030	.0025	.37	.005	.027	.0238
Hardness, Total	9.16	12.5	11.6	20.0	36.5	28.25	25.75	15.4	7.0	—	4.22
Hardness, Permanent	.97	1.1	0.8	2.5	24.0	13.25	14.25	5.2	6.0	—	1.3
Alkalinity	—	13.2	12.58	17.5	12.5	15.0	11.5	10.26	1.2	—	1.18

M.O.H. 1922-3-4.

Chemical
Composition
Johannesburg
Waters.

PUBLIC CLEANSING.

Cleansing.

The efficient administration of the various services for the removal of refuse in its wide sense is a question of primary importance to the health of communities both as regards (1) the general principles and methods adopted and (2) their satisfactory practical application to the various services.

Both in England, Scotland and other European countries and in South African cities, such as Capetown and Pretoria, the duty of the Medical Officer of Health in such matters is confined to

- (1) advising generally as to what principles and methods should be adopted and to making from time to time such suggestions or recommendations for their improvement or supercession as he may think necessary;
- (2) keeping himself closely acquainted with the general efficiency of these various services, as well as the nature and causes of shortcomings and failures, and communicating them to the Manager of these services;
- (3) arranging that the district sanitary inspectors shall report to the Cleansing Department failures discovered or complaints made to them and shall also co-operate with the scavenging overseers of their districts.

In short, the position of the Medical Officer of Health is essentially that of adviser and critic.

The actual carrying out of the various services for refuse removal necessitate the services of a Manager or Director, who must be a good organiser, with an expert knowledge of transport and able to control white men and natives. In England and Scotch cities, as already stated, and in the South African cities mentioned, this work forms no part of that of the Medical Officer of Health, and is the responsibility either of the City Engineer or of a special official appointed for the purpose.

The Medical Officer of Health referred officially before arrival in 1902, to the fact that the duties of the Medical Officer of Health did not include responsibility for the actual carrying out of the business details of these services. However, owing to the disorganisation then existing as the result of war conditions, he felt it essential to help personally in every way he could to get things right in this respect up to the date of the appointment of Mr. F. C. Gavin, M.R.C.V.S., as Manager in December, 1902. Thereafter, the whole actual administration of the scavenging services and the application of suggestions by the Medical Officer of Health became the sole duty of the Manager, Scavenging Department (Mr. Gavin), who has since had entire administrative and financial responsibility therefor, and he has discharged these difficult and constantly increasing responsibilities with conspicuous ability and economy.

In March, 1925, the Cleansing Branch of the Public Health Department became, by resolution of the Council, the Transport and Cleansing Department, the Manager being directly responsible to the General Purposes Committee. The work of this new Department includes:—

- (1) Provision of all animal transport required by the various Departments of the Council, *e.g.*, Town Engineer, Light and Power Works, Parks, etc.
- (2) Removal of Refuse, *viz.*:—
 - (a) Night-soil (pail service) and contents of domestic sewage tanks from unsewered districts and also from the underground workings on the mines.
 - (b) The contents of slop-water tanks from unsewered districts.
 - (c) Domestic and trade solid refuse.

Night-soil Removal Service.—This is nightly or tri-weekly, as requisitioned and paid for by the property owner. The pails are of a very efficient type (devised by Mr. Gavin and Mr. G. S. Burt Andrews, Town Engineer), stamped from a single piece of steel, with a double rim with a handle hole on each side. The pails used for the underground mine service have water-tight lids, which are clamped on.

Each pail, after removal, is scrubbed in hot water (by hand) with a very strong brush, then immersed in boiling creosote, lifted out by hooked handle and placed upon a grating, through which the creosote drippings run to a catchpit and are again used. The creosoted pails are then nested, and stacked in Scotch carts, by which they are distributed to the dwellings served, in readiness to replace the full pails, which are subsequently removed, the contents emptied into night-soil tumbrils, and the empty pails stacked and removed for cleansing. At first, tar was used instead of creosote, but it was found that it soon dried and did not repel flies as effectively as the creosote coating, which remains moist.

Sewage-tank Removal Service.—At a large and increasing number of houses in unsewered residential districts the water-carriage system has been installed, and as the underground discharge from septic tanks is no longer permitted, on account of the large number of wells in these districts, the sewage is conserved in a tank near the street boundary of the premises, the contents of such storage tanks are evacuated with little or no offence, as occasion requires, by a service of vacuum-tank vehicles and conveyed to specially constructed intakes at the nearest point of the sewerage system.

Domestic Waste-waters (except urine) from unsewered houses where sufficient land is not available for innocuous disposal by surface or sub-irrigation, is conserved in slop-water tanks, the contents of which are emptied by gravitation or bucketing into huge slop-tanks drawn by mules.

This service is often difficult, very costly, and often unavoidably objectionable; but under the conditions specified there is no alternative.

The slop-water tanks discharge their contents into the nearest sewage-intake on the line of sewers.

House refuse is removed in vehicles with sail-cloth or wire-netting covers by daily, tri-weekly or special service, and is disposed of at (a) destructors, or (b) pulverisers, or (c) tipping, *e.g.*, in the disused workings of the Nourse Mine and in isolated spots at Newlands, Forest Hill, Parkview and Orange Grove. Special attention is paid to keeping the working-face or faces of the tip narrow, to covering up the deposited refuse as far as practicable, to minimising fly-breeding and the risk of tips catching fire.

The pulverisers, which were adopted as the result of inspection, in 1914, of the Southwark installation by the Medical Officer of Health, have proved very satisfactory. The product is of low manurial value, but mixed in equal parts with stable manure is a valuable fertiliser, and is sold for 2s. 6d. per Scotch-cart load to farmers who remove it.

EFFICIENCY CHARTS FOR CLEANSING SERVICES.

For the purpose of these services the Municipal area is divided by the Cleansing Department into 17 districts, each with a day and night overseer, and in order to secure continuous and precise information as to district and general efficiency, two chart-records were instituted by the Medical Officer of Health in 1920, which have proved singularly informing and effective. One chart is headed horizontally with the names of the various districts and whether 'sewered,' 'partly sewerd' or 'unsewered.' In columns under the name of each district is entered each Monday the checked number of complaints made direct or transmitted to the Cleansing Department *re* night-soil removal (N.S.), slop-water (S.W.) and 'R' (dry refuse).

On a second chart is recorded for each district successively an analysis of the complaints made under 'N.S.,' 'S.W.' and 'R,' *e.g.*, in the case of 'N.S.' service, failures in removal, replacement of pails, of spillage, of leaking, etc. If the week's record of complaints for any district seem excessive, or if the aggregate for all districts exceed 30, the attention of the Manager is invited thereto: and it says much for his direction that the total rarely reaches that number in a city the size of Johannesburg.

NIGHT-SOIL DEPOSITING SITES: SELF-PURIFICATION OF.

For many years the Newlands depositing site was used for the burial of night-soil, three layers, with earth between, being deposited therein. This site has been disused since the end of 1906, that is, some 18 years. In 1911 (six years later) a number of trial holes were sunk, and the faecal deposit was still not only recognisable, but very offensive. Before and since 1911 this site has been cropped, and during the intervals between croppings there has been a very profuse growth of weeds and other vegetation. In March 1925, trial holes were again sunk to determine its fitness as a site for native dwellings. The results of inspection of fresh trial holes sunk to a depth of 6 to 7 ft. were very interesting. In each such trial hole greyish-coloured layers marked the site of the deposit, and from one of these layers a spadeful was taken in the presence of the Medical Officer of Health. On the spade it had no offensive smell, and pulverising the lumps made no difference. A box containing this soil was delivered the next day for examination by the Institute for Medical Research, and both the absence of smell (except that of ordinary garden soil) and the bacterial report indicate that the 'nitrification' or change in this soil during the last 13 years has been most effective.

The Medical Officer of Health reported that there is no reason now why this site should not have native quarters built upon it.

M.O.H. 1922-3-4.

Cleansing.
Purification of
Depositing Sites.

SEWERAGE.

The "separate" system of sewerage exists in Johannesburg in view of the seasonal and often tropically heavy rainfall.

Storm-water, apart from that portion which evaporates or is absorbed, is dealt with by some 60 miles of constructed storm-water drains and culverts, designed to carry off from 2 to 2½ inches per hour to the city's natural drainage outlets, viz., Natal, Fordsburg and Bezuidenhout Valley spruits.

Domestic and industrial sewage from 15,375 premises is delivered to Klipspruit irrigation farm by a system of modern sewers 137 miles in length.

SEWAGE DISPOSAL.

Klipspruit Farm, about 10 miles west of Johannesburg, by Section II. (1) of Private Ordinance, 1906, is included within the Municipal Area of Johannesburg. It was bought in 1904 for £84,500, and is used for the treble purposes of a sewage farm, of a native location and of a large native washing site. It is 2,642 acres in extent, of which about 900 acres are irrigable by gravitation: but by the use of flumes and pumping roughly another 100 acres and 200 acres respectively, could be utilised, making, say, a maximum area of 1,200 acres if required. At present, however, only 600 acres are in use. Obviously, therefore, there is, for the time being, ample provision for dealing with the results of further extension of water-borne sewage in Johannesburg. The soil consists of 12in. to 18in. light sandy loam over coarse gravel of varying depth, the underlying rock being amygdaloid diabase, which outcrops at various points, and in its turn overlies dolomite.

Fairly full details of the establishment of this farm are recorded at page 33 of the Medical Officer of Health's Report for 1916-19, to which those who desire further information are referred. It is, however, desirable to repeat that the suitability of this site was duly investigated and approved by a Transvaal Government Commission in 1904, which found, on the geological evidence of Dr. Hatch D.Sc., that there was no danger of pollution by passage of sewage through the diabase of the water supply which the Rand Water Board derives from the underlying dolomite in the Klip River Valley south of the farm: also that it was unlikely that there would normally be any appreciable run-off of sewage matter into neighbouring streams, and that, if this occurred in times of flood, the sewage matter would be so diluted with storm-water that such pollution would be negligible.

In November, 1907, this farm was brought into use, and with nearly 18 years' subsequent experience and maintained observation, including that of two severely fought actions in 1907 and 1911, the Medical Officer of Health knows of nothing to invalidate the Commission's finding.

PRESENT CONDITIONS.

Flow of Sewage.—The daily flow of sewage is now from three to four million gallons in dry weather: in wet weather it has exceeded five million gallons. The period of maximum flow is from 10 a.m. to 12 noon.

Nature of Sewage.—The sewage to be dealt with is extremely strong, owing to the cost of water, the relatively small number of water-closets and the tipping of pail-contents into the sewers at the various 'intakes.' In the following rough comparison with English crude sewage, the term '*dissolved solids*' refers to solids which, like salt or sugar, disappear from sight in the liquid, but are, nevertheless, there; '*suspended solids*' may be compared to tea-leaves floating in tea: '*total solids*' include both '*dissolved solids*' and '*suspended solids*':—

	English Cities. (Per 100,000 Parts of Sewage.)	Johannesburg.
Total Solids	60 to 196	300 to 700
Dissolved Solids	39 to 129	140 to 158
Suspended Solids	21 to 67	132 to 565

Screening.—The sewage on emerging from the outfall sewer passes through two screens of nearly vertical iron bars with interspaces of respectively ¾in. and ½in. These screens are primitively but effectively cleaned by hand-raking, and the screenings are trucked to a depositing site and removed by farmers.

The Medical Officer of Health attaches very great importance to the effectiveness of the screening process.

Treatment of Sewage.—This consists of (a) screening, (b) passage through detritus tank, (c) continuous rapid sedimentation (4—6 hours), and (d) intermittent surface-irrigation.

For the latter purpose the irrigable land is divided into 26 areas, and the tank effluent applied to these areas in such a manner as to permit of adequate periods of rest.

The sewage-carriers are some 25 miles in length, of which over 9 miles have been lined with concrete half-tubes; the cost—10s. per running yard—is recouped within 12 months by the lessened cost of cleansing.

Rye grass has been found of exceptional value in securing the even distribution of sewage on the irrigated land and in preventing the formation of runnels.

Irrigation is only carried on during the day time, the night flow of tank effluent being held up in a reservoir of one million gallons capacity. The object of this is to minimise risk of sewage finding its way, through possible neglect, into streams before having been efficiently applied to the land.

On 30th August, 1924, the Medical Officer of Health noticed slimy brownish-green growths on the floor of the night reservoir. Dr. Annie Porter, D.Sc., of the S.A. Institute for Medical Research, reported that these contained actively motile specimens of *Trichomonas hominis* (which is often associated with flagellate diarrhoea) and a few flagellates, probably *Bodo* (*Prowazekia*) *parva* and the ciliate, *Colpidium striatum*, both of which might aid in forming a zoogeal scum. Ova of *Tania saginata* and of *Ascaris lumbricoides* were also present in small numbers.

Filtration Area.—Immediately adjacent to the sedimentation tanks an area of 13 acres in extent has been levelled and under-drained for the purpose of dealing rapidly, in times of very heavy rain, with sudden great increases of tank-effluent, and of subjecting such sudden increases to rapid land-filtration, where it is liable to be rapidly swept by tropical downpours from the irrigation areas into streams.

The very high figure for evaporation (75in. per annum) is, of course, a great factor in favour of land treatment of sewage in South Africa.

Percentage purification effected by treatment.—The average results of the analysis of 21 monthly sets of '24-hour' samples are interesting:—

			Parts per 100,000.		
July, 1922—June, 1924.			Before Screening.	Final Tank Effluent.	Percentage Purification.
Total Solids	...	...	311.61	143.66	53.8
Dissolved Solids	...	...	129.67	112.80	13.0
Suspended Solids	...	...	181.94	30.86	83.0
Chlorine	...	...	25.55	23.36	8.5

The chlorine variation ranged from a 15.7 per cent. increase to a 53.9 per cent. decrease.

Disposal of Screenings, Detritus and Sludge.—This amounts to over 25 tons per day. The screenings and detritus are trucked to a tip, from which they are removed by neighbouring farmers. The sludge is buried in the usual way in trenches, and owing to our favourable climatic conditions, no difficulty is experienced in disposing of it in this way.

Staff.—In addition to the Manager, Mr. S. Spencer, formerly of the Mersey and Irwell Rivers Board, and the Assistant Manager, Mr. B. R. Spencer, 24 white men are employed at 12s. 6d. per day and 30 natives at 2s. per day and quarters.

Since 1909, the Medical Officer of Health has been jointly responsible with the City Engineer for the conduct of the sewage farm, all executive orders going, of course, through the latter official. In this final report, therefore, it is opportune to record the entirely pleasant relations which have, without any exception, existed in this respect, and also to refer to the knowledge, intelligence and conscientious keenness with which Mr. S. Spencer has discharged his responsible and, at one time, very trying, duties as Manager.

TOWN PLANNING.

In 1922, the larger Municipalities and the Town Planning Association were invited by the Secretary for Public Health to approve model regulations for town planning in South Africa. The latter body, after conference with the Council's officials, submitted a draft code, but owing to legal and other difficulties, no material practical effect has yet been achieved.*

On the other hand, the important matter of open space about dwellings has been dealt with by the Council in conference with the Association of Transvaal Architects, the following provisions being agreed to in July, 1923:—

* *The Provincial Subsidies, etc., Act 1925* endows Provinces with wide powers re lay-out of new areas intended or believed by Provincial Executive to be intended for building plots; also for re-planning of partially-developed estates of unsatisfactory lay-out, with power of expropriation on compensation, by agreement or arbitration, in land or cash.

M.O.H. 1922-3-4.

Open space
about houses.
Housing

- (1) That as regards ordinary dwellings, hospitals and schools, the unbuilt-upon portion of the site be 40 per cent. gross and 24 to 34 per cent. nett.
- (2) That in regard to tenements (flats) at least 30 ft. to eaves, provided they are equipped with water-carriage, but not otherwise, the following less stringent requirements are permitted:

Fronting on one street—20 per cent. nett of site.

Fronting on two streets—15 to 20 per cent. nett of site.

Fronting on three streets—10.5 to 12.5 per cent. nett of site.

These requirements were duly embodied in the revised code of Building by-laws which has been in the hands of the Executive of the Provincial Council for many months. It is now, however, understood that they are about to be gazetted, and they are badly required, because under the existing by-laws (which they will replace) it is possible to create even greater crowding-on-site than exists already in many insanitary properties.

HOUSING.

HOUSING FOR EUROPEANS.

(Housing Act No. 35 of 1920.)

In June 1923, the Council received from the Central Housing Board copy of Circular No. 5 of 1923, No. 178/86/182, stating in effect (a) that the sum of £1,000,000 was now available for European housing throughout the Union; (b) that the Government's object is to assist the man of "very limited means" to secure his own house; (c) that loans should be in respect of dwellings costing not more than £1,000, exclusive of ground, or, in exceptional cases, £1,250, exclusive of ground; (d) that interest should be at the rate of 5 per cent. per annum.

On 3rd July, 1923, the Council resolved:—

"That the Central Housing Board be requested to allocate to the Johannesburg Municipality the sum of £200,000 under the Housing Act No. 35 of 1920, to meet the requirements of applicants as set out in the Housing Board's Circular No. 5 of 1923."

On 1st August the Housing Board thereupon suggested an early conference with the Council, in order "to be placed in possession of the full facts, including the views of the Council's Medical Officer of Health and the Town Engineer, so as to enable it to gauge what exactly the present housing needs are in respect of the European population."

Pursuant to directions to report without delay, the Medical Officer of Health issued instructions for the enumeration of "empty dwellings in the poorer or less expensive districts where the less skilled workman and less prosperous artisan seek housing," viz.:—

Newlands, Brixton, Mayfair, Vrededorp, Fordsburg, Burghersdorp, Braamfontein, Ferreira's, Marshalls, City and Suburban, Jeppe's South, Jeppe's Extension, Wolhuter, Denver, Malvern, Fairview, Troyeville, both sides of Bezuidenhout Valley, including Kensington South, Doornfontein (New and Old), Hillbrow, Hospital Hill, Bellevue, Bellevue East, Orange Grove, Norwood and Orchards, Booyens, Ophirton, Southern Suburbs,

such empty dwellings to be classified under the following headings: (a) Townships; (b) Accommodation (2 rooms, 3 rooms, 4 rooms, 5 rooms, not including k.p. and b.r.); (c) Rent per month.

The Medical Officer of Health subsequently discussed the matter with (a) leading house agents; (b) the Rent Board; and (c) the Health Visitors.

The result of the special enumeration showed that in addition to 32 houses nearing completion, there were 322 empty dwellings, viz.: 38 two-roomed, 148 three-roomed, 91 four-roomed and 45 five-roomed, and that the rent varied from £2 10s. to as much as (in the case of five-roomed houses) £12 per month.

The Real Estate Agents regarded the existing provision as generally sufficient, except within the one-mile limit, where, however, it would be both difficult and expensive to get building sites. It was further found that in many instances two small families occupied the same dwelling, to save both in house rent and house-keeping charges. It was considered, too, that any shortage which existed was capable of being sufficiently and reasonably met by private enterprise, and the Town Engineer's return showed that no less than 734 houses had been completed in the seven months ending 31st July, 1923.

The members of the Rent Board while not questioning the return of empty dwellings, emphasised that in many cases these dwellings were of inferior quality and in a bad state of general repair; but careful individual inspection demonstrated that those incapable of satisfactory repair were negligible in number. The Board, moreover, deprecated the close housing association of poor whites with native and coloured persons, and quite spontaneously stated that the necessity for assisted

white dwellings, whatever it might be, was relatively negligible compared with the urgency for the segregation and decent housing of natives, a view which the Medical Officer of Health entirely and unreservedly shared. The Rent Board further expressed the opinion that if any loan assistance be accorded, it ought to be limited to applicants whose income does not exceed £35 or, in exceptional cases, £40 per month, and that the maximum amount of the loan in Johannesburg in any circumstances be £750.

In view of the foregoing facts and considerations, the Medical Officer of Health submitted the following conclusions:—(1) That there is little or no Public Health necessity or justification for State-aided housing for Europeans in Johannesburg; but (2) that the conditions of European housing in certain of the central poorer districts would from the Public Health point of view (apart from any other) be greatly improved by the provision, in locations or native villages, of adequate suitable housing for natives and their removal from close residential association with poor whites.

SLUM PROPERTY.

No material betterment herein was practicable during 1922-3. As reported to the Health Committee (30th June, 1919), there have long been a large number of premises scheduled as unfit for human habitation: but the crowded population of these places consisted almost exclusively of Natives and Coloured persons for whom no accommodation elsewhere was available, and, therefore, the Medical Officer of Health was not prepared to certify them for closure unless definitely instructed to do so by the Committee. In addition, it is possible under the Building By-laws at present in force to crowd dwellings on site to an extent even greater than that which exists in some of the worst slums. This danger will be removed by the revised code of Building By-laws, which has been for many months in the hands of the Executive Council, but, till it is gazetted, it is inadvisable to take further action.

HOUSING OF NATIVES.

During the past five years very considerable addition has been made to the provision of Native Housing by the Council, and the following details as to the present position have kindly been supplied by the Superintendent of Locations, Mr. C. W. James:—

SITUATION.	ACCOMMODATION.			CAPITAL COST (Approximate).
	Completed.	Building.	Projected.	
Western Native Township	627 Houses (2-Roomed). 36 Single Rooms, 96 Nissen Huts	42	258	£143,100
Wemmer Barracks ...	1,000 Beds	640	—	£46,624
Salisbury-Jubilee Barracks ...	900	—	—	Rented by Council
Eastern Native Township	—	—	200 Houses	£2,724

The estimated expenditure, 1925-26, is £31,368, and the estimated revenue £20,763.

The accommodation at the Western Township and at the Wemmer Barracks is particularly good of its kind.

At Klipspruit Location some 5,500 Natives (2,500 adults and 3,000 children) are accommodated in single or married quarters, tank-huts and 2-roomed houses. Amongst those who cannot afford brick houses, the semi-circular tank-hut seems to be the most popular, and the sum of £12,000 has recently been voted for 300 of an approved type of this dwelling.

POSSIBLE NATIVE HOUSING FUNDS FROM SALE OF KAFFIR BEER.

In view of the very heavy capital and maintenance expenditure which Native Housing involves, the Medical Officer of Health ventures to express regret that the Council, after extremely careful consideration of all sides of the question, and in view of various hostile representations made to it, did not feel itself justified in undertaking the monopoly of manufacturing and selling Kaffir Beer in its District, which monopoly is provided for by the Natives (Urban Areas)

M.O.H. 1922-3-4.

Housing.
Native Housing.
Native Housing
Funds from
Kaffir Beer.

M.O.H. 1922-34.

Kaffir Beer.
Native Abattoir.
Segregation
of Natives.

Act, Section 20. In reporting generally to the Parks and Estates Committee on the question in September, 1924, the Medical Officer of Health quoted the finding of the Mining Regulations Committee in 1910, as follows:—

"That Kaffir Beer, properly made and consumed in moderation, is a very wholesome and entirely permissible beverage for those Natives who are accustomed to it, but we think that its manufacture should be carefully supervised."

Good Kaffir Beer is a valuable and natural food for Natives, possesses distinct preventive and curative properties in respect of scurvy, and contains the same bacillus as that in Metchnikoff's curdled milk or bacillogen, which is a staple food amongst some of the hardiest and longest living races of the world.

In view of the foregoing, of the need of large sums of money for Municipal Housing of Natives, and of the large revenue derived by Durban from its regulated manufacture and sale, the Medical Officer of Health hopes that some day the Council may perhaps see fit to reconsider the matter.

NATIVE ABATTOIR AT KLIPSPRUIT LOCATION.

Klipspruit Farm, including the Location, is situated some 11 or 12 miles from the Johannesburg Municipal Abattoirs. It is, nevertheless, in terms of Ordinance No. 11 (Private) 1906, S. 2 (1), within the Municipal Area, and therefore subject to the provisions of Chapter VIII, 2 of the Public Health By-laws, which provide that no person, except for his own or his family's consumption shall slaughter within the Municipal Area elsewhere than in the Municipal Abattoir, any animal the flesh of which is intended for the food of man.

The strict enforcement of this By-law means that Natives have to drive their animals 11 or 12 miles to the abattoirs, pay certain charges and then cart the meat 11 or 12 miles out again. In 1921, representation herein was made by the Native Advisory Committee as to the hardship involved and the Medical Officer of Health has repeatedly brought it to the notice of the Health Committee since that time, with the recommendation that a suitable disused building at the Native washing-site be adapted for the purpose, at an estimated cost of some £50.

Nothing effective has, however, been done in the matter, and the Medical Officer of Health therefore wishes again to emphasise this necessity strongly, and to point out that its absence encourages illicit killing in the neighbourhood, because outside the boundaries of the Council's farm, the prohibitive By-law does not apply.

SEGREGATION MEASURES UNDER THE NATIVES (URBAN AREAS) ACT, 1923.

Shepherding of Natives in Johannesburg to Locations.

Since 1901 and probably before, the housing of Natives (other than domestic servants) amongst white people, has been a standing cause of objection and complaint. Repeated efforts have been made by the Medical Officer of Health to deal with this matter. These efforts, however, proved quite ineffective for two reasons.

The first was that the wording of Section 41 (76) of the Johannesburg Private Act, No. 2 of 1906, compelled only those Natives "not residing on the premises of their European employers" to live in locations, and the Council's subsequent inability to secure an amendment of the law restricting exemption to *bona fide* domestic servants only. The result was that employers, genuine and otherwise, themselves hired dwellings, which thereby became for the time being the "premises of European employers," in which large numbers of Natives other than domestic servants were housed.

The second difficulty was the almost entire absence of suitable accommodation for Natives evacuated from their dwellings, except at Klipspruit Location, at the inconvenient distance of 12 miles from the city.

In 1923, however, the Natives (Urban Areas) Act was passed, and on 12th December, 1924, the application of its segregation provisions (Section 5) to Johannesburg was gazetted in Government Notice No. 301, 1924. The effect of this section is, as regards urban areas in the Transvaal, that the only Natives (including women and children) exempted from residence in locations are—

- (1) Registered owners on 25th November, 1924, of immovable property within the urban area, rateable at £75 or more, and the wife, minor child, unmarried daughter, or *bona fide* dependant of such owners.
- (2) *Bona fide* domestic servants.
- (3) Any Native for whom his employer has provided outside a location, Native village or hostel, accommodation approved by the local authority.

- (4) Any Native temporarily or permanently exempted by the local authority. M.O.H. 1922-3-4.

Native
Segregation
Measures.

Complementary to the new segregation provisions is that which, under Section 1, empowers the Minister to require local authorities to provide locations or/and native villages and/or hostels for the Natives in their district: and as obviously this obligation, if unqualified, would impose an enormous burden on the local authority, Section 2 (1) empowers the local authority to require every employer (including Government) of more than 25 Natives and any employer of Natives on work of a temporary nature to provide or hire accommodation for his Natives, subject to the approval and under the control of the local authority.

The nett effect of this alteration of the law is that Johannesburg is now, for the first time in its history, in a position to commence effectively the removal of Natives to locations, hostels, etc.

It should, however, be most clearly understood that this Act applies to Natives only: that a Native is defined as "a member of an aboriginal race or tribe of South Africa": and that neither under this nor any other statute does the Council possess, nor has it possessed at any time, any power whatever to regulate the choice of place of residence of Coloured people, whether Indians or "Cape." Moreover, the Council has no concern whatever with the enforcement of prohibitive clauses in township owners' private leases in regard to residence of Coloured persons. A clear conception of these definite facts will obviate much misconception and, it is hoped, also much of the usual reckless abuse of officials.

Some months ago, in anticipation of the application of the new Act, the Chief Native Commissioner requested the Council to authorise some one to confer and co-operate with the Native Affairs Department. The Town Clerk, the Medical Officer of Health, and the Superintendent of Locations were accordingly nominated.

Very serious consideration was given to the selection of the first site, and the fact that the Malay Location has for many years past been regarded by the Medical Officer of Health as a menace to the health of the community, appeared to indicate that district as the first one from which Natives should be evacuated. But, as the Council has no power whatever to prevent Malays and other Coloured people from living in the Location, and as these Malays etc., are not under the same medical control as Natives and are more liable to introduce infection, it was considered that the displaced Natives would be replaced by Coloured people, so that the last state of the Location might possibly be worse than its present state.

The first area to be delimited for segregation operations was a White residential district in New Doornfontein, which had become badly infiltrated by Natives. A census was taken by the Medical Officer of Health's Staff and early in January, 1925, notices framed by the Medical Officer of Health in terms of the Act were served on all non-exempted Natives, giving one month's warning to obtain accommodation in a Municipal location or barracks, and advising property owners of the liability to heavy penalty for sheltering Natives in contravention of the Act.

In addition, the pass numbers of these Natives and the names and addresses of the property owners so warned were supplied to the Native Affairs Department and Police, so that those who were subsequently found to have failed to comply with the terms of the warning could be prosecuted.

Further, a list was prepared of insanitary rooms thus vacated for amendment or closure, and of unauthorised shacks for removal.

At the same time, the Health Committee defined the general grounds on which exemption from segregation may be sanctioned under Section 1 (1) (e) of the Act, viz., (1) where employers have provided, or are prepared to provide in non-residential districts, approved and properly supervised accommodation for their Natives; (2) where Natives are necessarily employed in the care of animals after working hours; (3) where Natives' services are required at very early hours in the morning on premises inconveniently distant from hostels and barracks.

In March, 1925, the delimitation of a second area was decided upon, in which the Chief Native Commissioner, in sympathy with strong feeling in adjacent districts, included a portion of the Malay Location, and also a small area adjacent to the Doornfontein district already referred to.

In the course of this segregation work, the interesting point has arisen whether Natives employed in restaurants in kitchens and cleaning work are 'domestic servants.' In view, however, of the very large number of Natives to be accommodated, which will heavily tax the resources of the Council, the Chief Native Commissioner, in whom is invested the legal enforcement of segregation, has advised that, for the time being, the term 'domestic servant' be very liberally interpreted where proper housing and supervision are provided.

M.O.H. 1922-3-4.

Native
Segregation.
Licensed Places.

It would appear, moreover, that the wording of Section 5 (2) (c) does not compel an employer, as one hoped it would do, to house his domestic servant on his domestic premises. All that is stipulated is that "sleeping and sanitary accommodation to the satisfaction of the urban local authority has been provided by his employer." This should be noted as a point for future amendment.

A further interesting question has been raised by application of the owners of certain townships already occupied by Natives or Coloured people to have them proclaimed "Native Townships." But the Act provides only for "Native Locations" and "Native Villages," which cannot be privately owned, but must be owned and controlled by the Council. It is, however, possible to apply under Section 5 (2) (h) for the Council's necessary concurrence to an application to the Minister for approval of these townships as areas for the residence of Natives. But the Medical Officer of Health advised the Parks and Estates Committee that such concurrence would mean the establishment of private locations over which the Council would not possess the very desirable special control which the Act provides for locations and Native villages. He suggested that the Council decide its general policy in the matter, and if it chose to approve such applications at all, to do so conditionally on the exclusion of Whites and Coloured persons from such areas. It was further suggested that, in the meantime, the Natives already living in these townships be not for the present interfered with, but that newcomers thereto receive temporary permits under Section 5 (2) (j).

The Parks and Estates Committee, on 5th May, 1925, resolved to inform the owners that it was not prepared to concur with any such applications.

Up to the present, the full desired result of these 'shepherdings' or 'drives' has not been realised, for many of the evicted Natives have failed to secure accommodation in Municipal locations and barracks, and have migrated to other parts of the city. The Chief Native Commissioner and Police have, however, been supplied with the names and pass numbers of those who have secured and retained Municipal accommodation, and those who have failed to do so will now be prosecuted by Government when run to earth. Several successful prosecutions have already been instituted, including one of a White property owner for "harbouring" Natives; but much more energetic police action is necessary if the Council's efforts are to be successful.

LICENSED PLACES.

In the two years from 1st July, 1922, to 30th June, 1924, 4,804 applications for licences of various kinds have been dealt with each year, the premises in question being in all cases carefully examined as to sanitary requirements.

	1922-24.		
	Granted. 5219	Refused or not taken out.	Total.
1. Tea Shops, Eating Houses, Restaurants, etc.	1,290	62	1,352
2. Dairies	322	54	376
3. Milkshops	191	35	226
4. Butchers' Shops	520	59	579
5. Private Cowkeepers	397	74	471
6. Bakers and Confectioners	84	6	90
7. Permits to introduce Milk	319	46	365
8. Kaffir and Asiatic Eating Houses	155	22	177
9. Nursing Homes	29	—	29
10. Laundries	69	11	80
11. Ice Creameries	492	55	547
12. Noxious or Offensive Trades	250	39	289
13. Aerated Water and Ice Factories	29	3	32
14. Hairdressers and Barbers	170	21	191
	4,317	487	4,804

Right of Appeal against Granting of Licences.

M.O.H. 1922-3-4.

The Medical Officer of Health has more than once commented on the anomaly that whilst any applicant can appeal against the Council's refusal to grant a licence, the Local Government Ordinance does not extend this right to neighbours prejudiced by the granting of any such licence, even where the conditions contravene the by-laws.

Appeals against
Licences.
Prosecutions.

It is therefore satisfactory that the draft Ordinance to be introduced in the coming Session of the Provincial Council will contain the following amendment:—

"Provided that any person interested who may feel himself aggrieved at the granting of any licence by the Council, or any applicant for a licence whose application has been refused, may appeal against the Council's decision to the Magistrate, and in the event of the Council failing to satisfy such Magistrate on the appeal that the licence was granted or refused on good and sufficient ground, such Magistrate may order the Council to cancel or grant such licence as the case may be, and such licence shall be cancelled or granted accordingly. The decision of the Magistrate given on appeal to him hereunder shall be final."

PROSECUTIONS.

Two hundred and forty persons were prosecuted for various breaches of the Sanitary Regulations, 198 were convicted, and fines aggregating £965 were imposed. Particulars are appended:—

BY-LAWS INFRINGED.	Race of Accused.			Totals.
	Whites.	S.A. Coloured.	Asiatic.	
Prevention of Nuisances	60	2	20	82
Sale of Food and Drugs	89	3	5	97
Dairies and Milk Shops	38	1	3	42
Kaffir Eating House	6	—	3	9
Butchers	9	—	—	9
Bakers	1	—	—	1
TOTALS	203	6	31	240
RESULTS—				
Convicted and Fined	163	6	29	198
Convicted and Cautioned	25	—	—	25
Dismissed	7	—	1	8
Withdrawn	8	—	1	9
AMOUNT OF FINES	£792 10 0	£28 0 0	£144 10 0	£965 0 0

This work is supervised by the Medical Officer of Health, under whose directions proofs of evidence, summonses, subpoenas and charge-sheets are prepared and handed to the Council's Solicitors.

M.O.H. 1922-3-4.

STAFF: MEDICAL OFFICER OF HEALTH'S DEPARTMENT.

Staff.
Acknowledg-
ments.

Medical: Medical Officer of Health, Assistant Medical Officer of Health, and Director of Venereal Clinic (part-time). In addition, Dr. Basil Melle has acted as Honorary Medical Officer to Child Welfare centres.

Office: Chief Clerk, whose position is now correctly graded: typist-correspondent, licensing clerk and typist, and two junior clerks.

Inspectors, etc.: Chief 1, Plans 1, District 17, Mines 2, Town Dairies 1, Outside Dairies 2, Food and Drugs 1, Infectious Disease 1, Disinfecting 4, Health Visitors 4.

Rat-catchers: 2 permanent, 14 men and 14 youths temporary.

The Staff is adequate (with a fifth Health Visitor added). Speaking generally, its personnel is keen and competent, and the Medical Officer of Health tenders his sincere thanks to its past and present members, professional, technical and clerical, for their fine work during his long period of association with them. Experience, however, very definitely shows (in the Medical Officer of Health's opinion) that the physical activity and, therefore, to some extent, the keenness of average Inspectors commence to lessen at or about 50, and that this class of official should be retired at 55, a recommendation which applies with at least equal force to Health Visitors. The conditions of the Council's service are particularly good. The Council is therefore entitled to the very best service-years of young active people in the prime of life, and the maximum age-limit on joining, for both Inspectors and Health Visitors, should certainly not exceed 30. It is not, moreover, from the practical working point of view, by any means in the best interest of the Council's work that persons already in the service of the Council in other Departments, who happen to possess a Sanitary Inspector's certificate, should therefore be accorded preferential consideration when a vacancy arises, to the virtual exclusion of outside men with superior technical qualifications, such as the training and experience of an architect, builder's foreman and certain building mechanics. Lastly, as regards junior clerical recruits, the Medical Officer of Health begs to repeat the general suggestion made to the Grading Committee of 1922, that these be selected by competitive examination, as in the English Civil service and the London County Council.

ACKNOWLEDGMENTS.

The Medical Officer of Health, in this final report, desires to acknowledge fully and gratefully, the sympathetic and unfailing support during the last twenty-four years of the Medical Profession in Johannesburg: also the uniform consideration of the Secretary for Public Health (Dr. J. A. Mitchell) and his Department. As regards the South African Institute for Medical Research and the Government Analyst's Department, it would be difficult to overstate the immense value and practical help of both the routine services and the special skilled advice (and often investigation) which have invariably been most courteously and promptly accorded by Dr. Watkins Pitchford, Sir Spencer Lister, Dr. Pirie, Dr. Annie Porter D.Sc., and Dr. John McCrae Ph.D. (Government Analyst). Their counsel has exposed many a pitfall and cleared up innumerable difficulties and uncertainties. As regards Municipal colleagues, one recalls the privilege and inspiration of working with Mr. Lionel Curtis and Mr. (now Judge) Feetham, C.M.G., as Town Clerks: whilst almost daily collaboration with Mr. G. S. Burt Andrews, M.I.C.E. (City Engineer), Mr. E. J. Waugh (Building Surveyor), and Messrs. Gavin and Jervis of the Transport and Cleansing Department, has been an uninterrupted help and pleasure. The Medical Officer of Health is also deeply indebted to the Directors of Native Labour (Colonel Pritchard and Major Cooke), to Dr. R. P. Mackenzie, C.M.G., and to the Government Mining Engineer (Sir Robt. Kotzé) and the Mine Managers without exception, for their long friendly and valuable co-operation in matters of housing of natives, venereal clinic, hospital and maternity and child welfare, and mines sanitation respectively. His obligation to the Chairman and the late and present Chief Engineers of the Rand Water Board has been referred to at p. 46. It remains to thank Dr. Mehliß of the Rietfontein Hospitals for his ever-ready and exceptionally able diagnostic help in dealing with smallpox: and lastly the daily and weekly Press for their willing and valuable support in all important health matters.

IMPORTANT MATTERS REQUIRING SPECIAL ATTENTION.

M.O.H. 1922-34.

The Medical Officer of Health begs, in conclusion, to direct the Council's attention to the following important matters:—

Important matters.

1. The high maternal-mortality-rate of Johannesburg and the necessity for its reduction by the provision, in conjunction with the Hospital Board and the University, of a system of District Midwifery Nursing and Training (see pp. 9-10).
2. The segregation of Natives living amongst Whites in the Municipal area by the continued application of Section 5 of the Natives (Urban Areas) Act, 1923, in co-operation with the Departments of Native Affairs and Police: and concurrently
3. The Closing and Demolition of Slum Property.
4. The continued extension of the Water-Carriage System of Sewage Disposal both in the mining and non-mining districts.
5. Additional Fever Hospital Accommodation (see p. 32).
6. Additional Accommodation for the Venereal Clinic (see p. 22).
7. The necessity for just and up-to-date powers, on the New Zealand lines, for the Acquisition of Land, etc., required for approved Public Purposes.

CHARLES PORTER M.D., LL.D., D.P.H.,

Barrister-at-Law,

Medical Officer of Health.

19th July 1925.





Act.

