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INFANT MORTALITY, TUBERCULOSIS, VENEREAL DISEASES

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The prevention of infant sickness and mortality and the combating of tuberculosis and venereal diseases have come to be, in this country as in many others, functions of the local authority. They are wide subjects, and within the limits of this paper I can only refer to certain aspects of them in which I am particularly interested. I propose to deal with them mainly in the light of experience in Cape Town, and by way of comparison to refer to English conditions, with which I also have some acquaintance.

The three subjects have one character in common, viz., that they are closely related with social welfare. The problems in Cape Town are to a great extent determined by the presence of a large population of Cape Coloured people, in whom the social-welfare factor assumes great importance.

The population of Cape Town is almost equally divided between Europeans and non-Europeans, and outside the Native location at Langa, the Cape Coloured make up more than nine-tenths of the non-European section. The non-European vital statistics that will be quoted refer to the non-European population of the City exclusive of Langa location, and they differ so slightly from those of the Cape Coloured section alone that they may be read as applicable to the Cape Coloured.

INFANT MORTALITY

The infant welfare movement dates from the end of the nineteenth century. Sanitary reform had been in active progress since the middle of the century and the reform policy had been in full operation in England from the time of the passing of the Public Health Act of 1875. Between that year and the end of the century the fall in the general death rate had been well under way, but no reduction had taken place in the heavy mortality amongst young children indicated by the infant mortality rate (see Table I). By the end of the century attention became focussed on the enormity

and persistence of the prevalent infant mortality. It was realized that scores of thousands of infant lives were being thrown away every year, and that this "massacre of the innocents" was preventable. Moreover, permanent damage was being wrought on the physique of the survivors. A sense of national responsibility for this state of affairs sprang up, which had hitherto been lacking. It was a resurgence of the reforming zeal of Chadwick's day. Voluntary infant welfare associations were formed, and eventually the prevention of infant mortality became a settled part of the responsibilities of local authorities and the central government.

Another element in the campaign was the earlier "infant life protection" movement. This took its origin in the revulsion of public feeling which was caused by the revelation of baby-farming horrors and resulted in the passing of the Infant Life Protection Act in 1872. In South Africa the first Infant Life Protection Act (Cape) was passed in 1907, and the Child Life Protection Society of Cape Town was instituted at about the same time.

The infant life protection movement was directed against deliberate cruelty and neglect and was mainly interested in the "unwanted baby": But with the coming in at the end of the century of the infant welfare movement, which was concerned with the health of babies in normal family life, the interests of the two movements were fused in infant welfare in its wider sense. The Cape Town society concerned itself from the first with the institution of infant consultations as well as the police work associated with the name "infant life protection".

The successful rearing of a healthily born baby is a task well within the compass of a mother living in reasonably favourable conditions, provided she is instructed in the methods that are to be followed and has expert advice and help available when difficulties arise. The awful infant mortality of the nineteenth century was due to a widespread ignorance of proper methods, extending through all classes of society from the highest to the lowest, and aggravated by the miserable and insanitary conditions in which the poorer classes lived. The lines along which the infant welfare movement developed were determined by these considerations. Its principal features were (1) the spread of knowledge about infant rearing amongst mothers by various means of propaganda, (2) health visiting, and (3) infant welfare centres.

HEALTH VISITING.—Health visiting appears to have been first practised in Manchester, where in 1862 a voluntary association appointed unpaid visitors for the guidance of mothers, and later employed paid visitors to supervise their work. In 1890 the visitors were placed under the direction of the medical officer of health and became municipal officials. Other English local authorities followed with the appointment of health visitors. Florence Nightingale, writing on the subject in 1901, drew attention to the difference between health visiting and sick nursing, and foresaw in health visiting a new profession for women. Special

training and qualifications for health visitors have since been organized. In its inception the work was by no means confined to nurses, but more and more it has come to be an extension of the nursing profession.

Many thousands of health visitors are now employed in different countries. Their work is not restricted to child welfare only, and in America the corresponding officials are known as public health nurses.

With the growth of health visiting it was found necessary to secure early information of all births, and compulsory early notification of births was introduced in 1907. The same principle was brought in in South African towns in 1920 and subsequently.

WELFARE CENTRES.—The infant welfare centre is an institution where the kind of work done in the homes by health visitors is centralized, supplemented and elaborated under medical control. It has developed around the "infant consultation", which is a weekly session where mothers are encouraged to bring their infants for medical examination and advice. The first infant consultations were started in 1892 in France, where they became associated with infant milk depots. The idea spread in neighbouring countries, and in England infant milk depots were started in 1899, and welfare centres much on the modern lines at St. Marylebone and St. Pancras, London, in 1906 and 1907.

Around the infant consultations many other activities have gathered. The consultations were extended into the pre-school age. Then, in order to combat neonatal mortality, which is largely due to pre-natal causes, sessions were established for expectant mothers under the name of pre-natal clinics. These naturally became centres for maternal welfare, and were linked up with maternity and gynaecological hospitals and with the municipal control of the practice of midwives. A beginning has been made with post-natal sessions for mothers, designed to obviate the disabilities that may follow confinement. Syphilis is a major cause of abortion and miscarriage, and of debility in the infant, and dramatic results are obtained by anti-syphilitic treatment of the pregnant woman, which is undertaken at the pre-natal clinics. Dental sessions are added for mothers and pre-school children, sometimes remedial exercises and massage, and in the relatively sunless climates of some European cities sessions for ultra-violet irradiation. To cover these various activities the centres are now known by the more comprehensive name "maternal and child welfare centre".

Provision is usually made at the welfare centre for the supply of dried milk, etc., for infant feeding, and in some centres meals for undernourished mothers and children.

The welfare centre may also serve as the headquarters of the health visitors working on the district. It provides a place where the health visitor can meet her mothers and children by appointment; and as far as possible she assists at the sessions where they attend, and thus can maintain intimate touch and where necessary follow up into their homes the advice given at the centre.

In some cities the welfare centres serve also as clinics for school children and headquarters for school medical work.

CAPE TOWN MATERNAL AND CHILD WELFARE SERVICE.—Cape Town was early in the field of child welfare. Dr. A. Jasper Anderson, medical officer of health, had in 1902 secured the appointment by the town council of a nurse to undertake health visiting duties. He was prominently associated with the formation of the Child Life Protection Society in 1908, and in 1914 infant consultations were instituted by the Society in conjunction with the City Health Department. Three years later the consultations were taken over entirely by the Department, and in 1920 a full-time lady medical officer was appointed to take charge of child welfare.

To-day the full-time staff of the maternal and child welfare branch of the City Health Department includes three lady medical officers and one dental officer, and their services are supplemented by part-time medical and dental officers who undertake sessions at the welfare centres. The health visitors in this branch number 33. Thirteen welfare centres are maintained, at which some 60 medical (or dental) sessions are held every week, including infant consultations, toddlers' clinics, pre-natal and post-natal clinics, dental clinics, and clinics for school children (general, dental and ophthalmic). Plans have been drawn for four additional centres on the Council's housing estates, and other centres are projected. Last year the attendances at the consultations and clinics amounted to 141,068, of which 78 per cent. were made by non-Europeans, and attendances for free dinners and milk meals, etc., 156,464. The new cases coming to the infant consultations numbered 8,120 and to the pre-natal clinics 3,758. The number of non-European babies under one year old who were brought for the first time was 61 per cent. of the number of non-European babies born. The corresponding figure for European babies was 39 per cent. ; this figure, however, does not include those who attended the consultations for European babies provided by the Mothercraft Training Centre.

The reason why meals are provided is that there are many mothers and pre-school children, chiefly non-European, who are suffering from actual undernourishment due to poverty. They need food before advice. Dried milk and cod-liver oil for infant feeding are supplied to poor mothers at cost price ; in cases of great poverty the charges are remitted. As the result of this provision no suckling infant in the municipal area need go without its due nourishment, so long as it is in attendance at a welfare centre. Last year 64,280 lb. of dried milk was issued from the centres.

The high proportion of non-European attendances is due to the fact that 72 per cent. of Cape Town births are non-European. Except for two centres for non-Europeans and one for Europeans, all the welfare centres receive both Europeans and non-Europeans. The consultations for the two race-groups are held at different

times. Every service supplied by the City Health Department is open to non-Europeans as well as Europeans.

SOCIETY FOR THE PROTECTION OF CHILD LIFE, CAPE TOWN.—This Society undertakes much of the work under the Children's Act, including cases of cruelty or neglect and the administration of Government grants for "committed children" (other than those in institutions). It is a voluntary organization, employing a salaried staff. The grants paid out in the year 1939-40 amounted to £27,234. The Society also maintains within the City area the "places of safety" for European and Coloured children, the "emergency home" for European children, a dietetic hospital for European babies, and four centres for European infant consultations where in the year 1939-40 750 new babies were brought and 8,466 attendances were made.

The visiting of foster-children registered under the Children's Act, and other work under the Act, are undertaken by the City Health Department.

RESULTS OF THE INFANT WELFARE MOVEMENT.—The infant welfare movement has been accompanied by a decline in the infant mortality rate which must have exceeded the most sanguine expectations of its promoters. In England and Wales during the 35 years from 1900 to 1935 the rate fell from 156 to 62, a reduction of 59 per cent. The Cape Town figures show a decline in the 40 years from 1900 to 1940 amounting to 77 per cent. in Europeans and 58 in non-Europeans. (See Tables I and II, and Diagram 1.)

TABLE I
ENGLAND AND WALES.

Period	Birth rate per 1,000 population	Standardized death rate per 1,000 population	Infant mortality rate (deaths of infants under 1 year per 1,000 births)
1841-45 ...	32·3	20·6	148
1846-50 ...	32·8	22·4	157
1851-55 ...	33·9	21·7	156
1856-60 ...	34·4	20·7	152
1861-65 ...	35·1	21·4	151
1866-70 ...	35·3	21·2	157
1871-75 ...	35·5	20·9	153
1876-80 ...	35·3	19·8	145
1881-85 ...	33·5	18·7	139
1886-90 ...	31·4	18·5	145
1891-95 ...	30·5	18·5	151
1896-1900 ...	29·3	17·6	156
1901-05 ...	28·2	16·0	138
1906-10 ...	26·3	14·4	117
1911-15 ...	23·6	13·7	110
1916-20 ...	20·1	13·4	90
1921-25 ...	19·9	10·9	76
1926-30 ...	16·7	10·3	68
1931-35 ...	15·0	9·6	62

TABLE II
CAPE TOWN MUNICIPALITY.

Period	Birth rate per 1,000 population		Death rate per 1,000 population		Infant mortality rate (deaths of infants under 1 year per 1,000 births)	
	Eur.	Non-E.	Eur.	Non-E.	Eur.	Non-E.
1896-1900 ...	25.5	54.9	19.1	43.9	180	290
1901-05 ...	23.2	52.1	15.1	37.8	136	261
1906-10 ...	22.9	47.5	10.5	29.1	103	225
1913-15 ...	29.0	47.2	12.1	27.1	95	219
1916-20* ...	26.7	47.5	11.9	29.5	91	212
1921-25 ...	21.5	49.6	10.1	26.7	72	182
1926-30 ...	21.4	50.2	10.5	26.2	63	169
1931-35 ...	18.2	48.9	10.3	23.9	50	147
1936-40 ...	18.1	47.0	9.7	21.3	41	123

* 1918-19, the year of the influenza epidemic, excluded.

In September, 1913, the Municipality was extended from a population (for the year) of 32,174 Europeans and 39,259 non-Europeans to one of 80,863 Europeans and 74,555 non-Europeans. The period denominated 1913-15 is from 8th September, 1913, to 30th June, 1916.

In September, 1927, the Municipality was extended from a population (for the year) of 117,078 Europeans and 106,540 non-Europeans to one of 128,980 Europeans and 119,778 non-Europeans.

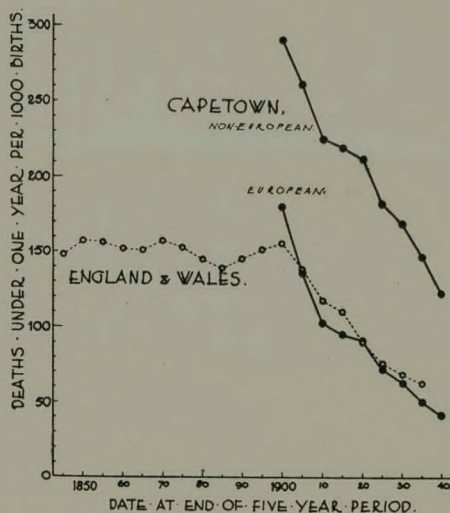
In and after 1903 the death rate is corrected for "outward transfers". In and after 1920 the birth rate and infant mortality rate are corrected for "outward transfers".

The birth and death rates are not standardized for age and sex constitution.

DIAGRAM I

INFANTILE MORTALITY.

QUINQUENNIAL PERIODS.



The resulting benefit is by no means restricted to the saving of lives in the first year : there is also a general improvement in the physique and stamina of the survivors. It is a remarkable fact that although attention has been to a considerable extent concentrated on the first year of life the reduction in mortality in the later pre-school years has been even greater than in the first year. In England and Wales in 1933 the deaths of infants under one year old per 1,000 births was 59 per cent. less than in 1896-1900 ; but the corresponding reduction in the death rate per 1,000 survivors was 73 per cent. in children aged 1-2 years, 68 per cent. at 2-3 years, 69 per cent. at 3-4 years and 67 per cent. at 4-5 years. In Cape Town in the year ended June, 1940 the mortality rate of European infants under one year old was 27 per cent. less than in the five years ended June, 1931, while in children aged 1-2 years the reduction was 34 per cent. In non-Europeans the figures were 34 and 37 per cent.

The policy of the child welfare movement, then, not only saves life, but produces an improvement in the health of the survivors. It is an example of true preventive medicine ; indeed it is one of the most successful examples that can be adduced. The question arises, however, whether any other factors are involved ; for instance, a general improvement in social welfare.

EFFECT OF SOCIAL CONDITIONS.—It is an old observation that unfavourable social conditions have a bad effect on the health of the community and are reflected in the mortality statistics. (*a*) In England, for example, poor working-class towns show higher death rates than "better-class" residential towns ; and the same, and often greater, contrast appears when the comparison is made between poor and well-to-do quarters in the same town. (*b*) Certain English statistics divide the population of the whole country into social strata according to the occupations of the adult males, and it is found that the death rates increase progressively as one passes from the highest of the strata (professional occupations, etc.) to the lowest (unskilled workers), not only in the male adults, who may be affected by occupational hazards as well as social conditions, but also in married women and in children. (*c*) Similar results have been found (in German towns, for example) when comparisons have been made between social strata determined according to actual income. (*d*) Housing has also been made the basis of such comparisons, and it is found that populations living in houses with insufficient accommodation, in overcrowded houses, in back-to-back houses, or under slum conditions generally, show proportionately high death rates.

The effect on mortality statistics varies with different diseases. Deaths from some causes, such as tuberculosis, bronchitis and pneumonia, diarrhoea and enteritis, measles and whooping cough, are increased by bad social conditions, whereas this is not the case with certain other causes of death, such as cancer, arterial disease and diabetes. Infant mortality is conspicuously influenced by social conditions. In the abovementioned English statistics the

infant mortality in the "unskilled" class (77), was 2.3 times as great as that in the "professional" class (33); this was 1930-32, and in previous decades the contrast was still greater. Illegitimate children provide another example; it speaks well for the care they receive that the English infant mortality in illegitimate children is only some one-third greater than in the legitimate. Twenty years ago the difference was 100 per cent. and in Cape Town Europeans to-day it is even greater.

Amongst the chief causes of infant mortality are (1) bronchitis and pneumonia, (2) diarrhoea and enteritis, and (3) congenital malformations and certain other conditions due to pre-natal causes and not to post-natal influences. It is found that the deaths from the first two causes are greatly increased by bad social conditions, and deaths from the third much less so. It is also found that mortality occurring during the first few weeks of life, which is due largely to pre-natal causes, is less affected by social conditions than infant mortality occurring later.

It may be taken then that infant mortality is strongly influenced by social conditions. In Cape Town the bad social conditions of the Coloured people afford a reasonable explanation of the fact that their infant mortality rate is about three times as great as that of the Europeans. (a) the Cape Town Social Survey shows that, according to the standards of the Survey, about 53 per cent. of Coloured households are below the poverty datum line, as compared with 6 per cent. in white households. As to housing conditions, it is only a small minority of the Coloured people that is satisfactorily housed, and only a small minority of the whites that is not. The non-European housing is expensive as well as bad. (b) More than 20 per cent. of non-European births are illegitimate as compared with 5 per cent. of European births, and venereal disease is rife in the Coloured people. (c) Education is not compulsory for the Coloured people and their general level of schooling is low; there is a lack of discipline in adolescents and a serious problem of delinquency.

I am inclined to doubt whether there has been much economic or social improvement (until very recently) in the Cape Town Coloured people such as might account for a substantial part of the decline in their infant mortality. If that is correct the decline may all the more exclusively be attributed to child welfare work. I think this view is supported by the fact that there has been no corresponding fall in the coloured birth rate. In white communities, including that of Cape Town, the two rates have fallen together. The drop in the birth rate is probably due to the same social changes as have affected the infant mortality rate; and the reduction in size and "spacing out" of families which it reflects are themselves one of the causes of the improvement in child health.

In England, on the other hand, the fall in the infant mortality rate did accompany an obvious improvement in the social conditions of the mass of the people. For instance, there was a definite and almost steady increase in "real wages" from the eighteen-

fifties onwards; and from a comparison of Booth's Survey of London Life and Labour in 1889-90 with the New Survey of 1929-30 it appears that the percentage of persons below the poverty line had fallen from 31 per cent. to 10 per cent., notwithstanding that with increased prices the cash expression of the poverty line had almost doubled. The effect too of the introduction of sickness and unemployment benefit, which are still lacking in South Africa, must have been considerable.

The correct view seems to be that the child welfare movement has reduced the infant mortality rate in all classes of the people, rich and poor, but that in a community afflicted by poverty, bad housing and the other social evils it can never bring the rate down to the same level as in a well-to-do community.

THE FUTURE.—It may be expected that the European infant mortality rate in Cape Town will yet be brought to a lower level than that of to-day. As for the non-European children, it is obvious from the figures that their mortality is still more than twice as great as it should be. More can yet be done for them by ordinary child-welfare methods. One particular need is the provision of a dietetic hospital providing for them the services that are available for Europeans at the Mothercraft Training Centre. But the child welfare problem will never be solved in non-Europeans until their social level has been greatly raised by the payment of economic wages, the provision of sufficient adequate houses and the attainment of a higher standard of education and culture.

INFANT MORTALITY IN INDIANS.—The Asiatic community in Cape Town, consisting chiefly of Indians, presents a remarkable contrast to the Cape Coloured in its mortality statistics. In the following table the mean annual birth rate, general death rate, infant mortality rate and tuberculosis death rate for the five years ended June 1941 are shown for Europeans, Asiatics and Cape Coloured :

	EUROPEAN	ASIATIC	CAPE COLOURED
Birth rate	18.1	53.3	47.5
General death rate	9.7	14.1	21.3
Infant mortality rate	41	48	122
Tuberculosis death rate	0.71	2.0	4.5

The Indian general and tuberculosis death rates lie about midway between those for Europeans and Coloured, but the Indian infant mortality rate is very slightly above the European and in great contrast to the Coloured. This is all the more remarkable in view of the fact that the Indian birth rate is about three times as great as the European, and higher than the Coloured.

The reason for the low infant mortality rate in Cape Town Indians is worthy of further investigation. I have not been able to discover any statistical fallacy in connection with it. The Indians are chiefly traders, and I believe that not many of them are below the poverty line : a proportion of them are well-to-do.

TUBERCULOSIS

The tuberculosis death rate for Europeans in the Union of South Africa is a little more than one-half that in England and Wales. The prevalence of the disease (in Europeans) varies greatly in different parts of the country. Amongst the large towns it is greatest in Cape Town, and it is generally greater in the coastal towns, including Port Elizabeth and Durban, than in those up-country. The four provinces show great differences. For the period 1931-35, taking the European tuberculosis death rate of the Union as 100, the figures for the provinces were as follows : Cape 132, Natal 93, Transvaal 88, Orange Free State 44. Thus the mortality rate in the Cape Province was three times that of the Orange Free State.

There are no death statistics for the non-Europeans of the whole Union, but they are available for the large towns. In Cape Town the tuberculosis death rate in non-Europeans for the last five years was 6.4 times as great as in Europeans, and in many towns up-country the contrast between the two racial groups is no less. Counting all races the tuberculosis death rate in South African towns is considerably greater than that of England and Wales.

In Cape Town tuberculosis causes more deaths than any other disease. In the year 1939-40 the number of deaths (all races) from the five greatest causes were as follows : Tuberculosis 797, bronchitis and pneumonia 677, heart disease 512, arterio-sclerosis (including cerebral arteries) 478, diarrhoea and enteritis 394. The position differs greatly in the two racial groups. The following table shows the death rates from the leading causes of death in the European and non-European sections of the population respectively :

CITY OF CAPE TOWN — YEAR 1939-40 : DEATH RATES PER
100,000 POPULATION.

EUROPEAN.	NON-EUROPEAN.
Heart disease 183	Tuberculosis 425
Arterial disease* 177	Bronchitis and pneumonia ... 371
Cancer 110	Diarrhoea and enteritis ... 215
Tuberculosis 73	Heart disease 138
Bronchitis and pneumonia ... 53	Arterial disease* 107
(all causes 977)	(all causes 1,988)

*including cerebral arteries.

The European population of the City is in line with the white communities of Europe, America and the British Dominions, in which circulatory diseases and cancer are the greatest causes of death. These diseases are not closely related with social conditions. The mortality from them is completely outnumbered in the Cape Town coloured population by that from tuberculosis, respiratory diseases and diarrhoeal diseases, all of which are conspicuously aggravated by bad social conditions.

There has been an enormous reduction in tuberculosis in

civilized countries generally. In Table III and Diagram 2 the death rates from tuberculosis are shown over a series of years for England and Wales and for Cape Town (European and non-European). In England and Wales the rate for 1938 was 60, which is only one-sixth of the figure for 1851-55. In Cape Town the fall in the European tuberculosis death rate has been similar to that of the English rate, but has slowed up in the last twenty years. The far higher non-European rate fell until 1921-25 but has since suffered a reaction.

TABLE III
TUBERCULOSIS (ALL FORMS) : ANNUAL DEATH RATE PER
100,000 POPULATION.

PERIOD	ENGLAND AND WALES*	CAPE TOWN	
		European†	Non-European†
1851-55 ...	364	—	—
1856-60 ...	333	—	—
1861-65 ...	332	—	—
1866-70 ...	322	—	—
1871-75 ...	296	—	—
1876-80 ...	282	—	—
1881-85 ...	256	—	—
1886-90 ...	234	—	—
1891-95 ...	214	—	—
1896-1900 ...	191	—	—
1901-05 ...	174	178	736
1906-10 ...	156	152	594
1911-15 ...	139	114	471
1916-20 ...	136	88	447
1921-25 ...	106	79	409
1926-30 ...	92	74	475
1931-35 ...	78	84	499
1936-40 ...	—	71	456

* Standardized for age and sex constitution.

† Not standardized.

NATURE AND CAUSE OF TUBERCULOSIS.—Tuberculosis is an infectious disease caused by invasion by the tubercle bacillus. There are several forms of the disease in different animals, each with its own strain of tubercle bacillus. Man is susceptible to two of these strains, viz., the human strain, which normally occurs in man only, and the bovine strain, which normally occurs in oxen (and some other animals) but is sometimes found causing disease in man.

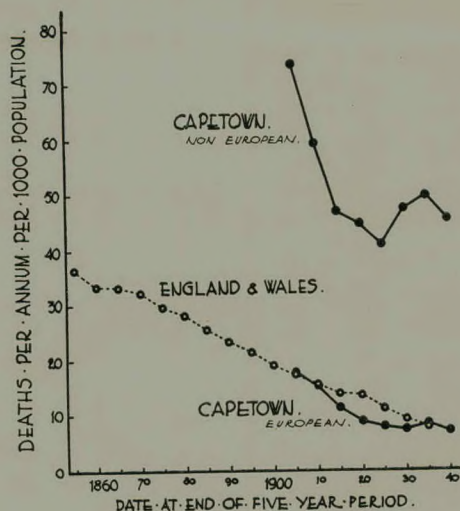
Most infectious diseases take what is known as an "acute" form. They are short and sharp, and the patient either dies or recovers for good in a few days or weeks. Tuberculosis usually takes a "chronic" course, and it may be years, even decades, before the issue is determined by the arrest of the disease process or the death of the patient. This chronic course gives tuberculosis a character of its own very different from most infectious diseases and presenting entirely different problems.

Tuberculosis takes several forms in man. The most important is tuberculosis of the lungs, or pulmonary tuberculosis, which in Cape Town is responsible for five-sixths of the total mortality from tuberculosis. The other forms, together causing the remaining one-sixth of the deaths, and spoken of as non-pulmonary tuberculosis, include tuberculous meningitis and tuberculosis of the bowels, glands, bones and joints, and other parts of the body.

DIAGRAM II

TUBERCULOSIS · DEATH · RATE.

QUINQUENNIAL PERIODS.



Tuberculous meningitis in Cape Town produces two-thirds of the deaths from non-pulmonary tuberculosis. Pulmonary tuberculosis occurs chiefly in adults, especially young adults, though in Cape Town non-Europeans it is not uncommon in children also. The non-pulmonary forms occur mainly in children. Tuberculosis of the bones and joints is the greatest cause of crippling, and as such has a public health and social importance out of proportion to the small number of deaths it causes.

In most parts of the world it appears that the human strain of infection is responsible for nearly all cases of pulmonary tuberculosis and the majority of non-pulmonary cases. The bovine strain has been found chiefly in abdominal, glandular and certain other non-pulmonary forms, and the prevalence of this type of infection in man varies from place to place. In South Africa it has not yet been proved to play an important part in the problem of human tuberculosis, even non-pulmonary. The infection of the bovine strain comes from cattle, and chiefly in the milk from infected herds. I would advise that young children should not be given raw

milk from untested herds, but I do not propose to make any further reference to the bovine strain of infection.

The main source of the human strain of tuberculous infection is the sputum of pulmonary cases. It contains the bacilli, and these in the act of coughing are discharged from the mouth in droplets of moisture, which may be inhaled by another person ; or the sputum may be carelessly disposed of with the result that the bacilli are inhaled with the dust of the polluted room. Infection may also take place in other ways. It is most likely to occur indoors, and particularly in the household of the infectious patient. Most adults are relatively resistant to infection, but young children are more susceptible. The chief spread of the disease is through the infection of young children living in the same household as persons with open pulmonary tuberculosis. The degree of danger depends to a great extent on conditions in the home. In a clean, spacious house, free from poverty, where precautions are intelligently taken, the risk is minimized. It is at its maximum in the slums. An extreme case is the family living in a single-room dwelling, where heavy and repeated infection is inevitable.

Infection is not the whole story of tuberculosis. By no means everyone who receives the infection succumbs to the disease. The body possesses inherited powers of resistance, which are latent and undeveloped at birth but grow with exercise. As successive invasions of the infection are overcome the powers of the body to resist tuberculosis tend to increase. In the majority of persons there is evidence of former tuberculous infection successfully overcome. The victims of the disease are those in whom resistance has not been successfully developed or has later broken down. Such a breakdown in a person in whom the infection is latent may take place through physiological crises such as puberty and child-birth, the effects of intercurrent disease, or through unfavourable conditions, amongst which malnutrition, domestic overcrowding, overwork and unhygienic industrial conditions play an important part. The fate of the individual depends on the constantly changing balance between infection, old and new, and resistance.

From this brief reference to infection and the breakdown of resistance it will be realized that both unfavourable events are promoted by poverty and bad social conditions. There is in fact voluminous evidence associating tuberculosis with social factors, such as low wages, unemployment, unhealthy housing, overcrowding, and bad industrial conditions.

CAMPAIGN AGAINST TUBERCULOSIS.—The measures taken against tuberculosis are based on the conception of infection and resistance, and their main features are the provision of hospital accommodation and attention to social welfare.

Hospitals are needed for the double purpose of treatment and isolation. Tuberculosis can be arrested in many cases, especially if treatment is begun at an early stage. Apart from other considerations the arrest of a case has an obvious value in the prevention of spread. From the point of view of isolation all cases that are

living under conditions likely to lead to the spread of infection should be admitted to hospital. If eventually the patient returns home the training he will have received in hospital concerning precautions against infection and in other matters will enable the best to be made of home treatment. For these reasons there should be available enough hospital and other accommodation (including sanatoria) to enable every case of pulmonary tuberculosis discovered to be admitted without delay and retained in an appropriate institution for as long as necessary. The number of beds that will be required for a given number of cases will depend largely on social conditions in the district. The greater the proportion of people living under conditions of poverty and overcrowding, the more need there will be for hospital accommodation. On the other hand it is not slum-dwellers, but the more enlightened members of the community, who are most willing to accept hospital treatment.

A standard suggested for the number of hospitals and sanatorium beds in local authorities' tuberculosis schemes is 75 beds per 100 annual deaths from the disease. Many English and Continental towns, however, have found it necessary to provide more than 100 beds per 100 deaths. In Cape Town the deaths from pulmonary tuberculosis (all races) exceed 700 per annum, and the beds for this disease provided or arranged for by the City Council (including those occupied by Cape Town cases at Nelspoort Sanatorium) amount to 300, of which about 50 are occupied by Cape Divisional cases. The City Council has acquired land near Durbanville for a new sanatorium hospital, which it is expected will accommodate 200 patients, with room for expansion.

Municipal schemes for combating tuberculosis require not only institutional accommodation but also an organization for the discovery and diagnosis of cases. In Cape Town this work is in charge of a full-time specialist tuberculosis officer, with a staff, in addition to part-time medical officers, of 7 tuberculosis health visitors, whose duties include attendance at clinic sessions as well as home visitation. Two clinic-centres have been built, of which one includes the administrative quarters of the tuberculosis officer and his staff and of the care committee. At these two centres six medical sessions are held weekly for cases, suspects and contacts, as well as medical examinations of individual patients at other times throughout the week. The tuberculosis officer also holds regular clinic sessions for natives at Langa location. All notified cases are visited and an endeavour is made to induce the household contacts to attend for examination. There is also an out-patient department at the City Hospital, equipped with x-ray facilities, which is chiefly used for the continuation of artificial pneumothorax treatment begun in the City Hospital, at Nelspoort Sanatorium, or elsewhere.

Last year the persons attending at the clinics and out-patient department for the first time numbered 2,144 and the total attendances for medical examination or treatment 11,257.

The voluntary tuberculosis care committee works in close co-operation with the tuberculosis officer. It employs a full-time

almoner. Normal assistance of the affected families in the way of food, etc., is provided by the Cape Town Board of Aid, whose funds are contributed in equal shares by the Union Department of Social Welfare and the City Council. Supplementary nourishment is supplied by the City Health Department. The Care Committee distributes grants from funds provided mainly by the City Council, the Cape Town Community Chest, the King George V Jubilee Fund, and the Christmas Stamp Fund. About 160 families per annum are helped by the payment of rent and maintenance grants, chiefly in cases where the breadwinner is in hospital or sanatorium. Families are also helped by the provision of clothing and blankets. The Care Committee maintains the Duinendal Settlement for European single men who need institutional accommodation, usually before or after sanatorium treatment.

This medico-social work is supplemented by the provision of holiday-home and convalescent-home treatment for contacts or so-called "pre-tuberculous" cases at the Sunshine Home of the Christmas Stamp Fund, where there is accommodation for 60 European children in new premises recently completed; and for European and Coloured children and adults at the convalescent homes of the Cape Hospital Board.

Local authorities are encouraged to proceed with schemes for combating tuberculosis by the fact that subsidies are payable on their approved expenditure under this heading, amounting to one-half (from the Union Health Department) on capital and three-quarters (one-half from the Union Health Department and one-quarter from the Provincial Administration) on maintenance. Unfortunately the policy of the limitation of subsidies operates so that on maintenance expenditure the larger local authorities lose a part of this grant. In Cape Town the sum lost by the City Council out of normal subsidy on expenditure incurred on measures against tuberculosis and other infectious diseases amounts now to over £15,000 per annum, and will be greater as the expenditure increases. On future increases of expenditure on tuberculosis the maintenance subsidy will amount to only one-quarter of the normal amount; that is to say, the City Council, instead of being responsible for only 25 per cent. of the additional expenditure, will be responsible for 81 per cent. of it.

No reference has hitherto been made to the need for hospital accommodation for persons (chiefly children) crippled by tuberculosis of the bones and joints. Such cases, most numerous in the coloured people, constitute a serious social problem. Hospital accommodation is needed for social reasons, but also because the prospect of cure is favourable in the early stages. The cases are not usually highly infective, and it is not for purposes of isolation that they should be in hospital. The prevention of bone tuberculosis is to be achieved by the isolation of pulmonary tuberculosis. There are about 250 beds available in Cape Town for tuberculous orthopaedic cases, and a movement for increasing the accommodation is well under way.

HISTORICAL.—It was not until the end of the nineteenth century that the prevention of tuberculosis become a recognized aim of public policy. Philip's pioneer anti-tuberculosis dispensary at Edinburgh dated from 1887, the first in France was opened in 1902, and the first in England in 1909. Voluntary notification of tuberculosis by doctors had begun in England by 1892, and was made compulsory throughout the country in 1908. From 1899 onwards a rapid building of sanatoria took place, and by 1906 several English local authorities were contributing to them. At that time certain local authorities were making provision for tuberculous patients in their isolation hospitals, and this was followed by the building of sanatorium-hospitals by local authorities. The provision of sanatorium-benefit under the National Insurance Act of 1911 gave a great impetus to the national campaign against tuberculosis.

Dr. Anderson was the pioneer of preventive measures against tuberculosis in South Africa. The disease was made compulsorily notifiable in 1904, and cases reported in Cape Town were systematically visited by health inspectors. A few patients were admitted to the new infectious diseases hospital from 1905 onwards, and in 1909 temporary wards for ten patients were built there, soon afterwards increased to twenty. A nurse was appointed in 1911 for the home visitation of cases. Tuberculosis clinic sessions were in operation by 1912. Nelspoort Sanatorium, made possible by the gift of John Garlick, of Cape Town, was opened by the Union Health Department in 1924.

SOCIAL BACKGROUND.—In conclusion I wish to return to the point that, as a disease of the community, tuberculosis is pre-eminently associated with bad social conditions, being promoted by poverty, undernourishment, bad housing and overcrowding, ignorance and vice. These factors are in my opinion sufficient to account in the main for the prevalence of the disease in the non-European part of the Cape Town population. It is a remarkable fact that in England and Wales, for example, there was a steady improvement in the tuberculosis position during the second half of the nineteenth century before ever the *ad hoc* measures that are now in operation were instituted. The most probable reason for this is the general social and sanitary improvement which was taking place at that time. Another factor that has been suggested as an explanation is the great amount of hospitalization of advanced pulmonary cases that was practised in the poor-law hospitals, which was done as a measure of relief and not as a preventive measure. It is difficult to explain the check in the fall of the tuberculosis death rate in Cape Town during the last 15 years or so, because during that time the preventive work of the City Health Department was intensified; and although the number of beds provided for cases of pulmonary tuberculosis is still insufficient it has been considerably increased.

THE FUTURE.—Bad as the statistics show the tuberculosis position amongst the non-Europeans to be, it is probably no worse than what obtained amongst the labouring classes in European countries at the middle of the nineteenth century. The improvement that has since been brought about there gives us reason for confidence that with active measures of social reform and adequate facilities for the discovery, treatment and isolation of cases results no less satisfactory can be obtained in the non-Europeans of this country.

VENEREAL DISEASES

The most important of the venereal diseases are syphilis and gonorrhoea.

SYPHILIS.—Syphilis is justly regarded as one of the most formidable of infectious diseases. It is the cause of an enormous volume of disability and mortality, not only in those who acquire it by infection but also in their offspring.

The disease starts with a sore at the site of infection, followed after a few weeks, but sometimes longer, by an illness marked by eruptions of the skin and mucous membranes. These stages do not necessarily cause much disability and they may even pass unrecognized. Years later they may be followed by syphilitic disease of almost any part of the body, including degenerative conditions of the heart, blood-vessels and central nervous system. About ten per cent. of first admission to mental hospitals (U.S.A., 1930) are cases of general paralysis of the insane (a result of syphilis) and cerebral syphilis.

The child of the syphilitic parent develops the disease *in utero*. Congenital syphilis is estimated to be responsible for more than ten per cent. of pre-natal mortality, and it is the cause of far more infant mortality than is assigned to it in the death returns. In the London County Council schools for the blind (1920) one-third of the cases of blindness were attributed to congenital syphilis.

GONORRHOEA.—The symptoms and complications of gonorrhoea may be very severe and disabling, but fatal cases are now rare. It is a frequent cause of sterility, both in men and women, and it is also the cause of ophthalmia neonatorum, a severe inflammation of the eyes of newborn children. This form of ophthalmia is stated to be one of the chief causes of blindness, but fortunately loss of sight can almost always be prevented by adequate treatment. Ophthalmia neonatorum is compulsorily notifiable, and attention is concentrated on reported cases in order to secure proper treatment.

PREVALENCE.—The Royal Commission on Venereal Diseases (1909-16) estimated that the number of persons who had been infected with syphilis, acquired or congenital, could not be less than ten per cent. of the whole population of the large cities, and that the number infected with gonorrhoea was still greater. It is

difficult to get reliable comparative figures for their incidence. The death returns are less useful than with most other diseases, because firstly there is a tendency to avoid the use of the name of venereal diseases in death certificates, and secondly the cases in which syphilis is recognized as being the original cause of the fatal disease represent only a fraction of the deaths which actually result from it.

Set out below are the deaths (per million population) classified annually under the heading of syphilis for England and Wales, the Union of South Africa, and the City of Cape Town, and for syphilis plus tabes dorsalis and general paralysis of the insane, which are amongst the sequelae of syphilis.

	Syphilis	Syphilis, tabes and G.P.I.
England and Wales (10 years ended 1938) ...	32	75
Union of South Africa (5 years ended 1937) :		
Europeans	60	76
City of Cape Town (10 years ended 1938) :		
Europeans	70	110
Non-Europeans	720	850

Although for the reasons stated these figures should only be accepted with reserve they may be taken as showing that there is far more mortality from syphilis in the Cape Town non-Europeans than in Europeans.

A figure that is sometimes quoted as indicating prevalence is the number of cases attending the public venereal disease clinics. This again is not a reliable figure in the absence of further information, because it obviously depends on what proportion of the total number of cases report at the clinics. The new cases of venereal disease attending at the Cape Town municipal clinics in the year 1939-40 were as follows :

	Primary and Secondary Syphilis (excluding Congenital)	All forms of Syphilis	Gonorrhoea	Other Venereal Diseases
European ...	149	222	340	29
Non-European	663	1,500	662	84

(These figures do not include 727 cases of syphilis, mostly tertiary or latent, found amongst expectant mothers at the pre-natal clinics and maternity hospitals.)

MODE OF SPREAD.—Venereal diseases differ from all other infectious diseases in the mechanism of their spread. It is true that syphilis can be contracted through infection of any mucuous membrane or any part of the skin with discharges from an infected

case, but under present-day conditions of western civilization the proportion of syphilis cases that are due to extragenital infection is small. Published estimates of the proportion vary in different communities from under 1 per cent. up to 10 per cent. The experience of the Cape Town clinics is more in accordance with the former figure. Almost every case of acquired syphilis is contracted by extra-marital intercourse or from a spouse who has caught it in that way.

Extragenital cases of gonorrhoea also appear. Cases of vulvovaginitis in little girls occur from time to time, and multiple cases have been reported from school hostels and other places where children live in crowded and unhygienic conditions. Infection is usually attributed to the use of common towels or other articles, but it is not certain to what extent it may be due to actual personal contact with individuals infected with gonorrhoea.

PREVENTION.—Chastity then is the sovereign preventive of venereal disease, but it seems that this knowledge is no more likely to result in preventing the continuance of the disease than considerations of morality have been.

The next line of defence is protection from possible infection without abstinence. The failure of attempts to secure this by the control of prostitution I will do no more than mention. In the coloured people actual prostitution is not a large factor in the promiscuousness that leads to the spread of venereal disease.

There are methods, such as ablution stations and preventive packets, which have been found substantially to lower the frequency of infection amongst soldiers and sailors. It is generally agreed that information about these methods of prevention should be included in the knowledge about venereal disease which everyone should have, especially young persons. There is, however, difference of opinion whether it is desirable to include a public service on these lines as part of official schemes for the control of venereal disease.

The last resource is the medical treatment of the actual case, and this is the policy on which present-day schemes for the combating of venereal disease are based. It has been made possible in syphilis by the revolution in treatment inaugurated by the introduction of the famous 606 remedy in 1910. After the first injection or two the patient ceases to be infective, and during the early stages of the course of treatment the symptoms rapidly clear up. But to remove all possibility of a recurrence of infectiveness, to make marital life safe, and to avoid the threat of dangerous sequelae, it is essential that the complete course of treatment, which will extend over many months, should be taken.

The recent discovery of the value of sulphonamides in gonorrhoea has greatly increased the speed and efficiency of the treatment of this disease, and should lead to an increase in the value of treatment centres from the point of view of the prevention of spread.

In the majority of cases the treatment of venereal disease can

be adequately carried out on out-patient lines, but in some cases in-patient treatment is desirable for medical or social reasons. There are wide differences of opinion about the proportion of cases that ought to be admitted to hospital.

It is recognized that the campaign against venereal disease if it is to be effective must include educational and propaganda work designed to lessen if possible the amount of exposure to infection, and also to induce those who have been exposed to the risk of infection to take the precautions that are available and to make prompt and effective use of the facilities provided by the local authority. The social reform in the depressed classes, both white and coloured, which are necessary to secure proper health conditions, would have as one of its results the fostering of the sense of responsibility that would go far to remedy the present unsatisfactory position regarding venereal disease.

SCHEMES FOR COMBATING VENEREAL DISEASE.—Local authorities' schemes are based on the preventive value of efficient treatment. Treatment centres (clinics) are provided, where free and confidential treatment is available for all. The first object is the prevention of spread and the second object the prevention of the ill effects of the disease in the patients and their unborn children. A subsidy of two-thirds of the approved capital and maintenance costs of the schemes is payable to local authorities by the Union Health Department. The policy of the limitation of subsidies, already referred to, operates so as to reduce the proportional refund to the larger local authorities.

Municipal venereal-disease clinics were started in Cape Town in 1920, and a year later a full-time medical officer was appointed to take charge of the work. There are now, in addition to clinics for natives held at the Langa location, three treatment centres in the City, at which 28 medical sessions are held per week. The centres are also open daily for the irrigation treatment of gonorrhoea. Last year 3,339 new cases attended and the total attendances at medical sessions amounted to 49,355, besides 10,515 attendances for the irrigation treatment of gonorrhoea. The staff of the clinic service includes two full-time specialist medical officers, a number of part-time medical officers, four nurse-visitors and two orderlies. At the City Hospital 24 beds are reserved for venereal-disease cases, and in the year 1939-40 260 patients were admitted. The provision of additional beds is now under consideration.

In the evaluation of the success of municipal schemes the difficulties are again encountered that stand in the way of an estimation of the prevalence of venereal diseases. In England and Wales, where it is believed that 85 per cent. of all new cases attend the public clinics, the death rate from syphilis, tabes, general paralysis, and aneurysm, had been reduced by 1937 to one-half the rate prevailing from 1911 to 1920. The Cape Town figures do not show a corresponding reduction, but a tendency to decline is seen in the syphilis mortality rate of the last few years.

The campaign against venereal disease in South Africa, as in Britain, is not based on compulsion, but on co-operation. The diseases are not compulsorily notifiable by medical practitioners. Compulsory notification, such as is in force in certain countries, is strongly advocated in some quarters, but the Union Health Department share the view of those that hold that such a measure would tend to deter patients from consulting a doctor. There is a section in the Public Health Act of the Union which requires doctors to report cases of "venereal disease in a communicable form" who fail to continue to attend for treatment, but it is practically inoperative. There are other compulsory provisions, including one making it obligatory on patients to obtain medical treatment. Use is made of this power in the follow-up work carried out at the Cape Town venereal disease clinics. Every patient who prematurely defaults in attending is communicated with if he or she can be traced, and if the default continues is reported to the Magistrate in order that the compulsion prescribed by the Act may be applied.

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