

NON-EUROPEAN TUBERCULOSIS IN SOUTH AFRICA.

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P R E A M B L E.

The seriousness of tuberculosis among Africans has been known for a long while, but only within comparatively recent years has the fact been turned to the benefit of phthisicology by using it as an approach to the understanding of some of the pertinent problems of the science. The result has been that no disease of Africans is now being more diligently studied. A vast literature on tuberculosis in the native has now accumulated. The more practical fact that the European population can never be safe from the disease unless the hazard of infection from the Bantu race is removed, is a strong motive for the study of those characteristics of the disease in Africans that indicate methods of control.

A number of excellent discussions on tuberculosis in Natives has been published, such as the exhaustive report of the Tuberculosis Research Committee, that by Lyle Cummins on Primitive Tuberculosis, the papers of Dr. Neil Macvicar, the publications of Dr. Dormer, Dr. Peter Allan, of Willcocks, Burrows and Matthews, and Lewis's publication, the Biology of the Negro. To these publications credit must be given as the source of most of the data herein cited.

HISTORICAL SURVEY OF TUBERCULOSIS IN SOUTH AFRICA.

It is agreed that tuberculosis was introduced into the African Continent by invaders from other countries. The first of the invasions was in Northern Africa, along the Mediterranean, and is of great antiquity. The length of time tuberculosis has existed there can be measured to some extent by the undoubted tuberculous lesions found among long-buried excavated human skeletons. In more recent times contacts were made with the disease through invasions that spread down the East and then the West coast as far as the extreme end of the Continent. Then finally the interior was invaded. With the advent of missionaries, slave traders, explorers, merchants, colonists and soldiers, there is scarcely a part of Africa that has not been touched by the white man, "whose footprints are left in the form of tuberculosis among the natives". (Lewis 1942). There is no question but that even within recent times tuberculosis was completely absent in the more inaccessible parts of the Continent. In some cases observers were able to note a lack of it and then to find, after an interval of a few years, unmistakable signs of its appearance. (Lyle Cummins).

In the Sudan among the Eastern Dinkas who were, to quote Cummins (1935) "until 1901 one of the most isolated and illusive of African tribes," and therefore such people as he had described as being free from tuberculosis 30 years before, Burrows (1935) found that tuberculosis had a rather wide distribution and that 32.7 per cent of the general population reacted positively to intra-dermal tuberculosis with a reaction rate of 56 per cent amongst adult males.

There is evidence that tuberculosis is spreading rapidly in French West Africa. Calmette found positive reactors in under 15 per cent of the general population in 1912. This had risen to 44 per cent in 1930. Soldiers arriving in Marseilles from the Ivory coast in 1932 had 46 per cent positive reactors, as compared with a general average of 8.4 per cent in the Ivory Coast in 1912. (Cochrane 1937).

At the present time tuberculosis exists in Africa in varying forms and in varying amounts, depending on such factors as

proximity of foreigners, and the amount of aggregation as in villages, and the length of contact with the disease. It is most common where civilisation has been longest established and it has apparently followed the main lines of traffic, just as in Tropical Africa it has followed the trade routes from the coast.

It is of interest to note that there are no records of virulent epidemic tuberculosis in Africans living in their own country and in their traditional surroundings, such as the epidemics recorded by Robert Louis Stevenson and others amongst the Marquesas in the South Seas, where whole valleys are said to have been depopulated in a matter of months from the time of the first introduction of the disease. (Bushnell 1920).

In South Africa the disease attracted little attention until 1895 when a system of registration of births and deaths came into operation in the Cape Province, due mainly to the efforts of Dr. Gregory, Medical Officer of Health for the colony, who drew attention to the ravages of tuberculosis amongst the non-Europeans. He believed the disease had been introduced by tuberculous coming to South Africa from Britain and cited the high tuberculosis death rate in the towns which were the favourite health resorts; at Grahamstown it was 6.4 and at Beaufort West 7.86 per 1,000 natives.

The earliest history of Tuberculosis in South Africa is very limited, and what information there is, has been gleaned from the writings of travellers and missionaries. (Tub. Res. Comm. 1914)

The first reference to "Consumption" was made by Cornelius de Jongh, the commander of a Dutch man-of-war in a book published on his travels to the Cape of Good Hope in 1781 - 1797. Percival and Barrow at about the same time also comment on the presence of "consumption". It can be inferred from their comments that tuberculosis was not of any serious moment. It was observed that the kaffirs and Xosas showed very little disease at all and they ascribed this to their simple diet, temperate life, limited exercise and few cares. It appears to have helped in the elimination of the Hottentots amongst whom it was reported by J.W.D. Moodie in 1820, to be very prevalent; the same observer noted that it was uncommon among the Dutch and English.

Dr. Hammerschmidt who practised in the Western Province of the Cape from 1858 to 1860 found only three cases of tuberculosis in over 1000 cases seen. Hirsch writing in 1881, said that Phthisis occurred mostly amongst the Hottentots inhabiting the coastal belt.

The Tuberculosis Research Committee (1932) thinks it would be rash to assume that even in remote times the coastal tribes of Bantu were free from tuberculosis and it may be taken as certain that the disease was frequently introduced among them from the sixteenth century onwards, and probably long before. There is little or no evidence that tuberculosis was prevalent amongst the Bantu when they were first encountered by the white race. Lichenstein encountered none in 1803 - 1806 and reports the absence of "cough, chronic disease and syphilis" amongst the kaffirs; Livingstone in 1857 stated that "tuberculosis did not exist" amongst the tribes of the interior with whom he was working. Theal speaks as follows:- "Consumption was almost unknown until recent years". The picture was not one of static contact with coastal Arabs or Portuguese but of a long series of tribal movements accompanied by all the stress and hardships of war and travel and stern selection by survival of the fittest. "Woe to the old, the infirm and the infected under the conditions of such a journey". The merciful custom of the tribes was to desert the old and the fatally ill and leave them in the bush to die; and as Theal says "all the weaklings were destroyed in infancy". In these circumstances a debilitating disease like tuberculosis was unlikely to flourish or spread. The state of constant warfare in which these people lived preserved them from the fate that had already overtaken their neighbours. Their mode of living militated against its spread even if it is accepted that tuberculosis did occur amongst them.

Macvicar in 1908 made extensive enquiries from long-established practitioners all over the sub-continent with a view to eliciting its origin and its prevalence. In his own experience in the Shire Highlands in Central Africa he saw "not a single case of any form of tuberculosis among the natives" at Blantyre Mission during the two years 1896 - 1900. He ascertained from the Reverend John Moffat that consumption in Southern Rhodesia "was of the rarest

natives who had contracted the disease whilst working in the colonies.

Both Livingstone and Moffat who spent a considerable amount of time in Bechuanaland in the middle of the nineteenth century, were of the opinion that there was no tuberculosis among the Bechuana people. The consensus of opinion was that in the Transvaal and Free State tuberculosis was unknown until the advent of the white man.

Ramsbottom (1905) states that up to 1885 with the exception of a few imported cases the Orange River Colony was free from tuberculosis. During the previous ten years he had seen cases occurring amongst the whites, and during the past three years the number had steadily increased. Amongst the blacks the disease was not uncommon and was spreading more rapidly than amongst the whites.

In Natal along the coastal region tuberculosis was found to be common but inland it was rare or absent. In the Eastern Cape Province the evidence pointed towards wide distribution of the disease among the Bantu, it was common in some districts and rare in others. Macvicar believes that this varied incidence is strong evidence that tuberculosis did not exist among these natives originally, because in countries where the disease has long been established, its distribution is fairly uniform.

D. Melville (1913) practising in the Transkei, noted that the first 3,000 cases he had treated in 1897, there were only some 1 per cent of these tubercular, whilst the first 3,000 cases treated in 1912 showed the enormous number of 40 per cent tubercular with lung cases predominating (diagnosed clinically).

In trying to establish which racial group was responsible for the introduction of tuberculosis into South Africa, Macvicar came to the conclusion that European immigrants and soldiers were largely to blame. He quotes figures from Parkes Practical Hygiene showing the average mortality for tuberculosis of the British Army from 1830 to 1846 to have been 8.86 per 1000. Large numbers of British troops were employed in the kaffir wars. In Portuguese East Africa there is a tradition according to Macvicar that consumption came from the Indians. It was certainly the case in Natal in 1908

that the Indians were infected and were probably infecting the natives. Evidence points to the Zanzibar Arabs as the chief introducers of tuberculosis in East Central Africa. (Macvicar 1908).

From 1880 onwards a stream of tuberculous from Britain travelled to the Cape which had become widely recognised as a health resort. In glancing over the files of old medical journals of the Cape Colony one is struck by the fact that almost the only references to tuberculosis found are contained in papers written in praise of this or that health resort for consumptives. In 1895 when registration for births and deaths became compulsory it was discovered that tuberculosis had become widely disseminated about these health resorts. Beaufort West which had been one of the most popular, was in 1908 one of the most gravely affected towns in the whole sub-continent. The death rate for Europeans was 6.37 and for non-Europeans was 14.32 per 1000. Since that time the tendency of medical opinion has been to check the indiscriminate importation of consumptives. It is certain too that tuberculosis was disseminated in the Native Reserves by the native miners suffering from tuberculosis repatriated from the gold, coal and diamond mines in South Africa. In 1908 Macvicar placed it as the most important single factor in spreading the infection.

In May 1904 tuberculosis - all forms - was made a notifiable disease in the Cape Colony; and in the same year pulmonary tuberculosis was made notifiable in Natal except in Pietermaritzburg where it became notifiable in 1907. In 1905 the South African Native Affairs Commission pointed out the increase in tuberculosis amongst natives. In 1907 the Free State introduced notification on a voluntary basis at the will of the local authorities, the majority of which did in fact adopt it. The Transvaal lagged behind, the Municipal Association being against notification, but Johannesburg introduced voluntary notification in 1907. In 1906 a conference of Medical Officers of Health of the British South African Colonies and Territories passed a strong resolution on the great increase in tuberculosis among the natives and the risk of its further spread. In the same year the Federal Council of the Municipal Association of South Africa at a meeting in Johannesburg, passed a resolution urging their respective governments to appoint a commission on the subject.

In 1907 a deputation of Members of Parliament, Mayors and others waited on the Cape Government and urged the necessity for taking steps to prevent the spread of the disease. In the same year the Cape Town Municipality provided temporary accommodation for 20 tuberculosis patients in connection with the City Infectious Disease Hospital.

The first tuberculosis clinic in South Africa was started by the Medical Officer of Health in Cape Town. In 1908 the Cape Town Free Dispensary was opened and it devoted a special section to the out-patient treatment of tuberculosis. At about the same time a Society for the Prevention of Consumption was organised in Cape Town. The society has since done very useful educative and propaganda work. In 1911 the municipality of Durban appointed a Tuberculosis Officer and established a Tuberculosis Dispensary. In 1901 to 1911 at the various Medical Congresses, resolutions were passed urging the respective Governments to enquire into the whole matter of tuberculosis.

In 1912 following on pressing appeals by the Medical and Municipal congresses and other bodies, the Government of the Union appointed a commission to investigate and report on the whole matter. (Report submitted in 1914). Clauses were included in the Immigrants Regulation Act (1913) prohibiting the entrance of persons suffering from tuberculosis in a clinically recognisable form, except by permit, and subject to certain conditions. Owing to the Great War little further was done until 1919 when a Public Health Bill including provisions based largely on the 1912 commission, was introduced and passed into law. Measures under Public Health Act 1919 against tuberculosis may be summarised as follows:-

- (1) Improvement of housing and prevention of overcrowding:
- (2) Improvement of general sanitation:
- (3) Educative work: the teaching, dissemination and inculcation of the elementary principles of hygiene and healthy living:
- (4) Enforcement and precautions against spread (through promiscuous spitting and so forth) by persons suffering from the disease:
- (5) Disinfection of infected dwellings, clothing, bedding and other articles:
- (6) Prevention of the use as food of tuberculous meat, milk or dairy produce:
- (7) Notification of cases:
- (8) Provision of facilities for early diagnosis and treatment, including facilities for laboratory examinations:
- (9) The establishment of tuberculosis hospitals, sanatoria and farm colonies or settlements.

with a donation of £25,000. towards the cost of a sanatorium in the Cape. In 1920, the sanatorium was established at Nelspoort and pending its completion the then Superintendent Dr. Peter Allan carried out a tuberculosis survey of the Union. He reported that it was a very serious menace especially to the coloured and native races in the Union.

In 1925 a Tuberculosis Research Committee was established by the Government and the Chamber of Mines, which reported in 1932, after a comprehensive study. In 1934 accommodation was increased at Nelspoort and beds were made available at Springkell Sanatorium. Non-European cases were provided for at Rietfontein Hospital. The King George V Hospital was opened in 1939 in Durban. In 1938 the municipality of Cape Town appointed its first Tuberculosis Officer. In 1945 the appointment of a Tuberculosis Officer for the Union was announced by the Secretary of Public Health,

THE INCIDENCE OF TUBERCULOUS DISEASE AMONG THE BANTU.

The exact incidence of tuberculosis in the Bantu is impossible to determine. There is no accurate census of the non-European population, births are not registered and deaths are haphazardly notified; many natives who die are never seen by a medical practitioner and the cause of death is thus never ascertained.

In 1908 Macvicar had cause to write that the provisions of the Act (enforcing notifications of tuberculosis) had been carried out very mildly, and that only a fraction of the deaths were registered; in East Griqualand and Tembuland about one half, in the Transkei about two thirds and in Pondoland not more than one fifth.

Mitchell (1920) remarks that even in the Cape many Europeans and coloured cases are never notified. In other provinces where notification was a recent innovation, the percentage of cases was still higher. The number of notifications was no criterion of the numbers affected.

The position is only slightly improved today and the overall incidence can only be determined by wide generalisations. Small sections of the Bantu population have however been carefully examined and an accurate assessment of infection and disease has been made in these groups.

NOTIFICATION OF TUBERCULOSIS IN THE UNION.

<u>YEAR ENDING</u> <u>30TH JUNE.</u>	<u>NOTIFICATIONS</u>	<u>POPULATION</u>	<u>INCIDENCE</u> <u>PER 1000</u>
1928	624	1738937	0.358
1931	617	1828175	0.337
1936	792	2003875	0.

According to the Framingham standards, it is recognised that for every annual death from tuberculosis there are eight living cases of the disease. This ratio has been challenged, and proportions of six and seven active cases have been suggested. There is an agreement, however, that for negroes the ratio of annual deaths to living cases is much smaller than it is for whites, being estimated as from two to four cases per annual death, the reason for this being that the duration of the disease before termination in death is much less. Roth (1938) obtained from army statistics a white ratio of one annual death to 8.75 living cases, a close approximation to the Framingham standard. Under the same conditions he obtained a ratio for American negroes of 2.63 cases per annual death. (Lewis 1942).

Mitchell in 1920 estimated that there were 4000 Europeans and 20,000 coloured and native cases suffering from active tuberculosis. Cluver (1945) placed the estimate at over 4000 Europeans and 60,000 non-European sufferers from the disease in an active form. Dormer (1943) quotes an R.A.F. survey by means of mass miniature radiography showing approximately two cases with positive sputum per 1000 men. He thinks this figure could be applied to the white population and doubled in the case of the non-European. This gives the approximate number of cases which are infectious as 4000 Europeans, 3,140 coloured, 24,000 Bantu and 860 Asiatics.

Macvicar (1908) noted that the death rate over three years (1903-05) was 7.20 per 1000 for non-Europeans, giving a figure four times as great as that for England and Wales. The towns of the Cape Province in which the Bantu predominated, had as high a mortality as those in which the coloured race predominated. In the Eastern Cape Colony, whilst tuberculosis was "very prevalent", it was "not yet so excessively common as in the towns and villages of the central and western parts of the Colony". In the Bantu who lived east of the Kei River and who had come under European influence only half a century previously, tuberculosis was widely disseminated. In the districts along the coast it was very common although in some of the inland areas it had "not yet obtained any great hold on the people". The raw native was less affected than those in contact with the

European. In Natal although no figures could be obtained tuberculosis was found to be prevalent in the coastal areas and less common inland. The Indian death rate for tuberculosis was higher than that of Europeans in the Colony. In the Free State Macvicar stated that infection was spreading amongst the non-European elements. G. Turner, Medical Officer of Health for the Transvaal (quoted by Macvicar in 1908) found that disease was fairly common in and near towns, whilst in the native kraals away from white influence it was rare. In Swaziland and Basutoland disease was not uncommon, being noted especially in natives who had worked on the gold mines.

A commission was appointed in 1912 to enquire into the extent and cause of the prevalence and spread of tuberculosis among all sections of the community in the Union; and to enquire into the extent and causes of mortality of the natives on the Witwatersrand mines and to make recommendations thereon. The following is a "summary of the facts concerning the prevalence of tuberculosis as regards natives".

(1) Tuberculosis is of comparatively recent introduction among the Bantu tribes.

(2) We are satisfied that it has now become a most serious menace to the future of the native races throughout the Union; that it is increasing, and that unless effective measures are taken it is likely to materially increase.

(3) The disease however prevails to a variable extent among the different native tribes and communities, from a comparatively small degree in the native who remains in his kraal and has come into little contact with civilization, up to a very large amount occurring among those brought under the influence of European industrialism and living under conditions, to the native, of exceptional stress. There are many gradations between these extremes. No single term therefore will define the extent of its prevalence among the natives.

(4) The prevalence is in proportion to the degree and duration in which the following factors have operated.

(a) The adoption of civilized habits and modes of life as practised by the natives, including clothing, housing and diet.

(b) The change from the freedom and openness of kraal life to town locations, compounds, barracks, kaffir lodging houses and other close aggregations.

(c) The change from a leisurely life to one of continual labour under more or less arduous conditions.

(d) The coming into contact with massive infection by association with the European and coloured races.

(e) The indulgence in deleterious kinds of alcoholic liquor.

(7) Pulmonary and acute general tuberculosis predominate more especially among adult males; among females and children there is a large proportion of glandular cases, mostly cervical, especially among the less civilised and raw natives.

(8) Speaking generally, it is found to be least prevalent in Zululand and Northern Transvaal, more so in Basutoland, still more in the Cape Native Territories and most wide-spread among the natives in the settled districts of the Cape Province.

In the official history of the Great War (quoted by S. Lyle Cummins 1939) the liability of native troops to tuberculosis is clearly shown in the following figures:-

Incidence and death per 10,000 troops.

<u>SOURCE OF TROOPS:</u>	<u>CASES PER 10,000:</u>	<u>DEATHS PER 10,000:</u>
British and Dominion	6.056	0.398
Portuguese Troops	33.636	9.242
Chinese Native		

primary infection under unfavourable conditions of climate and hard work.

Mitchell (1920) stated that tuberculosis was seriously prevalent amongst the native and colonial populations in the Cape Peninsula and South Western districts, in most of the larger centres of the Cape Province and in those districts of the Transkei and Eastern Province from which native labourers go freely to the mines. During the six years 1914-1919 the notifications in the Cape Province totalled 13,048 coloured and native cases an average of 2174 cases yearly.

Almost a third of South Africa's population lives in the Native Territories.

Tonkin (1944) believes that the greatest problem of medicine and public health is pulmonary tuberculosis. Macvicar on the other hand places malnutrition ahead of tuberculosis with syphilis third.

Ryno Smit (1945) remarks that it is commonly accepted that tuberculosis is "rife" in the Transkeian territories although no evidence has been produced to prove it, in the absence of vital statistics. In the light of simple economic factors, however, he asserts that it can reasonably be said that there should be a great deal of tuberculosis.

Peter Allan (Rept. of Tub. Res. Comm. 1932) learned from various practitioners in the Transkei that in Butterworth between 8.8 and 10 per cent of natives consulting them were suffering from tuberculosis. In the Umtata district the figure was 18 per cent. In Ciskei of 300 consecutive admissions to Lovedale Hospital, 74 were suffering from tuberculosis. Allan (1945) concludes that tuberculosis is widespread and endemic in the Transkeian and Ciskeian Territories, and while a certain number of sufferers can lead a sheltered life for many years, it is a different story when the unfortunate natives have to go out and face modern industrial conditions in urban areas. He observes that the same marked increase in the incidence of tuberculosis occurred in England one hundred years ago when England developed into an industrial country.

Macvicar (1932) states that between 1913 and 1931 pulmonary tuberculosis maintained a steady level of frequency in

the Ciskei except in 1919-1920 and 1929-30 when, following severe droughts, admissions rose above the general level. Of a total 418 admissions to Lovedale Hospital in 1913, 71 or 16.98 per cent were for pulmonary tuberculosis. In 1936 of 1029 admissions 95 or 9.23 per cent were cases of pulmonary tuberculosis. Over the 24 years previous to 1936 the percentage of pulmonary cases averaged 12.10 of all admissions of 10,017 cases seen from 1932-1936. Macvicar found that 571 or 5.16 per cent were suffering from tuberculosis (all forms). Of these 29.7 per cent were under 17 years of age, 38 per cent were between 18 and 40 and 30 per cent were over 40 years.

Of 2,936 natives of all ages examined by Burton in his private practice 161 (5.5 per cent) were suffering from tuberculosis (all forms); of these 140 were suffering from pulmonary tuberculosis (4.7 per cent), 13 or 0.40 per cent from glandular tuberculosis, 7 were suffering from tuberculosis of the spine (0.3 per cent) and 1 was suffering from peritoneal tuberculosis (0.03 per cent). In a former series of 1,252 natives he had noted 115 cases of tuberculosis, (9.18 per cent). During 14 years (1920-1933 inclusive) in the Transkei he examined 33,308 male natives between the ages of 16 and 45 years, for native labour recruiting organisations. Of 5,592 rejected, 254 or .70 per cent had pulmonary tuberculosis (clinically).

In the way of warning to a too easy generalisation about tuberculosis the Annual Report of the Union Health Department for year ending 30th June, 1941, states that much confusion of ideas as regards the prevalence of tuberculosis in the native territories exists in the public mind. "There are not sufficient data available to make sweeping statements, but one fact has been ascertained, and that is that well nigh every spare native with a dry skin is labelled 'tuberculous, not only by the lay public but in many instances by 'medical men'. "A brief survey was made of notified tuberculosis in five locations in Umtata district in 1939 and it was discovered that 'only 2 per cent of cases suffered with 'open' tuberculosis".

"the prevalence of tuberculosis".

Ryno Smit (1945) states that attempts have been made by the Department of Public Health to encourage notification of tuberculosis but they proved valueless on account of the fact that the majority of District Surgeons and medical officers maintain that no good purpose is served by notifying cases, as nothing is being done for them. This is borne out by Tobias (1943) practising about 18 miles from Umtata who claims that tuberculosis is the greatest individual problem that medical officers have to deal with in the territories. During the three previous months he had notified 143 new cases of pulmonary tuberculosis and of these not more than 5 cases went to hospital.

Dormer and his colleagues working in Natal reported in 1943, after a comprehensive survey of 10,000 natives taking 6 years to complete, that in the native reserves there is the problem of the high rate of infection combined with the low rate of disease. In the Natal tribal reserves he found the amount of active disease was remarkably low, 0.25 per cent was the highest figure ever reached. Three types of disease were encountered in the reserves.

- (a) The delayed disease characteristic of the European.
- (b) The infants had the typical dissemination disease of all infants - European or native.
- (c) The progressive primary disease or severe delayed disease in the native who had returned diseased from industry in towns.

In the mission type of reserves the rate rose to 0.75 per cent with the same types of disease as in the tribal reserves. In the peri-urban areas the rate rose to 1 to 1.5 per cent. Here the type of disease was mostly progressive primary disease or severe delayed disease (roughly 70 per cent of the former 30 per cent of the latter). In the urban areas the rate rose to 1.5 to 2 per cent. Here again the proportion of progressive primary disease and severe delayed disease occurred in the proportion of 70 to 30.

The only group of urban dwellers in whom they found a low incidence rate was in domestic servants in good homes and in the native staff of King George V Hospital, where there had been no case of tuberculosis in 5 years.

During 1941, 431 cases of tuberculosis were admitted to the Non-European Hospital, Johannesburg (Gillman and Gordon 1942). This represented 2.5 per cent of total admissions during 1940 or 6.8 per cent of all medical admissions.

AGE AND SEX INCIDENCE AND MORTALITY.

<u>AGE GROUP</u>	<u>TOTAL CASES - BOTH SEXES</u>	<u>TOTAL DEATHS</u>
0 - 9	56	16
10 - 19	47	14
20 - 29	116	44
30 - 39	88	41
40 - 49	66	36
50 - 59	34	20
<u>60 - 70</u>	<u>24</u>	<u>14</u>
TOTAL	<u>431</u>	<u>185</u>

Williams L.S. 1945 (quoting Dr. Retief) reports that 26 per cent of all new East Coast natives had evidence of pulmonary tuberculosis as shown by mass miniature radiography. The cases were not all active.

Out of a total of 412 medical cases seen in the wards of King Edward VIII Hospital in Durban by Macfayden and Horne (1937) in the previous 12 months, they found 50 cases of pulmonary tuberculosis and 8 cases of tuberculous peritonitis. During a corresponding period at Addington Hospital there had been 26 pulmonary cases and no cases of tuberculous peritonitis.

Studying the death rate for tuberculosis in natives at New Brighton Location, Port Elizabeth, where

Peter Allan (Rept. Tuberculosis Res. Comm 1932) observes that the curve of non-Europeans tuberculosis incidence is following the European curve in its downward trend. He believes that each race living under constant conditions as regards habits, work and opportunities for infection, has its own index of mortality.

It is of interest to compare the findings of Kahn (1936) among the Bush Negroes of Dutch Guiana, since they show that although the opportunity for infection is present, this is very infrequent as revealed by the extremely low rate of positive tuberculin tests (2.34 per cent) and the great rarity of clinically recognisable disease. The isolation of the group which has lived under the natural conditions to which they were accustomed in Africa before transportation as slaves to America may account for these unusual findings, but Kahn suggests that the favourable circumstances of their life may be of considerable importance in bringing about this unusual situation.

EXISTING FACILITIES FOR HOSPITALIZATION AND TREATMENT OF
NATIVE TUBERCULOTICS AND SOME SUGGESTED IMPROVEMENTS.

Tuberculosis control in the Union is under the Department of Public Health. A special branch was created in 1945 for dealing with the disease. The Public Health Act 1919 (as amended) contains a special provision for refunding to local authorities who are made responsible for provision of facilities and for the treatment of tuberculosis of a part of the expenditure incurred, in erecting and maintaining institutions and in treating communicable tuberculosis cases. Where the hospital has been erected at his request, to serve a large area, the Minister may refund the whole of this nett cost. Provision is also made for the limit of £10,000. in refunds to local authorities to be exceeded when approved expenditure on tuberculosis is undertaken. Health education and propaganda have been delegated to the South African Red Cross Society which has appointed a Health Education Committee. Voluntary Associations are encouraged (under the Public Health Act) by provision for grants in aid. A summary of unofficial activities for the control of tuberculosis in this country was given in a paper by Marais (1936). Among the voluntary associations interested are the Witwatersrand Anti-Tuberculosis Association, the Cape Provincial Tuberculosis Prevention Committee, the Natal Anti-Tuberculosis Association, the Association for the Prevention of Consumption, and various local authorities' anti-tuberculosis committees.

According to the Secretary of Public Health (Allan 1945) 92 beds were available for tuberculosis in the Union in 1924. On the 30th June, 1944 the position had improved and the following accommodation was available:- For Europeans 589 beds, for Non-Europeans 1,803 beds. He stated that further schemes were in hand to provide beds for 135 Europeans and 705 Non-Europeans. Various other plans were under discussion and it was hoped to take over certain military hospitals and camps which would provide at least another 3,000 beds.

The National Health Services Commission of 1914, using the generally accepted standard of a bed for every fatal case of

tuberculosis per annum, estimated that there should be 15,000 Non-European beds made available for treatment of Non-European cases. Dormer (1943) however, bearing in mind the reluctance of natives to be hospitalized and the fact that only 20 per cent of natives are diagnosed early enough for treatment to be effective, estimates that 4,800 beds would be sufficient to cope with the need. Of these he suggests that 1,600 should be in the Cape Province, 1,200 in Natal, 1,600 in the Transvaal and 400 in the Orange Free State. According to Dormer's estimation therefore it will be noted that there is a shortfall of beds available for isolation and treatment amounting to 3,000.

The service available for treatment of natives including those suffering from tuberculosis are today grossly inadequate. Most natives when ill never see a medical man either because of inaccessibility of their dwellings or because they are unable to afford a visit from a European doctor. Many South African practitioners have urged the necessity of a medical service for natives in their territories (Gear, Gale, Allan, Burton, Tonkin).

In 1939, the Minister for Public Health laid down the policy of establishing a chain of health clinics throughout the native territories. It was proposed to establish one such clinic at Polela, as a model, and to expand the service as the clinics proved their value. This clinic was to have six satellite clinics, each of which was to be attended by a medical officer on one day a week. £12,000. was voted by parliament towards this end in 1940. (Gear 1941)

Dormer (1943) has stated that 70 per cent of tuberculosis cases diagnosed in Durban hospitals have advanced bilateral pulmonary disease.

Gillman and Gordon (1942) discuss the fate of 150 pulmonary tuberculosics admitted to the Non-European hospital Johannesburg the previous year, who did not die in hospital. They found that 45 cases had been discharged by physicians, 88 cases refused further hospital treatment and only 17 cases were transferred to other institutions for further treatment. Of the 133 cases returning to their homes only 7 were found to have negative sputum. The average duration of hospitalization was 30.1 days; 20 per cent of cases were hospitalized

for more than 90 days; 26.5 per cent of cases remained in hospital for less than 10 days. They found the average length of stay of tuberculous patients in American hospitals to be 164 days and in Nelspoort and King George V Sanatorium the average duration of hospitalization during 1940 was 166 and 158 days respectively.

Macvicar (1932) states that in his hospital native tuberculous are retained for an average of a month to educate them in preventive methods. Most of his cases are rapidly progressive in type.

From 1936 to 1943 the Public Health expenditure on tuberculosis amounted to about £750,000. The amount spent by the Provinces totalled about £170,000. while a quarter of a million had been spent in capital expenditure. (L.S. Williams 1945).

The capital cost of tuberculosis beds in the Union works out at approximately £800. per bed for Europeans, through lessening amounts for Europeans and Asiatics to £100. per bed for the Bantu. This, explains Cluver (1945) is not because of deplorable race discrimination but because the African is not happy in the sumptuous surroundings demanded by civilized Europeans. He is most successfully treated in his own primitive home surroundings, provided with a diet to which he is accustomed. The maintenance of beds works out at 20/- a day for the European and 2/- a day for the African.

Many suggestions have been made as to the best way of reducing or eliminating the grave problem of tuberculosis in the South African native.

Macvicar (1908) believed that efforts should be directed along two lines: firstly to reduce the spread of tuberculosis and secondly to improve the social conditions of the people: he considered the second to be the more difficult and the more important task. He urged the control of tuberculous natives repatriated from the mines which he believed were as much responsible for spreading the disease as all the other agencies put together. He recommended sanatorium treatment for early cases and general hospital treatment for advanced cases making use of skilled native nurses, and he urged the necessity for health education through schools, universities and native health societies, citing as example the success which had

attended elementary health propaganda among the Red Indians in Canada in reducing the disease by one third and the mortality by one half. He believed that the natives would not ever be able to afford treatment in clinics unless it were free.

The Tuberculosis Commission (1914) laid special emphasis on the fact that measures for combating tuberculosis must begin with the prevention of cases, and that the way to effect this was by improving firstly the conditions under which so large a proportion of the coloured and native population lived in urban areas and secondly the conditions under which they worked in the industrial centres, especially on the mines.

Dormer suggests that the essential measures to combat tuberculosis are to find and isolate the infecting case and to feed all sections of the community adequately; as a corollary he adds that no one should be allowed to do sustained physical effort without adequate diet. To implement his first recommendation he suggests mass miniature radiography combined with tuberculin surveys. He believes that education of the patient in hygiene is the most effective public health measure and that a patient who has learnt how not to infect others is already isolated even though he is never admitted to a hospital. Dormer is so strongly convinced of the part that adequate feeding plays in the development of tuberculous disease that he states that if nothing else were done than to feed a nation on a fully adequate diet, tuberculosis would die out in a reasonable number of years.

Ryno Smit (1945) agrees with Macvicar and Dormer in the importance of the economic status of the native. He advocates provision of facilities for isolation in the form of farm colonies and care of the soil and elimination of "cattle barons", in the native reserves. He states the need for accurate vital statistics.

Gale (1945) believes that an adequate public health programme of housing, feeding and health education is of even greater importance than the building of more hospitals and the establishment of more clinics. For tuberculosis is more than a disease, it is "itself a symptom of a disordered socio-economic system".

homes when staff and funds are available, W. Harden Smith quotes the work done by Kibongoto Tuberculosis Hospital at Kilimanjaro. This hospital acts as a separate unit and associated with it is a chain of dispensaries on the mountain which are partly conducted in collaboration with mission dispensaries. Cases are detected at the dispensaries, and when considered advisable they are sent to the main hospital. At the hospital artificial pneumothorax and other surgical procedures are carried out in suitable cases who may be sent home to continue their treatment, including refills by visiting members of the hospital staff at the dispensaries. Results are definitely encouraging and many apparently arrested cases may be seen; these cases have a considerable propaganda value.

At Kibongoto, a village settlement for open cases who are able to do light work has been established, but it is new and still in the experimental stage.

the tempo of the disease and in the infected person it may increase the likelihood of disease. The importance of nutrition seems to be so great that it would appear reasonable to regard it as the most vital of all factors underlying the association between a low standard of life and the high incidence and rapid progression of tuberculous disease.

Influence of housing:- Willcocks (1938) believes that the chief factor influencing the incidence of tuberculosis is close contact in small dark ill-ventilated huts where it is the custom for whole families to sleep together.

Dormer (1943) on the other hand finds that crowding gives the opportunity for infection but not necessarily for disease. In this he is supported by Ustvedt (1942) who believes overcrowding to be of doubtful influence in the development of tuberculous disease.

testing of all recruits. Willcocks (1938) has warned against the employment of natives showing positive reactions, with vesiculation to tuberculin testing, in industry.

Canada have noted favourable results from the prophylactic use of B.C.G., but so far it has not been used in the South African native. Dormer (1943) is chary about recommending it for use as he feels there is not yet sufficient information on the type of disease following its administration.

Grasset (1944) has reported on the use of tubercle endotoxoid prepared by him. From the pathological point of view, a fibrotic transformation was observed accompanied by a clearing in more recently infiltrated areas. Of a series of 47 unselected cases treated at the non-European Hospital, Johannesburg (1939-42), suffering from acute, and in most cases, advanced forms of pulmonary tuberculosis (39 with bilateral disease, 40 with cavitation, and all with positive sputa), 32 benefitted from endotoxoid treatment and showed fibrotic changes of varying degrees. Of 14 patients who died in this series during treatment, 9 showed either radiological or postmortem evidence of fibrotic changes of the lesions including two cases of miliary tuberculosis.

glandular infection was encountered in 100 cases. Of these 85 cases arose in the 376 positive reactors (22 per cent), 15 in 49 hyper-reactors (30 per cent) and 15 in 95 negative reactors (16 per cent). The Tuberculosis Research Committee (1932) concludes that the rarity or absence of epidemic spread of acute tubercular disease in isolated communities exposed to occasional infection is perhaps to be explained in terms of the tendency to spontaneous arrest of cases in the glandular stage, as noted by Borrel, when placed at rest and suitably dieted.

Lamprecht (1944) reviewing the health of cattle in the Transkei stated that a few years previously 1,500 head of cattle had been tuberculin tested with negative results; only odd cases of disease had been noted amongst carcasses inspected at the Umtata abattoir. Tuberculosis of pigs on the other hand was fairly common; of 3,100 pigs slaughtered at Umtata during the previous five years 99 were found to be suffering from tuberculosis (type unspecified).

Allan in 1924 was of the opinion that tuberculosis was widespread amongst dairy herds, especially in the Western Province where tuberculin testing yielded up to 73.9% positive reactors in one herd.

BOVINE TYPE TUBERCULOSIS CAUSING DISEASE IN HUMANS

Harvey Pirie (Rept. of Tub. Res. Comm. 1932)

examined bacilli isolated from 100 cases of tuberculosis in mine natives and every one was of the human type. Dormer (1943) claims that only three cases of bovine infection in human being have been recorded in South Africa. In Natal he and his associates typed 200 cultures of organism obtained from human sputum, bone abscesses, joints and neck glands, and all were of the human type. Willcocks (1938) found in Tanganyika that of 70 strains of tubercle bacilli isolated from natives of the territory, only two were of the bovine type. Matthews in 1935 found that in Zanzibar "the predominant type of causal organism seems to be of the human type." It would appear therefore from the scanty investigations that have been undertaken, that the role of bovine tuberculosis in producing human disease is a relatively minor one.

