

Broadly speaking, the Natives from the Portuguese territories are principally engaged in drilling, as they show special aptitude for this type of work, which requires a considerable amount of skill and intelligence. B.S.A. Natives are principally employed in shovelling and pushing trucks, although an increasing number of these are being introduced into drilling gangs.

Although the majority of compounds are situated close to the shaft which the Natives have to descend to reach their work, there are a few instances where a considerable distance has to be traversed by the Natives before they reach the shaft-head. In a few instances this distance is as great as two and three miles, but these are exceptional. The transportation of the large number of Natives underground takes a considerable time, and a certain number may have to wait an hour or even two before they can enter the cage which is to carry them underground. On a cold winter's morning this waiting, which is often done in the open, or practically in the open, may make a serious inroad into the Native's vitality, which, if one takes into account a long walk on the surface and a long walk and perhaps a climb underground, may *in toto* represent a serious drain on his energy, so that he may reach his work already in a tired condition. This factor is appreciated by the managements and efforts are constantly being made to minimize this waste of energy as well as the drain on the vitality of the individual.

When the Native's work underground is finished there is again liable to be a considerable period of waiting before he can be transported to the surface.

The mine managements have appreciated the importance of avoiding exposure between the shaft-head and the compound, and there is an adequate provision of changing rooms and baths on most mines.

It appears to the Committee, however, that there has not been an equal appreciation of the risk of chill run by the Natives during the time spent (which may be an hour or more) after knocking off work in a hot, damp place, in waiting to be hauled up out of the mine.

The waiting-places are near the down-casts and comparatively cool and dry. The contrast between one's temperature sensations in the slow-moving air of most working-places and in the gales blowing down the underground main roads must be experienced to be appreciated. At a working place one is glad to be stripped while in the main road one is just as glad to get into clothes, although the thermometer may be registering practically the same temperature in each situation.

A rub-down and a blanket immediately on knocking off work would be better than a Turkish-bath an hour or more later on the surface.

Owing to the Regulations framed with a view to preventing silicosis, a great deal of water is used underground. Not only is all drilling done with axially water-fed drills, but additional water is sprayed on the exposed rock face when drilling is first commenced—"collaring," as this is known—and in addition to it, no rock is handled in any way until it is thoroughly saturated with water by means of a hose. Further-

more, the floor, sides and roof of the working-place are also thoroughly sprayed with a hose. The shafts are also subjected to spraying, and water is atomized by means of compressed air to form a dense curtain during blasting time. The result of this immense and, from the silicosis-prevention point of view, probably greatly excessive use of water, is that the mine atmosphere is in a state of saturation. This saturation, combined in the deeper workings with a temperature between 85° and 90°F., undoubtedly subjects the mine workers to serious physiological stress. Studies conducted by Orenstein and Ireland<sup>43</sup> indicate that under certain unfavourable underground conditions, with a wet Kata cooling-power of 5, as much as 45 per cent. of the efficiency may be lost, as measured in output of work.

In connection with the high humidity of the underground air, the possibility of these conditions facilitating infection leading to respiratory diseases cannot also be lost sight of, when one recalls the difficulty experienced in experimental respiratory infection with dry bacilli, and the ease with which this can be achieved with bacilli suspended in fluids. The fact that work in humid atmospheres is a frequent cause of epidemics of furunculosis may also be an indication of the favourable influence such atmospheres have on the implantation of infection.

#### SECTION B.—INDUSTRIAL BENEFITS AND RISKS IN GOLD-MINING.

“ . . . We may still question the expediency and efficiency of those measures introduced by the white man, not in order to satisfy his own commercial requirements, about which he is quite likely to be a competent judge, but in order to satisfy his ideal of what he thinks the dark man under his control ought to require, when he has been taught what his needs should be by him, the superior white. The existence of the so-called ‘Native Problem’ is sufficient evidence that in this latter respect white men are, and have been, generally speaking, most incompetent.”—*Pitt-Rivers* <sup>93</sup>.

It would be easy to write this section from the conventional European standpoint, but the quotation given above indicates the advisability of approaching the subject as far as we can from the Native point of view. This entails some general consideration of his needs, hopes, prospects and outlook, and the reader is advised in this connexion to consult such works as those of Junod<sup>26</sup> and Molema<sup>90</sup>.

The gold-mining industry, like other industries, is organized primarily in terms of commercial requirements, and the dark man has no private grievance in this respect. This industry entails special risks and has special methods for securing its Native labour force, so the question here to be considered is whether the dark man, as he now finds himself in South Africa, gets any benefit from the gold-mining industry other than that of being employed.

#### 1. BENEFITS.

One may assume that the Native himself considers that employment on the Witwatersrand gold-field is to be sought after, since, of the 400,000 that go through the mines every year, about 80 per cent. are re-engagements. The labour force is not secured locally, but comes from considerable distances.

Molema writes: “. . . The Muntu (*pl.* Bantu) is essentially a farmer, agriculturist and stock-breeder and, even when at the mines he has, or had, often a little land to cultivate and a few animals to look after . . . his ultimate hope is to return, buy some more cows, and settle down on his little plot.”

The land available in the Union whereon the Native can acquire interest is scarce and, for him, expensive. He wants money for another of his needs—a wife. Unless he has paid “lobola” or bride-price he is of no account; moreover, the children will not be legally his but his wife’s and go with her in the event of a separation.

The occasion of the desire of this pastoral community to take up mining is, therefore, not far to seek. The industry is the one considerable avenue to skilled labour and the higher wage it commands.

Lovedale and other organizations make praiseworthy attempts to equip the Native as a tradesman, but it is most difficult for the Native thus equipped to secure employment. In this country there is the utmost prejudice against encouraging the Native to become a competitor as opposed to a hewer of wood and a drawer of water. This prejudice is perfectly understandable when one remembers that the Native’s desired standard of life can be secured on a much lower wage than will satisfy the European and, other things being anything like equal, cheap labour drives less cheap labour out of the market.

In the respect of earning a decent wage, the Native’s position is getting worse rather than better. The prevailing unemployment from which the Union has not escaped has resulted in Native government servants being swept out of the railway departments, post office and telegraph departments and the Civil Service, to be replaced by Europeans.

Since the land available for the Native in South Africa is limited and—for him—costly, the great benefit that he gets from the gold-mining industry and his reason for seeking employment there is that it affords him almost his only means of securing economic ability to become economically free after the only fashion in which economic freedom appeals to him.

It may well be asked: If the gold-mining industry has all this to offer, why recruit labour?

The idea of recruited labour is rather repugnant to the modern European, but it is quite in keeping with the Bantu’s own recent tradition.

Before ever the Bantu and the European cultures clashed, the former had an established custom of national service. Every three years or so the adolescents were collected into “mephato” or regiments to undergo the rites of circumcision and initiation into full tribal membership. Each mephato had a distinctive name given to it, and any

mephato was liable to be called upon at any time by the chief to do any work. ". . . Each had, of course, to provide his food and the work was a free service to the tribe, no one getting paid."

The idea was not primarily military at all so far as concerned the Bantu as a whole, although the tribes often did engage in some fighting among themselves, much as did the Highland clans and Border folk in Great Britain.

It is true that about the beginning of last century Dingiswayo, of the Ba-Temba, substituted conscription for national service and militarism for communism, and this idea came to full fruition under Chaka and Mzilikazi, but the manner in which these two fighting captains marched over Africa is good evidence that the rest of the tribes were not organized in a military sense.

The object of this digression has been to show that it comes natural to the Bantu to be sent off in large numbers to work for a central authority. Their own people would never have sent them far away nor have sent them for long; on the other hand, they would not have fed, housed or paid them.

Since the labour for the mines comes from a distance, transport organizations have to be supplied and enlistment for civil purposes is as conventional for the Bantu as is enlistment for military purposes to the European.

Full details of the work of these agencies are to be found in a paper already referred to on p. 61 of this Chapter.

Just as the Native himself does not take any particular exception to the circumstances of his engagement, so, too, he is tolerably well satisfied with his housing.

A visitor from Europe going round a mine compound for the first time is liable to be reminded of the Acts of the Apostles, i., 13, ". . . they went up into an upper room, where abode both Peter, and James, and John, and Andrew, Philip and Thomas, Bartholomew, and Matthew, James the son of Alphæus, and Simon Zelotes, and Judas, the brother of James." There is here some suggestion of overcrowding, but we are unaware of any complaint on the part of the apostles, just as there is none on the part of the Native in his compound room.

Of course, this does not imply that the responsible authorities are always satisfied with the manner in which the Native is housed, but that is another story which is considered elsewhere in this Report. Here we are considering the Native's own attitude towards what he gets and what he gives.

The nearer he can get to his kraal conditions the better he is pleased, and in his kraal he is not now as well housed as he used to be. In older times his hut cost him nothing; there was no lack of ground, materials could be had for the taking and, on application, his headman turned out a party to help with the building.

Nowadays there is not always the necessary ground; material has to be bought and paid for, and his fellows are less ready to do tribal work for nothing. The Native with a growing family can no longer

put up another hut as a matter of course, and his mine wage comes in very useful in this connexion.

The feeding of the labour force is always a very present problem, although the Native is easy to please in this respect, and there are far fewer complaints than among the general run of members of a Johannesburg club.

The diet is certainly adequate from the nutritional point of view. Table 5 summarizes the weights relating to over 20,000 Natives at the beginning and end of a contract. Every Native had at least six months' service; they were selected at random, subject only to the stipulation that all Natives included in the return must have been discharged as apparently fit.

TABLE 5.

Mine.	Total Number of Discharged Natives dealt with.	Natives gaining llb. or more between Initial and Final Weighings.			Natives losing llb. or more between Initial and Final Weighings.			Natives neither gaining nor losing more than llb.	
		No.	%	Average Gain in lbs.	No.	%	Average Loss in lbs.	No.	%
Brakpan Mines ...	827	419	50.7	4.98	334	40.4	3.70	74	8.9
City Deep ...	1,000	707	70.7	6.25	236	23.6	3.83	57	5.7
Cons. Main Reef ...	500	328	65.6	5.83	148	29.6	4.63	24	4.8
Crown Mines ...	1,000	728	72.8	7.12	210	21.0	3.95	62	6.2
Durban-R. Deep ...	300	227	75.7	8.61	59	19.7	4.34	14	4.6
E.R.P. Mines ...	700	509	72.7	6.74	147	21.0	4.14	44	6.3
Geduld Prop. ...	1,000	594	59.4	6.39	317	31.7	3.94	89	8.9
Geldenhuis Deep ...	340	229	67.4	6.89	85	25.0	3.31	26	7.6
Government Areas	1,000	489	48.9	6.62	432	43.2	4.54	79	7.9
Langlaagte Est. ...	1,000	648	64.8	6.70	262	26.2	3.81	90	9.0
Meyer & Charlton	300	240	80.0	7.60	41	13.7	2.05	19	6.3
Modder B. ...	771	521	67.6	6.49	195	25.3	4.01	55	7.1
Modder Deep L. ...	379	215	56.7	6.38	138	36.4	4.13	26	6.9
Modder East ...	890	512	57.5	4.25	277	31.1	4.17	101	11.4
New Kleinfontein	250	186	74.4	9.62	46	18.4	3.54	18	7.2
New Modder ...	974	593	60.9	6.44	261	26.8	4.74	120	12.3
New State Areas ...	1,014	484	47.7	5.49	462	45.6	4.92	68	6.7
Nourse Mines ...	300	223	74.3	5.84	64	21.3	4.16	13	4.4
Randfontein Ests.	1,000	762	76.2	3.67	192	19.2	3.33	46	4.6
Robinson Deep ...	500	344	68.8	6.07	124	24.8	3.69	32	6.4
Rose Deep ...	200	158	79.0	7.57	33	16.5	4.33	9	4.5
Simmer & Jack ...	445	273	61.4	8.92	130	29.2	3.55	42	9.4
Springs Mines ...	1,000	598	59.8	6.43	332	33.2	4.06	70	7.0
Van Ryn Est. ...	172	93	54.1	6.34	57	33.1	3.74	22	12.8
Van Ryn Deep ...	400	236	59.0	5.53	129	32.3	5.06	35	8.7
Village Deep ...	1,000	740	74.0	7.94	98	9.8	4.90	162	16.2
West Rand Cons.	300	239	79.7	7.33	48	16.0	2.21	13	4.3
West Springs ...	550	332	60.4	5.45	185	33.6	4.21	33	6.0
Witwatersrand ...	1,000	751	75.1	6.88	197	19.7	3.56	52	5.2
Wit. Deep ...	1,000	820	82.0	9.04	128	12.8	4.64	52	5.2
Sub Nigel ...	500	389	77.8	7.46	80	16.0	4.49	31	6.2
	20,612	13,587	65.9	6.58	5,447	26.4	4.13	1,578	7.7

Although they were, in most cases, coming from the leisure of the kraal to physical labour, the average weight was 132·4lb. on entry and 135·7lb. on discharge.

In so far as there are complaints, they arise, in the main, over tribal taboos. For instance, some tribes will not eat fish, and others consider that fat should be used for external application only. It is more serious when one has to deal with the vegetable taboos. An old hand may not infrequently be seen peevishly picking the vegetables out of his stew and throwing them on the floor. Should he go on doing this long enough and thoroughly enough, he may end by getting scurvy.

The fact is that getting a sufficiency of the accessory food factors into the diet is rather like concealing a powder in the spoonful of jam given to a baby. Should the deception be detected, there is trouble.

On the whole, however, the Native does not find fault with the food provided; he maintains his health and, in the majority of cases, improves in condition during the course of a contract.

## 2. RISKS.

While the Native derives advantages from his employment on the gold mines, he exposes himself to certain risks from which he would be free if he remained in his kraal.

Mining is a dangerous trade, even in an old-established European mining district with a long tradition and spontaneous discipline. Organization and supervision is reducing the Native's accident rate from year to year, but the mine medical officer's accident wards are still far from lacking patients.

Accidents are not the only mining risk. Apart from an occasional epidemic, the Native in his home is not a great sufferer from bacterial and other diseases. In the mine compounds, however, there is always a certain amount of sickness, mostly respiratory, and the conditions facilitate case-to-case spread.

Nevertheless, the general health of the force, as judged from percentage of "shifts lost" owing to sickness, is good and, if there be more sickness on the mines than in the kraals, there is less than there is in city locations.

There is a rather instructive comparison between the gold mines and collieries on the one hand and the Kimberley diamond mines on the other. The former draw their labour from a distance, and there is consistently a high sickness rate during the early part of a contract. As the new arrivals settle down, all forms of sickness diminish greatly in incidence.

In the case of the diamond mines, labour is drawn from local sources and there is not this excess sickness rate at the start of a contract.

Quite apart from the novelty of mining conditions, the general change is greater for those who come from a distance, and their resistance is affected adversely by the journey and the associated collection of Natives from different localities.

Another matter arises in this context. Natives employed on the diamond mines remain on the mine property throughout their contract,

while the gold-mine and colliery Natives have the run of the neighbourhood.

As soon as Natives are collected in large numbers in accessible places, they are subjected to unaccustomed temptations of drink and venery inseparable from such opportunities for profitable exploitation by a certain unprincipled class of the community. Arising out of this circumstance, which, although unlawful, appears also to be uncontrollable, is one of the risks to which the labour force is exposed, although it is not a risk connected with either gold mining *per se* or with compound management.

There is no doubt that the Natives would benefit in most respects were it practicable—which it is not—to house the labour force in townships and give them an ordinary family life. In one very serious respect, however, this would probably be a disadvantage. It would almost inevitably lead to continuous instead of intermittent employment. The special risk of gold mining would then come more into play and the last state might be worse than the first.

The special risk on the Witwatersrand goldfield is the exposure to silica dust, and in this risk the Native shares. Owing to his intermittent employment and comparatively short total employment, however, this risk is favourably modified. While there is a steady, if comparatively low, incidence of silicosis on the Natives employed, the presence of silica dust must affect the tuberculosis incidence unfavourably.

When considering the benefits and risks of gold mining, we may finish—as we began—with a quotation from Pitt-Rivers:—

“The impotence of the more lowly and barbarian cultures to make an effective resistance against attempts at Europeanization has left the Natives ill-equipped and without the will to survive the destruction of all the values that gave meaning and zest to their lives.”

Gold mining does give some meaning and zest to the lives of this landless and homeless proletariat of ours that is loitering on the outskirts of civilization; it does supply a sort of community of interest.

For many tribes, going to the mines has taken the place of going on a razzia and renders the miner a man of consequence.

He is spoken of as one “acquainted with the deeds of men.” A girl who is in a position to choose will choose a miner and this not only because he may make a better home for her: he has accomplished the present-day equivalent of “wetting his spear.” The European may not approve of polygamy, but the Native does. The dignity of a man is increased by the number of his wives, and the wife or wives encourage him to take more. It is like showing the neighbours that your husband can keep more than one car. Few Natives other than those who have been employed on the gold mines can run to more than one lobola.

It is probable that the Native dislikes mining less than other manifestations of European culture with which he is brought into contact, and he dislikes it less for the reason expressed in the words of his own grace—“If I have seen the fat I have also partaken of the meat.”

## CHAPTER III.—HEALTH SERVICES IN THE GOLD-MINING INDUSTRY.

The extensive and efficient health services directed to the welfare of all Natives upon their recruitment to the mining industry stand in direct contrast to the almost entire lack of any such provision for them in their home areas, where the entire medical services available are confined to a few district surgeons and private practitioners, whose numbers are so small that their combined efforts can hardly be said to constitute a medical service in the slightest degree adequate for the necessities of the large and scattered population of the Native Territories.

Here follows a brief description of the system of health services for Native mine labourers in existence on the Witwatersrand, together with a reference to the chief organizations concerned in carrying it out.

## SECTION A.—HEALTH SERVICES ON THE MINES.

## I. THE MINE MEDICAL OFFICERS.

Government Regulations provide that the Natives employed on the mines shall receive free medical and hospital treatment during their employment. For some considerable time the majority of the mines have provided this treatment through medical officers who devoted their whole time to the Native employees, but there were some of the mines on which this service was rendered by medical officers giving only part of their time to this work. In 1925 Regulations were promulgated, making the employment of full-time medical officers for mine Natives compulsory. The principal duties of a mine medical officer are as follows :—

- (1) He is an examiner, under the Miners' Phthisis Act, in so far as Natives are concerned. This imposes upon him the duty of medically examining every Native applicant for work and certifying him as fit for employment, especially in regard to being free from tuberculosis. He must also carry out periodic examinations of all Natives, to satisfy himself that they are fit for work, and especially that they are free from tuberculosis and silicosis. He must examine every Native at the termination of his employment and certify as to his freedom or otherwise from tuberculosis and silicosis. The periodical examination takes the form of weighing at least once every six weeks every Native employed. Any native who is found to have lost 5lb. between two consecutive weighings, or a total of 6lb. or more in three consecutive weighings, is subjected to a special clinical examination,



including, if necessary, detention in hospital. Furthermore, any Native who is admitted to hospital for any cause whatever is specially examined with a view to determining whether he has any signs of tuberculosis and silicosis.

The efficacy of these examinations is indicated by the fact that out of 2,217 consecutive cases of pulmonary tuberculosis (not including tuberculosis with silicosis) which had been certified on the gold mines of the Witwatersrand, 1,006 were diagnosed during illness in hospital, 504 as a result of clinical medical examination outside the hospital, and 707 at periodical weighings. The value of weighing is indicated by the finding that out of 2,054 consecutive cases of pulmonary tuberculosis unconnected with silicosis, 1,714 had lost weight, 404 gained weight, and 136 remained stationary in consecutive weighings. The subject of periodical weighing as an aid in the early diagnosis of tuberculosis receives further consideration in Chapter IV. p. 110, *et seq.*

- (2) He is responsible for the hygiene of the Native employees. In this connexion, he periodically inspects compounds, underground workings, food supplies, etc., except that this duty is not imposed upon medical officers on the mines of the Central Mining/Rand Mines Group, where a central organization for the supervision of hygiene exists.
- (3) He is responsible for the medical and surgical treatment of all Native employees.

## 2. MINE HOSPITALS.

In terms of the Regulations, hospital beds in the ratio of  $2\frac{1}{2}$  per cent. of the average number employed must be provided. With the exception of seven mines of one mining group, a hospital for Natives is provided at each individual mine. In the group above referred to, there are three central hospitals situated on centrally-located mines, each serving several mines. In these so-called "Central Native Hospitals" the nursing personnel consists of European sisters and Native female nurses, the latter being trained in these hospitals. In the other mine hospitals the nursing personnel consists of European male trained nurses, assisted by trained and untrained Native males. At the mines served by the "Central Native Hospitals," except those at which the central hospitals are situated, there are provided auxiliary "clearing" hospitals, in charge of a European male trained nurse, where minor cases are detained for treatment. Experience has shown that, except in very minor ailments and injuries, restoration to health is delayed in the case of Natives treated as out-patients. For this reason the hospital admission figures of mine Native hospitals are not comparable with general hospitals, even those serving an industrial population, because a very large number of the patients admitted to mine hospitals would not be considered for admission in other hospitals, but would be treated as ambulatory out-patients.

Broadly speaking, 60 per cent. of cases at any one time in mine Native hospitals are surgical, and 40 per cent. medical. The majority of the medical cases are, as a rule, respiratory diseases.

The equipment of these hospitals is up to the standard of ordinary general hospitals. The wards are well ventilated and lighted, provided with suitable beds, and all the ordinary nursing apparatus. In most hospitals there is installed an X-ray plant with sufficient power to make satisfactory radiographs of the lungs. There are well-equipped operating theatres, provided with sterilizing and surgical apparatus. Ablution facilities are ample, and the standard of cleanliness in nursing is in every way satisfactory. Of course, because of the larger size and consequently proportionately lower overhead costs of the "Central Native Hospitals," it is possible to provide a higher grade of equipment in these than is economically possible in all individual mine hospitals.

Mention has been made above of the head office organization of one of the mining groups. This consists of a medical officer, who is in charge of all the medical and sanitary services on the mines comprising this group, who has on his staff a trained sanitarian, and the necessary clerical assistance. The whole administration of the medical and sanitary services is in his hands, and all communications from and to Local and Union Government relating to medical and sanitary matters pass through him. This organization, therefore, potentially permits of unification of policy and interchange of experience and knowledge obtained on the various mines comprising that group. It also permits of the establishment and prosecution of definite lines of investigation, for which purpose a special medical officer is employed, and in which various mine medical officers of the group also lend a hand.

### 3. TRANSVAAL MINE MEDICAL OFFICERS' ASSOCIATION.

Early in 1921, principally through the instrumentality of the late Dr. H. T. H. Butt, the Senior Medical Officer of the Randfontein Estates G.M. Co., and with the assistance and encouragement of the Chamber of Mines, the mine medical officers for Natives were organized into the Transvaal Mine Medical Officers' Association. This Association holds monthly meetings for the interchange of experience, and conference on the various problems with which its members have to deal. Its *Proceedings* contain a number of valuable contributions, covering investigations into such important matters as pneumonia, tuberculosis, enteric fever, the treatment of various surgical injuries, etc. It also acts as a technical advisory committee to the Chamber of Mines. It is undoubtedly serving a most useful purpose in many directions.

### 4. HYGIENE OF MINE COMPOUNDS.

The carrying out of the various prophylactic measures in the compounds rests with the compound managers and their staffs, on the advice and under the supervision of the mine medical officer or, in the case of the one group, the headquarters organization. The compound manager is responsible for the cleanliness of the compound, for the

maintenance in a satisfactory condition of the rooms, washing and sanitary installations, kitchens, etc. He supervises the preparation and issue of the food, and the sending for medical treatment of Natives who appear to be unwell or who are injured.

The compound managers are selected from among men who have had long and intimate contact with Natives, and who can speak at least one of the Native dialects. Their duties are very responsible and onerous and, generally speaking, they discharge these in a highly satisfactory manner. Several years ago a course in elementary hygiene was given to compound officials, which was largely attended and which undoubtedly served a very useful purpose. Quite recently, one of the mine groups prepared a special manual on elementary hygiene and the duties of the compound staff in relation to hygiene, which was issued to every member of the staff, and which should also serve a useful purpose. It would appear desirable that all members of the compound staffs should receive a course of elementary instruction in hygiene and sanitation before they are promoted to senior positions.

#### 5. UNDERGROUND SANITATION.

The underground sanitation is in charge of the underground manager, and under him of the mine captains and subordinate officials in charge of the various sections of the mine.

Bacteriologically and chemically satisfactory drinking water is provided underground at conveniently situated centres.

Permanent latrines are provided in reasonably close proximity to the working-places, and are supplemented by portable installations, carried as close as possible to advanced workings. The permanent latrines are constructed with concrete floors, so curbed as to prevent pollution of the mine, and are fitted with pails provided with hermetically closing covers for transport to the surface, where the contents are disposed of, either by dumping into sewers, trenching, or incineration. Separate latrines are provided for Europeans and Natives.

Owing to the presence of a considerable number of hookworm carriers in the mines, the latrine floors and buckets are treated with rock salt, and the perches, walls, etc., are swabbed with a 20 per cent. salt solution daily. Salt treatment is also carried out on the cages which carry the buckets to the surface, and the areas on which the buckets are placed prior to being loaded into the cage are also strewn with salt. The same salt treatment is also applied to any underground and surface transport, where such is employed in carrying the pails.

Where the water used in connexion with drilling, hosing-down of the working-place and rock is found to be infected, it is usually chlorinated.

Supervision directed towards the prevention of faecal and urinary pollution of the mine is a very difficult matter, owing to the great extent of the workings and the visual difficulties, but the underground officials

and European miners have been made very much alive to this danger, and recent investigations seem to indicate that such pollution is at present exceptional.

Several years ago an investigation was made on a number of sputum specimens collected underground, and in a considerable percentage of these acid-fast bacilli, which on ordinary microscopic investigation were stated to be *B. tuberculosis*, were found. A more recent investigation at the South African Institute for Medical Research (see Appendix 6, p. 367) by means of biological tests, indicates, however, that the acid-fast bacilli found were probably not *B. tuberculosis*, as similarly obtained specimens of sputum showing acid-fast bacilli did not produce tuberculous lesions when inoculated into susceptible animals.

#### SECTION B.—GENERAL HEALTH SERVICES.

##### 1. WITWATERSRAND NATIVE LABOUR ASSOCIATION'S HOSPITAL.

###### (a) Examination of Recruits.

As stated in Chapter II, Section A, all Natives for employment on the gold mines are examined at the Witwatersrand Native Labour Association's central dépôt hospital in Johannesburg.

From 170,000 to 180,000 recruits are examined annually, and the numbers presented for examination daily vary from 300 to 1,200. A staff of six whole-time medical officers performs these examinations.

On arrival at the dépôt every Native takes a bath, being given soft paraffin soap with which to cleanse himself. The clothes of the British South African Natives are degerminized in a steam disinfector—a necessary precaution in view of the prevalence of typhus fever in the Native Territories of the Union. Thereupon the Natives are drafted in batches to the examination rooms, where they are first taught by trained Native orderlies to breathe in a manner suitable for auscultation. This preliminary may appear unnecessary, but in practice it is found to be essential and saves a great deal of time, as some Natives are very nervous and apprehensive.

These recruits are then lined up, naked, in rows of about 25 before each medical officer, who carefully auscultates the chest—front and back—and makes a mark on the chest on the detection of any abnormality, however slight. He is thereupon removed to a special room for re-examination by a medical officer whose whole time is thus occupied.

If considered advisable, the suspect is detained in hospital, X-rayed, his medical and labour history enquired into, and a bacteriological examination made of his sputum.

On the completion of the auscultation of each row, an inspection is made of the limbs, eyes and glands, while signs of venereal disease are looked for, and those passed fit are sent to the dépôt pass office for registration.

In spite of the schooling, there are always some who will not, or cannot, breathe suitably. It has been found necessary to X-ray the chests of such Natives, as a large proportion of them are found to have tuberculosis or silicosis. In many cases the poor breathing is wilfully done, the Native thus hoping to escape the detection of disease.

Cases of early silicosis and early hilus tuberculosis are almost certainly missed at this initial examination, for it is impossible to detect these conditions by auscultation alone.

*Disposal of Natives found Unfit at Initial Examination.*—Natives found to be unfit at the distributing depôt, including those returned after examination by the mine medical officers on the mines, are dealt with as follows :—

- (i) Natives who are ill are admitted to hospital and treated, and if the disease from which they have suffered has been of a serious character, they are repatriated in due course.
- (ii) Recruits who are out of condition, or merely "train-weary," are weighed and detained in the depôt under medical supervision for a fortnight or longer. During this time they are periodically examined and only passed out when sufficiently improved for underground mine work. Those who do not improve to any extent are usually put on light surface work at a mine ; they are not allowed to work underground until passed as fit therefor.
- (iii) Natives with chest abnormalities are detained in hospital for investigation (radiographic and bacteriological) to exclude cases of silicosis or tuberculosis.

Natives found to be non-tuberculous and otherwise fit for light work are discharged from hospital and offered mine surface work. Tuberculosis cases—incipient or otherwise—are repatriated to their homes. Silicotic or tuberculo-silicotic cases are transferred to the miners' phthisis wards for examination by the medical officers of the Miners' Phthisis Medical Bureau to determine, in terms of the Miners' Phthisis Act, the degree of incapacitation. Such Natives are repatriated when fully dealt with in terms of the Act.

The Service Contracts of all Natives found to be unfit for underground work but fit for surface work are endorsed accordingly, and in each case a certificate of unfitness to work underground, stating the cause, is made out and sent to the Native Affairs Department. Should the mine at a later date wish to transfer these Natives to underground work, it is under the obligation to send them to the W.N.L.A. depôt for re-examination. If fitness for underground work be then confirmed, the Service Contract is duly amended.

Table 6 gives the number of Natives dealt with and the causes and percentages of rejections, at the Central Depôt during the twelve months January to December, 1929 :—

TABLE 6.

Class.	Total Examined.	Total Rejected.	CAUSES OF REJECTION.			Percentage of Rejection.
			Tuberculosis.	Defective Lungs.	Other Causes.	
East Coast Recruits ... ..	43,392	2,908	160	667	2,081	6.70
East Coast Natives for Re-engagement ... ..	11,573	119	18	65	36	1.03
British South African Recruits	54,031	2,287	178	674	1,435	4.23
British South African Non-recruits ... ..	43,795	986	57	319	610	2.25
British South African Re-engagements ... ..	16,058	198	8	104	86	1.23
Contractors' Natives ... ..	2,736	5	2	3	—	.18
	171,585	6,503	423	1,832	4,248	3.79

N.B.—Silicotic and tuberculo-silicotic cases are included with tuberculosis. The term "Defective Lungs" refers to such conditions as crepitations, pleurisy, etc.—anything pulmonary not definitely tuberculous.

(b) *Treatment of Invalid "Transfers" from Mine Hospitals.*

The W.N.L.A. acts as a receiving depôt for the following classes of sick Natives from the Mines :—

(i) *Natives for Specialized Treatment.*—Special eye, ear, nose and throat cases, requiring the attention of a specialist, are frequently sent to the W.N.L.A. hospital, when arrangements are made to have them specially examined and treated.

(ii) *Convalescent Accident Cases.*—All compensatable accident cases—usually about 40 to 50 per week—are dealt with at the W.N.L.A. hospital by a Central Medical Board, which estimates the degree of disability in each case. The compensation is assessed by the Department of Native Affairs, and the amount is paid out, on behalf of the Rand Mutual Assurance Company, by the W.N.L.A. prior to repatriation.

(iii) *Cases under the Miners' Phthisis Act.*—All cases of pulmonary tuberculosis and silicosis diagnosed on the mines are sent into the W.N.L.A. hospital, for examination there by the Miners' Phthisis Medical Bureau, with a view to assessing the degree of incapacitation and the payment of compensation (if any) in terms of the Phthisis Act.

(c) *Repatriation.*

*Convalescent Sick Natives for Repatriation.*—About 120 convalescent Natives whom the mine medical officers regard as unfit or think inadvisable to continue working on the mines, are sent in weekly to the W.N.L.A. hospital for repatriation. During the two or three days the convalescents are in hospital awaiting repatriation, their temperatures are taken night and morning, and they are examined mainly

with regard to their fitness to undertake the homeward journey ; any who are found to be unfit to travel, or who require further treatment, are either detained or sent back to the mine hospital.

East Coast Natives are forwarded, under the care of a trained European orderly, to the W.N.L.A. hospital at Ressano Garcia twice weekly by train, being accommodated in coaches specially equipped with cooking and other facilities. At Ressano Garcia the Natives are re-examined and provision is made for the conveyance of all serious cases to their homes. Telegrams are despatched to the various stations en route, and at every point of arrival, whether by train or steamer, one of the W.N.L.A. European staff is in readiness to provide all necessary attention.

The acutely-sick Natives proceed to the W.N.L.A. camps, where they are fed and cared for and, in necessitous cases, whatever transport is available is placed at their disposal. The majority of the repatriates consist of the less serious cases of illness, and these usually proceed direct to their homes accompanied by their healthy relatives and friends among the time-expired Natives.

British South African Natives are repatriated by train once a week to the station nearest their homes, where they are met by relatives with a wagon or other means of conveyance.

A specially equipped coach, with lying-down accommodation and cooking arrangements, is provided, and the Natives travel under the care of a European orderly.

In all lying-down cases, arrangements are made at railhead to have the Natives conveyed by available transport to their homes, and if hospital attention is required their admission to the hospital nearest their homes is arranged.

The train is met en route by a medical man who orders to hospital any Natives who have become seriously ill.

## 2. THE MINERS' PHTHISIS MEDICAL BUREAU AND THE COMPENSATION SERVICE FOR SILICOSIS AND TUBERCULOSIS.

(a) The Miners' Phthisis Medical Bureau is a Government institution in the Department of Mines and Industries, and its work comes under the direct control of the Minister of Mines and Industries, who is responsible for all appointments to the Bureau. The Bureau consists of nine whole-time medical officers, namely, a chairman and eight members. There is also a part-time radiologist, whilst the pathological services are carried out by the Department of Pathology of the South African Institute for Medical Research. The Bureau has in addition a technical and clerical staff of 19. All salaries and administrative expenses of the Bureau are paid by the Government.

The very large amount of pathological and laboratory investigations (examination of lungs, sputum, blood, etc.) necessitated by the work of the Bureau is carried out by the S.A. Institute for Medical Research, but the Bureau is responsible for all decisions which may be based on such investigations.

(b) "*European Miners.*"—The great bulk of the work of the Medical Bureau is concerned with the application of the medical provisions of the Miners' Phthisis Act (Act No. 35 of 1925, Union of South Africa) to "European miners."

The more important classes of examination and investigation conducted by it are :—

(i) *The "Initial Examination"* of all persons desirous of entering the mining industry, with a view to determining their fitness or unfitness for underground work.

(ii) *The "Periodical Examination"* of all working miners, with the object of securing the early detection and notification of cases of the three compensatable conditions, "silicosis," "tuberculosis with silicosis," and "tuberculosis" (without silicosis). Each individual miner is examined clinically and radiographically once in six months. Any person so detected and notified becomes *ipso facto* eligible for an original award under the Act.

(iii) *The "Benefits Examination,"* by which is meant the examination of claimants for further awards in respect of a possible advance in his condition. A few original awards also follow from claims made by retired miners who have not previously been found to have silicosis or tuberculosis at a periodical examination.

(iv) The investigation of *Claims made by Dependants in respect of Deceased Miners.*

During 1929-30 over 44,000 examinations and investigations were made in respect of 29,000 European recruits, working miners or beneficiary miners. The actual number of working miners examined was 16,130.

(c) "*Non-European Miners.*"

The "initial," "periodical" and "benefits" examinations of non-European (Eurafrican and Asiatic) miners are also conducted directly by the Bureau; 1,127 such examinations were carried out in 1929-30.

(d) "*Native Labourers.*"

The "initial" examinations of Native mine labourers are carried out by the medical officers of the W.N.L.A. Central Depôt, with a supplementary examination by the medical officers of the respective mines to which such Natives are thereafter drafted.

The "periodical" examinations are conducted by the mine medical officers. The system of examination and the methods employed upon the mines for the detection of cases of silicosis or tuberculosis are described in another section of this Report (see Chapter IV, p. 110). An additional examination, termed a "final" examination, is made of all Natives leaving underground employment.



These duties are carried out by the medical officers of the W.N.L.A. and of the mining companies in the capacity of "medical examiners" under the Miners' Phthisis Act, and are subject to the general supervision and control of the Medical Bureau.

All mine Natives who, as a result of these examinations, are found by the medical examiners to be suspected cases of silicosis or pulmonary tuberculosis, or of both conditions, are sent forward to the central hospital of the W.N.L.A. for examination and disposal by the Bureau. Each such case is examined both clinically and radiographically and a sputum examination is also made. Tubercle bacilli are present in the sputum of 75 per cent. of all cases certified by the Bureau to have pulmonary tuberculosis. All decisions as to compensation of Native labourers in respect of silicosis or tuberculosis are thus made after examination by members of the Bureau. These examinations rank as "benefits" examinations. In 1929-30 1,689 Natives were so examined by the Bureau out of a total of 195,151 employed.

(e) *The System of Compensation* in respect of "silicosis," "tuberculosis with silicosis" and pulmonary "tuberculosis" prescribed by South African law is briefly as follows:—

(i) *Silicosis* (uncomplicated by tuberculosis) is graded in three stages—an early stage ("ante-primary"), including cases in which disability due to the disease is absent or is, at most, slight; an intermediate stage ("primary"), in which such disability is definite, but moderate; and an advanced stage ("secondary"), in which disability arising from the disease is serious and permanent.

For the two former stages lump-sum awards are made; for the final stage a life pension is paid in the case of European and non-European miners, with allowances to the miner's wife and his children up to 16 years of age, such allowances continuing after the miner's death, provided that silicosis has caused or contributed to death.

A miner who is notified by the Bureau that he has silicosis is not compelled to leave underground work, but unless he does so within three months after the receipt of such notification, he forfeits within his life time any awards further than that to which the original notification entitled him.

(ii) "*Tuberculosis with Silicosis*" is held, for the purpose of compensation, to be equivalent to silicosis in the "secondary" stage, no matter what the actual stage of silicosis may be.

(iii) A miner who is found by the Bureau to be suffering from "*tuberculosis*" (without silicosis) or "*tuberculosis with silicosis*," is immediately and permanently debarred from further work underground in scheduled mines. He receives, however, a lump-sum award in lieu of loss of occupation, provided that he has been employed underground in scheduled mines within the twelve months prior to the date of his being found by the Bureau to have pulmonary "tuberculosis."

This system applies also to Native mine labourers, except that in their case lump-sum awards only are granted, the reason for this differentiation being that a very large proportion of mine Natives comes

from territories outside the Union, and that the payment of a pension is accordingly impracticable. In respect of payment of compensation for tuberculosis to mine Natives, it is a necessary pre-requisite that the claimant should have been in continuous underground employment for at least one month, and that his condition of tuberculosis must be detected by the Bureau within six months after he has ceased to be employed underground. The latter restriction is due to the fact that pulmonary tuberculosis in many cases runs a very rapid course (often of only a few weeks) amongst South African Natives.

### 3. THE SOUTH AFRICAN INSTITUTE FOR MEDICAL RESEARCH.

The Institute was founded in 1912. The cost of the original buildings and equipment was borne by the W.N.L.A. acting on behalf of the Mining Industry, whilst the Government set aside a piece of ground for the site. In addition, both bodies contribute equally to the maintenance of the Research Division. The building was completed and occupied in August, 1914.

The Institute is controlled by a Board consisting of six members, three of whom are nominated by the Union Government and three by the Witwatersrand Native Labour Association, the technical administration being in the hands of the Director.

Although administered as a single body, the Institute is organized in two distinct technical divisions, known respectively as the "Research Division" and the "Routine Division." The Research Division, as its name implies, is concerned entirely with original research work, *i.e.*, the advancement of medical knowledge in matters yet unsolved.

The Routine Division, on the other hand, is mainly concerned with the application of already known and accepted principles and procedures in the diagnosis and treatment of disease, with university teaching in the medical faculty, with the carrying out of public health, medico-legal and such-like investigations, and with the preparation of bacterial vaccines, antitoxins and other sera.

Research investigations have covered a wide field, including, amongst others, silicosis, pneumonia, meningitis, tuberculosis, plague, rabies, influenza, dysentery, malaria, ancylostomiasis, cell-growth *in vitro*, cancer and biochemical problems.

The Institute is constantly in close touch with health problems relating to the mining population, both European and Native, not only through its association in pathological work with the Miners' Phthisis Medical Bureau and the Witwatersrand Native Labour Association, but also through its frequent collaboration regarding matters of health with the medical officers of the individual mines.

From the circumstances connected with its establishment; its constitution in relation to both the Government and the Mining Industry; together with its activities previously referred to, the Institute furnishes a centre possessing complete research facilities in regard to staff, equipment and available material for the investigation of medical problems in general and, perhaps, in particular those which form the subject of this Report.

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