The Economic and Social Background of Industrial Medicine in Madagascar

by

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In tropical and subtropical countries in the course of development the protection of the safety and health of workers runs up against a number of special difficulties ; the author of the present article has therefore been careful to start his study of the subject by describing in some detail the social and economic setting in which occupational medicine operates in the Malagasy Republic (population trends, wage-earning and independent activities, internal migration and the like). Against this background he then analyses the causes of occupational diseases and employment injuries, drawing attention to what is typical of the country, and gives an account of the statutory and administrative measures taken for the protection and compensation of workers and their families.

GENERAL

MADAGASCAR is a whole continent in itself and far more akin to Malaya than to Africa, from which, however, it is only separated by the 500 kilometre-wide Mozambique channel. It is very large, with an area of about 600,000 square kilometres and a length of over 2,200 kilometres, although its width is at no point greater than 500 kilometres. Roughly speaking the centre consists of a huge north-south plateau about 1,000 metres high, containing a number of extinct volcanoes, some of which rise to more than 2,500 metres. On the eastern side of the island the plateau falls off sharply in an almost impassable escarpment about 80 kilometres from the sea, while towards the west it falls gradually without a break. The escarpment is covered by thick forest, but the west consists of an enormous and fairly fertile savanna.

These geographical facts govern the life of the country, which on 1 January 1960 had about 5,400,000 inhabitants, distributed very unevenly throughout the island and forming 18 distinct tribes ranging from Malayan to negroid in stock. Despite this remarkable anthropological and ethnographic diversity, the inhabitants form a single people united by a common language and store of traditions based on the family unit. Respect for their ancestors and love for their children—who are " a family's riches "—are the twin poles around which their life revolves and which absorb a large share of their earnings. With such a mentality it is not surprising that there should have been a tremendous increase in population over the last 15 years as a result of the spectacular fall in infant mortality. In 1945 births and deaths balanced out, but then the scales tipped and before long the annual excess of births over deaths rose to 20,000, then to 50,000, reaching 100,000 by 1954 and more than 150,000 today.

Most of the population is rural, as is shown by the general statistics for 1 January 1958, when out of 5,071,000 inhabitants only 691,000 or barely 12 per cent. of the community were living in towns. This population is distributed between 72 towns (see table I).

TABLE I. DISTRIBUTION OF URBAN POPULATION

Size of town	Number of towns	Number of inhabitants
Over 100,000 inhabitants	1	201,162
20,000-100,000 ,, ...	5	210,527
5,000- 20,000 ,, ...	16	138,555
2,000- 5,000 ,, ...	50	141,111
Total . . .	72	691,355

The 50 towns of between 2,000 and 5,000 inhabitants are administrative centres or rural townships where fairs and markets are held for the sale of farm products. Until recent years the countryfolk lived in a closed economy on the produce of their own farms, but their outlook has changed since the end of the Second World War and a good many small farmers now grow export crops with the help of their families (e.g. vanilla, coffee, pepper and cloves), while continuing the traditional stock raising.

Compared with the self-employed farming community the wage-earning population only totalled 221,380 persons, or 4 per cent. of the over-all population, on 1 January 1959. This percentage, however, does not reflect the true importance of wage-earning

employment, for about a million people are supported by these wages, i.e. 20 per cent. of the entire community. These figures will certainly be exceeded before long, because the widening gap between the number of deaths and births and the increase in the birth rate mean that by 1970 there will be a population of between 8 and 9 million ; in a few years' time this is bound to create some very serious problems, because the present economic trend does not hold out any prospect of an expansion in employment.

Sources of Manpower and Migration

As an island, Madagascar is isolated and in any case its population is ample to meet the needs of the labour market, so that it does not rely on foreign labour except for certain skilled occupations and managerial posts. The statistics on this subject are quite conclusive, e.g. those quoted in the 1958 report of the General Inspectorate of Labour and Social Legislation issued on 1 January 1959 (see table II).

TABLE II. ORIGIN OF WAGE EARNERS

Origin	Labourers	Other wage earners	Salaried employees	Supervisory and managerial	Total
Madagascar . . .	148,000	39,240	19,150	1,025	207,415
Comoro Islands. .	1,970	300	30	—	2,300
France and Réunion	—	1,305	5,000	3,775	10,080
Abroad	290	145	800	350	1,585
Total . . .	150,260	40,990	24,980	5,150	221,380

Thus, non-local manpower amounts to barely 7 per cent. of the total and a high proportion of this is accounted for by workers from the Comoro Islands and Réunion, with which Madagascar has close links. Leaving these neighbouring islands out of account, the proportion of aliens is hardly 0.75 per cent. and their numbers are so small that for all practical purposes their immigration involves no problems whatsoever.

At the present time Madagascar can meet all its manpower needs, but the supply will soon develop into a surplus as a result of the population growth of the past few years. The problem of finding work for this labour force will be aggravated by the fact that the neighbouring islands are already faced with underemployment.

Migration is the traditional answer to local or relative overpopulation, and colonisation has undoubtedly enabled this to take

place on a much bigger scale. It has also opened up a whole range of new jobs, e.g. general farm employment and more skilled occupations as stone-masons, carpenters, drivers, mechanics, secretaries, book-keepers, etc. Very often these migrations have developed into a steady flow of labour, e.g. from the south to the plantations on the east coast, while sometimes tacit agreements have come into being whereby one particular village supplies the farm workers for a certain estate.

But the growth of small local family plantations, the mechanisation of certain agricultural jobs and the unpopularity of farm work all mean that other employment opportunities must be devised or that present ideas of farming must be overhauled. The economy must be redirected with emphasis on industrialisation to absorb the increased population of the years ahead.

A new rural policy has been outlined in a recently published and extremely exhaustive survey of internal migration in Madagascar.[1] The ultimate purpose of this policy is the " conquest of the far west " of Madagascar, i.e. the whole of the thinly populated western area, where the tribes from the overpopulated regions could be resettled on new land. The author comes to this conclusion after a study of traditional migrations. He bases his argument on a calculation of population density per square kilometre of cultivated land rather than of total land. For example in some areas which are supposed to have a population density of 5.5 there are in fact 314 inhabitants per square kilometre of cultivated land.

Internal migrations are therefore governed by the population pressure and the amount of cultivated land available. The coastal populations migrate, often over long distances, to work on farms, while the inhabitants of the high plateau migrate for employment in service occupations.

Reasons for Taking Wage-earning Employment

An expanding population on a fairly constant area of cultivable land forces the men in some parts of the country to look for work elsewhere, because the soil can no longer support them. There is in fact a steady population overspill. Most of the labour force is made up of these small landless farmers with scanty elementary education (or none at all), who find jobs as labourers or servants.

In accounting for this urge towards wage-earning employment, it must be borne in mind that the Malagasy woman is free. She marries in accordance with her own inclinations and there is never

[1] Hubert Deschamps : *Les migrations intérieures à Madagascar* (Paris, Berger-Levrault, 1959).

any dowry contract of the kind still encountered in many parts of Africa. As the founding of a family is not subject to any financial considerations and a wife never becomes an " investment ", most of the reasons for working are quite unrelated to this particular question. This leads us to the distinctive social background of the Malagasy family. Any full description would be beyond the scope of this article, but a few figures, even if only rough estimates, will give some idea of the problems encountered in Madagascar.

The whole structure of the country is solidly based, as was stated earlier, on the family unit, which involves a love of children and a strong traditional respect for ancestors. Parents are ready, even if it means heavy sacrifice, to give their children a good education to enable them to get on in the world. Out of a little over 750,000 children of school age, 46.5 per cent. regularly attend school. Unfortunately the public school service, which provides education free of charge, is swamped by the growing population, even though the many denominational schools provide invaluable help. The cost of educating the children can be estimated very roughly at between 1,000 and 1,500 million francs.[1] For many wage earners, their children's education is a primary concern and one of the biggest items in their budget.

Ceremonies in honour of their ancestors are usually held only by those who can afford them ; but, although pagan in origin, the practice is observed even by Christians. Each year between July and October, processions of about 100 people go to the family tomb to " turn over " the dead, who are taken out of the vault and carried about. Everybody dances around them and finally they are wrapped up in new shrouds before being laid to rest again on stone slabs until the next festival This ceremony, which is known as *famadihana*, is full of gaiety and lasts on the average for two days. All this is an expensive business because it involves buying costly silk *lamba* to wrap the dead in, paying the musicians and also feeding the guests lavishly, which means slaughtering bullocks, pigs and poultry. Our investigations show that the cost of a *famadihana* ranges from 60,000 to 200,000 francs, the average being 100,000 francs. Since the average annual number of these festivals is about 20,000, this gives a total yearly expenditure of between 1,500 and 2,500 million francs by the population of Madagascar.

On top of this expenditure, which is peculiar to the Malagasy family, is the poll tax amounting to 2,500 francs per head. As a million men are subject to this tax, the total amount is of the order of 2,500 million francs (for purposes of comparison the value of

[1] 100 Malagasy francs are worth approximately U.S. $0.50.

imports of pharmaceutical products, including bandages, in 1958 was 1,200 million francs).

Conspicuous consumption as evidence of material success is another frequent item of expenditure.

EMPLOYMENT

Madagascar is essentially an agricultural country. Over 85 per cent. of the population live in the countryside, either farming their own small family plantations or working on the big estates.

The figures for wage-earning employment (table III) published by the General Inspectorate of Labour in its annual report for 1959 show the respective importance of the different branches of economic activity. Those figures call for two comments.

Firstly the lack of skill among the wage earners, 69 per cent. of whom are labourers, 17.5 per cent. operatives, 11 per cent. salaried employees and 2.5 per cent. supervisors. In the case of the operatives the figure of 17.5 per cent. is to a large extent made up of semi-skilled workers. The reason is that despite the fairly large annual output of the training schools and technical colleges, skilled workers

TABLE III. DISTRIBUTION OF WAGE EARNERS BY BRANCH OF ACTIVITY, 1959

Activity	Labourers	Operatives	Salaried employees	Supervisory and managerial	Total
Private sector :					
Agriculture, fishing, forestry, saw mills . .	47,560	4,920	2,300	610	55,390
Extractive industries .	3,690	720	175	140	4,725
Manufacturing industries and workshops	11,620	7,185	2,100	710	21,615
Building and civil engineering	8,370	5,355	595	390	14,710
Commerce, banking and the professions .	11,000	3,360	10,330	1,960	26,650
Transport and lighterage	4,820	6,050	1,380	480	12,730
Domestic service . . .	40,500	4,100	2,100	—	46,700
Total . . .	127,560	31,690	18,980	4,290	182,520
Public sector :					
Employees other than civil servants . . .	22,700	9,300	6,000	860	38,860
Grand total . . .	150,260	40,990	24,980	5,150	221,380

are still few and far between ; the newly qualified tradesmen prefer to take better-paid office jobs for which they are fitted by their knowledge of French.

The second point is that the following percentage distribution of these activities in the national economy (the calculation is only made for the private sector but the public sector is similar) shows how limited productive employment really is :

Agriculture, fishing, forestry, saw mills	30
Extractive industries	3
Manufacturing industries and workshops	12
Building and civil engineering	8
Commerce, banking and the professions	15
Transport and lighterage	7
Domestic service	25
Total	100

Agriculture employs 50,000 wage earners whereas forestry, saw mills and fisheries do not employ more than 5,000. All these activities are similar to what the workers were accustomed to doing on their own account, so that very little adjustment on their part is called for.

In broad outline the agricultural resources of Madagascar are as follows :

On the east coast and the escarpment : vanilla, coffee, cloves, pepper, timber, sugar cane, together with a sugar mill 100 kilometres south of Tamatave.

On the west coast : tobacco, rice, perfume plants and sugar cane, output of which totals some 600,000 tons a year and which is refined locally in three big mills. Cattle are raised on a fairly large scale.

The south has its own distinctive products : sisal, Lima beans, and cotton, which appears to be promising, together with large-scale stock raising.

Lastly, on the high plateau there are very large rice and manioc plantations with potato starch works and various crops grown for their vegetable oil, such as groundnuts, aleurites and the castor bean plant, while there are also vineyards, orchards and market gardens. Here, too, there is a good deal of stock raising.

The extractive industries are represented by a number of mines producing graphite, mica, garnet, beryl, quartz, a little asbestos, radioactive minerals and rare earths containing these elements. Almost all these mines are opencast and none is more than 80 metres deep. Some of them belong to native Malagasys who dig their pits using traditional methods which do not meet modern safety standards. This mining involves virtually no migration because the work is done by a floating labour force from the local villages, and in fact few workers stay in their jobs for more than a year.

The fairly diversified manufacturing industries and workshops employ quite a large number of workers. Cotton, jute, and sisal mills, a cement works producing some 30,000 tons a year, cigarette and chewing tobacco factories, a large brewery, meat-packing plants, mineral water and bottling plants are the main local industries.

In the towns there is a wide range of activities, e.g. an electric accumulator factory, a tyre-retreading plant, a compressed-air factory, tanneries and skin dressing works, some small foundries and scrap-metal pressing plants. In the food trades there are bakeries, pastry and biscuit factories, dairies, soft drink factories and a number of wine depots, while in the clothing trades there are some garment factories and a boot and shoe plant. In addition to all these there are some furniture factories, one of which turns out metal furniture, and brick, tile, pipe and sanitary ware plants. Lastly, there are quite a large number of small craftsmen employing from one to three wage earners, e.g. tailors, bookbinders, weavers, embroiderers, lace makers, cabinet makers, tinsmiths, etc.

Building and civil engineering throughout the island are also a major outlet for workers with little skill. A number of dams, all of them on the high plateau, supply electric power and since their output is at present higher than consumption there is a surplus available for industrial development.

The housing drive, large-scale private and public building schemes and a number of public works have led to quite a boom in construction during the last decade.

Commerce, banking and the professions provide large numbers of office jobs, especially in the towns.

Transport and lighterage also account for quite a large segment of wage-earning employment. The railways, with slightly less than 1,000 kilometres of track, employ some 5,000 men. In addition to the railways, there are a number of big trucking and bus companies, lighterage companies at all the open roadsteads and a number of small coastal shipping firms. To complete this picture mention should also be made of the large number of one-man transport businesses, most of them run by Malagasys, who cover the whole island, with their " bush taxis " for passengers and lighter trucks for goods.

Servants also bulk large in the community of wage earners. The commonest jobs are as boys, cooks, washerwomen and nursemaids ; most of the immigrants from the Comoro Islands find jobs as boys or cooks.

This distribution of manpower—agriculture 30 per cent., domestic service 25 per cent., commerce 15 per cent. and transport 7 per cent.—shows that in all more than 75 per cent. of the occupa-

tions in the country do not call for any particular adjustment by wage earners, while the remaining 25 per cent. (extractive industries, manufacturing, and building) only call for a certain amount. This bears out the two remarks made at the beginning of this section about the absence of skill and the limited importance of the really productive industries.

Health Hazards

In a tropical country both the hazards and the pathology tend to run riot, helped by poor education, by beliefs and customs which make people in some parts go to a witch doctor rather than a physician, and by the working conditions themselves. The sources of health hazards differ widely in nature, some of them being only indirectly connected with employment, namely migration, and changes in geographical and social environment, and others being inherent in the work itself, namely the working environment, occupational diseases and employment injuries.

External Hazards

When big plantations are opened up in thinly populated areas, labour begins to flow towards them, and in a few years the whole ethnic and demographic pattern of the area is changed.

In the towns the uprooting of workers from the countryside has far more serious consequences. Badly housed, cut off from home, lost in an anonymous mass, the wage earner (and especially the labourer) often falls an easy prey to slum life, unemployment and social diseases ; this leads to alcoholism, which pulls him down still further.

Migration.

Migrations in Madagascar, as we saw earlier, are entirely internal and in practice only involve the rural population, which looks for work elsewhere when there is none at home. This can take one of two forms. Either the worker sets off alone and keeps moving by slow stages until he reaches an area where there is plenty of wage-earning employment, or else the firms themselves recruit batches of workers and send them straight to the place of employment. In the latter case a medical check is held when each worker is hired to make sure that he is not suffering from any contagious disease and is physically fit for the job. Most workers are in fact recruited in this way.

Some wage earners, however, are more independent and prefer to look for their own work. Madagascar has the good fortune to

be free from smallpox, yellow fever and sleeping sickness, but individual migrants are quite often carriers of social diseases (incipient leprosy and tuberculosis, syphilis and blennorrhagia), infectious diseases (especially cerebro-spinal meningitis and diphtheria), diseases which are endemic in some regions (malaria, dysentery and bilharzia) and pestilential diseases (poliomyelitis and plague). Here is an example. Some years ago a few migrant workers were hired as cattle drovers. One of them went down with pneumonic plague in a village where he died the following day, while the others went on their way. A few days later the village itself was contaminated, followed by the other villages along the route as the drovers caught the disease one after the other. The epidemic was made even more serious by the fact that the district was too remote for the necessary health measures to be taken in time. This is of course an extreme case, but it does show the danger caused by migrating workers, who in the same way, but less dramatically, help to spread bilharzia, dysentery, syphilis, blennorrhagia and infectious diseases. Even when migrations are organised and supervised, they involve a real danger which it will be difficult to circumscribe for a long time to come.

Change of Geographical and Social Environment.

Changes of geographical and social environment are not as abrupt in Madagascar as in other countries, because of the existence of a single language and (except on the high plateau) of a uniform climate, so that the change is one of degree rather than kind. But before discussing the factors involved we must first set the migrant workers against the background of the whole wage-earning community. The statistics of workers housed by their employers on 1 January 1959 (i.e. mainly migrant workers housed during their contracted periods of employment) are revealing. Out of the 49,560 workers so housed some 30,000 (i.e. 15 per cent. of the total number of wage earners) are migrant workers, all of them in agriculture and domestic service. Most of these workers sign on for one year and travel without their families, so they are forced to settle down in an alien community where food, hygiene and recreation are unlike anything they were used to in their own villages.

As far as food is concerned, employers issue dry rations and each worker buys his own meat and vegetables locally and cooks them during breaks. Quite often workers of the same tribe form little groups, where they take it in turn to cook the meals. While the amount of food is adequate and it can be asserted that there are no underfed farm workers among the migrants, it must be admitted that their diet is very monotonous, deficient in vitamins

and almost always lacking in fats and proteins. This lack of balance is not due to negligence on the employers' part, for there are nearly always company stores where meat and fats are sold at cost ; it is due rather to the nature of the traditional diet, which is very rich in glucides and deficient in meat and fats.

As regards hygiene, a migrant worker being housed by his employer has to get used to new and unfamiliar practices which sometimes shock his tribal traditions. For example Antaimoro custom demands that each caste should have its own latrines ; quite obviously in a camp this cannot be complied with and it requires a good deal of patience to break in new workers to these unfamiliar habits. As a result of these conditions, typhoid, dysentery and intestinal parasitoses may be present among small groups of workers but, if so, are difficult to detect. While the health of the camp can be maintained by observing a few elementary rules of hygiene, a working community of men from all parts of the island is bound to reflect the pathology of each region. This, however, is almost always latent and unobserved and it is only when there is a decline in the general standard of health that a complicating infection brings out a regional disease which has been quiescent for some years ; after a varying evolutionary cycle, the disease, whether typhoid, malaria, bilharzia, dysentery or tuberculosis, is contracted by individuals who had hitherto been uninfected. As they come from parts of the country where these diseases are unknown, they usually suffer severely, because they have no natural immunity.

Rest and recreation also involve new living conditions, and a single individual suffering from malaria can infect all his fellow workers while they are asleep, even in a properly ventilated room, if there are any malaria-carrying anopheles mosquitoes about.

Hazards Inherent in Employment

Apart from dangers to the health of migrant workers which are not directly connected with their work, and leaving out of account those jobs which cause occupational disease or injury, there are many occupations which are harmful to the workers' health because of the conditions in which the job is done. Light, colour, ventilation, heat, humidity, noise and vibration, all have an effect on a worker's output and even on his health.

Environmental Factors.

In Madagascar environmental factors are not overlooked but employers do not usually grasp their full importance and prefer to keep their factories as lightly equipped as possible in order to

hold their costs down (this attitude is due to the heavy shipping charges on machinery imported into Madagascar from Europe). The workers' attitude on this point is unhelpful too, because new equipment upsets their routine and causes trouble. For example ventilation is often inadequate or inefficient in workshops where the actual cubic volume of air is in accordance with the health standards. Out of pure indifference a breakdown in the ventilating equipment will not be reported or else the equipment will simply not be used at all, even though it is in perfectly good working order.

In the mines conditions are unsatisfactory for a number of reasons which fall under two main headings, namely negligence and the nature of the traditional methods.

These two factors also apply in industrial establishments ; the most modern of these are well laid-out but many of them are ramshackle and out of date. Lighting is inadequate or badly distributed and this leads to ophthalmic migraines. Vibration, where it does not endanger the building itself, is, like noise, almost invariably neglected. But noise, infrasonic and ultrasonic waves, and vibration (which differ only in frequency) all have unquestionably harmful physiological effects. Yet it is easy to overcome this by mounting the machinery in certain ways and using special building methods. These practices would not only pay for themselves but would save the workers acute headaches and even in some cases behavioural disorders. For example some rice mills are built on former marshland, and when they are running the ground trembles underfoot continually like the deck of a ship. In other firms using heavy flywheels the vibration, though much slighter and barely noticeable, gives some (though very few) employees partial anuresis throughout the working day and for one hour afterwards.

Another point is that in a tropical country heat and humidity are of great importance. Although each has its own distinctive effect on workers, the one is rarely found in industry without the other and the combination of the two sets off a violent physiological reaction resulting in the classic type of heatstroke. It is a mistake to claim, as some do, that the Malagasys are immune, and there are a number of examples to show that the inhabitants of the high plateau are at least as susceptible as Europeans. As is well known, the answer is to avoid a combination of heat and humidity by drying the air, since dry heat is always easier to stand than damp heat of the same temperature. If dried air can automatically be pumped into the workshop, the ventilation will always be satisfactory. This method is not employed in Madagascar, where industrial concerns are not big enough to afford the equipment. On the other hand, many of them use a chemical method of re-

chloridation which they can afford, i.e. a few grammes of cooking salt in tablet form are issued to workers to offset the loss of choride and so prevent heatstroke. In this very simple way the employers secure effective but cheap prophylaxis against most of the effects of damp heat.

Environmental conditions are thus important, but as it is very unusual for them to cause any serious trouble they are usually neglected. The physical disturbances they cause are looked upon as one of the inevitable discomforts of the job, and both workers and employers (for different reasons) do not bother about them, although their elimination by modernisation would undoubtedly help to raise output.

Occupational Diseases.

The occupational diseases encountered in Madagascar can be classified as industrial, agricultural and tropical. While not very common, they do reflect the country's industrial pattern, and the fact that they are not frequently met with can be put down to the following reasons :

(a) The workers change their employment after only a fairly short time of exposure, e.g. in the mines, where labour turnover is high and workers leave dangerous jobs after having absorbed dangerous substances, but before they are poisoned, so that their health ultimately recovers.

(b) The disease is not always detected, sometimes because there is no doctor but occasionally because of ignorance on the worker's part.

(c) Some industrial processes do not exist in Madagascar.

(d) Because of the definitions of an employment accident—a sudden injury occurring unexpectedly—and of an occupational disease—an infection or poisoning due to continuous or repeated exposure—some cases of poisoning are reckoned as accidents, e.g. workers poisoned by carbon-monoxide in lime kilns, who are considered to be injured rather than diseased.

1. *Occupational Diseases Peculiar to Industry.*

These diseases are not common because of the limited industrial development of Madagascar. Here they are divided into diseases caused by metals, mineral dusts, vegetable dusts, physical agents and toxic chemical products.

(a) *Metals.*

The only metal employed on an industrial scale is lead, which is used in the manufacture of batteries and printing type. Organic lead is only encountered in the form of lead tetraethyl in liquid fuels.

The manufacture of batteries until recently took place in such unhealthy conditions that over 50 per cent. of the workers suffered from lead absorption and 12 per cent. needed hospital treatment for serious lead poisoning.

Those hospitalised usually resumed work after an absence of only three weeks. The remainder were given treatment by means of medication taken orally and all of them eliminated the lead without taking time off from work. Various health measures such as compulsory showers, good housekeeping, dust suction equipment, the wearing of overalls, boots and gloves, and strict medical supervision combined with suitable treatment of individuals who absorbed any lead, remedied what had been a disastrous state of affairs.

In the printing works the position, while less serious, is still bad enough. Apart from two fairly big firms, they all employ an average of five or six workers, who are either unaware of the dangers involved in handling lead or do not bother to take precautions. It is an odd fact, however, that in these small firms, occupying cramped, badly lit and badly ventilated premises, only 20 per cent. on the average of the workers suffer from slight lead absorption and no case of poisoning has yet been detected. The health regulations merely insist on a shower and efficient ventilation together with strict medical supervision, so that any worker can be treated immediately he absorbs any lead.

The discovery of chelating agents, which enable the lead to be eliminated through the urine, has been a tremendous step forward which has completely transformed the treatment and prognosis of lead poisoning. The doctor can now detect and treat even a slight infection and provide proper chemical prophylaxis against lead poisoning, which is particularly dangerous in a country where special measures of hygiene tend to be unknown or ignored.

Tetraethyl lead is encountered in Madagascar only in liquid fuels shipped to the island, so that the possibility of poisoning can only occur when the storage tanks are cleaned out. As this is always done by specially trained workers, no case of poisoning has yet been reported.

(b) *Mineral Dusts.*

Workers employed in mines, cement manufacture, small foundries, grinding mills and dyeing powder factories are exposed to various mineral dusts. But as all these industries are small, occupational diseases are not often met with.

In the opencast mines dry drilling methods are normally used but, since the dust concentration is less in the open air, the danger is also reduced. Quartz, beryl, garnet, asbestos, mica and graphite are mined in this way. As labour turnover is high, the period of exposure is short and no worker has yet needed hospital treatment for pneumoconiosis of mineral origin. One European supervisor was found, on radiological examination, to be suffering from asbestosis. Underground mining usually takes place in hard rock containing silica. Wet drilling methods are used, which produce a concentration of dust similar to that found in other mines where this method is employed.

Other occupations where there is a risk of silicosis are scaling in some foundries, and hand grinding of pieces in certain small pottery works.

Cement is manufactured at a works in the Majunga area; as the wet method is used, little dust is given off except during bagging, and few cases of dermatosis have been observed. Dyeing powders for colour washes are also made in small factories and their preparation, particularly the crushing and grinding, gives off a good deal of dust, although no case of pulmonary disease or dermatosis has yet been notified.

In all these trades the dust is irritating rather than dangerous, with the exception of free silica which injures the lung by its constant mechanical action. No case of pneumoconiosis (silicosis, asbestosis or berylliosis, with

the exception of the case referred to earlier) has occurred so far. A few dermatoses and passing irritations of the mucous tissues of the eyes, nose and throat, are the only pathological consequences worth reporting.

(c) *Vegetable Dusts.*

Some local products are processed on the island and these give off vegetable dusts.

Among the textile fibres, mention should be made of cotton, which is woven into cloth, jute, which is made into sacking, and sisal, which is made into ropes. Cotton causes pulmonary conditions (which go by the name of byssinosis) caused by impurities or bacteria in the coarser fibres; the dust from jute and sisal causes pulmonary conditions, although the exact extent is difficult to ascertain. All these phenomena can be detected by X-ray examination. In such cases workers are taken off the jobs causing the condition.

Sugar cane after milling gives a fibrous residue known as bagasse which causes bagassosis. This by-product is not used at the present time and therefore no hazard is involved. Tea, coffee and tobacco also produce dust. Tea is not processed industrially and has not yet caused any cases worth noting. Coffee, however, is processed mechanically and the removal of the parchment produces large quantities of fine dust, which sometimes causes respiratory disturbances (asthma).

Tobacco is made into cigarettes and chewing tobacco, the latter being very popular with the Malagasy peasant, who prefers it to cigarettes. This chewing tobacco is a mixture of tobacco leaf and various vegetable essences reduced to very fine ash, which gives off a good deal of dust when it is being prepared, and here again certain respiratory troubles are encountered.

All these vegetable fibres also cause a special condition known as " mill fever ", which is encountered in all badly ventilated factories where the air is polluted by too great a concentration of various dusts. This fever usually occurs when work is resumed at the beginning of the week and lasts for about 24 or 48 hours.

(d) *Physical Agents.*

Radiations and work in compressed air come under this heading. Hazards due to radiations are encountered in hospitals, Sometimes there is slight anaemia among doctors who neglect precautions because of overwork, but there has been no evidence of any diseases due to X-rays. As regards the forms of osteoarthritis found among divers, men working in diving bells and those using pneumatic drills, no bone lesion has been encountered apart from a few minor shoulder conditions. There have been no cases either of lesions caused by pneumatic drills. All these jobs in any case employ only a very small number of workers, who are regularly given a medical examination.

(e) *Chemical Agents.*

As industry is only on a small scale and fairly unspecialised, many poisonous chemical substances are never used at all. Some are in use quite often, but never continuously, which substantially curtails the risk and accounts for the fact that no case of occupational disease has been detected.

The main products used are as follows : methyl bromide and chloride (repair of refrigerators) ; trichlorethylene, perchlorethylene and carbon tetrachloride (dyeing and dry cleaning) ; cellulose paints (motor car bodies) ; varnish paints and glue (furniture manufacture) ; benzol inks (checks in printing works have found no case of absorption, even slight) ; and carbon sulphide (little used and no case detected of occupational sulphocarbonism).

2. *Diseases Peculiar to Agriculture.*

In Madagascar the problem of occupational diseases in agriculture is complicated by the employment of a migrant labour force which often only works for one year, by the use of seasonal workers who are only employed for a few months a year, and by the great variety of agricultural jobs involving exposure to a number of different hazards but almost always only for a very short time. The scope for occupational disease and poisoning is thus very large, and detection is greatly hampered in many cases by the lack of doctors and in almost all cases by ignorance or neglect.

For example in 1955 one province in Madagascar reported more than 1 million days worked in agriculture during the year without a single employment injury. In conditions of this kind detection of occupational diseases, which are never startling or sudden in their onset like an injury, but stealthily undermine the workers' health, is very much a hit or miss affair. Some diseases can be detected fairly easily, namely infectious diseases which give some warning by causing sudden illness. But cases of parasitosis and poisoning by metals, chemical products and vegetable dust have hardly ever been notified.

(a) *Infectious Diseases.*

Such reliable information as is available on infectious diseases has been compiled by the hospitals to which sick workers are sent and not by the industrial medical service. Strict orders have been given that antitetanic serotherapy must immediately be administered to any injured person treated at a medical post, but even so cases of tetanus do occur among workers. Anthrax among humans is exceptional although some areas do contain contaminated livestock. Spirochaetoses have occurred in a few cases, as have brucelloses, which are, however, less common. No cases of leptospirosis, tularemia, cowpox or undulant fever have been reported among wage earners, although every year the hospitals treat a few individuals suffering from murine typhus and foot-and-mouth disease.

(b) *Parasitoses.*

In a tropical country it is always very difficult to prove that a parasitosis is occupational in origin, since most adults have suffered from polyparasitism since earliest childhood. For example in the coastal areas hookworm eggs are found in more than 95 per cent. of school children, sometimes combined with ascaris, trichocephalus, etc. Ankylostomiasis is very common and is usually tolerated fairly well; distomiases and hydatidoses are much less common without being in any way exceptional.

(c) *Metals.*

Arsenic is mainly used for the treatment of hides in special workshops. Madagascar has a large number of cattle and some of the meat goes to the canning plants, while the hides are prepared for export. The workshops using arsenic must always have a permit from the Health Service and the Livestock Service to ensure that the health regulations are observed. The workers employed on this job tend to be unskilled labourers, but prevention is always very strictly enforced and there have been no cases of poisoning.

Mercury and arsenic compounds are little used in agriculture; the only users are a few very big farming concerns, which take special care to ensure that the spraying is done properly.

(d) *Chemical Products.*

The main products used are rodenticides and insecticides, which are employed both in agriculture and for public health purposes.

The former usually belong to the category of anti-coagulant poisons. Their use has not caused any occupational diseases, but domestic animals are sometimes poisoned and, when eaten by their owners, occasionally cause illness. These cases are, however, very few and far between.

Insecticides are widely employed by the public health authorities in combating malaria and plague and by farmers to keep down locusts and other harmful insects. Some malaria-carrying insects become resistant, which changes the general pattern of contamination. Some species disappear and their place is taken by other more resistant types which changes the regional pathology.[1] The insecticides used are always organic halogenic derivatives which act by both contact and ingestion. They are divided into three classes according to their chemical composition—harmless, fairly poisonous and very poisonous. The statistics show that minor forms of poisoning account for two-thirds of the cases, the remaining third being more severe, a fifth of them fatal. In practice insecticides are used in the form of powder or solutions, which cause clouds of liquid or solid aerosols. The risks by the workers using them are mainly the possibility of alveolar penetration of the lung by the insecticide, and the more toxic the solvent used the more dangerous this is. Percutaneous penetration can be ignored, unless solvents such as benzol and carbon sulphide are employed. Some cases of digestive troubles have occurred among D.D.T. sprayers. The small number of cases, however, is due to the fact that the spraying of insecticides is mainly carried out by the authorities; in agriculture there are few men but ample equipment, while in public health large numbers of men are employed but there is constant medical supervision, which ensures that any worker who is affected is immediately taken off the job.

Clearly, private agriculture is bound to make increasing use of chemical products, which will be handled by unspecialised and (medically speaking) virtually unsupervised employees. This is when cases of poisoning can be expected, especially if new and little or poorly understood products are introduced.

(e) *Vegetable Dusts.*

Vegetable dusts cause various forms of anaphylaxis, the best known of which are due to flower pollen. In Madagascar vegetable dust comes from the cultivation of tropical plants; this is an almost entirely virgin field which will be discussed below in connection with tropical diseases.

3. *Occupational Diseases Peculiar to Tropical Countries.*

Although the subject of occupational diseases peculiar to tropical countries has been little explored and nearly everything has still to be discovered, some occupational hazards have been isolated, e.g. a parasitosis (bilharzia), dermatoses in forestry, anaphylactic or pulmonary conditions caused by cotton, sisal, jute and kapok fibres and groundnut shells, and a special syndrome (vanillism). In the present state of our knowledge, these are the occupational diseases caused by the special tropical pathology of Madagascar. Let us briefly review them.

Bilharzia is very widespread in all the coastal areas—generally speaking the intestinal form is found on the west coast and the plateau, and the

[1] Another difficulty is that useful species are killed off by the large-scale use of insecticides. This happened for example to the bees of the Tanala district for three years running, with the result that there was a sharp fall in the output of wax, which is one of the country's main sources of wealth. This loss of income led to a temporary fall in family expenditure.

vesical form on the east coast. Workers are usually infected when they come to work in the rice fields and on public works schemes. While detection is fairly simple, proof of its occupational origin is always hard to come by (as with all parasitoses). Perhaps when workers are taken on for jobs which expose them to this hazard they could be given a careful medical examination consisting of blood, stool and urine tests repeated several times at intervals of a few days. Healthy individuals could then be compensated if they were found to have caught bilharzia after being employed in jobs which exposed them to it.

Some tree oils, especially rosewood, which has a strong sap, cause dermatoses when they come into contact with the skin. All the workers affected are not equally sensitive to these vegetable saps. Some of them hardly suffer at all except from a slight erythema, while others suffer from severe pustulous eruptions.

The weaving of cotton, jute and sisal leads to pulmonary conditions caused by vegetable dusts. In agriculture, the opening of cotton and kapok seeds and the harvesting of sisal and jute fibres cause similar conditions as well as other phenomena which are probably anaphylactic in nature ; the shelling of groundnuts and the winnowing of coffee also have similar effects on the lungs.

Madagascar has a virtual monopoly of the world trade in vanilla, which is only grown in the Antalaha region (east coast). The occupational hazards involved are due to the handling of the vanilla pods, which contain various heterosides. Some particularly susceptible individuals suffer from anaphylactic conditions. Apart from these, the symptoms caused by vanilla vary somewhat and can be summarised as follows : cutaneous conditions with the eruption of red papules, simulating erysipelas ; mucous conditions ; nervous disturbances involving headaches ; and gastric disturbances accompanied by diarrhoea. Finally the female genital system is severely affected because vanilla is a powerful emmenagogue, which may even bring on metritis.

These are the main hazards encountered in Madagascar. Clearly as knowledge of occupational risks evolves, a whole new symptomatology will come to light and broaden the existing approach.

Accidents.

Since January 1958 new legislation has been in force on industrial accidents, which gives wage earners greater security than before, especially as regards compensation.

The statistics presented below do not take account of minor injuries not entailing disability (especially common among farm workers). Even as little as 15 years ago these invariably developed into rodent ulcers. These first of all grow quite slowly but after a few days break out into festering, irregular sores which keep on spreading. Cure used to take some weeks or months and, even so, large scars of very delicate, thin dry skin were left and the slightest knock on the skin led to the formation of new ulcers. Since 1950 cases of these ulcers have declined consistently in number, and since 1955 they have become quite uncommon. Better diet and the determined anti-malaria campaign have brought about a marked

TABLE IV. NUMBER AND GRAVITY OF INDUSTRIAL ACCIDENTS BY BRANCH OF ACTIVITY, 1958

Type of incapacity	Public utilities	Agriculture, forestry	Extractive industries	Manufacturing industries and workshops	Building and civil engineering	Commerce	Transport	Other	Total
Temporary incapacity :									
1 to 4 days	114	45	9	259	159	120	92	72	870
5 days to 1 month . .	213	66	8	509	278	187	176	201	1,638
more than one month .	25	6	1	34	16	23	15	8	128
Permanent incapacity under 50 per cent. . .	34	7	2	41	28	20	32	14	178
Permanent incapacity over 50 per cent. . .	—	—	—	2	2	—	—	—	4
Death	16	3	4	9	10	3	5	2	52
Unknown at time of compiling table	90	59	27	174	132	94	93	97	766
Total . . .	492	186	51	1,028	625	447	413	394	3,636

improvement in the population's general health since 1945 and it is this improvement that is responsible for the growth of the population and the disappearance of rodent ulcers.

1. *Seriousness of Injuries.*

The number of employment injuries notified has almost doubled since 1955. This jump is not due to an increase in hazards but to the introduction of new legislation. Injuries in fact are usually not serious, as is shown by the statistics for 1958 published by the General Labour Inspectorate (table IV).

As can be seen, out of 2,870 employment injuries only 2,636 entailed temporary incapacity, 178 an incapacity of less than 50 per cent., and 4 an incapacity of more than 50 per cent., while there were 52 deaths. The number of cases of temporary incapacity should be far higher, because injuries lasting for less than five days are hardly ever notified.

While the bulk of employment injuries do not have serious consequences, deaths are thirteen times more numerous than accidents entailing incapacity in excess of 50 per cent.

The workers have a curious attitude towards rehabilitation. Many of them remain disabled, continuing to draw their pensions, because they do not know that rehabilitation can help them to regain the use of their limbs, sometimes completely. Some of them on the other hand like a life of idleness and prefer to live meagrely off their pensions.

2. *Causes of Accidents.*

Table V, which is also taken from the 1958 annual report of the General Labour Inspectorate, gives a breakdown of the causes of accidents by branch of employment.

Thus manufacturing industries and workshops have the highest number of accidents, whereas mining and agriculture appear to be the least dangerous ; however, in order to have a general idea of the causes of injuries, the nature of the work and the frequency of accidents must be examined in the case of each branch of employment.

Related to the total, the figures in table V show that 72.20 per cent. of accidents are caused by workplaces and gangways, objects being handled or in accidental motion, vehicles and hand tools. On the other hand only a small proportion of injuries occur in dangerous trades such as those using pressure vessels (0.21), explosive substances (0.30), portable mechanical tools (0.46), earth-moving equipment (0.57), electricity (0.73) and hoisting and handling equipment (1.09). It is interesting to compare the accident rate for objects being handled (25.70) with the figure for hoisting

TABLE V. CAUSES OF INDUSTRIAL ACCIDENTS BY BRANCH OF ACTIVITY, 1958

Cause	Public utilities	Agriculture, forestry	Extractive industries	Manufacturing industries and workshops	Commerce	Transport	Other [1]	Total
Workplaces and gangways	68	16	9	232	97	77	220	719
Objects being handled or in accidental motion	111	18	11	221	157	123	289	930
Particles or pieces of matter	16	4	2	55	13	10	29	129
Hoisting and handling equipment	4	—	1	4	2	15	14	40
Vehicles	110	24	11	60	37	64	85	391
Transmission devices	4	1	—	11	1	19	2	38
Earth-moving equipment	5	1	—	5	1	—	9	21
Portable mechanical tools	3	—	—	7	2	1	4	17
Hand tools	69	95	3	206	37	28	154	592
Machinery	30	10	4	89	30	28	78	269
Pressure vessels	1	1	—	3	3	—	—	8
Caustic and poisonous substances	9	—	—	6	2	4	10	31
Explosive substances	1	—	1	5	1	—	3	11
Steam, gas and dusts	9	—	2	12	6	5	11	45
Electricity	1	—	—	16	2	3	5	27
Miscellaneous	63	16	7	100	57	42	98	383
Total	504	186	51	1,032	448	419	1,011	3,651 [2]

[1] Mainly building and civil engineering. [2] This total shows 15 more accidents than table IV; the difference is due to accidents notified on the last few days of the year which have been carried forward until the next year because their consequences were not known.

and handling equipment (1.09), and the figure for hand tools (16.20) with that for portable mechanical tools (0.46).

The following conclusions can therefore be put forward: most accidents occur to labourers in unskilled jobs to which they are unaccustomed. On the other hand, in highly specialised occupations, even though they are dangerous, there appear to be few accidents, as is confirmed by the figures for handling equipment and mechanical tools. Nevertheless, even if these figures are accurate in absolute terms, they are still misleading, as will be found on consulting the percentage figure in the remarks on accident rates in the following section. However, in the highly skilled occupations dexterity and strict enforcement of prevention measures do diminish the number of accidents.

3. *Accident Rates.*

When compared with the total wage-earning population (221,380) the total number of accidents (3,651) gives an over-all percentage rate of 1.64. But this over-all rate and the remarks made earlier would be inadequate without the following breakdown showing the percentage frequency of accidents in relation to the number of workers in each branch of activity:

Manufacturing	4.77
Transport	3.37
Commerce	1.68
Public utilities	1.29
Building and civil engineering	1.24
Extractive industries	1.07
Domestic service	0.84
Agriculture	0.33
All activities	1.64

Manufacturing has the highest accident rate and there would appear to be a discrepancy between this latter statistic (4.77) and the figure for mechanical tools (0.46). But this discrepancy is merely apparent, because most accidents occur to workers who only handle materials occasionally, e.g. a joiner moving beams. The same applies to employees of shops or transport firms who are injured during loading and unloading. This explains the figure of 72 per cent. for accidents caused by workplaces and gangways, objects being handled or in accidental motion, hand tools and vehicles.

Moreover, highly skilled workers (turners, milling-machine operator) are few in number, which explains the small number of accidents they suffer—a number that is nevertheless relatively high because of the risks inherent in their occupations.

* * *

To sum up, a study of employment injuries in Madagascar shows that the nature of the employment and the frequency of accidents have much the same relationship as in France, but that the workers' age and mental and physical reactions as well as the general time pattern are all peculiar to Madagascar. Knowledge on the subject will become more accurate in future because the new employment injury legislation has set up a Prevention Council to centralise information about all employment injuries and produce statistics on punched-card machines.

Protection of the Active Population

The fast population growth that has taken place in Madagascar since the end of the Second World War is due to the Medical Care Service, which has made effective use of the discoveries of the past 15 years in treatment, hygiene and preventive medicine. A few words should therefore be said about the organisation and background of this service with which industrial doctors work in close contact.

Madagascar is divided into 31 medical regions, each with an average area of 20,000 square kilometres and a population of between 120,000 and 200,000. In charge of each is a state-qualified doctor assisted by between five and eight graduates of the Tananarive Medical School, each of whom is responsible for an up-country area containing a small hospital unit. Attached to each unit are a number of medical outposts and maternity clinics, which are usually set up where the population is sufficiently large to warrant them. These outposts, which are staffed by a male nurse and a midwife and usually have a maternity wing attached, number about 12 or 15 in each medical area.

The structure of the Medical Care Service can very sketchily be summarised as follows : 720 administrative districts each containing about 7,000 inhabitants ; 400 medical and maternity outposts, making an average of one for every two districts ; 150 up-country hospital units run by Tananarive medical graduates ; 60 dental posts ; 31 medical areas ; 6 provincial hospitals ; and a central directorate under the immediate authority of the Minister of Public Health.

Thus there is a chain of treatment which enables the seriously ill to be quickly passed on to a central unit. The same staff at all levels are also responsible for hygiene and prophylaxis. An example of this is the scheme of chemoprophylaxis for children under school age as part of the anti-malaria campaign ; to cope with local conditions this scheme is carried out through evenly spaced distribution centres set up around each medical post (often, too, the mid-

wife teaches mothers the rudiments of protection for themselves and their children). Side by side with these medical care facilities, the mobile health service covers the whole country with its ten health teams, each of which is equipped with an X-ray unit. A team consists of a state-qualified doctor, a Tananarive medical graduate, five nurses and a secretary. In the past few years these mobile teams have compiled a pathological map of Madagascar and are now able to follow any changes in great detail. The investigations into plague, malaria, bilharzia and tuberculosis have shown the right health policy to follow and details of the medical and prophylactic measures required have been supplied to the remotest medical posts. These measures, while usually very simple, have been consistently enforced and have contributed to the spectacular fall in malaria which has resulted in the amazing population growth of recent years.

Industrial medicine supplements the work of the Medical Care Service by protecting the active population.

Statutory Standards

The Labour Code of 15 December 1952 and the regulations issued under it contain detailed provisions for the protection of the active population.

The following standards are laid down :

(1) For all wage earners—

(a) a thorough medical examination at least once a year ;

(b) first aid and transport at the employer's expense to the nearest medical post ;

(c) maintenance of general health standards, particularly anti-malaria prophylaxis ;

(d) enforcement of special health and safety measures respecting the occupation concerned ;

(e) compensation for employment injury.

(2) In establishments with 100 workers or more, a daily medical examination of all workers who report sick.

(3) For migrant workers, housing and in some cases food rations.

(4) For women and children, more frequent medical examinations and special forms of protection.

The statutory requirements can therefore be summed up as follows :

(a) Regular medical examinations to check the workers' health and their suitability for their employment. It is at these examinations that occupational and social diseases are detected.

(b) Medical consultations for the treatment of sick workers (and their families when also housed by the employer), the extent varying according to the size of the firm.

(c) A wide range of preventive measures, some of them designed to protect workers against the effects of dangerous diseases and others to limit the risks inherent in the job by prescribing preventive measures.

Methods

Detection, care and prevention are also the concern of medical services the cost of which is borne entirely by employers.

When private practitioners are not available, government doctors often work for factory medical services, their mutual obligations being laid down by " treatment agreements ". In this way industrial medical care is sometimes given by private practitioners and sometimes by government doctors, but in either case the organisation is the same and the employers have a choice between two very different systems, namely an individual factory service or a joint service with other firms.

In the former case the employer is responsible for the management of the service in his own factory, which must meet the statutory obligations regarding medical standards and facilities. A joint service, on the other hand, may be formed by a number of employers who pool their resources ; their obligations remain as laid down in the Labour Code but (especially in the case of small and medium firms) this system enables legally and financially independent associations to be set up, thereby relieving the employer of the trouble of organising and running his own service. On top of this substantial advantage, employers who set up joint services can obtain loans not only to meet initial installation costs but also to improve the medical equipment and provide more comprehensive medical treatment than required by law. This system is particularly advantageous from the workers' standpoint, because the obligations of a joint service are more extensive than those of an individual factory service. Moreover, in their rules and regulations these services enjoy far greater latitude and flexibility than other industrial medical departments.

Whenever employers are unable to find the medical staff they need to comply with the Labour Code, they can use the facilities of the official medical centres or dispensaries (on condition that they employ fewer than 1,000 workers). In this case they can choose

between having their own factory medical service or becoming members of a joint scheme. They must also prove that they cannot recruit the medical or nursing staff required by law. They then conclude a " treatment agreement " with the medical service, under which the latter assumes responsibility for all or part of the facilities required by law, including premises, equipment and medicines. Each agreement merely specifies how much must be supplied by the service and how much by the employer. In this way, compulsory standards can be complied with even in remote areas. The agreements are sufficiently flexible to allow employers to make arrangements with the authorities either individually or in groups.

Prevention

Prevention is one of the widest branches of medicine. Its task is to detect dangers, to eliminate them by means of special medical supervision and to educate the worker to an awareness of the hazards involved in his job, so that being fully warned he will be able to take precautions.

This is the aim of general health and safety measures (sanitary hygiene, protection against environmental factors, employment accidents and occupational diseases generally) and of the special health regulations for dangerous, unhealthy or dirty occupations.

A series of orders were issued on 20 May 1960, laying down clear, detailed prevention standards : against accidents (building and civil engineering, groundnut shelling plants, cotton and kapok ginning factories, mining and prospecting installations, quarries, explosive materials and electric currents) ; and against occupational diseases (benzol poisoning, the spraying of paint and varnish, work in compressed air, diving, the use of quick-setting cement, silicosis, lead poisoning, prohibition of the use of white lead, the use of lead sulphate and linseed oil containing lead in house painting, anthrax, X-rays and dangerous radiations).

Compensation for Employment Injuries and Occupational Diseases

A compensation scheme for employment injuries and occupational diseases has been in existence for many years, but it was overhauled in 1958 to give wage earners the same benefits as French legislation as regards compensation, retraining and rehabilitation. As in France, 40 schedules of occupational diseases in respect of which compensation is payable have been published, although not all of them are relevant to the present state of industry

in Madagascar. Nevertheless, they have all been introduced so that any new industry which is set up will be aware of the hazards and can take the steps needed to prevent them.

Special Benefits for Migrant Workers

Any worker who leaves his home district must be housed by his employer. A good many agricultural concerns do in fact accommodate their wage earners, and often the houses they provide are well equipped ; sugar mills and some other firms have pursued a policy of providing their workers with hygienic houses of durable materials with a floor space of about 50 square metres.

In parts of the country where food supplies are difficult to obtain the employer issues rations to workers and gives them opportunities of varying their diet by purchasing staple foodstuffs at cost price. The official food ration varies from 3,200 to 3,400 calories.

Achievements

On 1 January 1959 there were 221,000 wage earners in Madagascar, of whom 46,000 were servants not covered by the compulsory medical benefits of the Labour Code. Thus, in all, some 175,000 workers have to be supervised by the industrial medical services.

There are 18 of these medical services in firms employing more than 1,000 wage earners—36,500 workers are covered by 11 joint departments and 20,000 by seven independent departments. Fifteen are run by full-time private practitioners. Three others employ part-time independent practitioners who are assisted by graduates of the Tananarive Medical School. Each of these departments has its own X-ray equipment and spends about 2 million francs on medicines. This sum covers the cost of treating 3,000 workers in the countryside and 5,000 in town.

In agriculture some big employers, especially the sugar mills, possess not only sick-bays but full-scale hospitals with between 40 and 80 beds. One of them even employs a doctor and a surgeon, and most of the other practitioners have a good knowledge of surgery. Each of these hospital units has its own surgical department capable of coping with major operations.

There are some 300 medical services catering for firms with fewer than 1,000 wage earners. These are independent and employ 20 part-time doctors who attend workers in small sick-bays at their place of work ; 12,000 wage earners are cared for in this way.

In the public utilities 10,500 workers are covered by independent factory medical services operated on a part-time basis by government doctors.

Under the treatment agreements government doctors supervise 14,000 wage earners in medical care service clinics.

In all, 93,000 workers are regularly seen by some 50 doctors. In addition to this figure 30,000 workers are supervised by about 60 male nurses, who have been approved for work in industrial medical services ; these nurses pass on to the medical care service any sick workers they cannot deal with themselves.

* * *

Mention should be made of two schemes of considerable medical and social interest launched by the Ministry of Health. One of them, which is designed to encourage employers to give the fullest possible treatment, enables medical services in factories with more than 1,000 wage earners to hold additional tests, such as specialised consultations, laboratory tests and X-rays, at very low fixed charges. The other is designed to ensure that, in all firms which have no doctors of their own, the workers are given an annual check-up by mobile health teams.

For this purpose the Labour Directorate uses the punched cards of the family benefits fund, with which most employers are registered. A special coding system has been devised for medical benefits so that firms in which annual medical check-ups have not been held can be listed. These lists are drawn up to allow for the itineraries of the mobile teams. An addressographed circular is sent to all firms that are not up to date, notifying them of the date on which the mobile health team will call. At the time of writing, the teams are making their first tour and this should produce accurate figures of the number of workers suffering from social or occupational diseases. In this way a clear picture will be obtained over the next few years of the magnitude of these two problems.

In short, Madagascar has in a few years made great strides in the field of industrial medicine. The aims of the methods employed are those of the Occupational Health Services Recommendation, 1959. In Madagascar, however, there are a number of distinctive features—the great importance attached by the authorities to medical treatment and the use of mobile health teams to make systematic examinations of all wage earners.

Conclusion

In conclusion, the old saying " prevention is better than cure " remains valid ; prevention always pays whether in the field of general health or of safety. The detection of hazards, their elimination and the education of workers to an awareness of the danger involved, are the aims of industrial medicine.

But in a country where less than half the population goes to school, prevention, not being spectacular, does not always receive the attention it should. Treatment, on the other hand, is always much sought after by the workers, who have complete confidence in their doctors. Since this treatment cannot always be given in government clinics, the workers greatly appreciate it when it is given in factory medical services, especially when their families benefit as well.

Prevention can only be made effective if the worker's doctor gives the treatment. His own contacts with the worker and his family in his capacity as a physician make the human touch possible, so that the doctor becomes an adviser as well, which helps in awaking the worker to the need for prevention. In a tropical country prevention is even more important than elsewhere, partly because of the exuberant exotic pathology, the effect of which on various occupations is little known (over and above the industrial and agricultural hazards encountered in the temperate countries) and partly because of the many tropical products which cause pathological conditions, some of which are little understood, e.g. sugar cane, vanilla and certain types of timber.

In this field nearly everything remains to be done and the way is wide open for those who care to venture into it, e.g. the identification of hazards, the best ways of eliminating them and the education of workers to an awareness of them.

This awareness is necessary because it is the only way in which genuine progress can be achieved. Workers must report to their factory doctors any syndromes which have hitherto been ignored, either out of ignorance or out of carelessness or negligence, if these evils are to be eliminated and their own lot improved.