

PRINCIPLES OF OCCUPATIONAL HEALTH *

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The health, physical and mental, of the worker in industry is influenced not only by the environment and conditions of his job, but also by the many factors outside his employment. Indeed, one or several of these external factors may even play a dominant role in the state of his physical and mental health.

With the above in mind, this paper will deal principally with the factors arising out of employment which may react deleteriously on the workers' health, directly and acutely, and, even perhaps more frequently, slowly and insidiously.

It had been known, of course, even in ancient times that certain occupations and trades are particularly hazardous. A common form of protecting free citizens against these hazards was to assign such jobs exclusively to the slaves or bondmen. Hippocrates wrote of dangerous trades and so did Galen and many others. But right up to the present century, even as recently as the 1930s, physicians were more concerned with the treatment of the diseases and accidents of occupation than with seeking their causes and means of prevention.

In their well-known book *The Health of the Industrial Worker*, published in 1921, Collis and Greenwood wrote: 'Many and valuable books exist which describe diseases peculiar to certain occupations . . . No book is known to us which deals at all adequately from the standpoint of hygiene.'

*Based on an introductory lecture on Occupational Health, 19 October 1964.

The authors attempted to fill this gap. In the 40-odd years that have passed since then, the gap seen by Collis and Greenwood has very greatly widened with increased understanding of the importance of environment, of the many physical and psychic factors impinging on the worker, and of appreciation of the ever-growing complexity of the problem. The great expansion in the use of potentially toxic substances, the hazards due to mechanization, the improvement of diagnostic techniques and appreciation of the economic importance of a healthy working force, led to very considerable advance in the study and understanding of industrial hazards and consequent adoption of measures of health conservation and protection of workers from the hazards connected with their occupations.

In *Occupational Diseases and Industrial Medicine* by Johnston and Miller, published in 1960, the authors comment: 'In the United States 3 phases of metamorphosis of occupational medicine may be identified: The accident and safety phase; the occupational and industrial hygiene phase, and the present broad health conservation phase.'

This is going quite a long way beyond the concept of Collis and Greenwood of only 40 years previously.

How great the advance has been is indicated by the training nowadays considered necessary, and indeed in effect, in the United States.

The recognized course for the Diploma in Occupational Medicine is 2 years' full-time university postgraduate work, plus a year of approved plant work. For registration by the Specialty Board a further 3 years of experience is required, followed by an examination. Johnston and Miller in their book quoted above, speak of this training as a definite requirement for a full-time industrial physician.

Postgraduate training for medical practitioners intending to specialize in industrial medicine is now considered obligatory in many industrialized countries, although usually not as exacting as the one mentioned above. Indeed, the types and magnitude in various countries of industrial enterprises, economics, traditions of medical practice and other factors influence the range and quality of industrial medical practice, and consequently the training. There can be, and indeed are, several types of industrial medical practices. Johnston and Miller state that with the decentralization and expansion of industry in America the general practitioner is now caring for the majority of workers. I am inclined to think that this is also true in South Africa, and is likely to grow as industry grows and spreads over the country.

It seems advisable therefore that general practitioners should acquaint themselves with at least the basic principles of industrial hygiene and the health hazards of such industries as they are likely to encounter.

It has been suggested that industrial health be included in the medical curriculum. I doubt the wisdom of this proposal. However, it is important that in every industrialized country, and this fully applies to South Africa, there should be a cadre of persons who have the training and experience to undertake full-time positions in large industrial plants, or practise as consultants. Such specialists are particularly required to fill the posts of State Medical Inspectors of Industries—this point is discussed more fully below.

The worker in modern industry may be exposed to obvious and not so obvious hazards to life and limb, as well as to psychic trauma. There is interplay between his bodily functions and the ambient plant conditions: heat and cold, dryness and moisture, light and darkness, noise and air impact. He may arrive at work already under physical or mental stress, fatigued by long walk or travel, or financial or family worries. He may dislike his job or his boss, or be physically or mentally unfit for his job, or he may dislike people he works with. He may be unsuitably clothed for the plant environment or for his particular job. Thus he may start work with a handicap.

Hence the important principle of modern thinking on industrial health: 'Fit the job to the man—not the man to the job'.

Posture, in relation to the job, periods of rest where the posture is necessarily awkward and fatiguing, temperature, saturation and air movement, as well as illumination, may be not only important factors in productivity, but play a big role in maintenance of the workers' health and well-being. Noise may harm the hearing, and also affect productivity. It may also be a cause of injury by covering changes in the normal machine sounds and rhythm which to an experienced operator can give warning of an impending dangerous breakdown.

An understanding by the workman of hazards associated with the job, of methods of protection against these hazards and of the correct procedure in an emergency may mean the difference between safety and severe or perhaps fatal injury. It is wrong to conceal from the workman the hazards of his task, although this is indeed sometimes the policy. He should know about them and how to deal with them.

All these considerations, and many others, form the pattern of the obligation assumed by the occupational medical practitioner. For the correct discharge of his obligation he must keep in personal and intimate contact with the worker and the management. How intimate and at how many points will depend on the particular industry and management policy. But this contact must never be lost.

In some large industries a very broad policy is often followed. It can be stated to be that responsibility for hygiene and prophylactic advice and supervision is accepted by the employer for the worker at the plant and at home, insofar as the latter is practicable and mutually acceptable. Full-time medical officers are employed competent by training, experi-

ence and personality to implement the policy. There are pre-employment and pre-placement medical, psychological and aptitude examinations, the results of which are recorded in detail. There is continuous supervision of processes and machinery, as well as of the working environment and of safety measures. Expert first aid, and, in some instances, specialist and hospital treatment for both disease and injury, are provided. In some instances workers' families are included in the scheme. Obviously only large establishments can provide such comprehensive services.

On the other hand, in many industries, there is only provision for emergency first aid, supplemented perhaps by visits from a part-time practitioner.

In between there lie a variety of schemes. It might be profitable to review some of these. But before doing so, we should evaluate the role of the State in this matter. By 'State' in the present context is meant the public body and the officials to whom, by law, is delegated the duty of protecting the health of the people. The 'officials' are people competent by training and experience to help and advise workers and managements on safeguarding health and life and limb. The words 'advise and help' must be stressed. These officials must be professionally, and by background and character, of so high a status that they will fully command the confidence and respect of both managers and workers. They constitute the Medical Inspectorate.

An Inspectorate supported by a suitably staffed and equipped laboratory service is provided in almost all industrialized countries, and is particularly necessary in a country with a relatively small but rapidly expanding industrial experience, such as our country.

An exception to the establishment of a State Inspectorate is Sweden. In this highly industrialized country, there is a very high degree of mutual trust between employees and employers, which makes it possible, to the satisfaction of all concerned, to entrust the provision of occupational health services to the Confederation of Employers.

I think I should here mention the Finland scheme. Finland has only 1 medical practitioner per 1,600 inhabitants. It is therefore forced to make the most of its medical manpower. The occupational health service is motivated to at least some degree by this consideration. This service is based on the renowned Institute of Occupational Health, in which are combined research, teaching and advice to government. The Institute is a voluntary foundation. It is governed by a Board on which serve representatives of government, universities, employers, employees and insurance companies.

All plants employing more than 50 workers are required by law to have a joint committee responsible for safety and health and empowered to call for a visit of inspection.

It may be at present difficult to provide a special industrial health laboratory in South Africa. Existing laboratories may have to be depended upon for some time. It is important, however, that at least the required special equipment should be provided and that the industrial inspectorate work should have high priority.

We may now consider the various ways in which the day-to-day task of safeguarding the well-being and health of the workers may be carried out.

I have already mentioned the most primitive industrial medical service: it is also the least satisfactory. The next advance is the engagement of a part-time medical officer who in addition to clinical duties undertakes to keep watch on the plant, particularly on any jobs or processes which are potentially hazardous, and also on the environmental conditions. These practitioners generally acquaint themselves with the tasks and processes of the plant in their charge. They may be said to be 'trained within the industry', and generally are alert and helpful in many ways.

Then there are the full-time medical officers of the large industries. These industries provide several types of service. Some, like the large mines in this country, provide a complete clinical service for certain classes of workers, as well as a health service, including pre-employment and pre-placement examinations, and supervision of environmental hygiene, feeding, sanitary services and housing. In some industries these services are provided for all employees, including their

families. This may be financed and administered by the employer, or paid for by some form of levy by the employer but administered by the workers' union. In most cases, however, the full-time industrial medical officer is only responsible for everything in the plant which has, or may have, a bearing on the health and safety of all employees, and for emergency treatment. He is also the advisor to the employer on all medical problems.

It is for this type of practice that the training programme previously referred to—extending over 3 years—is designed. Since it is actually in effect in several leading American universities, there must be a need and demand for such an elaborate training, capped by another 3 years of approved employment before one can sit for the examination for the Specialty Board Diploma. In the light of South African conditions, I am of the opinion that such prolonged training could not be justified here for several reasons. For one thing, few could afford 9 years of university training before starting to make a living. Secondly there is no demand, or likely to be in the immediate future, for such highly specialized officials. Thirdly, experience in many industries and in various countries has shown that excellent services are rendered by medical practitioners who have not had the opportunity of such prolonged academic training. I do believe that academic postgraduate training is advisable for those who wish to make a career in industrial health work. But it need not be a 3-year course. Nor, on the other hand, should it be a hastily conceived and rushed presentation of smatterings of a number of subjects, mostly in the form of didactic lectures. Such courses, in my opinion, are a waste of time for all concerned—teachers and students.

Perhaps for our country, for the present anyway, an acceptable method would be a modified form of 'training within industry'. That is, an assistantship in the industry, and a course of instruction, either part-time spread over a year or 18 months, or full-time over a shorter period. The curriculum should be carefully thought out and prepared. The teaching should be predominantly by men with experience in industrial medicine. Enough laboratory work should be included to inculcate the role and importance of the industrial health laboratory, and to teach the technique of such laboratory investigations as the medical officer ought to be able to organize and carry out, e.g. dust sampling, air analysis, light and noise intensity measurements.

Exemption from certain parts of the curriculum might be granted to holders of the D.P.H.

The course should include elementary statistics, and the keeping of such records as are of importance for efficiently carrying out the duties of an industrial medical officer.

Each industry has its own special and often peculiar problems. Even the most exhaustive teaching and training

programme cannot hope to cope with all of them, especially as many of the problems are never static, and new problems always keep coming up. It has been said, with some justification, that clinical medicine textbooks are generally 10 years out of date. This, so far as my own experience is concerned, is the case with textbooks on occupational medicine, particularly as regards details of preventive practice. No man can hope to keep abreast of all the developments in the whole field of occupational health. But we can be expected to keep fully and timeously informed of all that concerns the plant and processes for which we assume responsibility, and be alert to the introduction of new substances, processes, machinery, changes in the microclimate of the plant—of everything that may affect health, fatigue, or the well-being and contentment of employees.

It is now generally agreed that the concept of health includes mental health, and within this falls satisfaction with the job. I have mentioned pre-employment and pre-placement examinations. Pre-employment examination is directed to ascertaining the general physical and mental condition of the applicant. Pre-placement examination goes a bit further: it is directed to the physical and mental attributes which would be required for a particular job. For example, a man may be physically and mentally what would be designated as normal, but because of muscular or circulatory inadequacy unsuited for a job in which he would be required to lift heavy objects. Yet this same man might be fit to operate an automatic press. Proper matching of man and job results—other factors being equal—in contented and efficient workers. If they are improperly matched, the contrary is usually the case.

I think it would be a great advantage both to industrial medical officers and industry, for the medical officers to have access to specialists for consultation and advice. I mean not only such specialists as ophthalmologists, dermatologists, orthopaedic surgeons, neurologists and psychiatrists, but also to specialists in related sciences, such as chemists, physicists and engineers.

There is just one thing more. From my knowledge of views and comments of occupational medical officers, and from personal observation, I am quite convinced that to carry out his duties efficiently the industrial medical officer must be close to top management, and must have top management's full confidence. It is equally important—it would not be an exaggeration to say essential—that he also at all times has the respect and confidence of the workers.

In the minds of management and workers must be firmly implanted full confidence that the medical officer's advice is based on the best information available; that it is always quite impartial as between any conflict of interests; and that it is, above all, completely honest.