ADVANCING FRONTIERS IN INDUSTRIAL HEALTH*

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"The great joy of the practitioner of Medicine is that he lives in a land of advancing frontiers."—The first Lord Moynihan.

We are here today to commemorate a man and to study an idea: the man, James Mackenzie; the idea, the advance of health in industry. Commemoration is a day for taking stock and for looking ahead: for remembering with gratitude those who have contributed to the development of industrial health, and for looking at what we are making of the opportunities that we owe to their high intentions. Perhaps the things that matter most cannot be inspected, things that cannot be so much seen as felt. In the modern term they cannot be quantified; spiritual phenomena never will be, yet most of us recognize the importance of a high sense of spiritual values.

James Mackenzie, who is not to be confused with the famous physician of the same name, was perhaps the only man to have devoted a great part of his life's work to industrial health education. By this Mackenzie meant "educating the industrial workers to realize that, by means of personal precautions, each of them can safeguard his or her health" (Mackenzie, 1936). Mackenzie died in 1944 and few here today remember him; he was one of the great dedicated social workers. The obituary notice in *The Scotsman* (March 1, 1944) rather quaintly says that he was born in Edinburgh "of godly parentage". He was a printer-compositor and early devoted his spare time to Sunday school instruction, an interest he never gave up. After college qualification for mission work, he became General Secretary to the Scottish Council of the Y.M.C.A. In 1925 he was so moved by the prevalence of ill health among industrial workers that he founded in Edinburgh the Industrial Health Education Society. Mackenzie defined its purpose: "The objects of the Society shall be to provide Lectures and other information or advice to Industrial Workers on Occupational Sickness and Diseases, Personal Hygiene and General Health, and the Prevention of Accidents;

but the Society shall not take part in any political or controversial questions as between employers and employed or otherwise". These objects are entirely praiseworthy, but no one has thought it worth while to revive the Society which was wound up in 1940. The Society's foundation must be remembered against a social background of unemployment, poverty, disease, and undernutrition difficult to imagine today for those who have grown up during the present period of prosperity. During the 15 years of its life the Industrial Health Education Society achieved national significance. All the prominent medical men of the day were actively associated with it, including Lord Moynihan, Lord Horder, Sir Thomas Oliver, Sir Robert Philip, and Sir Humphrey Rolleston. Never has there been such a team as this! As General Secretary of the Society, James Mackenzie organized over 6,000 talks to groups of industrial workers; all the talks were given by doctors or dentists, usually without fee.

It seems to have been assumed then that much industrial sickness absence was due to illness contracted at work and arising out of work. Mackenzie himself wrote, "Almost every advance in industrial method means the birth of some new baffling health problem and that tens, perhaps hundreds, of workers will suffer and many even die before effective preventive measures can be evolved". Advancing frontiers indeed! Today this statement is occasionally true, but much more is now done to safeguard the health of the workers when new processes are introduced.

We have advanced from the Victorian concept of the single cause of each event; today we think in terms of multiple causation and we believe that some contributory part may be played by the physical and psychological conditions of work in the production of disease generally, apart altogether from true occupational disease. In this strictly limited sense, occupational factors are causative of general diseases; there is a long future here for the industrial

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physician who can unravel the separate causative elements in the occupational environment and then proceed to eliminate them. This, I think, is what is now meant by "preventive medicine". The concept can be expressed mathematically: where D represents the occurrence of a disease, and $a, b, c, d, e \dots$ represent the genetic factor, previous history, age, physical environmental factors, psychological environmental factors, and so on, and $k, k', k'', \dots$ represent the quantitative value to be assigned to each factor, then

$$D = ka + k'b + k''c + k'''d \dots$$

Certain of these terms may be "essential" factors, without which the disease will not develop. This is already a useful concept for the assessment of causation and therefore for the design of preventive programmes, but it will be long before precise values can be given for the part played by each individual factor.

In industrial health education programmes our aim should be to give the workers information on how they can best safeguard their health against the sicknesses and diseases that affect them in the course of their employment and on health matters generally (Horder, 1937). James Mackenzie was a man of immense drive and character whose rewards were not material. In these days of the gods of consumer goods and status symbols men like Mackenzie remind us that these things are not all. Perhaps the highest human endeavour is the lifelong pursuit of a single purpose with selfless integrity.

Where Stands Industrial Health Education Today?

Health education in industry is a frontier that is stationary, with a rather large no-man's land of uncertainty. Industrial health education no longer exists as a discrete discipline, despite Professor Lane's dictum that "industrial medicine means ensuring that the worker is fit for the job, the job is fit for the worker, and health education". Industrial workers are no longer set apart as a separate section of the community, as they used to be; we are all in occupations and many of our wives are, too. The levelling social revolution of the 1940's has made us into a much more closely-knit community than before, and it is more than ever true today that

"No man is an Island, entire of itself; every man is a piece of the Continent, a part of the main. Any man's death diminishes me, because I am involved in Mankind; and therefore never send to know for whom the bell tolls; it tolls for thee" (John Donne, *Devotions*, XVII).

The modern trend is for health education to be directed towards the community as a whole, or towards such groups as the old, the young, and the

pregnant, rather than towards industrial workers. Exceptions lie in propaganda against dermatitis and certain occupational diseases, and the prevention of accidents.

Ill health is of four main kinds: infective, degenerative, neoplastic, and psychiatric. The infective diseases are being overthrown, but the degenerations, neoplasms, and psychiatric disorders now assume great prominence in the individual and public mind; here is a field where health education is sorely needed. Much information about disease and indeed some about health is being disseminated by the modern media for the propagation of knowledge. This is a controversial field in which some think that a little learning is dangerous for laymen, others that the worst kind of darkness is ignorance. It was the Clown who said, "There is no darkness, but ignorance"; but Malvolio replied, "This house is as dark as ignorance, though ignorance were as dark as hell" (*Twelfth Night*, iv, 2). Actively to perpetuate ignorance would be an unseemly role for the doctor. It is our duty as doctors gradually to increase community knowledge of human biology, and perhaps of pathology, in such ways as to avoid emotional disturbances. If we take no part in health education, or hold to the view that "it is bad for them", others will do it for us and we shall have only ourselves to blame for any inaccuracies or lack of balance that might occur through the absence of professional guidance. Nevertheless, some doctors, for one reason or another, would prefer to keep the public in ignorance of medical matters.

The British Medical Association (1961a; 1961b) includes among the duties of the doctor in industry: "the arranging and carrying out of such educational work in respect of the health and fitness of the employees as may be desirable and practicable". The Association of Industrial Medical Officers (1956) takes a similar view:

"In addition to providing the usual posters, leaflets, and similar material, it is possible to arrange, for example, Health Weeks. Suitable material and helpful advice may be obtained from the Central Council for Health Education. A useful catalogue of films on medical and health subjects is obtainable from the Scientific Film Association."

Both Associations recommend that health education should be undertaken in industry. Also the Ministry of Labour booklet on the Organisation of Industrial Health Services (1962) has this to say:

"The education of the workers in matters of general personal hygiene is an important function of the doctor. This will generally take the form of giving advice to

individual workers. Short talks by the doctor to groups of workers may also be a useful way of teaching the simple rules of hygiene and of precautions which should be taken to avoid specific health hazards encountered in the factory."

In spite of all these recommendations, it is doubtful whether as much is done in this area as should be.

I think it may be fairly said that in one way or another the public is receiving enough education in pathology, operating theatre techniques, and the romantic aspects of medical and hospital life. Doctors employed in industry can do much in the practical atmosphere of the workshop to counteract the current barrage of emotion about disease which is being fed to much of the population today. We should like to see more health education, that is, education for health, through the mass media. In these days when personal health measures are coming to form the basis of preventive medicine, will someone succeed Mackenzie and develop health education in industry? Health education in individual cases seems a more promising field of development than the instruction of groups. This personal health counselling is particularly suited to individual requirements, the new trend in preventive medicine, and is likely to be more effective than group propaganda. Such counselling and guidance are of particular value for young people, and where there is a junior staff health scheme for those under 21 much can be done to promote healthy attitudes of mind. Where a doctor's opinion is respected in a factory or office he can also contribute to the promotion of health by means of talks and articles in the house magazine and, with good humour and gentle ridicule, remove some of the disease consciousness and anxiety that are prevalent today.

The British Medical Association's "Subject of the Year" for 1961 was Health Education. The views of 43 Divisions ranging from Aberdeen to the Isle of Wight were incorporated in the report (British Medical Association, 1961c) which is a representative cross-section of the views of the medical profession in urban, rural, and industrial communities. The encouragement of the appointment of doctors to industrial firms was recommended in the report, with a view to the promotion of health education in industry. Industrial nurses also have an important part to play here. There was a general measure of agreement that the public should know as much as possible about health and how to secure it. But to seek too actively after health is itself unhealthy; we all know people who suffer from this disease. We should teach what we know to be the truth: that individual health is a dynamic balance, changing and moving from day to day and from year to year. To

seek after health as a positive entity is to chase the rainbow's end.

"The fictions, health and disease, serve a useful intellectual purpose, though we know they refer merely to uplands and lowlands in a continuously graded and terraced country" (Lewis, 1953).

The Doctor in Industry

There have been doctors working in industry for over a century. Thirty years ago about 50 doctors were giving their full-time services to industry in Britain. Now there are about 400 and probably another 3,000 rendering part-time services. Much of this expansion took place during and shortly after the second world war. Many of these doctors therefore began their industrial careers between 1945 and 1950, and now some 15 years later the time is opportune to assess their progress, for theirs has certainly been an advancing frontier.

The value of an industrial medical service is clearly accepted and appreciated in most large undertakings, and instances of contraction or closure of medical services have been happily few. A continuing steady expansion of services is likely to occur, but rapid advance is improbable. This is because the main field for expansion lies in the many small undertakings, where there is sometimes a fear of increased costs, not so much of the medical service itself as of adopting the recommendations that may be made. Where buildings and plant do not measure up to modern standards this fear is understandable although regrettable.

The way of the future lies mainly in an extension of part-time industrial services provided by the general practitioner; but before undertaking an appointment in industry, on however limited a part-time basis, he needs to acquire a knowledge of the main principles of industrial medical work, which are entirely different from those of general practice. It is more a change in outlook, of approach, in itself exciting and stimulating, rather than the acquisition of new knowledge. Such thinking is most conveniently undertaken during attendance at a short course at a university. In any event a slow advance in the development of medical services is desirable, for there are not the doctors, with industrial knowledge and experience, available to fill any large number of posts, even in a very limited part-time capacity.

The conflict there used to be between full-time and part-time doctors in industry has ceased to exist; we are both working for the common end of improving and maintaining the health of industrial workers. With good will an informal and happy partnership

between the general practitioner and the industrial doctor is achieved; such a partnership must be based on respect for each other's skills and tasks. Occasionally in the past the will has been less than good and then molehills tended to become matters of principle. A useful step forward was taken three years ago by the British Medical Association, squeezed a little by the Association of Industrial Medical Officers, when it abolished the ethical rules for doctors in industry and replaced them by the present helpful notes for guidance. We have now advanced to the point where instances of serious disagreement have been virtually eliminated. Differences of opinion will, I hope, continue to occur as befits a free society; in a community where men and women were trained from earliest infancy by Pavlov techniques, all individuals could grow to think alike on certain principles, but this is not the road for us.

It is worth considering for a moment whether the word "ethics" is the right one to use in our professional dealings with each other. Ethics is the science of morals. It is not a question of morals but simply of good manners and of courtesy not to treat a patient who is under the care of another doctor. Patients themselves often use the word "etiquette", wearing as they do so a wry smile that is not complimentary to the medical profession. We should advance to Belloc's idea of courtesy rather than of ethics:

"Of Courtesy it is much less
Than Courage of Heart or Holiness,
Yet in my Walks it seems to me
That the Grace of God is in Courtesy."

It is only by maintaining such high values and equally high professional standards that we can lift our heads among the new scientists who have invaded our community. It is often said in industry that "consultation" means "What can I put into it?" while "negotiation" means "What can I get out of it?" Consultation should be our line of advance.

In the present rapid development of the human sciences we must not lose the common humanities and the "guide, philosopher, and friend" approach that is the essential bedside manner of the doctor in industry as well as in general practice. In addition to great scientific advances, medicine will not lose its personal quality so long as we remember with van der Meersch that "Almost the greatest good a doctor can do is to speak a word of kindness" (van der Meersch, 1948).

The doctor in industry, whether whole- or part-time, can be a strong influence for good, or the opposite, in the working group. By "good" in this connexion I mean the improvement of morale, and

productivity depends very closely and directly upon morale.

The success of the doctor in industry depends *inter alia* upon his own morale; and there are several directions from which his morale can be undermined, so constituting an occupational hazard for the industrial physician himself. During 27 years as a doctor in industry, I have met and had to deal with these attacks on my own morale and I thought it might be of interest to consider them today. I suppose it is a hazard for every doctor that, having been "caught out" by one or two bad cases, the iron may enter his soul and he may look too critically, perhaps even bitterly, at others. To develop a suspicious mind may be laudable in a customs officer; it is inappropriate in a doctor. There is, of course, an acceptable element of suspicion in achieving high clinical diagnostic acumen, but there is no joy in the discovery of some deceit or falsehood on the part of a patient, merely a passing sadness at having uncovered a human failing: it is a doctor's privilege to observe such failings and to take delight in studying them. But do not be cast down at the few who "get away with it". There are so many successful cases that you can afford to be generous in mind.

There are other hazards. First, the fear of ignorance, which is much more demoralizing than unrecognized ignorance itself. No one knows the whole of even one branch of Medicine. To seek information from those who have special knowledge of a particular subject is prudent; it adds to one's own knowledge, promotes confidence, and dispels the fear of ignorance. Second, there is cynicism. The doctor tends to see frequently the halt, lame, and demoralized, but they are a small group compared with the many healthy employees who are seldom seen. He has therefore to resist the impression that the diseased and maladjusted group is disproportionately large. Again, it is a natural human tendency to look over neighbour Jones's fence, a tendency that has become accentuated in recent times. Preoccupation with expense accounts, allowances, or perquisites can be demoralizing; each must decide for himself where the balance lies between undue preoccupation and a healthy interest in these matters. The defeat of cynicism rests on a healthy and balanced attitude towards the demoralized, the scrimshanker, and the apparently excessive achievements and property of others. Third, there is the fear of unpleasant legal consequences of medical decisions and treatment. To be constantly looking over the shoulder at an imaginary judge or coroner is detrimental to a doctor's confidence and work. The fear of claims for damages could cripple a doctor's mind. The civil law is man-made and indeed varies from country to country. When there is a conflict

between civil law and moral law it should be remembered that moral law is international, universal, and divinely inspired.

The Council of the B.M.A. in its Annual Report for 1961 said that "a doctor's first consideration will be the health of his patient irrespective of his position in law".

Sometimes the advance of a frontier involves the application and dissemination of existing knowledge rather than new discovery. The bounds of professional secrecy, for example, are not as well known as they should be. Thus it was reported by a member at the Annual Representative Meeting of the B.M.A. in Belfast in 1962 that the Medical Defence Union had advised a doctor not to disclose to the railway authorities the case of a schizophrenic engine-driver. This was subsequently denied by the Medical Defence Union (*Daily Telegraph*, correspondence, August 6, 1962) whose secretary stated that it is the practice of the Union to advise members that there may be occasions when it may become a practitioner's duty to society to make disclosure to an interested party if the patient, after having been clearly advised as to the action which he should take, refuses or fails to do so on his own responsibility. The case of the schizophrenic engine-driver falls in this category. There has never been an action in the courts in this country in which a doctor was sued for breach of contract on the ground that he had contravened the rule of professional secrecy. The position as regards disclosure in a court of law of information given confidentially to a doctor is clear. The leading case is that of the Duchess of Kingston, decided in 1776, in the course of which case Lord Mansfield said, "If a surgeon was voluntarily to reveal secrets, to be sure he would be guilty of breach of honour and a great indiscretion, but to give that information in a court of justice, which by the law of the land he was bound to do, will never be imputed to him as any indiscretion whatever" (Sir Thomas Lund, personal communication). These fine words hold true after nearly two centuries.

Fourth is the ivory mind. This condition correlates with experience and with age. It is easy to diagnose—in others. In ourselves we must wage a constant personal war to avoid rigidity. Wilfred Trotter issued a warning here when he wrote:

"We like to suppose ourselves easily receptive of the new . . . Unfortunately this is the exact opposite of the truth. The mind likes a strange idea as little as the body likes a strange protein, and resists it with a similar energy. It would not perhaps be too fanciful to say that a new idea is the most quickly acting antigen known to science. If we watch ourselves honestly we shall often find that we have begun to argue against a new idea even before it has

been completely stated. I have no doubt that last sentence has already met with repudiation, and shown how quickly the defence mechanism gets to work" (Trotter, 1939). "The difficulty lies not in the new ideas, but in escaping from the old ones" (Keynes, 1936).

Fifth—and this is not peculiar to those who work in industry—is the difficulty of keeping abreast with the rapid advance of medical knowledge. The treatment for this hazard is easy to see, less easy to put into practice. Critical reviews on all subjects of importance are published at sufficiently frequent intervals, but the effort and time required to read and understand them are often considerable. But reading alone is not sufficient; frequent meeting with colleagues in hospital and general practice is essential for the industrial physician.

Sixth, the doctor's clinical skill, about which he is proud and sensitive if doctoring means anything to him, may find people unfit for work. There is satisfaction in detecting an obscure lesion. But let us never forget that the true motivation of the doctor's work in industry is to keep employees at work as long as they are able. The word "clinical" does not mean the same thing to different people, even to different doctors. To some it may mean diagnostic and therapeutic techniques, the interpretation of radiographs and the like; but to patients "clinical" ability may suggest the confidence they have in their medical adviser.

Seventh is the use of time. Unfortunately, doctors are not trained in the careful use of their own time, although most will agree that time, or the apparent lack of it, is a major problem in their lives. The full-time doctor in industry often exchanges the satisfactions of therapy for increased uncommitted time. He has time for environmental studies in addition to consultations. Every man should have time to potter and to think. What Osler called "sessions of sweet silent thought" are essential for every educated man, enabling him to make his contribution in research, and community and cultural activities.

All that I have said about the doctor applies *pari passu* to his colleague, the nurse. Many nurses work in industry with little or no medical supervision. The nurse has many of the same difficulties and the same opportunities for attaining high standards as the doctor. She has an important part to play in advancing the frontiers of industrial health. The nurse and the doctor in industry, by their enthusiasm for their work, by striving to attain ever higher professional knowledge and standards, by jealously guarding their reputation and by securing the confidence of management and men, can make for themselves—and no one else can do it—a career that

is as satisfying and stimulating as any in the profession.

Advancing Frontiers

Trying to see tomorrow is an interesting, if not always successful, intellectual exercise.

There are seven growing points of industrial health as follows:—(1) Occupational health services, (2) occupational hygiene services, (3) the application in industry of human sciences and ergonomics, (4) legislation, (5) compensation for industrial injury and disease, (6) toxicology, and (7) research.

(1) Occupational Health Services.—The development of occupational health services has reached a stage where any major advance probably depends upon legislation to require the provision of additional services. This is an important question of national policy. Competitive productivity and the incompletely understood effects of joining the Common Market form the background against which services to promote health, morale, and prosperity in industry must be considered. The Conservative government holds firmly to the policy that industrial health services must develop on a voluntary basis; within this framework it is encouraging the development of services through the Industrial Health Advisory Committee and by means of publications such as *Health at Work*, a description of the medical services provided at 14 British factories. The Socialist opposition would introduce legislation for the expansion of industrial health services. Inevitably this important national issue is political and there are those among us who join sides. Others prefer to remain aside from active participation in political questions and to serve in a strictly professional capacity. This is the position of the Association of Industrial Medical Officers, which is a professional organization and not in any sense a political one.

In a booklet entitled *The Future of Occupational Health Services*, published in 1961, the British Medical Association laid down the lines on which advances in the development of services are likely to take place. The main recommendation was that an immediate beginning should be made in setting up a comprehensive occupational health service. This recommendation was criticized by some who did not take sufficient account of the word "beginning"; and in fact a beginning is being made with the two new services in Rochdale and Dundee. These have been made possible by a generous grant from the Nuffield Foundation; under the voluntary principle government funds are not available. The recommendations of the Porritt Committee (Medical

Services Review Committee, 1962) generally resemble those of the British Medical Association.

Thirty years ago a doctor with a good clinical background could take up an industrial appointment and learn as he went along; many successfully did so. Today the complexities of knowledge and techniques make it very difficult for a doctor to do anything but blunder miserably about if he tries it this way. These difficulties will increase. The remedy lies in training; that is, in postgraduate teaching in the university departments at both full-time and part-time courses. The full-time doctor in industry becomes after some years, in effect, a consultant with much special knowledge; the part-time doctor needs to have some special knowledge and interest if his services are to be worth while in industry. There is no point in trying to transfer the skills of general practice by themselves into the factory; anyone who does so does not understand the first principles of occupational health. A basis of postgraduate courses exists today, and what is needed is a means of ensuring that doctors who are starting industrial work make use of them. It is perhaps too early to expect this to be made a statutory requirement, but many Appointed Factory Doctors already attend such courses. Employers, and the doctors themselves, should be encouraged to ensure that doctors receive such training when they enter industry. Above all things we must have a quality service. Let us fall behind other countries in quantity; I would prefer to see the gradual development of a first-quality service. To attain this we must rely mainly on university teaching and research to provide a few consultants and many general practitioners with the necessary background of knowledge, attitude, and enthusiasm.

In the advance of health services there is one disquieting feature on which I should like to focus attention. There is a tendency towards fragmentation, a splitting of occupational health into separate disciplines which tend to grow apart as they have become increasingly developed and specialized. Fragmentation would mean that a manager seeking advice might have to call separately on physiologists, psychologists, psychiatrists, social scientists, ergonomists, medical practitioners, occupational health engineers, health physicists, heating, lighting, and ventilation engineers, sociologists, and others not yet thought of. A manager faced with such a choice of specialists might well lose heart and fail to seek the advice he needs. This disintegration could destroy the concept of occupational health as an entity. To prevent this, existing groups should be brought together, without loss of individual sovereignty, for their common purpose of improving the health, and incidentally the efficiency and prosperity, of people

at work. Much goodwill exists towards this development, but vigorous enthusiasm will also be needed to put it into practice.

(2) Occupational Hygiene Services.—For more than a decade many of those who work in industry have thought that there is a need for nation-wide provision of an occupational hygiene service and laboratories to undertake routine and special environmental and toxicological measurements. Again with the generous help of the Nuffield Foundation, occupational hygiene services have been established at Slough, Manchester, and Newcastle. These services are required to become self-supporting within a few years. A slow and steady development may be forecast. In the development of occupational hygiene services, as well as in industrial health services generally, there is a good case for application of the tripartite insurance principle of contributions from employers, employees, and government, for all three would derive benefit from such a provision. The three recently established services will probably not be able to cover the needs of the whole country. However, this frontier has advanced notably, and the progress of the three will be keenly followed.

(3) The Application in Industry of Human Sciences and Ergonomics.—This scientific frontier has advanced greatly since the second world war. In 10 years "ergonomics" has progressed from a high falutin' bit of academic nonsense to a household word. The doctor in industry who neglects this field is in danger of lagging sadly behind. The concept is simple in principle, it is the practical application of the study of men and machines working together; an old principle with a new name, and names count. The sizes of men and their physical and mental performances can be selected to some extent, but they can be modified only a little; the limitations of selection become evident when men aged from 18 to 65 or over are employed on similar work. Machines, however, can be redesigned at man's command and made to comply with human performance; at least, they should be. Almost every object or machine, from a chair to a microscope, can and should be designed from the point of view of the user. But is a well-designed chair "physiological", "ergonomically satisfactory", "anatomically suitable", does it "comply with anthropometric considerations" or is it just a well-designed chair? In addition to design, work processes can be studied and often improved by ergonomic methods which here approach the field of work study. A useful account of the application of human sciences in industry was published by the Department of Scientific and Industrial Research (1961).

Some industrial health workers consider that there is no need for a separate science of ergonomics because the study of the mutual interaction of men and machines is already included in the wider concept of occupational health. Be that as it may, ergonomics has established itself, and its existence should be accepted *de facto*. Its future is difficult to forecast, but it may become mainly concerned with a range of specific techniques such as instrument and machine design.

(4) Legislation.—The important thing about legislation is that it should be observed. The British have some reputation as law-abiding citizens, but a survey undertaken by the Ministry of Labour (1958) revealed certain deficiencies in compliance with the Factories Acts. No doubt these are being dealt with, but the survey was a warning against too rapid an advance on the legislation frontier. There are still those who think that evils can be remedied by legislating against them; this is not always so.

Factory legislation has made a number of advances since the second world war and is still moving forward. There is now the conveniently consolidated Factories Act of 1961. Legislation is promised in respect of shops, offices, and railway premises, and further growing points will cover the use of radioactive and other toxic materials as they are developed. Improved requirements for first-aid training in factories have been introduced, and first aid itself is on the march, particularly in resuscitation techniques, improved dressings, and the virtual abolition of antiseptics, the tourniquet, and the hot water bottle.

(5) Compensation for Industrial Injury and Disease.—The procedure for compensation of injuries received in the course of employment, which was changed in 1948 to a national insurance scheme, appears in general to be operating satisfactorily, and the growing points are of a minor technical nature. Some workers in this field consider that, in this welfare age, the weekly benefits payable should be the same whether an accident occurs at work or not. The amalgamation of the sickness and injury schemes would be a useful simplification and would reduce administrative costs, but there are certain difficulties. First, there is the long-standing tradition of compensation for injury received at work; but it might be a psychological benefit to morale if this were abolished. Second, equality could only be achieved by increasing the amount of sickness benefit or by lowering industrial injury benefit, or both, and there would be obvious difficulties here. Third, the individual employee and his employer contribute toward industrial injury benefit. Changes in the national insurance schemes are matters for the

government to decide, and such major changes as this seem unlikely to be made in the near future.

The list of prescribed diseases is reviewed annually by the Industrial Injuries Advisory Council. Advances here have tended to be by the inclusion of specific diseases which can be identified in individual cases as being more probably than not due to particular occupational processes. The Minister of Pensions and National Insurance has recently agreed to spend £65,000 on research into occupational deafness. The results of this investigation in relation to both prescription and prevention will be studied with interest. Two common diseases or groups of diseases, bronchitis and rheumatism, both of which undoubtedly have an occupational association in some cases, have so far proved too elusive to be brought within the requirements for prescription. It is only when individual cases can be identified in relation to specified working processes that diseases can be prescribed by the Minister under Section 55(b) of the Industrial Injuries Act, and this position is not yet in sight in respect of bronchitis and rheumatism.

(6) **Toxicology.**—Knowledge of the biological effects of new and newly-used substances continues to expand, and it is very difficult for the doctor in industry to keep himself up to date in this field. A most useful advance would be the establishment of a central library or information service to which inquiries could be addressed. Suggestions to this end have been made and it is to be hoped that such a service will be established. Manufacturers who, for good reasons, are reluctant to disclose the contents of their products, might do so on a confidential basis to a central reference service. At present much helpful guidance can be obtained from H.M. Medical Inspectors of Factories.

(7) **Research.**—The late Lord Horder said that medical research in industry is a two-way traffic. There are opportunities in industry for a contribution to be made to the main stream of medical research as, for example, those made by my colleagues in London Transport on the epidemiology of ischaemic heart disease and bronchitis. Conversely, the results of medical research may be applied to the benefit of industrial workers. Research is always an advancing frontier; much of it is undertaken by full-time research workers who are not always industry-orientated. The time of the doctor working in industry is fully occupied with normal duties, and research is necessarily a spare-time occupation for him. In spite of this handicap many doctors have made and published useful contributions. The Research Advisory Committee of the Association of Industrial Medical Officers is avail-

able to guide and help those who wish to undertake research on medical problems in industry. It is the purpose of the *British Journal of Industrial Medicine* to publish the results of original research and not of day-to-day observations. The *Journal* is appreciated by research workers in many countries; but the further a doctor is removed from the advancing frontiers of research, the less he may find to interest him. During the six years in which I have been Editor, the *Journal* has received 325 papers, of which 231 have been published, many of them of a very high standard. The Editor must read each paper three times; if anyone wished to keep up to date in the research field, I can think of no better way than to become Editor, but I must warn you that a good deal of homework is involved.

A Personal Philosophy

It is now generally accepted that the doctor in industry gives an unbiased medical opinion in both clinical and environmental problems. In clinical matters he will not expect his opinion to be challenged except by another doctor; but many undertakings have more "doctors" than appear on the Medical Register. In environmental matters he is a member of a team and must present his case in proportion to the degree of the health factors involved. Many problems are straightforward but a few are associated with management-employee relations or even disputes and the doctor seldom knows all that lies behind these. He must give a strictly medical opinion, caring not whether one side or the other is supported, and being particularly careful to avoid becoming involved in non-medical considerations. This is the razor edge of impartiality on which he spends his working life. He must be impartial in his decisions, but must avoid being neutral and thus failing to give a definite opinion. The distinction between impartiality and neutrality is an important one. Having given his opinion, the doctor must be prepared to state his case, orally or in writing. The danger here is of retreat into the ivory tower. To be effective and to earn respect for his opinion, the doctor must be prepared to set out his reasons, both to management and to staff representatives, in both clinical and environmental matters. Anyone can handle easy cases; it is by his handling of difficulties that a man is judged. This work is like midwifery; 95% of cases give no difficulty, the other 5% give more trouble than all the rest put together. The skill lies in recognizing the difficult cases at the earliest possible stage, and in changing one's mind, if necessary, when new facts appear. To adhere rigidly to an opinion once given can be foolish in the extreme.

The doctor in industry is himself an important frontier in industrial health; advance or retreat lies

in his hands and depends most of all on his personal attitudes. I believe that industrial medicine and general practice can be two of the best forms of medical practice today. Both depend for success and happiness on the personal qualities of the practitioner; in both he can mould his work and life a little to suit his academic inclinations, cultural interests or sporting activities; both therefore offer a good life for the individualist. If we choose to compare general practice with industrial medicine, each has advantages over the other, and a familiar set of disadvantages. But looking over the fence does no one any good. In today's world of glaring light, we in Medicine have joys that are peculiarly our own, the joy of helping another along the road, the fun of seeing human nature at its best—and worst. Many men and women withstand a personal crisis on a firm religious foundation; perhaps the road is easier for those who can receive help in this way. Man is an indivisible trinity of body, mind, and spirit*, and health education should take note of all three. Science and religion are two facets of the same Truth. Man is very new to the world, and the scientist and the religious are both only beginners. The scientist has a little knowledge and slowly expands and consolidates each step gained. The religious arrives in a single bound, a blinding flash, but cannot describe the journey at all. It may be many years before the two link up, but link up I believe they will. And so we may agree with Milton: "Our history now arrives on the confines, where daylight and truth

meet us with a clear dawn . . ."; and three centuries later, with Chesterton:

"And walk with clearer eyes and ears this path
that wandereth
And see undrugged by evening light the decent inn
of death
For there is good news yet to hear and fine things
to be seen
Before we go to Paradise by way of Kensal Green".

I am deeply grateful to my friend Andrew Meiklejohn, who from the depths of illness found the energy to provide me with title, initial quotation, and theme. Thus to use adversity graciously for the help of another exemplifies the high spiritual achievement of which men, or at least some men, are capable. I am grateful, as always, to many friends and colleagues in London Transport for their help and encouragement.

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*A phrase used by H.M. the Queen Mother at the laying of the Foundation Stone for the Royal College of Physicians of London new building on March 6, 1962.