interesting example recently came to my notice. A small factory which had been carrying on quietly and safely for many years decided to introduce so-called efficiency engineers to improve its methods. This resulted in turning out rather more material per man-hour, but at one stage a very large proportion of the workers were down with lead poisoning. In this particular instance, had a trained medical officer with adequate industrial experience been asked to co-operate with the engineers it is certain the "speed-up" could have been carried through without such disastrous results to health.

How is the employer to obtain this advice? Much may be procured directly from the Home Office authorities. Where, however, experimental work is necessary this may now be carried out at either London or Birmingham University, where a department of industrial hygiene has been opened. In other instances the problem might be investigated by the Industrial Health Research Board, which, as you know, is administered under the Privy Council. The problems investigated by the Board are usually of fairly wide application, and the findings can be of value over a large range of occupations or industries. In many cases it is important to have a completely impartial body, and one of high scientific attainments. It is a good thing, for instance, that the investigation of the incidence of gastric sickness among busmen was started by the Industrial Health Research Board some four years ago and was completed before the question became controversial. Whether or not the pioneer work is best done by University bodies, by the Industrial Health Research Board, or by the industry particularly concerned may be a matter of opinion, but that it must be done by someone is obvious. Most people will be ready to agree with this contention in the case of the dangerous trades. The figures available are convincing evidence that a danger existed, and that certain steps were successful in overcoming the danger, while the most obstinate director is likely to be convinced of the value of this type of work when he finds that it is actually saving him money and that his medical department is costing rather less than he had previously spent on compensation. It is perhaps not so easy in ordinary industry to convince the sceptic that these methods are necessary, but those of us who are in close contact with the medical side of industry know that it is just as important for these industries as for the dangerous trades.

Commentary

I hope I have made it clear that in order to obtain real and final success the attitude of the employer must be the correct one, and the worker must be co-operative. The education of both employers and workers in these matters is of vital importance, and it is only by improvement in both and by the general education of public opinion that we can establish the best conditions in industry. This education is going on and conditions are improving steadily, but it behoves all who are interested in the public health to see that this education grows and flourishes. It appears to me that this means that the medical profession must take a much greater interest in these health problems, and must make an effort to acquire a real and accurate knowledge of industry's needs in this sphere.

A large cancer institute with an experimental department, hospital, and out-patient department has recently been founded in Buenos Aires, with a branch at Bahia Blanca. It has been found that only 3 per cent. of the patients seek advice in the first month, as compared with 86 per cent. after the end of six months.

THE WIDER ISSUES OF HEALTH LEGISLATION IN INDUSTRY*

BY

ERNEST BEVIN

It is a gratification to the great trade union movement that the industrial health problem is receiving much closer consideration than at any period in its history. The problem has given our movement much anxiety and has involved considerable expenditure of money and effort in bringing about investigations to secure the scheduling of industrial diseases.

Opportunity for a Co-ordinated Service

With the passing of the Factories Act, although in many respects it falls short of our desires, and the placing of the industrial health problem on a more organized basis, an opportunity is presented for a really co-ordinated service which, for the first time, can be made universal in its application. We agree that a large contribution has been made by voluntary effort. It is true that it may have been introduced from a variety of motives, possibly paternal, or from the point of view of economic efficiency; or schemes may even have been conceived with an idea of handicapping our own movement. But motives do not always govern achievements or determine the effect of a course of action which may be taken. The net result has been to produce sufficient evidence to enable the State, employers, and trade unions to approach this problem and place it on a more organized basis, co-ordinating all the contributing factors and linking it with a complete medical service which, if handled correctly, will become a great national asset.

The Health Problem and Capital Values

If the health problem could be viewed from the point of its capital value it would be possible to arrive at a better estimate of the result to the nation of its neglect, for it must be remembered that the only capital a worker has is his skill and ability to work. Therefore if the capital loss could be calculated in terms of depreciation, as is done in the case of machinery, the facts would be such that, applying the same result to the mechanism of a works, the industrial management would call in the best scientific and engineering ability at its command to remedy the loss. I suggest that the loss of value resulting from the lack of proper standards for the health of the worker, if it could be translated into capital, would represent a greater total than would appear under any other head. No attempt, however, has been made to calculate the actual capital value of an efficient worker, as represented in output and gain to the community. In addition, the loss is extremely far-reaching, for whilst a machine may depreciate, its effect is limited; but physical deterioration of the worker has a very grave repercussion upon his home, on the well-being of his family, and on his general environment.

We welcome the consideration of the industrial health problem from yet another angle. For a long time it was assumed that the main thing to be decided in the case of a worker who was ill was whether or not he was a malingeringer. Practically the whole of the Workmen's Compensation Laws and restrictions associated with certain health services have been based upon the assumption that protection had to be secured against exploita-

* Read in opening a discussion in the Section of Medical Sociology at the Annual Meeting of the British Medical Association, Belfast, 1937.

tion on the part of the worker, and to that extent the service has been handicapped in its outlook. I am not too sure that the attitude of the medical profession itself in the past has not been coloured by this conception. Happily, however, with the growth of the study of psychology and a deeper understanding of the industrial health problem, this approach has to a large extent been changed. Housing and the habits of the people themselves have also been a great stumbling-block.

The Works Doctor

Another difficulty which has handicapped us in dealing with the medical examination of work-people has been the attitude of the people themselves towards the works doctor, and the works doctor's attitude towards the work-people. It must be remembered that in many public services and large works the works doctor is looked upon as the person employed by the management to protect its interests. For instance, in one great undertaking if a man is away ill for a period of three weeks he must be specially examined before returning to work—not for the purpose of finding out the cause of illness, but to ascertain whether he is fit for the particular occupation upon which he is engaged. The result of this has been to create fear in the minds of the workers, and they try to get back to work within the specified period even though they may not have fully recovered. Had I time I could mention many other examples. In order to protect men undergoing medical examination my own organization has found it necessary to establish agreements making provision for the union to submit the worker to a second doctor if it is not satisfied with the decision of the works doctor; then, if agreement cannot be reached, to a medical referee. While this is necessary to protect the individual, the psychological reaction on the man is not conducive to his recovery.

Welfare Work

The same difficulty is experienced in connexion with welfare work. This has been very useful in some cases where there has been a common understanding. On the other hand, where it has been introduced without the union and in antagonism to them it has produced quite a bad reaction. For these and many other reasons I welcome the opportunity now presented for a complete overhaul of the whole medical service and the establishment of a branch which might be designated an industrial medical service.

Another great difficulty with regard to the health factor is that before steps are taken to remedy an existing evil one must establish a *prima facie* case by comparison with other controlled groups. This seems to be a fetish of the medical profession. The matter was brought out very clearly in the recent London bus situation. In 1928 I saw the difficulty which was arising: here was a body of men with a high physical standard of health who were beginning to show certain intensified nerve reactions different from those that had hitherto existed, and I pressed for an examination of the matter. It took me from 1928 to 1934 to get it into a position for a proper study to be made by the Industrial Health Board of the Medical Research Council, and the report of the investigation has only just been issued—in July, 1937, a period of nine years.

The Study of Health Problems

We want a service which will study health problems immediately they arise in industry and take measures to safeguard the health and welfare of the worker, remember-

ing that prevention is better than cure. Very often a worker, for economic reasons, will suffer a long time before acknowledging he is ill and going to a doctor. Even then the ordinary medical practitioner has little time to study the complaint seriously, and may have only a slight idea of the effect of industrial conditions upon the health of his patient. Similarly the union, until it receives complaints from a sufficient number of its members, has little or no knowledge of the insidious development of factors undermining the health of the people. We must therefore try to ascertain the best way to take advantage of the new conception of health measures, to profit by our past experience and difficulties, and to tackle the health problem at its source.

Suggestions for a Co-ordinated Service

We should be reluctant to see a new segregated medical service established. It must be remembered that while we have exerted considerable pressure to bring factory legislation up to date, the workpeople and industry generally are paying a substantial sum per annum for a medical service which, in the general view, is not yielding the results we are entitled to expect. I am hopeful that ere long the new Joint Committee of the British Medical Association and the Trades Union Congress, together with the Departments of State concerned, will examine the whole problem with the view to ascertaining the best possible form of organization to establish: (1) a co-ordinated medical service; (2) a comprehensive research organization; (3) a reorganized panel service; (4) a more rapid and practical application of scientific discovery to the needs of the medical service.

The bulk of medical practice in this country is concerned with industrial workers. How can this be linked with the industrial medical service we contemplate? Taking the great hospitals as a centre, I should like to see the following experiment made:

- (a) Twenty or thirty medical practitioners pooling the whole of their panel patients.
- (b) The State or public authorities providing the necessary building accommodation and equipment for the setting up of a special clinic.
- (c) Each medical practitioner, whilst continuing as a general practitioner, having an opportunity to specialize on some phase of industrial medical work.
- (d) Works doctors participating in the work of the clinic and acting as part of the General Practitioners' Service.
- (e) Close contact between clinics, hospitals, and research institutes, and every possible facility given to the carrying out of such work.
- (f) Arrangements made for the diagnosis of the various cases to be sent to the appropriate research institution for investigation and record, and the prompt application of the most up-to-date treatment.

A better knowledge of the causes of illness in particular groups and classes of workers would soon be available. For instance, in looking over some of the last returns of the Registrar-General I find we have one of the highest tuberculosis mortality figures among dock labourers. The reason for this is a question not easily answered, but the high mortality figure is a definite fact. Is it due to the nature of the employment, to malnutrition of the workers, to irregular hours of work, to climatic conditions or exposure; or what is the reason for it? Similarly other industries have their specific diseases.

A detailed analysis and record of illnesses and diseases experienced in various sections of industry would be of tremendous value to the research institutes and to the

medical service. Details could also be supplied to the various Joint Industrial Councils throughout the country with regard to the trade or industry covered, and both sides would be compelled to discuss the difficulties existing; we should then get co-operation between the lay and medical mind in the promulgation of remedies.

Conclusion

The trade unions of this country, whilst asking for the most efficient medical service, are more concerned with prevention than with cure. It has been a great struggle for us to secure facts and data, and I do suggest to the great medical fraternity that individualism has been one of your greatest handicaps. Can you not concentrate your efforts and co-operate with us? If this is possible I am sure that industries will not limit their consideration to wages and hours alone. When discussing conditions of employment they will have before them a new basis upon which to work, resulting in general provisions for dealing with health problems being incorporated in the industrial structure.

As I said at the outset, our chief concern is to maintain what is, in fact, the capital value of our members, with ability to enjoy good health, preserve a high standard at home, rear strong and healthy families, and avoid the waste and loss of illness.

I appeal to the great medical service and to my own people to set aside all prejudices of personal outlook and make one great combined effort to establish a really correlated service that will remove one of the blots from our civilization.

THE USE OF ADULT SERUM IN MEASLES AN ACCOUNT OF AN EPIDEMIC IN A PUBLIC SCHOOL

BY

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The following report of an epidemic of measles in a public school of three hundred boys with an age group of 13 to 18 years in which treatment by adult serum was used will be of special interest to all medical officers of schools as well as to doctors in general practice.

The school having escaped an epidemic of measles for several years the risk had been steadily increasing, and on January 15 we started the term with ninety-nine boys at risk of measles. On the 17th a boy was admitted to the sanatorium with a high temperature, and the next day he showed the typical rash of measles. The case was not severe: on the fourth day the patient's temperature was normal, and on the twelfth he was able to go home for a few days' convalescence.

Meanwhile the school had been infected, and the question of using adult serum in the hope of attenuating the disease in consequent cases was considered. The head master gave enthusiastic support to the suggestion, and steps were at once taken to obtain a supply of serum. Through the good offices of Dr. E. H. T. Nash of Hounslow we were put in touch with Drs. O'Brien and Parrish of the Wellcome Research Laboratory, by whom we were supplied with 100 doses of 10 c.cm. each. To replace the stock we undertook to return the equivalent in blood from selected adults. Members of the teaching staff readily volunteered for this purpose. The next step was to circularize parents and obtain permission to use

serum. Consent was in the main readily given, but fifteen refusals were received. This number made a useful group of controls.

The most difficult point of all now arose—namely, to whom to give the serum and how soon? Supposing we were lucky enough to have escaped widespread infection and had meanwhile given serum to all at risk, we should very much have compromised our position in dealing with a future epidemic on the same lines. In the first instance, therefore, we decided to give serum only to those boys who showed a rise of temperature, or were +++ risks—a plus standing for dormitory, house, or form contact. The temperature of each boy who had not had measles was recorded daily. It was recognized, of course, that serum used in any but the earliest stage of incubation was probably of little use; but as it could do no harm and experience had not yet crystallized on this point, it was decided to proceed on these lines.

The course of events very soon clarified the position, and a fortnight later cases began to come in so freely that on February 14 serum was given to all who were susceptible. In the end seventy of the eighty-five cases were so treated. The object of this report is to be as helpful as possible to the head masters and medical officers of boarding schools, and in weighing the conclusions here arrived at it is important to bear in mind the following points:

1. That this is the first occasion on which the treatment has been used in a public school, and we were without experience to guide us.
2. That though the number of cases was large for a school, it is small for statistical purposes.
3. That the writer has had experience of at least three equally large epidemics at the same school under similar conditions.
4. That it is not always easy to give proof of clinical impressions even where those impressions are well marked.

The most important conclusion is that the serum proved all the help that we anticipated, and more. The attenuation of the disease was remarkable, and we shall certainly use the method in future. The load of anxiety a school medical officer has to carry during an epidemic of this nature must be experienced to be understood. With this adjunct to his armour of defence the doctor is materially relieved of that load.

Results

The examination of the records of the cases for statistical purposes supports the general conclusion arrived at very definitely, but the impression from clinical observation was even stronger.

The cases fall into three groups:

1. *Serum Not Given* (15 Cases).—This group includes the original case and one boy who was reported to have had measles as a child. The average period of pyrexia for these cases (excluding complication cases) was 8.2 days. The complications that occurred were one extremely severe case of bronchopneumonia (in oxygen tent fourteen days), and two cases of middle-ear inflammation necessitating paracentesis.

2. *Serum Given During Incubation* (20 Cases).—The average pyrexial period was 6.5 days. The complications were four cases of middle-ear inflammation necessitating paracentesis. Of these one was inoculated thirty-six hours only before the rash appeared, and should really rank with Group 1 as a complication. The remainder were injected ten, twelve, and thirteen days before the rash appeared.

3. *Serum Given Before Infection* (50 Cases).—The average period of pyrexia was 5.2 days. There were no complications.