Two Addresses

ON THE

IMPORTANCE OF INDUSTRIAL MEDICINE TO THE COMMUNITY.

*Papers read at a discussion on this subject held at the
Section of Preventive Medicine with Industrial
Diseases of the British Medical Association.*

I.

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THE stages of scientific progress are represented by thought, then by research resulting in knowledge, and finally by action. Where for any reason, as in the art of medicine, action based on empiricism has come first into existence, new knowledge based on research frequently finds some vested interest opposing action on new lines, or at least some vis inertiae resulting from innate conservatism. New knowledge in medicine has recently been acquired through research, and practice is gradually changing accordingly. But in no branch is thought, research, and knowledge less hampered by action than in that of industrial medicine, because there is little or no action, and in no branch, possibly for that very reason, has the trend of thought been advancing more rapidly.

MEDICAL SERVICE: CHANGE IN THE OUTLOOK.

During the past 20 years there has been a change in the outlook of medical service. Previously treatment of the sick was the first consideration, and the public only came in contact with the profession in case of illness. Questions affecting the maintenance of health were impersonal and left to the public services concerned with water-supply, drainage, disposal of refuse, and the sale of wholesome food. More recently, however, the personal note has been sounded in relation to maternity and infant welfare, school medical service, tuberculosis, and venereal clinics. Notification of births has provided the information upon which infant welfare work is being constructed. Schools, by gathering together children for educational purposes, provide the opportunity for medical inspection of each child. Notification of tuberculosis again is of value for establishing, through the work of health visitors, personal touch with contacts—the preventive side of the tuberculosis campaign. Here adult life is just touched; but, generally speaking, means have yet to be found for bringing preventive medicine into direct personal contact with the adult. For this purpose industry, which gathers adults together, provides the means. The points for consideration are, whether the community would benefit if industry shouldered this responsibility, and whether industry itself would benefit by such action. The benefit to the community is closely interlocked with the benefit to industry, since the community is composed of constituent groups, among which the industrial group (using the word industrial in its widest sense) forms the greatest part. And if the industrial part of the adult population were sound in health there would not be need for much else.

The state of health of the industrial part of the community is the first thing to be ascertained. Appeal on the matter may be made to different types of data. First come the recent disclosures of the army recruiting examinations. Here only 36 per cent. of the male adults of age to bear arms were classed as Grade 1; but the numbers attaining this standard were found to vary widely according to occupation; the miner and the agriculturist provided a far higher proportion than other groups of industrial workers. Next, appeal may be made to mortality statistics. Here we find the agricultural labourer with a comparative mortality figure of 470; a standard set by the lowly paid and poorly housed agriculturist who

works long hours is surely not too high to aim at. Yet the comparative mortality for printers is 773; for tailors, 799; for cotton operatives, 811; for shoemakers, 820; for iron and steel manufacturers, 837; for Lancashire coalminers, 941; for edged toolmakers, 1010; for costermongers, 1507; and for general labourers, 2301. Thirdly, age distribution gives us some information. Out of 1000 occupied agriculturists 225 are aged 55 and over; out of 1000 cotton operatives, 69; out of 1000 printers, 66; out of 1000 coalminers, 75; out of 1000 metal workers, 98; and in the building trades, 121.

None of these sets of data indicates a satisfactory state of affairs, and each brings out marked differences in different occupations. There is, then, a wide field of work before industrial medicine to establish the why and wherefore of these differences. There is an inclination to associate the subject of industrial medicine only with occupational diseases, such as poisoning from lead, mercury, or phosphorus, anthrax, miner's nystagmus, writer's cramp, or caisson disease. These peculiarities of industrial disease are important, both in themselves and in drawing public attention to the influence of occupation upon health. Moreover, through them the guide-post of industrial hygiene has been established—the guide-post which directs attention to prevention rather than to cure. The scope of work has enlarged much beyond the boundaries of occupational disease, but the guide-post is the same. To-day industrial medicine is recognised to be directly aimed at preventing disease and maintaining health. In industry more easily than elsewhere in the community can the balance be cast between the debit of sickness and inefficiency and the credit of health and productivity; this matter will be referred to again later. Here there exists a direct economic interest in maintaining health, an interest which up to the present has hardly been perceived by industry. Nor does the matter end here, for opinion is hardening towards expectation of fulfilment of a definite duty by those who employ labour. The State is now undertaking work upon which large sums of money are being spent in order to bring up from birth to adolescence healthy individuals. Those who thereafter employ these persons have to thank the State that this supply of labour is at their disposal and must in their turn maintain it in health. This opinion finds its expression in Workmen's Compensation Acts and schemes of unemployment benefit. The tendency in the past has been to shift the burden of responsibility on to some insurance agency; but the latest compensation scheme under the Workmen's Compensation (Silicosis) Act, 1918, places upon industry—the refractories industry in this case—the responsibility of shouldering its own insurance. Action on these lines will probably prove a direct incentive to industry to lighten the liability by actively pursuing preventive measures.

THE PERSONAL NOTE.

Allusion has already been made to the personal note in the application of modern preventive medicine. This note is not to be perceived to-day in factory life. Yet the community as a whole needs it. The State up to adolescent life is striving to instil the principles of health, and its efforts are yearly increasing in effectiveness. Then the youth passes into some occupation where his master, as judged by social standing and worldly wealth stands far above the school teacher, and is presumably more worthy of respect. But now the youth finds no attention paid to health and its maintenance. Is it a matter for surprise that he disregards the precepts of his former teachers as something only concerned with boyhood, something not needed in manhood, something it is manly to despise? There are here immense possibilities in industry. Fresh air, sunlight, cleanliness, and wholesome food are necessary to efficiency in the work of adults just as they are for children. Moreover, a standard set in these matters by the all-admired capitalist who rules industry would spread from the factory to the home.

To-day the reverse holds good; the coalminer carries home the colour-bar of his occupation, and no Sherlock Holmes is needed to recognise the cement-maker, the stoker, the cotton operative, the dock labourer, the tanner, or the man from the rolling mills on his way to carry the grime of his work to his artisan dwelling. Example, indeed, is stronger than precept. Not until tidiness, cleanliness, and fresh air, which are the breeding ground of good manners and good thought, are to be found in British industries can we expect to find them in British homes. Here, again, a duty is owed by industry to the community, and a debt the payment of which is long overdue. The community, being largely composed of industrial workers, must benefit by any action which benefits industry, and consideration of the importance of industrial medicine economically to industry must indicate at the same time its economic importance to the community. A few short sums in arithmetic will give help.

LABOUR TURNOVER AND LOST TIME.

A heavy economic burden upon employers and employed has now been recognised in the drift of workers from one place of employment to another. Employers suffer because workers newly engaged experience more accidents and suffer more sickness than the more permanent staff; they are also less productive units. Various estimates have been made of the cost of changing a worker, some place it as high as £5. Let us err on the safe side and put it at £2 10s. The worker himself, on changing employment, may be out of work for a while, then, when he does get work, at first he earns less and is more liable to sickness and accidents. He also loses not less than the employers, say £2 10s. on the average. That is to say, every change costs industry not less than £5. Labour turnover in some cases, according to various calculations made in America and in this country, has been placed at 400 per cent. Let us be content to place it at 100 per cent., which means that to maintain a personnel of 1000 workers at full strength every year 1000 workers require to be engaged to replace those who have left. In our factories and workshops alone are some eight million workers; then there are over a million miners with a similar turnover. These, together with those employed on the land, on the railways, and in transport service, as well as shop assistants, clerks, and the mercantile marine, make up not less than 20 million persons. A labour turnover on this total of 100 per cent. at £5 per head comes to 100 million pounds a year. This high labour turnover is unnecessary, as has been shown both in the United States and here; it falls to 30 per cent. where medical supervision of entrants and hygienic conditions of employment exist. This would mean a saving of 70 million pounds a year.

It has been established by careful inquiry that the underlying cause at the back of lost time is either certificated sickness or that condition of lowered health which precedes sickness. Various estimates of lost time have been made. In some cases it amounts to 20 per cent. of total possible hours; but when health conditions are favourable it may fall below 4 per cent. An average of 10 per cent. probably is not excessive for half the employed population; while 4 per cent. may be taken for the other half. Total possible working hours each year may be placed at a round figure of 2000. The loss of 10 per cent. means 200 hours, which at a wage of 1s. per hour comes to £10. The loss of 4 per cent. means 80 hours, which comes to £4. Ten million persons at £10 means £100,000,000. Ten millions at £4 means £40,000,000. The difference, £60,000,000, represents what may be easily attained by medical supervision in industry. On these two items alone there is a possible saving of £130,000,000 a year.

INDUSTRIAL CONVALESCENCE.

Another valuable contribution, connected with recovery from sickness, can still be made by industry to the community with benefit to industry itself. Sickness among industrial workers, whether due to accident or ill-health, is liable to be unduly prolonged

for two reasons. In the first place, weekly wage earners tend to be unduly anxious about themselves and their symptoms, and unduly anxious lest if their invalidity is prolonged their place may be filled up. This anxiety tends at once to delay recovery and also to induce them to attempt to resume full-time employment before they are ready, when a second breakdown ensues. In the second place, these persons are in receipt of either compensation pay or sickness allowance; both are forfeited directly they start upon work of any kind. Convalescence can be expedited both mentally and physically by graduated activity of an interesting nature, and the best form of interest is remuneration for work done, which is to-day precisely the form of activity prohibited for the industrial convalescent. The result is that to-day enormous sums of money, which there are no means for estimating accurately, are expended in retarding convalescence. Instances of this kind of case can readily be recalled; the poisoned hand or injured limb, cured so far as the surgeon is concerned, for which short-time light employment is needed to restore functional usefulness; the consumptive discharged from sanatorium, but quite unfit to resume full factory hours; the nervous heart case for whom graduated exercise up slopes only gives opportunity for concentrating attention on the vagaries of cardiac behaviour to the detriment of convalescence; the dyspeptic who needs oxygenation resulting from exercise to rectify his gastric peristalsis; the great class of neurasthenias often called debility and suspected to be laziness, which after initial rest urgently need a period of short-time work. The list could easily be lengthened indefinitely. Each and all require—what to-day they cannot get—a period of short-time remunerative activity.

The permanently maimed in industry—to-day cast on to the scrapheap as unemployable, to be a permanent charge on industry or on the rates—still remain for consideration. Holman has estimated that annually 250,000 workers are permanently thrown out of employment through accident or preventable disease in the United States. There are no accurate statistics for this country, but a census taken in Wales in 1918 revealed that one in every 810 civilians had lost one or more limbs, and that in the industrial district of South Wales the proportion was one in every 695. Application of the former figure to the population of the United Kingdom gives a total of limbless civilians at any time of over 58,000. Few persons are ever maimed so that they do not retain some productive capacity. The Ministry of Pensions in this country—and similar evidence is forthcoming from France, America, and other countries—have shown what can be done through industrial re-education for maimed soldiers. Eighty per cent. of war cripples can be trained to carry on a trade without special equipment. The need for continuance of this work for those maimed while earning their livelihood—for assuredly peace has its victims no less than war—is clear. The duty, and also the benefit resulting, lie with industry in whose service the disability is sustained, just as the State has undertaken the duty for those injured in her service.

DEBIT AND CREDIT.

The proposition is put forward that industrial medicine properly applied can effect a saving each year on labour turnover of from 60 to 70 millions, on lost time of 50 to 60 millions, and through industrial convalescence of many millions more. Put the total at £140,000,000 on a conservative estimate. There are to-day something over 40,000 doctors in the kingdom; the cost, if industry employed half the profession and gave each doctor £2000 a year for whole-time work, would amount to £40,000,000 a year, leaving a handsome balance of £100,000,000 a year. Such wholesale engagement of the profession is not proposed, and indeed is not needed. The figures are only instanced to demonstrate that industry by developing industrial medicine has the promise of great profit while it fulfils a great social service.

The trend of thought to-day is against nationalisation of industries, but industries must realise that while maintaining their independence they take over at the same time certain responsibilities as regards those employed which under nationalisation would be undertaken by the State. Recognition of these responsibilities and taking them up would entrench the position of industrial independence. Failure in this matter, quite apart from economic waste, must sooner or later cause those employed to demand reconstruction of modern industrial organisation. Such reconstruction might seriously dislocate the community with sufferings as a consequence such as Russia is now experiencing, with no commensurate advantage. To-day our profession stands too much aloof from such thoughts, and does not do enough to impress upon industry that there is a science of medical sociology the principles of which, if applied to labour unrest, would give results more certain, more sure, and more enduring than all the remedies evolved from the inner consciousness of political economists who may know somewhat of politics but know nothing of the economies of the human machine, and who give lip service only to the truth that a healthy body is necessary for a healthy mind. In very truth the community to-day greatly needs an industrial medical service; it needs it in the interests of health; it needs it in the interests of economy; it needs it in the interests of industrial efficiency; it needs it in the interests of social contentment.

II.

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DURING inquiry into the causes of the disabilities suffered in many industrial processes, more especially those in which lead is used or manufactured, one is constantly hampered by the perfectly frank and often good-willed obstruction offered by both employer and employee to innovations directed towards the improvement of health conditions. On the other hand, extreme measures may be proposed to combat an evil recognised by its effects, though its actual cause may be little understood, and the somewhat tempting but unscientific and uneconomical attitude expressed in the phrase, "I cannot away with it," is easily adopted. An instance of this no doubt perfectly genuine but misguided frame of mind is to be found in the controversy at present raging regarding the suggested prohibition of the use of white lead as a pigment in the arts and manufactures. It is well known that lead poisoning exists amongst the users of lead, and that its incidence has diminished, following the reduction of lead dust in dangerous lead processes; yet in an extraordinary document bearing evidence of the hand of the acute propagandist—the so-called questionnaire emanating from the International Labour Bureau at Geneva—dust as a cause of poisoning in the painting trade is dismissed with an almost contemptuous negative. Reference has only to be made to the excellent results obtained through the special Home Office rules in the white lead manufacture, in potteries, and in other trades—in the administrative application of which rules Prof. Collis had no small share—to see the fallacy of disregarding dust as the most important vehicle by which lead poisoning in industry is produced. In these industries the use of the deleterious material is still continued with comparative safety in processes in which it has been possible to reduce the

amount of dust produced within innocuous limits; the quantity of soluble lead in pottery glaze has been reduced, but it is essential to point out that the glaze is still obtained by means of lead silicate, although the application is modified, in that the fritting or combining of the lead with the silica is carried out before the glaze is applied to the ware, in lieu of the formation of the lead silicate from a soluble salt of lead during the process of firing the ware; it is therefore not fair to argue from the diminution of the quantity of soluble lead present in a glaze that there is a diminution in the quantity of soluble lead present in a paint. This by the way. Prof. Collis has emphasised the necessity of the industrial individual acquiring a competent knowledge of the danger of any deleterious process in which he is engaged, and I would further add that as in microbic disease individual susceptibility varies within wide limits, so also the resistance towards varieties of industrial poisoning shows wide variations of tolerance and intolerance.

LEAD POISONING.

Prof. Collis has shown a curve (Fig. 1) demonstrating the presence of susceptibility and immunity towards T.N.T. (*Journal of the Royal Society of Medicine*, 1916), and in a recent paper (*Royal Society of Arts*, June, 1921) I was able to show that the largest incidence of lead absorption amongst workers in white lead factories occurs within the first six months of their exposure, and that by careful supervision, alteration of employment and suitable treatment, such susceptible persons finally obtain a tolerance which enables them to work over long periods without disability (Fig. 2). This important factor is well brought out by Prof. Collis's suggestion of a period of industrial convalescence for persons who have suffered from any type of industrial disease; at present the factory surgeon is often handicapped by the absence of facilities to carry out such procedure. Lead poisoning bulks largely as an industrial disease, but its statistics are sometimes regarded with some degree of suspicion, particularly as regards those trades in which lead poisoning is not a certifiable disease, and in which no special rules or medical inspection is extant. The statistics of lead poisoning may thus be divided into two categories:—

1. Those in which the case is seen by a certifying surgeon—a surgeon appointed with a special knowledge of the symptoms of the disease, and practising

T.N.T. Poisoning.

Susceptibility and immunity. Time of onset and fatal cases according to number of months worked (after Collis).

Final development of tolerance. Extracted from factory medical registers, 1911-1921. Upper curve shows number exhibiting signs of absorption without definite symptoms of poisoning.

in the particular district in which the diseases are likely to occur. I regard the suggestion that the certifying surgeon should be superseded by a whole-time official as not in the highest interests of the working class population. A surgeon practising in a district is better acquainted with the general run of disease in that district than a whole-time officer not engaged in private practice, who has not the same opportunity to estimate the value of certain symptoms common to both lead poisoning and other diseases.