Effects of industrial occupations on the health of operatives : a speech / by Edward Headlam Greenhow.

EFFECTS

OF

INDUSTRIAL OCCUPATIONS

ON THE

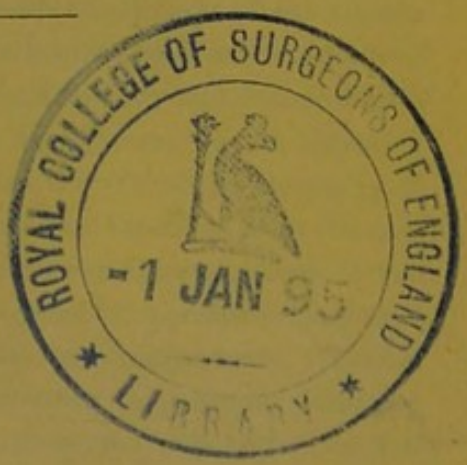
HEALTH OF OPERATIVES.

A Speech

BY

EDWARD HEADLAM GREENHOW, M.D.

Reprinted from the Transactions of the National Association for the Promotion of Social Science, 1862.



LONDON:
EMILY FAITHFULL,
Printer and Publisher in Ordinary to Her Majesty,
VICTORIA PRESS, 83A, FARRINGDON STREET, E.C.
1863.

EFFECTS OF INDUSTRIAL OCCUPATIONS

ON THE

HEALTH OF OPERATIVES.

Dr. Greenhow said, that the subject to be brought under discussion was one of great interest in a community where manufactures have attained a development elsewhere unknown, where the greatest diversity of occupation exists, and where, either directly or indirectly, as employers or employed, almost every one is personally interested in the effects of occupation on health. The terms in which the question was announced as the business of the evening were so comprehensive, that it might, without impropriety, be made to include the influence of vapours and other products of manufacturing operations on the health of the surrounding population, or the injury to the health and lives of young children caused by the withdrawal of women from their natural sphere of domestic duties, in order to their employment in various industrial occupations. He would, however, presume that it was the design of those who drew up the programme that only the more direct effects on the health of those actually engaged in industrial occupations should form the subject of the evening's debate, and even so the question was too large to be exhausted in a single discussion. It would be impossible to dilate on all the various modes in which occupations are directly injurious to health; such as the effects of undue pressure on certain parts of the body, causing deformity and disease—as in the case of shoemakers, who frequently suffer from derangement of the digestive organs, consequent on the pressure of the last against the pit of the stomach; or such as the influences of the inhalation of certain noxious vapours—as in the case of lucifer-match makers, whose jaw-bones often rot away from exposure to the fumes of phosphorus; or of poisonous dust—as in the case of persons employed in colouring wall papers or other articles with pigment containing arsenic. Neither would it be possible to dwell on the mischiefs resulting to painters, plumbers, filecutters, earthenware dippers, glass-cutters, &c., from the poisonous effects of lead used in their various occupations; nor on the sufferings of individual operatives, working independently, such as chaff-cutters, stone-hewers, mattress-makers and others, from breathing an atmosphere charged with dust. He (Dr. Greenhow) would therefore confine his observations to one class of diseases, and that the most widely spread and fatal among all classes of operatives, and also the one most frequently arising from causes over which the sufferers have no control, and from which, therefore, it was peculiarly desirable that they should be

protected. With a view to this purpose, and also to give the debate a definite object, and thus maintain the prestige which the Public Health Section of the Association has especially gained, of aiming at practical results, he begged, before entering into details, to propose the following resolution :—

"That in the opinion of this Meeting, the principle of regulating labour already adopted by the Legislature in certain mines and factories, should be extended to other kinds of industrial employment where several persons are employed in the same factory or workplace, with the special purpose of endeavouring, as far as possible, to obviate conditions dangerous to the health or safety of the employed; and that the Council of the Association be requested to consider whether it can, with propriety and advantage, represent the importance of the subject to the Legislature."

In speaking to the resolution, he should first explain the extent of the evils arising from the class of diseases to which he had referred—viz., diseases of the lungs—and which in his opinion fully justified its adoption; and secondly, state why it seemed to him that the Legislature, without acting on any new principle, or making any encroachment on the dearly prized liberty of the subject, might, with perfect propriety, follow the course suggested.

First, therefore, as to the extent of the evil. Its magnitude was such that a severe epidemic of cholera every alternate year would scarcely involve greater loss of life. Diseases of the lungs of all kinds, including consumption, caused on an average nearly 100,000 deaths in England and Wales during each of the 9 years 1847-55. This mortality was largely contingent on circumstances connected with the occupations of the people, although not entirely so; and it was probably on this latter account that the industrial causes of these diseases, which are in great measure preventable, had not received, either from the public or from employers of labour, the attention due to the importance of the subject. The relation between these diseases and the occupations of the people was shown by the uneven distribution of the mortality occasioned by them throughout the country. There were a few districts in which only 3 out of each 1000 of the living population annually died from pulmonary diseases. There were other districts in which the population died at the annual rates of 8, 9, and even as high as 10 in the 1000. In the former class of districts the people were chiefly employed in healthful open-air occupations, in the latter a considerable proportion of the population were engaged in mining or manufacturing labour. There was one large and compact district in this country, comprising an area of 1,256 square miles, and containing a population of 56,000 persons, in which the rate of mortality from pulmonary diseases, on an average of nine years, scarcely amounted to even the low rate already mentioned of 3 in the 1000; and this may therefore be regarded as the normal rate of mortality from this class of diseases in the United Kingdom. If the mortality throughout England and Wales could be reduced to this standard, there would be an annual saving of more than 45,000 lives. But even if this should be regarded as a degree of improvement practically unattainable, let it be supposed that, by the adoption of proper precautions, the lives of 30,000 or even 15,000 persons, now annually dying of pulmonary diseases, could be saved, as he was fully convinced might be the case, what an

infinite amount of good would be accomplished, and what an incalculable amount of human suffering would be averted! Sufferings, not only from physical pain and premature death in the case of those who perish, but the sufferings of bereaved families and friends, of the widows and fatherless left destitute by the loss of him on whom they depended for support. But it might be asked, how this mortality could be clearly shown to be dependent on the occupations of the people? First of all, by means of general statistics; and secondly, by means of specific facts, which he (Dr. Greenhow) had carefully collected during personal investigations in some of the chief mining and manufacturing districts in the country. Statistics proved, as he had already stated, that the mortality from pulmonary diseases was very unequal in different districts, but they moreover showed it to be very unevenly distributed even among different sections of the population in the same districts, as for example in some of the lead mining districts, in which the men die at nearly twice the rate of the women. In Alston, a lead mining district in Cumberland, taking the sexes separately, it was found that whilst the men died annually at the rate of 14, the women died only at the rate of 7 in the 1000 from this class of diseases. At Reeth, a lead mining district in Yorkshire, the rate of mortality among the men being 12 that among the women was only 7 in the 1000. At Redruth, a copper and tin mining district in Cornwall, whilst the men died at the rate of nearly 10, the women died at the rate of less than 5 in the 1000 annually. These were all districts in which men alone were employed in the mines. On the other hand, where females were largely engaged in the special industry of the district, the rate of female mortality was sometimes found to be higher than that among the male population, as at Leek—a silk manufacturing district in Staffordshire, where the females died at the annual rate of more than 7, and the males at considerably less than 6 in the 1000; and at Macclesfield, another silk district, where the rate among females being 8, that among males was less than 7 per 1000. Examples such as the above might easily be multiplied, and, in reference to the silk-making districts, it must be remembered that the discrepancy between the rates of mortality in the two sexes was diminished by the fact, that the men were also exposed to industrial causes of disease, whereas, in the mining districts, the women were almost totally exempt from them. Even as regarded persons of the same sex in the same district, the rate of mortality could be shown to be very unequal among different classes of the population; as in Sheffield—where the rate of mortality from pulmonary diseases among males of all classes being 8, that of the class called grinders was at least 13 in the 1000. Not to dwell further on the general statistics of the subject, he would now enumerate a few of the specific circumstances which he had satisfied himself were, in great measure, the causes of the undue prevalence of these diseases among certain classes of operatives. These might be briefly summed up under a few heads; viz., the breathing of an atmosphere either more or less charged with mechanical impurities—such as dust, or flax, cotton or woollen fibre,—or vitiated by the products of combustion or by gases; or else of an atmosphere either highly dried and overheated, or imperfectly renewed from the want of proper ventilation; or, lastly, the maintenance of a constrained unnatural posture while at work. To illustrate these several heads, he

might mention that miners, more particularly those who work in metalliferous mines, suffer also from inhaling an atmosphere loaded with gritty dust, and charged with soot and other products of the combustion of gunpowder used for blasting the mine, or with gases, especially carbonic acid gas, given off from the strata through which the mines are driven. Potters suffer from inhaling the fine dust diffused through the air in their workshops, and from breathing an atmosphere over-dried and heated by the processes of their manufacture. Dust is not an essential accompaniment of the potter's occupation, the doughy paste employed in the manufacture of earthenware being used moist; but bits falling on the floor during the various processes dry very rapidly, and being crushed by the feet of the operatives into an impalpable powder, the dust is raised into the air by the pattering to and fro of the potters' assistants. There is also, among the pottery workers, a class of women who suffer greatly from pulmonary disease, caused by inhaling the dust of powdered flint given off during the process of scouring the biscuit china with sand-paper. The operatives in certain departments of linen manufacture, especially flax-hacklers, are peculiarly subject to pulmonary disease, in consequence of inhaling a fine and very irritating dust, evolved from the flax during their labour; and the same evil exists, though in a less degree, among the operatives employed in the carding rooms of cotton factories. He (Dr. G.) had been informed last autumn, by a medical man of large experience in one of the cotton districts, that few men who had entered those rooms at the age of twelve or fourteen years, ever reached the age of thirty-six or thirty-eight, the large majority dying of pulmonary disease at an earlier date. He had ascertained by personal examination that of 107 flax operatives of the hackler class, 79 were suffering from disease of the lungs; and in a single factory he had found 23 out of 27 men in the same condition. The inordinate mortality already referred to among the Sheffield grinders, he had found to be due to pulmonary disease caused by inhaling a fine dust, composed of one-third particles of steel and two-thirds particles of grindstone. In Birmingham he had also found the operatives suffering from several of the above enumerated causes. The makers of pearl buttons, for instance, contract pulmonary disease from inhaling the dust given off in the processes of cutting out and polishing the discs, and from working in over-crowded, over-heated, and ill-ventilated apartments. The jewellers, on the other hand, suffer in the same way from working in small, ill-ventilated shops, the atmosphere of which is vitiated by gas, largely consumed in certain processes of their manufacture. In Nottingham, the ill effects of breathing an atmosphere imperfectly renewed from the want of proper ventilation were clearly demonstrated by the great prevalence of pulmonary disease among the women employed in the mending rooms of warehouses, where no cause of ill health existed arising out of the nature of their occupation. The same town afforded some remarkable illustrations of the deleterious consequences of working in an atmosphere artificially dried and heated. In one case, in which the fresh air was heated by being passed over an iron flue, and then sent baked and dried into the several parts of the factory, he had found that of 200 members of a benefit society connected with the establishment, 190 had suffered from bronchial catarrh during the previous year. Lastly, to illustrate the tendency of a

constrained posture of the body during work to induce pulmonary disease, he might point to the silk weavers of Macclesfield, the lace makers of Buckinghamshire, and the glovers of Yeovil. In the first of these three classes the mischief was caused by pressure of the chest against the breast-beam of the loom, preventing the due expansion of the lungs; in the two other classes the same evil was produced by the contraction of the chest, induced by habitual stooping over their work. He had found by examination of children employed in the lace-making trade, as compared with others of the same age in more favourable circumstances, that whereas, in the normal condition, the anterior and posterior circumference of the chest should be equal, in the lace-making children the posterior circumference exceeded the anterior by from one and a half to three inches. Taking all these facts into consideration, there could surely be no doubt that the great excess of mortality from pulmonary diseases among certain classes of the population was attributable to circumstances connected with their industrial occupations. The practical question which would then naturally arise out of this conclusion, was, whether these circumstances were necessarily contingent on the nature of the several occupations, or whether, and in what degree, they were preventable. He believed, after minute and careful investigations, that they were, in a great degree, remediable. As an instance, he might state that the pitmen of Northumberland and Durham scarcely suffered more than the rest of the population from pulmonary diseases, whilst among those of Staffordshire and some parts of Wales the mortality from the same diseases was excessive—a discrepancy entirely due to the more perfect ventilation of the mines in the former district as compared with those of the latter. Again, in the lead mining districts, whilst in certain mines the men almost invariably broke down from miner's asthma before middle age, those who worked in better ventilated mines were found able to continue their employment till an advanced period of life. In the case of the grinders of Sheffield, there was a marked difference in the amount of pulmonary disease existing among those working in shops provided with a fan for carrying away the dust, as compared with that found among the grinders in shops unprovided with this essential means of protection. A still stronger illustration of the preventability of this class of diseases was afforded by the present, as compared with the former, condition of the needle grinders of Redditch. Formerly these operatives suffered even more than the grinders of Sheffield, but the dust formed during the grinding of needles being comparatively light, a proportionably greater improvement had taken place since the general introduction of fans into their workshops. The remedies for the chief causes of pulmonary disease among potters were simple and evident: the more frequent removal of *débris* from the floor of the workshop, together with its occasional sprinkling with cold water, would prevent the rising of dust into the air, whilst a different arrangement of the stoves used for drying the moist ware might be easily made to obviate the evils arising from an over-dried and heated atmosphere. Among the silk operatives of Leek, he had satisfied himself that the prevalence of pulmonary disease was mainly to be ascribed to the imperfect ventilation of the factory rooms, consequent on the almost invariable closing during work hours of the openings intended for the admission of fresh air, on

account of their position being such as to produce a draught intolerable to the operatives. Obviously, this cause of disease might be entirely removed by more perfect arrangements for ventilation. With regard to the influence of posture in producing disease and deformity of chest, he would observe that, although much depended on the mere habit of stooping over work, a different arrangement of the seat and a little systematic instruction of the operatives at starting would go far towards remedying the evil.

Having thus sufficiently demonstrated the extent and the large preventability of the class of diseases to which he had proposed to confine his observations, he (Dr. Greenhow) would in conclusion venture a few words on the second branch of the question, which he was aware would be warmly debated, as to whether the Legislature, without going beyond precedents or infringing the due liberty of the subject, could interfere to bring about, or at least to accelerate, the improvement which he trusted he had clearly shown to be feasible. The fact was, that the course suggested in the resolution involved no new principle of action, seeing that legislative provisions for the regulation of labour and for the prevention of accidents in certain mines and factories were already in force, the punctual fulfilment of which was secured by the supervision of Government inspectors; and all that he intended to propose was, that these, as it seemed to him, most salutary provisions should be extended so as to reach other branches of industry, and other classes of evils besides those over which they had already exercised so beneficial an influence. If it could be fairly understood by the public, that the mortality arising from the preventable causes of disease, indicated by him this evening, alone greatly exceeded that caused at any time by the evils over which the Legislature had already assumed control, he believed that the weight of public opinion would sanction the object of his resolution, which he now strongly urged that meeting to adopt.