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Author: A. M. Anderson
Editor: T. Oliver
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CHAPTER II

HISTORICAL SKETCH OF THE DEVELOPMENT OF LEGISLATION FOR INJURIOUS AND DANGEROUS INDUSTRIES IN ENGLAND

"Now, since both the Ages of Antiquity and that we now live in shew Laws . . . . calculated for the good Order and Reputation of Tradesmen, 'tis but reasonable that Physick should contribute its quota for the Benefit and Comfort of those of whom the Law has been so tenderly careful, and display itself in a particular manner (that has been hitherto neglected) for the safety of Tradesmen, that they may follow their Trades without injuring their Health."—RAMAZZINI: *Treatise of the Diseases of Tradesmen.* English Edition, 1705. Italian Edition, Modena, 1670.

"Year after year, as far forward as any present judgment would willingly speculate, the same terrible waste of adult life must, with no great mitigation, continue, unless the Legislature see fit to provide by special enactment for more wholesome conditions of labour . . . . The canker of industrial diseases gnaws at the very root of our national strength. The sufferers are not few or insignificant. They are the bread-winners for at least a third part of our population . . . . That they have causes of disease indolently left to blight them amid their toil . . . . is surely an intolerable wrong. And to be able to redress that wrong is perhaps among the greatest opportunities for good which human institutions can afford."—*Report of the Medical Officer (Dr, afterwards Sir John Simon) to the Privy Council*, 1861.

From the benevolent and learned Italian physician of the seventeenth century, in touch with every available source of information of his own and preceding ages, searching for mitigation of the diseases of workmen which he believes to be "incurable," to the English State physician of the nineteenth century seeking to persuade men that the diseases must not be allowed even to arise, is indeed a long way. The way is long in all that concerns knowledge of the causes and treatment of disease, no less than in circumstances and organisation of industry. It is doubtful, however, whether the transformation of ideas in either is so great as in the general attitude of civilised society towards protection of labour and promotion of industrial

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health. The change cannot be accounted for, completely, either by change in the methods and organisation of industry, or by increased knowledge, medical, economic, or social. Nor can the increased breadth of conception be attributed solely to that increased intensity and quantity of human suffering which inevitably accompanied concentration and growth of industry. In all ages there have been physical, moral, and economic evils which fell to the lot of the labourer, probably differing from time to time on the whole more in degree than in kind, and doubtless felt at each stage by the sufferers, and sometimes by onlookers, with an intensity which relatively was great, and which with adequate discernment of a remedy and the duty or expedience of applying it, would have led to legislative action.

In the great civilisations of antiquity, whether in the East, West, or in Europe generally, there was sufficient concentration of the forces of labour to produce the intensest forms of the maladies classed by Pliny as the "diseases of slaves." Some of the most injurious processes known to us now are extremely ancient. To mention but a few: lead and quicksilver mining, the potters' craft, and the textile processes of preparing and weaving asbestos and flax.

The long history, in another department of social ills, of legislation and organised guild efforts for protection of buyers from dishonest manufacture and dishonest trading in adulterated products, or again, of efforts to regulate supply of labour and to enforce honest service from workers, affords many illustrations of the action that could be taken in Middle Age and Renaissance Europe, where an evil was both recognised and also believed to be remediable. It is to be noted how few the indications are that the strivings after social improvement of handicraftsmen and labourers were in those times inspired by any clear vision of the physical safety and health of individuals as part of the well-being to be sought. Illustrations might indeed be gathered from records of craft guilds and municipal organisations, of provisions and regulations that tended to results similar to those expressly aimed at by modern sanitary regulations. This is especially true of England, where the masses of manual workers came earlier than in other countries of Modern Europe to comparative physical comfort. We must, however, avoid the mistake of reading into past events, however interesting, ideas that are consciously at work in practical affairs only in our own times.

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Of much later date are the first documents that I have been able to trace expressly dealing with the nature and results of industrial occupation in dangerous or injurious processes. These are in the *Transactions of the Royal Society of England*, and are of the theoretic and reflective character that is appropriate to their setting. Belonging to the same century as Ramazzini's most human treatise (1670 and onwards), touching both manufacture and mining in Europe (*e.g.*, manufacture of white lead, silvering of mirrors by mercury, lead mining, coal mining), they would take an important place in a general history of European thought and action on this question. The vivid descriptions by the Italian as well as by the English writers of the effects on the worker of lead,* of mercury,† of silk dust,‡ of explosions in mines,§ give one a sense now of the kinship of past labour with present, and a clearer perception of the magnitude and the worth of the object that this generation has set itself—to remove such causes of suffering from the path of the labourer.

In those papers, however, we are still far from any practical preventive treatment of industrial diseases. My task in this paper is to trace out in England, that is in the foremost industrial community of recent times, the history of tentative, halting efforts, almost wholly within living memory, to engraft on the earlier legislative movements of the nineteenth century towards hygienic and moral reforms in industry, that special, applied regulation of injurious manufactures for which Sir Edwin Chadwick‖ and Sir John Simon were the earliest and most distinguished advocates. In this history itself, I think, is found the nearest attainable explanation of the wide difference between the general attitude of our day towards care of the health of the adult labourer

* For example: "The accidents which happen to the workmen are: Immediate pain in the stomach, with exceeding contortions in the guts, and costiveness that yields not to cathartics; . . . . next a vertigo or dizziness in the head with continual great pain in the brows, blindness, stupidity, and paralytic affections; loss of appetite, sickness and frequent vomiting to the extremest weakness of the body.—*Transactions of the Royal Society*, Abridged Edition, vol. ii., p. 576; paper by Sir Philberto Vernati).

† The same volume, papers by Dr Walter Pope and Dr Ed. Brown.

‡ Ramazzini: see passages I have quoted, with comparisons, in the Annual Report of the Chief Inspector of Factories for 1898, pp. 171-2.

§ *Transactions of the Royal Society*, vol. ii.

‖ See especially, Report on an Inquiry into the Sanitary Condition of the Labouring Population of Great Britain. Printed by W. Clowes & Sons for Her Majesty's Stationery Office, 1842, pp. 256-261, 409-444, etc.

at his trade, and that of any previous age, when the diseases accompanying industry were the subject of scientific observation. In it is to be seen the gathering momentum which could so completely sweep away age-long modes of regarding the worker at his bench as merely a means to the ends of others than himself and his family, that the legislature and administration could at length treat the promotion of the physical security of each individual labourer as a worthy end for the State no less than the labourer. Lord Londonderry, when he railed in Parliament in 1848 against the "hypocritical humanity" which sought by protective legislation to save the lives and limbs of the miners of Great Britain, represented but a singularly extreme though not isolated survival of the older assumption of legislators that the health of the masses of people, as of individual labourers, might be left to take care of itself, if indeed it was worth thinking about at all. Even the learned and humane contributors in the seventeenth century to the *Transactions of the Royal Society* on dangers of mining and means of overcoming them, can tell without a thought of irony how a ventilating tube was first placed in a dangerous mine after an accident from fire-damp, resulting in the loss not only of men but of a "gentleman of quality." There is indeed a long series of laws, extending back to before the time of Elizabeth, for the protection of the poorer wage-earner in making his contract so that he should not be cheated by extortionate charges or unfair payments in goods. The real contrast in the normal attitude of the centuries before our own towards the *persons* of workers is nevertheless well seen in Macaulay's wondering notice of the fact that in the latter end of the seventeenth century it was possible for an eminent philanthropist to exult in the thought that in Norwich, the centre of the clothing trade, where "a little creature of six years old was thought fit for labour," boys and girls of "very tender age created wealth exceeding what was necessary for their own subsistence by £12,000 a year." Greater degradation than any shadowed there had to be achieved, in England at least, before the first legislative foundations could be laid, on which afterwards was to be engrafted the special trade legislation with which we are here concerned. Out of the desecration of child-life and womanhood, underground and in factories and workshops, recorded in the Blue Books of the earlier part of last century, came the needed force for the beginnings of a State control in England of special conditions of health and security, which in some other European countries had been for long, at least in mines, partially

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maintained through the operation of a more or less definite theory of State or Imperial ownership.*

Although I refer necessarily to the general sanitary and social protective measures, the development of which belongs to the great humanitarian movements of the first half of the Victorian age, I must at this point make it clear that I exclude here their history, so far as concerns purely the control of economic and moral abuses, which were not inherent in manufacturing and mining industry itself. We are not directly concerned with physical sufferings which, owing to the apathy of the community, in fact accompanied the earlier developments of the factory system, nor with the barbarities which culpable ignorance too long allowed to survive, from rougher and harder times, underground in mines. Our concern is with those material risks in any industry which, when reasonably good methods of working have been developed by the necessary help of law, remain as ordinary accompaniments of the occupation itself, either because of the nature of the substance used, or because of the appliances necessary to the processes carried on. Some special regard for classes of persons employed is also necessary in so far as they are specially affected by risks on account of tender years or physical constitution, but not because Parliament was first and foremost compelled by unnatural conditions to safeguard young workers and women, nor because the force of law remains, and, humanly speaking, will continually remain necessary in competitive manufacture to maintain for them good normal conditions.

We must remember that applied scientific protection of all workers against industrial injury was from the outset introduced step by step into two distinct sets of Acts of Parliament, the Mines Acts and the Factory Acts, both with primarily social aims, each acting and re-acting on the other throughout, both in Parliament and in the Department administering them. This compels study of the stages of development in those Acts, as distinct from the movements which produced them, in order to arrive at any comprehension of the nature of the now resulting form of control of injurious trades.

In a complete history of this subject a long section would be devoted to the development of the later-initiated law relating to

* See more particularly, Special Reports on Mines Legislation in Germany, France, Belgium, by Her late Majesty's Mines Inspector, Mr Tremenheere, in 1848 and 1849.

Public Health, to the origins of the two great Sanitary Commissions of 1843-5 and 1869-71 and their reports, and adequate recognition would be possible of one main cause of gradually quickened public and official understanding of the need of special precautions for health in injurious industries. This cause was the introduction into the service of the State, first as special commissioners, later as permanent officials, of scientific investigators and medical officers, whose work brought to light not merely new facts bearing upon industrial disease, but also new and broad ideas as to their origin and effects, and whose reports secured in some instances attention far beyond the boundaries of England. It is difficult for a modern Factory Inspector to realise all that is implied in the brief allusions of a former Chief Inspector, Mr Redgrave, in one of his annual reports, as late as 1868, to the fact that cleanliness, ventilation, and prevention of disease generally, in factories, were then regulated only so far as they were provided for at all in the "Sanitary Act," and applied by local medical officers—where there were any—without effective central control or organisation. What it meant in loss of life and injury to the bread-winners of the masses of the nation was only too clearly set forth in the accumulated evidence in Dr Simon's and Dr Greenhow's reports to the Board of Health and to the Privy Council on the sanitary state of the people of England from 1858 onwards. The words I quote at the head of my paper indicate Sir John Simon's idea of the magnitude of the evil at that time. In many passages he showed his view of the worthlessness of such general powers as then could be applied to the more general classes of evil.* In prolonged special investigations, guided by the danger signals of mortality statistics, he traced out the preventible

* "Defects of ventilation are in theory dealt with under the Nuisance Removal Act. . . . In practice these powers are hitherto almost unapplied; partly because the magnitude of the evil is but most imperfectly appreciated either by local authorities and justices, or by the slowly suffering artisans themselves; and perhaps still more . . . for another reason. In any proceedings . . . an official complainant should be ready to state in precise terms what remedy he asks the justices to apply. Now, to describe suitable ventilation for a workplace there must be a fair amount of intelligence and discrimination. . . . An average inspector of nuisances cannot dictate ventilation off-hand, as he would direct the clearance of a dust-bin. Justices acting without skilled advice cannot themselves order in detail particular means of ventilation. . . . Thus it seems, the evil is left unabated. . . . Against the other sources of disease to which the report has referred, no law yet pretends to make provision."—*Fourth Report of the Medical Officer of the Privy Council*, 1861, p. 29.

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injuries going on steadily in half-regulated or wholly unregulated dangerous trades. "Certain industrial establishments," he said, writing in 1862, "are subject to Government inspection, and some to a very limited extent are regulated by Act of Parliament. . . . Is there any sufficient reason why these precedents should not be followed in other industrial establishments. . . . There is abundant causation of premature death in mines which are neither coal mines nor ironstone mines,* and potters, grinders, carders, hacklers, not to mention hosts of other artisans, may, any of them, show the same claim as miners—the claim of grievous physical suffering—to have the special circumstances of their industry subjected to Government supervision."† These observations were not based on vague description or casual inquiry into the circumstances of industry, but on systematic notes of conditions of employment in selected localities where mortality due to given diseases—for example, tubercular phthisis or irritative disease of the lung—was three, four, or even six times as high as in other parts of England. The evidence for this need of supervision by centrally directed specialists, working under a specialised legislation, had been already repeatedly touched on in Reports of Royal Commissioners primarily appointed to inquire into employment of children and women. Far more had to be later said and written before the first steps could be taken in some of these manufactures to remove causes of injury which, later, the Commissioners of 1878 referred to as a "public scandal," and for which no basis of control existed until 1891.

What, then, are the first beginnings of special legislation; and how did the succeeding steps follow each other in the Factory and the Mines Acts respectively? First, it must be pointed out that whereas the particular kind of legislative weapon (the provision for "Special Rules"), which was destined to be forged for use against dangerous trades, was first planned in connection with regulation of mines, it reached its most elaborate form in connection with regulation of manufacturing industries, that is, in the earlier and more fully regulated industries, under the Factory Acts.

It is now almost incredible that one of the most dangerous of all groups of industry—mining—should have been free in

* Except for prohibition of underground employment of women and girls, and limitation of employment of boys (1842), metalliferous mines were unregulated until 1872.

† Fourth Report of the Medical Officer of the Privy Council, 1862, p. 31.

England from any form of protective legislation until 1842,* when women and girls were excluded from underground working, and that it was not until 1855 that any comparatively useful safeguards of health, life, and limb were prescribed by law. It is still more difficult to realise that before 1814 it was not customary to hold inquests on deaths of miners killed by accidents in mines. With the exception of regulations against truck, there was no provision except such as protected the colliery owner—and of that kind there were many—against injury to his property by miners.

Meanwhile the landmarks from the present standpoint in factory regulation had been the Acts of 1802 and 1833. The first, aiming only at the preservation in cotton mills of the "health and morals" of apprentices, further laid down that "visitors," to be appointed by justices in every county for repression of contraventions, were empowered to "direct the adoption of such sanitary regulations as they might on advice think proper." The Act of 1833,† regulating first the labour of children and young persons in textile factories generally, replaced those "visitors" of the Act of 1802 (who had seldom been appointed, and still more seldom had acted) by "inspectors" with similar powers of entry, and of calling to their aid expert advisers, but with additional powers: to administer oaths and to make such "rules, regulations, and orders" as were necessary for the execution of the Act, and to convict offenders and impose penalties under the Act, as if they were Justices of the Peace. In 1844 an Act applying similarly only to textile factories repealed these remarkable powers of Factory Inspectors to make rules, orders, and regulations, and to act as Justices of the Peace; at the same time it organised the Inspectorate, with institution of an office in London, on lines comparable to those of our own time. Certifying surgeons were then first provided primarily for the purpose of examining young workers under sixteen years of age as to their fitness for employment, and granting certificates of age and ordinary strength; but further also, for re-examination of such workers at the instance of an inspector where there was reason to believe that injury would be caused by continued

* When legislation followed the terrible revelations of the Royal Commission of 1841.

† Intervening Acts had extended the general principle of protection to young workers in cotton mills other than apprentices.

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employment. The Acts were now extended to women, and for the first time special provisions for health and safety (as distinct from general provisions for cleanliness of the factory) began to make their appearance. Workers in wet spinning became entitled to sufficient means against being wetted and against unnecessary escape of steam into the room if young persons or children were employed there; but far more important were the new attempts to reduce accidents by providing for the safer use of machinery, inquiry into causes of accidents, and penal compensation to workers for accidents due to machinery remaining unfenced after notice from the inspector that it was "deemed to be dangerous." These provisions embodied a few of the recommendations made in Special Reports of the Inspectors of Factories, presented to Parliament in 1841, and the recommendations of the Select Committee of the House of Commons presented in the same year; with them, however, was also introduced the principle of Arbitration on the objections raised by an occupier. The inspector might give notice of dangerous machinery to be fenced, but for fourteen days the right remained with the occupier to require the appointment of arbitrators "skilled in the construction of the kind of machinery" to which the notice referred. Each party, the occupier and the inspector, was then to nominate his arbitrator, and the two arbitrators were to proceed to examine the machinery "alleged to be dangerous" within fourteen days. If they could not agree, they were together to appoint as umpire a third arbitrator "possessing a similar knowledge of machinery." When the ultimate decision supported the occupier's objection, the inspector's notice as to danger was annulled, and even if an accident thereafter occurred, penal compensation could not be obtained for an injured worker. Not until the Act of 1891 did this principle, later so greatly extended in application to matters of health as well as safety, cease to control the fencing of dangerous machinery (other than mill-gearing) in factories, and it still remains for all dangers in mines not expressly covered by any other provision. As regards this first introduction into the Factory Acts of penal compensation for preventible injuries, it appears to have been the outcome of a discussion by witnesses before the Royal Commission on Labour of Young Persons in Mines and Manufactures in 1841. This was the "trade charge or insurance payable by the branch of industry liable to the

accidents," which has been at length secured to the worker only at the end of the nineteenth century by the Compensation Acts.

In the year in which these considerable steps had been taken in factory legislation (1844), the Mines Inspector under Lord Ashley's Act published his first report. Even two years later women were still to be found in considerable numbers underground. Progress nevertheless was being yearly made—through the reports on safety and ventilation of special scientific commissioners (including Lyell, Faraday, Playfair), by the action of associations of miners, by spread of knowledge of the dangers of mining, and not least, by the recurrence of appalling accidents which ever increasingly shocked the public conscience—came the first tentative measure for general safety in coal mines—the Act of 1855.* In 1854 the Select Committee on Accidents had reported, adopting among other recommendations a suggestion of the Inspectors for legislative extension of the practice of several colliery owners, of framing special safety rules for working in mines. The Act, in addition to specifying seven general rules binding on owners and agents of collieries for safety, relating to: (1) adequate ventilation to dilute and render harmless noxious gases; (2) fencing of disused shafts; (3) fencing of pumping pits when not at work; (4) secure lining of shafts; (5) proper means of signalling; (6) indicator and break for machine raising or lowering persons; (7) proper gauges and valve for steam boiler, provided for the framing and enforcement of special rules, to be submitted by owners for approval of the Secretary of State, at every colliery. These special rules, when established, were to have the force of law both for owners and miners, but were enforceable only by penalty in the case of owners, by penalty or imprisonment with or without hard labour (maximum three months) in the case of miners. This latter distinction occasioned considerable bitterness at the time, but the provision which was most generally criticised was the elaborate one for arbitration in case of objection on the part of the owner to any alteration or addition to special rules made by the Secretary of State. Within twenty-seven days the owner had power to nominate three or more "practical mining engineers or other competent persons of experience in the district," not "interested in or employed in the management of . . . . the colliery," and the Secretary of

* The principles of organised inspection and reporting of fatal accidents had been already secured by a short Act of 1850. Both this and the Act of 1855 were to continue for five years only in force; later Acts were permanent in form.

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State might appoint "one or more" such persons "to determine the matter in difference." In case of the owner not exercising this power within the time specified, arbitration could be organised on lines very similar to those provided by the Factory Act of 1844, with the difference that in the case of special rules in mines one of the parties to the arbitration was the Secretary of State instead of the inspector. In the framing of special rules following on this Act, it was common for groups of collieries working under similar conditions to adopt one set of special rules, but sometimes individual owners drew up their own special rules, and occasionally attempted to introduce remarkably irrelevant matter, such as attendance at "Divine Service at least once on the Lord's Day," for the regulation of the conduct of miners.

Five years later the law relating to mines was extended, and in some ways strengthened, several disastrous accidents and explosions, entailing loss in the aggregate of thousands of lives, having in the meanwhile occurred. At several of the inquests strong evidence was given of incompetent management and neglect of rules in addition to disregard of inspectors' suggestions for improvement of ventilation in the interests of safety; in one case the coroner's jury returned a verdict of manslaughter against the manager, the overman, and the fireman of the colliery, though this was subsequently followed by acquittal at the assizes. The Act of 1860 touched on several new points, besides extending the law to include ironstone mines; wages and education sections were first introduced, but a demand for certificated managers of coal mines was not met until 1872. The chief advances in the direction of increased safety were, by extension of the general rules to include provision for places of refuge on engine planes, use of covers overhead in lowering or raising persons in every pit, fencing of flywheels of every engine, maintenance of boreholes to prevent inundations, by empowering an inspector to propose additional safeguards for dangers not covered by any rules (but in case of objection by the owner, the matter was to go to arbitration); by raising the age of those entrusted with charge of steam engines to eighteen years.

In the meantime the course of factory legislation continued to illustrate the strength of the original motive—rescue of young workers and women in textile factories from monstrously long hours and overwork—rather than intelligent and steady assimilation by the community of the evidence of need of special control

of drainage, ventilation, use of deleterious substances, and other matters affecting health in a large number of non-textile industries. Such evidence was first strikingly presented by the Report of the Commission on Mines and Manufactures, published in 1843, but later in greater detail as regards the injurious industries of lucifer match and pottery making in the Report of the Children's Employment Commission of 1862. A long and fierce battle had to be waged over the form and degree of limitation of hours in textile works before the gradual extension of the principle of regulation could begin and proceed from trade to trade. It was in the Act of 1864, which added the largest number of these, including earthenware and lucifer match works, that the fruit of the labours of expert commissioners began to appear in explicitly sanitary measures, applicable to all classes of factories under the Acts.* In this Act we first find the idea of ventilation applied in order to render harmless "gases, dust, or other impurities generated in the course of manufacture that may be injurious to health." And here we find the first fleeting attempt to introduce the "special rules" system from the Mines Acts, on the employers' initiative, but without the arbitration clauses. Manufacturers were empowered to draw up special rules binding on workers, after approval by the Secretary of State, "for compelling the observance . . . of the conditions necessary to ensure the required degree of cleanliness and ventilation, and to annex to any breach of such rules a penalty not exceeding one pound." These powers were extended to many other trades, including indiarubber works, letterpress printing works, blast furnaces, and iron mills, by the Act of 1867, and were soon unfavourably reported on by inspectors, as throwing too heavy a burden on the workers, "the onus of being a principal under the Act," to use Mr Baker's words. In 1868 he reported that special rules were in force in most of the iron works in his district, which gave the employer "power over his workpeople who sub-employ in his works," by holding them responsible for various sections of the Acts relating to employment of young persons; a purpose which we can now readily see to have been foreign to the general intention of such legislation. By the Act of 1871 penalties for breach of these rules were made recoverable by summary proceedings, but the provisions for framing such rules disappeared when the law was consolidated by the Act of 1878. The Work-

* It should be noted that in 1862-3 skilled observations were being made and valuable reports presented by Dr Bristowe and others, under the Medical Officer to the Privy Council, on industries in which lead, phosphorus, arsenic, and mercury were used, and the precautions necessary for health.

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shop Regulation Act of 1867, amended in 1870, practically completed the application of the general law to all workplaces in which manual labour was exercised for gain, in the making or finishing of articles or parts of articles for sale. The "Sanitary Act" of 1866 had provided for cleanliness, ventilation to remove injurious gases and dust, and for freedom from overcrowding in any workplace not under the operation of any of these Acts. The Factory Acts of 1864 and 1867 prohibited the taking of meals in certain workrooms where dangerous processes are carried on, *e.g.*, lucifer match making, earthenware dipping, china scouring, glass-making (mixing, grinding, cutting, polishing), and the application of power to the extraction of injurious dusts was furthered by introduction of provision for a "fan or other mechanical means," approved from time to time by the Secretary of State, in case of grinding, glazing, polishing on a wheel, or "any other process in which dust is generated or inhaled by the workmen to an injurious extent." The Act of 1878, in consolidating all previous Factory and Workshop Acts, re-cast some special safety provisions (for example, those relating to prohibition of certain workrooms for meals), in such a form as to empower the Secretary of State to extend the prohibition to other industries, a power which was exercised in a considerable number of industries. Employment of young workers was also prohibited in certain dangerous processes, and power was taken to extend such prohibition. Nothing was done, however, at the time of this great measure—which was primarily for better administration of existing provisions, and was accompanied, on the recommendation of the Commissioners of 1875, by a thorough reorganisation and extension of the inspectorate—towards securing more detailed regulation of methods and conditions of working in dangerous trades, in spite of a recommendation to that effect by Mr Redgrave. The first decisive step in that direction was taken in 1883 in the case of one of the most deadly of lead industries, the manufacture of white lead, whose effects had been recorded for centuries, and in France had been the object of special inquiry followed by regulation early in the century under the direction of the *Conseil de Salubrité*. It is rather remarkable to read in a report of the Chief Inspector, 1882, that although "employment in dangerous occupations has on several occasions been brought under the notice of the legislature, until recently special attention has not been drawn to the manufacture of white lead."* Now, however,

* In the Report of the Commissioners of 1875, this industry was especially named as needing closer regulation.

the evils pressed for remedy, and the "Mines Acts as to general precautions and special rules" were adopted as a "precedent" to be applied to white lead works.*

Before touching further on this new departure and tracing out its sequel, a brief reference must be made to the course of Mines legislation since 1860. While political conditions had been unfavourable to additional legislation for some time after the Act of that year, the conditions in the coal industry had been developing steadily, both as regards extent and methods of getting mineral on the one hand, and as regards association amongst miners on the other, in such a way as to make a complete law possible when it inevitably came. Scientific knowledge as to mechanical means of ventilation and other provisions for safety became at the same time incomparably wider spread. Greatly increased public discussion brought out far more clearly the objects and desires both of masters and men, and the determination of the latter to obtain certificated and competent management, extension of the system of "general" safety rules, improvement of the method of forming "special rules," and increased inspection, had its effect in the consolidating and amending Act of 1872. The number of general rules was more than doubled, matters formerly left to the chances of special rules were permanently transferred to the general law, which now included compulsory use of safety lamps where needed, regulation of use of explosives in blasting, securing of roofs and sides, daily examination of the state of the mine, facilities for inspection by representatives of the miners. Special rules became more clearly defined as intended for the guidance, safety, and proper discipline of the miners at work, and they might only be transmitted for the Secretary of State's approval after they had been posted in the mine for two weeks with a notice that objections to them might be sent by any person employed to the inspector of the district. Wilful neglect or contravention of any provision of a kind likely to endanger safety became punishable, in the case of employers as well as miners, by imprisonment with hard labour. The machinery of arbitration on any questions of safety under the Acts was made considerably clearer. In all these matters† the great advance

* Report by Alexander Redgrave, Esq., C.B., on white lead poisoning, November 1882, p. 12.

† I set aside entirely consideration of the otherwise important educational, wages, and employment sections of this code, as beyond the scope of this article.

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was by way of development of previous ideas. The entirely new departure lay in the six sections relating to daily control, and supervision of every mine by a manager holding a certificate of competency from the Secretary of State, after examination by a board of examiners appointed by the latter, power being retained to the Secretary of State to cause inquiry, if necessary, later into the competency of the holder of the certificate, cancellation or suspension of the certificate being possible in case of proved unfitness. There is little room for surprise that so great an advance in the law should have given wide-spread satisfaction to the miners, and that for a considerable time efforts of their associations were directed to securing vigorous enforcement rather than extension of the law. In the same year the question of health and safety in Metalliferous Mines* received its first treatment in a separate code (which remains in force to the present time), of similar scope to the Coal Mines Act. A Royal Commission had been appointed in 1862, and had reported in 1864. The great excess of mortality and sickness among metalliferous miners, "mainly attributable to the imperfect ventilation of the mines" and inhalation of gritty particles, to excessive physical exertion in climbing up and down ladders of great length, to the great changes of temperature, and exposure to wet, were brought out in the report and made the subject of recommendations. It was also shown that accidents were of frequent occurrence from falls from ladders, falls of the rock or stuff, carelessness in blasting, defective gear, and sudden irruptions of foul air and water. The method of regulation adopted for Metalliferous Mines, by general rules for safety, special rules for conduct and guidance of miners, and the requirements as to notice of accidents, coroners' inquiries, fencing of abandoned mines, being similar to those for Coal Mines, details are unnecessary for the purpose of the present essay. In 1881 the Coal Mines Acts were strengthened in regard to the use of explosives underground, in 1886 the Secretary of State was empowered to direct a formal investigation of any explosion or accident and of its causes and circumstances to be held (a provision embodied by reference in the Factory Acts in 1895). In 1887 the Coal and Ironstone Mines Acts

* Hitherto touched only by the employment limitations of Lord Shaftesbury's Act of thirty years before, and the first five sections of the Act of 1860 relating to age and certificates of boys, and prohibition of employment of youths under eighteen in charge of machinery for raising and lowering persons at the pit.

were again consolidated with amendments strengthening the already existing provisions. By General Rule 4 more stringent provision for inspection of working parts of mines before commencing and during shifts, and the distinction between mines in which inflammable gas had been found within the preceding twelve months and those in which it had not, disappeared. By Rules 8, 9, 10, 11, construction and use of safety lamps became much more detailed and stringent than in the former Rule 7, which they replaced. By Rule 24 the age of competent male persons in charge of machinery for raising and lowering persons at the mine was raised to twenty-two. By Rule 34 provision of ambulances or stretchers with splints and bandages ready for immediate use at the mine became compulsory. Other main provisions of the Act strengthened were those relating to distance and height of communications between the two shafts required in mines; daily personal supervision of the mine by the certificated manager; notice of opening or abandoning seams. Arbitration on special rules and other matters was modified so that while the qualification of being a practical mining engineer was retained for the two representative arbitrators, the umpire, if any, is bound to be a county court judge, a police or stipendiary magistrate, a recorder of a borough, or a registrar of a county court.

Turning again to the Factory and Workshop Act of 1883, which forms the first distinct attempt to regulate a dangerous manufacturing industry, we find, in its unamended form, a remarkable parallel to the method of mines regulation, not merely in the requirement that every occupier of a white lead factory shall frame and submit for approval to the Secretary of State special rules* which have been affixed in the factory with a notice to the workers of their power to send objections to the Chief Inspector; but also in the prescribing of six general conditions for obtaining a certificate to carry on the dangerous industry. These include provision for ventilation of stoves and stacks, means of maintaining personal cleanliness, and proper room for meals. The special rules, however, were not in the original statute liable to any process of arbitration, merely to full consideration by the Secretary of State, who had power to make modifications after hearing the occupiers' objections, if any, to his modifications.

* "Such special rules for the guidance of the persons employed . . . as may appear best calculated to enforce the use by them of the requirements provided under this Act, and generally to prevent injury to health in the course of their employment," 46 and 47 Vict., ch. 53, sect. 7.

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This procedure was considerably modified when by the Act of 1891 provision was made for establishment of special rules in any industry (not being a domestic industry) certified by the Secretary of State to be dangerous or injurious to health, or dangerous to life or limb. Then the initiative in drafting the "special rules or requiring the adoption of such special measures as appear to the Chief Inspector to be reasonably practicable, and to meet the necessities of the case" was transferred from the occupier to the Factory Department, but a counterbalancing force was provided by addition of the arbitration clauses wherever the occupier persisted in objections to the proposed special rules, and the Secretary of State could not see the way to accepting modifications asked for by the occupier. At the same time the share of the worker in framing the rules, by his legal right to make objections before they were established, entirely disappeared. It was not until the Act of 1895 that this loss was imperfectly compensated, by a right to representation on the arbitration on conditions prescribed by the arbitrators which was then secured to workmen interested, or any class of them. In 1896, in the Mines Acts that privilege was superadded to the other. The general tenor of the Factory Act of 1891, following as it did on the important work of the House of Lords' Committee on the Sweating System, and the Berlin International Conference, was one of development of sanitary organisation, particularly with regard to workshops, and of closer regulation of dangerous and injurious trades. It had been preceded in 1889 by an Act with special reference (like the Act of 1883) to a single class of factories, in this case the cotton cloth factories, in which excessive heat and humidity produced by artificial means seriously affected the health and comfort of operatives. The Act not only limited the temperature of workrooms and amount of moisture in the atmosphere, but also provided for tests and records of the same, and fixed a standard minimum volume of fresh air, 600 cubic feet, to be admitted in every hour for every person employed. Power was retained for the Secretary of State to modify by order the maximum limit of humidity of the atmosphere at any given temperature, and a short Act of two sections in 1897 extended this power to other measures for the protection of health recommended by a Departmental Committee appointed to inquire into the working of the Act of 1889. Without doubt, the most important measures adopted under this Act in 1898 were those tending to purify the air of workrooms by prescribing a CO

standard of ventilation ("during working hours in no part of the Cotton Cloth Factory shall the proportion of carbonic acid in the air be greater than nine volumes of carbonic acid to every ten thousand volumes of air"), and by prohibiting use of impure water for production of artifical humidity. One other point of historical interest in connection with the Act of 1889 must be touched on. It contained a general provision enabling an inspector, where he considered that dust was inhaled by the workers to an injurious extent, to serve a notice on the occupier of the factory to adopt mechanical or other means for its removal, but subjecting the notice in case of objection by the occupier to the same process of arbitration as the notice of fencing for dangerous machinery provided in the Act of 1844. In both cases the power of the employer to send the notice to arbitration was repealed by the Act of 1891, and, consequently, the ordinary procedure for the inspector to enforce such notices was by establishment of the evidence in support of his requirement in the ordinary courts. For the first time some provision was made in 1891 for means of escape in case of fire in factories and workshops. Certifying surgeons were now called upon to report annually as to the persons inspected and the results of inspection.

On the Act of 1891 followed a period of greatly increased administrative activity with the new powers to initiate detailed regulation for promotion of special hygiene in factory and workshop life. No fewer than sixteen trades, including the majority of those referred to in the reports of Royal Commissioners and special medical experts of the earlier and middle parts of the century, were certified, under sections, by the Secretary of State, as dangerous or injurious within four years of the passing of the Act.* The Act of 1895, extending greatly in several directions the sanitary control of industrial life, followed on this period of increased activity, after the Royal Commission on Labour had reported on the results of its wide survey of industrial conditions, after two important Departmental Committees had reported on lead and phosphorus industries, and after two successive annual reports had embodied reports and recommendations from the women inspectors who in 1893 were first added by the Home Office to the staff of factory inspectors. In the year in which this Act came into force, medical knowledge was established

* Mention may be made of manufacture of lucifer matches, extraction of arsenic, manufacture of earthenware, enamelling of iron plates, quarries, chemical works, lead smelting, flax mills, and linen factories.

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as a guiding factor in the permanent administration of the Department. Probably no more important step towards control of use of poisonous substances in manufacture has been taken than that contained in the provision for reports to the Chief Inspector from every medical practitioner attending in certain cases of poisoning contracted in any factory or workshop. Complementary to this is an extension of the province of certifying surgeons; it included now not only examination of workers under sixteen, but also the duty of inquiry and report in certain cases of industrial disease and accident, and, under special rules, where required, periodical re-examination of workers. In the general provisions of the Act appear for the first time the questions of reasonable temperature, requirement of lavatories where poisonous substances are used, formerly only touched by special rules; it became possible by order of a court of summary jurisdiction to secure prohibition of use of dangerous structures or a dangerous machine until the necessary steps had been taken to remove the danger by the occupier of the factory or workshop. The field of factory regulation was extended by the inclusion of certain conditions of health and safety in "laundries," and of general and special conditions of safety in every dock, wharf, quay, and warehouse. In the special rules it became possible for the Secretary of State, subject to the award of arbitrators if objection were raised, to introduce provisions prohibiting or limiting employment of any classes of persons in the industries scheduled as dangerous, a power which has been exercised in the case of white lead works (prohibition of women's employment in the most dangerous processes), vulcanising of indiarubber by bisulphide of carbon (limitation of hours of adults), and lead smelting works (limit of spells in cleaning flues).

A few words must be said about the dangerous industry of quarrying in open quarries (as distinct from underground quarries under the Metalliferous Mines Act). These were nominally under the Factory Acts by section 93 of 1878, but it was not until special rules could be introduced under the Act of 1891 that any practical steps could be taken at all to enforce the particular measures of safety applicable to the conditions. These proved inadequate, and in 1894, on the recommendations of a Special Committee appointed in 1893 to inquire into the whole matter, a special Quarries Act was passed which, while retaining those provisions of the Factory Acts that were suitable, such as fencing and regulation of employment, applied also those provisions of the

Metalliferous Mines Acts which from the nature of the industry rendered them better adapted for control of its peculiar dangers; at the same time the administration passed to the Mines Department, and in a few years it was reported that special rules for safety had been established in over 2000 quarries with satisfactory results.

Much remains to be said of the methods of regulation of injurious and dangerous industries since 1896;* of the steps taken by inquiries and action of the permanent staff, with its increasingly expert character; of inquiries by Departmental Committees and by specially appointed advisers on scientific and technical aspects of processes; of endeavours, successful and unsuccessful, to frame and carry through special rules without resort to arbitration to meet the risks to the life and health of whole classes of workers; of the results of arbitration in two of the most injurious industries, manufacture of earthenware and china, and of lucifer matches, where white or yellow phosphorus is used. All this, however, belongs so much to current history and controversy that its true meaning and tendency can best be brought out later, and perhaps by a more detached observer. At the very time when the proofs of this sketch leave my hands, an important Bill is passing to report stage in the House of Commons from the Grand Committee on Trade, where opinion has been shown to be practically unanimous in regard to the substitution of a better method of establishing special rules for the precarious and clumsy method of arbitration; power has been taken to prohibit, limit, or control use of any material or process in industry; and, where fruitful extension has been made of the principle of legislating, for details in matters of health by means of departmental orders. Enough has, I trust, been said to illustrate the rise and growth in the last hundred years of the still new ideas of the claim of the industrial worker in a civilised country to reasonable, practical measures to secure his immunity from needless suffering, of the claim of the community that the profits of manufacture shall not be bought at the expense of the life and health of citizens, in whose individual well-being the true wealth of the community lies.

ADELAIDE M. ANDERSON.

* For example, by control of structural conditions, ventilation and cleanliness of workrooms, and of modes of handling dangerous substances, and condition of appliances and machinery used; of provision for cleanliness of workers, and maintenance of their general health by periodical examination and suspension; and, not least important, by exclusion of young workers.

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