

## STATE MEDICAL SUPERVISION OF FACTORIES AND WORKSHOPS.\*

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AS is not at all uncommon with gentlemen taking up the honourable office of president, I have been very much perturbed respecting my choice of a suitable subject upon which to address you. My position as a port medical officer undoubtedly provides a certain amount of scope, and the question of food inspection has been so recently elevated to such great importance among port sanitary authorities that at one time I entertained very serious thoughts of inflicting on you some of my views in connection therewith. I however recognized that, no matter how good a subject, I should be running the risk of dispensing an over-dose, as most of us who have been actively concerned in instituting this inspection have missed few opportunities of explaining our methods and opinions. I have therefore drawn upon another section of my work to provide suitable material.

In the first place I should mention that I have two precedents for introducing to your consideration a subject connected with that branch of public health directly concerned with industrial occupation, in the admirable addresses delivered before this Branch by Dr. A. Greenwood and Dr. W. M. Hamilton, and that I feel I shall be treading on safe ground by following such eminent leaders. Other good reasons for taking up this line are the usefulness to medical officers of health of obtaining some acquaintanceship with contemporary work, and the undoubted tendency exhibited by the Home Office of appointing medical officers of health, who are able to undertake the duties, to the position of certifying factory surgeon. A large number of part-time medical officers of health now hold this office, and there are certain cases of otherwise whole-time medical officers who are doing factory work in addition. As examples of the latter I might mention Dr. Paddock Bate, a former president of the parent society, and Dr. H. Jones, one of the present honorary secretaries, also Dr. W. M. Hamilton, past president of this Branch, Dr. A. M. N. Pringle, president of the Eastern Branch, and myself. Again, the physical condition of school children is so important to local governing bodies that

the supervision of children and young people occupied in factories and workshops cannot but be of interest to their medical officers. A further justification for my attempting a complete survey of the system of medical supervision of industrial occupations in vogue in this country is that no such description has yet been published; so that this address may possibly become the means of creating a better understanding of the work and obligations of a rather important branch of our profession.

The chief inspector of factories is a medical man, so that to this extent it can be said that the whole of factory and workshop supervision is under medical control. In addition there are two medical inspectors of factories attached to the department to supervise, though perhaps to a limited extent only, the work of the certifying factory surgeon, whilst devoting most of their time to the investigation of dangerous trade processes and advising on measures of safety.

The particular task I have set myself is to describe the work undertaken by the certifying surgeon. Several countries employ medical inspectors for investigating the purely medical aspect of industrial conditions, but no country except our own has, up to the present, succeeded in evolving such a scheme of systematic and universal supervision as that I am about to explain. I have good reason for stating that this system is highly thought of by Continental experts on industrial matters, and it is very probable that other nations will attempt something on the lines we have laid down.

The particular merits of the service I shall endeavour to bring out later on under various headings, but there is at least one that deserves some preliminary reference—viz., that of antiquity.

The commencement of the great industrial era in England, at the end of the eighteenth century, brought about such a change in the conditions of labour in the textile and allied industries that other methods of control to those in vogue under the old apprenticeship system became, from a humanitarian standpoint, absolutely essential. As a result, in the year 1802, the first Factory Act was passed, and this, as well as making provision for cleanliness, ventilation, limitation of hours of labour, inspection, and secular and religious education of juveniles, was the actual pioneer of medical supervision. One of the serious consequences of the concentration of labour units under insanitary conditions was the

\* Presidential Address to the North-Western Branch of the Society of Medical Officers of Health, delivered on October 21st, 1910.

spread of epidemic disease, notably small-pox and typhus. Occupiers were therefore directed to call in the aid of a medical man whenever infectious disease became prevalent, with the object of his "ascertaining the nature and probable effects of such disease, and for applying such remedies and recommending such regulations as he shall think proper," it being, at the same time, his duty to forward a report direct to certain official visitors.

The trend of each successive Act has been to elaborate on these fundamental sanitary principles as necessity has arisen and knowledge grown, and to extend their protective influence over other than the textile industries. The Act of 1833 further limited the hours for juvenile employment and fixed the minimum age for working half-time and full-time at nine and thirteen respectively. Medical supervision was further extended by the requirement of a medical certificate for each child or young person, attesting that he or she was of the ordinary strength and appearance of the age specified. These medical examinations were placed in the hands of duly appointed certifying surgeons by the Act of 1844; the certificate became one of health and fitness as well as of age, and the age period for this requirement was raised to sixteen. The investigation into the causation of accidents was another obligation placed upon the certifying surgeon. A universal ten-hours work-day was established by the Ten Hours Act of 1847, women and juveniles not being allowed to work more. As associated industries grew in importance and extent they were brought under the control of the Factory Department. Commencing with print works, dye works, bleach works and lace factories, the list has been so added to that every manufacturing process in the country has been brought into line, and even bakehouses and laundries have now been successfully gathered in. The importance of responsible medical supervision has been particularly emphasized in later years. The Act of 1891 empowered the Secretary of State to make "special rules" to regulate dangerous trades or processes, and in these, medical examinations, periodic and otherwise, are a pronounced feature. The Act of 1895 directed the certifying surgeon to investigate reportable cases of industrial poisoning and disease, and gave to the Home Secretary power to add any industrial disease to the list. The Act of 1901 gave the certifying surgeon power to qualify his certificates of fitness by conditions, and the

"dressmakers order," which came into force in 1907, extended the certificate of fitness requirement to a large number of workshops. The list is completed by the Compensation Act of 1906, which requires the certifying surgeon to examine workpeople claiming compensation for industrial poisoning or disease.

At the present time the United Kingdom is mapped out into about 2,000 districts, each provided with a certifying surgeon. The practice has been to make the boundaries of these districts the same as those of local governing bodies, though in some cases such localities have been amalgamated and in others divided up for Factory Act purposes. In the majority of these districts the duty of the certifying surgeon entails very little demand upon his time, and indeed there are only about 200 districts that can be regarded as of practical importance from this standpoint. The appointments are made by the chief inspector of factories, who is somewhat particular in appointing only medical men of good standing in their particular neighbourhoods, these being mostly general practitioners, though a fair number of consultants are on the list. The chief inspector may revoke or modify the conditions of the appointment or alter the district, the surgeon on his part having the right of appeal to the Secretary of State. A number of surgeons in large manufacturing districts devote their whole time to factory work, and a number of others combine this work with that of another public appointment, such as medical officer of health. Should the certifying surgeon desire to resign he is required to give a month's notice to the district inspector. The remuneration for his services is in all cases by fees, and he is allowed to charge mileage, one or more "central points" being fixed in each district for the purpose of reckoning the amount. The work cannot be deputed except for a limited period, when the name of the deputy must be submitted to the superintending inspector, who makes a definite appointment for the period specified, the certifying surgeon himself ceasing to act during this time. For the purpose of his official duties the certifying surgeon has power to enter at all reasonable times any factory or workshop to inspect any process, to examine official registers and documents, and to take evidence from any person he finds therein; also should he anticipate serious obstruction he may call upon a constable to accompany him. He has likewise power to enter any premises to which a person suffering from the

results of a factory accident or industrial poisoning has been removed. He cannot, however, prosecute for any contravention of those parts of the Act which have relation to his duties, but must report such or any other offences which come under his observation to a district inspector, who has full discretionary powers as to legal proceedings. All official reports of the surgeon to the department and any information gained in the discharge of his duties are regarded as confidential, and if called upon to give evidence in private suits he should only do so under the direction of the judge, after a full statement of his obligations to the department. A certifying surgeon cannot act for any works in which he has an interest, whether proprietary or as medical officer. Where the surgeon prefers to retain such interest the certifying surgeon for the next district has the duties assigned to him. Except for the purposes of the Workmen's Compensation Act and for reporting of certain accidents, the duties of the certifying surgeon are confined to factories and workshops. Broadly a factory denotes premises where a manufacturing process is carried on by means of mechanical power, and a workshop is a place where such processes are carried on without mechanical power. The following are especially scheduled as factories apart from the employment of mechanical power, viz.: Print, bleach and dye works; earthenware, lucifer match, percussion cap, cartridge, paper-staining, fustian-cutting, metal, india-rubber, glass, tobacco, letterpress printing and bookbinding works; blast furnaces, copper mills, iron mills, foundries, paper mills, flax scutch and electrical stations.

#### CERTIFICATES OF FITNESS.

The examination of children and young persons for certificates of fitness for employment still forms the principal work of the certifying surgeon, and it is from this duty that he receives his designation. Up to the age of sixteen these examinations are obligatory for all factories, and for workshops where file cutting, carriage building, rope and twine making, brick and tile making, making of iron and steel cables, chains, anchors, grapnels, and cart gear, making of nails, screws and rivets, baking bread, biscuits or confectionery, fruit preserving, or making, altering, ornamenting, finishing or repairing of wearing apparel by the aid of treadle sewing-machines are carried on. The examination must be made within seven days (or thirteen days if the central point of the district be more than three miles from the works) of the first

day of employment. Certificates are granted for half-time employment to applicants between twelve and fourteen years of age, and for full-time employment to applicants between thirteen and sixteen years of age, and the examination must take place at the factory or workshop unless it can be shown that the total number of children and young persons employed on the premises is under five. The obligation rests with the occupier to see that certificates are obtained within the requisite period, and where the examination takes place at the works he must advise the certifying surgeon, on engaging young people, so that this can be done. When the total number of children and young persons employed is less than five the employer can send applicants to the surgeon's rooms. The names and addresses and date of employing children and young persons must be entered up in what is known as the "General Register," and a certified copy of birth registration or other satisfactory evidence of age must be produced to the certifying surgeon before the examination can proceed. The surgeon enters the date of birth opposite the name in the register, and places his signature in a further column which is headed by a form of certificate to the effect that the applicant is physically fit to work at the employment proposed for the full period allowed by law. According to circumstances the surgeon may either grant the certificate unreservedly, may qualify it by conditions, or refuse it outright. In deciding as to the course he will adopt he takes into consideration the health and general physical condition of the boy or girl, the general sanitary conditions under which the work is carried on, and any special condition attached to a particular process at which it is sought to employ an applicant. In order to judge of the two latter conditions he has full power to enter the works and make any investigation he may regard as necessary. To form his judgment of physical fitness he must take note of the weight, height, and general development; such defects as deformity, skin disease, pediculi, eye or ear affection, adenoids and enlarged tonsils, anæmia and chorea, readily attract attention, and any extensive heart or lung trouble shows sufficient signs to indicate the necessity for further examination. Some certifying surgeons make a rule to use the stethoscope in all cases, but though this may not be regarded as a necessity in the obviously healthy, it is certainly a correct thing to do where suspicion of ill-health is

aroused. As far as general conditions are concerned he must take into account the lighting, temperature, air-space, and ventilation of the work-room, and refuse the certificate if these be not satisfactory, at the same time informing the district inspector, who can enforce rectification. In open-air employment, exposure to weather has also to be taken into account. With respect to special conditions, working among machinery involves an extra risk to those with defective eyesight or hearing, mental defect, chorea, or tendency to epilepsy, and the habit of wearing the hair long or tied up with huge bows (in girls), and loose sleeves (in boys), must receive due attention. The carrying of heavy weights, the utilization of poisonous materials, the exposure to dust or fumes, and the licking of labels in certain processes, all call for the exercise of discrimination on the part of the surgeon. Note must also be taken of the fact that in some processes employment of children and young persons is prohibited. Children and young persons under sixteen cannot be employed in the making or finishing of bricks or plain tiles, the making or finishing of salt, and the silvering of mirrors by mercury; children cannot be employed at lucifer-match dipping or dry grinding of metals; in white-lead works females are not to be employed in the white beds, rollers, wash-becks, or stoves, or anywhere so that they would be exposed to the lead dust; in earthenware and china works no person under fifteen is allowed to work in what are specified as dangerous processes, or in making transfers for pottery; in bi-chromate works no young person or child may be employed in a chrome process; no female can be employed in a room where brass casting is carried on, in any room where bi-sulphide of carbon is used in the vulcanizing of india-rubber, in the manipulation of dry compounds of lead, or in pasting in electrical accumulator works; and in the manipulation of lead colour in paint and colour works the employment of children and young persons is forbidden. In the heading of yarn or as shunter in private lines or sidings attached to a factory or workshop no person under sixteen can be employed.

I think I have made it clear that the "certificate" is not to be taken as a guarantee of perfect bodily health, but simply as an indication that the applicant is able to undertake the particular employment sought without personal detriment or any danger to other workers. In such cases as specific febrile

disease, or incomplete convalescence from such, in advanced heart affection, severe anæmia, tubercular disease, pediculi, in contagious or severe skin disease, acute keratitis or otitis, the certificate is refused outright, as it is perfectly plain that following any class of work would be either detrimental to the applicant or the other workers or would interfere with the requisite treatment. There are, however, many cases of physical defect occurring in every certifying surgeon's experience where work can be permitted not only without detriment but to the manifest advantage of the applicant, the surgeon making "treatment" a condition of employment, and the wages earned being a specific factor in obtaining such. Other cases occur where the particular occupation sought would be quite unsuited to the physical state of the youth applying, and where it would obviously be wrong to sanction an employment which would have to be given up later on. With these, suitable situations can usually be found either at the same works or at others in the neighbourhood. With undersize, deformity, debility, and certain degrees of anæmia and heart disease, physical strain is forbidden as a condition of employment; with partial blindness from squint, cataract or corneal opacity, deafness, deaf mutism, chorea, history of epilepsy, mental defect, working among machinery is debarred; with refractive errors of vision, glasses are ordered; with rheumatism and catarrh damp processes are forbidden; with chest disease dusty processes are not sanctioned.

Actual rejections for physical incapacity now amount in round figures to 7,000 per annum, the examinations varying from 350,000 to 400,000. Conditional certificates being a recent requirement, surgeons have not yet arrived at a proper system of keeping records, but the returns are showing large increases each year. In 1906 particulars of 800 were recorded; in 1907, 1,550; in 1908, 2,468; and last year, 5,775. These figures are compiled from the annual reports of the certifying surgeons, which are sent in to the chief inspector at the end of each year.

I am adding three tables which will assist materially in arriving at an understanding of the certifying surgeon's work under this heading. The first is an example of a series being drawn up by the Association of Certifying Factory Surgeons as a guide to members; the second is a percentage classification, compiled from particulars of 13,693 rejections for physical

incapacity, supplied by members of the same Association; the third, compiled by Dr. T. M. Legge, and published in the report of the Chief Inspector of Factories for 1909, gives a most excellent summary of conditions and reasons for affixing such to certificates of fitness.

#### INVESTIGATION OF ACCIDENTS.

Accidents occurring in factories, workshops, docks, wharves, quays, ships in harbour or canals (through unloading, loading, or coaling), warehouses, buildings under construction where mechanical power is used, buildings over 30 ft. in height being constructed or repaired by means of scaffolding or where more than twenty people (not domestic servants) are employed for wages, and on private railway sidings used in connection with such premises, causing loss of life, or due to machinery moved by

mechanical power, molten metal, hot liquid, explosion, escape of gas or steam, electricity, and so disabling any person employed therein as to cause him to be absent throughout at least one whole day from his ordinary work, must be notified forthwith to the certifying surgeon by the occupier.

Apart from fatal ones the accidents notified come under the heading of "preventable," though it will be noted that no provisions are made for reporting non-fatal accidents brought about by hand or treadle machines, escape of corrosive fluid and falling bodies, or falls from unprotected scaffolding or platforms.

The employer supplies the following particulars in his notice: The name of the employer, address of works, and nature of industry; information as to whether a factory,

TABLE I.  
COTTON SPINNING.

Processes of Industry.	In what Manner Process Injurious.	State of Health or Degree of Infirmary considered Injurious.	To what extent requiring Refusal.	To what extent requiring Conditions.
CARDING ..	Presence of machinery.	Eye and ear defects, resulting in interference with normal sight and hearing, chorea, epilepsy, wearing hair loose.	With none of these conditions existing should work be allowed amongst machinery.	If loose hair be tied up, work amongst machinery should be permitted. With other conditions mentioned, work can be allowed in the warehouse.
	Dust, dirt, and fluff given off in scutching.	Chest affections, dermatitis produced by the dirt and dust, ophthalmia.	Disqualify or this work.	Work in other departments to be permitted.
	Assisting in carrying rolls of cotton.	Undersize, ill-development, rickets, heart disease, anæmia.		Direct not to do this work.
	Cleaning machinery in motion.			This should be prohibited if at all dangerous, and brushes should be used instead of cloths.
SPINNING ..	Generally, owing to high temperature and, in some cases, foul atmosphere.	Lung or heart disease.	Refuse if extreme.	Order treatment and re-examine in one month with former; re-examine at discretion in latter.
	Presence of machinery.	As in "carding."	As in "carding."	As in "carding."
	Carrying "doffing" tins, "buffaloes," or skips. Tins are used in ring-spinning mills and are not often carried by children or young persons. Buffalo-hide receptacles weigh about 40 lbs. empty, and skips from 14 to 17 lbs. Children and young persons carry empty buffaloes and skips up the staircase, and, in case of the latter, generally in "nests" of three.	Undersize, ill-development, rickets, deformity, heart disease, debility. Being under 14 years of age.		Direct that empty tins, buffaloes or skips be not carried. In certain cases occupation at "tubing" may be provided, if unfitted for "piecing."
CONDITION-ING	Damping of the cotton, mostly done in basement.	Rheumatism, catarrh, chest complaints.	Must not work in the conditioning room.	May work in other departments.
YARN DOUBLING	Presence of machinery. Gassing, causing fumes and irritating burnt particles to pervade the atmosphere.	As above. Conjunctivitis created by this condition, and previously existing inflammatory conditions of conjunctiva or eyelids.	As above. Refusal required for this particular work.	As above. May work in other part of mill if ailment is treated.

TABLE I—*continued.*  
COTTON CLOTH MANUFACTURE.

Processes of Industry.	In what Manner Process Injurious.	State of Health or Degree of Infirmary considered Injurious.	To what extent requiring Refusal.	To what extent requiring Conditions.
WINDING AND WARPING	Freeing of dust from sized and weighted yarns, more particularly in case of soft and coloured kinds. Orange chrome dust is highly dangerous from presence of chromate of lead.	Inflammatory conditions of the cornea, conjunctiva, or eyelids; respiratory disease; eczema.	If condition acute or severe, should refuse. If milder, trial for one month may be allowed, but certificate should be refused if not improved under treatment in that time. Where orange chrome forms the colouring matter of the yarn, the certificate should be refused.	If slight, may order treatment and re-examination in one month. May order work in another department.
	Workers being on their feet throughout the working hours. "Reaching in" causes strain on eyesight.	Anæmia, debility, dysmenorrhœa. Defective eyesight.	Refusal if extreme.  In corneal opacities and squint, refuse.	As above.  Where condition can be remedied by glasses, certify on condition that such be worn. For extreme cases work may be found in the warehouse.
WEAVING...	Extremes of heat and moisture; damp or wet floors; workers being on their feet during working hours.	Anæmia, debility from any cause, rheumatism, tubercular disease, undersize or deformity, enlarged tonsils and adenoids.	In extreme anæmia, and in all other conditions mentioned, certificate refused. If there be excess of moisture, in any case, the certificate may be refused and the matter reported to the district Inspector. Enlarged tonsils and adenoids require refusal until treated.	In cases of undersize, deformity, and moderate anæmia, if the eyesight be good, "reaching in" may be allowed; but if permitted to work at weaving, carrying of heavy weights must be prohibited.
	Carrying of "cuts" into warehouse.			
	Presence of machinery.	Defective eyesight and hearing, chorea, epilepsy, deficient intellect, loose hair, loose sleeves.	With defective eyesight (if glasses not sufficient remedy), deafness, chorea, epilepsy and deficient intellect, the certificate should be refused.	Loose hair and loose sleeves must be forbidden; in defective eyesight, glasses may be worn in suitable cases; if eyesight unaffected, "reaching in" can be allowed. This practice should be prohibited.
	Sweeping whilst machinery is in motion.			

TABLE II.—COMPARATIVE TABLE OF REJECTIONS FOR MEDICAL REASONS

(Compiled from particulars of 13,693 rejections).

	Per cent.
Imperfect convalescence after accident or illness	1·88
Unsuitability for dangerous process ...	4·02
Want of cleanliness (including pediculi) ...	30·75
Developmental disease ...	9·38
Constitutional disease (including tubercular disease) ...	7·95
Infectious febrile disease ...	2·31
LOCAL DISEASE OF :—	
Nervous system (including mental disease) ...	2·06
Organs of special sense ...	18·63
Circulatory system ...	4·26
Respiratory " ...	4·88
Digestive " ...	0·45
Lymphatic " ...	2·85
Urinary " ...	0·07
Reproductive " ...	0·02
Locomotory " ...	1·09
Integumentary " ...	9·40
	100·00

laundry, dock, etc.; date and hour of occurrence; causation of accident and how employed at the particular time; name, home address and address of place to which the injured person has been removed; sex and age; hour at which work commenced on the day of accident; whether the injury is fatal, severe or slight, with nature and extent; the dates on which the injured person has been prevented from working. The information supplied by the surgeon in his report is given under the same headings, with the slight addition of the classification of the injury under a letter and utilizing a space for "further observations." The similarity, however, commences and finishes with the headlines. The occupier's notice is much inclined to inaccuracy, mistakes being often made in connection with the simplest details. Describing the position, nature, and degree of an injury is scarcely the function of

TABLE III.—ANALYSIS OF 5,775 CERTIFICATES OF FITNESS IN WHICH QUALIFYING CONDITIONS AS TO WORK WERE ATTACHED, AND THE DEFECTS OR ILLNESSES GIVING RISE TO THEM.

Nature of Work to which Condition attached.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
		Imperfect growth.	Physical defect (254), deformity (31), rickets (19), disease of spine (15), of hip (12), infantile paralysis (6).	Mental defect (16), epilepsy (13), chorea (10).	Defective vision (92), errors of refraction (83), loss of or blind in one eye (15), strabismus (10).	Blepharitis (27), conjunctivitis (2), ophthalmia (23).	Deaf (68), otorrhœa (1), deaf mutism (5).	Heart disease (144), heart strain (53).	Anæmia (114), debility (98).	Phthisis (15), bronchitis (15).	Adenoids and enlarged glands.	Pediculosis (886), eczema (6), skin diseases (31).	Biting nails.	Long loose hair (1227), loose sleeves, etc. (22).	Unsuited to the work.	Too young.	Injuries.	Carious teeth (715), kidney disease (1), ulcer of leg (1), rheumatism (2), alopecia (2).	Indefinite.	Total.
At or near machinery, forbidden	30	20	32	262	—	68	1	8	3	—	—	—	—	948	—	—	3	—	21	1396
Unless hair tied up	—	—	—	—	—	—	—	—	—	—	—	—	—	172	—	—	—	—	—	172
At treadle machines	21	4	—	—	—	—	—	3	6	—	1	—	—	—	—	—	—	—	—	35
Heavy work	189	40	—	—	—	—	—	86	50	1	1	—	—	—	—	—	2	—	7	376
Lifting weights	200	84	1	—	—	—	—	94	40	—	—	—	—	—	2	—	—	1	4	426
Standing work	2	14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—	18
Indoor work	1	—	—	—	—	—	—	—	4	4	2	—	—	—	—	—	—	—	—	11
Amongst dust	—	—	—	—	—	42	—	—	—	7	4	—	2	20	—	10	—	—	1	86
Poisonous materials	—	—	—	—	1	—	—	—	—	—	—	3	56	—	—	—	—	—	—	60
Moist hot work	3	—	—	—	—	—	—	—	—	—	—	2	—	—	—	—	—	1	—	6
Fine work and work without glasses forbidden	—	—	—	734	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	734
Work in bad light	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	2
Unless treated for defect	—	1	—	3	2	2	—	7	6	123	868	—	9	—	—	—	1	716	—	1730
Unless re-examined	3	1	—	—	3	—	10	2	—	1	15	—	—	—	—	—	—	—	23	58
Label licking	—	—	—	—	—	—	—	—	—	—	—	2	—	—	46	—	—	—	—	46
Work with food products	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2
In card-room	5	1	—	—	—	2	—	—	3	—	—	—	—	—	—	—	—	—	—	11
In spinning-room	2	—	—	1	—	—	—	—	14	—	1	—	—	—	—	—	—	—	—	18
Piecing only allowed	—	—	—	—	—	—	—	—	11	—	—	—	—	—	—	—	—	—	—	11
Tenting forbidden	—	2	—	3	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	7
Doffing	3	10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	13
Doffing only allowed	10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10
Winding	10	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12
Reaching	21	21	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	8	51
Reaching forbidden	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2
Weaving	94	24	3	10	3	3	2	51	7	2	23	—	—	—	—	—	—	—	1	223
Too many looms	—	1	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	2
Knotting only allowed	—	3	—	10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	13
Plaiting	—	24	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	24
In dye-house forbidden	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12	—	12
In glasshouse	4	1	—	1	—	—	—	—	3	—	—	—	—	—	—	—	—	—	—	9
Working alone	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2
Errands only allowed	1	3	—	—	—	—	1	4	—	—	—	—	—	—	—	—	3	—	—	12
Hours restricted	7	76	—	—	—	—	—	6	—	—	—	—	—	—	—	—	—	—	40	129
Indefinite	—	5	1	2	—	—	—	—	—	2	5	18	—	—	—	—	—	1	22	56
Total	606	337	39	1030	52	74	197	212	30	140	923	58	1149	48	10	9	721	140	5775	

an employer, and it cannot with justice be supposed that he can supply these particulars with any pretensions to correctness. The description of the causation of the accident supplied in the notice is also frequently vague and often not in accordance with the version given by the injured person. These deficiencies are, however, adequately compensated for in the certifying surgeon's report. Wrong details are checked and restated correctly, the situation, nature, and extent of the injury are properly described, and the cause of the accident is reliably set down.

I have always insisted that the true estima-

tion of the causation of an accident is of the very first importance, as on such depends the ability to arrange precautionary measures against future occurrences. To arrive at this, after obtaining his elementary idea of the facts of the case from the employer's notice, the surgeon visits the works, and makes an examination of the structure and surroundings of the machine or other main factor concerned, and collects evidence from those who understand the process being worked or saw the actual occurrence; he then visits the injured person to take his evidence respecting the causation and to ascertain particulars of the

injury inflicted. The surgeon has thus four factors on which to base his judgment of the actual causation of an accident, viz.: The evidence of the employer or his agents; the evidence of the injured person; the understanding he has acquired of the machine, apparatus and process; and his knowledge of the necessary particulars respecting the injury. When there is no direct evidence as to causation, or when that of the different parties concerned differs materially (as is not infrequently the case), the last two factors provide the necessary means to help him to his conclusion. It may thus be truly said that professional knowledge of the relationship between cause and effect in the creation of surgical injuries is often of incalculable service in settling what to a lay mind might prove an impossible problem.

Particulars are also obtained as to the presence or not of guards, their nature and degree of efficiency, also any other information which might be thought of use to the department.

Under the heading "escape of gas" certain cases of acute poisoning become reportable as accidents; sulphuretted hydrogen, nitrous oxide, arsenuretted hydrogen, and carbonic oxide poisoning being well-known examples. In such cases the surgeon's report is considered to be extremely valuable.

The surgeon's report is sent to the district inspector, and as the duty of devising methods of protecting dangerous machines devolves upon this official, a perusal of the document enables him to decide when a visit from him will be necessary for the purpose of exercising his function. The preliminary sifting separates a large number of cases in connection with which no guards or instructions could be of use to prevent repetition, at the same time it ensures the right kind of accidents being brought into notice. It is quite clear that this selection could not be brought about without the systematic personal investigations of the certifying surgeon, and it is also obvious that an inspector could not hope to perform his part satisfactorily without these preliminaries to guide him.

A very large number of accidents notified produce slight injuries only, and the question has been raised as to whether these are of sufficient seriousness to demand the surgeon's investigation. As, however, accidents of an exactly similar nature and causation may be the means of producing either a slight, severe,

or fatal injury, the degree of this can really have nothing whatever to do with the necessity or otherwise of rendering a dangerous machine or process safe for the future. One has to look more to the capabilities of a particular accident in the direction of producing injury than to an actual injury inflicted, and these capabilities cannot of course be gauged without investigation.

The certifying surgeon does not in any way interfere with surgical treatment, and must get his information as to injury without disturbing dressings. There is, however, not much difficulty in obtaining all necessary particulars. About forty thousand accidents are reported upon by certifying surgeons each year.

#### INVESTIGATION OF INDUSTRIAL DISEASE AND POISONING.

Any case of anthrax, or poisoning by lead, arsenic, phosphorus, or mercury, contracted in a factory or workshop, is investigated by the certifying surgeon. If noticed by himself in his official capacity he proceeds with the investigation, and reports to the district inspector in due course: other cases are notified to him by the district inspector, and others by the occupier. Any general practitioner attending a patient whom he believes to be suffering from any of these complaints must notify the chief inspector, and is entitled to a fee, hence the notifications coming *via* the district inspector. The surgeon visits both the works and the patient, and reports on the causation, nature of symptoms, whether regulations or special rules have been properly observed, his own views as to prevention, and whether his investigation confirms the diagnosis and causation at the factory or workshop. He is also asked to mention anything special in the treatment adopted. As the use of yellow phosphorus for lucifer-match making is now prohibited in the United Kingdom, phosphorus poisoning will soon become a thing of the past. The Home Secretary has power at any time he may consider it desirable to add to the list of notifiable trade diseases and poisonings by published order.

The benefits arising from notification are shown by their gradual diminution in number. In 1898 1,327 were reported upon by certifying surgeons, and in 1908 only 727.

#### PERIODICAL MEDICAL EXAMINATIONS IN CERTAIN INDUSTRIES.

The Secretary of State has power to make regulations or special rules for the carrying on of certain dangerous trades in premises



subject to the provisions of the Factory Acts, and a number of these require the periodical medical examination of employees. Special rules apply to specified works only, but regulations cover all works engaged in the particular industry requiring supervision. The former are now being gradually superseded by the latter. In some industries the examinations must be made by the certifying surgeon, viz.: the manufacture and decoration of earthenware and china, the making of transfers for earthenware and china, lucifer-match dipping where yellow phosphorus is employed, and in the vulcanizing of india-rubber by means of bi-sulphide of carbon. With other processes the examinations may be made either by the certifying surgeon or by a medical man appointed by the employer and sanctioned by the chief inspector of factories. These are the manufacture of electric accumulators, paints and colours, nitro- and amido-derivatives of benzole, white lead, red and orange lead, and bi-chromate or chromate of potassium or sodium; the heading of yarn dyed by means of a lead compound; the enamelling of iron plates and metal hollow-ware with use of lead or arsenic. The certifying surgeon may also, if desired by the employer, take up like duties with respect to other dangerous or risky trades where examinations are not required by order.

Each code specifies the precise duties, but they may be generally summarized as follows:

1. The periodical attendance at the works at a day and time to be mutually arranged and the examination of all employees presented; the employer being expected to set aside a private room for this purpose.

2. The entry is what is known as the health register of the results of each examination, favourable and unfavourable, and, where necessary, the formal suspension from work of any particular operative. This forms a very valuable record, a perusal of which will very readily show the fitness or otherwise of any operative for working at the particular process.

3. Special examinations of individual employees, at other than the specified times, on application.

4. Advising the employer, when required by the code, as to the use of certain protective appliances, such as overalls, respirators, etc.

5. The re-examination of suspended work-people before resuming work.

6. The reporting to the district inspector of any breach of rules or regulations.

7. The reporting to the district inspector of any cases of poisoning requiring notification.

8. The forwarding of a report to the chief inspector at the end of each year containing the prescribed particulars respecting these examinations.

#### DUTIES WITH RESPECT TO WORKMEN'S COMPENSATION.

Occupational diseases and poisonings, scheduled under the provisions of the Workmen's Compensation Act as entitling the sufferer to reimbursement for loss of wages, require investigation by the certifying surgeon of the district before payment can be enforced. The list is as follows:—Poisoning by lead, mercury, arsenic, phosphorus, nitro- and amido-derivatives of benzole, carbon bi-sulphide, nitrous fumes, nickel carbonyl, African box-wood, and their sequelæ; anthrax, ankylostomiasis, chronic ulceration or its sequelæ; excematous ulceration of the skin produced by dust or liquids, or ulceration of the mucous membrane of the nose or mouth produced by dust; epitheliomatous cancer or ulceration of the skin, or the corneal surface of the eye, due to pitch, tar, or tarry compounds; chimney-sweep's cancer; miner's nystagmus; glanders; compressed-air illness and its sequelæ; miner's beat hand, beat knee, beat elbow, and wrist synovitis; glassmaker's cataract; telegraphist's cramp. The last-mentioned is excepted from the certifying surgeon's duties, the necessary examinations being made by the post-office medical officer. If the certifying surgeon has examined the applicant under provisions of the Factory Act he has the requisite information, and grants the proper certificate on request. If not so investigated the necessary particulars are obtained and the applicant examined on presentation or by appointment. The certificate must be given in a prescribed form, and is either to the effect that the surgeon is or is not satisfied that the workman is suffering from the disease or poisoning claimed as entitling to compensation. It is handed to the workman, and a copy kept. If the employee be suffering from the symptoms specified, but the surgeon is of opinion that such have not been caused as the result of his occupation, he certifies to that effect. If possible such a certificate is to be given simultaneously with and included in the certificate of disablement, but may be given separately on application.

Where examinations are made under the special rules or regulations previously referred to, if the certifying surgeon or appointed

surgeon suspends a workman on account of his having contracted a disease to which the Compensation Act applies, or where the workman has applied to be suspended on account of having contracted such, and the surgeon refuses to comply with such request, on the application of either the employer or employee he must supply a certificate of such suspension or refusal to suspend. If though suspended the surgeon is of opinion that the disease has not been contracted at the works, he certifies accordingly. All these certificates and copies of such are only to be granted on payment of the specified fees.

If either the employer or workman should think the certifying surgeon or appointed surgeon has certified wrongly, he can make an application to the county court having jurisdiction for the case to be submitted to the appointed medical referee. It is very uncommon, however, for the certifying surgeon's or appointed surgeon's certificate to be set aside. The certifying surgeon, both from his experience of these kinds of cases and his knowledge of the particular processes, is particularly suited for the duties assigned to him, though there is no doubt as to their being somewhat onerous and that it behoves him to exercise all his special knowledge in coming to a decision, particularly, of course, in doubtful cases. For instance, in many cases where lead poisoning is alleged it is certainly advisable to make a thorough examination of both the blood and urine before certifying either one way or the other.

The surgeon is required to make a return to the Home Office each year, giving particulars of the examinations made and the various certificates granted.

Besides the important functions I have detailed, the certifying surgeon may be called upon by the district inspector to give evidence in court, or to re-examine any child or young person appearing unsuited to any particular employment, also to undertake any special examination on request of the chief inspector.

In conclusion I would like it to be understood that I consider the supervision exercised by certifying surgeons to be a good one. I do not claim however, that it is perfect, but believe it could be extended with advantage as well as improved. For instance, I am of opinion that the whole of the work of these officers should be properly supervised and directed by well-qualified medical inspectors, and that this could be best done by attaching one of these to each superintending inspector's district. Such appointments would

enable a great deal of the work undertaken by the present medical officers to be done locally, and would allow a chief medical inspector in London to devote the greater share of his time to directing the operations of others. Furthermore such officials might fitly undertake the work of medical referees under the Compensation Act. I also think that, as medical supervision must necessarily be the fundamental factor upon which all knowledge of occupational disease is to be built up, more scope should be given to the reporting of industrial poisonings and disease. I am also in perfect agreement with Dr. R. J. Collie, who considers that as only fifteen certificates out of 1,615 granted by certifying surgeons during 1908 under the Compensation Act were upset upon appeal to the medical referee, similar machinery might well have been made applicable to the whole of the Act. I believe the possibilities to be prolific for good work, as a prominent feature of the service is the fact that every part of the country is provided for, and without unnecessary expense entailed upon the State or on industry. If there is little work to be done there is little cost to be met, but the surgeon is always available when needed; if there is much work either his whole time or the requisite portion necessary is devoted to his duties. The State has, however, always someone to depend upon to carry out the obligations assigned who is directly responsible to the central authority for promptness and efficiency.

DR. D. L. POLE, assistant medical officer of health of Worcester, has been appointed county medical officer of health of Radnorshire.

**SOUTHWARK SLUM CLEARANCE SCHEME.**—The London County Council on November 8th decided, on representations by the medical officers of health of Southwark and Bermondsey, to spend £387,000 on a clearance scheme in the Tabard Street area, off the Borough High Street, and two smaller slums in the vicinity. It is proposed to re-house half the displaced population in block dwellings, to lay out five acres of the Tabard Street area as an open space, and to use the remaining three acres of the site for commercial purposes. The chief death-rates of the area are as follows:—Deaths from all causes, 1904-08: Tabard Street area, 36·8 per 1,000; Southwark, 18·2; and London generally, 14·9. Phthisis death-rate: Tabard Street, 3·88; Southwark, 2·09; and London, 1·44. The principal endemic diseases: Tabard Street, 6·07; Southwark, 2·29; and London, 1·71.