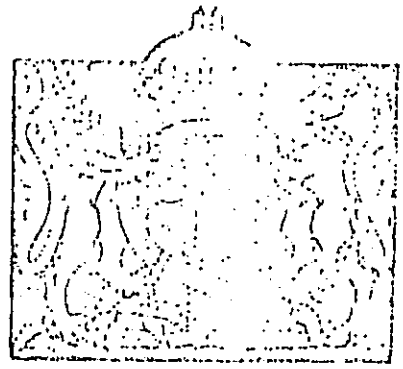
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FACTORIES

ANNUAL REPORT OF THE CHIEF INSPECTOR OF FACTORIES

FOR THE YEAR

1949

Presented by the Minister of Labour and National Service to Parliament
by Command of His Majesty
February 1951

LONDON
HIS MAJESTY'S STATIONERY OFFICE
PRICE 4s. 6d. NET

Cmd. 8155

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Even in the home of this staple industry there are hardly any unoccupied weaving sheds, and what premises have been available have not complied with either the whole or parts of Regulation 7 of the Cotton Cloth Factories Regulations. The main difficulty has been in complying with Regulation 7(a), which prescribes that the average height of a shed shall not be less than 14½ feet and Regulation 7(b), which prescribes that the lights shall face between north-east and north-north-west. In a number of suitable cases exemptions from parts of Regulation 7 have been granted but there have been several cases where applications from firms to use unsuitable premises for weaving have been rejected on the grounds that the premises have been so patently at fault from the viewpoint of the Regulations that District Inspectors have unhesitatingly advised the people concerned to seek alternative premises.

Inspectors report that the number of "dry" sheds, i.e., those in which no steps are taken to humidify the atmosphere by artificial methods, is undoubtedly increasing, due in part to changes in the type of cloth woven, better sizing and the introduction of rayon yarns into cotton sheds. Where artificial humidity is used, it is reported as a great deal less on the whole than was the custom at the time of the introduction of the Regulations.

The long warm summer last year gave ample opportunity for observing conditions in weaving sheds when outside temperatures were high, and it was interesting to find that in only very few cases did the Inspectors in cotton districts find contraventions. These cases were mainly among firms weaving very fine cloths where 75 per cent relative humidity was stated to be required to avoid warp breakages. As the temperature rose, readings in excess of 72½° F. were found on the wet bulb, whilst humidity was still required to attain 75 per cent relative humidity. Complete air conditioning plant which would entail the installation of refrigerating plants to deal with the very few hot dry days on which such conditions occur in the normal English summer, whilst a possible solution of the problem, is not a practical one from the financial and economic standpoint.

Another marked change over recent years is the fact that temperatures are rarely found too low on cold mornings — the use of unit heaters and air conditioning plants and combined heating and ventilating plants has materially improved conditions in the sheds, and temperatures can now be raised much more quickly than by former methods. Far more cotton-weaving factories have now installed plant whereby the temperature can be automatically controlled.

Asbestos Regulations

The Code of Regulations dealing with the dangers arising in the handling of asbestos has been in force since 1931, and reports show that constant vigilance is necessary in order to ensure that there is no slackening in the fulfilment of the precautions by employers and others. In factories where processes scheduled under the Regulations are carried on, the maintenance of dust control, particularly adequate exhaust ventilation at all possible points where dust may be evolved, is of the utmost importance. Those firms which have had long experience with the product and realize how the incidence of asbestosis arises are fully alive to the many problems involved and from the inspection point of view, it is very necessary to keep in close watchful eye for the new use of asbestos in some manufacturing or other process, for example, on ships or buildings where the work may be undertaken by someone not fully realizing the necessity of preventing as far as possible the inhalation of asbestos fibre and dust.

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It is well known in this industry as in others where there is a dust hazard, that there is scope for research and experiment in the effective application of exhaust ventilation to a variety of processes and machines. The weaving of asbestos is one such process, and reference is made to one weaving factory where it had been the practice to wet the asbestos before weaving and it was realized that there would be certain advantages if this wetting could be dispensed with. The local application of exhaust ventilation above and below the warp, behind the heald and at the "beat up" have been tried with only partial success and it was thought that it might be possible to place each loom in an exhausted enclosure so that the weaver remained outside and all the dust produced at various parts of the loom thus extracted without entering the air of the shed. This was tried experimentally on a pair of looms. The enclosures were built up of light hardboard panels some hinged and some removable to give access to the loom when necessary. Panels of transparent plastic material were fitted in the top of the enclosures and artificial lighting provided inside. The enclosures were exhausted from the top. It was found that this was an effective way of dealing with the dust, but there were so many other difficulties with regard to lighting, heating and handling to overcome that the firm decided not to extend the idea. It was finally considered that reorganization involved in filling a weaving shed with large box-type enclosures was too complicated to make the idea worth-while. Other methods of exhaust ventilation are now being considered.

The main method of preventing the escape of dust into the air of another weaving shed consists of a combination of an extensive exhaust ventilation system and wet processes. The weft pirns are steamed in cabinets situated alongside the looms and the warp is damped as it passes over a roller which revolves in a trough of water mounted in front of the warp beam. Exhaust ventilation is also applied above and in front of the shuttle race and beneath the reeds and healds. Blending for the textile product at this works is at present carried out by hand on the floor of one workroom, mechanical exhaust ventilation being provided in this room by means of a duct at a height of 7 ft. 6 in. on the walls with many openings fitted with slides which can be opened or closed as required. Experiments are in hand, however, with a mechanical drum blender in which a water spray is injected as the drum rotates and the whole plant installed in an enclosure provided with exhaust ventilation.

One large asbestos factory has instituted a scheme for replanning and reorganizing part of the works where opening and mixing processes are carried on, because they were dissatisfied with the existing methods of dust suppression and realized that having regard to the old premises in which these particular processes were housed nothing short of re-siting and reconstruction would solve their difficulties. At the same time, on the medical side, the firm has started a new scheme of medical examinations, and has appointed a part-time works' doctor who has a thoroughly good knowledge of the asbestos industry and the risks of working therein. The new scheme includes an initial clinical examination and X-ray screening, followed by a clinical and/or X-ray examination every year of workers employed in scheduled areas. Arrangements have been made to buy screening apparatus and to have X-ray films taken. It is proposed to alternate clinical examinations carried out by the works' doctor with those carried out by the Pneumoconiosis Medical Panel and for this purpose the firm is anxious to work closely with this Panel and have made a request to the local doctor in charge. The scheme should be well under way in 1950 and its development will be watched with the greatest interest.

Portable asbestos spraying plants are used to an increasing extent by contractors on buildings, ships, etc., for insulation purposes. Asbestos is fed into

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the spraying machine by hand, and conveyed by means of a small spiked band to a small card cylinder which takes the fibre from the travelling band and feeds it in a flocculent condition to a fan by which it is blown to a spray gun where it is ejected by means of compressed air. The spray gun consists of a centre jet for asbestos, surrounded by four jets of water which converge on the asbestos spray at about 1 foot from the end of the gun. Also a fine spray of water is provided over the spike band conveyor in the actual machine. The control, by means of a valve on the spray gun, is so arranged that the water jets must be in operation before asbestos can be delivered to the gun. If the water supply fails the supply of asbestos is automatically stopped.

In view of the risks to health unless proper precautions are taken in the spraying of asbestos by means of these portable plants, the firm from which they are hired runs a school where employees of various insulation contractors are given a course of training in their proper use and manipulation, lasting about 14 days, and representatives attend these courses from overseas as well as from the British Isles.

Several Inspectors refer to the unsatisfactory practice of packing raw asbestos fibre into unlined hessian or jute bags (frequently it is shipped at the country of origin and delivered to a factory in this manner) which renders workers handling them liable to considerable exposure to dust and fibre. The Regulations prohibit the use of such sacks or bags for transport of the material within the factory -- for which purpose only containers constructed of impermeable material kept in good repair are permitted. In handling packages which are not impermeable, the use of an approved type of respirator by all workers concerned is very important.

Clay Works (Welfare) Special Regulations, 1948

These Regulations have now been in force for over a year and it is possible to give a better assessment of the degree of compliance than was possible last year. It appears that this is variable from works to works; on the whole a serious attempt to fulfil the requirements is being made in the larger works, but much remains to be done in the smaller places. These small works are faced with their own special problems; many of them work only intermittently and some have remained closed for long periods. Demand varies and they are not always able to compete with the larger firms; they are often situated in remote areas without sewerage or piped water supply. In some localities it seems that employers have decided not to act unless pressed, particularly on the provision of protective clothing, and several Inspectors suggest that legal proceedings may be necessary before this attitude is changed. In one District a completely non-co-operative firm was prosecuted and fined, and now shows signs of improvement. In another, a firm fined for breaches of the safety sections of the Act has had a general change of attitude and is now setting about the provision of amenities.

The best progress is reported in the provision of washing facilities, sometimes in the face of very real difficulties of water supply and drainage. Many reports tell of new basins with hot water laid on; some works have shower-baths and a number of ablutions blocks are approaching completion. Where the provision is of good standard and well placed, it is found to be well patronized and abuse is rare. Poor provision rapidly becomes worse as there is no incentive to treat it well.

There has been steady development in the provision of canteens. In the smaller works, snack meals are popular. Some messrooms have been transformed by colour schemes.

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will be seen from Table XXIV that of the excess, 47 cases were due to Carbon Monoxide, mainly (29) in group (*d*) of Table, viz., cases other than Blastfurnace, Power or Coal Gas. The Blastfurnace cases in 1947 were actually one less than 1939, a most creditable achievement.

Pneumoconiosis

Regarding the pneumoconioses, the matter is rather more complicated, and it is necessary to split up the figures (which relate to deaths only).

TABLE XXVI

	1939	1940	1941	1942	1943	1944	1945	1946	1947
Silicosis (coal miners) ↘	439 (197)	522 (232)	406 (196)	417 (230)	470 (276)	445 (277)	508 (323)	553 (343)	558 (347)
Asbestosis	18	11	17	11	8	10	11	16	15
Other pneumoconioses (coal miners) ...	—	—	—	6	7	38 (34)	85 (64)	86 (78)	246 (230)
Totals	457	533	423	434	485	493	604	653	819

From this we see that two-thirds of the increase (362) of the 1947 figure over that for 1939 is accounted for by the figure for " other pneumoconioses " which related almost entirely to coal mining. Moreover, in 1947 there were 347 deaths from silicosis in coal miners as compared with 197 in 1939—the difference (150) more than accounting for the remaining one-third of the increase.

We are left, therefore, with an apparently stable position over these nine years regarding the mortality from silicosis in factories and, as already mentioned, it is necessary to relate back such deaths to conditions of work obtaining over a varying number of years previously.

Regarding the apparent increase in coal miners, many factors contribute, I understand. Amongst these seem to be the recognition of the importance of pneumoconiosis as a disease of coal miners as distinct from silicosis; the comprehensive reports of the Medical Research Council in 1942 on Chronic Pulmonary Diseases in South Wales coal miners, and the wide extension of the compensation schemes, especially in including pneumoconiosis, have produced a much higher public awareness of these diseases and their impact on the miner, and, with a greatly increased use of radiography, a much higher standard of diagnosis.

Dermatitis

The figures given in Table XXV are based on arrangements for voluntary reporting aimed at improvements, where practicable, in precautionary measures rather than at statistical accuracy. The compensation statistics, however, for the scheduled " dermatitis produced by dust or liquids " indicate that there were, in 1947 compared with 1939, more than twice as many such cases in the wide occupational field. The two-thirds increase in Table XXV is supporting evidence that there are more cases of industrial dermatitis in factories now than formerly. It does not follow, of course, that the incidence rate is actually higher in those industries in which dermatitis is a well recognised risk so that more careful precautions are taken by employers and workers concerned; but a more satisfactory system of classifying dermatitis cases is being devised and a detailed analysis of the 1947 figures is not at present available.

In 1941 nearly all (90%) of the compensated dermatitis cases were voluntarily notified: the comparable figures for 1939 and 1947 were 56% and 42% respectively. Industry does a valuable service to industrial health by voluntarily reporting cases of dermatitis and it is to be hoped that this assistance will be maintained towards the control of factors favouring a high incidence of dermatitis.

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Pneumoconiosis etc. The usual Tables have been brought up-to-date and are se out below

TABLE XXXI

DEATHS FROM FIBROSIS OF THE LUNG, INCLUDING SILICOSIS, ASBESTOSIS, PNEUMOCONIOSIS AND BYSSINOSIS (ENGLAND AND WALES) 1940–1947

	1940	1941	1942	1943	1944	1945	1946	1947
SILICOSIS :—								
1. Refractories industries ...	16	12	7	7	6	9	8	10
2. Pottery, Manufacture of...	53	45	47	41	32	41	49	54
3. Sandstone Quarrying and Dressing	42	24	14	24	26	21	20	12
4. Sandstone masons ...	67	58	40	33	31	44	41	43
5. Metal Grinding	24	13	13	11	7	11	6	9
6. Sandblasting	13	4	4	6	7	6	4	5
7. Steel dressing and cleaning of castings	4	9	9	4	10	5	22	13
8. Stone, pebble, flint and sand crushing	5	1	2	1	4	—	—	3
9. Scouring powders, Manufacture of	—	2	—	1	1	1	—	—
10. Abrasive wheel Manufacture	—	—	—	1	1	2	1	—
11. Glass cutting and bevelling	—	1	2	—	—	—	2	—
12. Millstone dressing ...	—	—	1	—	—	—	—	—
13. Slate quarrying and dressing	7	6	4	6	7	6	13	20
14. Granite quarrying and dressing	1	1	3	2	—	1	—	4
15. Tunnel mining (Sewage works, etc.)	2	—	5	4	4	4	5	—
16. Coal Mining	232	196	230	276	277	323	343	347
17. Gold Mining (South Africa)	10	7	7	4	9	4	7	5
18. Tin Mining	21	17	12	14	11	19	14	12
19. Iron ore (haematite) mining	20	4	7	5	7	2	9	6
20. Lead mining	—	1	3	1	1	1	1	2
21. Copper mining	—	1	2	1	—	—	—	—
22. Barytes mining ...	3	3	—	4	—	2	1	1
23. Clay mining	—	—	—	1	—	1	—	—
24. Mining Engineers ...	—	—	3	1	—	—	1	1
25. Miscellaneous	2	1	2	2	4	5	6	11
Total—Silicosis ...	522	406	417	470	445	508	553	558
ASBESTOSIS	11	17	11	8	10	11	16	15
PNEUMOCONIOSIS :—								
Coal Mining	—	—	—	—	34	64	78	230
Other Industries	—	—	—	—	3	11	5	12
BYSSINOSIS	—	—	6	7	1	10	3	4
OTHER CASES OF FIBROSIS	130	461	443	493	531	529	568	616
GRAND TOTAL ...	1,183	884	877	978	1,024	1,133	1,223	1,435

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TABLE XXXII

FATAL CASES INVESTIGATED UP TO END OF 1947

	Number of Deaths	Average age at Death	Duration of Employment in years		
			Longest	Shortest	Average
SILICOSIS					
Pottery :—					
Silicosis	505	60·9	62·0	2·8	39·0
Silicosis with Tuberculosis ...	387	55·2	67·0	5·0	34·6
Sandstone :—					
Silicosis	200	58·9	60·0	9·0	39·4
Silicosis with Tuberculosis ...	204	56·6	55·0	5·0	37·2
Grinding of Metals :—					
Silicosis	91	58·2	56·0	14·0	36·3
Silicosis with Tuberculosis ...	186	53·5	53·0	2·8	32·7
Sandblasting :—					
Silicosis	57	48·7	28·0	1·7	12·0
Silicosis with Tuberculosis ...	91	45·8	46·0	2·0	13·2
Manufacture of Scouring Powders :—					
Silicosis	12	38·1	37·0	2·3	8·4
Silicosis with Tuberculosis ...	6	40·8	11·2	2·0	7·0
Miscellaneous :—					
Silicosis	172	54·1	57·0	1·5	22·9
Silicosis with Tuberculosis ...	172	50·0	50·0	0·7	23·7
Total :—					
Silicosis	1,037	58·2	62·0	1·5	34·3
Silicosis with Tuberculosis ...	1,046	55·6	67·0	0·7	31·3
ASBESTOSIS					
Asbestosis	160	47·5	48·0	0·5	14·9
Asbestosis with Tuberculosis ...	72	39·0	29·0	0·8	10·4

Asbestosis and Carcinoma of Lung

During the 23 years 1924 to 1946 inclusive, 235 deaths, either caused by Asbestosis* or in which Asbestosis has been proved at autopsy have come to our notice.

Cancer of the lungs or pleura was found to be present either as a cause of death or as a concomitant in 31 (13·2%) of these 235 cases. One case, a male aged 77, diagnosed post mortem as "Sarcoma" of lung has been excluded and is not included in the above or subsequent figures, as the diagnosis was considered to be unreliable.

The 235 cases of asbestosis and the 31 cases of asbestosis complicated by carcinoma of the lungs or pleura grouped according to age are shown in Table XXXIII. A further grouping according to age and sex is shown in Table XXXIV. It will be seen that of the 128 male deaths, 22 (17·2%) were complicated by carcinoma of the lungs or pleura and of the 107 female deaths 9 (8·4%) were similarly affected.

TABLE XXXIII

Age in Years	Asbestosis	Asbestosis and Carcinoma of lung	Per cent.
15–24	9	—	—
25–34	42	2	4·8
35–44	71	4	5·6
45–54	53	10	18·9
55–64	43	11	25·6
65 and over	17	4	23·5
Total ...	235	31	13·2

* The Expression "Asbestosis" here includes Asbestosis accompanied by Pulmonary Tuberculosis.

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TABLE XXXIV

Age in Years	Males			Females		
	Asbestosis	Asbestosis and Carcinoma of lung	Per cent.	Asbestosis	Asbestosis and Carcinoma of lung	Per cent.
15–24	3	—	—	6	—	—
25–34	9	—	—	33	2	6·1
35–44	30	—	—	41	4	9·8
45–54	36	9	25·0	17	1	5·9
55–64	37	11	29·7	6	—	—
65 and over	13	2	15·4	4	2	50·0
Total ...	128	22	17·2	107	9	8·4

Age at Death

The mean ages at death of the cases of asbestosis and of asbestosis complicated by carcinoma of the lungs or pleura are shown in Table XXXV. The mean ages distinguished for males and females are shown in the first four columns and combined in the last two columns.

The mean age at death for asbestosis is 44·2 years and for asbestosis with carcinoma of the lung, 52·1 years.

TABLE XXXV

	Males		Females		Total	
	Asbestosis	Asbestosis and carcinoma of lung	Asbestosis	Asbestosis and carcinoma of lung	Asbestosis	Asbestosis and carcinoma of lung
Mean age at death in years ...	49·2	55·2	38·1	44·6	44·2	52·1
Standard Deviation	12·4	5·9	10·1	13·96	16·0	10·3
Range in years...	19–77	46–70	22–72	32–71	19–77	32–71

Exposure to Asbestos Dust

The mean durations of exposure in years to the hazard of breathing asbestos dust are shown in Table XXXVI to compare the exposure of the cases of asbestosis and asbestosis and carinoma of lung. The sexes are differentiated in the first four columns and combined in the last two.

Those cases of asbestosis developing carcinoma of the lung show a mean exposure of 16·5 years compared with 13·4 years exposure for those cases dying with no evidence of carcinoma of the lung.

An attempt was made to classify the cases according to dustiness of occupation. This had to be abandoned owing to the frequency with which workers are transferred from process to process and to the fact that dusty and less dusty processes are often carried out in close proximity.

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TABLE XXXVI

	Males		Females		Total	
	Asbestosis	Asbestosis and carcinoma of lung	Asbestosis	Asbestosis and carcinoma of lung	Asbestosis	Asbestosis and carcinoma of lung
Mean duration of exposure in years ...	18·5	20·1	7·8	7·6	13·4	16·5
Standard Deviation	15·3	9·9	6·8	4·6	8·7	10·3
Range in years	2–40	6–40	0·5–32	1·5–16	0·5–48	1·5–40

Asbestosis and Carcinoma of Lung compared with Silicosis and Carcinoma of Lung

For the purpose of comparing the above figures of cases of Asbestosis and Carcinoma of the lung with some similar disease the 6,884 cases of silicosis occurring between 1930 and 1946 were analysed.

Ninety-one of these 6,884 cases of silicosis or 1·32% were found to have carcinoma of the lungs or pleura at post mortem.

The average age at death of those dying of silicosis and carcinoma of the lung was 59·4 years.

Summary

Thirty-one cases of carcinoma of lungs and pleura were found at autopsy of 235 cases of Asbestosis. That is 13·2%.

The average age at death of those suffering from carcinoma of lung was 52·1 *years* compared with 44·2 *years* for those with asbestosis alone.

The average duration of exposure to asbestos dust was 16·5 *years* for those cases complicated by carcinoma of lung, compared with 13·4 *years* for those not so complicated.

Out of *6,884* cases of silicosis at post mortem, *91* (or 1·32%) had carcinoma of the lungs and pleura.

The average age at death of these cases of silicosis and carcinoma of lung was 59·4 years.

Dermatitis in 1947.

There were in 1947, 4,884 voluntarily notified cases of dermatitis. The corresponding figure for 1946 was 6,166. A more satisfactory system of classification of dermatitis is being devised and at present no analysis of the 1947 cases has been made.

At a firm engaged in developing and processing colour films, 10 cases of dermatitis, among about 600 workers, occurred. While metol, a developer, was believed to have given rise to some cases, it was thought possible that a mould, the growth of which coincided with the use of phosphoric acid in some of the dye solutions might have caused some of the skin lesions. The mould throve on the inside and outside of ducting woodwork and was easily dislodged by cleaning. The part played by this mould in the occurrence of dermatitis has not been proved conclusively but in two of the suspected cases there was an extension of the affected skin areas after work had ceased, while clinically the skin lesions appeared infective in origin. An interesting point was the presence in the mould of mites identified as belonging to the family Anoctidae and probably a species of Histiostonia Yostro serratum meguin.

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