Notes and miscellanea

Respiratory disease in foundrymen

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Concern for the health of foundry workers has a long history, perhaps almost as long as the craft itself. Hunter (1969) comments that 'the founding of metal is an ancient craft, so ancient that, under the weight of tradition, both employers and workers have regarded the hot, dusty, and dangerous conditions as inevitable; and industrial countries made no campaigns for better working conditions until about 1930'. Apart from the general provisions of the Factories Acts, legislation specifically affecting iron and steel foundries is comparatively recent. Conditions in foundries in the United Kingdom have been the subject of reports by a series of committees over the last 25 years—iron in 1947, non-ferrous in 1957, and steel in 1961.

McLaughlin (1950) studied mainly the radiographic abnormalities found in the lungs of iron and steel foundry workers. Pneumoconiosis is still a problem in these men and the recently published figures (Digest of Pneumoconiosis Statistics, 1970) show that in 1969 there were 48 new diagnoses of pneumoconiosis in foundry workers (iron, 35 men; steel, 11 men; non-ferrous, 2 men).

The most recent investigation of the health of foundry workers is reported by Dr. T. A. Lloyd Davies, at the time the Senior Medical Inspector of Factories, and his medical colleagues. The enquiry was made at the request of the Sub-Committee on Surveys and Statistics of the Industrial Health Advisory Committee as it had been suggested that foundry workers had more chronic bronchitis than other comparable workers in industrial areas. The study was called for in 1963, begun in 1964, and completed in the middle of 1965. The full report went to the Industrial Health Advisory Committee in May 1968 but was not published until 1971. Advantage

was taken of three new developments since earlier studies of respiratory disease in foundry workers. These are the use of standardized questions in the Medical Research Council Short Questionnaire on Respiratory Symptoms; standard ventilatory function tests; and observers trained in interviewing techniques. Furthermore, the important role of cigarette smoking as a factor in lung disease, and, in particular, in dust diseases of the lung was well recognized by the time the survey was planned.

The survey was based on a 1 in 40 sample of the 130 000 people known to be employed in foundries. A total sample of 1 997 men was drawn randomly from four size ranges of foundries of four types—iron, steel, non-ferrous, and mixed. Men over 35 years of age were chosen to ensure that any factors in the foundry atmosphere would have had time to operate. In the event, 1 780 foundry workers, 93% of the eligible sample of men aged 35 to 64, were matched for age, height, and weight with 1 730 factory workers as controls. The controls were from engineering works of the same occupier of the foundry surveyed, or a near one. The only significant differences between these two groups were that the controls had about 3% more smokers which therefore had to be allowed for in the comparison, and they were slightly less well off socio-economically.

Although the authors refer to bronchitis from time to time, they have coined two new terms for chronic bronchial disease—sputum-breathlessness syndrome and sputum-chest illness syndrome. The first of these is defined as production of sputum for at least three months together with breathlessness grade ii (i.e., dyspnoea when walking on the level with others at an ordinary pace) or more. The sputum-chest illness syndrome is a combination of disabling chronic

bronchitis with loss of work in which there is sputum for at least three months of the year plus one or more chest illnesses. These are rather unwieldy terms but they have the advantage that they are more descriptive and specific than chronic bronchitis.

The sputum-breathlessness syndrome was significantly more prevalent in foundry workers than in controls but the difference disappeared when a correction for smoking was applied.

The prevalence of sputum-chest illness syndrome, on the other hand, increases with years of employment in foundry work, and this increase was nearly double that recorded in men in the control factories. It was found more frequently in foundrymen than in controls in all the regions studied except one. This exception was explicable by the presence of four former foundrymen who had been transferred to the control factory because of sputum-chest illness syndrome. Prevalence of this syndrome increased with smoking in all the men studied, and the combination of foundry work and smoking gave a higher prevalence for all grades of smoking. Men not exposed to foundry or any other dust who smoke 25 cigarettes a day have as much sputum-chest illness syndrome as those who have never smoked but have worked in a foundry for 45 years. The rates of sputum-chest illness syndrome in the different smoking groups suggested an additive rather than a synergistic effect. It is interesting that obstructive airways disease, although much more frequent in men with sputum-chest illness syndrome, did not seem to be associated with occupation.

An unexpected finding was that men without the sputum-chest illness syndrome had a higher forced expiratory volume in 1 second ($FEV_{1.0}$) than controls and higher than the predicted values. Lung function in foundrymen declines more quickly with age than in controls but they have high lung function values at age 35 years. This is not explained by self-selection of men with better physique, and pneumoconiosis is unlikely to be involved.

Only simple pneumoconiosis was seen and this was found in 143 foundry floor men (14.1%) and 62 fettlers (34.6%). The most advanced form of this (category 3) was seen in only one fettler (0.6%) and three foundry floor workers (0.3%). These prevalence rates were applied to the whole foundry industry and it was calculated that between 2 524 and 7 767 foundrymen were potentially eligible for industrial injury benefit for pneumoconiosis. The discrepancy between the estimated number of approximately 5 000 men with pneumoconiosis category 2 and 3 and the numbers recorded under the National Insurance (Industrial Injuries) Act is noted but not adequately explained. Although this survey took place in 1964-65 it does not appear to have influenced boardings as the average number of foundry workers in whom pneumoconiosis was diagnosed

between 1966 and 1970 is only 47 per annum.

This survey shows that in spite of regulations introduced to suppress dust in foundries the foundry environment is frequently unsatisfactory. Work in foundries is still notoriously dirty. As the young intending foundry worker is told when he reads about this career choice (*The Foundry Industry*, 1965), 'by contrast with the pattern shop which is invariably light and clean and sometimes air conditioned, the foundry itself looks less attractive. The sand commonly used is black and the workers, particularly the moulders, are apt to get somewhat dirty'. He is reassured, however, that the dirt will easily wash off in the shower baths which must be provided. But there is also heat which may be excessive, unavoidable noise, dust, and vibration. 'In fact, dust, smoke and fumes are inevitable by-products of many foundry processes...' but dust suppression or extraction and air filtration alleviate these nuisances to a great extent.

In a booklet published in the Safety Health and Welfare Series '*Improving the Foundry Environment*' (1962), it is pointed out that although in the past it has often been thought that efforts to keep a foundry clean were a waste of time because of the nature of the work, this idea was rejected as long ago as 1947 by the Joint Advisory Committee on Conditions in Iron Foundries. The booklet underlines the importance of proper standards of cleanliness in foundries and gives a detailed account of how to attain them. Dust measurements and analysis and their interpretation are described, but in reference to methods of dust suppression it is remarked that it is unfortunate that so few foundries are in a position to estimate the efficiency of such methods. The additional hazards from gases such as carbon monoxide, sulphur dioxide, chlorine, and complex fumes from core binders are referred to as well as particulate matter containing oxides of iron, lead, zinc, selenium, tellurium, beryllium, and phosphoric acid. Fumes also arise from fluxes and degassing materials in non-ferrous foundries, from shell moulding, organic solvents, and other materials.

This is a well planned and carefully executed survey and as it is clearly important that foundry conditions should be improved it is a pity that publication has been so long delayed. The survey raises questions about the nature and extent of occupational hygiene in foundries and the kind of medical advice available for their workers. One wonders what efforts are being made by the industries concerned to eliminate the essentially dirty and smoky nature of the work and to introduce techniques which are cleaner.

This report is not easy reading and the way in which it is set out sometimes increases the difficulty. There are large blank areas on some pages in which the column of print is pushed to the right-hand side.

Tables are all titled at the top with minimal explanations so that one has to refer constantly back to the text. Finally, the references are set out in a way which makes it difficult to disentangle individual papers by an author of several publications.

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An unusual case of rosewood dermatitis of the genus *Dalbergia* (East Indian rosewood)

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Dermatitis due to industrial irritants or sensitizers is responsible for a large proportion of occupational morbidity. More than 55% of prescribed diseases are due to non-infective dermatitis. For the correct diagnosis and assessment of these the dermatologist must obtain a full understanding of the industrial environment of affected workers.

Case report

The patient, a man aged 51, was referred to the Rupert Hallam Department of Dermatology in October 1970. He was complaining of an irritable rash which had been present for six weeks. On examination there was a dry, scaly, excoriated eruption which affected the dorsum of the feet, the back of the neck, and the front and back of the upper part of the trunk. The past medical history revealed a brief episode of infantile eczema. He had not received any treatment before attending the clinic.

The patient had been the director of a small saw-tool manufacturers for more than 20 years. His work involved

contact with a variety of greases, mineral oils, and inorganic acids but he had not suffered previously from skin irritation. More detailed questioning revealed that an adjacent factory manufactured cutlery handles, and the extractor fan from this works covered the surrounding area with a fine sawdust. The patient also admitted using wood waste from this factory as firewood and had, therefore, handled pieces of wood and sawdust.

Investigations

The sawdust was identified as East Indian rosewood (*Dalbergia latifolia*). The patient showed a strongly positive reaction to a standard patch test with this dust and with a known sample of rosewood dust.

A visit to the area revealed several small old factories built around a rather Dickensian courtyard which was dominated by an extractor fan blowing fine rosewood sawdust over the surrounding buildings (Figure). The buildings housed small private light engineering firms whose employees worked continually exposed to fine rosewood sawdust. However, there was no evidence of