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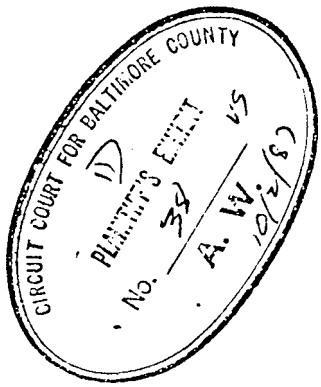
A SURVEY OF DANISH MEDICINE

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taining many ex-servicemen, Ulrich (1930) found 16 out of 5,700 (etiology: bullet wounds, 5 cases; pleurisy, 5 cases; tuberculosis, 1 case; pneumonia, 1 case; unknown, 4 cases), and Behrendt (1930) found 12 out of 966 subjects (etiology: bullet wounds, 5 cases; tuberculosis, 7 cases). Head (1934) considers tuberculous pleuritis and hemothorax the only causes definitely known to produce calcification of the pleura.

Patch & Perry point out that calcification is usually unilateral, but bilateral in the so-called idiopathic cases (approximately 20 per cent of all cases).

A special investigation of workers exposed to dust was carried out by Smith (1952). She found 35 cases of pleural calcification out of 8,779 subjects examined. Only four groups showed a definitely higher incidence of calcification than that among the average population, *viz.*, workers exposed to the dust in making bakelite insulators, (1.5 per cent), calcimine (1.7 per cent), mica (1.6 per cent) and tremolite talc (6.3 per cent). Tremolite talc is a calcium magnesium silicate, which structurally resembles asbestos. It is known to cause pneumoconiosis. Calcimine is composed of whiting, clay, talc, silica, mica and asbestos. Four cases of pneumoconiosis were found in this group. Mica is a complex silicate of potassium, aluminium, magnesium, calcium and fluorine. Bakelite was mixed with talc and mica. No case of pneumoconiosis was found among the workers exposed to mica or bakelite. No pleural calcification was found among 261 asbestos workers. Smith suggests that it is the combined exposure to calcium and magnesium, together with a dust producing pleural irritation, which provokes the calcifications.

None of the workers examined by us have been working with asbestos alone; all of them have been exposed to kieselguhr, magnesium, rockwool and glass-wool too. The last three substances do not cause pneumoconiosis. Exposure to kieselguhr is known to involve a risk, as several cases of pneumoconiosis seemingly caused by this substance have been reported. According to Luton, Champeix, Ravet & Vallaud (1956) it is primarily a question of the alpha-quartz content. Exposure to the amorphous form of kieselguhr involves considerably less risk than does exposure to the flux-calcinated substance, nearly all of the silica of which may be in the form of alpha-quartz. The kieselguhr used in this country is not known to be flux-calcinated, and sample-analysis has not revealed the presence of alpha-quartz.

In our cases the workers have been exposed to asbestos, which is known to produce pneumoconiosis with pleural affection, and to kieselguhr, magnesia, rock-wool and glass-wool. Our findings thus give some support to Smith's contention that the incidence of pleural calcification may be connected with exposure to mixed dust; but it should be emphasized that our subjects have also been exposed to calcium.

While smaller pleural thickenings and adhesions are a rather common finding in chest X-rays of persons not known to have had any lung disease previously or to have been exposed to dust at their jobs, the findings of pronounced bilateral pleural changes in the present series definitely point towards an occupational origin. The diagnosis of asbestosis may be made with confidence when these pleural changes are found together with parenchymatous lesions of the lungs. The occurrence of similar pleural changes without any definite changes of the lung proper may also, with reasonable certainty, be accepted as evidence of asbestosis in subjects known to have worked with insulating material of the sort used by the workers examined here.

SUMMARY

31 workers engaged for 20 years or more in different kinds of insulation works were examined for occupational lung disease. They had been exposed to dust containing asbestos, kieselguhr, magnesia, glass-wool and rock-wool. 9 were found to have definite signs of pulmonary asbestosis. 19 showed abnormalities of the pleura, 12 of these being bilateral. In 11 cases calcification of the pleura was found, being bilateral in 3 of them.

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