PLAINTIFF'S EXHIBIT SA-406

Fatalities from Silicosis and Asbestosis

THEIR INCIDENCE IN INDUSTRY

The problems associated with silicosis and asbestosis amongst industrial workers are receiving close attention. The former has tended to increase, and the latter, on balance, to decrease, in recent years

A SECTION of the Annual Report* of the Chief Inspector of Factories dealing with health refers to the question of dust and its effects, including silicosis and asbestosis. It is pointed out that for some years past, particulars of the total number of deaths from these two causes, which have been investigated by the Department, have been given and brought up to date. These figures have been specially useful from the practical point of view in aiding the installation of preventive measures of the necessary standard in processes exposed to risk. Of much importance and more general interest, however, is the trend of mortality rates from these diseases with or without tuberculosis, which does, when comparison is made after a number of years, reflect the effectiveness of the preventive measures installed. For this purpose, comparison of the figures of two successive years is of no value and sometimes misleading.

Table I shows deaths attributed to silicosis (with or without tuberculosis) during the last four years, together with the industries concerned. In factory cases, the cause of death has been borne out by departmental investigation. The variety of industries will be noted, and it is permitted to give in detail the precise occupational history in each case, the very widespread nature of the risk would be still more evident. For example, refractories industries include [illegible] the 53 fatalities three whose occupation was that of repairing the silica brick linings of steel furnaces or converters, one a pot maker in a glass works, one an engine driver in a silica brick works, and one a grinder of refractory bricks, the remainder being associated with processes in the getting, crushing, grinding and manufacturing of refractory materials.

TABLE I.—*Deaths from Fibrosis of the Lung, including Silicosis and Asbestosis (England and Wales), 1935-38.*

Disease and industry.	1935.	1936.	1937.	1938.
Silicosis :—				
Refractories industries	12	9	19	12
Pottery, manufacture of	56	47	64	48
Sandstone quarrying and dressing	40	43	19	27
Sandstone masons	61	58	74	58
Metal grinding	28	24	12	25
Sand blasting	14	10	13	7
Steel dressing and cleaning of castings	1	4	2	3
Stone, pebble, flint, and sand crushing	1	1	4	8
Scouring powders, manufacture of	1	2	—	1
Enamel and glaze makers	—	1	—	—
Compo mixer (Tripoli)	1	—	—	—
Abrasive-wheel manufacture	1	—	—	—
Millstone dressing	—	—	1	1
Slate dressing with sand	—	—	—	1
Electrician at steel foundry	—	—	—	1
Slate quarrying and dressing	3	6	10	7
Granite quarrying and dressing	1	—	1	1
Tunnel mining (sewage works, etc.)	3	—	2	2
Grave diggers	1	—	—	—
Coal mining	111	120	187	177
Gold mining (South Africa)	16	4	16	12
Tin mining	25	24	20	20
Iron ore (haematite) mining	12	9	15	13
Lead mining	2	1	1	1
Copper mining	—	—	1	1
Barytes mining	2	1	1	2
Mining engineers	—	1	3	2
Total : silicosis	392	365	416	430
Asbestosis	15	11	13	9
Other cases of fibrosis	535	544	534	503
Grand total	942	920	963	942

The table also shows the fatalities from asbestosis and asbestosis with tuberculosis coming to the Inspector's knowledge and investigated during the years in question. The figures given under "Other Cases of Fibrosis" are the number of cases in which "Fibrosis of the Lungs" was entered on the death certificates as the primary cause of death, these figures being supplied by the courtesy of the Registrar General. It has not been possible to investigate all the deaths from fibrosis of the lung; but in the majority the occupation of the deceased appeared not to have involved risk from silica or asbestos, and it is well recognised that fibrosis may be due to causes other than the inhalation of dust. These returns are indispensable since, from time to time, they provide the starting point of further investigation which provides valuable information.

Silicosis and Asbestosis and Cancer of the Lung

In recent years the suggestion has been made in medical publications that there is some relationship between silicosis or asbestosis and cancer of the lung. The question is a difficult one, and the figures available are not yet large enough for it to be safe to draw conclusions from them. In exploring this question the field to be covered is wider than appears at first sight. Major points which will have to be settled are: Does silica or asbestos or the fibrosis of the lung they produce tend to inhibit cancer of the lung or to produce it? If the latter, do either of these two substances act as specific carcinogenic agents like tar, or is it that the disease they produce only prepares the soil for the occurrence of cancer? The following information has been collected from the Inspector's records. No case has been included in which a post-mortem examination has not been made.

Among 943 fatal cases in which silicosis or silicosis with tuberculosis was present, cancer of the lung was associated in 23 cases (2.4 per cent.). Of these 23, in 17 it was considered that the cancer was the primary cause of death, and in 6, silicosis or silicosis with tuberculosis. Among 347 deaths which were investigated during the same period owing to the possibility of silicosis being present, post-mortem examination revealed no silicosis but cancer of the lung was found in 17 cases (4.9 per cent.).

Similarly with asbestosis, among 103 fatal cases in which asbestosis or asbestosis with tuberculosis was present, cancer of the lung was associated in 12 cases (11.6 per cent.). Of these, 12, in 6 it was considered that the cancer was the primary cause of death, and in 6, asbestosis or asbestosis with tuberculosis.

It is clear from these incomplete figures that extended inquiry and collection of data and evaluation of age incidence and age distribution are necessary before any conclusions can be arrived at.

The importance of the most careful post-mortem examination is emphasised by a recent case in which naked-eye examination revealed only advanced asbestosis, but what appeared to be a small blood clot in a bronchus turned out on microscopical examination to be a carcinoma, and also another case in which silicosis, tuberculosis and primary carcinoma were all present in the lungs.

Substitution of Siliceous by Non-Siliceous Materials

In processes in which the risk of silicosis is serious and uncontrollable or only partially controllable, the prevention of silicosis lies either in substitution by harmless materials or at the last resort in prohibition of the process. Efforts have been made therefore to find and introduce efficient substitutes for siliceous materials in certain processes. Progress has been made in this direction in the following processes—in some to a considerable extent; in others it is confined to technical experiments in the processes:—(1) Alumina for flint in china bedding; (2) alumina for siliceous material in parting powders; (3) non-siliceous abrasives for sand or flint in blasting; (4) non-siliceous material for kieselguhr used in the slow cooling of steel; and (5) non-siliceous material for silica bricks for lining steel and other furnaces.

Hydraulic Stowing in India

(*Concluded from page 335.*)

livers sealing water to the suction gland of the sand pump. Sealing water may be led from a storage at the colliery itself when the river is in flood as the river water then contains an appreciable quantity of sand; but in dry periods of the year, when a large basin has been excavated, clean sealing water is obtained direct from the river. The suction pipe is submerged and is attached by a special flange to the pump; it is raised or lowered by a winch mounted on the pontoon. By this arrangement flexible hose pipe is not needed on the suction side, and the quantity of sand to water is regulated easily.

From the delivery side of the pump the sand and water mixture is conveyed by means of an armoured flexible hose pipe to a line of 9 in. steel pipes in 18-ft. to 20-ft. lengths, fitted with Victaulic joints, the pipe range is carried on floats in the stream. The pipeline delivers the sand-water mixture into a conical separator at the rate of 8 tons per min. The sand-water mixture is fed on to screen plates with 1½ in. holes; the velocity of the incoming mixture is so reduced that sand is deposited in the bottom of the separator and fairly clear water flows through the shutes at the sides of the separator. The sand contains too much water, however, to be delivered direct to the belt conveyor, and the sand is further dewatered on a drying belt.

Sand-Drying Device

The sand-water mixture—by weight approximately 4 parts of sand to 1 of water—passes from the bottom of the separator through a control valve over a distributing plate on to a 4 ft. wide drying belt. The drying belt consists of a series of shallow trays, 2 in. deep, carried on rollers; each tray contains a mixture of graded slag which is kept in place by ½ in. thick iron plates perforated with ¼ in. holes. The belt is driven at a speed of 40 ft. per min. Three rollers or squeezees are placed equidistantly along the upper belt surface, and a series of prongs placed in series along the belt turn the sand over as it is carried forward. The rollers and prongs help in the dewatering of the sand, whilst the slag in the trays allows water to pass but not the sand.

The sand issuing from the drying belt contains by volume approximately 10 per cent. of water. The sand is delivered from the end of the drying belt direct on to a 26-in. troughed belt conveyor which delivers it into the sand bunker. The belt conveyor elevates the sand 43 ft. in 130 ft. run to the top of the bunker, on account of this grade only fairly dry sand can be carried.

The sand is delivered by the belt conveyor into a specially constructed bunker holding approximately 1,000 tons. On the underside of the bunker runs the single rail around which the sand buckets of the aerial ropeway gravitate after being delivered from the rope. On one side there are 7 shutes which deliver sand to the buckets; the regulator at the bottom of the shute controlling the sand outflow to the buckets is of a simple type, and is kept in place by a balance weight. A one-ton capacity bucket is filled in 5 secs. through one of the shutes.

Luxemburg : Iron and Steel Output, July 1939

Pig-iron output in Luxemburg in July was 184,848 metric tons (182,565 tons in June and 117,904 tons in July, 1938). Steel production was 177,649 tons in July, against 167,861 tons in June and 110,393 tons in July, 1938. A total of 20 blast furnaces were in blast on July 31.

* Obtainable from H.M. Stationery Office, York House, Kingsway, London, W.C.2. Price 2s. 6d. net.