Correspondence

Infective Nature of Massive Pneumoconiosis

SIR,—It is believed in the Welsh National School of Medicine, Cardiff, that coal-miners' pneumoconiosis is of two distinct pathological types.¹ Simple pneumoconiosis is thought to be due to dust alone and massive fibrosis to dust plus infection. Tuberculosis is regarded as being the infection.^{2,3} Dr. A. L. Cochrane and his colleagues (*Journal*, May 26, p. 1193) have investigated this opinion as part of the now famous Rhondda Fach inquiry. Their findings support the "Cardiff" view, but they point out that one feature which does not permit the wholehearted acceptance of it is the fact that, at necropsy, taking all cases into account of massive fibrosis only 40% of cases have demonstrable living tubercle bacilli. The incidence of these living bacteria varies with age group and is only 29% at 59 and over.⁴

The Cardiff School has been very conscious of this defect in their thesis. We have, however, been able to approach the problem from a new direction, inspired by the work of Consden and others.⁵ Certain bacteria, including tubercle bacilli, produce α - ϵ -diaminopimelic acid, which is not a normal constituent of the human body. The presence of this substance, therefore, even in the absence of living organisms, indicates a previous infection. We have investigated 15 consecutive cases of massive fibrosis obtained at necropsy in miners aged 59 and over, and found that 14 of them contained diaminopimelic acid. The work is incomplete and is based so far only on chromatography. In 13 of the 15 cases no living tubercle bacilli were found. To try to obtain further information we are examining these lesions of massive fibrosis for mycolic acid. Viable tubercle bacilli are present in less than a third of the lesions of P.M.F. in older subjects, but bacterial residues remain in these lesions in the majority of cases, and can be readily identified.

Our findings, therefore, add support to the view that massive fibrosis is infective in origin. We would like to mention incidentally, but not related to pneumoconiosis, that we have examined other lesions which are thought, but not proven, to be infective. One swallow does not make a summer, but we have found diaminopimelic acid in a typical case of sarcoidosis of lymph glands. On the other hand, we have failed to find this substance in a number of subcutaneous rheumatoid nodules. We hope to publish further details, both of the investigation and techniques used.—We are, etc.,

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An Improvised Iron Lung

SIR,—On a recent trip to New Zealand a passenger contracted poliomyelitis of a rapidly ascending type. As soon as it was evident that respiration was being affected, the construction of an iron lung was begun with materials found on board. While this was being constructed the patient was placed on a rocking stretcher with marked temporary improvement. The lung was completed, tested, and in use in 12 hours, and, although the outcome was fatal, life was prolonged for 36 hours. The following is a short account of its construction, which might prove interesting and even instructive.

An airtight box was made using $\frac{1}{2}$ in. (19.1 mm.) plywood; joints were made watertight with glue and brown paper; dimensions were just big enough to enclose the patient up to the neck. The headpiece was in two halves, hinged top

and bottom respectively, with a semicircular hole cut in each to accommodate the neck. The halves had $\frac{1}{4}$ in. (6.4 mm.) rubber to land on the box edging; the centre joint was sealed by a brass strip overlapping the $\frac{1}{4}$ in. (6.4 mm.) rubber on one side. The circular hole was lined with round-section "sorbo" rubber jointing so as to fit snugly round the neck. This caused, after some hours, acute discomfort, and was replaced by a piece of foam rubber which was fortunately discovered under one of the crew's radios. The lower half was secured by heavy-duty door hooks to the box, and the upper by heavy-weather door slip-bolts with their keepers on the lower half. When all was in position the leaks were sealed with plasticine, which proved very effective.

The pumping mechanism was composed of two large bellows used for supplying air to the ship's fire-fighting smoke helmets. Their function was modified so as to use the bottom chamber only to create supply and exhaust, instead of their normal function of continuous supply only. They were clamped together on a large board and connected to the lung by supply hose. A manometer (engine-room equipment) was attached to the lung. The whole was tested on a volunteer and found to be satisfactory, giving a positive and negative pressure of $\frac{1}{2}$ in. (12.7 mm.). The patient was placed on a ply-board suitably matted and slid into the lung: it proved very satisfactory as far as artificial breathing was concerned.

A more efficient pump was constructed composed of a generator cylinder-liner, bolted to a 1 in. (2.5 cm.) plywood base having a heavy flexible pipe outlet at the bottom of about $1\frac{1}{2}$ in. (4.4 cm.) diameter (purifier hose type). The generator piston had one piston ring only fitted, and all pins and links were made of wood to reduce weight. The handle was of the lever (pump handle) type, and the length of stroke was fixed by a wooden stop, this stop determined according to the manometer reading. This improved pump was not, in fact, put into operation, owing to the patient's death before the apparatus was completed.

If time permits the following improvements should be made in the box: (1) inspection window in the roof; (2) hand holes and a pan hole at the sides; materials needed: sorbo rubber in sheet form to suit holes with tapered plug doors.

I would like to express my appreciation of the two officers who, between them, devised and constructed the entire apparatus—namely, Chief Officer, now Captain, S. G. Robinson and Second Engineer J. D. A. Bright, both of the New Zealand Shipping Company.—I am, etc.,

Littlehampton.

A. J. MURRAY.

The American Approach to Anaesthesia

SIR,—The article entitled "The American Approach to Anaesthesia," by Dr. M. K. Sykes (*Journal*, May 19, p. 1148), has an authoritative sound to it. We feel that a number of opinions are stated which will cause justifiable irritation to colleagues in the United States, and as we also have some experience of the practice of anaesthesia in many parts of that continent we would like to be allowed to say that our views differ in many respects from those expressed by Dr. Sykes.—We are, etc.,

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