

the British Army, and the rest were their travelling dependants. They came from many different areas. In fact, a more mixed population in terms of their region of origin within the United Kingdom would be hard to imagine.—We are, etc.,

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### Continuous Ventilation and Oedema

SIR,—We should like to record a patient suffering from severe myasthenia gravis who has required assisted ventilation for nine years using a Barnet Mk II ventilator. For the past five years she has required continuous controlled ventilation. A subatmospheric phase was not employed.

During the period of continuous ventilation she developed pitting oedema of the face and extremities. The oedema could not be attributed to cardiovascular, renal, or liver disease as her serum proteins, electrolytes, and osmolarity were within normal limits. Hitherto it was believed that the oedema was due in some way to the immobility of the patient. However, a mean intrathoracic pressure resulting from mechanical ventilation of the lungs which is continually maintained above that of atmospheric pressure may possibly cause oedema by two mechanisms.

Since 1947<sup>1</sup> it has been known that continuous pressure breathing causes an anti-diuresis and that a diuresis results when the intrathoracic pressure is lowered.<sup>2</sup> It was believed that these effects were mediated by changes in the size of the left atrium.<sup>3</sup> It seems likely that adaptation to such changes would occur after very prolonged periods of time as has been suggested,<sup>4</sup> and would not be operative in this case.

Another mechanism is that based upon the recent observations of Guyton.<sup>5</sup> Guyton, using an implanted capsule technique, has produced evidence that the interstitial fluid pressure is subatmospheric, and that if the interstitial fluid pressure rises to atmospheric then there is a considerable increase in the mobility of the fluid in the tissue spaces, so that these spaces balloon outward to fill with fluid. This is the opposite of the compaction of the tissues which is associated with normal subatmospheric interstitial fluid pressure.

This appraisal suggested that if a subatmospheric expiratory phase were employed the mean intrathoracic pressure, the venous, and the capillary pressures would fall, so that the interstitial fluid pressure would return below that of atmosphere and the oedema disappear. The employment of a subatmospheric expiratory phase down to  $-10$  cm.  $H_2O$  led to a gradual diminution of the oedema, so that after

6-8 weeks the patient now has no oedema of her hands and feet and can now wear rings last worn five years ago. When she was ventilated for 14 days without a subatmospheric phase the oedema rapidly reaccumulated.

It has not been possible because of vascular puncture difficulties to undertake haemodynamic studies so that the actual mechanism causing the oedema has not been elucidated.—We are, etc.,

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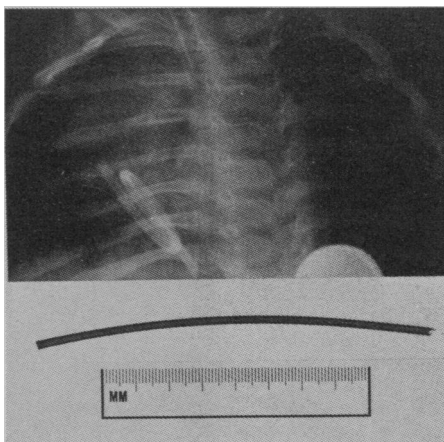
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### Catheter Fragment in the Heart

SIR,—We read with interest Dr. J. H. N. Bett's letter (1 August, p. 287) concerning the removal of catheter fragments from the heart. On the same day a thirteen-month-old child (weight 9.56 kg.) was referred to the thoracic unit, the Hospital for Sick Children, with a portion of Silastic catheter in the heart.

The child was noted to have a thoracolumbar meningomyelocele at birth, and subsequently developed hydrocephalus, for which a Spitz-Holter valve had been inserted in the usual fashion. This had ceased to function, but during the operation for its removal a portion of the distal Silastic catheter became dislodged. The operative radiograph showed the detached portion to be lying within the cardiac silhouette, presumably in the right atrium.



The following day, with the child sedated, a cardiac catheter was introduced into the right long saphenous vein under local anaesthesia, and passed to the right

atrium. By viewing the child in various positions it was then possible to confirm that both the cardiac catheter and the fragment of Silastic catheter lay within the right atrium. A catheter system which allows a variable degree of flexion of the catheter tip was then introduced. (The Muller-U.S.C.I. guide system is routinely used in this department.) The catheter tip was then hooked and the loop of Silastic catheter caught in it. The whole assembly was withdrawn, but the Silastic catheter could only be pulled to the external iliac vein, this limitation being due to the relative diameters of the vein and the created hook.

The femoral vein immediately above the sapheno-femoral junction was dissected out through the original incision. The smallest Fogarty catheter available (5F) was then introduced into the femoral vein and passed up until its tip lay alongside the Silastic catheter. With the balloon partly inflated the Silastic catheter was then drawn out of the femoral vein. The venotomy was sutured. There were no complications and the procedure was tolerated well by the child.

It is felt that a catheter assembly which makes it possible deliberately to vary the shape of the catheter tip can at times be used successfully in the location and removal of foreign bodies, especially catheter fragments from within the heart, without recourse to thoracotomy.

We would like to thank Mr. James Dickson for permission to report this case.

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### Sleeping Pills

SIR,—The increasing body of evidence that hypnotics cause quite long-term alteration of sleep pattern (8 August, pp. 296 and 310), as well as the mounting wave of gross abuse of barbiturates by young people, must surely raise the question whether it is not time for all barbiturates to be classed under the D.D.A. This may seem a rather sweeping suggestion, but now the only real indications for the use of barbiturates, except very occasionally for the extremely disturbed patient, seem to be in anaesthesia and the small doses of amylobarbitone used in conjunction with high-dosage chlorpromazine in the intensive treatment of schizophrenia. I know many neurologists still use phenobarbitone in epilepsy, but most psychiatrists are painfully aware of the dopiness, paradoxical irritability, and behaviour disturbances that are so common in patients on long-term medication with phenobarbitone and its derivatives.

It is neither logical nor desirable to use hypnotics to damp down insomnia caused by pain, cough, depression, anxiety, or even noise in hospital, instead of tackling the causes. Psychiatric units are among the worst offenders in creating and perpetuating dependence on hypnotics, but this really is not necessary. In my last year at my previous hospital I was the ward doctor for a busy short-term admission unit with a patient population liable to range from 16-year-old psychopaths to 86-year-old senile