abnormality. He was discharged home after three days, and when seen at the clinic a fortnight later said he felt much better mentally. He was advised to resume chlorpromazine but would not do so.

COMMENT

There appear to have been only two reports of similar reactions after chlorpromazine. Labhardt (1954) mentions two patients, one a neurotic and one a psychopath, who showed "hysteriform" symptoms resembling *arc en cercle* and spasmodic torticollis, but gives no further information. Ayd (1956) describes the case a 16-year-old girl receiving 300 mg. of chlorpromazine daily who on the twelfth day suddenly developed dysarthria, facial grimacing, and involuntary muscle movements. She began taking chlorpromazine again three days later and had no recurrence of dystonia.

This type of reaction, very rare with chlorpromazine, appears to be less rare with the related drug prochlorperazine ("stemetil"). As one of the recognized toxic effects of both chlorpromazine and prochlorperazine is a parkinson-like syndrome, it is perhaps not altogether fanciful to picture the dystonic syndrome described here as in some ways analogous to the oculogyric crises of post-encephalitic parkinsonism.

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A Guided and Guarded Trephine for Bone-marrow Biopsy

There are many conditions in which histological examination of bone marrow may give information not obtainable by the examination of films made from material aspirated from the bone-marrow cavity.

Sometimes very small masses of marrow are withdrawn by needle puncture, and these may be picked out from the material aspirated and sections made from them. A small trephine, 5 mm. in diameter, may be driven into the sternum after an incision to obtain small portions of bone marrow (Dameshek, 1935). The specimens obtained, however, may be much too small for adequate histological study.

A larger trephine may be used at open operation on the sternum (Custer, 1949), a portion of rib may be excised (Hutt, Smith, Clark, and Pinniger, 1952), or a wedge of the crest of the ilium may be removed (Leonard, Israëls, and Wilkinson, 1957).

There is need for an instrument which will always produce an adequate amount of bone marrow for histological study from a part of the skeleton where red bone marrow is always present, without crushing of the specimen, without danger of damage to important structures, with the scar in an inconspicuous position, and by a method which is acceptable to the patient as a relatively minor diagnostic procedure that may be repeated at intervals, if desirable, to observe changes in the bone marrow with time or treatment. The instrument here described was designed in an attempt to fulfil these requirements.

It is unlikely that any method will be devised for obtaining an adequate amount of bone marrow without open operation.

The instrument consists of a combined guide and guard, and a trephine with a hole up the handle into which the guide fits (Fig. 1). Two trephines are available, 15 mm. and 11 mm. in diameter, the smaller one being more suitable for the narrower ribs of female patients.

A portion of rib is exposed posteriorly, and the periosteum is reflected from the outer surface and also from the inner surface to about half-way down the width of the rib. The tongue of the guard is inserted in a vertical direction behind

the rib, with the guide firmly pressed against the upper border of the rib. The trephine is then placed over the guide and, by pressure and rotation, is driven home against the guard. Care must be taken to saw through the bone, and not to use too much pressure, or the bone marrow may be crushed, rendering it useless for histological study. An

FIG. 1.—Diagram of the instrument.

instrument which is designed to bite out portions of bone is unsuitable because of the crushing of the marrow which occurs. The guard and trephine are then removed together. A portion of the upper margin of the rib, of the whole thickness of the rib, and nearly semicircular in shape, is thus obtained (Fig. 2). Contact smears or films can be made from the cut surface of the bone marrow and the semicircular disk of rib then placed in fixative and processed in the usual way.

If the patient's condition warrants it, the operation is best done under general anaesthesia as advised by Hutt *et al.* (1952). It takes about five minutes under general anaesthesia and ten minutes under local analgesia.

Not once, either in the post-mortem room or in the operating theatre, has a rib been broken or the pleura damaged.

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The prototype of the instrument was made in soft metal by Alan Hickling, mechanical sciences undergraduate, Cambridge University, from which the instrument was made in stainless steel by the London Splint Company Limited, 67-69, Weymouth Street, London, W.1.

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FIG. 2.—Actual size of sections obtained with the two trephines.