AN IMPROVED TREPHINE

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In this paper an improved skull trephine designed by the author is described. It has been used since April 1947 by the neurosurgical department of the Lahey Clinic in a sufficient number of cases to prove its worth. This instrument was developed after repeated urging by Dr. James L. Poppen and was the outgrowth of difficulties encountered with the older type of trephine, namely, easily dulled and slow-cutting teeth, and the necessity for drilling a starting hole for the center point of the trephine. These difficulties have been completely eliminated by the new design, and a bone button can be removed rapidly from any type of skull with a minimum of effort, owing to the size and set of the cutting teeth. The original model has been in use at the clinic for 115 lobotomies and 230 bone buttons consecutively, and the cutting blade has neither been resharpened nor replaced. The instrument was built primarily for use in prefrontal lobotomies; however, the same type but of smaller caliber can be used for biopsies or craniotomies (frontal). The adaptation of trephines attached to the Hudson brace is not original with us. The design of the trephine, however, is new.

The instrument consists of 4 main parts: the shank, the guard, a cutting blade, 1 inch in diameter, and center drill. The cutting blade and center drill are made of high speed tool steel, which accounts for the excellent durability, and the remainder of the instrument is made of stainless steel, to avoid rusting and chrome-plate flaking. The original model consisted of a shank and guard of brass with the steel cutter, but owing to the softness of brass, it was thought that stainless steel was far superior. The trephine is shown in Fig. 1. The cutting blade is held onto the shank by a stainless steel nut and the center drill slides into the shank until it rests against the bottom of the hole, and is held by a headless set screw. The guard slides down over the cutting blade until about 1 cm. of blade is exposed, and is locked in position with another headless set screw. A 1 cm. depth setting, in our experience, is correct for at least 80 per cent of all skulls trephined in the prefrontal region. When a thick skull is encountered, the guard is loosened and set back slightly to allow a deeper cut, whereas if the skull is thinner than usual, the trephine may drop through against the dura, but only for a few mm., and will not cut the dura if the instrument is turned slowly as recommended. Fig. 2 shows the instrument disassembled.

The trephining is done dry, without use of water or saline solution, and the Hudson brace is turned slowly, using firm pressure against the skull. It is not necessary to drill a starting hole since the center drill rapidly cuts its own hole. When the teeth have cut into the bone to a depth of about 2 mm., the center drill is removed, and the remainder of the bone is cut

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through. It has been our practice to stop just short of cutting through the inner table, and to raise the bone button with a periosteal elevator or a narrow chisel (Fig. 3). This leaves a thin shoulder of bone around the under edge of the button, and aids in replacing it at the time of closure. The inner table may be cut entirely through and the button lifted out in the trephine. If the trephine is turned rapidly and without firm pressure, the rapid cutting action of the teeth is decreased, and energy is expended uselessly. We have not attempted to use this instrument in a motor-driven handle; however, the smaller-caliber instrument has been used