Clinical and other Notes.

A SHAKER FOR USE IN THE KAHN TEST:

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This shaker was designed and constructed because no mechanical shaker was available in the laboratory in which the writer works and because it was found almost impossible to shake a rack of Kahn tubes at the recommended rate by hand. Despite its simple and inexpensive construction it has worked satisfactorily for more than a year with the minimum of attention. It is described in order to enable others who perform Kahn tests and have no mechanical shakers to have similar machines made. The design may be modified to enable racks of other types or several racks at the same time to be shaken.

The apparatus is built on a strong base board of 1 inch oak measuring 26$\frac{1}{2}$ by 6 inches. Firmly attached to this, towards one end, are two side pieces of 5/16 inch oak, 17 by 3 inches. These sides are kept 4 inches apart by three steel plates (4 by 3 inches), one at either end and the third intermediately. The steel plates have $\frac{1}{2}$ inch flanges to which the oak side members are bolted; they have also similar flanges which are screwed to the base board. The middle steel plate has a slot $1\frac{1}{2}$ inches deep and $\frac{1}{2}$ inch wide in its upper edge to allow a connecting strip to pass through. Two $\frac{3}{4}$ inch holes are drilled 2 inches apart and 2$\frac{1}{2}$ inches above the base board through the middle plate and one of the end plates. Through these holes pass the ends of two $\frac{3}{4}$ inch steel rods, each 10$\frac{1}{4}$ inches long. The ends of these rods are threaded for $\frac{1}{4}$ inch so that they may be firmly attached to the supporting plates by nuts.

A lidless box is used to hold a rack of tubes. It is strongly constructed of $\frac{1}{4}$ inch oak with mortised joints. In this model, the box measures 8 9/10 by 3$\frac{1}{4}$ by 1$\frac{3}{4}$ inches internally so as to hold firmly the copper rack of a Hearson's Wassermann water bath. Two transverse oak (or, preferably, brass as is shown in the diagram) blocks, 3 inches long and 1 by 1 inch in section, are firmly bolted to the bottom of the box. These blocks are situated 5 inches apart and 1$\frac{1}{2}$ inches from the ends of the box. Two $\frac{1}{2}$ inch holes, 2 inches apart, are accurately drilled through the blocks so as to lie in the long axis of the box. These enable the box to slide on the steel rods fixed longitudinally beneath.

The crank assembly is of simple construction. Two $\frac{1}{2}$ inch steel rods are screwed into the ends of the crank arms. The opposite ends of the crank arms are joined by a short piece of $\frac{1}{4}$ inch steel rod, screwed in a similar...
manner. The crank arms, which are made from $\frac{1}{2}$ by $\frac{3}{8}$ inch steel strips, measure $1\frac{3}{4}$ inches overall and the holes are 1 inch apart. The connecting strip of $\frac{1}{4}$ by $\frac{3}{8}$ inch steel, 6 inches long, has $\frac{3}{8}$ inch holes drilled at either end, $5\frac{3}{8}$ inches apart. One end is attached to the crank before the assembly is completed; the other is connected to the near sliding block, on the underside of the box, by means of a U-plate screwed to the block. This U-plate carries a $\frac{1}{4}$ inch pin which passes through the hole in the connecting strip and is prevented from falling out by a split cotter. The connecting strip is kept central on its bearings by washers.

The crank assembly is supported in brass bushes let into the oak side pieces 2 by 2 inches from their ends and 2$\frac{1}{2}$ inches above the base board. A 2-inch boxwood pulley is fixed to one end of the crank axle.

Towards the end of the base board remote from the box is an oak block 5 by 5 by 3$\frac{3}{8}$ inches. To the sides of the block which are parallel to the long axis of the base board are screwed steel plates measuring 4$\frac{1}{2}$ by 1$\frac{1}{2}$ inches with $\frac{1}{4}$ inch flanges which are slotted. Through the slots pass screws holding the block to the base board. This arrangement permits the block to be moved longitudinally to take up slackness of the driving belt. The block is drilled transversely $3\frac{3}{8}$ inches above the base board to take a brass tube which acts as bearing for a $\frac{3}{8}$ inch steel rod. To the projecting end of this rod a 5$\frac{3}{8}$-inch box wood pulley with a cranking handle is fitted. This pulley is aligned with the 2-inch pulley attached to the crank axle. A round section leather belt transmits power from the large pulley to the small one. This part of the apparatus is not shown in the diagram.

A rack of Kahn tubes is fitted in the box and, by means of the cranking handle, the large pulley is rotated exactly 100 times a minute for three minutes. In practice, it is best to aim at 25 revolutions every quarter minute. This oscillates the rack 280 times a minute with an excursion of 2 inches. With this shaker a rack is shaken at the correct rate with much less fatigue than when the rack is shaken by hand, but, if desired, an electric motor may be fitted.

I have pleasure in expressing my indebtedness to Captain J. B. Hurll, R.A.M.C., who was largely responsible for the design of the shaker and who drew the diagrams, and to the officers and men of a company of R.E.s who made the machine.

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THE TOXIC EFFECTS OF LOCAL ANALGESICS.
THEIR PROPHYLAXIS AND TREATMENT.

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Local analgesics are protoplasmic poisons with a selective affinity for nerve tissue. The toxicity of a particular local analgesic may be actually