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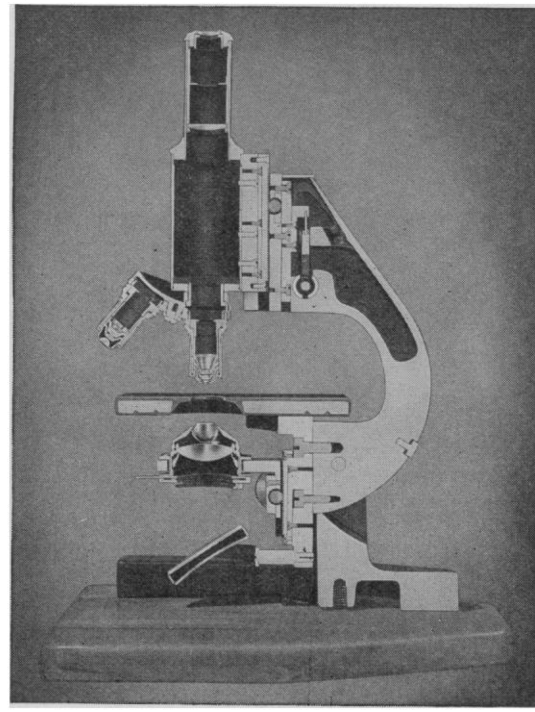

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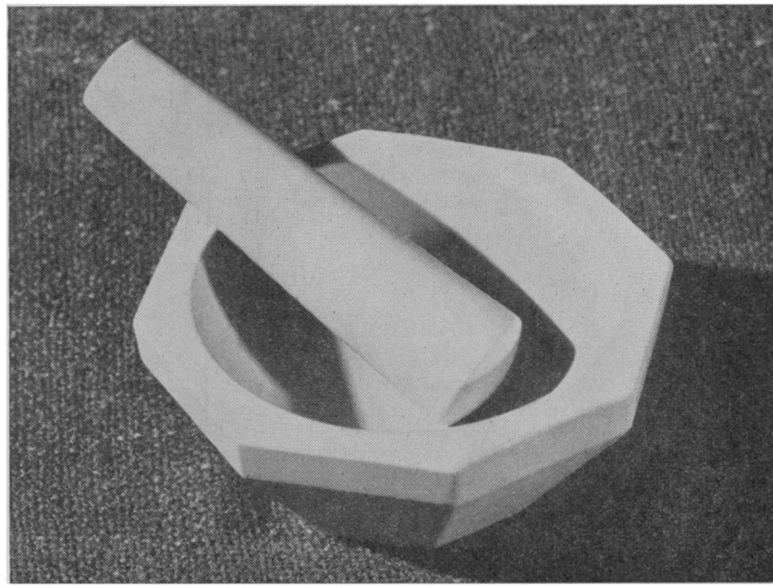

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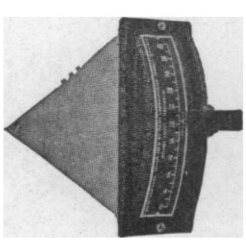

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BURRELL TECHNICAL SUPPLY COMPANY, Pittsburgh. *The Burrell Technical Announcer.* Pp. 11. Illustrated.

CAXTON PRINTERS, LTD., Caldwell, Idaho. *Spring List of Caxton Publications, 1941.* Pp. 19. Illustrated.

CENTRAL SCIENTIFIC COMPANY, Chicago. *Cenco News Chats. January, 1941.* Pp. 22. Illustrated.

DU PONT DE NEMOURS AND COMPANY, INCORPORATED, E. I., Wilmington. *The Neoprene Notebook. November–December, 1940.* Pp. 129–136. Illustrated.

FISHER SCIENTIFIC COMPANY, Pittsburgh. *The Laboratory. Vol. 12, No. 2.* Pp. 47. Illustrated.

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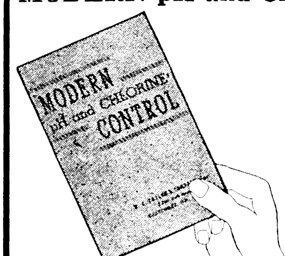

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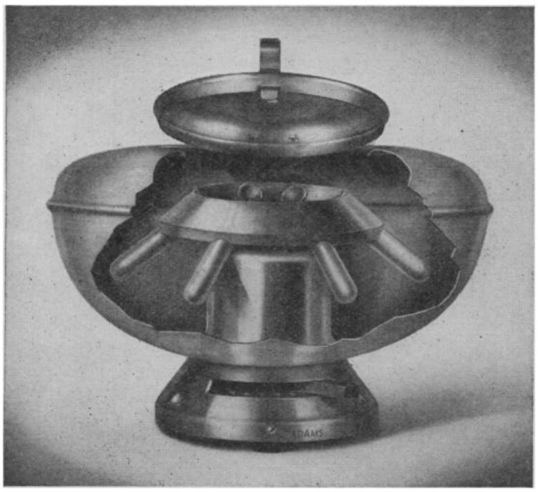

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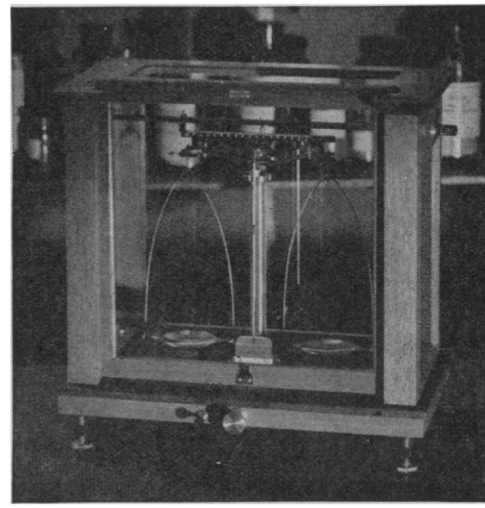

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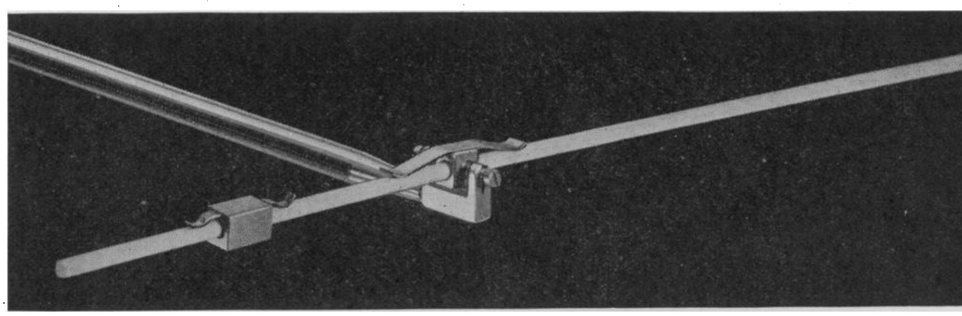

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SCIENCE AND HUMAN PROSPECTS[1]

By Professor ELIOT BLACKWELDER

STANFORD UNIVERSITY

IN this fateful year, one should need no excuse for departing from the common practice wherein the president of the society devotes his final address to the field of his own research. It seems to me that the occasion calls for a subject of larger importance and one that has a more direct relation to the welfare of the nation. Therefore my remarks on this occasion will bear upon some aspects of education in science and its relation to the future welfare of humanity.

It seems to me that a teacher of geology, or indeed of any other science, should devote himself not only to giving his students information, and explaining processes and theories—however important those educational duties may be—but especially to training young people in the scientific way of thinking and helping them to acquire the scientific spirit. To my mind, that is his most important function.

Since geology is considered a science—albeit not one of the so-called exact sciences—and since we call ourselves scientists, it may be well to ask at this point—what, essentially, is science? In general terms the dictionaries say that it is knowledge established, organized and systematic. To me, however, this concept is not adequate. In the words of the great French mathematician, Poincaré: "A collection of facts is no more a science than a heap of stones is a house." Verified knowledge is one element, organization and classification are necessary and so is the testing of hypotheses, but I can not regard any of these as the core of science. To me the basic thing about science is an attitude or habit of

[1] Address of the retiring president of the Geological Society of America, delivered at the annual meeting in Austin, Texas, on December 26, 1940.

and the arms to which the bit is attached are pulled away from the animal's head, stretching it tightly and pulling against the ear plugs. At the same time the height of the bit is adjusted to hold the head level in the longitudinal plane. Tightening the set screws (F and F′) makes this adjustment permanent.

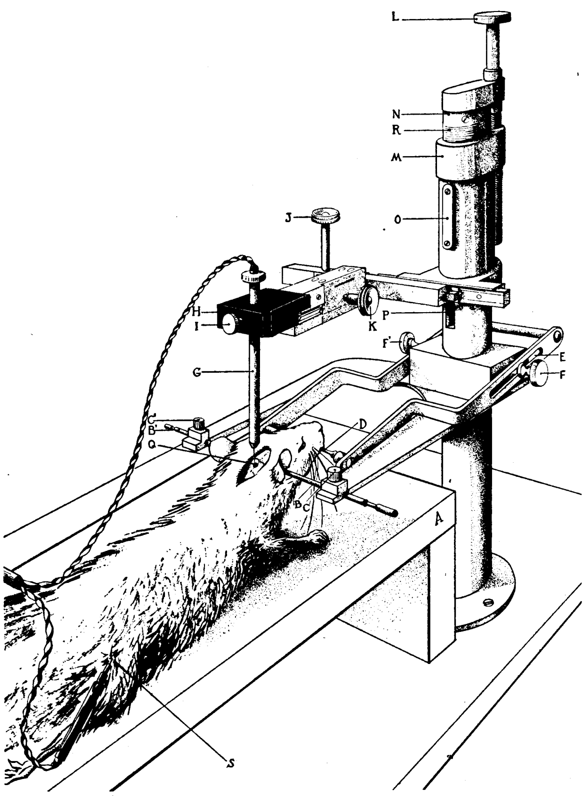

FIG. 1

The electrode holder (G) is adjusted coarsely by sliding it downward through the insulated block (H), and is fixed in position by tightening the set screw (I). The insulated block (H) is attached to a mechanical stage which, in turn, is fastened to a sliding collar (M) that moves vertically on a fixed shaft (N). The mechanical stage, taken from a microscope, is fixed to the collar by two small screws and the insulated block is similarly attached without in any way spoiling the stage for later use on a microscope. The mechanical stage hand screws (K and J) facilitate delicate lateral and longitudinal adjustment of the electrode.

After the horizontal position of the electrode has been adjusted, the entire unit (stage, insulated block and electrode holder) is lowered by turning the large screw (L) which controls movement of the collar (M) on the vertical shaft (N). The depth to which the needle is inserted may be read in millimeters on the scale provided (R). As the collar is moved vertically on the shaft, sidewise movement is prevented by the key (O) on the collar, which fits snugly in the slot (P) in the shaft.

A steel needle inserted in the hind leg of the animal serves as the indifferent electrode. The electrode (Q) in the brain is composed of fine insulated wire. The point of the wire is sharpened and the insulation is removed for a few millimeters above the point. When a direct current is passed through the electrode an electrolytically produced lesion is inflicted about the uninsulated point of the wire.

Cortical destruction is limited to the puncture made when the fine electrode is inserted. The extent of the subcortical lesion is a function of the length of uninsulated electrode, the strength of the current and the duration of its application. We have found it advisable to make the current at a very low voltage (less than 1 volt) and then step it up rapidly to the desired maximum. After the exposure the current is brought down to the low voltage before the circuit is broken. Make and break shocks are thus eliminated. Destruction of relatively large nuclei (*e.g.*, the lateral geniculate) may be achieved with an exposed electrode area of approximately $\frac{3}{4}$ mm if a current of 8 volts is applied for 30 to 45 seconds. Nearly all the corpus striatum is destroyed if 1.5 mm of the electrode is exposed and a current of 9 volts is applied for 90 seconds.

Absence of cortical landmarks and variability in the size of the rats used makes it difficult to place the electrode accurately. A few preliminary operations serve to determine the correct point of insertion necessary to achieve destruction of a particular region. Attacking the corpus striatum we have found the skull sutures to be the most practicable landmarks. If the electrode is inserted directly through the coronal suture at a point 3 mm laterally from the sagittal suture and lowered to a depth of 4 mm below the surface of the brain the uninsulated electrode lies directly in the center of the corpus striatum.

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KIPPING, F. STANLEY and F. BARRY KIPPING. *Perkin and Kipping's Organic Chemistry.* Third edition. Pp. xxiii + 1029. 45 figures. Crowell.

PEARSE, A. S. *Hell's Bells.* Pp. x + 121. Seeman Printery, Durham, N. C. $2.00.

RIOJA, ENRIQUE. *El Mar Acuario del Mundo.* Pp. 405. 56 figures. Editorial Seneca, Varsovia 35-A, Mexico.

Smithsonian Institution. *Explorations and Field-work of the Smithsonian Institution in 1940.* Publication 3631. Pp. 100. Illustrated. The Institution.

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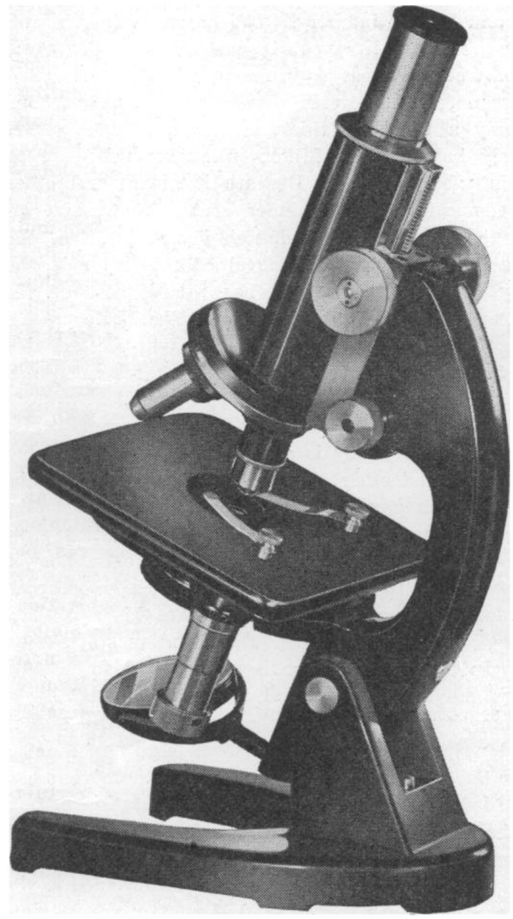

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