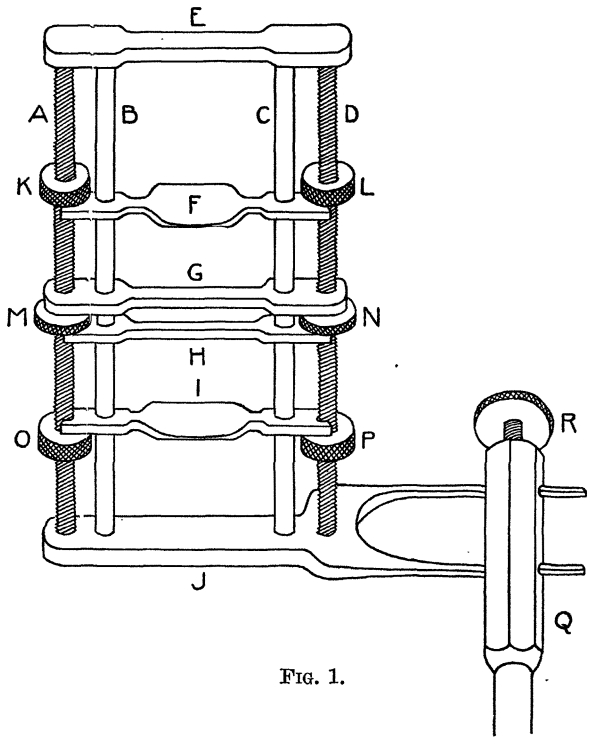

FIG. 1.

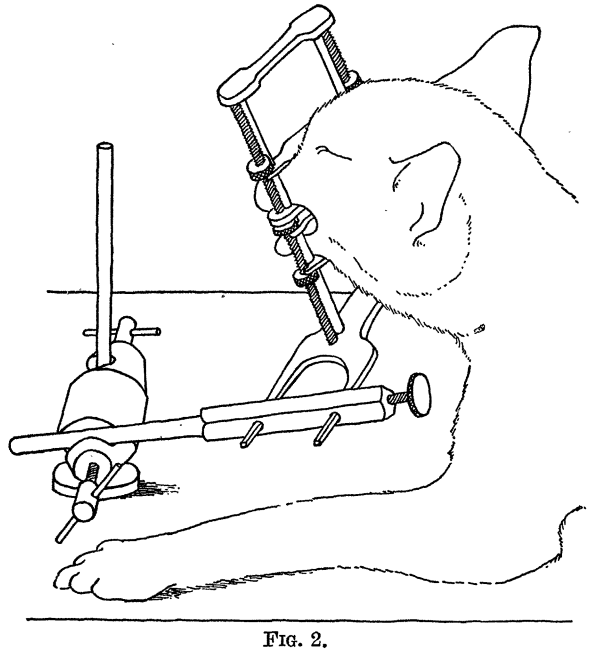

FIG. 2.

clamp thus fixed on the animal's head is inserted into the rod Q and fastened tightly by the screw R. Q is then attached to an upright rod, which is part of the operating table, by means of a universal clamp shown in Fig. 2. This clamp enables the head to be tilted to any desired angle. The figures show the instrument set up for operation on the dorsum of the head and back. It can, however, be reversed for operations on the ventral surface.

CLYDE MARSHALL
YALE UNIVERSITY SCHOOL OF MEDICINE

A SIMPLE METHOD FOR INCREASING THE AMPLIFICATION OF THE MAREY TAMBOUR

ONE of the greatest difficulties in making a record of the carotid or jugular pulse is in obtaining enough amplification. The device suggested in this paper makes it possible to increase the amplification five times as much as that obtained by use of the stock Marey Tambour. Also, by counter balancing the system of levers, increased sensitivity is obtained.

The following is a drawing of the device which we

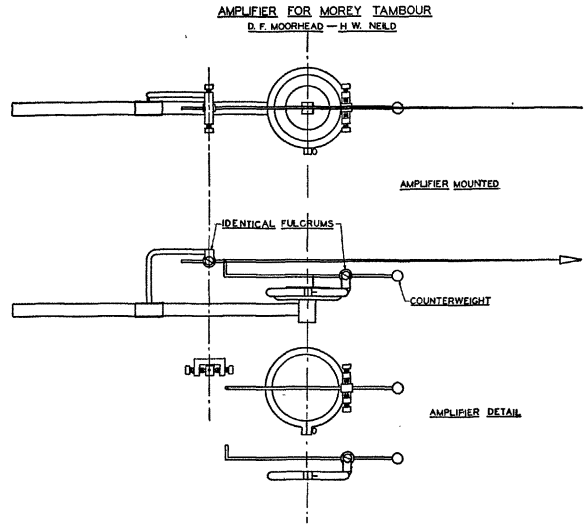

FIG. 1.

have found very satisfactory in situations that require great amplification and increased sensitivity.

D. F. MOORHEAD
H. W. NEILD
UNIVERSITY OF ILLINOIS

SPECIAL ARTICLES

THE PROBLEM OF STIMULATION DEAFNESS AS STUDIED BY AUDITORY NERVE TECHNIQUE

THE chief method of investigation of stimulation deafness has consisted in the histological examination of the cochlea following prolonged stimulation of the ear by sound. Results obtained by this method have been inconclusive, due both to inconsistencies in the findings of different investigators and to the fact that

histological changes within the cochlea are not necessarily indicative of a loss of hearing.

A second, more direct method consists of the study of auditory responses both before and after prolonged exposure to sound. A few investigators have incorporated this method with histological studies, but they have determined sensitivity only by such crude means as the pinna reflex or general bodily movements. Recently, however, development of the conditioned response technique has provided a more reliable means of determining sensitivity in animals.[1] The conditioned response technique is now being used in a study of stimulation deafness by one of the writers.[2]

A third method approaches the problem through a study of auditory nerve responses. The electrical effects obtained from the auditory nerve are investigated to determine whether they are significantly affected by prolonged stimulation. This method has been used by the writers in the preliminary study here reported.

Three young cats were stimulated, the first with a Galton whistle tone of 3,350~/sec. maintained 15 hours each day for 10 days (150 hours), the second with the same tone 15 hours daily for 25 days (375 hours), and the third with a tone of 980~/sec. continuously for 45 days (1,080 hours). The intensities of the tones were not measured, but we estimate them as about 80 to 90 decibels above the human threshold. At the end of the stimulation period, the animals were prepared and tested by the auditory nerve method.[3] In these tests no attempt was made to distinguish between electrical effects from the nerve fibers and from the sensory or nervous cells of the cochlea, for previous investigations have indicated that both effects reveal the essential activity of the end-organ.[4] Various tones were used in the tests, with especially careful exploration of the region of the stimulating frequency.

The results showed no significant variation from those obtained with control animals. In one experimental animal (the third) a depression of sensitivity to the amount of 6 decibels was found, extending from 745~/sec. to 765~/sec., but, since this region is remote from the stimulating tone of 980~/sec., we attach no significance to its presence, so far as the present experiment is concerned. Regional depressions of sensitivity are not unusual in the general run of animals, and even tonal gaps are sometimes encountered.[5]

Conclusions from so few results as these must necessarily be tentative. The absence of any noticeable depression of response at the stimulating frequency argues against any specific effect of the stimulation. On the basis of the majority of histological studies of this problem one would expect depression of responses in the general region of the stimulating frequency, but no such effect was observed. We are not able to state that no effect at all occurred as a result of the stimulation, for a general depression involving all frequencies to a relatively small extent, say 5 decibels or so, might not have been observable under our conditions.

The above results, tentative though they are, provide a basis for questioning the inferences for auditory theory that have been drawn from the histological studies and emphasize the need of further investigation. To solve the problems in this field, the three methods described above should be combined, with tests of auditory sensitivity before and after stimulation, followed by a study of auditory nerve responses, and finally by histological examination of the cochleas. A study of this kind has been going on for some time and will be reported soon.

ERNEST GLEN WEVER
CHARLES W. BRAY
GEORGE PLANT HORTON
PSYCHOLOGICAL LABORATORY
PRINCETON UNIVERSITY

IS THE HIGH BASAL METABOLIC RATE IN "HYPERTHYROIDISM" DUE TO THYROXINE?

THE most abundant source of an internal secretion has been the gland producing it, although in the case of insulin and cortin post-mortem changes cause a loss. *Thyroxine has never been isolated from any other part of the body except the thyroid,* and Prescott (Thesis, Minnesota, 1931) has shown that all the detectable thyroxine is in the *thyroglobulin.* Notwithstanding these facts, the thyroids of persons who have been universally called "hyperthyroid" or by some name in which hyperthyroidism was implied may be shown to be very poor in thyroxine. The basis of this assumption of hyperthyroidism in these persons has been their high basal metabolic rate, but Rice and Cavett read a paper on "The Effect of Feeding Thy-

[1] M. Upton, "The Auditory Sensitivity of Guinea Pigs," *Amer. Jour. Psychol.,* 41: 412–421, 1929; G. P. Horton, "A Quantitative Study of Hearing in the Guinea Pig (Cavia Cobaya)," *Jour. Comp. Psychol.,* 15: 59–73, 1933.

[2] G. P. Horton, "Preliminary Report on the Study of the Effect of Prolonged Sound Stimulation on the Auditory Sensitivity of the Guinea Pig," *Psychol. Bull.,* 30: 548, 1933. See also M. Upton, "Functional Disturbances of Hearing in Guinea Pigs after Long Exposure to an Intense Tone," *Jour. General Psychol.,* 2: 397–412, 1929.

[3] E. G. Wever and C. W. Bray, "The Nature of Acoustic Response," *Jour. Exper. Psychol.,* 13: 373–387, 1930.

[4] E. D. Adrian, D. W. Bronk and G. Phillips, "The Nervous Origin of the Wever and Bray Effect," *Jour. Physiol.,* 73: 2P–3P, 1931; G. Finch, E. A. Culler and E. S. Girden, "Relation of the Wever-Bray Effect to Auditory Acuity in Dogs," *Psychol. Bull.,* 30: 581, 1933.

[5] See Horton, cited in note 1.