

MODIFICATION OF THE "ÉMIB" STEREOTAXIC APPARATUS
FOR SIMULTANEOUS IMPLANTATION OF TWO ELECTRODES
INTO THE ROSTRAL AND CAUDAL ENDS OF THE CAT'S
BRAIN STEM

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To implant electrodes into the region of the medulla in the cat the animal's head must be rotated about the axis of the ear rods by 45° below the horizontal plane because of the bony roof of the cerebellum [2, 3, 6]. Electrodes are implanted into the rostral portion of the brain stem, however, with the animal's head in the horizontal position [2, 4-6].

In order to implant two microelectrodes into these areas simultaneously in accordance with Szentagothai's atlas, two micromanipulators were used and the animal's head was rotated about the ear rods by 45° forward and downward by means of P. S. Aref'ev's halter, fixing the head by Szentagothai's method [2, 6]. One micromanipulator was placed vertically (Fig. 1, 1) for implanting the electrodes into the medulla, while the other was inclined forward at an angle of 45° for implanting the electrode into the rostral portion of the brain stem (Fig. 1, 3). The micromanipulator was fixed at an angle by means of two modified clamps (Fig. 1, 4), securing it to the square guide rail (Fig. 1, 8) of the stereotaxic apparatus and 10 mm higher than the standard clamps (Fig. 1, 2).

The modified clamps (Fig. 2) differed from the standard version by their greater length. The planes of their top edges formed an angle of 100° with one another, and not 120° as in the standard clamps. By this modification of the construction of the fixing clamps, the micromanipulator could be tilted through a greater angle than is allowed by the normal construction of the stereotaxic apparatus.

For working with the inclined micromanipulator, a clamp lengthened to 120 mm (Fig. 1, 6) was used for fixing the electrode, and an additional control zero rod was supplied (Fig. 1, 7b).

The suggested modification of the stereotaxic apparatus also enables an approach to be made to the medulla when a standard halter is used, without rotating the head. The main horizontal plane when the head is fixed by Szentagothai's method passes through the centers of the external auditory meatuses and the surface of the hard palate at the base of the canine teeth. The rostral part of this plane is tilted downward by comparison with the main horizontal plane of Horsley and Clark through an angle of 10° (and not about 20° as stated in Szentagothai's atlas). Accordingly, when Szentagothai's atlas is used, and when the cat's head is fixed with a standard halter, to approach the rostral portions of the brain stem the micromanipulator must be tilted forward 10° , and to approach the medulla it must be tilted backward through 35° ($45^\circ - 10^\circ$).

In contrast to the exciting rotating device for working with a micromanipulator inclined to the horizontal plane (suggested by T. E. Kalinina and G. N. Smetankin [1]), the authors' modified apparatus is simple to make and it enables the micromanipulator to be rotated not in the frontal, but in the sagittal plane.

SUMMARY

For a simultaneous implantation of two electrodes into the caudal and rostral portions of the brain stem the cat head was turned 45° and two micromanipulators were used. One was set vertically, the other inclined forward by 45° to the horizontal plane with the aid of modified planks. Each plank is 10 mm higher than the standard one,

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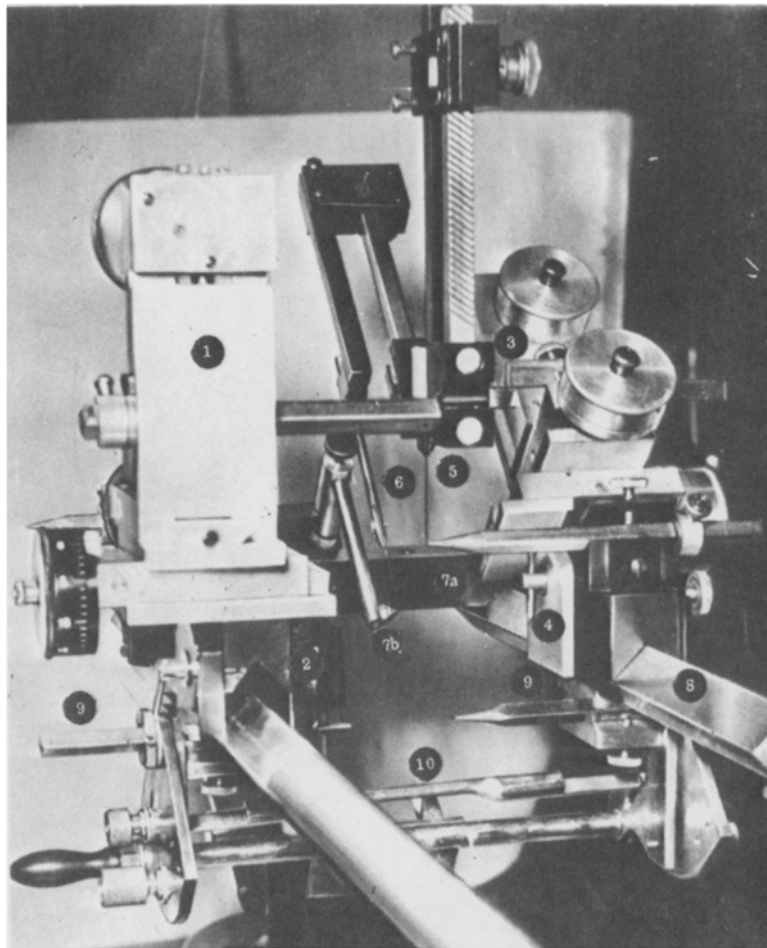


Fig. 1. External view of the stereotaxic apparatus. 1) Erect micromanipulator; 2) standard fixing clamp; 3) inclined micromanipulator; 4) modified fixing clamp (left); 5) standard clamp with microelectrode; 6) lengthened clamp with microelectrode; 7) additional control zero rods: a) for the erect; b) for the inclined micromanipulator; 8) square guide rail (right); 9) ear rods; 10) additional halter (P. S. Aref'ev's modification).

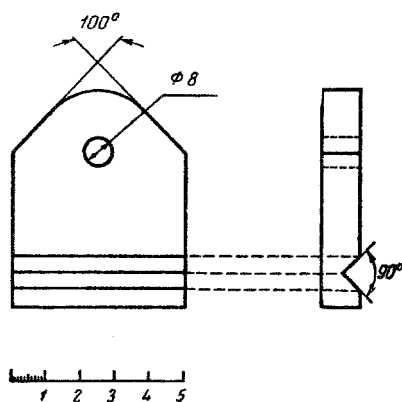


Fig. 2. The fixing clamp.

while the planes of the upper sections of the plank form a 100° angle. This makes it possible to incline the manipulator in the sagittal plane by a considerably larger angle.

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