

APPARATUS FOR PRECISE RADIOGRAPHY

by

Erik Lysholm

Chief Assistant

(Tabula XXXII)

For the investigation of the skeleton system and of the urogenital apparatus this Institute, like other roentgen departments in Sweden has made use of the table which in its original form was brought out by ALBERS-SCHÖNBERG of Hamburg and which has since been improved by Professor FORSSELL. For certain difficult functions, however, this table has proved to be not very suitable, and consequently attempts have been made to devise more precise arrangements. In the course of this work it has proved advantageous to have one special apparatus for roentgenological examination of the cranium and another for the examination of other parts of the body and of the cranium in certain positions. Both apparatuses are put together in accordance with the same principle, which consists in the fact that the arrangement and control of the situation are made both from beneath and from above, instead of only from above, as in the case of the earlier table.

I. Apparatus for the Roentgenological Examination of the Cranium

(Figs. 1 and 3)

The head or the object which is to be radiographed is placed on the object-table on a thin transparent slab of celluloid twice as thick as an ordinary film. This celluloid slab is mounted in a frame so that it can be stretched tight and fixed by screws and be changed easily. Beneath the celluloid slab there is a metal plate with central opening. On this plate are placed the cassettes, and thus these can be changed without its being necessary to move the objects under investigation. Under the centre of the celluloid slab there is a mirror, which forms an angle of 45° with a horizontal plane, and in the mirror a hair-cross is engraved. The hair-cross is looked at through a tube in order to get the centre. The object-table can be

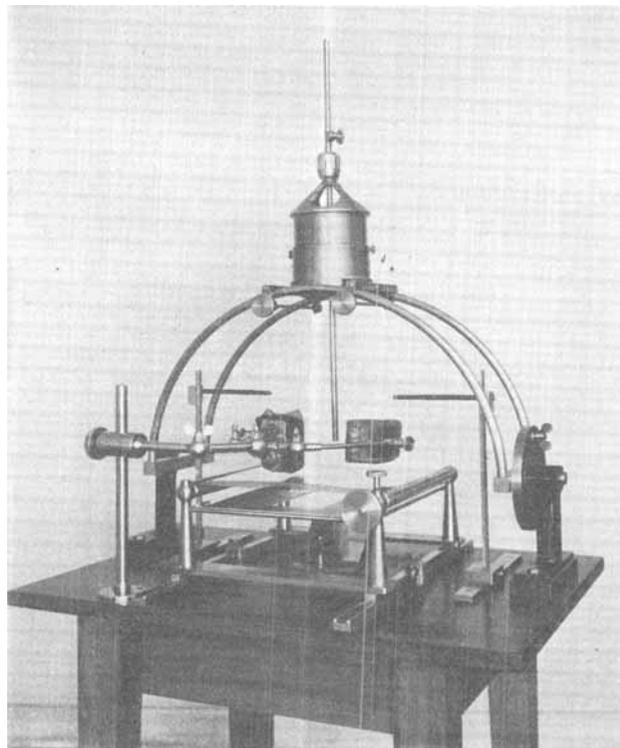


Fig. 1.

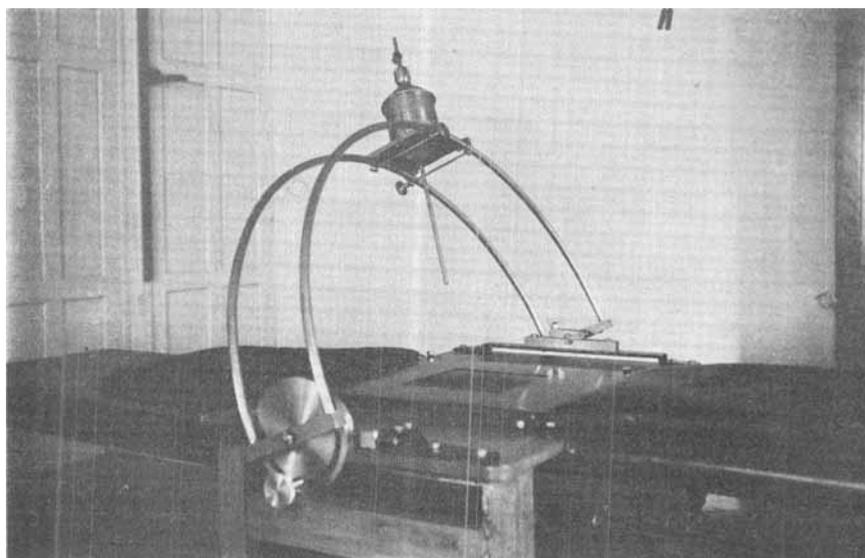


Fig. 2.

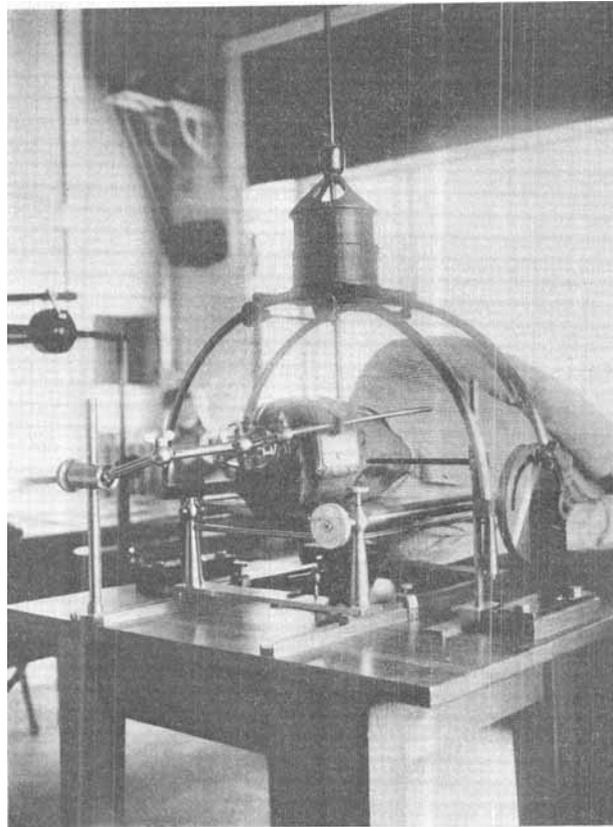


Fig. 3.

moved forwards or backwards in two grooves in the longitudinal direction of the table. Round the object-table there moves a swin-gable semi-circular graduated metal arc with its centre in the middle of the celluloid slab, which can be fitted and fixed at different angles in the longitudinal direction of the table, on an axis which traverses the celluloid slab. On the metal arc, which is also divided up into degrees there slides the tube-holder, in which there is a removable centering-pin, which can be swung round at a point (corresponding to the focus of the roentgen tube) and which can be locked by means of a screw. Hence when the roentgentube is moved through different angles, by sliding on the arc or by swing-ing, the central ray retains its direction towards the middle point of the celluloid slab — that is to say, the point which can be seen in the centre of the hair-cross. By the side of the object-table there

are movable graduated index-pegs, which serve to control the positions sideways. For fixing the head there is a fixing arrangement, which can be regulated within wide limits, and by means of which it is possible to fix the object at three points by means of pelottes of rubber-sponge and cork.

The procedure, e. g. in arranging a head, is as follows: first there is marked on the patients head or on that part of the body which is to be radiographed, the point which is to serve as the base point for the central ray. The patient is placed on the table and the head is so placed that the marked point is made to coincide with the hair-cross when one looks through the guide-tube. Then the head is arranged in a fronto-occipital or bitemporal direction, or in the position desired, in such a way that corresponding symmetrical points (e. g. the hearing passages, processus occipitalis-externa the base of the nose) are arranged horizontally through the two side guide-pegs and vertically through the upper centering-peg. In many cases it is sufficient to arrange the object through the hair-cross and the upper centering-peg. The head is now fixed by wedging in the pelottes in the way that is shown in figure 3 and the position is controlled. Then the centering-peg is removed and the roentgen tube is mounted. It is now possible to take pictures at different angles, and it is also easy to take stereoscopic pictures, as the apparatus is graduated in such a way that a movement of 10° corresponds to the distance between the pupils.

This apparatus makes it possible to take pictures with a very small diaphragm and to make a uniform reproduction of arrangements and symmetrical adjustments e. g. the maxillary joints, processus mastoideus, canalis opticus, porus acust. intern., foramen ovale et. cet. by using the angular values found in photographing dry skulls. As examples pictures are shown below of maxillary joints, processus mastoideus, foramen ovale with the use of the angles stated on the pictures. A future memoir will throw detailed light on the diagnostic results that have been obtained by the use of this apparatus.

II. Apparatus for Skeletal and urogenital Investigation

(Fig. 2)

This apparatus differs from the above mainly in its size. The arc has a radius of 65 cm. and can be swung upwards from the table. This gives the advantage that the patient can be lifted on to the table without needing to be drawn through the arc. Other features in the design of the apparatus are shown in the figures.

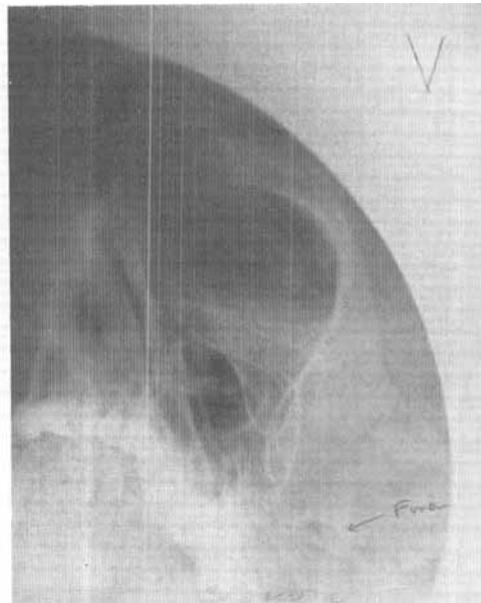
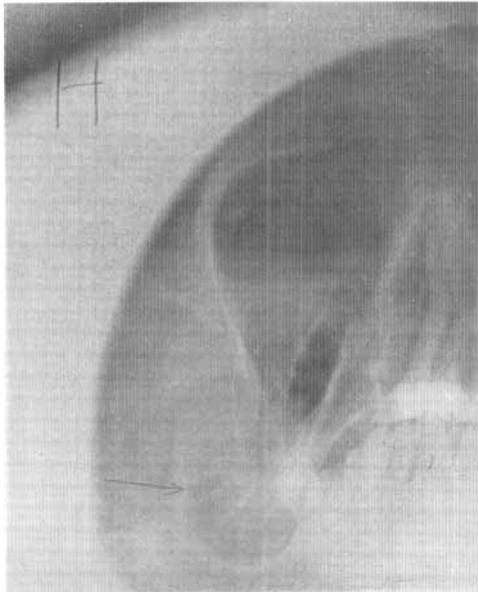


Fig. 1. Right and left foramen ovale.

Fig. 2.

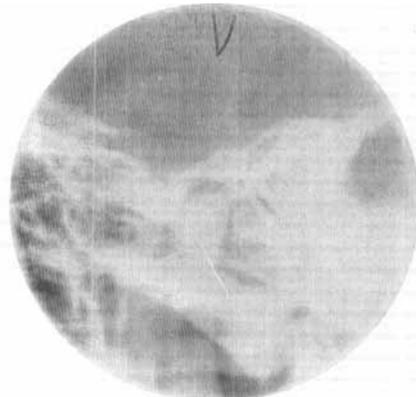


Fig. 3. Right and left maxillary joint 3° occipital 5° caudal.

Fig. 4.

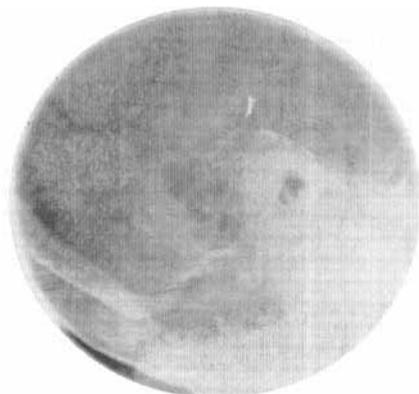


Fig. 5. Proc. mastoideus 20° occipital 15° cranial.