

**Radiograms taken during Labour from its onset  
until the Head is Born, indicating the  
Position of the Anterior and  
Posterior Shoulders**

BY

DR. N. A. PURANDARE, M.D., F.C.P.S.

*Hon. Visiting Obstetrician, Sir N. M. Wadia Maternity Hospital;  
Hon. Gynaecologist, King Edward Memorial Hospital, Bombay;  
Hon. Lecturer in Midwifery and Gynaecology, Seth G. S. Medical  
College, Bombay.*

IN the latter weeks of pregnancy the recognition of the anterior shoulder helps to distinguish positions in vertex presentation, and to estimate the amount of engagement of the head. If it is followed during labour the anterior shoulder is serviceable in showing how the labour is progressing and whether the internal rotation has begun. The latter information is very useful, especially in relation to the occipito-posterior position. The descent of the anterior shoulder can be estimated by measuring its level on the middle line from the top of the symphysis pubis. So long as it is above the brim, it can be distinguished by abdominal palpation. But when it has further descended, it becomes the more difficult to make out by palpation. It is then that radiograms are helpful in determining the exact situation of the shoulder in the pelvis. Realizing this, a series of radiograms was obtained from the onset of labour to the delivery of the head in the left occipito-anterior and the right occipito-posterior positions. But the task of taking the series was not easy: first to have a complete series until the head was delivered, the patient had to be confined on the X-ray table, there taking all the necessary aseptic precautions. During this exposure, though short, either the mother or the child moved obscuring one of the films and entailing taking a fresh series. Sometimes, the exposure may turn out to be more or less than needed. In this way several series had to be spoiled and, therefore, much time was wasted.

## POSITION OF THE ANTERIOR AND POSTERIOR SHOULDERS

While taking the series, the first thing that impressed me as I obtained the lateral views was to find in the occipito-posterior position the cervical spine not merely straight from extension of the head, but it even appeared over-extended with the convexity forward. This state of the cervical spine was maintained until the head descended on the pelvic floor. When this peculiarity was first noticed, it occurred to me that it might be accidental; so more radiograms representing the lateral view were taken of other cases with occipito-posterior position, which also showed the same thing. It thereby conclusively proves that such condition is always present.

Again as the head glides over the perineum and undergoes internal rotation, the trunk does not follow the internal rotation of the head to the same extent in both anterior and posterior positions. In the anterior position the back nearly rotates forwards, carrying the spine almost to the middle and the shoulders to the sides, whereas in the posterior position the back rotates slightly forwards, the anterior shoulder just crossing the middle line. The explanation that can be advanced is that, in the anterior position the back, being to the front, can easily glide along the concave anterior wall of the uterus; while in the posterior position the back, situated behind, has to pass along the side of the uterus and then along the anterior wall, thus meeting with greater resistance. In consequence the back does not rotate so much forward as it does in the anterior position by the time the head is born. I can even maintain that I have during labour noticed corresponding rotation of the anterior shoulder by abdominal palpation, which I invariably do as I attend any case.

The radiograms also show that while the trunk is rotating the ribs on the side rotating forward are elongated and crowded together; whereas those of the posterior side are bulging out and separated, showing that the anterior side is subjected to more compression. This compression of the anterior side of the chest is most when the posterior shoulder is sweeping over the perineum. This, however, is not to be seen in the anterior position when the back has completely rotated forwards and the shoulders are lying transversely. Here I must contend that in some of the anterior positions the rotation of the back is complete before the head is liberated, while in others it is incomplete and the shoulders are then seen lying midway between the oblique and the transverse diameters. This accounts for what is observed after the head is released, viz. that in some cases in which the back rotates forward completely, the head remains looking to the perineum

without undergoing restitution from half a minute to two minutes, while in others with incomplete rotation restitution is noticed on delivery of the head.

In the posterior position the internal rotation of the back, as stated above, has not been observed to be complete. Besides this, in this position the spine appears to be more extended and the pelvic pole even slightly bent back.

I have much pleasure in acknowledging with thanks the great help that I received from Dr. B. R. Pathankar, M.D., M.S., in taking the radiograms.

ANTERIOR POSITION: VERTEX I.  
(Thick lines represent Anterior Shoulder.)

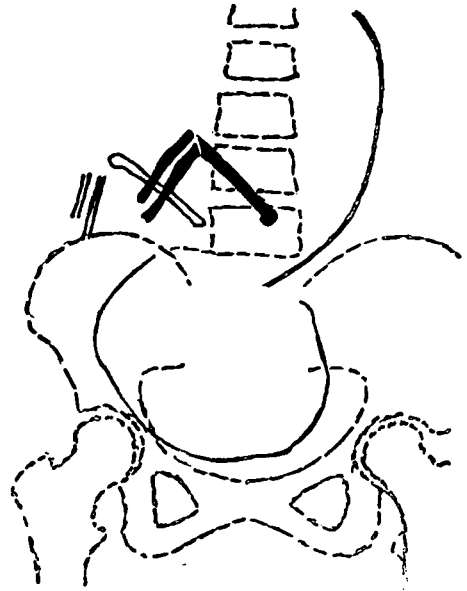


FIG. 1. At the onset of labour, the anterior shoulder is to the left of the middle line and the posterior to the right, both at the level of the fifth lumbar vertebra. The shoulders are as though in the direction of the right oblique diameter.

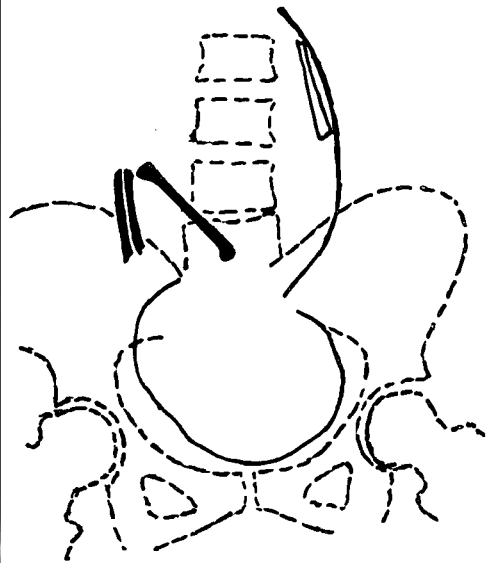


FIG. 2. Internal rotation has begun. The anterior shoulder is at the level of the middle point on the promontory of the sacrum. The anterior arm crosses the spine obliquely upwards and to the right, the forearm is flexed. The posterior arm has passed over the spine and is lying some distance to the left of it. The back has turned a little forwards.

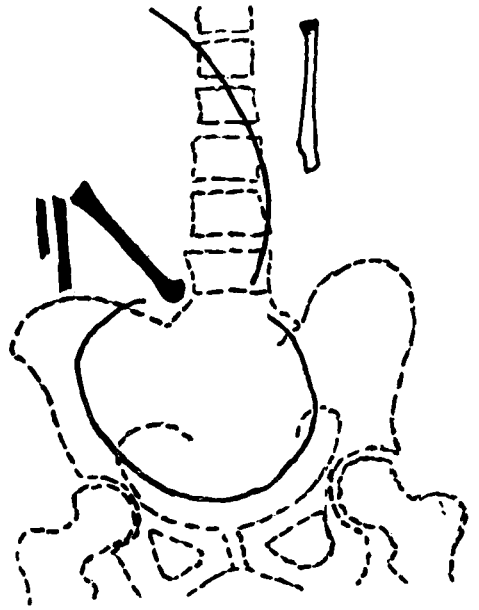


FIG. 3. Further internal rotation. The anterior shoulder has come to the right of the promontory. The back has turned forward and the posterior shoulder is rotating forward and is seen farther from the mother's spine.

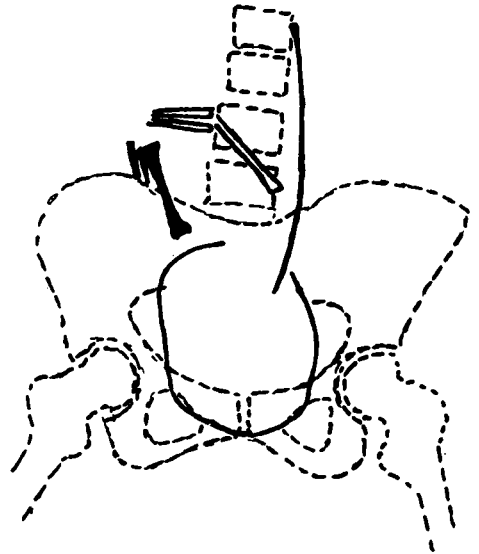


FIG. 4. The head has descended to the lower border of the symphysis pubis but is yet oblique, the internal rotation not being complete. The anterior shoulder has turned more towards the right side, the shadow is seen as if in front of the right wing of the sacrum. The posterior shoulder has descended and is at the upper border of the last lumbar vertebra, the arm crossing the spine obliquely to the right; the back has turned still more forwards and the spine has become straight from extension.

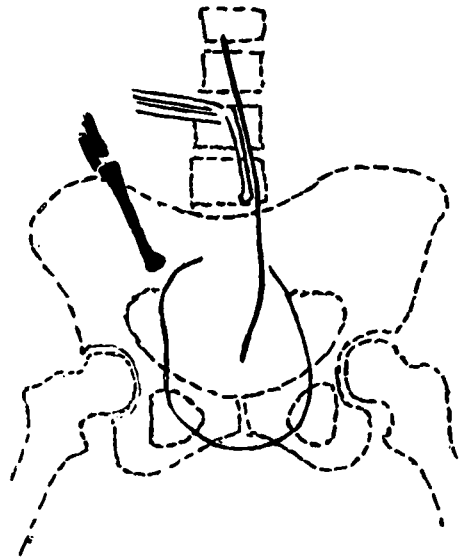


FIG. 5. The occiput is rising in front of the os pubis; the internal rotation of the head is approaching completion. The shoulders are at the level of the pelvic brim. The back is almost to the front.

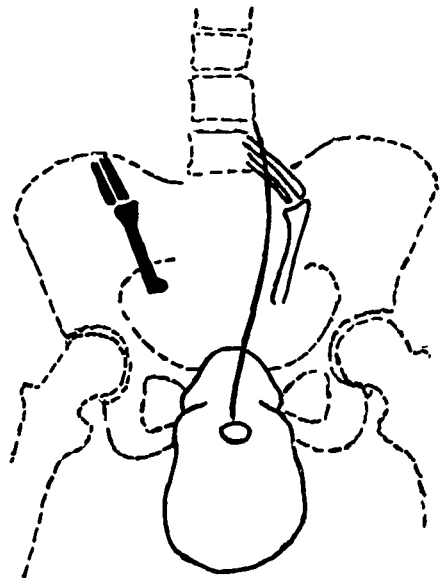


FIG. 6. The head is crowned and is lying antero-posteriorly. The shoulders are in the cavity, both being nearly at the same level and lying in a diameter midway between the transverse and oblique diameters. Marked extension of the spine is seen in the cervical and upper dorsal regions.

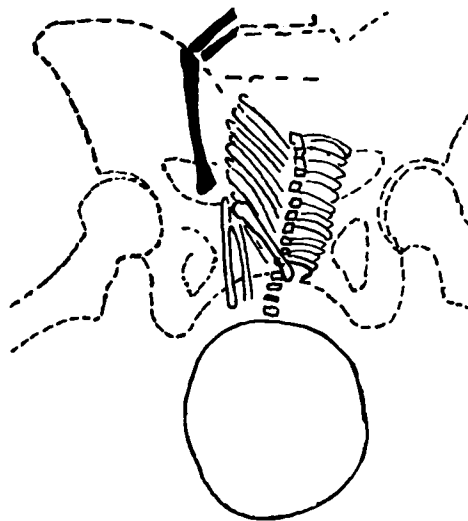


FIG. 7. The head is delivered. The posterior shoulder is gliding over the perineum and is at a very low level. The anterior shoulder is high, at the level of the sciatic notch. Since the posterior shoulder is gliding over the perineum the anterior side of the thorax (the right side of the chest) is bent over the posterior side (the left side), the ribs are brought closer together.



POSTERIOR POSITION: VERTEX III.

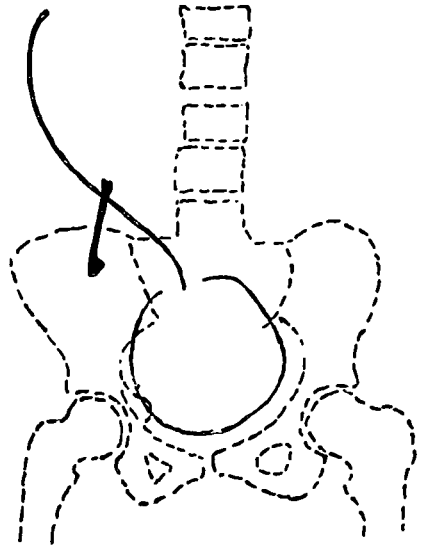
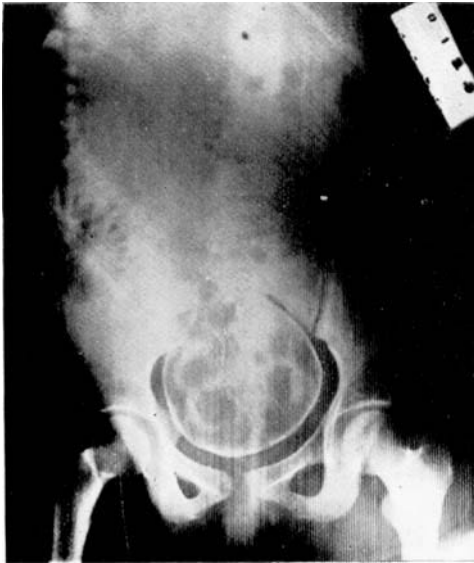


FIG. 1. The anterior shoulder is faintly visible, situated laterally and in front of the iliac fossa. The posterior shoulder is not discernible. The spine is to the right and behind.

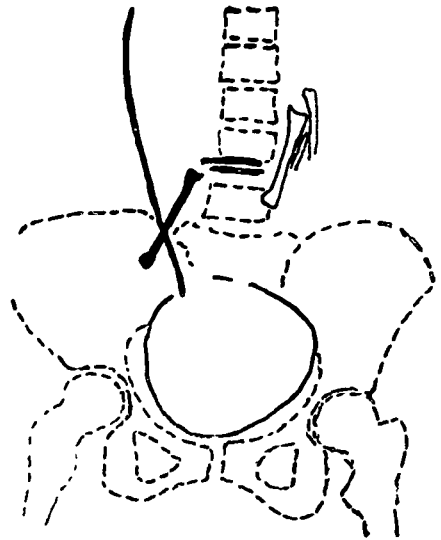


FIG. 2. The head has descended farther; the shoulders are in the direction of the left oblique diameter, the anterior lower than the posterior. The anterior is as if in front of the iliac fossa at its upper part, the posterior to the left of the spine at the level of the second to the fourth lumbar vertebra.



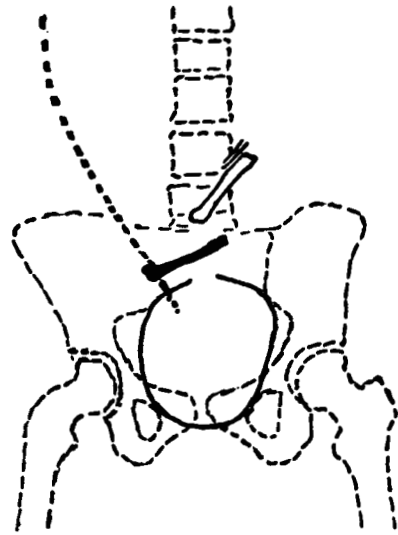


FIG. 3. The head has approached to the lower border of the os pubis and is directed obliquely. The shoulders are above the level of the pelvic brim. The posterior shoulder is against the fifth lumbar vertebra at its middle. This shows that the back has turned a little forwards and become less bent.

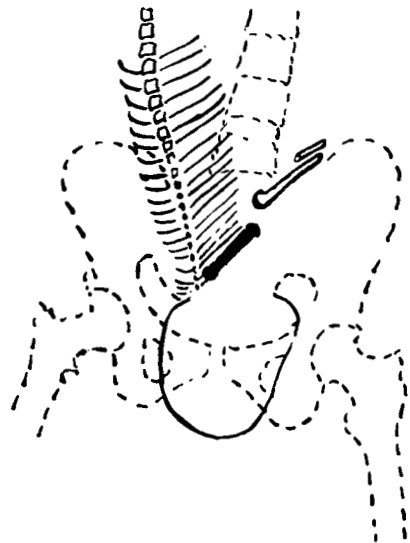


FIG. 4. The occiput has descended below the pubis. The shoulders are below the brim. The anterior shoulder has rotated inwards but is just to the right of the middle line. The spine has extended and is nearly straight. The back has turned more forwards.

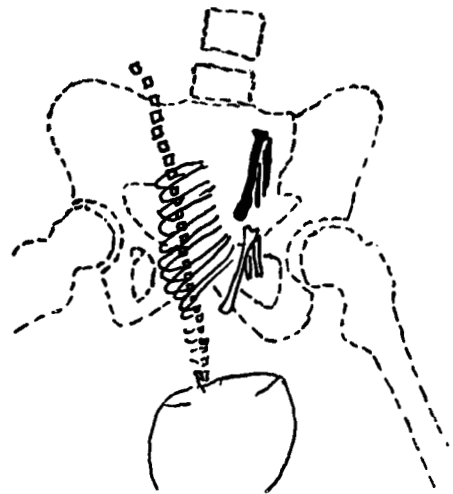


FIG. 5. The head is delivered. The posterior shoulder is gliding over the perineum and has come to a level below the lower border of the pubis; the anterior shoulder is steady at a higher level, a little to the left of the middle line. The left side of the chest is bent as the right shoulder is sweeping over the perineum. The spine is somewhat over-extended below.

ANTERIOR POSITION. VERTEX I.  
(Indicating complete rotation of the back.)

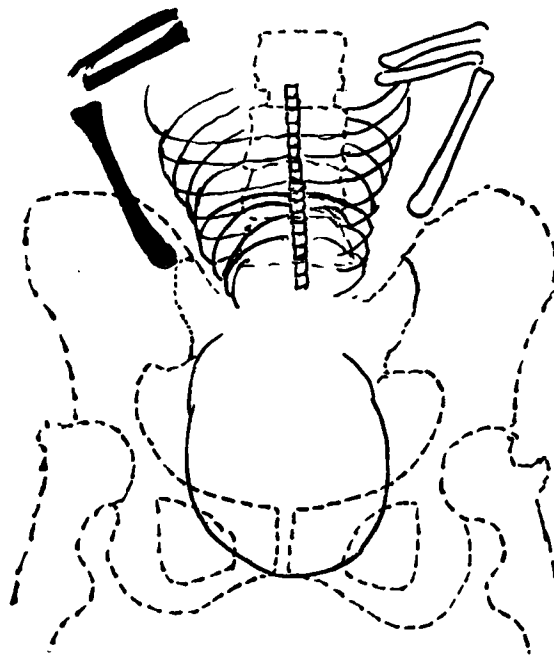


FIG. 1. The occiput has reached the lower border of the pubis and is lying in the antero-posterior diameter. The back has completely rotated forward. The shoulders are in the transverse diameter.

**Radiograms taken during Labour from its onset until  
the Head is Born, indicating the Position of the  
Anterior and Posterior Shoulders**

BY

N. A. PURANDARE, M.D., F.C.P.S.

*Hon. Visiting Obstetrician, Sir N. M. Wadia Maternity Hospital;  
Hon. Gynaecologist, King Edward Memorial Hospital, Bombay;  
Hon. Lecturer in Midwifery and Gynaecology, Seth G. S. Medical  
College, Bombay.*

It appears when the skiagrams indicating the varying positions of the anterior and posterior shoulders during labour as it progresses, sent for publication and published with the original article,\* the skiagrams of the lateral views of the left occipito-anterior and the right occipito-posterior positions miscarried, and were not printed.

These lateral views are important, as they show how far the head had sunk into the cavity when it was engaged and how the attitude of the back and head varied in both positions. The posterior one is interesting, as it exhibits quite definitely the extension of the back as being opposed to the mother's convex spine, and the consequent deficient flexion of the head. The spine is almost straight in the back, but, on looking at the neck, it appears hyperextended, thus inducing slight extension of the head and bringing the occipito-frontal diameter across the pelvis before the onset of labour, and not the suboccipito-frontal as is usual in the anterior position.

The case on which the skiagram was taken was followed during labour and was confined naturally in the reduced right occipito-anterior position. The notes are as follows :

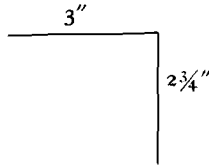
Sakhubai Ganpat, age 20 years, 1-para, registered number 1930, X-ray number 130 of 36. Position vertex III, head more than half engaged, the

---

\* See pages 726-728.

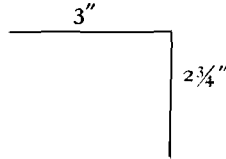
## POSITION OF THE ANTERIOR AND POSTERIOR SHOULDERS

measurements of the anterior shoulder being  $2\frac{3}{4}$  inches high above the symphysis pubis and 3 inches away from the middle line:



Pelvic diameters, I.S.  $8\frac{1}{2}$  inches, I.C.  $9\frac{1}{4}$  inches, Ext. Conj. 7 inches. Admitted with labour pains on 12th September 1936 at 7.45 p.m., with weak labour pains from 4 p.m.

Measurements of the anterior shoulder at the time of admission were:



First stage: from 4 p.m. to 12.50 a.m. (8 hours 50 minutes); pains weak.

Second stage: from 12.50 a.m. to 2 p.m. (1 hour 10 minutes); contractions strong.

Third stage: from 2 a.m. to 2.10 a.m. (10 minutes); placenta and membranes intact (delivery as the second position). Baby: female; perineal tear, one stitch).

The radiogram of this case representing the side view in the right occipito-posterior position taken before the onset of labour shows clearly the altered attitude of the back and neck and deficient flexion of the head, but in the course of labour the flexion of the head became complete, overcoming the hyperextension of the cervical spine, and the case ended in occipito-anterior delivery.

LATERAL VIEW. VERTEX I.

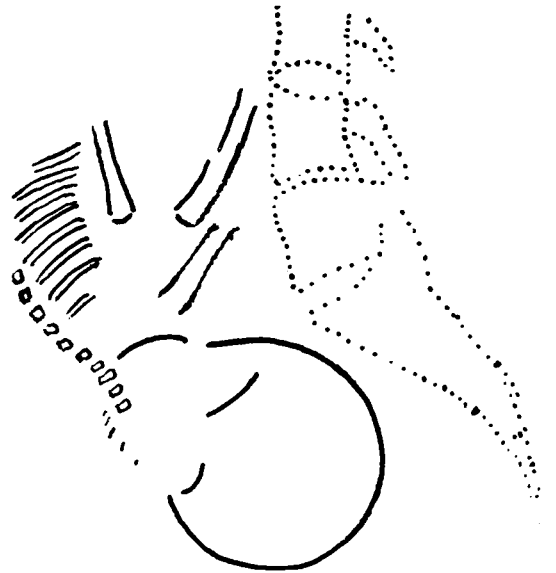
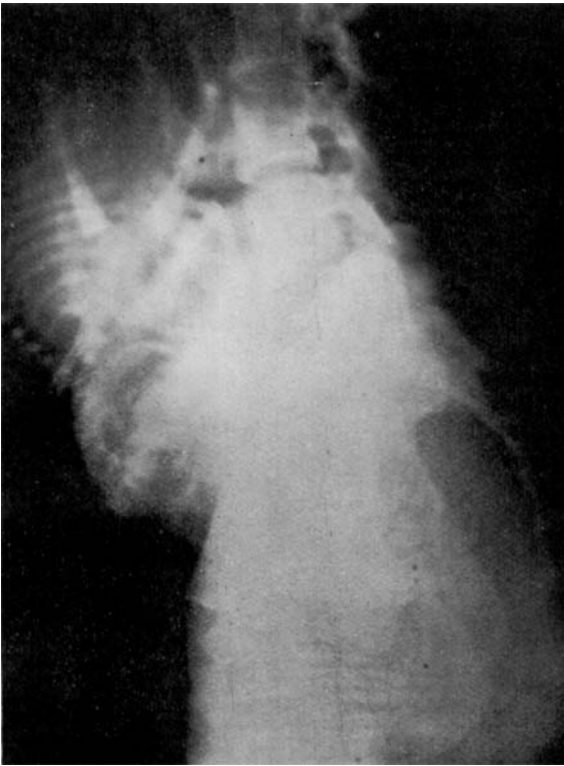


FIG. 1. Vertex I. Back: To the front away from the mother's spine. Bent forward. Head: Occiput forwards, face behind; diameter of engagement, sub-occipito-frontal.

LATERAL VIEW. VERTEX III.

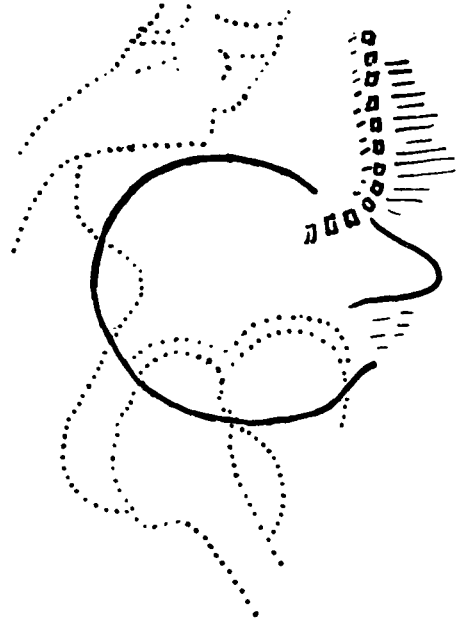
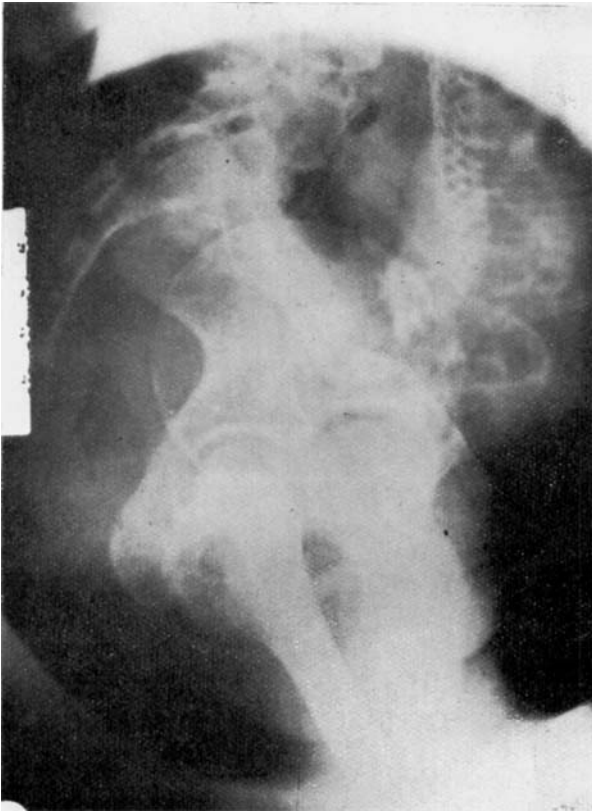


FIG. 2. Vertex III. Back, in front of the spine, straight, hyperextended in the neck. Head: occiput behind, deficient flexion; diameter of engagement, occipito-frontal.