

Studies in Sex Physiology, No. 14.

The Situation of the Developing Foetus in the Uterus of the Live Merino Sheep.

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IN a previous study (Curson and Quinlan, 1934), the opinion was expressed that the most suitable time to gain knowledge concerning the situation of the developing foetus would be during life. Such an opportunity presented itself when sheep D.O.B. 37782 and D.O.B. 37931 were made available for X-ray examination.

According to Arey (1931) bone begins to appear in man after the seventh week, so the first attempt to X-ray the developing foetus was left to the 59th day (Sheep 37782), but no foetal skeleton was observed. Actually centres of ossification in the Merino foetus may be seen in the metacarpal and metatarsal bones as early as the 45th day.

While the lateral recumbent position would have suited best for photography, it was considered that the most reliable picture would be obtained by photographing the uterus transversely while the ewe was in the standing position. In this way uterine displacement was obviated.

The ewe, during the taking of the photographs, was kept on a ration low in roughage (a little teff hay), so as to reduce the transverse diameter of the rumen. In addition $\frac{3}{4}$ lb. crushed oats, $\frac{1}{2}$ lb. crushed maize, and a little green barley *per diem* was given. No food or water was allowed during the 24 hours prior to photographing.

The ewe was strapped loosely in the standing posture to a rotary Potter-Buchy diaphragm. The exposure was as follows:—K.V. 90; M.A. 200; time 0.2 seconds; distance 30 inches and supra-screens were used. Longer exposures than 0.2 seconds were unsatisfactory owing to the blurring of the negative by respiratory movements and secondary rays.

Penetration of the contents of the rumen is not easy at such low kilovoltages as will not completely penetrate the developing bones.

The situation of the foetuses at the various intervals was as follows:—

Ewe 37782 (served 21st August, 1933.)

- Fig. 1 (73 days). *Presentation posterior; position of foetus lumbo-iliac.*
- Fig. 2 (87 days). *Presentation anterior; position of foetus dorso-ilio-pubic.*
- Fig. 3 (107 days). *Presentation anterior; position of foetus dorso-sacral with lateral cephalic rotation.*
- Fig. 4 (129 days). *Presentation posterior; position of foetus lumbo-pubic.*
- Fig. 5 (134 days). *Presentation anterior; position of foetus dorso-iliac.*

On the 142nd day (10th January, 1934), a ram lamb (D.O.B. 38853) was born.

Ewe 37931 (served 5th September, 1933.)

- Fig. 6 (92 days). *Presentation anterior; position of foetus dorso-iliac.*
- Fig. 7 (114 days). *Presentation anterior; position of foetus dorso-ilio-sacral.*
- Fig. 8 (119 days). *Presentation posterior; position of foetus dorso-ilio-pubic.*
- Fig. 9 (140 days, taken at 9.15 a.m.). *Presentation anterior; position of foetus dorso-ilio-pubic.*
- Fig. 10 (140 days, taken 3 p.m.). *Presentation anterior; position of foetus dorso-pubic.*

On the 150th day (2nd February, 1934), the female lamb 28959 was born.

It will be seen at once after studying the above figures that the "defined position" of Franck (quoted by De Bruin) or "very nearly constant position of Craig did not apply to the ewes in question. Apart from the alterations of the foetal position the presentation actually changed three times (Ewe 37782) and twice (Ewe 37931) respectively, as recorded by the X-ray photographs. How many times there were alterations in presentation during the intervals it is impossible to say. There is therefore no doubt but that the situation of the foetus varies a great deal. The factors, however, underlying the regulation of foetal situation are not clearly understood. In the circumstances it is perhaps helpful to compare the foetus *in utero* to a ship at anchor, which moves on the anchor as the currents and winds compel. In the foetus, however, there is in addition some factor which in the final stages brings about cephalic presentation.

The photographs are reduced approximately to one-sixth of the original and details are therefore not as distinct as in the X-ray negatives.

We are much obliged to Mr. T. Meyer for making the prints.

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Fig. 1.

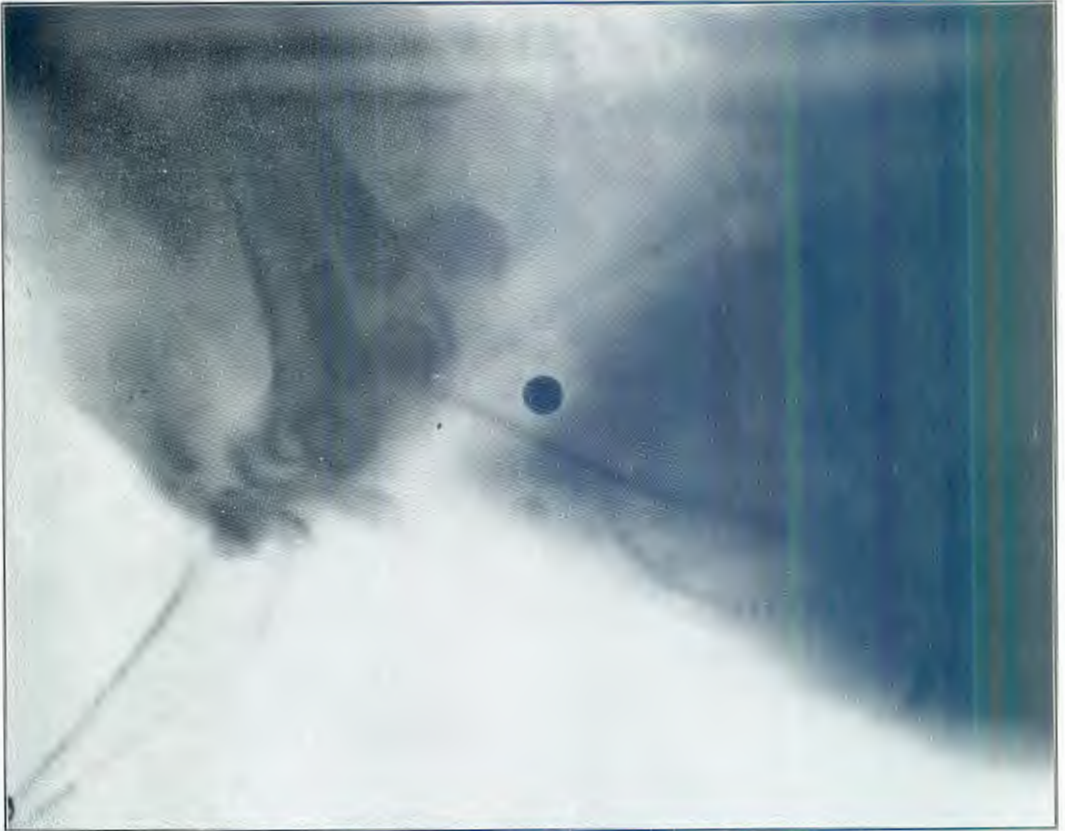


Fig. 2.



Fig. 3.



Fig. 4.

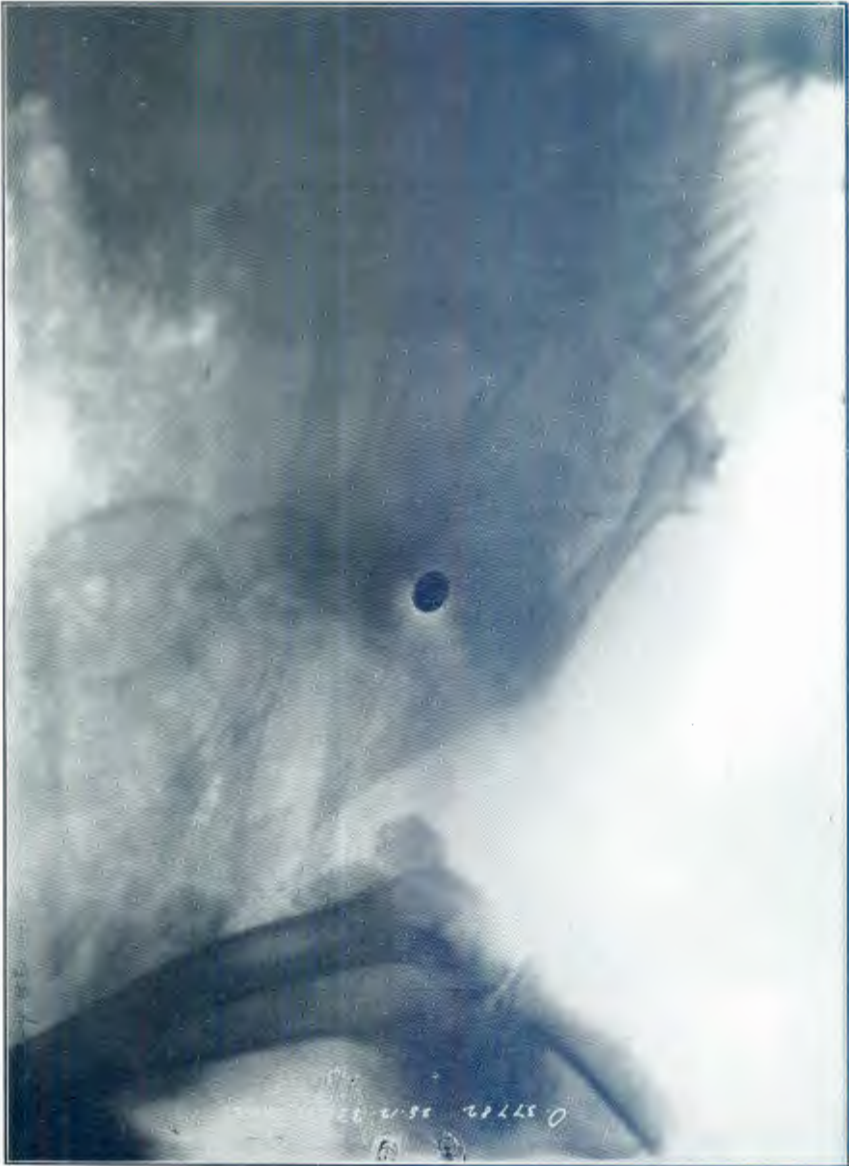


Fig. 5.



Fig. 6.



Fig. 7.



Fig. 8.

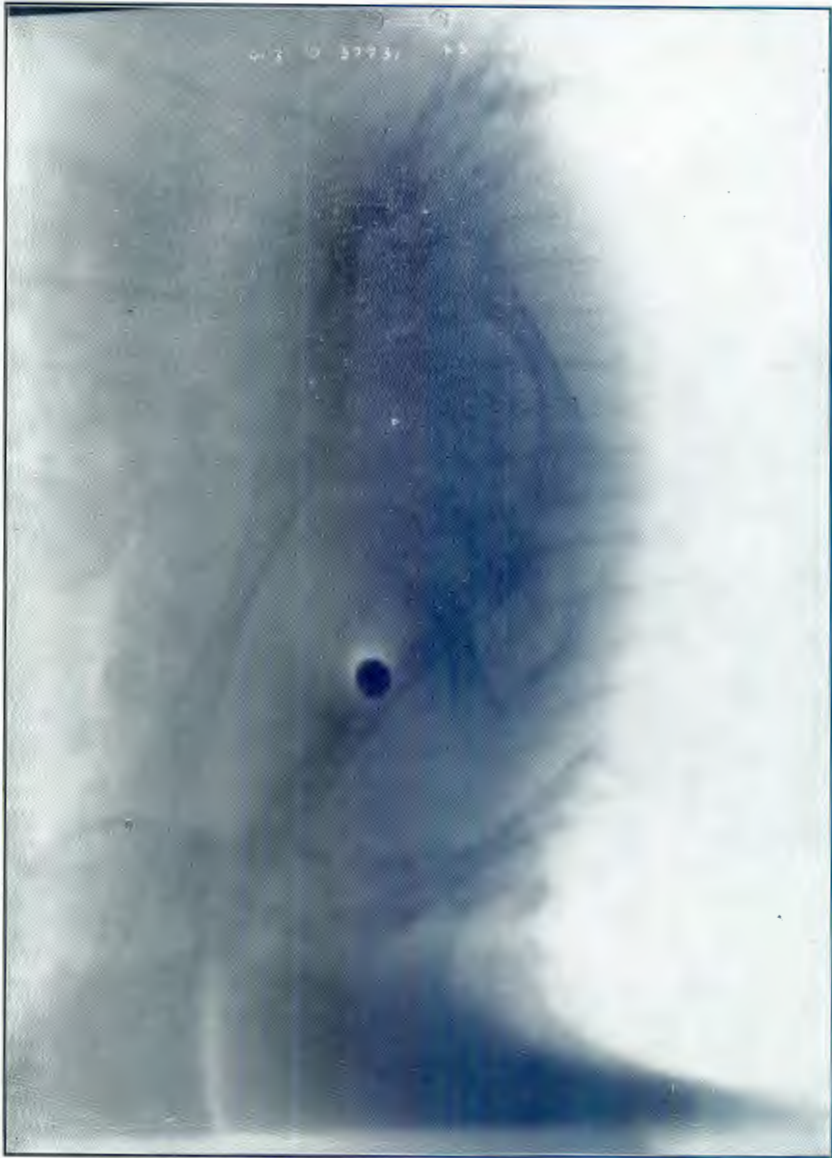


Fig. 9.

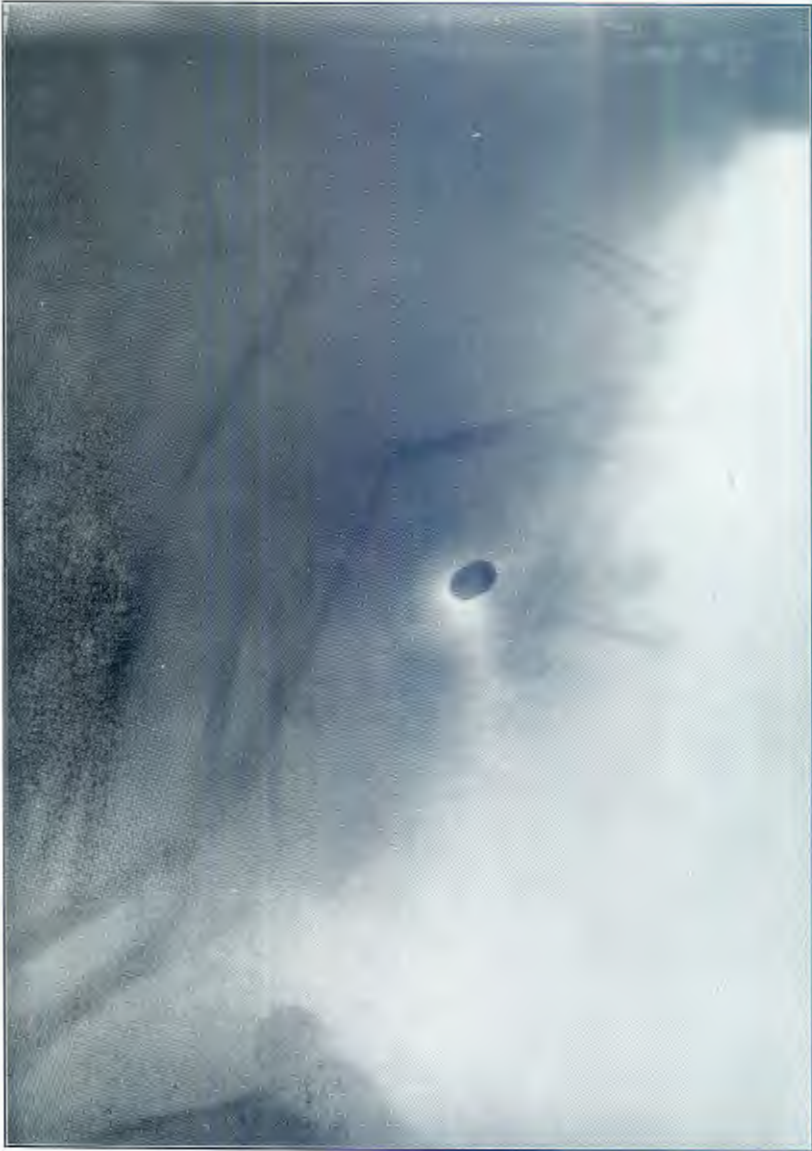


Fig. 10.