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Calcium Content of Maternal and Foetal Blood Serum Following Injection of Parathyroid Extract in Foetuses in Utero.

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In considering the changes in the maternal organism during pregnancy many observers from the time of Rokitansky have noted alterations in the teeth and skeletal tissues.[1] In this connection, Seitz[2] has pointed out that "of all the mineral substances, calcium passes in the greatest amount from the mother to the foetus" during gestation. It has been found also that about the time of very active development of bone in the foetus, which probably necessitates the mobilization of a considerable supply of calcium in the foetal body, the parathyroid glands of the embryo are already differentiated morphologically.[3] Of immediate interest, however, are the recent investigations of Collip,[4] as a result of which there is available an extract of the parathyroid glands which exerts a powerful influence on the mobilization of calcium in the blood. By means of this highly concentrated parathyroid substance, the old problem of the mechanism which is involved in the exchange of calcium from mother to foetus is reopened to experimental inquiry from a new angle. The possibility of the escape of active parathyroid substance from the foetus to the mother across the placental boundary, can be tested by direct observation.

In the present experiments, parathyroid extract was injected into foetuses *in utero*. Observations were made upon the calcium content of the maternal blood serum at intervals of about 4 hours, in order to detect any changes in the calcium level of the maternal blood, such as might be produced by the escape of parathyroid substance into the maternal circulation. About 17 to 22 hours after the injection of the foetuses, the uterus was opened and blood samples for calcium determinations were taken from all of the foetuses. The

TABLE I—Calcium Content of Maternal and Foetal Blood Serum following the Injection of Parathyroid Extract in Foetuses *in Utero*.

					Serum Calcium (mg. per 100 cc.)					Control		
					Foetal		Maternal				Serum Calcium	
Dog No.	Stage of Pregnancy	Weight (kilos)	Units of Parathyroid Extract Inj.	Number Foetuses Injected	Injected Foetuses	Non-injected Foetuses	Before injection of Foetuses	Highest level during experiment	Duration of Experiment (hours)	Dose (units)	Before injection	After injection
1	Near term	12.1	120	4	18.2 14.8 16.2 18.4	12.6 12.1 12.5	11.1	11.3	21	70	10.7	15.4
2	Very near term	24.3	100	3	13.5	13.8 13.3 13.2 13.5 13.8 13.4 14.0 13.1 13.4	11.2	10.3	21½	100	10.1	14.8
3	Near term	20.4	100	3	14.0 15.8 16.0	12.0 13.0 12.3 12.2 12.8 12.6 12.2	11.2	11.0	18	80	11.2	13.2
4	Near term	16.7	100	3	17.2 18.6 17.3	13.8 13.6 13.6	11.9	12.0	17	60	11.0	15.1
5	About 8 weeks	16.0	100	5	15.8 19.2 19.8		9.8	11.1	22	(See above)		

findings in the case of each dog are summarized in Table I, and the procedure in a typical experiment is outlined in the graph (Fig. 1).

In these experiments in which parathyroid extract (Collip) was injected into foetuses in the dog, there is no evidence that the active substance reached the maternal circulation, as indicated by the calcium content of the maternal blood serum. The foetal blood serum obtained at the end of each experiment was found in the non-injected foetuses to be about 1 to 3 mg. higher in calcium than the maternal serum. In foetuses which had been injected previously with parathyroid substance, the calcium content of the serum was more than 3 mg. higher than in the maternal serum. The present

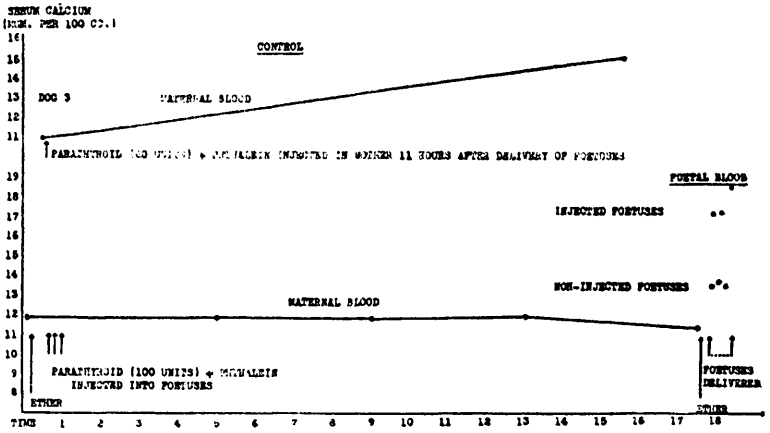

FIG. 1.

findings in the case of parathyroid extract are in agreement with previous observations which have been made upon the effect on the mother of the injection of insulin, adrenalin, and pituitrin in rabbit and guinea pig foetuses, *in utero*. No evidence has been obtained that these endocrine substances pass from foetus to mother across the placental boundary.[5]

The parathyroid extract (Collip) or "Para-thor-mone" used in the experiments was donated by Eli Lilly & Co.

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Cephalically Situated Respiratory Mechanism in the Brain Stem of the Cat.

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The origin and course of the reticulospinal tracts in the cat, recently described by Papez[1] suggested the possibility of their being respiratory tracts. It was thought that this problem could best be ap-