vessels of the autologous cell masses with no suggestion of formation of new endometrial tissue. These results are in agreement with the distribution of the characteristic lesions in cases of human ectopic endometriosis. While Sampson[1] has found a venous dissemination of endometrial tissue within the human uterus and possibly in the groin, no instance of metastasis of non-neoplastic endometrial emboli has yet been observed above the diaphragm.

Halban[2] invoked lymphatic metastasis from the uterus to explain ectopic pelvic endometriosis, especially its extraperitoneal locations. He had recognized characteristic uterine glands in the regional lymph nodes. Glands have been found in pelvic lymph nodes in both the male and female but without typical endometrial stroma or menstrual reaction. However, since a venous invasion has been proved a lymphatic dissemination is at least theoretically possible.

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Effect of Parathyroid Hormone and Sodium Acid Phosphate on Bones of Guinea Pigs.*

ROBERT C. GRAUER. (Introduced by Samuel R. Haythorn.)

From the William H. Singer Memorial Research Laboratory, Allegheny General Hospital, Pittsburgh, Pa.

When parathyroid hormone is administered to normal subjects there is a rise in the serum calcium and a decrease in the serum phosphorus. Albright and Ellsworth believed that, following the administration of parathyroid hormone, the body fluids became depleted of phosphorus as evidenced by falling serum phosphorus; the tendency to make up the deficiency of the phosphorus and consequently the phosphate ions in the blood serum was met by removing calcium phosphate from the bones and a rise in the serum calcium ensued.

The recognition of the relationship of decalcification of bone in clinical hyperparathyroidism (fibrous osteodystrophy) and the experimental production of similar lesions by the use of the hormone of the parathyroid gland have interested us in the study of the

[1] Sampson, J. A., *Am. J. Path.*, 1927, **3**, 93.

[2] Halban, J., *Wien. klin. Wchnschr.*, 1924, **37**, 1205.

* The parathyroid hormone employed in this experiment was kindly supplied by the E. R. Squibb Co.

effect of simultaneous injections of phosphate and parathyroid hormone. Three groups of growing guinea pigs whose average weight was 215 gm. were employed. One group of 3 animals received increasing daily doses of parathyroid hormone beginning with 5 units and were injected for 25 days. The second group received daily increasing doses of $Na_2HPO_4.12H_2O$ in aqueous solution so that 1 cc. of the solution equaled 0.075 gm. of Na_2HPO_4 or 0.05 gm. of PO_4 or 0.0163 gm. of P. The injections were made daily into the peritoneal cavities, beginning with ¼ cc. and gradually increasing the dose to 1 cc. Preliminary injections had shown that a dose of over 1 cc. was rapidly fatal. The third group received subcutaneous injections of parathyroid hormone and intraperitoneal injections of the phosphate solution simultaneously. The doses were given in the same amount as that administered to the control groups. The diet allowed the animals was the same as that given our regular stock guinea pigs and consisted of white bread, leafy greens, hay and oats.

The combined action of parathyroid hormone and sodium acid phosphate was considerably more toxic to the guinea pigs than either the parathyroid or phosphate solutions alone. The injection of 5 units of parathyroid and ¼ cc. of phosphate produced a mild transient tetany that lasted for a few minutes, while the control groups were symptomless. Tetany was observed in the control animals only when the dose of phosphate injected alone was over ½ cc. The toxicity became more pronounced with the advance of time so that the animals receiving phosphate plus parathyroid hormone were either found dead or were *in extremis* at the end of 19, 20, and 22 days respectively. The total amount of parathyroid hormone administered to the control animals varied from 250 units to 370 units. The total amount of phosphate and parathyroid hormone given to the group which received simultaneous injections varied from 220 units of parathyroid to 310 units and from 11 cc. to 14 cc. of phosphate solution. Sections were taken from all the bones and from the soft tissues. They were fixed in Zenker's fluid, decalcified with 2% nitric acid and were stained with phloxine and methylene blue.

We wished to observe the toxic effects of the phosphate solution on an animal that had received parathyroid for a length of time. One control animal, after having received daily injections of parathyroid hormone for 23 days, was given 2 intraperitoneal injections of ½ cc. each of phosphate solution on the 24th and 25th days respectively. This guinea pig showed marked weakness of the ex-

tremities on the morning of the second day and was found dead a few hours later.

Microscopic studies of the long bones and costochondral junctions of the ribs revealed marked differences in the degree of decalcification in the respective groups. The control parathyroid guinea pigs showed osteoclastic activity and fibrous replacement at the costochondral junctions with a minimal amount of lacunar resorption in the corticalis. The long bones showed the greatest amount of osteoclasis and fibrous ingrowth, though this was pronounced, at the growing ends of the bones with lesser lacunar resorption and fibrous replacement in the shaft.

Those animals that received the phosphate solution in addition to parathyroid hormone showed a greater degree of fibrous replacement in the shafts of the long bones, in the marrow cavity, and more active osteoclasis throughout. It required twice the amount of parathyroid hormone alone to produce the degree of decalcification and other pathologic changes observed in fibrous osteodystrophy *(Osteitis fibrosa cystica)* than when parathyroid and the phosphate solution were used together. All the sections in this group showed wide hemorrhagic areas in the marrow cavities of the long bones.

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Anterior Pituitary Therapy and Uterine Motility in the Unanesthetized Rabbit.

SAMUEL R. M. REYNOLDS.* (Introduced by Ferdinand C. Lee.)

From the Department of Embryology, Carnegie Institution of Washington, Baltimore.

In earlier experiments[1, 2] on the action of the ovary-stimulating substance of human urine of pregnancy on uterine motility, it was shown that the contracting uterus of the unanesthetized rabbit either approaches the quiescent state or becomes fully quiescent 5 to 7 hours following a single intravenous injection of this material. This takes place whether or not the ovaries are present and so may happen independently of ovarian tissues which might contribute to

* Fellow in Medicine, National Research Council, 1931-32.

[1] Reynolds, S. R. M., *Am. J. Physiol.*, 1932, **100**, 545.

[2] Reynolds, S. R. M., and Friedman, M. H., *Am. J. Physiol.*, 1930, **94**, 705.