some, ending in a broad flat and somewhat stiff tendon of insertion 2.74 centimeters long.

The slender round tendon of origin passes along the line of origin of *M. sartorius* on the crest of the ilium. The fleshy part and one centimeter of the flat tendon lie free amongst the layers of loose fascia so common in this region. Fleshy origin fibers of *M. gracilis* arise along the posterior 1.7 centimeters of the flat tendon, and for 1.2 centimeters of this from the tendon alone, the origin then shifting to the pubis. The flat tendon inserts on the anterior and ventral border of the pubis immediately lateral to the pubic symphysis. The position of this singular muscle suggests either a modified or abnormal Poupart's ligament.

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THE EFFECT OF PROLACTIN ON THE ESTRUS CYCLE OF NON-PAROUS MICE

THE mammary milk secretion is governed by a specific pituitary hormone which is independent of the growth- and gonad-stimulating hormone of the pituitary. It was first isolated by Riddle, Bates and Dykshorn[1] and named prolactin. Prolactin does not affect the mammary glands of normal adult guinea pigs or rabbits, unless they have been previously prepared for about three weeks with theelin and progestin. Moreover, it acts when injected in similarly prepared male or female animals that have been castrated or hypophysectomized. Crew and Miskaia[2] noted that the length of the lactation interval (from the estrum after parturition to the estrum at the close of lactation) extends for from 20 to 25 days. The question arises whether this delay in estrum is caused by the corpus luteum or the pituitary hormone prolactin. If this former were true, the injection of prolactin should not influence the estrus cycle in the non-parous animal.

Accordingly, the estrus cycle of 30 mature young female mice was studied over a period of one month. At the end of that time, 14 mice, whose cycles had been absolutely regular, were selected. These 14 mice were injected subcutaneously with one bird unit of prolactin[3] daily, over a period of 30 days. Daily examinations showed that no changes occurred in the mammary glands as the result of the prolactin. Twenty-four hours after the prolactin injections were begun, the estrum became suspended. Daily vaginal smears from all mice showed no estrum during the following 20 to 25 days. It reappeared after this period of 20 to 25 days in spite of further continued injections of prolactin, and was markedly prolonged, continuing from 4 to 8 days. During these days the vaginal smears showed only non-nucleated epithelial cells.

These observations may be summarized: In the mature, nonparous mouse prolactin suspends the estrus cycle for about three weeks, after which a prolonged estrum sets in lasting from 4 to 8 days in spite of further continued injections. It would appear from this observation that the suspension of the estrus cycle during lactation is caused by the pituitary hormone prolactin, rather than a hormone from the corpora lutea.

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SCIENTIFIC BOOKS

FARADAY

Faraday's Diary. Edited by THOMAS MARTIN, M.Sc., and published by order of the Managers of the Royal Institution of Great Britain, with a Foreword by Sir William H. Bragg, O.M., K.B.E., F.R.S. G. Bell and Sons, Ltd., London. Vols. III, IV, V.

VOLUMES I and II of this great publication were reviewed in SCIENCE of January 13, 1933. Two more volumes are to follow. The books will be sold only in sets, of which 750 copies will be issued. The price of the set is twelve guineas.

The volumes now in hand show the same careful transcribing and editing as the earlier ones. They are beautifully printed and bound. The editor, the managers of the Royal Institution and the publishers are to be again congratulated on the further progress of this noble memorial.

In Volume III Faraday records the progress of his research on electrostatic induction, the earlier part of which was recorded in the previous volume. He was particularly interested in proving that induction could act along curved lines, similar to the curved lines of magnetic force. When he was able to show this experimentally he was led to the belief that these lines of force were evidence of a polarized condition of the medium between the two conductors. He was then led to think that some differences in inductive power might be shown if different media were used to transmit the inductions and so to the discovery

[1] *Amer. Jour. Phys.*, 105: 190, 1933.
[2] Allen, "Sex and Internal Secretion."

[3] The prolactin used was furnished by the Research Department of E. R. Squibb and Sons.

of the specific inductive capacity of dielectrics. The experiments by which this result was reached were extremely difficult to carry out, and subject to many sources of error, but these were finally overcome, and Faraday at last felt justified in recording the conclusion in note 4184 that "From the above and the other results, I cannot resist the impression that there *is a difference of inductive capacity in body.* I do not see how it can be explained away, though I try all I can for that purpose."

The rest of this volume is filled with records of experiments on the electric discharge in different gases, which led to no important conclusions; on the electric properties of the gymnotus; and on the origin of the electric current in voltaic cells, which Faraday ascribed to chemical action in opposition to the contact theory of Volta.

This last study runs over into Volume IV, but the entries are less numerous than in the earlier volumes. There are very few in 1840 and there is a gap of more than a year in which nothing is recorded. Faraday's strenuous labors had exhausted him. He was troubled with fits of giddiness and loss of memory, for the cure of which he was ordered a complete rest. To some extent he recovered his strength and was able to work again, but his defective memory still persisted, and indeed became more pronounced as the years went on, so that at least in one case he found when he had finished a long series of experiments that he had covered the same field eight months before. Faraday began work again in January, 1842, on the production of electric charge by steam issuing in a jet, a fact which had been discovered by Sir W. Armstrong. There is a gap of a year from February, 1843, to February, 1844, before he took up anything else, and then he returned to his earlier work on the liquefaction of gases, which he carried on with a certain measure of success, though he never attained the goal which he sought, the liquefaction of oxygen, nitrogen and hydrogen.

In the year of Faraday's inactivity Joule published his first paper on the mechanical equivalent of heat. The question of the "Correlation and Conservation of the Physical Forces" began to be discussed. Faraday saw in this question a field for experimental investigation, and much of his work from then on is concerned with this problem. He first set out to discover some relation between light and electricity, by sending a polarized ray through an electrolyte. He found no effect on the light. Nor was there any effect when the light was sent through various transparent bodies under electric stress. He then turned to magnetism, and after many trials with various transparent bodies without success, he finally introduced into the magnetic field a block of his heavy glass. In many positions of the glass in the field he found no effect. But, when contrary magnetic poles were on the same side, there *was an effect produced on the polarized ray,* and thus magnetic force and light were proved to have relation to each other."

After spending two months in the search for other bodies possessing this property and the proof that the effect was a rotation of the plane of polarization, Faraday suspended a short block or rod of his heavy glass in the field of a powerful electromagnet and found that it swung to point itself equatorially or across the lines of magnetic force. He had thus discovered diamagnetism. By an analysis of the phenomena he proved that the bodies which he called diamagnetic moved from the stronger to the weaker parts of the magnetic field, in contrast to magnetic bodies, which move in the opposite sense. This was Faraday's last great contribution to experimental physics.

In the following years Faraday investigated the magnetic properties of many substances and studied the peculiar action known as magnecrystallic. He tried to find some way of producing the electric current by the action of polarized light, without result.

In Volume V is recorded his famous attempt to connect gravitation with electricity, in which he also failed. In this volume appears also his experimental study of the lines of force about a magnet, which led him to a clearer conception of their properties. With this work the volume closes.

Faraday. By THOMAS MARTIN. "Great Lives." Duckworth, London. pp. 144.

THE author of this little book is the editor of the monumental edition of Faraday's Diary, which is now being issued as a memorial to that great experimental philosopher. He is in position to write with authority. The outline sketch of Faraday's life and work is exceedingly well done. The book is interesting and, within the limits permitted to the author, complete. One can see that his long acquaintance with Faraday's records of work has given him a vivid conception of Faraday's character and mental processes. The book is an excellent example of a short biography.

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APPLIED ENTOMOLOGY

Applied Entomology—An Introductory Text-book of Insects in Their Relation to Man. By H. T. FERNALD. Third edition, viii + 403 pp., 384 illus. McGraw-Hill Book Company, Inc., New York and London, 1935. $3.50.

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