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OBSTETRICS.

The function of the Corpus Luteum.

FRAENKEL. *Archiv. für Gynäk.*, 1903. Bd. 68, Ht. 2.

THE late Gustav Born held that the corpus luteum of pregnancy must, according to its structure and development, be a gland with an internal secretion, whose function was to further the implantation and development of the ovum in the uterus. This idea Born handed over to Fraenkel for proof or refutation. During his investigations the latter has come to regard the corpus luteum as a yet more important structure. He holds that during reproductive life it maintains the raised standard of uterine nutrition. Throughout these years it keeps up the blood supply of the organ, and the monthly hyperæmia of menstruation, in addition to permitting the implantation and development of the ovum. In the absence of the corpus luteum atrophy of the uterus begins, and menstruation ceases; the physiological and the pathological menopause are alike due to its absence. The "internal secretion of the ovary" is the secretion of the corpus luteum—a point of practical therapeutic importance.

The writer mentions, as a possible argument against his view, the opinion of many that the lutein cells are derived from connective tissue—the *theca interna* of the Graafian follicle. This, he considers, has been finally controverted by the work of Lobotta, which proves indubitably that the lutein cells are derived from the *membrana granulosa* or follicle epithelium, the capillaries between the lutein cells being supplied by the *theca interna*.

The following three points were investigated by experiment:—

1. The influence of the ovary on implantation of the ovum.
2. The influence of the ovary on further development of the ovum.
3. Is this influence exercised by the whole ovary or the corpus luteum?

For the experiments, an animal is required in which we know the time of ovulation, of fertilisation, and of implantation of the ovum. In eight pages the writer shows that the female rabbit fulfils these requirements. Its follicles burst just after parturition; it permits

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ciotus at the same time, this coitus is fruitful; spermatozoa reach the ovary three hours later; 70 hours later the ova have reached the uterus; from 4—7 days later the developing ova are implanted on the uterine mucosa. Fraenkel allowed numerous rabbits to copulate just after parturition. He removed the ovaries from 13 of them, one to six days later, and some time thereafter killed the rabbits, and found the uterus empty in each case. The removal of the ovaries had prevented the implantation of the ovum. In other instances castration was done after the implantation of the ovum. In these animals the ovum underwent retrograde changes, but was not expelled from the uterus.

In order to show that the corpus luteum and not the whole ovary is especially concerned in permitting pregnancy, the experiments were repeated, destroying all corpora lutea present in the ovaries with the galvano-cautery instead of excising the ovaries. The results were the same. It was found that at least one corpus luteum must be left in order that pregnancy may continue.

Turning to human pathology, the writer suggests that the formation of vesicular moles is due to failure on the part of the corpus luteum of pregnancy. His evidence is drawn from the frequent discovery of double ovarian tumours in women with molar pregnancy. A number of cases are mentioned. Next he discusses the relationship between tubal pregnancy and cysts of the corpus luteum, holding that there is a causal and not merely an accidental connection between the two conditions.

Turning to the corpus luteum of menstruation, the writer refers to the atrophy of the uterus which follows removal of the ovaries. Will removal of the corpus luteum alone cause atrophy of the uterus? In animals this is the case; for 14 days after burning out the corpora lutea in rabbits, the uterus was found to be very greatly atrophied, while the ovaries remained perfectly healthy. In the human subject menstruation affords an indication as to the blood supply of the uterus. The writer has attempted to modify it by burning out the corpora lutea of patients on whom laparotomy was being done in the presence of healthy sexual organs. This has been done nine times, and with one exception menstruation was deferred until another ovulation had occurred.

The corpus luteum is a gland renewed every four weeks in women of reproductive age, and in animals at varying intervals. In cyclic mode it controls the nutrition of the uterus, prevents this organ from relapsing into its infantile or senile condition, and prepares its mucosa for the reception of the ovum. If the ovum be

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fertilised the corpus luteum continues to exist and to maintain the heightened nutrition of the uterus during pregnancy. If the ovum be not fertilised the corpus luteum merely produces the hyperæmia of menstruation and then degenerates. There is strictly but one corpus luteum, one ovarian gland, which regenerates itself periodically in slightly different situations, and controls uterine life from puberty to the menopause. Menstruation has its cause in the secretory activity of the corpus luteum, and not the pressure of the growing follicle on the ovarian nerves. For this secretory activity causes the monthly hyperæmia which leads up to pregnancy or to menstruation.

The writer next considers the corpus of menstruation in its pathological relations. Anomalous uterine bleeding may depend upon anomalies of the corpus luteum, which may also account for certain cases of sterility. Amenorrhœa and uterine atrophy are considered from the same standpoint, lactation-atrophy being specially cited.

From the therapeutic standpoint, Fraenkel compares öophorin or ovariin with tablets made from the dried and powdered corpora lutea of cows. If the corpus luteum is the ovarian gland there is no reason for using the whole ovary for purposes of organo-therapeutics. The material is easily obtained at any slaughter-house, for every fourth ovary contains a corpus as large as a walnut. Sixteen cases are detailed in which this substance "lutein" was used instead of ovarian substance, the writer being satisfied with the results. When the ovaries are removed during pregnancy this substance should be given. This paper occupies over 100 pages, and its wealth of detail and observation cannot be suggested in abstract.

W. E. Fothergill.

Simultaneous Extra and Intra-Uterine Pregnancy.

Reifferschied (Karl). *Zentralblatt für Gynäk.*, March 21st, 1903.

Hanna Christer Nilsson has collected 68 cases of the above, the earliest dating from the year 1761. The present case is taken from the Clinic in Bonn. The patient was aged 26 years, and was admitted on November 4th, 1902, for violent abdominal pain. She married in March, 1900, and bore a full-term child in December of the same year. In August, 1902, she was in hospital for articular rheumatism, which was not due to gonorrhœa. The patient considered herself again pregnant in August, 1902. From this date onwards she had an uneasy feeling in the left of the pelvis, and for

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