whose mammary glands showed only the estrus type of development was injected daily with 20 r. u. of the estrus-producing hormone during a period of three days. Following this 1 cc of the crude corpus luteum extract was injected daily for 11 days. No change could be noted in type or extent of growth in glands before and after injection.

Similarly a castrate male rabbit was injected daily with 20 r. u. of the estrus-producing hormone during a period of 30 days. A check gland removed at this time showed the development of the estrus type of growth. The injection of 1 cc daily of the crude corpus luteum extract was begun 10 days later and continued for 30 days. Glands removed at 10-day intervals showed neither additional growth of the ducts nor the pregnant type of development.

A second castrate male rabbit which had received the same previous treatment was injected with 1 cc daily of the crude corpus luteum extract plus 12 r. u. of the estrus-producing hormone. In glands removed at 10-day intervals during a period of 30 days increasing development of both ducts and lobules was observed strikingly similar to that produced during pregnancy.

In a third male castrate rabbit which had received the same previous treatment somewhat greater growth of the ducts and lobules was observed following injection of the same amount of the corpus luteum extract but an increased amount (20 r. u.) of the estrus-producing hormone. Additional experiments are now in progress having as their object the further determination of the effect of increasing amounts of the estrus-producing hormone with constant amounts of the corpus luteum extract.

It will be noted in the previous experiments that the estrus type of development of the ducts of the mammary gland had been produced previous to the initial injections of the corpus luteum extract. In a fourth male castrate rabbit daily injection of 12 r. u. of the estrus-producing hormone and 0.5 cc of the crude corpus luteum extract was made over a period of 30 days. The size and development of the mammary gland characteristic of advanced pregnancy were observed at that time.

These observations lead us to believe that the growth of the mammary glands during pregnancy comes as a result of the combined action of the increasing amounts of the estrus-producing hormone and one or more hormones from the corpus luteum. It should be noted, however, that lactation was not produced in these animals. This may be due to the fact that the injections were continued up to the time of examination of the glands. The initiation of milk secretion may be stimulated by any one of several factors. It is possible that it follows the complete withdrawal of the growth stimulus or it may result from changes in the effective concentration of the two hormones. It is also possible that an as yet unidentified hormone is required. This phase of the problem is at present being studied.

In our study of the effect of the estrus-producing hormone on the growth of the mammary gland it was suggested that the growth observed during pseudo-pregnancy may be due to either one or both of these hormones (estrus-producing and corpus luteum) acting on the uterus, which may in turn produce a hormone or hormones which may be the active agent.

Two separate lines of evidence seem to indicate that the action of these hormones is directly upon the mammary gland rather than through the mediation of the uterus. The production of the growth of the gland in male castrates eliminates the possibility of the uterus acting as a gland of internal secretion. On the other hand, the development of the mammary gland characteristic of pseudo-pregnancy was observed in a hysterectomized rabbit after coitus.

Having obtained the type of growth characteristic of pregnancy by the combined action of the estrus-producing and the corpus luteum extract, it became possible to test for the presence of the active principle in the urine of pregnant cows. In this we have been successful. It has been found possible to produce the growth characteristic of pregnancy with a water and alcohol soluble extract in both castrate male rabbits and rats in combination with the estrus-producing hormone. By using this method it is proposed to trace the changes in the concentration of this active principle (corpus luteum?) in the urine of cows during the course of gestation.

C. W. TURNER
A. H. FRANK

MISSOURI AGRICULTURAL EXPERIMENT STATION

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