

physiological saline solution; (b) an 0.84% suspension of powdered worms which had been subjected to prolonged extraction with ether in a Soxhlet or Pickel extraction apparatus; (c) a 1% suspension of finely ground worms which had been quickly frozen while alive with carbon dioxide snow and stored in evacuated glass ampoules for 3 months at -10°C .; (d) a 1% suspension of powdered worm material of *Taenia pisiformis*, a closely related species from the intestine of the dog. All rats, with litter mate controls, were fed with equal portions of a uniform suspension of onchospheres. At autopsy 35 days later normal sized cysts (4-5 mm. diameter) were present in the livers of control animals; while development of the larvae had been completely, or almost completely inhibited in the rats of groups a, b, and c. In these the larvae were represented for the most part by minute spots. In the livers of those animals injected with powdered *T. pisiformis* material (group d) the cysts developed as well as in the control rats, so that it has been demonstrated that no non-specific immunity developed from the injection of this closely-related worm material.

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Effect of Theelin upon the Developing Ovary of the Rat.

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This report is the first of a series based upon the studies of the effect of theelin, a female sex hormone isolated by one of us from the urine of pregnant human females, upon the genital tract of the female white rat. This report is confined to the histological study of the effect of subcutaneous injections of solutions of this substance upon the ovaries of immature female rats.

A group of 14 controls, usually taken from the same litters as the experimental animals, was killed at different age periods to establish normal developmental changes. One group of 11 animals was injected daily with 3 rat units of theelin for varying periods of time, beginning all animals on the twenty-first day and killing each animal on the last day of theelin administration. A second group of 9 animals was given a single massive dose of 20 rat units on the first day of the experiment, the twenty-first day of life, and then were allowed to recover for varying periods of time.

The animals were killed by ether anesthesia. The genital tracts were immediately removed and fixed in 10% formalin. The ovaries were later dissected away, imbedded in paraffin and serial sections prepared. The size of the various ovaries was determined by preparing camera lucida drawings of each serial section, measuring the outlines by the polar planometer, adding these measurements to obtain the total area, reducing this figure to absolute size and multiplying by the thickness of the section. There is often so great a variation in the size of the ovary on the 2 sides and in the size of ovaries of animals of the same age that a graphic chart, plotting age against size, has been prepared. (Not given in this report.)

The growth curve of the normal animals is almost a straight line throughout the fourth and fifth week of life corresponding to the first and second week of the experiment. This growth is due to 3 obvious factors; greater development and increase in size of many of the follicles, increase in the amount of loose fibrous stroma in the medullary portion and increased vascularity. The theelin continuous administration series maintained the same growth rate and presented the same histological appearance as did the normals during the first week of the experiment. The recovery after a single massive dose series shows a complete inhibition of growth, a relatively greater atretic degeneration of follicles and moderate hydropic degeneration of germinal epithelium during the first week.

The ovaries of the normal animals almost double in size during the second and third weeks of the experiment. The theelin continuous administration series shows only one-sixth as great a growth as the normals, while the recovery from a massive dose series shows recovery from previous inhibition and a greater rate of growth than the normals. The absolute size of the recovery series is still about 10 days behind that of the normal series and, histologically, the previously engendered hydropic degeneration of the germinal epithelium is not entirely recovered from, although there is a progressive increase in size and number of developing follicles and progressive return to the normal hyperchromatic, small germinal epithelial cell type. Histologically, the series receiving theelin daily shows progressive degeneration of follicles, progressive inhibition of the development of new follicles and progressive hydropic degeneration of the germinal epithelium.

During the fourth week of the experiment, the normals developed mature follicles, ovulated and produced the first crop of corpora lutea. This phenomenon was accompanied by a sharp increase in size, almost doubling the size in a single week. The continuous ad-

ministration series showed only about one-sixteenth the normal increase in size for this period, and, showed only a few well formed follicles and an increase of the intensity of the hydropic state of the germinal epithelium. The recovery series shows a growth rate of comparably normal rate although absolute size remains 10 days retarded. The histological picture is normal.

During the fifth and sixth weeks of the experiment when the animals were 8 and 9 weeks old, the normals showed only a very slight increase in size due to the fact that the ovary has about completed its growth. The continuous administration series showed even less increase in size. The recovery series which had previously recovered from the histological effects of a single massive dose of theelin and has since showed only 10 days' retardation in growth, ovulated 10 days late and appears identical in size and appearance with a normal of the same age.

The effect of the continuous administration of 3 rat units of theelin for a period of 5 weeks was to retard growth almost completely after the first week of the experiment, to decrease the number of developing follicles, to increase the amount of atretic degeneration of follicles and to produce a most remarkable hydropic metamorphosis of the germinal epithelium. A few follicles will reach maturity, rupture, and become luteinized apparently, since 2 small corpora were seen in one and one in another of the 2 animals carried longest.

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Immunity Studies Among Central and Polar Eskimos.*

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(Introduced by J. Bronfenbrenner.)

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This report is based upon material and data collected within the Arctic Circle by one of us (P. H.) during the summer of 1930 for the purpose of checking the work which led Heinbecker and Irvine-

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