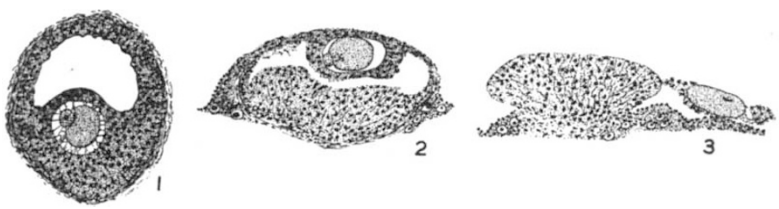
Mechanism of Ovulation and Corpus Luteum Formation in Elephantulus

IN the course of an examination of serial sections of close on two hundred uteri and ovaries of *Elephantulus myurus jamesoni* in our studies on the menstrual and reproductive processes of this animal, we have had the opportunity of observing all phases of follicular and luteal growth in the ovary. This was facilitated by the fact that Elephantulus sheds up to sixty ova at a time from each ovary although only one embryo develops in each uterine horn. The corpus luteum does not commence to form *after* the extrusion of the ovum from the follicle, but rather before the ovum is extruded. In fact, the corpus luteum is responsible for ovulation (see accompanying illustration, 3).

The luteinizing granulosa cells proliferate at one pole of the follicle, encroach on the follicular cavity which is gradually obliterated, and the ovum is steadily pushed out of the follicle through the superficial layers of the ovary. During the process the theca interna proliferates, is vascularized and in turn invaginates the heaped-up luteal cells. By this method the original epithelium lining the follicular cavity is everted so that the free margin of the corpus luteum represents anatomically the lining epithelium of the original cavity, which now projects from the surface of the ovary, and the attached portion is vascularized by thecal vessels which extend radially towards the expanded free margin of the newly found corpus luteum.



1, RIPE GRAAFIAN FOLLICLE; 2, GRAAFIAN FOLLICLE ON THE SURFACE OF THE OVARY, PREPARATORY TO OVULATION; GRANULOSA CELLS ARE COMMENCING TO LUTEINIZE; 3, RECENTLY RUPTURED FOLLICLE WITH ATTACHED OVUM AND EVERTED CORPUS LUTEUM (×c.80).

Many theories have been invoked to explain the exact mechanism of ovulation, such as the increased tension produced by the secretion of the liquor folliculi, the contractions of smooth muscle and the action of enzymes[1].

While the method of corpus luteum formation in Elephantulus is unique and is so totally different from the accepted procedure in other animals, it nevertheless negates the above-mentioned theories of ovulation.

The findings in Elephantulus substantiate the claims that ovulation is a phase in the growth process controlled by the gonadotropic hormones, since there is most convincing evidence that pre-ovulatory differentiation occurs in the granulosa cells of the follicle.

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[1] Hartman, Carl G., "Sex and Internal Secretions", pp. 629–651. Edited by Allen, Darnforth and Doisy (Williams and Wilkins, 1939).

Possible Relation between Ability to Synthesize Vitamin C and Reaction to Tubercle Bacillus

WE had occasion to write the following two lists within a few days of one another and were struck by the close similarity between them:

CLASSIFICATION OF ABILITY OF DIFFERENT MAMMALIA SPECIES

(A) TO SYNTHESIZE VITAMIN C (MCCOLLUM 1939)[1].	(B) TO RESIST INFECTION WITH HUMAN AND BOVINE TUBERCLE BACILLUS (M.R.C. 1930)[2].
1. Require vitamin C in their diet (that is, are unable to synthesize vitamin C themselves): Man. Monkey. Guinea pig.	1. Susceptible to infection by both bovine and human tubercle bacillus: Man. Monkey. Guinea pig.
2. Query require vitamin C in their diets (that is, authorities are in doubt as to their ability to synthesize vitamin C): Rabbit. Pig. Cattle Mouse.	2. Susceptible to bovine but resistant to human tubercle bacillus. Rabbit. Pig. Calf. Goat. Sheep. Horse.
3. Do not require vitamin C in their diet (that is, are known to be able to synthesize vitamin C) Dog. Rat.	3. Resistant to both bovine and human tubercle vacillus: Mouse. Dog. Rat.

We feel that this similarity is too close to be a pure coincidence and that there is possibly a relation, at present obscure, between the ability to synthesize vitamin C and the reaction to the tubercle bacillus. This is especially interesting in view of the number of papers appearing recently which suggest that the vitamin C metabolism is higher than normal in tubercular patients.

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[1] McCollum, E. V., Orent-Keiles, E., and Day, H. G., "Newer Knowledge of Nutrition" (New York: Macmillan Co., 1939).
[2] "A System of Bacteriology" (London: Medical Research Council, 1930).

Growth of Protoplasm and Nitrogen Migration in the Coleoptile of *Zea Mays*

IT is generally accepted that during the growth in length of meristematic plant cells the increase of volume is principally caused by the formation of a big vacuole, whilst the protoplasm does not grow considerably. Investigations[1] on the coleoptile of *Zea Mays* disprove this view. Cytological measurements of the plasmatic content before and after the phenomenon of cell stretching show an increase of protoplasm of 1,670 per cent and more. This cannot be due to a simple swelling of the protoplasm, as during this time the protein nitrogen of the cells increases as many as 9·5 times. Therefore