

foot behind and was decorated with hawk's feathers (p. 76).

As these natives followed along with the expedition for a number of days, Captain White was afforded the opportunity to study not a few of their habits and customs; indeed, before this exploratory excursion drew to a close, he not only was the discoverer of an entirely new tribe, but he contributed a mass of ethnological and anthropological knowledge to what we formerly knew of the native tribes. This was not only new, but also of great importance, especially in view of the fact that these black men are now gradually being eliminated by the whites, and will soon become utterly extinct. Miscegenation with respect to the two races practically amounts to nil; moreover, the native women, as in the cases of other low races, are usually nonfertile in such crossing.

The women of this tribe never wear clothing of any kind, and Captain White's photographs of them exhibit those he succeeded in obtaining entirely nude. They have great affection for their children, and are much pleased when strangers pay them any attention. The peculiar ceremonies of this tribe are described by our intrepid explorer with very considerable detail, and among other things he remarks:

The dry watercourse before mentioned still traversing our line of march, we were at times passing over its loose, sandy beds, with a row of red-gums (which lined the watercourse) on either side. A native would give forth a sharp exclamation while looking up into one of the gumtrees. Then, in the twinkling of an eye, half a dozen natives would be up that tree, their lithe, muscular and naked forms moving from branch to branch with the ease of apes. They were in search of the large white grubs, or larvæ, of a well-known moth, which passes the first part of its existence boring in the gum wood. These grubs are much sought after by the natives, who call them "margoo." It is wonderful how they can tell at a glance if the grub is at home, and how well they can make a hole in the gum wood with a sharp-pointed stick hardened by fire! When the search was over, down they would come again to mother earth with a grunt, and on the march again. Not an item of anything missed these happy children of the desert. They would try to show me a bird, a reptile

or an insect at a distance when the object was stationary; and after several minutes of vain attempts to show me where it was, the object would move off; if I showed my vexation, they would laugh softly and pass remarks among themselves. Tracks, which these wild men saw at a glance as they walked along, the sight expressed only by a nasal "hem, hem" and the outspreading of the fingers, or the pointing in a certain direction with the index one, were not revealed to me, when, on hands and knees, I was peering into the spot where the track, to my dusky companions, was easily seen; and when I rose with a shake of the head, they only quietly laughed and passed on, wondering, no doubt, at the slow-witted white man.

Captain White found but few mammals in the country traversed, and snakes, too, were rare. Upon the other hand, quite a number of new birds were taken, and the specimens brought back with the party. In fact, ninety-four species of birds were collected, five of which were new. Many undescribed insects were found in the stomachs of the small birds brought back, and the main collection of spiders and insects contained a great many more entirely new forms. New moths and ants were also taken, the latter being worked up by Professor W. M. Wheeler, of Harvard University. Professor Wheeler found nineteen species of ants new to science. Five new plants were found in the two hundred species collected, one of which was a heretofore undescribed species of tobacco.

Another expedition will soon be organized; doubtless many more novelties will be discovered, and more exhaustive studies made of the rapidly disappearing natives.

R. W. SHUFELDT

WASHINGTON, D. C.,
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SPECIAL ARTICLES

THE OVULATION PERIOD IN RATS

THERE are many observations on the occurrence of ovulation in mammals; but very few investigations on the regular recurrence of that event, perhaps because of the fact that such investigation must involve the systematic study of sections of whole ovaries and oviducts of animals killed at frequent intervals over

a considerable period of time. This has been done by Leo Loeb for the guinea-pig. For the rat there are no published observations except those by Kirkham and Burr (1913), from which it is to be inferred that the ovarian cycle has a length of twenty-one days.

Although further studies on the rat are being carried on by the senior author, it seems worth while at this time to present in outline the chief conclusions arrived at, reserving for a later paper a more complete presentation and discussion of evidence.

The most obvious and certain evidence of the occurrence of ovulation is the presence of eggs in the oviduct. It is chiefly upon this kind of evidence that the conclusions are based. There is also a further source of information concerning the ovarian cycle in the corpora lutea, formed in most cases from the ripe follicles which have discharged their eggs. The corpora lutea grow and undergo such changes before degenerating that there may be as many as 40 in one ovary, of which only the youngest and oldest can sometimes be identified with certainty. However, the newest corpora up to an age of about $2\frac{1}{2}$ days can be distinguished from older ones. Such young corpora are always present when eggs are in the oviduct, and their absence when no eggs exist in the tubes is additional proof that ovulation either has not occurred (especially if the ovary contains large follicles), or took place several days before.

All of the 80 females used were isolated from males before their last litters were born, and thereafter were kept alone or with other females. Also their young were at once removed, usually before being suckled.

The ovaries and oviducts were sectioned, the position of the eggs (when present) in the oviduct was determined, and the condition of the corpora lutea noted. The animals were killed at intervals during 101 days after parturition, 67 of the 80 rats being taken during the first four 10-day periods as follows:

1	to	9	days,	18	rats
10	"	19	"	15	"
20	"	29	"	17	"
30	"	39	"	12	"
40	"	42	"	5	"

making an almost complete series at one-day intervals. They are grouped at still closer intervals about the tenth, twentieth, thirtieth and fortieth days. The rest of the animals were killed only at about ten-day intervals from 50 to 101 days.

Unfertilized eggs pass through the oviduct in about three days, usually having degenerated by the end of that time, as determined by a study of 15 animals killed during the first four days post partum. Accordingly the distance traveled by the eggs in the oviduct is of importance and was taken into account in estimating the time of ovulation.

Of the 80 animals examined 49 revealed eggs in the oviduct. To these may be added 14 more in which it is permissible to estimate the time of ovulation. Summarized they are as follows:

Ovulating after Parturition		Average
Rats	Days	
15	$\frac{3}{4}$ - 1	11
11	$9\frac{1}{2}$ - 13	
1	$15\frac{1}{4}$	
13	19 - $23\frac{1}{2}$	20
1	$24\frac{1}{2}$	
5	$27\frac{3}{4}$ - $34\frac{1}{2}$	$30\frac{1}{4}$
5	38 - $41\frac{1}{2}$	$39\frac{1}{2}$
2	$49\frac{1}{2}$ - 50	50
2	$57\frac{1}{2}$ - $58\frac{1}{2}$	58
2	$67\frac{3}{4}$ - $70\frac{1}{4}$	69
2	78 - 82	80
2	87 - $89\frac{1}{2}$	89
2	$97\frac{1}{4}$ - 101	99

Of the other 17 rats none had eggs in the oviduct, and the ovaries presented no evidence of recent ovulations. They were killed between the periods enumerated above.

The foregoing indicates that female rats when kept isolated from males ovulate on the average every 10 days.

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OVULATION IN MICE

It has been known since the time of Tafani (1889) that mice normally ovulate soon after giving birth to litters. According to Sobotta (1895) a second ovulation takes place in