Peking Branch

Peking Union Medical College, March 30, 1926.

3110

Observations on the "reversed" uterine horn of the rabbit.

ROBERT K. S. LIM and CHAO CHI.

[*From the Department of Physiology, Peking Union Medical College, Peking, China.*]

It is universally believed that the ciliated epithelium of the oviducts and uterus of mammals play the chief role in the transport of the ovum from ovary to uterine cavity. A few authors, however, seem to regard the contractions of the uterine muscle as being more important.

The above belief is based on two facts, (1) the direction of the ciliary movement being vaginal-ward and (2) the appearance of small particles in the uterus or vagina, after being introduced into the general peritoneal cavity.

In attempting to establish the corollary, namely that if the direction of the cilia be reversed, the ovum could not progress beyond the part reversed, we have found that the reversal of the uterus offers no impediment to the passage of the ovum.

The method employed was to divide the uterine horn (of rabbits) on each side, in two places 2.5 to 3.0 cm. apart and to reunite the cut ends after reversing each segment. The animals were then allowed to heal (a laparotomy being performed in some cases to determine the condition of the anastomosis) and were later mated.

Six animals thus experimented upon have all become pregnant. Three of the animals were subjected to observation before term, the remainder were left to complete their pregnancy.

It was found that implantation occurred most frequently within the reversed segment and in one instance *in the portion of the uterus between the segment and the cervex uteri.* It is thus es-

tablished, that an ovum may travel across two anastomoses apparently against an opposing ciliary movement.

If ciliary action is still responsible, it would mean that the direction of ciliary movement is capable of change; whether this is the case or not we have not yet had the opportunity to observe. Direct observation of the normal uterine mucosa shows ciliary movement mostly vaginal-ward but in part in a transverse and even in an ovarian direction.

The possibility of motor activity being responsible for the transport of the ovum has been subjected to some preliminary tests. Thus in the normal non-pregnant uterus, contractions may be conducted both up and down the tube, there being a slight polarity favoring vaginal-ward conduction. In the pregnant uterus, the polarity appears to be more marked. In the uterus with a reversed segment, a wave of contraction does not seem able to be conducted across an anastomosis in any direction, while the segment exhibits its inherent polarity, thus conducting more readily in the "reverse" direction. The possibility of conduction in either direction, however, cannot be excluded, although the failure to conduct across an anastomosis (in rabbits operated under six months) is definite.

In the cases here described, the ovum has already traversed the narrow and poorly muscular oviducts before reaching the uterine horn.

Further, a small portion (about 1 cm. in length) of the uppermost part of the uterus remains as in the normal, and it would seem that it is the rhythmic contractions of this small but normally situated part of the uterus which force a mucous mass (it is doubtful if so small a body of the ovum could itself be propelled along by the peristaltic activity of the uterus) containing the ovum progressively towards the vagina.