Recognizing the difficulty of even approximate measurements of physical and mental efforts during several days, it is evident that only a large number of similar experiments are apt to reduce the effect of accidental factors or of physiological fluctuations in the motor efficiency of the gastro-intestinal tract.

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On the behavior of the mammalian ovary and especially of the atretic follicle towards vital stains of the acid azo group.

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I have given elsewhere[1] a description of those cells of the mammalian body which react so predominantly even if not in a wholly specific way with vital dyes of the acid azo series as to justify their recognition as a great functional unit or cell class. For the cells in question it is suggested that we retain the old term macrophage, which although proposed by Metchnikoff without the kind or the complete extent of evidence now available for delimiting the class, nevertheless puts in the foreground their salient structural and functional peculiarity and has the further advantage of enabling us to coördinate these studies with those long made by the comparative pathologist.

It is worthy of note that in some of those cases of local tissue degeneration and death which one must regard as physiological or normal, the macrophages must, in analogy with the experience of pathologists, be actively concerned. This above all is exemplified by the cyclic changes undergone by the mammalian ovary. The strange cells which since the time of Pflüger have been known to be of assistance in atresia of the follicle and whose derivation from granulosa or theca or from leucocytes, *i. e.*, from practically every available source, has in turn been championed—are picked out by the azo dyes so brilliantly and so electively as to preclude the denial of their alignment as typical macrophage cells

There will be demonstrated a series of drawings of these colonies of macrophages in the atretic follicle of the mouse, rat,

[1] Evans, H. M., "The Macrophages of Mammals," *Am. Jour. Physiol.*, Vol. 37, No. 2, May, 1913.

guinea pig, rabbit, dog and monkey, in the latter of which the conditions are so similar as to stand for the case in man.

Striking as they are, these studies are not sufficiently indicative of the altogether unusual affinity of the atretic ovum macrophages for these dyes, a fact which forces itself on our attention when small doses of the dyes are given. The preparations showing the scanty macrophage content of the peculiar atresia of the dog demonstrate also that although but little general staining resulted, these cells have all accumulated dense deposits of the vital dye.

The macrophages are the cells which penetrate the zona pellucida of the degenerate ovum and in late stages of atresia may be present solely within the zona.

A different and more unique reaction in the ovarian follicle must now be mentioned. Impending atresia in the good-sized follicle has as its ear-marks a reaction never seen in the healthy state, for before the nuclear disorganization seen by Fleming and Schottander takes place the granulosa cells destined to perish have suddenly become permeable to the vital stain which they house in cytoplasmic granules frequent enough to mark out the whole layer as deeply stained. On the downhill, as it were, these cells never increase in size or function so as to often be confused with the macrophages. This reaction of the granulosa is significant one must feel, chiefly as proof not only of preliminary cytoplasmic as against nuclear change but of physical change in the protoplasmic state. It will be well now to know whether the differing behavior of the granulosa cells is dependent on a changed protoplasm into which now diffusion can take place (increased permeability) or whether it be due essentially to electrical surface changes which let adsorptive forces operate. The conditions which bring about this reaction are typically seen in the atresia which always overtakes the next succeeding crop of Graafian follicles after fertilization of the preceding crop, but this behavior is not repeated further in the pregnancy, where now other forms of atresia may come in. Enough warrant consequently exists for the recognition of types of atresia the occurrence of which is related with certainty to what one may broadly term the cycles undergone by the ovary in general. An examination of this point in animals where with many individuals we have followed the sexual cycles, is in progress.