length of 2 or more cycles as Hammond[6] has postulated. It is likely that overemphasis has been placed upon the rhythmicity of ovogenesis and follicular atresia in mammals in general. Although Allen clearly showed that there were distinct cyclical differences in the rate of mitoses in the germinal epithelium, the evidence favors the view that the production and destruction of follicles are continuous processes not entirely limited to single phases of the cycle. The presence of follicles in practically all intermediate stages of development is the rule. Further, very little evidence exists in favor of the view that ovogenesis and atresia are initiated by factors which initiate and regulate the oestrous cycle. Changes in hormonal concentrations affect them, no doubt, to a greater or lesser degree dependent upon the species. Ovogenesis and atresia occur, however, during the prepubertal period and continue after hypophysectomy.

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Vaccination of Monkeys Against Pneumococci with Special Reference to Oral Immunization.*

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Cecil and Steffen have found the Philippine macaque *(Macacus syrichtus)* more suitable than *Macacus rhesus* for the production of experimental pneumococcus pneumonia but the former were not available; consequently we were obliged to use the latter.

Four monkeys were given a subcutaneous injection of 1 cc. of vaccine per kilo of weight carrying 20 million Type I and an equal number of Type II and Type III pneumococci in broth suspension sterilized with 0.5% tricresol every 5 days for 6 doses.

Four additional animals were given 1 cc. of acid-killed mixed vaccine of the same numerical strength per kilo of weight by stomach tube every 5 days for 6 doses.

Two weeks after the last dose 2 monkeys of each series, with a normal control, were given intratracheal injections of 0.5 cc. of 1:20 dilutions of 8 hour broth culture of Type I pneumococcus. At

[6] Hammond, J., Physiology of Reproduction in the Cow. Cambridge Univ. Press, 1927, 44.

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the same time the remaining 3 monkeys of each series, with a normal control, were given intratracheal injections of 0.5 cc. of 1:20 dilution of 8 hour broth cultures of virulent Type II pneumococcus.

The rectal temperature of each animal was recorded twice daily, with daily leukocyte counts.

None of the animals succumbed and none developed septicemia (positive blood cultures) but both controls became very sick within 24 hours after the intratracheal inoculations, with total leukocytes reaching 24,900 and 33,500 per cmm. respectively and rectal temperatures 104 to 105.2°F. subsiding to normal (about 101-102°F.) within 3 to 6 days.

The 2 monkeys given the vaccine subcutaneously and inoculated intratracheally with Type I remained perfectly well, the highest rectal temperature being approximately 103°F. on the second day after inoculation with 18,200 leukocytes per cmm. of blood. Approximately the same results were observed with the 2 monkeys given the vaccine by stomach tube and inoculated intratracheally with Type I pneumococcus.

However, the 2 monkeys given the vaccine subcutaneously and the 2 given the vaccine by stomach tube and inoculated intratracheally with Type II pneumococcus became quite sick and ran a course of fever and leukocytosis quite similar to the normal controls.

With *Macacus rhesus* monkeys it has been found difficult therefore to compare the immunizing capacity of the 2 vaccines but we believe that subcutaneous injections of the chemically killed vaccine proved superior to the oral administration of the acid-killed vaccine, and that both were more effective against Type I than against Type II pneumococcus.

Summary. In general terms the immunization of *Macacus rhesus* monkeys with subcutaneous injections of a mixed chemically killed vaccine proved superior to the oral administration of an acid-killed vaccine of the same strength and dosage. Vaccination against Type I pneumococcus was more effective than against Type II with both vaccines.