for the inflammation produced. However, the following observation is of interest. Nicotine alkaloid in 0.005% solution which is alkaline to litmus, produced irritation about equal to that of the smoke from the di-ethylene-glycol treated cigarette. However, if the nicotine solution is made acid to litmus with an organic acid, or with carbon dioxide gas, the solution is irritating no longer, even if the concentration of nicotine is increased 10 fold. This shows that the irritating property of the cigarette smoke cannot be due to the amount of nicotine which is carried into the solution by the smoke. This conclusion is supported by the experiments of Dixon,[2] who found that the nicotine content of tobacco smoke was greater when the tobacco was moist. In our experiments, the moisture content of the cigarettes did not influence the irritating properties of the smoke, showing once more the independence between irritation and nicotine concentration in tobacco smoke.

Fig. 3 shows the maximum irritation, irrespective of time of onset or duration. The edema produced by the smoke solution from the untreated cigarette lasted an average of 31 minutes (8 to 82); that from the di-ethylene-glycol lasted 8 minutes (0 to 21); and that with the glycerine lasted 45 minutes (17 to 122).

Cigarettes made with 1, 3, and 5% glycerine respectively show a slight increase in irritation as the percent of glycerine increases. When di-ethylene-glycol is used, there is a slight but readable reduction in irritation as the percent increases. When the cigarette smoke is passed through mineral oil, the results are essentially the same as when water is used.

7631 C

Proliferation of Epithelium of Nipple of the Rat and Guinea-pig During the Oestrus Cycle.*

S. B. D. ABERLE. (Introduced by E. K. Marshall, Jr.)

From Yale University School of Medicine.

Nineteen rats and 30 guinea pigs having regular cycles were used. Daily smears were taken in the rats for 3 weeks and in the guinea

2 Dixon, *Brit. Med. J.*, October, 1927.

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pigs for 2 months. The animals were killed at various times during the oestrus cycle. The height of the epithelium was determined by averaging 10 cell-counts taken from sections near the center of the nipple.

In the rat the difference of the cell-count at oestrus and dioestrus is slight, but the shape of the epithelial cells changes. At dioestrum the cell is flat and the nucleus occupies most of the cell. During oestrum the cell is oblong. The change in shape increases the distance from the basement membrane to the periphery, while the nucleus appears to occupy a smaller part of the cell.

In the guinea pig the change in the shape of the superficial epithelial cells of the nipple is marked and there is an increase in number. The epithelium of the nipple of the guinea pig has rete pegs. During dioestrum the epithelium averages 10.5 cells for the height of the papilla and 4.2 cells for the intervening epithelium. The proliferation begins on the first day of the oestrus cycle. It then averages 16.1 cells for the height of the rete pegs and 7.3 cells for the height of the lower epithelium. It remains high until the fifth day after the onset of oestrum.

The epithelium from the nipples of 2 adult males, counting the lowest and highest part of the epithelium averaged 5.6 and 6.0 cells respectively. Females spayed for periods of 28, 33, and 46 days have a low nipple epithelium, averaging 9 and 3 cells in height, for rete pegs and lower epithelium respectively.

The ovaries, then, produce cyclic changes in the nipple epithelium of rats and guinea pigs; as can be seen by the change in size and number of cells during the oestrus cycle.

7632 C

Comparison of Mammary Glands of Normal and Ovariectomized Rhesus Monkeys.*

S. B. D. ABERLE. (Introduced by E. K. Marshall, Jr.)

From the Carnegie Institution of Washington.

Four monkeys were ovariectomized for periods ranging from 7 days to 6 months before autopsy. The ovaries were sectioned and found complete. The mammary glands were carefully dissected at

* This investigation was partially subsidized by a grant from the Committee for Research in Problems of Sex, Division of Medical Sciences, National Research Council.