eral anesthesia. Thus it was found that whereas the lethal dose of cocain per kilo weight of cat when injected intravenously under very light anesthesia was from 30 to 40 mg., the fatal dose for cats under complete general anesthesia was about 25 mg. per kilo weight and under deep ether anesthesia it was as low as 15 mg. per kilo weight. In the case of alypin it was found that when injected in cats practically under no ether anesthesia, the lethal dose varied from 30 to 24 mg. per kilo weight; under complete but light ether anesthesia the lethal dose was from 18 to 24 mg. per kilo weight, while under deep anesthesia the fatal dose was as low as 6 to 7 mg. Similar toxic synergism in cocain and alypin on the one hand and general chlorbutanol anesthesia was also noted. The above experiments were performed several years ago but have been repeated recently with the same results and are deemed to be worthy of mention in connection with the present renewal of interest in the toxicity of local anesthetics. In the experience of the author a combination of local and general anesthetics is dangerous and this fact should be borne in mind by surgeons who may desire to switch from a local anesthetic to a general one.

## 80 (2312)

## Note on the weight of the adrenals in crosses between the albino and the wild Norway rat (Mus norvegicus.)

By JOHN C. DONALDSON (by invitation).

[*From the Anatomical Laboratory, School of Medicine, University of Pittsburgh, Pittsburgh, Pa.*]

When the weight of the adrenal glands is compared with either the body weight or the body length, the wild pigmented rat is found to have much heavier glands than the domesticated albino. The females in both groups have heavier glands than the males, but the difference in weight between the glands of the two sexes is less in the wild gray form.[1]

[1] Hatai, S., *Anat. Record*, 1914, viii, 511.

The following experiments were undertaken to determine the weight of the adrenals in descendants from albino by Norway ancestors. It was appreciated that these observations must necessarily be made under the conditions of domestication and that the effect of domestication must be considered in the interpretation of the results. Under these limitations the purpose was to observe in what way the weight of the adrenals was related to pigmentation.

A wild gray male was crossed with a stock albino female and the offspring used for this work. The weights of the adrenals in the original pair are, unfortunately, not available. The values found in the other wild gray rats captured in the same vicinity are, however, close to those given by Hatai.[1] In our colony the average values for the female albino adrenals vary less than one per cent from that given in Table 71, "The Rat".[2] One hundred and two animals were examined, covering four generations. Twenty-two of these, however, had pus in the ears or showed gross pathological changes in the viscera, usually the lungs. Since disease seems to influence the size of the adrenal glands, these animals were excluded and the eighty remaining animals were used in the computation.

The results are shown in Tables I and II. The body weights at the time of killing varied from 64 to 368 gm. in the males and 97 to 342 gm. in the females. The method used for comparing the different groups has been described.[3] The adrenal glands of the experimental animal were weighed. The expected weight of the glands of an albino rat, having the same body weight and sex as that of the experimental animal was then found from Table 71 in "The Rat". The observed weight was compared with the expected weight and the difference in the observed weight expressed in per cent of the expected weight. The individual percentage values of each group were then averaged. The values in Table I, column 3, were obtained in this way. If body length instead of body weight is used as a basis of comparison, the results are similar.

While the variability is great and the number of observations small, it is evident in both sexes that the pigmented groups have

---

[2] Donaldson, H. H., *The Rat*, Data and Reference Tables, p. 133-138, Philadelphia, 1915.

[3] *The Rat*, pages 3-5.

distinctly heavier adrenals. The $F_1$ generation shows a sharp reduction in the weight of the adrenal from that found in the wild form. This reduction is greater than that following domestication of wild grays even for several generations.[4] In the $F_1$ generation the excess in weight of female glands over those of the male is close to that found in the wild form. In subsequent generations this excess is reduced so that there is less difference between the weight of the glands in the two sexes than is found even in the wild gray rats. The relation between the groups of experimental animals is more clearly shown by Table II. The average weight of the adrenal glands for each sex of the albinos in the $F_2$-$F_4$ generations has been taken as 100 and the relations of the other groups expressed as percentage of this value.

The evidence shows that, body weight for body weight, the albinos have lighter adrenal glands than do pigmented animals of the same ancestry and raised under the same conditions. This difference is much less than that between the wild gray and domesticated albino forms. The experiments were carried on, however, under the conditions of domestication, which tend to lower the weight of the adrenals in the Norway, and the effect of domestication is thus added to that of the albino in reducing the weight of the adrenals in the pigmented rats.

TABLE I.

| Group | No. of cases. | Av. adrenal wgt. expressed as a percentage above the expected wgt. | Probable error of the mean. |
|---|---|---|---|
| Males: | | | |
| Albino $F_2$-$F_4$ | 16 | 26.6 | ±3.9 |
| Pigmented $F_2$-$F_4$ | 20 | 38.6 | ±4.0 |
| $F_1$ generation (pigmented) | 10 | 31.2 | ±1.4 |
| Wild gray (Hatai) | | 114.0 | |
| Females: | | | |
| Albino $F_2$-$F_4$ | 12 | 3.18 | ±2.2 |
| Pigmented $F_2$-$F_4$ | 15 | 11.10 | ±3.1 |
| $F_1$ generation (pigmented) | 7 | 17.6 | ±2.7 |
| Wild gray (Hatai) | | 91.0 | |

The expected weight is that given for each sex in Table 71, "The Rat," 1911.

[4] At the Wistar Institute the reduction after three generations in captivity did not exceed 30 per cent in either sex. (Personal communication from H. H. Donaldson.)

TABLE II.

The average weight of the adrenals in the pigmented groups expressed as a percentage of the average weight of the glands as found for the experimental albinos.

| Group | Male | Female |
|---|---|---|
| Albino $F_2$-$F_4$ | 100 | 100 |
| Pigmented $F_2$-$F_4$ | 109.3 | 107.6 |
| $F_1$ generation (pigmented) | 103.1 | 113.9 |

## 81 (2313)

### Parathyroid extirpation in the cat.

By J. S. NICHOLAS and W. W. SWINGLE.

[*From the School of Medicine, University of Pittsburgh, Pittsburgh, Pa., and Osborn Zoological Laboratory, Yale University, New Haven, Conn.*]

A survey of the literature dealing with experimental parathyroidectomy in the cat shows amazing discrepancies. Some results are so clear cut that there can be no question as to the conclusions drawn from them while other experiments give quite conflicting data. In certain forms, *viz.*, the dog, there are uniform results after extirpation of these glands and these have led to the conclusion that in this form a complete parathyroid extirpation is fatal.

In order to clear up some of these discrepancies before proceeding with physiological studies which are now under way upon the cat it was deemed advisable to complete a large number of parathyroid extirpations in order that a consistent resurvey of the problem could be obtained. More than fifty parathyroidectomies have been performed at the Osborn Laboratory. These cases have been carefully studied and supplemented with anatomical observations.

A microscopic examination of the glands was made at the time of operation. The glands were placed in Ringer's solution and the parathyroids dissected away from the thyroid under the high power of a binocular microscope. A small vascular rete is associated with the parathyroids and assists in their rapid identification.