number with a rather quick return to normal levels after the pneumonia had completely resolved, leaving no complications.

Incidentally a very interesting observation was made in connection with eczematous babies. During the first half of the acute illness the eczema improved remarkably although no special treatment of the skin was instituted. Then at the end of the febrile period, the skin became worse, remaining in this condition for weeks. This period of improvement may coincide with the sudden flood of unsaturated fatty acids into the blood stream which Boyd[7] claims occurs at onset of fever. In one instance an eczematous infant fairly well under control developed an acute illness with fever, and the eczema became worse without the initial phase of improvement. The effect of acute infections on the course of infantile eczema is the subject of further investigations which are in progress.

8481 C

Water Metabolism of the Rat Following Removal of the Anterior Lobe of the Hypophysis.*

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There is considerable evidence that experimental diabetes insipidus is neither strictly an endocrine disturbance nor entirely an involvement of the brain but probably the result of both. Rats can be rendered diabetic by removal of the posterior lobe or by a stab wound in the base of the brain, providing the latter injury is such that it completely severs the stalk from its attachment to the brain.[1,2]

Fisher, Ingram and Ranson,[3] availing themselves of the Horsley-

[7] Boyd, E. M., *Canadian Med. Assn. J.*, 1935, **32**, 500.

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† The authors wish to thank Miss Frances Dobell for her valuable assistance in this work.

[1] Richter, C. P., *Am. J. Physiol.*, 1933, **106**, 80.

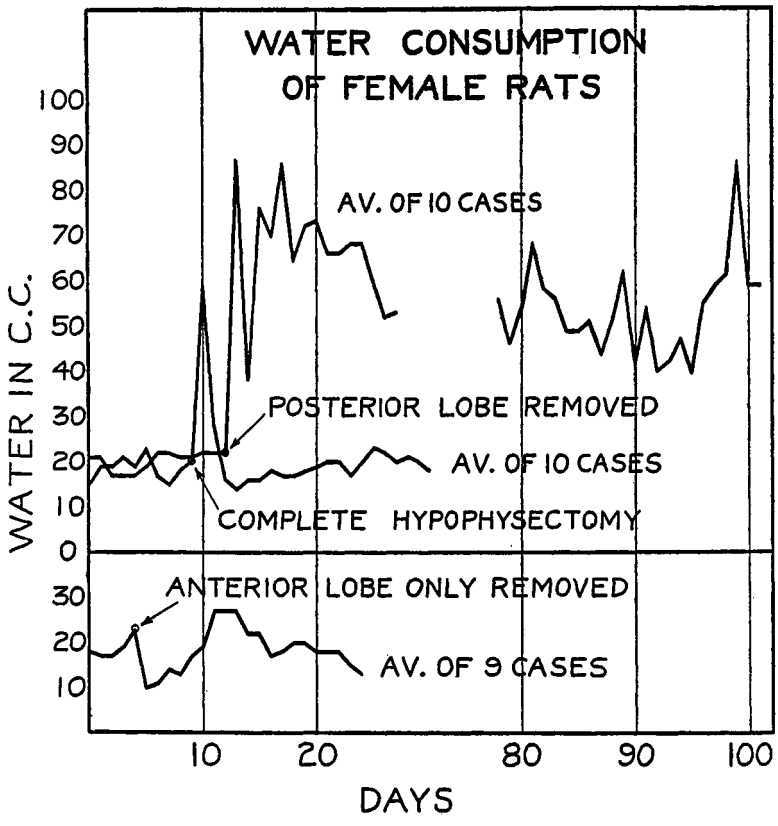
[2] Richter, C. P., *Am. J. Physiol.*, 1934, **110**, 439.

[3] Fisher, C., Ingram, W. R., and Ranson, S. W., *Arch. Neurol. and Psychiat.*, 1935, **34**, 124.

Clark stereotaxic instrument, investigated the effect of restricted hypothalamic lesions in the cat. Their observations were combined with careful histological studies of the resulting degeneration and they were able to demonstrate that a permanent diabetes insipidus ensued only when there was complete interruption of the hypothalamico-hypophyseal tract.

The literature contains numerous reports on the effect of complete hypophysectomy, hypophyseal injuries, and lesions of the tuber cinereum and the probable relation of these to experimental diabetes insipidus, but the writers are not aware of any investigations in which an effort was made to determine the effect of removal of the anterior lobe without concomitant injury to the posterior lobe or stalk.

The experimental material included 47 female rats, varying in age from 90 to 120 days at the time of operation. The results secured with completely hypophysectomized rats, rats with the posterior lobe alone removed, and the rats with the anterior lobe re-



moved, are summarized in the accompanying chart. It will be noted that following complete hypophysectomy there is an immediate and transitory polydipsia, a condition now known for some time.[4] Removal of the posterior lobe, providing sufficient anterior lobe tissue has been left behind, invariably produces a pronounced increase in water consumption which appears to be permanent. The results summarized in this chart include only those animals in which there was minimal injury to the anterior lobe. Findings of more extreme injuries to this portion of the gland varied somewhat from those described above and will be related elsewhere.

What we especially wish to direct attention to in this report is the result obtained by the removal of the anterior lobe alone. In contrast to the condition secured following total hypophysectomy or removal of the posterior lobe, water intake of rats following ablation of the anterior lobe falls below the normal or preoperative level. This decreased consumption of water is maintained for about a week; at the end of that time it returns to the normal level.

From our own experiments and from those of Richter, it would appear that either a surviving portion of tissue of the anterior lobe, in the absence of the posterior lobe, or section of the stalk is a necessary condition for the production of a permanent diabetes insipidus. If the polydipsia is provoked by a diuretic principle originating in the anterior lobe, one would expect a similar disturbance in the metabolism of water following implantation of fresh rat anterior lobe tissue in the hypophysectomized animal. With this in mind, 6 hypophysectomized rats were implanted with fresh rat anterior lobe tissue. Each rat received from one to 3 anterior lobes every other day for a period of 20 days. The results were completely negative. The intake and output of water by these animals remained unaffected and never rose above normal levels.

Richter suggests that the loss of cerebrospinal fluid, incidental to the removal of the pituitary, might be a contributing factor in the production of diabetes insipidus. It should be pointed out that in our operations such loss of fluid was not observed; however, to check this possibility the cerebrospinal fluid of 12 rats was drained through a small opening in the base of the skull posterior to the pituitary and the intake of water and output of urine were measured daily for a period of several weeks. No disturbance in the metabolism of water appeared.

Summary. 1. Complete hypophysectomy is followed by transient polydipsia and polyuria which disappear within 24-36 hours after

[4] Aschner, B., *Pflüg. Arch. f. Physiol.*, 1912, **65**, 341.

the operation. 2. Removal of the posterior lobe, with as little injury to the anterior lobe as possible, is invariably followed by a marked increase in the water intake and water output. This condition is apparently permanent, for it can still be observed 6 months or more after the operation. 3. Ablation of the anterior lobe, leaving only the pars nervosa and intermediate portion intact, including the stalk attachment to the brain, produces a slight decrease in the water intake for about a week after the operation. At the end of this time the water consumption returns to the normal level. 4. Hypophysectomized rats implanted with anterior lobes of the rat hypophysis show no disturbance in water metabolism. The water intake and output of animals so treated, even over a period of 20 days, never rise above those observed in the normal animal.

8482 C

A Method for Determination of Total Pigment in Bile Which Is Applicable to "Biliverdin Biles."

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Methods for quantitation of bile pigments, with the exception of the methods of Hooper and Whipple,[1] Beccari,[2] Kerppola and Leikola,[3] and Peterman and Cooley[6] have been confined to modifications of the van den Bergh method[4] for the determination of bilirubin. That the pigment in the bile of carnivora is present chiefly as bilirubin and that of herbivora as biliverdin[5] is a conception based partly upon physical appearances of the respective bile and partly upon specific tests for these particular constituents. Modifications of the van den Bergh method are satisfactory for clinical identification or quantitation of bilirubin; however, such methods are without value when used for the quantitation of pigment in bile in which the pigment is present in the form of oxidized bilirubin

[1] Hooper and Whipple, *Am. J. Physiol.*, 1916, **40**, 332.

[2] Beccari, *Boll. Soc. Ital. Biol. Sper.*, 1928, **8**, 332.

[3] Kerppola and Leikola, *Skan. Arch. Physiol.*, 1929, **55**, 70.

[4] McNee, *Quart. J. Med.*, 1923, **16**, 390.

[5] Hawk and Bergeim, Practical Physiological Chemistry, Philadelphia, 1927, 10th edition, p. 329.