The nature of the paralysis is now under study by one of us (R.L.M.).

Gross findings are briefly: (1) In ordinary movements the hind limbs were not used, but were dragged along, in the flaccid condition. However, when the animal made vigorous attempts to move its body, the hind limbs were alternately flexed and extended, but were unable to support the hind part of the body, suggesting a weakness in the adductors of the thigh. (2) Faradic excitation of the skin of the intact animal showed that the sensibility to painful stimuli had not been affected. (3) Faradic excitation of the isolated muscles and larger nerve trunks of the leg and gluteal region gave normal responses. (4) Although normal movement of the hind limbs is affected, the paralysis is neither completely motor nor completely sensory. At autopsy the muscles of the leg and gluteal region were not noticeably atrophic. The sensory ganglia of the brain and spinal cord and the posterior funiculus of the spinal cord had a yellow color. From microscopic examination there are indications of pathological changes which are being studied in detail.

Pathology of the vitamin E paralysis appearing in suckling young has been studied by Lipshutz.[3]

9397 P

Relation between Thyroid and Growth of Testes and Penis When Stimulated by Electric Light.

JACQUES BENOIT. (Introduced by Edgar Allen.)

From the Department of Anatomy, Yale University School of Medicine.

Immature male ducks, when fed with thyroid tissue[1, 2] or injected with thyroxin[2] become sexually stimulated. Furthermore, thyroidectomy delays the normal testicular growth in chickens and ducks[3] and reduces considerably the testicular growth in immature ducks exposed for 15 hours per day during 3 weeks, to the stimulating action of electric light.[4]

In new experiments, 10 Pekin ducks were thyroidectomized and

[3] Lipshutz, M. D., *Revue Neurologique, T.*, 1936, **65**, 221.

[1] Jaap, R. G., *Poultry Science*, 1933, **12**, No. 5.

[2] Aron, M., and Benoit, J., *C. R. S. Biol.*, 1934, **116**, 218.

[3] Benoit, J., and Aron, M., *ibid.*, p. 221.

[4] Benoit, J., *ibid.*, 1936, **123**, 243.

received the same daily illumination during periods of time longer than 3 weeks, in order to establish if the duration of the experiment would influence the response of the testes. Ten ducks were used as control animals.

In order to see if the penis grows as fast in thyroidectomized as in normal animals, some more controls, the testes of which were of approximately the same weight as those of the thyroidectomized animals, were chosen. The weights of their penis were compared in the experimental and control animals.

TABLE I.

Animal No.	Age (mo.)	Exper. (birds treated by electric light)	Duration (days)	Diam. of left testis (mm.) initial	Diam. of left testis (mm.) final	Wt. of 2 testes at autopsy (gm.)	Thyroid at autopsy (mg.)
1.							
778	5	controls	33	5.3	34.5	78.63	—
779	5		33	5.3	29.3	58.34	—
780	5	thyroidec-	32	5.7	9.5	2.33	0
783	5	tomized	34	5.3	10.4	2.99	0
2.							
836	4	controls	40	4.7	32.5	73.07	—
837	4		40	5	25.5	30.84	—
830	4		41	6	12.7	3.24	0
833	4	thyroidec-	41	6	25.7	38.97	0
834	4	tomized	41	6	13	3.11	0
844	4		37	5.2	25.4	36.02	0
3.							
823	5	controls	41	10	19	20.22	—
843	4		45	9	32	61.58	—
807	5	thyroidec-	47	10	29.2	55.43	1
826	6	tomized	41	8.5	27.3	37.3	0
4.							
818	6.5	controls	64	8.5	36.5	90.23	—
829	7		56	6.5	32.	68.27	—
831	6.5	thyroidec-	61	6.5	29.5	56.77	0
845	6.5	tomized	60	9	25	40.25	0

Table I shows that after 32-34 days thyroidectomy still markedly inhibited the growth of the testes, as described in the previous experiments conducted for 3 weeks.[4] This inhibition was diminishing after 37, 41, and 61 days. Testes weighing as much as 38.97 gm. and 56.77 gm. have developed after 41 and 61 days in complete absence of any thyroid tissue.

Prehypophyses from normal ducks treated by light appeared to be rich in gonadotropic factor when implanted into immature female mice.[5] Similar implantation of prehypophyses of thyroidectomized and illuminated ducks showed that these hypophyses were very poor in the gonad stimulating factor as long as the testes were small. The

[5] Benoit, J., *ibid.*, 1935, **118**, 672.

amount of that factor increases when the testes are increasing in size.

The weight of the penis ranged between 0.25 and 0.40 gm. in 4 thyroidectomized ducks whose testes weighed between 2.3 gm. and 3.2 gm. The penis of 4 untreated control animals, with testes of approximately the same weight, (2.3 to 3.7 gm.) weighed from one to 2 gm., that is to say 4 to 5 times more than in the animals under experiment. In experimental ducks having larger testes, that difference exists also but is less marked (ratio = 2.1 to 2.5): Six thyroidectomized ducks with testes from 36 to 57 gm. had penis weighing from 0.9 to 1.7 gm., but the penis of 5 control ducks with testes from 31 to 61.6 gm. weighed from 2.3 to 3.6 gm.

Summary. Thyroidectomy exerts an inhibiting effect on the growth of the testis of the duck stimulated by electric light. This effect is very marked during 3-4 weeks, but diminishes later on. It is not yet possible to say if it disappears completely after a sufficient length of time.

Thyroidectomy exerts also an inhibitory effect on the development of the penis. This inhibition is more marked and more prolonged than that of the testes.

9398 P

Influence of Hypophysis and Thyroid Glands on the Liver of the Duck.

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It has been shown previously that the removal of the thyroid glands induces a very marked hypertrophy of the liver in both male and female ducks, mostly through an increase of the lipids, and that the injection of anterior pituitary extract enhances this hypertrophy.[1]

Other experiments were made on 38 ducks (with 33 controls) in order to study the weight of the liver under different experimental conditions:* thyroidectomy, injections of different pituitary extracts, of urinary extract, and of benzogynoestryl[2] with varying

1 Benoit, J., *C. R. Ac. Sc. Paris*, 1936, **203**, 468.

* The histological and chemical analysis of the livers obtained in these experiments will be published later.

2 Benoit, J., *C. R. Ac. Sc. Paris*, 1934, **199**, 1671.