

21 to 28 hours. This is comparable to the excretion of normal nitrogenous constituents as urea and creatinine. Since dogs 1 and 3 in Table I excreted 77.34 and 54.4% respectively of the administered dose up to the time of complete recovery of the animals and negative barbital findings in the blood and urine, it is to be assumed that fairly large amounts of this drug have been destroyed in the body. An indeterminable amount of the urine from dog 2 was lost after the first 21 hours after the administration of the barbiturate and hence the results are not tabulated after that time.

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## Carcinoma in the Cottontail Rabbit Following Spontaneous Virus Papilloma (Shope).

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The Shope rabbit papilloma is an epithelial new growth caused by a filtrable virus<sup>1</sup> and transmissible in series through cottontail (Genus, *Sylvilagus*\*)<sup>1</sup> and domestic rabbits (Genus, *Oryctolagus*).<sup>2</sup> Both in the gross and histologically it is similar to the virus papillomata of man, cattle and dogs.<sup>1, 3-6</sup> Further, it has been found to possess not only the immediate characters of a tumor,<sup>7</sup> but also the potentiality of progressive alteration until finally it may assume the characteristics of a squamous cell carcinoma with metastases.<sup>8, 9</sup> We have confirmed these findings.

<sup>1</sup> Shope, R. E., *J. Exp. Med.*, 1933, **58**, 607.

\* Two species of cottontail rabbit, *Sylvilagus floridanus malluris* Thomas, and *Sylvilagus floridanus alacer* Bangs have been found suitable for serial transmission of the virus. We have confirmed the latter and can now report successful serial transmission through *Sylvilagus floridanus mearnsi* Allen, native to northwestern New York State.

We wish to thank Mr. George G. Goodwin of the Museum of Natural History, New York City, for the specific allocation of the cottontail rabbits used.

<sup>2</sup> Shope, R. E., *Proc. Soc. Exp. Biol. and Med.*, 1935, **32**, 830.

<sup>3</sup> Ciuffo, G., *Gior. ital. mal. ven.*, 1907, **48**, 12.

<sup>4</sup> Magalhães, A., *Brazil-med.*, 1920, **34**, 430.

<sup>5</sup> Findlay, G. M., *Great Britain Med. Research Council*, 1930, **7**, 252.

<sup>6</sup> De Monbreun, W. A., and Goodpasture, E. W., *Am. J. Path.*, 1932, **8**, 43.

<sup>7</sup> Rous, Peyton, and Beard, J. W., *J. Exp. Med.*, 1934, **60**, 701.

<sup>8</sup> Rous, Peyton, and Beard, J. W., *Proc. Soc. Exp. Biol. and Med.*, 1935, **32**, 578.

<sup>9</sup> Rous, Peyton, and Beard, J. W., *J. Exp. Med.*, 1935, **62**, 523.

Carcinomatous changes have been reported previously only in experimentally inoculated domestic rabbits.<sup>8,9,10</sup> It would be highly significant were the host-parasite relationship so perfected in the natural host, the cottontail rabbit, that malignant changes never occurred. The significance of such a finding would apply irrespective of whether the virus *per se*, or whether secondary factors were responsible for the carcinoma. The purpose of this communication is to report that such is not the case, for we have observed carcinomatous degeneration of a naturally occurring papilloma in a wild cottontail rabbit.

Of 132 cottontail rabbits (*Sylvilagus floridanus alacer* Bangs) received from southern Kansas, 11 have had spontaneously one or more of the papillomatous growths. These 11 cottontails were kept for observation and for a source of virus. With a single exception, our findings have agreed with those previously described.<sup>1,7</sup> The history of the exceptional case follows:

Cottontail rabbit S5-CR 363. Thin, young, adult male. Received March 30, 1935. On lower abdomen 4 pigmented warts were noted: A, 18x22x15 mm. in height, B, C and D, 4-6 mm. in diameter x6-8 mm. in height. Rapid gain in weight. Papillomata appeared unchanged for 85 days, when lesion A showed superficial ulceration with thickening of the underlying tissues. Six days later the rabbit died from fracture of the lumbar spine sustained accidentally the previous day.

Necropsy revealed a well developed and nourished adult cottontail rabbit. Externally the lesions were as noted. Sections were removed from each for histological study. In the left axilla an enlarged lymph node, measuring 7x7x12 mm. was found. It was irregular, but not indurated. No other lymphadenopathy or evidence of metastasis was encountered. Death had been caused by fracture of the lumbar spine with extensive hemorrhage.

Microscopic examination of the sections of lesion A and of the enlarged axillary node showed histological pictures entirely characteristic of squamous cell carcinoma.

A case is presented of carcinomatous change following a spontaneously occurring papilloma (Shope) in the cottontail rabbit, *Sylvilagus floridanus alacer* Bangs.

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<sup>10</sup> Beard, J. W., and Rous, Peyton, *PROC. SOC. EXP. BIOL. AND MED.*, 1935, **33**, 191.