

animals younger than those shown in the scatter diagram, differences were also noted between observed and predicted values in older animals. A few determinations on adult animals indicate that when growth ceases, the phosphatase values tend to remain at a constant level ranging between 4 and 8 units.

Summary. Within the age limits of 15 and 71 days the serum phosphatase values for healthy rabbits describe a statistically significant linear decrease with increasing age and weight.

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Effect of Spontaneous and Induced Infections upon Development of Mouse Sarcoma 180.*

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It has been recently observed that bacterial factors capable of eliciting the phenomenon of local skin reactivity to bacterial filtrates also produce, upon intravenous injections, selective hemorrhagic necrosis in transplantable malignant tumors of guinea pigs, mice and rats (Gratia and Linz,¹ Shwartzman and Michailovsky,² Duran-Reynals,³ and Apitz.⁴ The work described deals with the effect of spontaneous and induced bacterial infections upon the development of mouse sarcoma 180.

The antagonistic and inhibitory effect of Trypanosomes, *Bacillus tuberculosis*, *Bacillus bulgaricus thermophilicus* and *B. anthrax* upon the development of mouse and rat transplantable tumors was previously reported by Daels,⁵ Karczag, Csaba and Nemeth,⁶ Roskin and Exemplierskaia,⁷ and Boccolari-Segolini.⁸

Growth of Sarcoma 180 in normal mice. In a healthy stock of

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¹ Gratia and Linz, *C. E. Soc. Biol.*, 1932, **108**, 427.

² Shwartzman, G., and Michailovsky, Nicholas, *PROC. SOC. EXP. BIOL. AND MED.*, 1932, **29**, 737.

³ Duran-Reynals, D., *PROC. SOC. EXP. BIOL. AND MED.*, 1934, **31**, 341.

⁴ Apitz, Kurt, *Z. f. Krebsforsch.*, 1933, **40**, 50.

⁵ Daels, F., *Arch. Hyg.*, 1910, **72**, 257.

⁶ Karczag, L., Csaba, M., Nemeth, L., *Z. f. Krebsforsch.*, 1931, **33**, 371.

⁷ Roskin, G., Exemplierskaia, E., *Z. f. Krebsforsch.*, 1931, **34**, 628.

⁸ Boccolari-Segolini, A., *Ateno parmense*, 1933, **5**, 315.

mice the tumor gives 100% of takes. Within the first 2 weeks following inoculation the mortality rate is low (7 to 8%). According to Woglom, no fluctuations in growth energy and no seasonal influences on the growth of the tumor are observed. Based on inoculations of thousands of mice in the Crocker Institute for Cancer Research, spontaneous cure takes place in approximately 1.33%. In the experiments of the author of this paper, 2 weeks after the inoculation, about 50% of mice showed tumors measuring from 1.5x2 cm. to 2x2 cm. (large tumors) and the remaining, tumors measuring from 1x1 cm. to 1x1½ cm. (average tumors).

Growth of Sarcoma 180 in mice infected with B. enteritidis. Observations were made on a group of 610 mice infected spontaneously with *B. enteritidis*. Twenty-five and four-tenths per cent died during 12 days following tumor inoculation. Cultures of the tumor tissue, and pleural fluids, hearts' blood and liver of the dead and many of the surviving mice showed *B. enteritidis*. Two weeks following inoculation of the tumor, 377 surviving mice were examined. Of these no mice showed large tumors; 46% showed average tumors, 31% showed tiny necrotic tumors, and 23% no tumors. When mice bearing tiny necrotic tumors survived for 3 to 4 weeks following the transplantation, spontaneous regressions were observed in most of these. The exact percentage of regressions cannot be given since most of infected mice died within the first month. The possibility remains that the tumors would have resumed growth if the mice lived longer. It may be stated, however, that spontaneous regressions were observed beyond normal expectancy.

The effect of induced bacterial infections on Sarcoma 180. Young cultures of *Staphylococcus aureus* and of a rough variant of *B. enteritidis* respectively, were injected intravenously into mice bearing 12-days-old sarcoma 180. *Staphylococcus aureus* had no effect. *B. enteritidis* elicited hemorrhagic necrosis in tumors of 15 out of 20 mice tested within 24 hours. Eight of these tumors completely regressed. *Staphylococcus aureus* culture filtrate had no effect. *B. enteritidis* culture filtrate produced results similar to those obtained with live cultures of *B. enteritidis*.

Both filtrates were tested for their ability to elicit the phenomenon of local skin reactivity to bacterial filtrates in rabbits. *B. enteritidis* filtrate was active in dilution 1 to 500. *Staphylococcus aureus* filtrate produced no effect even in large doses.

As is seen from the above observations spontaneous and induced infections with *B. enteritidis* exert a striking inhibitory influence upon the development of sarcoma 180. There exists a definite cor-

relation between the ability of the filtrate of a given microorganism to elicit the phenomenon of local skin reactivity in rabbits and the inhibitory effect of an infection with the microorganism upon the development of sarcoma 180 in mice.

Attempts are under way to determine the effect of infections with certain avirulent microorganisms upon the growth of animal and human spontaneous tumors.

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Changes in the Hypophyses of Castrate and Cryptorchid Guinea Pigs.*

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Engle¹ has shown that the anterior hypophysis of the castrate rat is more potent in gonad-stimulating hormone than that of the normal animal. Evans and Simpson² confirmed this and demonstrated that glands from cryptorchid rats have more than normal potency. Severinghaus³ showed that the same holds for the castrate guinea pig.

In the present experiments anterior lobes from normal and castrate (4 to 12 months) adult male and female, and experimental cryptorchid (6 to 14 months) guinea pigs were implanted intramuscularly into immature female rats and mice. In all, 235 animals were used as donors and 83 as hosts. The relative impotency of the guinea pig pituitary in gonadotropic hormone made it necessary to implant considerable amounts in the rat. The amount of guinea pig anterior lobe (fresh gland weight) required to induce a significant increase in the immature rodent ovary was found to be approximately 4 times that of rat pituitary. In the case of the five types of guinea pig pituitaries mentioned above from 3 to 5 times as much, by weight, was required in the rat as in the mouse. Similar

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¹ Engle, E. T., *Am. J. Physiol.*, 1929, **88**, 101.

² Evans, H. M., and Simpson, M. E., *Am. J. Physiol.*, 1929, **89**, 371.

³ Severinghaus, A. E., *Am. J. Physiol.*, 1932, **101**, 309.