deflections have been observed in this area and, judging by the observed effects associated with equally intense anomalies elsewhere, local interference with radio reception might be expected.

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EFFECT OF CERTAIN ENZYMES AND AMINO-ACIDS ON CROWN GALL TISSUES

THE relation of the crown gall of plants (caused by *Phytomonas tumefaciens*) to malignant tumors of animals is deservedly occupying the minds of pathologists. The status of this subject is excellently presented in a recent paper by Riker and Berge.[1] It is apparent that while the main trend of experimental work is toward determining the stimulatory factors in both crown gall and cancers, comparatively little has been done on the therapy of crown gall with the idea of the ultimate application of the results to cancers of animals. Crown gall and different types of sarcomas have been successfully treated by different forms of radiant energy.[2, 3, 4, 5] There seems to be a certain degree of similarity in response of plant and animal cancerous tissues to different types of physical treatment.

The author working with the crown gall on geranium (*Pelargonium zonale*) observed destruction of galls following injection of a mixture of *Erwinia carotovora* (the cause of a soft rot in carrots and other fleshy roots) strains into galls one month old. Gall tissue usually was completely broken down in from four days to a week, depending on the size of gall and environmental conditions. Galls on young tomato (*Lycopersicon esculentum*) and sunflower (*Helianthus annus*) plants were treated similarly and responded in very much the same way. After the destruction of gall tissue on geranium plants there was no new gall observed to appear after one year. Plants were always maintained in a good growing condition. Geranium plants inoculated with *E. carotovora* were never affected by the organism.

[1] A. J. Riker and T. O. Berge, *Amer. Jour. Cancer*, 25: 310–357, 1935.

[2] C. Arnaudi and G. Venturelli, *Rivista di Biologia*, 16: 61–80, 1934.

[3] Georges Lakhovsky, "L'origine de la vie," 175 pp. Gauthier-Villard et Cie. Paris, 1925.

[4] I. Levin and M. Levine, *Jour. Cancer Research*, 7: 163–170, 1922.

[5] J. W. Schereschewsky and H. B. Andervont. Publ. Health Report 43: 927–945, 1928.

This interesting phenomenon led to the supposition that enzymes or other specific compounds might be involved in the elimination of over-growth. With this thought in mind, the author tested diastase, papain, pepsin, cysteine hydrochloride, leucine, iso-leucine, tyrosine and tryptophane.[6] Cysteine hydrochloride was applied in view of the fact that this material was successfully employed in curing Jensen's sarcoma of white rats.[7] All preparations tested were used in the form of 0.1 per cent. water solution or as crystals. Galls employed for treatment were from one to two months old and ranged in size from 3 to 5 cms in diameter and were induced on geranium and sunflower by a rose strain of *P. tumefaciens*. Injection of materials was made by hypodermic syringe in the case of the water solutions. Dry powder (a few crystals in each case) was introduced into a very small incision made in the center of the gall. Sometimes the galls treated with crystals were afterward atomized with sterile distilled water to aid the diffusion of the material. Controls were represented either by injection of sterile distilled water into the galls or by incisions with a sterile scalpel. In all treated cases, except with tryptophane and tyrosine, the galls gradually collapsed, dried and remained on the plant as hard vestiges easily detachable. Pepsin and papain acted very promptly, while diastase and other compounds used mummified the galls of 3 to 4 cms in diameter in from ten days to two weeks. In all these tests there were used from 10 to 20 galls for each treatment, making a total of 180 galls with corresponding controls.

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SEX DIFFERENCES IN ANEMIC RATS

IN the issue of SCIENCE for January 29, 1937, appeared a note by Margaret C. Smith and Louise Otis describing certain differences observed between male and female anemic rats in their response to various remedial measures. With those supplements incapable of promoting a maximal rate of recovery, the female rats responded better than the male rats. This was interpreted as a true sex difference, and the authors expressed the belief "that ignorance of this fact may explain some of the discrepancies of the same magnitude in the findings in various laboratories relative to the availability of iron in foodstuffs." Also, in 1932 Miss Helen Mitchell[1] observed an analogous phenome-

[6] Chemicals used were of the following brands: Papain-Merck. Diastase, pepsin, leucine and tyrosine-Pfanstiehl. One lot of pepsin from Parke, Davis and Co. Cysteine hydrochloride, isoleucine and tryptophane—Eastman Kodak Co.

[7] C. L. Connor, J. L. Carr and L. Ginzton, *Proc. Soc. Exp. Biol. and Med.*, 34: 374–376, 1936.

[1] *Amer. Jour. Physiol.*, 101: 503, 1932.