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Vaccination Against Spotted Fever with Agar-Tissue Cultures.

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The making of vaccines against the Rickettsial diseases with the contents of infected insects offers many technical difficulties to say nothing of the danger to those involved. There is no doubt that vaccines prepared in this manner by Weigl for European typhus, and by Parker for spotted fever, give considerable immunity.[1, 2] To eliminate the danger and expense of manufacture, culture vaccines of rickettsiae are the ideal, but until recently it has not been possible to obtain cultures that were sufficiently rich to permit vaccination on a large scale. By means of the agar slant method previously reported, we have been able to make vaccine which protects guinea pigs[3] and monkeys[4] against large doses of European typhus. It was hoped that spotted fever vaccine made in the same manner would be equally efficient.

Culture strains of spotted fever (Eastern type) are easily initiated with spleens of infected guinea pigs.[5] After the first generation, mouse embryo tissue is used. For the preparation of vaccine, the infected material from slants is ground in a mortar, and 3 cc of

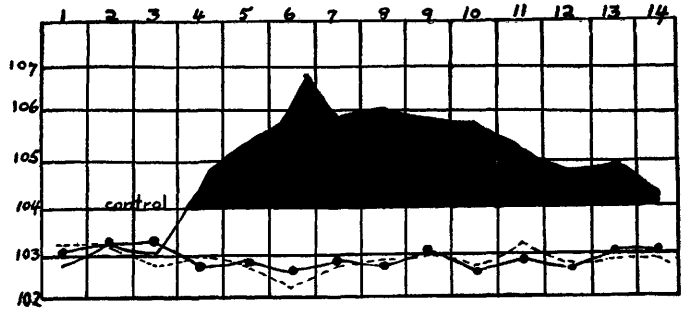

CHART 1.

Temperature curves of 2 vaccinated pigs and of control after receiving 1 cc of spotted fever blood intraperitoneally. (Black area indicates significant temperature elevation.)

1 Nicolle, C., and Sparrow, H., *Arch. Inst. Past. Tunis*, 1933, **21**, 25.

2 Parker, R. R., *J. Inf. Dis.*, 1935, **57**, 78.

3 Zinsser, H., FitzPatrick, F., and Wei, H., *J. Exp. Med.*, 1939, **69**, 179.

4 FitzPatrick, F., PROC. SOC. EXP. BIOL. AND MED., in press.

5 FitzPatrick, F., PROC. SOC. EXP. BIOL. AND MED., 1938, **39**, 501.

formol-saline is added for each slant. In vaccinating guinea pigs, a total of 4 cc of vaccine is administered subcutaneously in doses of one, one, and 2 cc at 5-day intervals. Animals so treated are found to be solidly immune when tested a month later with blood virus (Chart 1). Serum from 2 vaccinated pigs taken 3 weeks after vaccination agglutinated spotted fever rickettsiae (chick tissue slants) in dilution of 1/20+++, 1/40++, 1/80+. These 2 sera also protected normal guinea pigs when 1 cc was mixed with passage blood and injected after standing 40-60 minutes at room temperature.

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Estrogenic Properties of Extracts of Ovaries of Certain Marine Invertebrates.*

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The writer has previously reported that extracts of the ovaries of a Bermuda echinoderm *(Lytechinus variegatus)* caused considerable growth of the epithelium of the uterus and vagina when injected into the mature, ovariectomized rat.[1] However, failure of the uterus to swell with fluid as it does in full normal estrus indicated that the response was subthreshold and, possibly, that the stimulating agent in the extracts differed in some respects from estrogens derived from mammalian sources. The present study was undertaken in order to test for estrogens in other invertebrate ovaries and to make further observations of the effects of the ovarian extracts upon the vaginal and uterine epithelium of the rat.

The ovaries of the common sea urchin *(Lytechinus variegatus)*, the reef urchin (Echinometria), the holothurian *(Stichopus mobii)*, and the lobster *(Palinurus argus)* were collected in Bermuda during the summer of 1938 in considerable quantities. In all cases the ovaries were sexually mature or were rapidly approaching that state when collected. After removal the ovaries were drained of as much sea water as possible and then thoroughly ground in a mortar. The ground tissues were then placed in separate containers of 95%

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1 Donahue, J. K., and Jennings, E. D., *Endocrinology*, 1937, **21**, 5.