the determination of ages of various carbonaceous materials in the range of 1,000–30,000 years.

This investigation is continuing with other sources of carbon and is being extended to other possible cosmic radioelements. A more detailed report will be published elsewhere.

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Fowl Spirochetosis Transmitted by *Argas persicus* (Oken), 1818 From Texas[1]

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Hoffman, Jackson, and Rucker (*4*) have given a preliminary report of spirochetosis in turkeys in California in which no vector was found, although a careful search was made in all poultry houses. This spirochetosis manifested itself in a mild nature compared with that reported by various investigators in other parts of the world. The symptoms were: standing or sitting with the eyes shut, anorexia, loss of weight, and diarrhea. More severe cases walked with difficulty. In a later paper, Hoffman and Jackson (*3*) reported the pathological effects of the spirochete in fowl. The epizootiology of the disease in the flock remained unknown.

Steinhaus (*7*) reported the isolation of an unidentified spirochete from hen's eggs after inoculation with liver tissue from hens raised in Montana. This spirochete was not pathogenic for chickens—a fact which may indicate a difference from the known infectious agent of fowl spirochetosis.

Marchoux and Salimbeni (*6*) showed that the common fowl tick, *Argas persicus*, is a vector of *Borrelia anserina* (Sakharoff) (= *Spirochaeta gallinarum* Blanchard), the agent of fowl spirochetosis. This was verified by the work of Balfour (*1*) and others. The spirochete is transmitted to the progeny of an infected tick through the egg. Incubation in the fowl, when tick transmitted, takes 4–9 days before spirochetes are demonstrable in the peripheral blood. Recovery from the disease is followed by lasting immunity, but in some outbreaks in the Old World the case fatality has been from 60–90 per cent.

Cooley and Kohls (*2*) report *Argas persicus* of almost world-wide distribution in warm climates and a vector of avian spirochetosis in many Old World regions and in Brazil, Panama, and Cuba in the New World. Hungerford and Hart (*5*) showed that the common red mite of chickens (*Dermanyssus gallinae*) can serve as a vector of the fowl spirochetosis.

In the present studies a white Leghorn rooster, on which a large number of ticks obtained from a poultry raiser in El Paso, Texas, were being maintained, became very ill. Blood smears were not made at first, and later they were negative for parasites. Several hundred progeny from these ticks and a few unfed nymphs and adults were next fed on a white Leghorn pullet. A blood smear from the normal hen was negative with Giemsa stain. In 6 days the pullet was obviously ill, and blood smears were positive for spirochetes. On the 7th day many spirochetes were present in blood smears, and a few were still present in the peripheral circulation on the 8th day. After the 8th day no spirochetes were found in blood smears.

Symptoms of the spirochetosis were: jaundice, anorexia, and diarrhea, with loss of weight. The rooster exhibited symptoms of partial paralysis. Both birds tended to sit and droop the head with the eyes shut. Recovery was uneventful in each case. It is believed that this is the first finding of tick-borne avian spirochetosis in the United States.

[1] Paper No. 2338, Scientific Journal Series, Minnesota Agricultural Experiment Station, St. Paul.

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A Growth Inhibitor and a Growth Promotor in Sugar Cane[1]

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In connection with a study of structural development in sugar cane, a series of investigations was begun on the growth-regulating substances produced by that plant. In order to find a method by means of which the substances from all tissues of the plant, chlorophyllous as well as nonchlorophyllous, would be extracted, several methods of extraction and analysis described in the literature were tried. The results were unsatisfactory, however. When the direct ether extraction method of Boysen-Jensen was used, the chlorophylls, easily extracted from the green tissues of sugar cane, caused undesirable coagula which interfered with the accurate assay of growth substance in the *Avena* test. Van Overbeek, *et al.* (*10, 11*) applied this method to node and internode tissue of sugar cane stem, where apparently little or no chlorophyll was extracted. Furthermore, in all instances in which tissue was extracted with ether or with water, the sets of coleoptiles showed mixtures of curvatures, some positive toward the agar block and some negative. Since it was thought that such curvatures could not be averaged to give results of any significance, a series of experiments was begun to determine the source of the positive curvatures.

The presence in plants of substances which prevent the

[1] Published with the approval of the director as Technical Paper No 154 of the University of Hawaii Agricultural Experiment Station.