

whether they are, or are not, the same, I let Mr. Post have some specimens of bitter-rot and of the ripe-rot of the grape collected at least two hundred miles from where the sweet-peas grew. Seedling sweet-peas, inoculated with spores from these two sources, were killed at the point of infection in the same way that the original sweet-pea stems were killed, and other seedlings which were inoculated with pure cultures of the fungus causing the anthracnose of the sweet-pea.

It would seem, then, from the results obtained, as if the bitter-rot of the apple, the ripe-rot of the grape and the anthracnose of the sweet-pea are caused by the same fungus. A stage corresponding to the ascigerous stage of the bitter-rot has not been obtained yet in artificial cultures.

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INDICATIONS OF AN ENTOMOPHILOUS HABIT IN TERTIARY SPECIES OF QUERCUS.

THE occasional development of several embryos in the fruits of recent species of *Quercus* is of interest as suggesting an entomophilous habit in the flowers of the Tertiary species of this genus.

At present normally five of the six ovules in the three-celled ovary atrophy, and the one remaining forms later a perfect embryo which fills the entire cavity of the nut. But it not infrequently happens that two embryos develop, each with cotyledons, plumule and caulicle. Experiments made by the writer show that both embryos will grow, and the twin oaks were kept until they reached a foot or more in height. Several cases were found by the writer in which three perfect embryos occurred in acorns of the chestnut oak, *Quercus prinus*. All germinated nearly equally well. Finally a single case was found in which there were four perfect embryos. This also was an acorn of the chestnut oak, which develops several embryos more readily than *Q. alba*, *rubra* or *tinctoria*.

Several notes have been previously published on the development of two embryos in

Quercus, but I have not found any record of three or of four perfect embryos occurring in this genus.

The normal abortion of five ovules and reduction to one embryo seems to be an acquired character, and in the development of several embryos appears to be a reversion to an ancestral condition.

Now, it is well known that the formation of several or many embryos is characteristic of entomophilous flowers, but very rare among anemophilous.

This suggests that the oaks of the Greenland Tertiary flora were entomophilous, that their flowers were more conspicuous, and that their fruits normally developed several embryos. With the oncoming of the ice sheet the oaks moved very slowly southward because of the inadaptability of the fruit for wide dispersal. Deserted by the insects seeking the warmth farther south, the oaks may then have adopted their present anemophilous habit.

Paleobotany so far can give no evidence either for or against this theory, but later studies of the Tertiary floras may strengthen the indication now furnished by the development of two, three and four embryos in cases of reversion in *Quercus prinus*.

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BATHYGNATHUS BOREALIS, LEIDY, AND THE PERMIAN OF PRINCE EDWARDS ISLAND.

A FEW days ago I had occasion to examine the figure of *Bathygnathus* published by Leidy in his original description (*Jour. Acad. Nat. Sc. Phila.* (2), 11, pp. 327-330, pl. XXXIII.) and became convinced that it was not a dinosaur, as has been long supposed, but one of the most specialized of the pelycosaur, such as occurs in the Texas region, probably a *Dimetrodon* or *Naosaurus*. I communicated with Dr. Lambe, of the Canadian Survey, indicating my belief that this settled the question of the possible occurrence of Triassic deposits in Prince Edwards Island. Almost all of the geologists of the Canadian Survey who have worked on the island have considered the rocks as Permo-carboniferous and have