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Beggiatoa alba and the Dying of Fish in Iowa

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within rather narrow limits. But it may decide (a) the absence of some important element or (b) the presence of some element deleterious to plant growth. Analysis of the soils of the region, it may be said generally, show that its cultivable area is composed of a soil containing plant food in fair abundance and in a tolerably soluble condition; that its chief deficiency is lime and available phosphoric acid; that the ridge soils are easily tilled and thrifty when new but possess little durability; that, for the future as now, the best farming lands will be those that lie along the gentle slopes of the ridge. In this brief estimate, of course, the rich alluvium of the overflowed regions is not considered, for from the presence of abundant decomposing and decomposed organic matter, as well as because of constant additions of fine soil from other regions, this quality of land is always fertile and easily tillable.

There are no economic products of a distinctively geologic character to be found in northeastern Arkansas. There are no ores nor are there any deposits of coal. Its abundant lignite is unavailable for fuel, first, because it is a rather poor variety of brown lignite, with much hygroscopic moisture and comparatively little volatile matter and a minimum of fixed carbon, and second, because its stratigraphic relations to overlying and underlying soft clays are such as to render its mining difficult and expensive.

BEGGIATOA ALBA AND THE DYING OF FISH IN IOWA.

BY PROF. L. H. PAMMEL.

(Abstract.)

The secretary of the State Board of Health found fish dying in great numbers at Tama City, Marshalltown and Des Moines. The odor after the removal of ice was very disgusting, partly due to the decomposition of dead fish and other

organic matter contained in the water, but also to the growth of a micro-organism. The water below the glucose and starch works at the above places contained large quantities of a greyish gelatinous substance. In microscopical examination this was found to contain large numbers of putrefactive bacteria, but especially common was *Beggiatoa alba*, which is not uncommon on the dead filaments of *algæ* and other decaying organic matter in water. The odor of hydrogen sulphide was very pronounced in the fresh material. After the heavy rains in June the gelatinous masses were washed away and caused little trouble for the rest of the season.¹

SOME FUNGOUS DISEASES OF FRUIT TREES IN IOWA.

BY PROF. L. H. PAMMEL.

(Abstract.)

LEAF BLIGHT OF THE PEAR. ENTOMOSPORIUM MACULATUM LEV.

Last summer while investigating a cotton disease in Texas, Mr. R. D. Blackshaw called my attention to a disease among some of his Le Conte pear trees. This was in the latter part of June, the leaves were falling rapidly and of some all had fallen. Since then new leaves and flowers have been produced. On returning to Ames I found that many of the seedling pear trees in the orchard were affected in a similar way. The disease was especially bad in the nursery. With the exception of some of the Chinese pears every variety in the orchard suffered more or less.

Nearly all of the young trees set out by Captain Speer in the experimental orchard of the experimental station lost most of their foliage prematurely, regardless of variety. The

¹—The reader is referred to Dr. Kennedy's paper in July Bull. Iowa State Board of Health, 1889, for an extended account. For an account of the life history, Zopf, "Die Spaltpilze," 1884, p. 75; De Bary, "Vorlesungen über Bacterien," English translation Garnsey and Bal'our, p. 70; Flugge Mikro-organismen, p. 396; Warming, Om nogle ved; Danmarks Kejserleende; Bacterier i Vidensk Meddel-Især fra d. Naturhist. Forening, Copenhagen, 1875; Farlow Marine Algae of New England, p. 28 and p. 32; Cohn, Beiträge, I Heft 3, p. 157, etc., etc.