will be given in the final report for any assistance of this character, should such be submitted to the writer.

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COLLETOTRICHUM FALCATUM IN THE UNITED STATES

DURING the past two years, while studying the diseases of sugar-cane, careful search has been made for those which are troublesome in other countries but which are not known to occur in the United States. During the past year one of these has been found in Louisiana, and from material received from another state, this may be more widely distributed than was at first thought. This disease is one which is caused by the fungus *Colletotrichum falcatum* Went. This has been reported previously in nearly every sugar raising country in the world, in some places doing a large amount of damage. According to Butler[1] this fungus sometimes causes an immense loss in Bengal. Several common names have been applied to this disease, but the one in most common use in English-speaking countries is the red-rot disease.

The first specimen of this disease was found on a plantation in Orleans parish, Louisiana, in September, 1909. One cane was found which had a lesion about two centimeters in diameter which was covered with the fruiting pustules of this fungus. No other diseased stalk was found in the field. I was not willing to make a positive identification at the time because the causative fungus is very similar to *Colletotrichum lineola* Cda., which occurs very abundantly on Johnson Grass in this region, and it was barely possible that this latter fungus had gained an entrance into a wound in the cane. But since other material has been received there seems little doubt but what this was the true red-rot fungus.

[1] Butler, E. J., "Fungus Diseases of the Sugar-cane in Bengal," *Memoirs Dept. Agr. in India*, Botanical Series, Vol. I., No. 3, Pusa, 1906.

During the fall and winter of 1909 and 1910, a planter in Georgia, Mr. W. B. Roddenbery, of Cairo, who has had considerable trouble with a disease in his cane wrote to the sugar station at New Orleans and also sent specimens. This material was resent to me and I have since made a careful study of the trouble. There is no doubt but that it is the red-rot disease in a very serious form. He estimates that one third of the cane which he wished to use for planting was diseased.

As this disease is generally confined to the inside of the stalk, an examination of the external part usually shows but very little of the trouble. Unless the cane is severely affected the disease would ordinarily be overlooked, unless it was examined very carefully or unless the stalks were split. However, when the cane is severely affected, the rind covering the nodes, and even strips on the internodes, become dark brown in color, and the eyes are usually dead. If the stalks are split, the nodal region will be found to be badly decayed, with strips of red and brown extending out into the internodes. One of the distinguishing characters of the disease is the presence of light-colored spots surrounded by red or brown tissue. These were fairly abundant in the Georgia material. These have not been satisfactorily explained but it appears as if they are points where the fungus is present, it generally not being present in the red and brown surrounding tissue.

The fungus was found fruiting in some large internodal lesions on some soft top joints of one stalk, on the brownish colored nodes of two stalks, and also fruited on a split stalk that was kept moist. In the latter case, the fruiting postules developed directly from the diseased center of the node. A microscopical examination of the diseased tissue of the cane showed the presence of the typical mycelium and many of the so-called "appressoria" in the host cells.

This fungus is very similar, if not identical from a morphological standpoint, to *Colletotrichum lineola* Cda., mentioned above. The latter fungus has also been studied and inocu-

lation experiments have been tried on sugar cane but without success. The fungus would grow, and also fruit to some extent, at the point of inoculation, but would not spread into the healthy tissue.

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SOCIETIES AND ACADEMIES

THE GEOLOGICAL SOCIETY OF WASHINGTON

At the 229th meeting of the society, held at the George Washington University on Wednesday evening, March 9, 1910, informal communications were presented as follows:

Mr. Chas. A. Davis exhibited a map showing the distribution of workable peat deposits in the United States and their relation to the areas of glaciation and heavy precipitation.

Mr. E. G. Woodruff presented a diagram constructed from measurements made along an outcrop of coal beds in central Wyoming, showing their pronounced lenticular character.

Mr. J. T. Pardee exhibited photographs and a sketch map of the region covered by the former glacial Lake Missoula, which once occupied some 4,500 square miles in the drainage basin of the Clark Fork in northwestern Montana and was dammed by a south flowing ice tongue of the Cordilleran ice cap near Lake Pend d'Oreille.

Regular Program

A Microscopical Study of some Sulphide Ores: F. B. Laney.

A Proposed Classification of Petroleum and Natural Gas Fields based on Structure: Frederick G. Clapp.

The classification is a tentative one which was evolved at least in part in order to illustrate to oil operators the differences in geological conditions in different fields. The main divisions of the classification are as follows: (I.) Anticlinal and synclinal structures; (*a*) strong anticlines standing alone, (*b*) well-defined anticlines and synclines alternating, (*c*) monoclinal slopes with change in dip, (*d*) terrace structures, (*e*) broad geanticlinal folds. (II.) Domes, or quaquaversal structures (Salines). (III.) Sealed faults. (IV.) Oil and gas sealed in by asphaltic deposits. (V.) Contact of sedimentary and crystalline rocks. (VI.) Joint stacks.

As examples of subclass I. (*a*), the fields on the Eureka-Volcano-Burning Springs anticline of West Virginia and certain California fields are given. In subclass I. (*b*) are placed most of the fields related to anticlines and synclines in the Appalachian province, the Caddo field of Louisiana, the Coalinga and Los Angeles fields of California and the Burma and other well-known fields in other countries. The majority of the oil and gas pools of southeastern Ohio belong in division I. (*c*), or in I. (*d*) which is an exaggerated form of I. (*c*). The best example known of subclass I. (*e*) is stated to be the extensive field on the Cincinnati anticline in Ohio and Indiana. Class II. includes the fields of the gulf coastal plain. Class III. is exemplified by certain pools in the Lompoc field and perhaps other fields of southern California. Class IV. is somewhat hypothetical, so far as oil and gas accumulations of economic value are concerned, but it may be exemplified by the pitch lake of Trinidad. Class V. is known to exist in the Province of Quebec and to some extent in northern New York state, where natural gas is found in the arkose zone of the Potsdam sandstone resting on prominent knobs in the underlying crystalline rocks. Class VI. was added after the discussion in accordance with a suggestion by Mr. M. R. Campbell. An example of it is a part, at least, of the Florence oil field in Colorado. In illustrating the proposed classification, several notable deficiencies in past assumptions of geologists and oil operators were mentioned, and the lessons to be drawn from them in the light of recent developments were emphasized.

Some Notes on the Mammoth Cave, Kentucky: James H. Gardner.

The Mammoth Cave is essentially a product of solution in the St. Louis Limestone, which in this section of Kentucky is about 500 feet thick. Meteoric waters charged with carbonic acid gas began permeation of joint planes in the limestone as soon as Green River had cut its channel through the Kaskaskia sandstone into the St. Louis. In the opinion of the speaker these joints were produced by pressure exerted from the Cincinnati Arch either by movements of uplift or subsequent settling. The drainage of this section of Kentucky is chiefly underground where the St. Louis is the surface rock and the formation is one abounding in subterranean caverns.

The present entrance to the cave, which is in the hills bordering the east banks of Green River, is doubtless the original exit of Echo River, though this stream has found lower outlets from time to time and is now about 195 feet below this level. Writers on the cave have considered this