clearly: first, that English scholars have a genuine appreciation of the value of the study of the history of the physical sciences, and, second, a recognition of American activity in this same field. Present indications are that the study of this phase of the growth of civilization soon will win an important place in the curriculum of the American college.

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A NEW ELM DISEASE

AFTER the identification of the Dutch elm disease in Ohio, during the summer of 1930, some 300 specimens of diseased elm trees were collected or received from correspondents, examined and the fungi in them isolated in cultures at the Dutch elm disease laboratory operated by the Ohio Agricultural Experiment Station and the division of forest pathology, Bureau of Plant Industry, at Wooster, Ohio. In these cultures it was found that a certain fungus was present in a little over ten per cent. of the cases. The past history and the condition at that time of several of the trees from which this fungus was isolated indicated that they were probably parasitized, some dying entirely during the summer of 1930 and others losing part of their tops. On the strength of these observations, soon after growth began this spring, fourteen young elms were inoculated with the fungus.

About a month after inoculation, symptoms of disease appeared on seven trees. Drooping and wilting of the leaves, preceded or accompanied in most cases by a distinct yellowing was first noted. In a short time most of the leaves dropped although some leaves turned brown and remained on the twigs for more than a month. The diseased twigs and branches died as well as the main trunk above the point of inoculation. A blackening of the bark, which in a few cases extended directly up the trunk from the point of inoculation, was noted on some trees. Apparently the disease made more rapid progress upward than downward, since the branches below the point of inoculation with a few exceptions remained healthy. The entire top of one tree, inoculated at the base, died.

A brown discoloration of the cambium and current growth of sapwood was evident when cross-sections of the diseased branches were examined. The staining in the inoculated trees was more uniform and somewhat more diffused than that found in trees affected with either the Dutch elm disease or Verticillium wilt. However, the discoloration in some cases resembled that of the two latter diseases markedly.

The fungus was reisolated from the inoculated diseased trees but not from inoculated trees which did not develop the disease, although attempts were made to do so. Check trees remained healthy.

On potato dextrose agar the fungus first appears from plantings of diseased wood as a white, cottony colony of aerial mycelium. Later it becomes light brown. But one type of spore has been noted in the cultures. They are hyaline, generally elliptic, although the shape is variable, and in most cases contain one or two oil drops. The average size of 50 spores was 1.9 x 4.5 microns. Occasionally a group of spores loosely bound together in a small head and borne on the end of a short conidiophore was found. For this reason the fungus is tentatively referred to Cephalosporium. No difficulty is experienced in distinguishing this fungus from *Graphium ulmi* Schwarz. Although the spores are about the same size, the type of growth of the colony, its color, and the relatively scant spore production differentiate it from the organism causing the Dutch elm disease.

The fungus was cultured from specimens sent to the Dutch Elm Laboratory from Iowa, Missouri, New York and Washington, D. C., as well as from various localities in Ohio. A more detailed study of the disease and the fungus is in progress.

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THE GALL BLADDERS OF CHICKS IN A VITAMIN D DEFICIENT CONDITION[1]

SEVERAL times during the past few years we have noted in this laboratory that the gall bladders of chicks in a vitamin D deficient condition appeared to be larger than those of chicks of the same age but receiving an adequate supply of this vitamin.

Recently there was an opportunity to make quantitative observations of the gall bladders of two groups of chicks which had been on an experiment from hatching until nine weeks of age. Both groups received the same basal ration, which was deficient in vitamin D. For Group 1, 1 per cent. of cod-liver oil was incorporated in the ration, but Group 2 subsisted on the basal ration only. When the chicks were killed at nine weeks of age leg weakness was quite marked in the latter group, whereas the former was normal. The average weight of the gall bladders of Group 1 (ample vitamin D) was 0.57 gm (P.E. $\pm$ 0.04) and that of those of Group 2, 1.27 gm (P.E. $\pm$ 0.12). When the probable error of the difference between the two means is calculated and compared with the difference, a high degree of significance is obtained. Although accurate measurement of the volume of bile from the two sets of bladders was not feasible, the volume in the case of the deficient chicks was markedly larger than that of the normal chicks. It is significant that although the average

[1] Journal Series paper of the New Jersey Agricultural Experiment Station.