tinue to the site of the ancient city of Kax Uinic, which is situated on the frontier between British Honduras and Guatemala. There, with a party of Maya diggers, certain ruins will be excavated.

THE advancement of research in experimental and theoretical physics at the University of Bristol is assured by a gift of £50,000 by the Rockefeller Foundation and an offer of £25,000 by Mr. W. Melville Wills, of Bristol, to meet the stipulation of the Rockefeller Foundation. The gift is the climax of negotiations which have been going on for some time, during which representatives of the foundation have visited Bristol several times to make investigations as to the work of the Henry Herbert Wills Physics Laboratory. These convinced them that it was worthy of such liberal encouragement. Under the direction of Professor A. M. Tyndall it has won a wide reputation in the few years it has been open. It was founded by a gift of £200,000 by Henry Herbert Wills. Its founder in all gave over £680,000 to the university.

A CORRESPONDENT of the *Journal* of the American Medical Association reports that the institute for heart research established in Bad Nauheim, through a gift of Mrs. Louise G. Kerckhoff, of Los Angeles, is nearing completion and can probably be opened the coming spring. The new institute, named after the donor of the "Kerckhoff-Institut," will be in charge of Professor Groedel of Bad Nauheim. There will be four departments: a department of examination and diagnosis for patients of the social insurance system; a department for the collection of statistics on the causes of heart disease; a department for public enlightenment as to the causes and the best methods of combatting heart disease, and a department for experimental pathology and therapy of heart disease. An administrative council composed of federal representatives, the chairman of the bureau of insurance of Hesse, and representatives of neighboring universities and members of the medical profession will manage the institute.

ON February 3 the Congregation of the University of Oxford passed a decree accepting the offer of the Forestry Commission and the Secretary of State for the Colonies to make contributions at the rate of £5,000 a year as from March, 1929, to July, 1931, to the maintenance of an Imperial Forestry Institute in Oxford, the university undertaking to make during the same period contributions to the Department of Forestry at a rate not exceeding £300 a year in addition to its current contribution. Mr. C. G. Morison, in proposing the decree, explained that it is a renewal of a former decree. The institute, which has now been in existence for about five years, is active in research and in giving post-graduate instruction. The relations between the institute and the university are at present engaging the attention of council.

THE possibility of establishing an insecticidal plant industry in the Virgin Islands to supply this country with important insecticidal materials, which are now imported at high cost from foreign countries, will be investigated by Dr. W. W. Skinner, assistant chief of the Chemical and Technological Research Unit of the Bureau of Chemistry and Soils, U. S. Department of Agriculture, who left Washington for the islands on February 26. Dr. Skinner goes to the Virgin Islands at the request of the Department of the Interior which recently was placed in charge of the islands and which is seeking to rehabilitate the agriculture by the introduction of new industries to take the place of the production of oil of bay and sugar. These were formerly the leading native industries but have recently been suffering from the world depression and the over-production of sugar. Dr. Skinner will investigate the possibility of aiding the islanders to rehabilitate the bay-rum industry by assistance of a chemical character; he will study the situation with regard to the production of sugar; and particularly he will investigate the possibilities of growing such insecticidal plants as pyrethrum, derris, and "cube," and the extraction from these plants of valuable insecticidal materials. He will also consider the advisability of establishing a chemical laboratory to aid such developments in the islands.

DISCUSSION

ISOLATION OF PROTEIN CRYSTALS POSSESSING TRYPTIC ACTIVITY

A CRYSTALLINE protein has been isolated from commercial preparations of "trypsin" which digests casein and gelatin in neutral solution. The digestive power of the crystals is about ten times that of the most active commercial preparations and the activity remains constant through three successive crystallizations. The substance, however, is exceedingly unstable and unless care is taken it becomes less active during the course of the preparation. It is obtained by extraction of the crude preparation with one quarter saturated ammonium sulfate. The extract is brought to one half saturated ammonium sulfate and filtered. The filtrate is saturated with ammonium sulfate and the resulting precipitate filtered off and redissolved in cold one quarter saturated ammonium sulfate. Saturated ammonium sulfate is added slowly with stirring to faint turbidity and the solution is brought slowly to 25° C. Small square platelets which tend to form

chains or clumps appear in the course of about an hour and crystallization is complete in two or three hours.

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FEBRUARY 8, 1931

YELLOW-SPOT DISEASE OF PINEAPPLES TRANSMITTED BY THRIPS TABACI LIND.

EXPERIMENTAL evidence has been obtained by the writer that an insect identified as *Thrips tabaci* Lindeman is a major vector operating in the field occurrence of a destructive disease of pineapple plants in the Hawaiian Islands, and furthermore, that this insect carries the virus to pineapple from certain weeds of which *Emilia flammea* Cassini now appears most important. Hitherto no means of transmission of this disease has been known. This preliminary note summarizes the evidence which will be published in detail in the near future.

The yellow-spot disease of pineapples is an infectious chlorosis with some distinctive and striking characteristics. In many respects it resembles diseases of both mosaic and ring-spot types, while in others it stands alone. Symptoms begin with a distinct "initial spot" with which thrips egg-punctures and feeding injury are generally associated. This spot, of about 5 to 20 mm diameter, is characteristically circular or rounded in outline, chlorotic and somewhat hypertrophied. Often it is concentrically banded dark and light. Extending down the leaf from this initial spot and developing on the younger leaves of the plant are chlorotic stripes and circular spots, sometimes strikingly zonate. Occasionally a coarse mosaic pattern develops in plants that have been long diseased. Pronounced dwarfing occurs as in many virus diseases. In this case the dwarfing is commonly unilateral, and leads to a marked curvature of the plant. Necrosis and rotting of affected parts follow, leading to death and decay of the plant within a few weeks. Microorganisms, apparently wholly secondary, are involved in this breakdown, although none have been detected in earlier stages.

Closely associated with yellow-spot in its field occurrence is a virus disease of *Emilia flammea* which likewise shows both ring-spot and mosaic characteristics. Thrips (*T. tabaci*) collected from this diseased weed in the field and allowed to feed upon healthy pineapple and Emilia seedlings have transmitted the virus, producing yellow-spot in pineapple and ring-spot mosaic in Emilia. Furthermore, thrips reared through several generations in the greenhouse on diseased Emilia plants have similarly proved infective.

For critical experimental testing, pedigreed non-viruliferous colonies of this thrips were established. These colonies were started from a single larva each, which was removed to an insect-free seedling of Emilia or of *Pisum sativum* L. at the moment of hatching and before feeding had begun. Thrips from such colonies, when tested on both Emilia and pineapple seedlings, have proved non-infective. When, however, these non-viruliferous thrips have been allowed to feed on diseased Emilia plants they have acquired the virus which they have later transmitted to both Emilia and pineapple, producing typical symptoms in a high percentage of plants.

Preliminary evidence indicates that certain plants in addition to Emilia may be sources of the yellow-spot virus, but it appears that this one plant, because of its abundance in pineapple fields and because of its suitability for the rapid reproduction of thrips during certain seasons, is now of major importance. The feeding of this insect upon pineapple plants appears to be quite incidental, and therefore it is probable that any natural transfer of the virus from pineapple to pineapple is relatively uncommon.

This is not the first well-established case of virus transfer by one of the Thysanoptera. Pittman[1] (see also the report by Dickson[2]) has already demonstrated a thrips (*Frankliniella insularis*) to be the vector of spotted wilt of tomatoes in Australia.

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FRACTURING AND MOVEMENT IN ROCKS WITHOUT APPARENT DISPLACEMENT[1]

A RATHER unusual kind of rock deformation has been found along one of the branches of Bluff Creek in the southeastern part of the Nortonville quadrangle about thirteen miles northeast of Hopkinsville, Kentucky. The rocks at this locality exhibit typical features of faulting but show no dislocation of the beds. They are abundantly grooved and slickensided, showing the effects of movement under compressive force, but bedding planes can be traced across the breaks with none or at the most not more than one or two inches of dislocation. All the features of faulting are the results of components of vertical movement. Careful examination has failed to reveal any trace of either oblique or horizontal movement parallel to the

[1] H. A. Pittman, "Spotted Wilt of Tomatoes," *Jour. Council Sci. and Industrial Res.* (Australia), 1(2): 74–77, 1927.

[2] B. T. Dickson, "Spotted Wilt of Tomatoes," in "The Work of the Division of Economic Botany for the Year 1928–29," *Council Sci. and Industrial Res.* (Australia) *Pamphlet*, 14: 18–19, 1929.

[1] Published with the permission of the director of the Kentucky Geological Survey.