

sand imbedded in the outer part of the epidermis, and apparently thoroughly encased.

This feature is quite obviously the result of the nature of the water in which the shells grew. There is no lime to be had save what little weathers out of the felspar of the country rocks: as these are largely soda felspars, this amount is indeed small.

If this be a variety worthy of a name, I would suggest that it be called *Unio complanatus* var. *mainensis*. It seems to be a form native to the granitic region of New England, and so far as I know is found mainly in western Maine. It is common throughout the ponds and lakes of Oxford county in that state. Since 1909 it has become so plentiful in Songo Pond that one can pick up ten dozen in half a hour, within three hundred feet along the beach. I have been in the habit of gathering it to boil for eating: it is quite palatable if cooked just the right time and with much salt.

My thanks are due to Dr. L. P. Gratacap, of the American Museum of Natural History, for aid in determining the shells, and to Professor F. Loomis, of Amherst College, for suggesting that the variety might be of general interest.

STEPHEN G. RICH

ITHACA, N. Y.

#### THE AMERICAN PHYTOPATHOLOGICAL SOCIETY

A SPECIAL MEETING of the American Phytopathological Society and its Pacific Division, was held at the University of California, from August 3 to 5. Addresses of welcome were delivered by Dr. Herbert J. Webber, director of the Citrus Experiment Station and Dean of the Graduate School of Tropical Agriculture, Riverside, California, and Professor R. E. Smith, president of the Pacific Division of the society.

Dr. Haven Metcalf responded for the society.

The following program was presented:

*International Phytopathology*: OTTO APPEL, Dahlem, near Berlin, Germany. (Read by Dr. C. L. SHEAR. This will be published in full in *Phytopathology*.)

*Pythiacystis Infection of Deciduous Nursery Stock*: E. H. SMITH, University of California, Berkeley, Calif.

A dieback of young deciduous trees, which occurred extensively in northern California the past two seasons, has been traced to a species of *Pythiacystis*, morphologically identical with *P. citrophthora*. Most of the root stock is apparently immune, but above the bud the bark is infected in one to several cankers, which often girdle the tree and kill back the whole top. Profuse gumming occurs. The fungus has been isolated from peach, almond, pear and plum, and the disease produced by inoculation in apple, pear, peach, almond, apricot, prune and cherry, all from one-year-old stock. Similar cankers have been produced by inoculation with *P. citrophthora* isolated from lemon fruit. A pythiaceous fungus has been twice isolated from almond cankers and successfully inoculated into almond, which readily develops an oospore stage. This has different characters of growth from the original strain, and a less degree of pathogenicity, but may ultimately be placed in the same species.

*Two Eastern Forest Diseases which Threaten the Pacific States*: HAVEN METCALF, U. S. D. A., Washington, D. C. (with lantern).

The speaker exhibited lantern slides and specimens of the chestnut-bark disease (*Endothia parasitica*) and the white-pine blister rust (*Cronartium ribicola*). The danger which these diseases present to the cultivated chestnut of the Pacific states and to the native stand of five-leaf pines was indicated. Especially to be considered is the danger to the very valuable species *Pinus lambertiana* and *P. monticola*. The speaker advocated rigid state quarantines against nursery stock of the genus *Castania*, the 5-leaf species of pines, and the genus *Ribes*.

*Beet Blight*: R. E. SMITH, University of California, Berkeley, Calif.

Specimens of diseased beets were exhibited and the methods being employed in the study of the disease were explained and illustrated. The structure of the diseased beets was dis-

cussed and certain peculiarities were described. Possible connection with certain bacteria was suggested and the nature and difficulties of the problem concerned were discussed. In the discussion which followed the paper Director Ball, of Utah, and a number of others gave their views on certain phases of the problem, especially with regard to the relation of the disease to insects. Mr. August Bonquet, of Spreckels, California, gave support to the suggestion that only insects which have been in contact with diseased beets are capable of transmitting the disease.

*Forest Pathology*: E. P. MEINECKE, U. S. D. A., San Francisco.

A number of forest diseases were exhibited, including interesting and important rusts and mistletoes. Several new hosts were shown in the collection, and important but hitherto not well-known forms were included in the demonstration.

*Northwestern Apple Anthracnose*: H. S. JACKSON, Corvallis, Oregon.

Specimens were shown of the disease in various forms, and the technical phases, particularly culture work and cross inoculations with the different spore forms, were discussed and the economic status of the disease briefly indicated.

The second session was held in the laboratory of plant pathology Thursday morning, August 5, at 9:30.

*Apple Mildew*: W. S. BALLARD, U. S. D. A., Watsonville, Calif.

The nature of this disease was explained briefly, and an account of the history of the efforts which have been made to discover effective control measures was given. Use of colloidal sulphur, prepared by dissolving sulphur in melted resin, grinding and putting into ammonia water, was described. The difficulties involved in the use of sulphur in the California coast districts on account of the danger of injury to the trees were discussed and the reasons for the use of unusually dilute spray formulas were mentioned.

*Mottled Leaf of Citrus Species*: J. T. BARRETT, Riverside, Calif.

Professor Barrett reviewed the main features of this disease and showed typical specimens. No specific cause has been discovered and the disease is still classed as a non-parasitic disease. The diseased leaves contain more starch than normally on account of defective translocation, and apparently also an excess of nitrogen. Some relation appears to have been discovered between fertilization with nitrate of soda without the addition of vegetable material and mottled leaf, but it was pointed out that this is probably not a direct effect of the materials used, but of the soil condition produced, since in plots in which liberal use had been made of the vegetable material the disease has not appeared. The disease is being studied at Riverside from all possible points of view and is being treated as a station problem and not exclusively by any one department. The possibility of an infectious chlorosis is also being investigated. In the discussion Professor F. S. Earle pointed out that there are probably two distinct types of mottled leaf in Cuba and the Isle of Pines, arising from what is probably a specific disease of the small roots and from general unfavorable soil conditions.

*Bacterial Canker of Cherry and Filbert Disease*: H. P. BARSS, Corvallis, Oregon.

Griffin showed the bacterial origin of the bud blight in cherries. The identity of cause for bud blight and body canker was shown by the speaker by means of inoculations made in the fall. Inoculations at other seasons were not successful. The disease is most destructive during the first seven or eight years of the life of the tree. It is now largely controlled by planting Mazard apricot, prune and Simone plum.

The filbert disease is also caused by bacteria, being in this case a yellow organism similar to the walnut blight bacterium. A leaf spotting and killing of twigs are produced and cankers are formed, succulent tissue being susceptible.

*Crown Rot of Fruit Trees: Histological Studies*: J. G. GROSSENBACHER, U. S. D. A., Washington, D. C. (Read by title.)

*Some New and Old Methods in Plant Pathology*: J. FRANKLIN COLLINS, U. S. D. A., Washington, D. C. (Read by title.)

*Citrus Gummosis and Melaxuma*: H. S. FAWCETT, Whittier, Cal.

These diseases were illustrated by means of lantern slides and brief explanations, together with a set of specimens and photographic enlargements in the laboratory. The former is caused by the fungus *Pythiacystis citrophthora* S. and S., and the latter by a fungus which is probably a *Dothiorella*.

*Fruit Stain and Wither Tip of Citrus*: J. T. BARRETT, Riverside, Cal.

Effects of the fungus *Colletotrichum gloeosporioides* were illustrated on twigs and fruit. Dr. Barrett stated that he did not yet have evidence that the fungus is capable of infecting thoroughly sound and healthy tissue of leaves and twigs, but infection of the fruit through germination from appressoria, killing small areas of rind, and later development of the fungus cause serious fruit rotting in addition to the tear-stain marks upon the surface.

*Observations on Prune Rust (Puccinia Prunispinosæ Pers.) in Southern California*: J. T. BARRETT, Riverside, Cal.

This fungus has become serious at times in southern California on apricots and peaches. The characteristic spots and injury to the orchard by defoliation were shown by lantern slides. In some cases early fall pruning has stimulated fall growth in which foliage remains alive through the winter and rust developed in this has caused early spring infection with very detrimental effects to the orchards.

*Coryneum Fruit Spot of Apricots*: J. T. BARRETT, Riverside, Cal.

Characteristic spotting was illustrated by lantern slides. This disease is not of so wide distribution in apricots as has been supposed. Accordingly, spraying operations carried out for this trouble have not given satisfaction in all cases.

*Walnut Blight and Crown Gall*: C. O. SMITH, Whittier, Cal.

The symptoms of this disease were illustrated by means of lantern slides and specimens were shown in the laboratory.

August 5, 2 P.M. The program was continued in the laboratory of plant pathology.

*Peridermium Harknessii* Moore, and *Cronartium Quercuum* (Berk.): E. P. MEINECKE, U. S. D. A., San Francisco, Cal.

The results of extensive observations on these rusts and inoculation experiments with the different spore forms were given.

*An Established Asiatic Gymnosporangium in Oregon*: H. S. JACKSON, Corvallis, Oregon.

Results of careful studies and cross inoculations with a newly imported *Gymnosporangium* discovered on Oriental pears in Oregon were given.

*The Need of a Pure Culture Supply Laboratory for Plant Pathology in America*: C. L. SHEAR, U. S. D. A., Washington, D. C. (To be published in full in the October number of *Phytopathology*.)

*Studies of the Rhizoctonia Disease of Potatoes*: J. H. CORSAUT, Corvallis, Oregon.

On account of the seriousness of potato troubles due to *Rhizoctonia* in the state of Oregon, studies on this disease were undertaken. Affected plants and tubers were secured from different localities and a large number of different strains of the causal organism were isolated from sclerotia on the tubers, from sterile mycelium on the underground parts of the plant, from basidium-bearing mycelium, and from individual basidiospores. The cultural characters of these strains were similar, but showed some variation. A splendid development of the typical *Corticium* (*Hypochnus*) stage appeared on the stems of young plants grown in sterilized soils from sterilized seed pieces which had been inoculated with pure culture of the organisms isolated from sclerotia, sterile mycelium, and single basidiospores. A number of different varieties of potatoes were inoculated with *Rhizoctonia* grown under similar conditions and the effects noted. Some varieties proved extremely susceptible, while others were rather strongly resistant. It was also found that when grown on sterile raw plugs cut from different varieties of potatoes the fungus developed rapidly on certain varieties and but slowly on others. By artificial

means healthy *Rhizoctonia*-free potato plants were made to reproduce both the "aerial potato" condition and the "little potato" condition, which are frequent consequences of natural attacks of *Rhizoctonia*. These experiments indicate that the abnormal effects referred to are purely secondary results of the *Rhizoctonia* attack caused by interference with the normal process of food storage in the plant.

*Studies of Monilia Blight of Fruit Trees:*  
G. B. POSEY, Corvallis, Oregon.

From blighted twigs of apricot, prune and pear there was isolated by different members of the staff of the department of botany and plant pathology of the Oregon Agricultural College during the season of 1913 a species of *Monilia*, apparently unlike, in cultural characters, the common "brown rot" fungus of the stone fruits (*Sclerotinia cinerea* Bon.), which is abundant in Oregon. An investigation of this blight-producing *Monilia* was undertaken. Over fifty strains were isolated and a comparison made with over fifty strains of *Sclerotinia cinerea* from Oregon and other parts of this country and with four strains of *Sclerotinia fructigena* secured from England. Culture studies on a great variety of artificial media, inoculations into various kinds of fruits, and inoculations upon the twigs of various kinds of fruit trees proved that this apparently unrecognized species of *Monilia* is entirely distinct from the strains of *S. cinerea* and *S. fructigena* used for comparison.

The investigation thus far has shown that this *Monilia* is apparently common in the Pacific Northwest. It has been found on blighted blossoms, spurs and twigs, and sometimes on mummied fruits of pear, quince, apricot, peach, prune, plum and cherry. It usually starts in the spring as a blossom blight and works back into the spurs and branches, where the progress of the fungus is checked as the season advances. Tender shoots are sometimes attacked. Sporodochia are formed on the affected parts during the same season and spores are produced until late in the following spring. No ascospore stage of the *Monilia* under discussion has as yet been found, although

apothecia of the common *S. cinerea* were collected abundantly on mummied fruits of apple, pear, prune, plum, peach, apricot and cherry. The investigation will be continued.

*A Podosporiella Disease of Germinating Wheat:* P. J. O'GARA, Salt Lake City, Utah.

On examining a weak strain of wheat in Salt Lake Valley the trouble was traced back to the seed, the content of the kernels of which were found to have been largely consumed by a dark brown, septate mycelium, which did not appear on the surface. The seed coat was penetrated later by the fruiting stalks of the fungus, which was found to be a new species of *Podosporiella*. The fungus is not considered to be a true parasite, since it does not attack the kernel till about the time of germination, and has never been found in the growing portions of the plant. The disease is found to be most prevalent in volunteer wheat, and where several crops had been grown with only surface cultivation.

*The Utilization of Certain Pentoses and Compounds of Pentoses by Glomerella cingulata (Stonem.) S. and v. S.:* L. A. HAWKINS, U. S. D. A., Washington, D. C.

In the experiments an attempt was made to determine the effect of the apple bitter-rot fungus upon the pentose-containing compounds of the apple fruit, the relative value of certain pentoses and compounds of pentoses as sources of carbon for this fungus, and the effect of an aqueous extract of the fungus mycelium upon xylan. It was found that the fungus increased the alcohol-soluble pentosan content of the apple fruit, but decreased the total pentosan content. The fungus readily utilized either xylose, arabinose xylan or arabin as sources of carbon. The two pentoses were more favorable sources of carbon than glucose. Aqueous extracts of the fungus mycelium when allowed to act on xylan produced xylose. It is evident that the fungus secretes an enzyme, which hydrolyzes xylan to xylose.

*Armillaria or Oak Fungus Disease in California:* W. T. HORNE, University of California, Berkeley, Cal.

Cultures and specimens were exhibited and the action of the fungus briefly described.

There was considerable discussion of this important disease by a number of those present.

The sessions were presided over by Dr. Haven Metcalf in the absence of the president and vice-president of the American Phytopathological Society, and Professor R. E. Smith, president of the Pacific Division, and Professor H. S. Jackson, newly elected president of the Pacific Division, respectively. The attendance at these sessions varied from forty to fifty.

Wednesday, August 4, was spent with the botanists at Stanford University, and the plant pathologists joined the biologists in a dinner in San Francisco in the evening.

Following the reading of Dr. Shear's paper a motion was adopted directing the chairman to appoint a committee for the purpose of considering the question of the establishment of a culture supply laboratory. C. L. Shear, chairman, and L. R. Jones were appointed, with power to select a third member.

In the intermission between the second and third sessions, a business meeting of the Pacific Division was held, in which a report was made by the secretary-treasurer as to the activities of the society and its financial condition. Officers for the ensuing year were elected as follows: H. S. Jackson, president; J. T. Barrett, vice-president; W. T. Horne, secretary-treasurer. The question of affiliation with the Pacific Division of the American Association for the Advancement of Science was reported on and the matter of the next meeting was left until the next meeting of that society should be decided. The matter of relation to the parent society was then taken up and the report of the joint committee was adopted. The adoption of this report changes the name of the local society to the American Phytopathological Society, Pacific Division, and also reestablishes the distinction originally made between associate and active members, active members being those who are also members of the parent society.

C. L. SHEAR,  
*Secretary-Treasurer,*  
W. T. HORNE,  
*Secretary-Treasurer,*  
Pacific Division.

THE AMERICAN ASSOCIATION FOR THE  
ADVANCEMENT OF SCIENCE,  
SECTION B, PHYSICS

THE recent, August 2-7, California meetings of Section B of the American Association for the Advancement of Science were pleasant and profitable in every particular. The programs for three days, Tuesday, Wednesday and Thursday, had been amply provided for by a special committee of the Pacific Coast Division, of which Professor Fernando Sanford was chairman. These sessions, presided over by Vice-president Lewis were devoted to the presentation of rather full, invited papers and demonstrations on spectroscopy, high tension electric currents, and physics of the atmosphere. Friday's meetings, at which many brief papers were presented, were in charge of the American Physical Society, with President Merritt presiding.

All these meetings, however, were regarded as joint meetings between Section B and the Physical Society. Abstracts of the papers presented therefore will appear in the *Physical Review*.

Wednesday's meetings were held at the Stanford University, and given over entirely to a "Discussion and Demonstrations of High Potential Electric Currents" by Professor Harris J. Ryan. To say that these demonstrations, made in a building constructed especially for this purpose, were remarkable, is but to echo the statement of every one fortunate enough to see them.

But not all the meetings were for the presentation of scientific papers. Tuesday's luncheon given by Professors Lewis, Haskell and Leuschner at the Faculty Club, University of California, Wednesday's dinner at the Jules Café, San Francisco, and Saturday's excursion to the Lick Observatory were some of the most important meetings of the entire week, important because they contributed, as scarcely anything else could have contributed, to the perpetuation of old friendships and the beginning of new ones.

The vote of thanks, therefore, extended at the last session to the Pacific Coast Committee, to the University of California, to the Stanford University and especially to the physicists of the two institutions for making these meetings of Section B and the Physical Society so thoroughly successful was amply deserved and most heartily given.

W. J. HUMPHREYS,  
*Secretary, Section B*