

The uniformity and constancy of both the physiological and morphological characters of this fungus are quite remarkable and striking.

The Chinese organism has thus been shown to be practically identical with the American in all its morphological and physiological characters and in the production of the typical chestnut-blight and the pycnidial fructifications of the fungus. There is apparently but one other requirement that could be made according to the strictest pathological canons to perfect the proof in this case, and that is the production of typical ascospores of *E. parasitica* on the lesions produced by the inoculations. These could scarcely be expected to appear for some weeks yet. The evidence, however, appears to us sufficiently complete to allow no escape from the conclusion that *Endothia parasitica* occurs in China and in such a locality and under such conditions as would indicate that it is indigenous there.

Just as this note was finished, Mr. Fairchild received a package of photographs of blighted chestnut trees from Mr. Meyer, taken in the same locality from which the specimens were obtained. These will be published later. Suffice it to add here that the illustrations show clearly by the evident age of the trees and of the infections that this Chinese chestnut is much more resistant to the disease than the American and that there is much hope for the successful selection and breeding of resistant plants.

C. L. SHEAR
NEIL E. STEVENS

BUREAU OF PLANT INDUSTRY,
August 16, 1913

THE DISCOVERY OF THE CHESTNUT BARK DISEASE IN CHINA

MR. FRANK N. MEYER, agricultural explorer of the Office of Foreign Seed and Plant Introduction of the Department of Agriculture, during his first exploring trip in northern China, 1905-1908, visited the Pang shan region east of Peking. He reported upon the existence of considerable quantities of wild chestnuts there, where they "grow wild on the

slopes of rocky mountains. . . . It is mostly found in groves, growing among rocks and boulders, and even in its wild state it varies considerably in the size and flavor of its nuts and the spininess of the burrs. The Chinese name for the wild form is San li tze,"¹ otherwise spelled Shan-li-tze. At the time of Mr. Meyer's exploration in the Pang shan region, there was comparatively little interest in this country in the chestnut bark disease, and not being a plant pathologist, he did not look for the disease among the chestnut trees from which he gathered chestnuts for introduction into this country.

When it was announced that Mr. Meyer would make a second expedition to north China, the question was raised by Drs. Metcalf and Shear, of the Office of Forest Pathology, as to whether or not Meyer might be requested to search for the disease among these Chinese chestnuts. On February 26, 1913, therefore, at Dr. Shear's request, Mr. Meyer was asked to make a search for the disease, and in order to inform him specifically as to what to look for, specimens of the diseased bark were sent him.

On June 13, 1913, the American legation cabled the state department as follows: "Meyer requests the legation to report that he has discovered chestnut bark fungus. Seems identical with American form."

On June 28 a letter was received from Mr. Meyer, written June 4 from a Chinese inn in an old dilapidated town to the northeast of Peking, between Tsun hua tcho and Yehol. In it Mr. Meyer announces the sending of a small fragment of diseased chestnut bark.²

¹ Meyer, Frank N., "Agricultural Explorations in the Fruit and Nut Orchards of China," Bulletin No. 204, Bureau of Plant Industry, p. 52, March 25, 1911.

² SAN TUN YING, CHILI PROV., CHINA,
MR. DAVID FAIRCHILD, June 4, 1913.

Agricultural Explorer in Charge,
U. S. Department of Agriculture,
Washington, D. C., U. S. A.

Dear Mr. Fairchild: Here I am sitting in a Chinese inn in an old dilapidated town to the northeast of Peking, between Tsun hua tcho and

A subsequent shipment of the diseased material, consisting of bark and diseased branches of the tree, a few mature burrs, and nuts, was received July 23, 1913, and on August 11 a number of convincing photographs of the diseased chestnut tree. Full botanical material *Fehol* and have been busy for several days collecting specimens of this bad chestnut bark disease and taking photos of same. It seems that this Chinese fungus is apparently the same as the one that kills off the chestnut trees in northeast America. I hope to send a cablegram through the American legation at Peking about this discovery to the Secretary of Agriculture. I am also enclosing a small piece of bark with this fungus on it. More material I hope to send off from Tientsin and Peking. Here are my main observations:

This blight does not by far do as much damage to Chinese chestnut trees as to the American ones.

Not a single tree could be found which had been killed entirely by this disease, although there might have been such trees which had been removed by the ever active and economic Chinese farmers.

Dead limbs, however, were often seen and many a saw wound showed where limbs had been removed.

Young trees and trees on level, poor soil were much more severely attacked than old trees or trees growing on richer, sloping soil at the base of rocks and hills. . . . The wounds on the bigger majority of the trees were in the process of healing over.

The Chinese farmers ascribe this disease to the working of caterpillars, grubs and ants, which are very freely found beneath the bark on these diseased spots on the main trunks and branches.

To combat the disease they scrape the bark clean every winter or early spring. The strips of bark are all collected, tied up in bundles and sold as fuel.

This Chinese chestnut does not grow to such sizes as the American one. Trees over 40 feet are rare. They are of low-branching habits with open heads, more or less in the way of the European chestnut (*Castanea vesca*).

The lumber is hard, but even a good-sized tree produces relatively little good lumber.

Old wounds are to be observed here and there on ancient trees.

The maximum age of this Chinese chestnut as seen in its native habitat seems to be between 250

for identification of this particular species which Mr. Meyer has been asked to get has not yet arrived, and the burrs do not agree with the description of *Castanea mollissima* Blume. This species according to the identification of the Arnold Arboretum authorities was collected by Mr. Meyer in the Pang shan region in 1907, and is now growing in this country under our S. P. I. number 21875. The region where Mr. Meyer discovered the disease is very close to the locality in the Pang shan region where he collected the nuts of *Castanea mollissima* in 1907, but it is impossible at this writing to determine with certainty the identity of this partially resistant Chinese species from San tun ying. This whole question will be discussed in a subsequent paper.

Those better qualified, Messrs. Shear and Stevens, are describing in this same number of SCIENCE the various steps taken by them in corroborating Meyer's discovery of the presence of the disease in China. It is interesting and 300 years, but when that old they are already in decay.

The tree is not a fast grower and does not begin to bear until 12 to 15 years old.

The soil best suited to these chestnuts is a warm, well decomposed granite, with perfect drainage, while as locality they love the lower slopes of hills and mountains, where they are well sheltered.

The valleys and ravines in the lower altitudes of the Rocky Mountain regions would probably supply congenial localities for these chestnuts.

This northern Chinese chestnut is not a lumber tree, but attempts might be made to cross it with the American species, trying to give the last one more hardiness and resistancy against disease.

The nuts of this Chinese chestnut are not as large as those from the European and Japanese forms, but they are very sweet and are in great demand in China.

The great chestnut district of north China lies in the mountain valleys between the town of San tun ying and the Great Chinese Wall, 4 to 5 days' journey by carts from Peking to the northeast or 1½ to 2 days' journey by carts from the railroad station Tang shan on the railroad from Tientsin to Shan hai kwan. Most of the trees seen seem to be original growth, but also plantations have been made at the foot of the mountains and hills. . . .

to note, however, that only forty-two days elapsed from the time Meyer cabled, June 13, until every link in the chain of evidence of the identity of the Chinese with the American disease was complete. This included the discovery of the characteristic "mycelial fans," the making of cultures which appeared identical, the producing of the disease in American chestnut trees by inoculation from the cultures, and the discovery on July 24 of the ascospores of the fungus, *Endothia parasitica* (Murr.), on material later sent in. When we consider that the little town in the Chili province of China is a day and a half cart journey from a railroad, it is interesting to note the promptness with which exact laboratory research methods in Washington can be brought to bear on a field problem half way round the globe.

DAVID FAIRCHILD

U. S. DEPARTMENT OF AGRICULTURE

SCIENTIFIC NOTES AND NEWS

THE committee of the permanent commission for the International Congress of Medicine to be held in Munich in 1917 has been elected as follows: President, Professor Dr. Friedrich von Müller, of Munich (president-elect for the eighteenth congress); vice-presidents, M. Calman Müller, of Budapest (president of the sixteenth congress), and Sir Thomas Barlow, of London (president of the seventeenth congress); secretary-general, M. H. Burger, of Amsterdam; assistant secretary, D. Ph. van der Haer, of The Hague; member, M. L. Dejace, of Liège (president of the International Association of the Medical Press).

DR. ROUX, director of the Pasteur Institute, has been appointed a grand officer of the Legion of Honor.

MR. ROBERT BRIDGES, newly appointed poet laureate in Great Britain, holds a degree in medicine from Oxford and for some years was a practising physician.

THE Paris Academy of Sciences has awarded its Valz prize to Professor A. Fowler, F.R.S., for his investigations on the spectrum of hydrogen and other contributions to astrophysics.

DRS. A. BACMEISTER and L. Küpferle, of Freiburg, have received \$1,000 from the Robert Koch foundation for their studies on Röntgen therapy in tuberculosis.

DR. C. F. HODGE, professor of biology at Clark University, will have leave of absence next year and will conduct work in Oregon under the extension department of the university and the Oregon state game commission.

DR. HENRY FAIRFIELD OSBORN, president of the American Museum of Natural History, has been visiting the expeditions conducting paleontological explorations for the museum in the west.

DR. F. ROBERT HELMERT, the distinguished Berlin geodesist, celebrated his seventieth birthday on July 21.

PROFESSOR ARCHIBALD BARR is about to retire from the regius chair of civil engineering and mechanics at the University of Glasgow.

THE Michigan State Board of Health has offered the position of state sanitary engineer to Professor E. D. Rich, of the University of Michigan.

MR. JAMES A. BARR, who for the past year has been manager of the Bureau of Conventions and Societies of the Panama-Pacific International Exposition, has been appointed chief of the department of education. He will have general charge of the congresses and conventions as well as of the educational exhibits. Dr. Irwin Shepard, for twenty years secretary of the National Education Association, has been appointed national secretary of the Bureau of Conventions, in San Francisco. Up to this time 151 congresses and conventions have been scheduled for San Francisco or near-by cities in 1915. At the meeting of the National Education Association held in Salt Lake City in July, the directors recommended that the 1915 meeting be held in Oakland, just across the Bay from San Francisco and within an hour of the Exposition grounds. The directors also recommended that an International Congress on Education be held in Oakland in 1915, under the general direction of a commission of thirty-four educators, with