

Bureau: Plant Industry.

Type of Activity: Research.

Project Group: Foreign Seed and Plant Introduction.

Sub-group: Foreign Explorations.

Name: South China Explorations.

Leaders: David Fairchild and Frank N. Meyer.

Object: The exploration of the provinces of China lying southeast of Shanghai and south of the Yangtse River, which are practically unknown from the standpoint of American agriculture, for the purpose of securing collections of southern peaches, the edible and timber bamboos, the tung or wood-oil tree, and improved varieties of tallow trees, the litchi, a promising new southern fruit, the longan, an edible nut-producing oak, root crops for wet lands, varieties of rices, soy beans, remarkable southern raspberries, blackberries, and pears, rare and promising ornamental shrubs and timber trees, and new varieties of species of chestnuts.

Procedure: The experienced agricultural explorer, Frank N. Meyer, who has spent six years in northern China and Manchuria and is familiar with the methods of exploration in that country, will travel mostly on foot through the region, searching for new varieties

Procedure:-- cont.

of our cultivated plants and their wild relatives and studying the systems of agriculture employed there, and will write reports on such practices, and prepare descriptions, with photographs, of such varieties and species of plants which he finds there and sends in, as in his opinion may be valuable for introduction into this country.

Location: South China and, en route, Japan.

Legal Authority: Appropriations for the U. S. Department of Agriculture, Bureau of Plant Industry, 1916-17.

Cost Data: Proposed expenditures, 1916-17, \$6,000.

Date Submitted: July 25, 1916. (See attached argument.)

History: See attached argument, with enclosures, to the Chief of the Bureau, and yearly project reports.

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ARGUMENT FOR SOUTH CHINA EXPLORATIONS.

July 25, 1916.

Mr. W. A. Taylor,
Chief, Bureau of Plant Industry.

Dear Mr. Taylor:

As you know, it has been the intention that Mr. Frank N. Meyer should return to China for the purpose of continuing his explorations there, and the season for his departure is now at hand.

In conferences with Mr. Cook, Mr. Swingle and other members of the Bureau, and as a result of conferences which Mr. Meyer and I have had with Prof. Sargent of the Arnold Arboretum, the conclusion has been reached to send Mr. Meyer into the almost wholly unexplored provinces which lie, roughly speaking, along the coast from Shanghai to Canton. While the flora of western China has been quite thoroughly explored by E. H. Wilson, and the northern provinces have at least been prospected by Mr. Meyer during his six years of travel there, the provinces of Chekiang, Fukien, Kwantung, Kiangsi, Kwangsi and Yunnan, which lie south of the Yangtse, are practically unknown territory botanically and agriculturally speaking. That they offer a rich field for the explorer is indicated by Mr. Meyer's discovery last year of a wild and undescribed species of hickory in the Chekiang

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province, quite near Shanghai.

Mr. Meyer is the logical man to send, since he knows how to travel in China, has already familiarized himself with the plants of northern and central China, and is a tried explorer capable not only of finding new things, but of sending them in and landing them here alive.

It is desirable that Mr. Meyer should get from the region around Peking, before he goes south, larger quantities of certain of his previous introductions:

The davidiana peach (Amygdalus davidiana) has shown so much promise as a stock that a considerable demand for the seeds of this species has arisen, which the few fruiting trees now in California are not capable of supplying. Quantities of seed of this species are desired and these cannot be secured through correspondence.

The Chinese chestnut (Castanea mollissima) has shown itself hardy and semi-resistant to the bark disease, and it seems desirable to distribute to experimenters more trees than we have so far been able to secure seed for. It seems desirable even to test out small acre plantings of this Chinese species.

The Chinese pistache (Pistacia chinensis) has proved such a heat, drouth and alkali resistant shade tree that we could to advantage use large quantities of seed of it for propagation. It grows to an immense size and is one

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of the remarkable landscape trees of China.

The difficulty in getting seeds of the jujube for stock purposes in this country makes it an economical thing to import 1,000 pounds of seed of the best jujube used for stock in China.

The Ghormra persimmon (Diospyros lotus) has shown itself superior to the native Virginia persimmon as a stock for the Japanese and Chinese kaki in the southwest, and we need considerable quantities of seed on which to propagate the new Chinese varieties of this promising fruit.

There is probably a place for the Chinese hardy walnut in our nut culture, since it has proved hardy in Idaho, and 300 or so pounds of nuts of this Chinese variety will give it a fair trial on the northern edge of the walnut sections. We have never had enough trees to give it a trial in comparison with the hardy forms now grown in Pennsylvania and New York.

The striking beauty of the white-barked pine and the fact which has been established that it will grow and thrive in the United States, combined with its long-lived character, make it highly desirable to have a large quantity of seed of it collected and many hundreds of trees distributed to parks, cemeteries and private places.

The Chinese juniper and the Chinese horse-chestnut

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are two valuable trees which are well worthy of dissemination, and seed of these can only be secured by a collector on the spot.

The success of the Chinese cabbage or pai tsai, which has reached the commercial stage in many parts of the country, and the knowledge that there are numerous strains in North China which differ in their habit and season of maturing from those we have, make it desirable that a special collection of seed of these Chinese cabbages be made.

These commissions will require Mr. Meyer to go to North China and spend two or three months there before proceeding south.

The main exploration work will be in the southeastern provinces of China, and because of the large number of new plant species which exist there, it has been suggested by Mr. Swingle that Mr. Meyer should put himself in touch with the large herbarium and other facilities which Mr. Merrill has created in Manila by a brief visit to the Philippines before he actually pushes into the interior. He can by this means make arrangements to have his herbarium specimens determined by Mr. Merrill and duplicates placed in safety in the collection there in Manila, while the originals are on the way to Washington. He may find it to advantage, further, to send certain duplicate scion and seed shipments to Manila for propagation.

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The following are some of the more important plant industries which Mr. Meyer will be expected to investigate in southern China:

The litchi is one of the most important fruit trees of South China. Introduced litchi trees fruited at Santa Barbara, California, in 1914, and this year plants which we introduced have fruited at Oneco, near Tampa, Florida, and in Cuba, and it is apparent that the tree when once it becomes established is going to stand light frosts. How low a temperature it will withstand is not yet definitely known. Information from missionaries indicates that in the southeastern provinces which we wish Mr. Meyer to explore are to be found the hardiest of all the litchi varieties, whereas in the Island of Hainan are to be found many fine flavored sorts, accounts of which we have received from Augustine Henry and others.

The short-lived character of the seeds of the litchi, many having abortive seeds, as well as the great number of named sorts, makes it important for an expert to secure grafted trees and ship them in Wardian cases, and at the same time investigate the diseases of the litchi and make sure that only healthy trees are imported. Mr. Meyer is unusually expert in shipping and packing plants and has proved his keen powers of observation when it comes to the diseases of trees, as evidenced by his discovery of the chestnut bark disease.

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The South China varieties of peach, aside from a few introductions from Canton, have received no study by the Department, notwithstanding the fact that there are known to be good sorts in cultivation in the subtropical regions of South China which would probably fruit successfully in Florida.

Bearing upon the chestnut bark disease investigations, it will be desirable for Mr. Meyer to study the dwarf chestnut (Castanea seguinii), which is reported to be quite resistant to this disease.

The ever-green oak (Pasania cornea) produces a commercial, hard-shelled nut in the Kwantung province, and we already have a few young trees of it growing in our southern states. Its sweet kernel makes it eligible as a table nut, and since orchards of it are said to occur north of Canton, it seems eminently worthy of our investigation.

Special attention should be paid by Mr. Meyer to the subject of Chinese species of *Pyrus* and as large collections as possible made of the numerous Chinese forms, since the experiments of Mr. Reimer of the Oregon Experiment Station indicate that certain forms of Pyrus sinensis and Pyrus calleryana show a most unusual resistance to the pear blight organism. So much interest has been aroused by Mr. Reimer's experiments that the attached telegram and letter have been received regarding them.

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While Mr. Meyer can doubtless secure seeds of many of the forms of *Pyrus* which Mr. Reimer wants, Mr. Reimer's familiarity with the whole situation might make it very desirable that he be made a collaborator of the Department and assisted in every way to make an investigation of the pear species of China. Mr. Meyer could doubtless assist him with advice and counsel as to localities to visit and people to see, and it is important, since the pear season is at hand in China, that Mr. Meyer should visit Corvallis and Talent, Ore., and confer with Mr. Reimer as soon as possible regarding such a trip.

The bamboo groves already established in America and the fact that there are wide differences between the palatability of their shoots, some of which have begun to be sold as a vegetable in Georgia, coupled with the fact that there are large areas in Kwantung province covered with bamboos and specially fine flavored sorts in the regions of Canton, make it highly desirable that the bamboos of southern China be studied and living rhizomes of the various sorts secured.

The success of rice culture in California is intimately associated with that of earliness, and Mr. Meyer should make an investigation of the rice varieties of southern China and get for these California experiments any early maturing sorts of good quality which can be found there.

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The successful growth which the tung or Chinese wood-oil tree of the Yangtse Valley (Aleurites fordii) has made in Georgia, South Carolina, Florida, California and Texas, and the discovery by Wilson of the Arnold Arboretum that the wood-oil which is exported from South China comes from a different species (Aleurites montana) makes it very desirable that Mr. Meyer visit the plantings of this species and study them.

Owing to the long time required going to and coming from China, and the weeks of travel required to reach the interior points of agricultural interest, it is desirable that Mr. Meyer's trip should extend over more than one year. His other trips have all been of three years' duration, and this one would probably require quite as long a time.

Trusting that this outline will be satisfactory, and urging as prompt an action on it as possible, in order that Mr. Meyer may get to China before the early fruit season closes in September, I remain,

Very sincerely yours,

(Signed) David Fairchild

Agricultural Explorer in Charge.

F-R

The photographs which accompanied this letter were from our negatives Nos. 19163, 15949, Chico 571, Chico 593, 5012, 19121, 13155, 19654, 19240, 19833, 9595, 4629, 13719 and 14064.

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TELEGRAM.

Medford, Ore., June 23, 1916.
7:45 a.m.

Dr. D. Fairchild,
Department Agriculture,
Washington, D. C.

Our Association in three days convention at Medford has had opportunity to study at first hand the remarkable experimental work of F. C. Reimer, Superintendent of the Southern Oregon Experiment Station, in connection with pear blight resistance at a time when we are deeply alarmed for the safety of the pear industry of the Pacific Coast. We know of no other work of such great promise for the solution of the pear blight problem. We believe that steps should be taken to make the work of immediate practical value and most earnestly urge that Reimer be sent at once as a special agent of the Department to collect large quantities of the seed of those Chinese species which he has proved to be highly resistant to blight and very promising for use as stocks.

(Signed) Pacific Coast Association of
Nurserymen in Convention.

3:54 p.m.

Received Washington, D. C.,
June 23, 1915.

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FANCHER CREEK NURSERIES

Fresno, California, July 8, 1916.

My dear Mr. Fairchild:

After an absence of a couple of weeks in Oregon and Washington, I am again back at my desk trying to clean up the mail which has accumulated during my absence. I had so little time when travelling that I did not have an opportunity of confirming the telegram which I forwarded to you.

I understand that you have personally visited the Experimental Station where Mr. F. C. Reimer has been carrying on his experimental work for several years and that you have been very favorably impressed with the excellent work which Mr. Reimer is doing there. I had the pleasure of listening to an address which he made before the Pacific Coast Association of Nurserymen and the very clear and logical manner in which he went into all the details of the work he was doing made a deep impression on me. This was intensified to a still greater degree when I had the opportunity of visiting the station with him and observing for myself the thorough and capable work--both scientific and practical--which he has been doing for several years to solve the problem of overcoming pear blight, which has been such a serious menace to both

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the pear and apple industries in the United States.

You will have some appreciation of the seriousness of this disease in California when I tell you that in 1900 our output of dried pears was 14,550,000 pounds, while in 1913 it was 2,000,000 pounds. I do not know what the output has been during the last two years, but I do know that it has been steadily declining all the time. It is only by the expenditure of an immense amount of money and constant and careful work that the fruit growers who are still raising pears are in a position to hold this disease in check on their respective places.

In the San Joaquin Valley, which sixteen years ago was one of the great pear producing sections of California, the pear has been absolutely wiped out of existence, and for some reason for which I can give no particular explanation, as it was far more virulent here than elsewhere.

To my mind there is no man better equipped to make this contemplated trip to China and carry out the work of investigation than Mr. Reimer, because of the very close attention he has given for several years to the study of varieties of pears. Naturally he is more familiar with the various types on account of his very close association with them in the field than any one else could be. Under the circumstances, it seems to me that he is better fitted to bring about results more quickly than any one else who

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might be engaged for the purpose.

As I understand it, in case you commissioned him to pursue this investigation, it would be under the auspices of the United States Department of Agriculture and particularly under your Division of Seed and Plant Distribution, so that whatever credit was obtained as a result of his trip would be accorded to your Division.

I do not know that I can add anything more in Mr. Reimer's behalf except to say that I believe that when a man has the enthusiasm he possesses in the work he has accomplished so far, in conjunction with his scientific knowledge, he is going to succeed. All that is necessary to expedite his success is to have the requisite funds making it possible to take this trip.

Trusting that you will give this matter your very careful consideration and with very kindest personal regards, I beg to remain,

Yours very sincerely,

(Signed) Geo. C. Roeding.

GCR-GS

To Mr. David G. Fairchild,
Agricultural Explorer in Charge,
Foreign Seed and Plant Distribution,
U. S. Department of Agriculture,
Washington, D. C.

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South China Explorations,

Supplementary Report, December 31, 1916.

Mr. Frank N. Meyer, in charge of this project, was in the Washington office from December 5, 1915, until August 15, 1916, when he left for Seattle, Wash., from which port he sailed for Kobe, Japan, on September 20, 1916. It had been Mr. Meyer's intention to sail from San Francisco on September 10th but he could not get accommodations. En route to the Pacific Coast he stopped at Minneapolis, Minn., Mandan, N. D., Portland, Talent and Corvallis, Ore., and Bellingham and Seattle, Wash. He landed in Yokohama, Japan, on October 7, 1916.

Although, as stated in the argument for this South China Exploration project, it was planned that Mr. Meyer should visit the home of the blight resistant Chinese pears in central and northern China before proceeding to southern China, it was evident after his conference with Mr. Reimer that the securing of large quantities of these Chinese pear seeds was of much more importance than had been at first realized and that in consequence Mr. Meyer would have to devote much time to the region north of Peking where the forests of Pyrus ussuriensis occur and to the Upper Yangtse where the Pyrus calleryana with which Mr. Reimer is working grows.

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It was evident, therefore, before Mr. Meyer sailed, that this project would be modified by the discoveries of Mr. Reimer, which opened up an entirely new and urgent opportunity for work which was planned as incidental only to his South China explorations. It was contemplated that Mr. Meyer's work in the pear regions of north and central China would make it unnecessary for Mr. Reimer to visit China at this time.

On September 14, 1916, Mr. Meyer wrote us from Portland, Ore., regarding his visit to Mr. Reimer, as follows:

"My trip to Talent, to investigate Prof. F. C. Reimer's work, has proven to be extremely interesting. Later on I will write a full report on all that I have seen while journeying through this big land of ours, but this much I will say now: that Prof. Reimer is the first man in the world to test systematically all known species of *Pyrus* and all cultivated varieties of pears obtainable in his experiments concerning susceptibility or immunity to fire-blight. His idea of finding a root and a trunk that are immune is an excellent one, for with these two factors blight cannot be carried over from one year to another in the orchards and by being vigilant and removing affected branches from the crown one can pretty well control this blight.

"He has found that most of the wild species of pears with pubescent foliage are strongly susceptible to blight, like *Pyrus salicifolia*, *P. nivalis*, *P. betulaeifolia*, etc.

"One species of pear is apparently totally immune and that is my *Pyrus ussuriensis*; he made 200 inoculations at eight different dates and not one took! This refers especially to SPI 21880. Prof. Reimer stated that this one introduction is worth all of my work abroad!

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"Another pear, nearly totally immune, is Pyrus calleryana. The form from the Yangtze Valley seems to be better suited for Oregon than the one from So. China; this last one also seems more susceptible to blight. As regards resistancy to cold, both the northern and the southern Chinese forms have stood 4° above (Fahr.) at Talent in January, 1916, and the Ichang form has withstood 5 winters in the Arnold Arboretum, Mass.

"Besides these two very promising Chinese species of wild pears there are also a few cultivated varieties coming to the front which show an unusual amount of resistancy to blight. One is the 'Old Home' pear, obtained from Missouri; another is 'Orel No. 15', introduced by Prof. Budd of Iowa from Russia; still another is 'Florida sandpear'.

"Then there is a pear called Pyrus variolosa (?) which is almost immune and which is a remarkable vigorous grower. Prof. Reimer and Mr. Rehder of the Arnold Arboretum are trying to straighten out this species.

"Prof. Reimer has originated a totally new method of setting out pear orchards. His idea is to set out seedlings, immune to blight, in their permanent location; when these seedlings have made a well developed head with 4-7 or 8 main branches, bud every branch to the desired variety in September; when the buds have taken cut the seedling growth back and from two to three years after that the orchard comes into bearing. The expense is only slightly larger than buying ordinary grafted or budded pear trees from a nursery and one has the satisfaction of knowing exactly what one has and better than that, the trunk and the roots can never be destroyed by the blight!

"I have come to believe entirely in Prof. Reimer's ideas and I do wish I had known them before this. I strongly suggest that any of our folks who pass Talent should stop over there long enough to see the remarkable work that is being done there. If you and Mr. Fairchild think it worth while, I would like to see Mr. Waite being informed of what I am writing you here.

"Now to come down to my own work in connection with this blight, I am up against it!

Prof. Reimer wants, if possible, 100 lbs. of seeds of P. ussuriensis and of P. calleryana (northern form). I told him that this may prove impossible for us to procure; well, we have agreed that ten pounds of clean seeds of each species should be the lowest limit. Then he wants all cultivated varieties of Chinese pears, both seeds and scions, for testing in these blight experiments.

"What a pity that so many of all of the cultivated varieties of pears that I have sent in have become lost. This disease-testing work has opened up an entirely new field for certain introductions from abroad!"

Mr Fairchild wrote Mr. Meyer regarding Prof. Reimer's work on September 29, 1916:

"I cannot help smiling over your enthusiasm for Prof. Reimer's work after the difficulty I had to convince you that it was important for you to see Reimer and get in touch with his experiments. I was quite convinced that you would like Reimer and would see the bigness of his investigations, and that was the reason I was hurrying you to get through to see him. It is a satisfaction to realize that I was not mistaken in my estimate of him or his work.

"What you say with regard to Pyrus ussuriensis and the other forms of Pyrus which he finds resistant to the disease raises in my mind, however, a question which has been there ever since I saw his experiments; namely, is he positive that his experiments are broad enough to prove that the resistance of these stocks is of such a character that under all conditions they will show the same degree of resistance that they do in the nursery row? The apparently erratic character of that resistance among different varieties and different species makes me suspicious that something of the resistance or immunity of these plants may be due to the environmental conditions at the time he inoculates them. While he may believe that he has ideal conditions for the growth of the germ when he inoculates his nursery plants, he may not know what the ideal conditions are. I think it will take a great many thousand inoculations to settle for all time the question of the immunity of

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these species. I do not think, however, that this doubt constitutes any sort of a reason for not going ahead on a large scale. I believe that is the thing to do."

On October 3, 1916, Mr. Fairchild wrote Mr. Meyer again regarding this pear:

"I have just received the following telegram from Dr. Galloway and Mr. Bisset, after their visit to Talent and their interview with Reimer:

"'Have gone carefully over Reimer's work and are impressed with importance and value of it. Very important that Reimer have seed of two types by February 1st next. To secure one of these will require two days march north of Peking, neighborhood Chingteh, the other two days by train south to Hankau, thence by foot to Yehang. Recommend that Meyer be cabled to go after southern type as he had not planned to do this without instructions from you. Letter follows.'

"Reimer is so anxious to get the seeds of these two types of pears that I am cabling the Embassy in Tokyo as follows:

"'Inform Frank Meyer arriving Inaba Maru, Kobe, important he secure before February pear seeds from Ichang also from Chingteh.'

Stuntz and I don't understand the phrase 'by foot to Yehang'. Stuntz suggests that what is meant is by boat to Ichang. I wired to Reimer to verify this, but on looking at your letter to Dorsett about the pear matter, it is so evident that what Reimer wants is the Pyrus calleryana from Ichang that I have not waited for word from Reimer, but have sent the cablegram to the Embassy in Tokyo, asking them to get in touch with you when you arrive at Kobe today or tomorrow and give you the message. As I see it, Dr. Galloway is afraid that you will postpone the getting of the Ichang seed until after you have been to Peking. Evidently Reimer is particularly anxious to get this, more so than he was when he talked with you.

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Just what has come up to make him especially anxious to get this Ichang seed I do not know. You probably do. If they don't reach you with this cablegram I will wire you again in Peking. If you do go up to Ichang, I hope you will get some seed, if you can, of the Davidia involu-crata and anything else you find up there that is interesting."

Mr Fairchild sent Mr. Meyer on October 11, 1916, a copy of Dr. Galloway's letter of October 3, 1916, with enclosure. Mr. Fairchild's letter of October 11, 1916, is as follows:

"I am sending you a copy of Dr. Galloway's report on the Reimer situation.

"I trust my cablegram reached you and that you understood from it that you would be authorized to make this change in your plans in order to visit Ichang and collect there Pyrus calleryana. I hesitated to direct you to make so radical a change as this may mean in your plans, but the importance of Reimer's work and the opportunity to assist in such a big piece of constructive introduction work makes it seem worth while for you to postpone your trip to Manila until after you have rounded up these different varieties of pears and secured large quantities of seed for introduction.

"In your letter which you wrote from Portland, after visiting Reimer, you mentioned as almost totally immune to the pear blight your SPI No. 21880, Pyrus ussuriensis. Is this the true ussuriensis? You remember there was some discussion about it in the early days of its introduction, and I think you took the matter up with Prof. Sargent. My impression is that he maintained that it was not ussuriensis but chinensis. Have you anything to say with regard to this matter? I imagine until Rehder gets the genus straightened out we will be at sea as to the specific value of these Chinese forms."

The enclosure to the above letter, a copy of Dr. Galloway's letter of October 3, 1916, is as follows:

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"I am sending enclosed a memorandum bearing on Reimer's work at Talent. I do not know whether Meyer wrote you regarding his visit there. I think he came directly to Bellingham from Reimer's place, so that we had an opportunity of talking over this work together. Meyer was greatly impressed with the work Reimer is doing. I was pleased with the man; his unfailing courtesy; his breadth of knowledge; and his scientific spirit. His station is a model in its way. Reimer is fortunate in that he lives with his work. He is able to step directly out of his home into the experimental orchard. He has his laboratory, as you know, on the upper floor of his house. He has no distractions and is able to concentrate his efforts on the problems in hand. He seems to know every tree and plant on the 20 acres. This intimate knowledge with all the plants and trees and the hundreds of experiments under way greatly impressed me. He never consulted any records, nor was it necessary for him to look at labels. He seemed to have all the work in his mind. I think we should do everything in our power to aid him; hence, our telegram to you yesterday, reading as follows:

"Have gone carefully over Reimer's work and are impressed with importance and value of it. Very important that Reimer have seed of two types pear by February 1st next. To secure one of these will require trip two days' march north of Pekin neighborhood Chingteh. The other two days by train south to Hankau; thence by foot to Ichang. Recommend that Meyer be cabled to go after southern type as he had not planned to do this without instructions from you. Letter follows."

"Reimer was afraid that Meyer might not go down to the Ichang country for the calleryana found there. Meyer told Reimer that he was going to the Philippines and might not be able to make this southern trip. I did not talk this phase of the matter over with Meyer at all, as I had not been to Reimer's place when I saw Meyer. We do not know what is involved in the Philippine trip, if such a trip is contemplated, but it would seem very important to get the

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pear seed if practicable. The journey itself to Ichang would not consume very much time, according to Reimer, and according to Meyer, who discussed it with Reimer. The doubtful part of the journey is the length of time it will take to secure the fruits and get the seed out and back. You will have to decide these matters with all the facts before you; that is, you will have to decide as to whether Meyer is really going to the Philippines. It may be necessary to cancel this part of the trip in order that he may go south after the pear seed. I am getting very much interested in this matter of stocks for our fruits. After seeing what Reimer has done, and knowing a little of what Husmann has accomplished with his grapes, it would appear there is a very big field here. In the propagation of many of our fruits, we have simply gone forward in the old empirical way, using all kinds of stocks without regard to their adaptability to the many widely varied conditions of climate in this country and without much regard to their ability to resist insects and diseases; in fact, without much regard to anything, excepting merely a fairly well established tree in the nursery. You will remember our very early work in Franklin Davis and Company's nursery, where we were treating French pear stock and Japanese pear stock. You will remember the great differences in these stocks in the matter of leaf blight. You will probably also remember the great differences in the vigor of the different varieties of pears when grown on the two kinds of stocks. I have thought sometimes that it would be of interest and value, as a preliminary, to make some surveys of orchards put out in different parts of the country on different soils of trees worked on the two kinds of stocks. We could easily work through nurserymen and get records of such orchards. I know, in certain parts of the country, the Japanese stocks have not been successful; in other parts, they have been successful. Here on the coast, the interest all now seems to be in Japanese stocks, as they are finding them resistant to woolly aphis.

.....
 "Please send copy with memo on Reimer's work to Mr. Taylor."

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The enclosure to the foregoing letter reads as follows:

MEMORANDUM REGARDING MR. REIMER'S WORK ON PEAR BLIGHT
RESISTANT STOCKS AT TALENT, OREGON, SEPT. 29, 1916.

Without comment on the Oregon Branch Experiment Station at Talent, and without attempting to set forth in detail the admirable plan of the work there and the personality of Mr. Reimer, who is in charge, we wish to put down a summary of the objects of the work, and what has been accomplished to date. Incidentally, we may set forth a few of the things that would seem necessary to be done in the future.

1. Pear growing is one of the important industries of the Pacific Coast. Next to citrus production, it perhaps ranks second in importance as a purely fruit industry.

2. A number of years ago pear blight appeared in the pear orchards of California, and it has gradually extended its ravages northward until it now reaches into practically all the important nearcoast fruit growing districts.

3. The Rogue River Valley in Oregon has suffered severely from blight for the past seven or eight years. It has already caused damage, amounting to several hundred thousand dollars, and the injury is growing.

4. There are, according to Mr. Reimer, about 25,000 trees in the Valley, (only 416 acres 30 x 30 ft.) of which about 15,000 are pears. (250 acres only.)

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5. The great damage from blight in the Valley comes primarily from the fact that it gets into the body of the tree, either completely girdling the trunk and killing it, or so greatly reducing vitality as to make the fruit of little value. The blight does not stop at the body but frequently runs down and destroys the root as well. In many orchards, all of full bearing age, about one tree in five shows these trunk and fruit injuries. A good many trees have been killed and taken out.

6. Blight occurs in the tops but that is a comparatively simply matter, and can, according to Mr. Reimer, be easily controlled.

7. If pear growing is to continue in this valley and on the coast, the industry must be based on the varieties now grown. The problem, therefore, is to find a sub-structure for the top, which will give a long lived, healthy tree; which will adapt itself to a variety of soils and climates; which will be blight proof; which will withstand woolly aphis and other insects; which may be horticulturally handled in a practical way; and which may support the half dozen or more standard varieties now commanding this market.

8. It is not expected that any one stock will do this. There will need to be a number and from this number many combinations may be secured. In short, Reimer is opening up the very large and important question of the relation

of stock to cion in a very broad way, a question which we must soon consider in connection with many of our fruits.

9. Reimer has started in to work not only with species of *Pyrus* but with varieties as well, and with many combinations of both. He has used careful bacteriological methods and with pure cultures of the pear blight organism has, by process of elimination and rigid check tests, secured readings on about five species which appear promising as blight resistant. There are three or four varieties that also react favorably.

10. One species, *P. ussuriensis*, is absolutely blight proof to date, notwithstanding many hundreds of infections have been made in all sorts of ways. This work has been going on for two years or more now. Some of the trees are so scarred with infection marks that they look as if a double barreled shot gun, loaded with buck shot, had been used on them. Not only has this method of infection been used but the most susceptible varieties have been budded and grafted on to the resistant types and these in turn have been infected. *P. ussuriensis*, so far, stands absolutely blight proof.

11. From careful botanical comparisons with all other forms and species, it appears that *P. ussuriensis* is wholly distinct. Besides the plant at Talent, there is only one tree in the country and that is at the Arnold Arboretum.

P. sinensis has been confused with this species. Japanese nurserymen have for years grown P. sinensis under the name P. ussuriensis. Meyer, who spent three days with Reimer, confirms the foregoing. Reimer now has about 35 species of *Pyrus* growing at the station.

12. Four other species of *Pyrus* have proved very valuable, but not wholly resistant to blight. They are P. calleryana, two forms, P. viriolosa, P. ovidea and P. sinensis (Arnold Arboretum 452-8). The P. sinensis from the Arnold Arboretum may be a distinct species, as it does not resemble or behave towards blight like the ordinary P. sinensis.

13. Three varieties have proved valuable in the resistant work. They are "Surprise", from the Missouri Agricultural College; Urel (15) from Ames, Iowa; and a sand pear from Florida. These are all clean, vigorous growers with light, smooth bark, and work readily with nearly all varieties tried.

14. Some species of *Pyrus* are so susceptible to blight that one small infection will take out a row, unless checked. P. pashia, of India, seems to be one of the worst species to blight.

15. A combination of Surprise and P. ussuriensis makes a fine root and body that nearly all varieties seem to do well on. P. ussuriensis furnished the root; Surprise the

body. Infection has not "knocked" this sub-structure from under any of the now resistant varieties, not even the most susceptible ones.

16. All the promising species and varieties have been worked on dwarf stock to induce early fruiting, so as to get seed of the species and wood of the varieties. Many tender varieties have been worked on resistant species and varieties and then liberally infected to see if continuous blighting of the tops will affect the stocks. Results so far are negative.

17. There is urgently and immediately needed as much as 100 pounds of the seed of the true P. ussuriensis from country about three days' march north of Peking, China, and in addition what seed that can be obtained, up to 100 pounds, of P. calleryana, from near Ichang, China. Meyer said the last named place may be reached in about three or four days from Peking. One takes the train at Peking and goes south to Hankau; thence, by boat to Ichang. Reimer is extremely anxious that both lots be obtained and in his hands not later than February 1st next. The tree at Oroville, Cal., is of the southern type of calleryana. It comes from somewhere near Hong Kong. Reimer does not place much value in this stock, except for southern California, and possibly for breeding purposes.

18. The seed of the two types indicated is to furnish

stocks for a large number of budded and grafted trees, in order to get a widespread reading, to determine the practicability of reconstructing pear orchards in all parts of the country. Material is already at hand or can be secured for numbers of combinations with other species and varieties in providing bodies and roots.

19. It is proposed to grow the stock at the Talent Station, where there are good facilities for this kind of work.

20. S.P.I. should retain a portion of the seed (Bisset says about one-half) for aiding other works in this field. S.P.I. should take steps to get budwood or grafts from the Oroville tree, as seedlings from this tree appear to show evidences of crossing (see leaves sent); hence, the necessity of assuring a stock of the two South China types of P. calleryana. S.P.I. should arrange to secure from the Arnold Arboretum wood of the true P. ussuriensis, and the Central China type of P. calleryana.

21. In view of the importance of this phase of propagating work, it is believed well worth while for S.P.I. to consider the development of a definite project, dealing with the securing, testing and placing of a number of stocks for some of our most important fruits. This would include the work affecting such lines of investigation as Reimer is conducting, as well as work having to do with hardiness of fruits and the general question of congeniality.

(Signed) B. T. Galloway.

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On October 28, 1916, Mr. Meyer wrote in more detail as follows regarding his visit to Prof. Reimer:

"In the evening of September 8th I left Portland for Talent, Ore., where I got the next day at 10:40 a.m. I went straight away to the Southern Oregon Agricultural Experiment Station and met there Prof. F. C. Reimer, Mr. McCormick, his assistant, and an entomologist, Mr. Davidson. Prof. Reimer's parents are Germans, but he is born in Michigan; he used to be for a long time in North Carolina, where he worked at the Agricultural Experiment Station at Raleigh on Vitis rotundifolia (vide his bulletin 'Breeding Rotundifolia grapes', issued May, 1914).

"We spoke of course straight away about his pear experiments. First of all about Pyrus calleryana; of this pear there are two forms, the one as grown in Oroville and obtained from S. E. China and the other the Ichang form, as cultivated in the Arnold Arboretum. About resistancy to cold temperatures; well, in Boston this Ichang form has been growing now for several years and apparently never froze. In Talent both forms withstood 4° Fahr. above January, 1914.

"Professor Reimer's ideas are, that once we have obtained a species of pear or a variety which is immune to blight, we simply plant such a form in regular orchards. After they have become well established one buds, in the fall of the year (early September), from 5 to 8 of the main branches with the desired variety and this insures one at least a trunk, a root system and the main framework of a tree which is immune to blight. It now only requires close inspection, during these times that blight breaks out, to prevent any spread at all by removing and by burning immediately any infected branch or twig. As it is now, even if a large branch has been cut out, often the main trunk or the roots are infected already and, as insects carry the virus, it spreads again from tree to tree.

"Should blight once have been driven out of an inoculated locality, there is no reason why it should return again, assuming of course that sufficient quarantine rules are observed. What about native vegetation affected with blight, I asked? Yes, said Prof. Reimer, that is again

a problem, for around here we have the following species permanently affected, viz., Malus rivio-laris, Amelanchier canadensis and Crataegus douglasii, but, the pear orchards as a rule never touch quite upon the native vegetation.

"When we spoke about budding being preferable to grafting, Prof. Reimer said that it was easier, quicker done, and it makes a better union! One experienced man can put in 800 buds a day.

"We went over the grounds and Prof. Reimer showed me most minutely which species and which varieties were immune or fairly so and which were not. Here is a list of them:

Immune:

Pyrus ussuriensis, SPI 21880,

" variolosa (?)

"Old Home" from Farmingdale, Ill.

Almost Immune:

Pyrus calleryana from Oroville, Calif.,

" " " Ichang, China,

"Orel No. 15" from Prof. Budd of Iowa,

"Surprise" from Missouri,

"Florida Sandpear".

Semi-immune:

Pyrus bretschnideri,

" simonii,

" heterophylla,

" ovoidea,

Japanese sandpear. (Many strains exist, however, some far less immune than others.)

Non-resistant to blight:

Pyrus amygdalifolia

" balansae

" betulaefolia (bad)

" canescens

" cordata

" cotinifolia

" eleagrifolia (bad)

" fascicularis

" glabra

" longipes

" michauxii

" nivalis (bad)

" parvifolia

" pashia (very bad)

" phaeocarpa

" silicifolia (bad)

" serrulata

" seratina (extra bad)

" sinaica

As types of wild pears, Pyrus calleryana from Ichang and Pyrus variolosa (?) show remarkable promise, being of very vigorous growth and taking buds of commercial varieties very easily.

"Pyrus ussuriensis, SPI 21880, tho totally immune, has suffered slightly from the dry air and hot sun at Talent. For more northern sections, however, it may just be the stock. Prof. Reimer made 200 inoculations on this pear, at 8 different dates, on all possible places, but not one took!

"As a stock Japanese sandpear is far preferable than the French seedling stock. The last often gets badly infested with woolly aphid on its roots; the Japanese roots suffer only very little from this pest, while these roots also almost never suffer from blight. If nothing else was obtainable Japanese stock, selected, would be the best to employ, but,--with these new species of Pyrus far better material is available. Prof. Reimer stated that the value of a totally immune, congenial, stock is almost inestimable. The value of the pear-industry in Jackson Co., Ore., is worth c.a. \$10,000,000, and should this industry go the way the pear-orchards went in the Sacramento Valley it would mean bankruptcy to many a concern. We went through an old orchard of Anjou pears where I was shown trees that produce often from \$100 to \$200 worth of fruit a year. Something marvellous!

"I also was shown the damage that the blight has done in old orchards, having eaten away all the bark of a trunk or of main roots so that the people had to resort to inarching with seedlings so as to supply the crown with some nourishment. Prof. Reimer promised me to send you some fotos illustrating this phase of the situation.

"As I have written Mr. Dorsett already, this work of Prof. Reimer is simply remarkable; it is, so to say, a new way of testing a thing. It is not the old haphazard way of waiting to see whether nature tests a variety or a species as regards immunity to blight, but it is the ultra-modern way of carrying the virus to a plant by human hands and getting records concerning degrees of immunity. I went to Talent as a sceptic and after the first day with Prof. Reimer I was fully convinced, not by his words but by the material he had shown me.

"The question of getting sufficient quantities of seeds of Pyrus ussuriensis, north of Peking, and of P. calleryana from the Yangtze river regions is of course the thing. We will do our best, but naturally I cannot promise anything for sure. (By the way, the cablegram sent me c/o American Embassy, Tokyo, probably was inspired by a new request from Prof. Reimer for P. calleryana seeds.) Isn't it? I promised Prof. Reimer I would also send him some bundles of roots from P. ussuriensis and P. calleryana, for testing purposes. He also wishes all possible varieties of Chinese cultivated varieties.

"A book in which several rare species and varieties of pears are described and which Prof. Reimer often consults is: Le Jardin Fruitier, by J. Decaisne, Paris, 1858, Vol. I."

Mr Fairchild wrote Mr. Meyer in part on December 29, 1916:

"I see by your letter* that you are going to get Prof. Reimer some bundles of roots of Pyrus ussuriensis and P. calleryana. I am not at all sure that the Federal Horticultural Board will allow these to go to him, at least, not until they have been subjected to very close scrutiny."

Mr. Meyer wrote from Peking on November 15, 1916, transmitting six wooden boxes. A portion of the material contained in these boxes is as follows:

SPI No.	43796,	<u>Pinus bungeana</u> ,	110 lbs.,
" "	44197,	<u>Castanea mollissima</u> ,	125 lbs.,
" "	44198,	" "	325 lbs.,
" "	44199,	<u>Juglans regia sinensis</u> ,	245 lbs.,
" "	44200,	" "	60 lbs.

This material was not received at Chico until February 21, 1917.--At the same time he sent through the Legation in Peking four parcels, received on December 21, 1916, containing the following:

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SPI No.	43796,	<u>Pinus bungeana</u> ,	10-1/2 lbs.,
" "	43791,	<u>Ulmus pumila var. pendula</u> ,	
		31 cuttings,	
" "	43792,	<u>Wistaria venusta</u> ,	26 cuttings,
" "	43793,	dwarf pomegranate,	1 plant,
" "	43794,	<u>Wistaria venusta</u> ,	1-1/2 oz.,
" "	43795,	" "	1 oz. seed.

As usual Mr. Meyer made certain requests with regard to the disposition of parts of these introductions, all of which requests will be complied with. He remarked that he had bought 50 cattles of first quality jujubes which he would send off shortly, as well as Diospyros lotus, which was then too moist to be shipped. Of wild pears he had obtained but few but he had collectors out; the same condition applied to the collecting of seed of Amygdalus davidiana. Mr. Fairchild replied to this letter on December 22, 1916, as follows:

"Your letter of November 15 has just been received, and it is a pleasure to hear from you again and to know that you are 'on the job'.

"Six wooden boxes from Peking! You will be notified of their arrival. A hundred cattles of Pinus bungeana! Give my best regards to Mr. MacMurray and tell him that a hundred years hence, or two hundred years perhaps, or even three hundred years, if he will come back, the whole landscape effect of this country may be changed, that is, providing the Federal Horticultural Board does not see fit to find some dangerous fungous disease in these seeds and fumigate them and perhaps kill them.

"You will be interested to know that Dr. Galloway is already carrying on experiments in the disinfection of plants. I think we can congratulate ourselves that the Doctor has 'jumped' in here and is going to work out new methods which will prevent the death of many things which might otherwise go to the wall.

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"I am glad to see that you have obtained 400 cattles of Castanea mollissima seeds, 200 dark colored and 200 light colored, 215 cattles of large sized Chinese walnuts, Juglans regia sinensis, and 60 cattles of medium sized Chinese walnuts.

"I do not know what the Federal Horticultural Board is going to say about these large quantities. I have explained to them the good reasons for introducing large shipments, but I am not sure that I have convinced them of the wisdom of this course. My attitude in the matter is that a thorough inspection of the seeds, if it is done with the greatest care, is likely to reveal the presence of fungous spores on these large shipments which would not be detected on small ones, and these infections of the large quantities will often reveal the presence of diseases in foreign countries which we did not suspect existed.

"I want to warn you in particular about this Pinus bungeana seed. The Forestry Association holds a meeting on the 19th of January, and I have been asked to give a talk on the independence of our American nurseries of European nursery stock. They propose as an association to stop the introduction of all nursery stock on the ground that it is bringing in diseases of forest trees such as the pine blister rust which threatens to wipe out our wonderful white pine forests. If there is any pine disease on the Pinus bungeana, we ought to know it, and if you are where you can get at these pines, by all means make a thorough search for any possible disease. It would be a sad thing to bring in some new kind of disease on this wonderful white barked pine.

"I am glad you have obtained scions of the pendulous form of Ulmus pumila. This ought to be a handsome thing.

"Wistaria venusta I am sure will be a very acceptable introduction.

"A new form of pomegranate will be interesting to greenhouse growers, I suppose.

"I am sorry to hear that you have not yet secured seed of the wild pears, for there is so much interest attaching to this wild pear seed that you must not leave any stone unturned to secure it. Since you left the interest in Reimer's experiments has increased, and the demand for this seed will be insistent.

"The films which you exposed at Talent have been received, but the prints have not yet arrived. I am sorry to say that these are so small that they do not make much of an impression upon me. I hope sincerely that you are not going to use this small camera extensively in your work this year in China, for the demand now is almost entirely for larger photographs even than was the case when you left us and, as I have often said in my letters, you cannot do anything which will please us more than to get large sized photographs of the material which you collect. I have just been going over a lot of our photographs again, and it is a pity that we ever went in for the small photographs, for we cannot in the future use them in any such proportion as we can the larger ones."

In his letter of November 16, 1916, from Peking, Mr. Meyer commented as follows on Mr. Fairchild's letter of September 29, 1916:

"As regards Prof. Reimer's work, whether the same results concerning immunity will be obtained everywhere, no, I personally do not quite think so, but so far as the pear growing sections of the Pacific Coast are involved, I believe that his experiments will prove to be the main guide for fruit growers to go by. His work will have to be duplicated in other sections of the United States and, possibly, in the moister east, some species now immune in southern Oregon may show to be more or less susceptible to blight. But that is again another question. The sooner the American people realize that one kind of a product cannot be grown everywhere and under all sorts of conditions, the better it will be. Locally adapted varieties of plants will become the slogan in the near future for every progressive tiller of the soil."

In the same letter (November 16, 1916) Mr. Meyer wrote re our letter of October 3, 1916:

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"I really wonder why so much wiring has taken place. I told Prof. Reimer I would first go to Peking, where I had many seeds to buy and where my rougher exploration outfit was stored with the American Legation; then I would go to the Yangtze and get Pyrus calleryana and then to Hongkong and Manila. He possibly thought I would omit the Upper Yangtze trip, because I had stated that P. calleryana occurs also at Kuling, near Kiukiang."

Later in the same letter (November 16, 1916):

"No I never intended to go to Ichang first, as I am not acquainted with that part of China..

.....
 "When once in the Shing lung shan region I will try to get photos showing the rough black bark of this Pyrus ussuriensis, for publishing in Plant Immigrants. I sent in seeds of this same species of pear from Harbin, SPI No. 35304; I wonder if any of them have ever grown. I also sent in specimen fruits in alcohol; they were received I think in June, 1913. I had asked that Mr. Rehder should receive some but the last told me he never got any.

"When going through my own notes I find that I sent in material of P. ussuriensis under the following numbers: 17, 177, 184, 565a, 566a, 570, 573, 574, 589, 839a (this is the one Prof. Reimer has), 617 and 1799a. I just wonder how few of these numbers still could be located.

"The question: what is the true Pyrus ussuriensis, certainly has not been settled as yet; the plant called P. sinensis seems to be P. ussuriensis but as Londlet, the author obtained his material from extreme southern China, where no P. ussuriensis exists, everybody is at sea for the present. It may be many years however before some of these peculiar species have properly been worked out.

"Doctor Galloway's report on Prof. Reimer's pear work at Talent interests me very much. I agree perfectly with the Doctor's remarks concerning Reimer, especially the fact that he can run out of his house and laboratory straight into his orchard. Ye Gods, what do we miss much there in Washington, D. C.!! And what a loss it really is to science.

"I spoke with Dr. Galloway a long time about Reimer's work in Bellingham and I am therefore pleased to find that all of us agree upon the importance of his work. It now all depends how many pounds of seeds we can secure for orchard planting in various parts of the United States.

"I notice that several names Dr. Galloway gives of botanical species of pears do not agree with my way of writing them; I suppose everyone will be looked up before they are being published.

"This report opens up several lines of new work which will take many people many years to work out, such as the testing of all sorts of stocks for 'congeniality' experiments. It also means the building up of permanent collections of trees and shrubs related to our cultivated species of bush and tree fruits. Too little has been done in these lines!"

The following are extracts from Mr. Fairchild's letter of November 21, 1916, to Mr. Meyer:

"I cannot understand why you think that you have plenty of time to get seeds of Pyrus calleryana from Ichang this year after making your trip to Peking and Jehol but I suppose you understand what you are talking about; you generally do.

"I have just received a letter from Reimer who points out that they have had much better success with the planting of pear seeds in January than any other time. I wrote him that I did not believe you would get any pear seeds through to him by that time. Did you promise him any as early as January or February?"

In a letter of November 21, 1916, from Peking, Mr. Meyer wrote:

"We are now negotiating with carters to take us to the wild pear groves near Ma lan yü, 2-1/2 days by carts from here. The same place where the wild monkeys are living which I once tried to get."

In a second letter of November 21, 1916, from Mr. Meyer in Peking, he transmitted through the Legation twelve large

and one small parcels. Eight of the large parcels contained jujubes, not numbered, and the remaining four, clumps of Zizania latifolia, SPI No. 44069, received January 3, 1917. The small package contained first quality Chinese soy bean cheese, which Mr. Meyer said was extremely appetizing.

Another investigation which we requested Mr. Meyer to conduct pertained to Japanese cherry trees. In this connection we wired Mr. Meyer in Seattle, Wash., on September 18, 1916, as follows:

"Arrange while in Japan for fifty to one hundred pounds seed of Sargent's cherry called true Yama Zakura and like quantities of the ordinary wild cherry used universally as stock. Orders were placed with Suzuki, Yokohama, and Watase, twenty-six Miyamasu, Shibuya, Tokyo."

In his letter verifying this wire on September 18, 1916, Mr. Fairchild added:

"As you remember, most of the seeds of Prunus sargentii so-called, failed to grow, and we are in a position, as we were last year, to want these seeds very badly, and hope you will use every effort possible to get them. Let me know if you think the best method of securing these seeds is through the Yokohama Nursery Company. Find out further whether Wilson is right, or whether in your opinion he is right in his belief that this so-called Prunus sargentii is going to prove a better stock than the ordinary Prunus serrulata. I cannot figure out just how these flowering cherries are going to be influenced and made hardy by Prunus sargentii stock. Any light on this problem will be keenly appreciated."

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On September 19, 1916, also addressed to him in Seattle, we sent Mr. Meyer the following telegram:

"Following cherry varieties failed: Kirin, Taki-nioi, Shogetsu, Kan-zakura, Minakami, Koko-noye, Ranzan, Yaye-akebono, Gioiko, Horinji, Ohsima-zakura, Hitoye-Fudanzakura, Asagi-zakura, Botan-zakura, Surugadai-nioi, Sirayuki, Unju-zakura. Arrange duplicate supply budwood through Suzuki."

Mr. Meyer wrote on October 19, 1916, from Yokohama:

"On October 10 I spoke to Mr. Suzuki about this cherry matter and he informed me that when the request came the season was over already and we have to wait until next year.

"This afternoon I saw Mr. Watase in Tokio and he told me that same thing, only he has sent us last month about 10 lbs. of seeds of Prunus sargentii.* I hope this has arrived by now. Mr. Watase informed me that under the name 'Yama-zakura', which means 'mountain cherry' or 'wild cherry', various species are known; in other words the 'Yama-zakura' from Tokyo is a different species from the Yama zakura from Northern Hondo or Hokkaido. To him at least 4 or 5 distinct wild cherries are known. This is interesting news! I wish I had my copy now of Wilson's "Cherries of Japan", which is out in the Woods, to see what Wilson says about this. You had better look it up. Mr. Watase said that on Mount Fuji a distinct wild species occurs, called Fuji-zakura.

"I asked him to collect seeds of all of these wild cherries for us, as many as he can, but I said that you will write him a letter instructing so. Please do this."

We wrote Mr. Watase November 18, 1916.--Another paragraph in Mr. Meyer's letter of October 19, 1916, reads as follows:

"About your other questions in regards to suitability of Prunus sargentii stock, I cannot say much. I will have to ask various parties. That a host can be made hardier by a cold resistant stock is proven in the Citrus

trifoliata case, where the last makes its host 10 degrees hardier in North Florida. Of course in that case the graft is an evergreen while in cherries they are not.

"I have given Mr. Suzuki a written order for the 17 varieties of flowering cherries, as mentioned in your telegram to me of Sept, 19, 1916, and with Mr. Post Wheeler I have arranged to have them sent through the Embassy mail pouch."

On October 25, 1916, from Kobe, Japan, Mr. Meyer wrote:

"I have not been able to find anybody to talk to about the cherry-stock problems. The Suzuki brothers were out last Saturday for a several days' trip and I left Yokohama last Sunday and here there is no one to talk 'shop' about such matters. One would have to stay a long time in Japan to settle such questions. Please make a note about such affairs so as to put them into the hands of a person going to explore Japan."

Mr Fairchild wrote Mr. Meyer on October 26, 1916:

"In working over your Tang-hsi cherry which you know is the true Prunus pseudocerasus, the thought occurs to me to ask if it is not possible that there are other cultivated varieties of this species there in China. If you go into the Chekiang province why not look for them? If this is the cultivated strain what is the true wild species of Prunus pseudocerasus? Can't you find it and send it in? Just a suggestion, you understand."

At the request of Dr. Stockberger Mr. Meyer was requested to secure propagating material of definite varieties of Japanese peppermints. Mr. Meyer made as full an investigation as his limited stay in Japan would permit and on October 25, 1916, from Kobe, made a report (No. 518-a in his letter file), a copy of which was transmitted to Dr. Stockberger November 20, 1916.

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At Dr. David Griffiths' request we wrote Mr. Meyer on November 8, 1916, to be on the lookout for lilies for his work.

On November 11, 1916, Mr. Stuntz wrote Mr. Meyer in part as follows:

"I am sending you a few notes that have been extracted from various sources on the flora of central and southeastern China for your use, and hope to have more for you at various intervals.

"Mr. Chambliss asked me to remind you that he wants Zizania latifolia with as full information concerning it as you can get, as soon as you can get it.

"I am enclosing an abstract of a recent publication on the plants of Yunnan by L veill . Some of the notes have been taken from this publication."

The enclosure to the above letter reads as follows:

"H. L veill  has just published a Catalogue des Plantes du Yunnan, dedicated to the memory of Franchet and Delavay, arranged alphabetically by families and running as far as out to Euphorbiaceae. It contains many new species, but the quality of these new species may perhaps be shown by the fact that he described a Triosteum, T. hirsutum, as a new species of Echium, E. connatum.

"Of probable interest to you are 30 species and varieties of Vitis, none however described, 30 species of Berberis, without description or location, a rose-colored Tecoma, T. mairei, from Mount Pe-Long-Tsin, a new Abelia, A. mairei from Siao-Ou-Long, 26 Loniceras, Viburnum botryoideum from Mount Io-Chan, Celastrus yunnanensis with rose-colored flowers from Kiao-Kiao, Euonymus provicarii from Pi-Ka-Tong, Cupressus mairei, a superb tree around pagodas on the plain of Tong-Tchouan; Cornus capitathy-poleuca, a large umbrella-shaped tree from Mount Io-Chan; Cucumis mairei, with solitary white flower, and Petasites-like foliage, cultivated

and subsponaneous in the plain of Tong-Tchouan; Diospyros mairei from La Kou; 98 Rhododendrons; several species of Codonopsis and Cyananthus which may be of interest to the growing number of alpinists in this country."

We had a request on August 8, 1916, from Mrs. J. Dean, of the Dean Iris Gardens at Moneta, Calif., that Mr. Meyer be requested to secure any irises possible and particularly Iris speculatrix, described by Mr. Dykes in his monograph on the genus Iris. Mr. Meyer promised in his letter of November 21, 1916, to Mr. Bisset, to try to get this species when he went south.

A copy was sent Mr. Meyer on August 18, 1916, of Mr. Shear's letter of August 10, 1916, asking him to be on the lookout for all species of Endothia, the chestnut blight fungus and its relatives, not only on chestnuts but possibly on oaks and other trees.

In a letter of September 14, 1916, to Mr. Meyer, Mr. Dorsett included the following paragraph:

"In talking with Mr. Norton the other day he said there were a number of varieties of asparagus in China that he would like you to secure for him. He said he would send us a note relative to this matter. I will advise you when we receive his request for this material."

At the close of the year only the following introductions had reached us from Mr. Meyer:

SPI No. 43021, Clerodendron cyrtophyllum.*
 " " 43022, Iris sp.,*
 " " 43791, Ulmus pumila,
 " " 43792, Wistaria venusta,
 " " 43793, Punica granatum,
 " " 43794, Wistaria venusta,
 " " 43795, " "
 " " 43796, Pinus bungeana.

*Brought in by Mr. Meyer in 1915 but not numbered until 1916.

Since starting on this trip Mr. Meyer has sent in photographs Nos. 12368a to 12368i, made in Talent and Corvallis, Ore., Nos. 12369 to 12387, made in Japan and China, and Nos. 13225 to 13261, made in China. Prints from some of these negatives are used in this report.

Agricultural Explorer in Charge.

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"Citrus limonum. Dwarf lemons in a mud greenhouse in the Central Park, Peking. These lemons are not as acid as ordinary ones, but they are very juicy. They are called 'Hsiang tao', which curiously enough, means 'fragrant peach'." (Frank N. Meyer.)

Negative No. 12373, Peking, China, November 9, 1916.



"Ulmus sp. Magnificent forest of large elms, oaks and Manchurian walnuts, all ruthlessly cut down and given over to the flames. The shack is an inn, where we spent the night." (Frank N. Meyer.)

Neg. No. 12378, Chiu po tze ling, Shing lung shan district, Chihli Prov., China, December 5, 1916.



"Pyrus ussuriensis. A wild pear grove of many acres in extent all cut down and burned so as to make room for cereal crops." (Frank N. Meyer.)

Neg. No. 12381, Shing lung shan district, Chihli Prov., China, December 5, 1916.



"Pyrus ussuriensis. A large and extended grove of wild pears in the process of extermination. The valuable trunks are all ruthlessly burned, since no lumber is allowed to leave this district, as this might disturb the peace of the spirits of the deceased members of the late Imperial Dynasty, who have been buried 50 miles further south." (Frank N. Meyer.)

Negative No. 13229, Shing lung shan, Chihli Prov.,

China, December 3, 1916.

December 31, 1916.



"Pyrus ussuriensis. A large old specimen of a wild pear tree found at the base of a hill. Chinese name of this pear 'Shan li shu', meaning 'mountain' or 'wild' pear tree. This species of pear is the only one that withstands the severe and uncongenial climate of Petrograd, Russia." (Frank N. Meyer.)

Negative No. 13230, Shing lung shan, Chihli Prov., China, December 3, 1916.



"Pyrus ussuriensis. Near view of the trunk of an old wild pear tree which measures over 6 ft. in circumference, 4 ft. above ground. Note the characteristically grooved bark of grayish-black color. (South side.) My interpreter, Mr. Chow Hai Ting, stands near, so as to show the enormous size of the trunk." (Frank N. Meyer.)

Negative No. 13231, Shing lung shan, Chihli Prov., China, December 3, 1916.

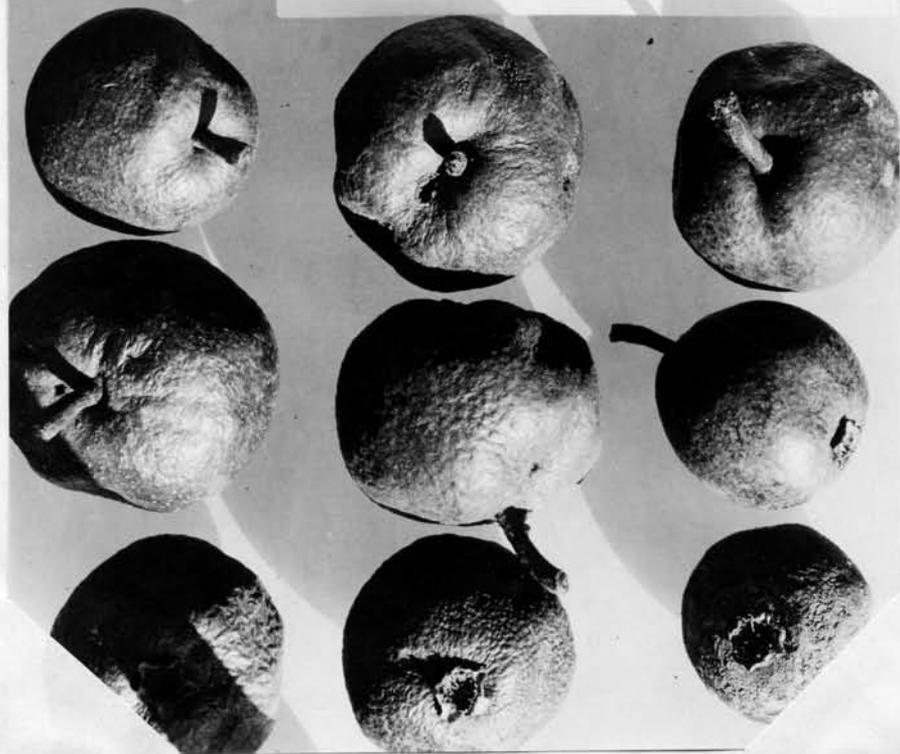


山梨

山梨

SHAN LI.

Pyrus USSURIENSIS.

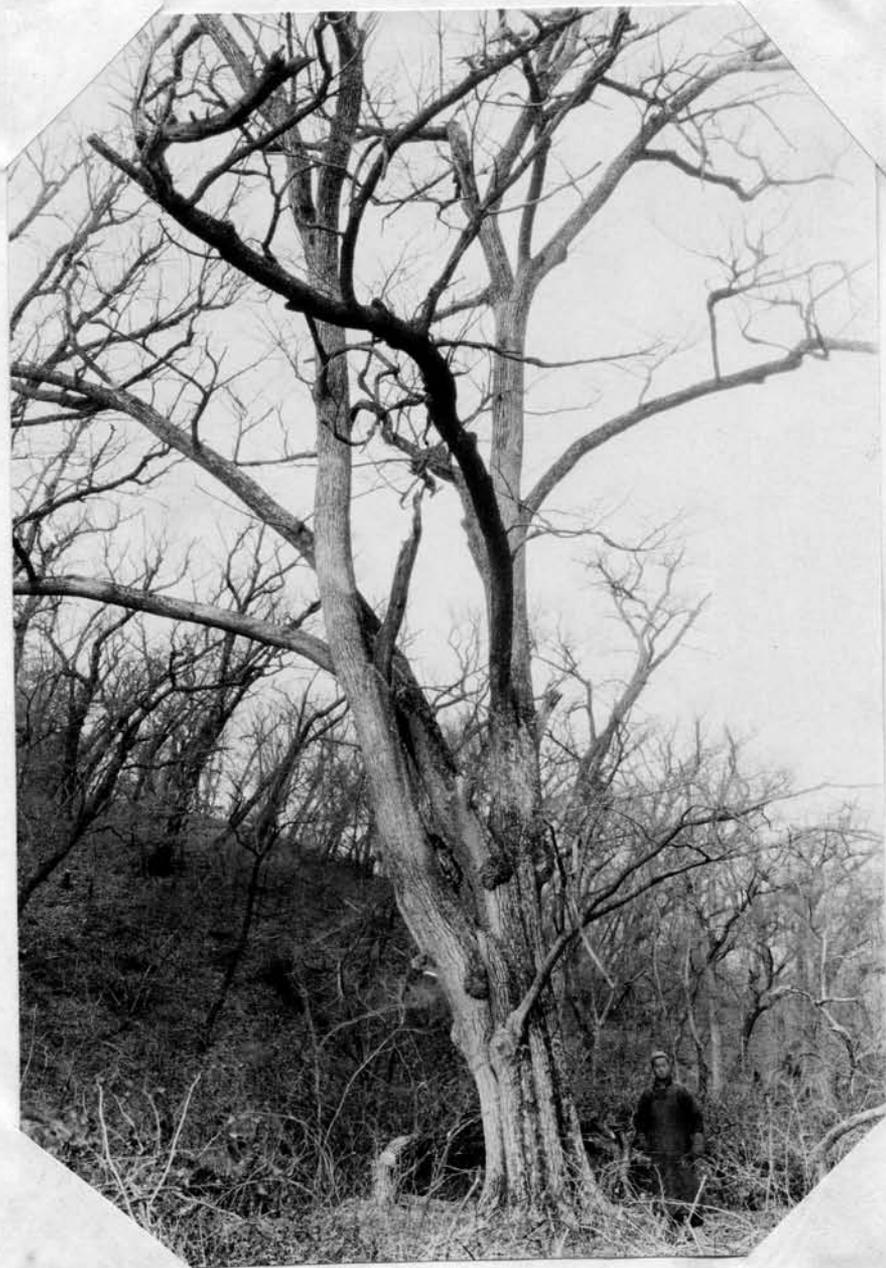


"*Pyrus ussuriensis*, natural size. Ten fruits of the wild pear, showing the short peduncles, persistent calyx and the flattened-globular shape of this small fruit, which is acrid before being frozen, after which it becomes soft and acquires a sour taste. Chinese name of these pears 'Shan li', meaning 'mountain' or 'wild' pear." (Frank N. Meyer.)

Negative No. 13234, Shing lung shan, Chihli Prov., China, December 4, 1916.



"Pyrus ussuriensis, natural size. Fruits of the wild pear, showing the coarse texture of the flesh. Seeds were sent under No. 2357a (SPI No. 44236) and No. 2358a (SPI No. 44237), scions under No. 1263 (dead on arrival), roots under No. 1281 (SPI No. 44176) and samples under Nos. 130b and 132b." (Frank N. Meyer.)
Negative No. 13235, Shing lung shan, Chihli Prov., China, December 4, 1916.



"Ulmus sp. A stately elm tree, over 80 ft. tall with a girth of 14 ft. 4 ft. above ground. Note the light ashy-colored bark. Found on moist lands at elevations over 2,000 ft. above sea level. A promising avenue tree for the cooler sections of the United States. Chinese name 'Shan yü shu', meaning 'mountain elm tree'." (Frank N. Meyer.)

Scions sent under No. 1264, dead on receipt.

Sample of wood under No. 131b.

Negative No. 13261, Chiu po tze ling, Shing lung shan district, Chihli Province, China, December 6, 1916.

December 31, 1916.

South China Explorations,

Supplementary Report, December 31, 1917.

Mr. Meyer's first letter in 1917 was written on January 2 in Peking and transmitted 16 cases, containing the following material:

200,000 stones of Davidiana peach, SPI No. 44686,
1,000 catties dried jujube fruits, SPI No. 44687,
60 catties Ghoorma fruits, SPI No. 44688,
c.a. 75 lbs. Juniperus chinensis berries, SPI No. 44234,
c.a. 70 catties walnuts, SPI No. 44200.

The first three items reached Chico April 21, 1917, the juniper berries on February 9, 1917, and the walnuts on February 21, 1917. In the last paragraph of this letter Mr. Meyer wrote:

I am describing another lot of material also which will go forward by the next diplomatic pouch and after I am thru with all this, then I'll be able to go down to the Yang tze River.

On January 2, 1917, we asked Mr. Meyer to send us, for the Bureau of Chemistry, seeds of all the different forms of Brassica or Sinapis which are grown commercially or exported from China. He replied on February 8, 1917:

I have set my interpreter on this work already and we expect to get a number of samples within a few days. I personally do not know by sight all of these Brassicas and Sinapis and may have some trouble in distinguishing them. We will try, tho', anyway.

He wrote further on February 12, 1917, from Peking, transmitting his Nos. 140b to 142b. Nine ounces of seed of each of these were received on March 20, 1917, given SPI Nos. 44316 to 44318, and turned over to Dr. Viehovever, of the Bureau of Chemistry, on March 29, 1917, together with a copy of the following extract from Mr. Meyer's letter of February 12, 1917:

According to your letter of January 4, 1917, many species of Brassica seeds are being exported from China, but I fail to see any B. juncea being mentioned and yet this seems to be the species that is being cultivated here up north.

My interpreter went around for a few days and says that this is the only kind of seed from which mustard is made here in China. The various dealers deny that other seeds are mixed with it. I suppose if adulteration takes place it must be in the Yangtze river ports, where Brassica campestris is raised so extensively as a winter crop on low lands. When once further south we will investigate further.

As regards the possibility of obtaining 50 kilos of various Brassica seeds, well, I think that can be done; the price for 50 kilos of B. juncea here in Peking will be c.a. \$24.00 to \$28.00 Yuan silver.

Concerning the exportation of mustard seed from up here, it is said that very little leaves this section of the country. If I can lay my hands on lists of the custom house, I'll look this matter up.

I trust these three samples may be of some use to the Bureau of Chemistry.

Mr. Fairchild requested Mr. Meyer, in a letter dated March 27, 1917, to secure the fifty kilos of mustard seed referred to.

Under date of January 6, 1917, from Peking, Mr. Meyer wrote of the despatch of twenty parcels of seeds, scions and specimens. This material was received on February 9, 1917. The parcels contained the following:

FNM No.	SPI No.	Name	Remarks
1262	-----	Populus suaveolens	Dead. FHB 20556
1263	-----	Pyrus ussuriensis	" " 20557
1264	-----	Ulmus sp.	" " 20558
1265	44163	Pyrus ussuriensis	Quarantined; 46 grafts made 2-16-17; Dead, April 10-18.
1266	44164	Pyrus lindleyi	Quarantined; 46 grafts made 2-16-17
1267.	44165	Pyrus lindleyi	Quarantined; 29 grafts made 2-2-16
1268	44166	Pyrus lindleyi	Quarantined; 13 grafts made 2-16-17; dead, May 18-17.
1269	44167	Pyrus lindleyi	Quarantined; 15 grafts made 2-16-17; dead, May 18-17
1270	44168	Pyrus lindleyi	Quarantined; 10 grafts made 2-16-17; dead, May 18-17
1271	-----	Pyrus ussuriensis	Dead. FHB 20571
1272	44169	Pyrus ussuriensis	Quarantined; 30 grafts made 2-17-17; dead, Mar 22-18.
1273	44170	Pyrus lindleyi	Quarantined; 12 grafts made 2-16-17;

FNM No.	SPI No.	Name.	Remarks.
1274	44171	<i>Pyrus lindleyi</i>	Quarantined; 20 grafts made 2-16-17; dead, 10-16-17
1275	-----	<i>Pyrus sinensis</i>	Dead. FHB 20574
1276	44172	<i>Pyrus</i>	Quarantined; 14 grafts made 2-16-17
1277	44173	<i>Pyrus</i>	Quarantined; 17 grafts made 2-16-17;
1278	44174	<i>Pyrus</i>	Quarantined; 10 grafts made 2-16-17
1279	-----	<i>Pyrus ?</i>	Dead. FHB 20575
1280	44175	<i>Iris sp.</i>	Quarantined 2-19-17
2330a	44203	<i>Ziziphus jujuba</i>	4 lbs.
2332a	44204	<i>Zea mays</i>	2 lbs. 14 oz. All destroyed except a few grains, which were quarantined.
2333a	44205	<i>Perilla frutescens</i>	1 lb. 12 oz.
2334a	44206	<i>Cannabis sativa</i>	1 lb.
2335a	44207	<i>Abutilon theophrasti</i>	12 oz.
2336a	44208	<i>Fagopyrum vulgare</i>	1 lb. 12 oz.
2337a	44209	<i>Soya max</i>	1 lb. 5 oz.
2338a	44210	" "	1 lb. 7-1/2 oz.
2339a	44211	" "	1 lb. 8 oz.
2340a	44212	" "	1 lb. 7 oz.
2341a	44213	" "	1 lb. 6 oz.
2342a	44214	" "	1 lb. 8 oz.
2343a	44215 to 44217	<i>Phaseolus vulgaris</i>	1 oz., 1 lb., and 4 oz., respectively

December 31, 1917.

FNM No.	SPI No.	Name.	Remarks.
2344a	44218	Vigna sinensis	2 lbs. 13 oz.
2345a	44219	" "	1 lb. 10 oz.
2346a	44220	" "	1 lb. 8 oz.
2347a	44221 to 44229	" "	
2348a	44230	" "	1 lb. 11 oz.
2349a	44231	Pisum sativum	1 lb. 11 oz.
2350a	44232	Phaseolus angularis	1 lb. 14 oz.
2351a	44233	Juglans mandshurica	2 lbs. 12 oz.
2354a	44150	Pyrus ussuriensis	6 lbs. 8 oz.
2355a	44151	" "	4 lbs. 8 oz.

Our distributions, on February 16, 1917, of the two last numbers, were as follows:

44150: 4 lbs. Chico
2 lbs. Yarrow
6 oz. Prof. Reimer
2 oz. James Mills

44151: 2 lbs. Chico
2 lbs. Yarrow
6 oz. Prof. Reimer

(The distribution of only the most important of Mr. Meyer's introductions will be given here.)

FNM No.	SPI No.	Name.	Remarks.
126b	44145	Pyrus ussuriensis	Fresh fruits; detention house
127b	44146	Pyrus lindleyi	Fresh fruits; detention house

FNM No.	SPI No.	Name.	Remarks.
128b	44147	<i>Pyrus ussuriensis</i>	Fresh fruits; detention house
129b	44148	" "	Fresh fruits; detention house
130b	-----	" "	Wood; FHB 20620
131b	-----	<i>Ulmus</i> sp.	" " 20580
132b	-----	<i>Pyrus ussuriensis</i>	Fragments of wild fruits; FHB 20581
133b	44149	<i>Picea meyeri</i>	18 cones

As was his usual custom, Mr. Meyer included, in his letter of January 6, 1917, suggestions regarding the disposition of some of the above material. He wrote:

Some numbers are quite valuable, like 1263, scions of wild *Pyrus ussuriensis*. I suggest to put them in the hands of very capable people only. Many of the pears in this shipment may be of very great future promise and I advise to supply Prof. Reimer with a good quantity of every one. He will be especially interested in the *ussuriensis* group. I have not attempted to give them Mr. Rehder's new names, for I do not think that he has had enough of material to work with to be certain whether a thing is a distinct species or merely a form.

The jujubes, No. 2330a, may be sown out in Chico and in localities in Texas to obtain new types. The beans, peas, fibre and oil seeds will no doubt go to various specialists. Mr. Dewey wanted especially a strong *Abutilon* hemp. I hope that No. 2335a fills the bill; I'll also send a sample of the fiber shortly.

No. 2351, *Juglans mandshurica*, might be tested in Rocky Mountain localities as a shade tree.

The numbers 2354a and 2355a are of special value as they may be immune cultivated varieties

of Pyrus ussuriensis. Actual testing will determine it of course. I was able to get but a very small quantity of seeds of the wild P. ussuriensis and I am sending them by another mail.

I wonder how the samples of fresh pears will arrive? If they are still in good condition a few pears of each lot might be sent to Mr. Rehder. I have good photos of them and it will therefore not be necessary to photograph them in Washington.

Of the samples 130b, 131b, 132b and 133b, some material should be sent to the Arnold Arboretum.

Well, this is all for the moment. I still have lots of note making to do and my room is not large enough for all this packing up.

Mr. Dorsett acknowledged this material on March 21, 1917.--On January 9, 1917, in accordance with the request contained in Mr. Meyer's letter of November 16, 1916, (see p. 22 of the 1916 report) we sent him a memorandum containing distribution and report data on twelve of his Pyrus ussuriensis introductions. (This is letter No. 540 in the file of Mr. Meyer's letters.)--On January 15, 1917, from Peking, Mr. Meyer wrote transmitting six parcels, which reached us on February 19, 1917. They contained the following material:

<u>FNM No.</u>	<u>SPI No.</u>	<u>Name.</u>	<u>Remarks.</u>
1281	44176	<u>Pyrus ussuriensis</u>	Quarantined; 35 roots
2356a	44235	" "	17 oz.
2357a	44236	" "	12 oz.
2358a	44237	" "	8 oz.
2359a	44238	<u>Quercus sp.</u>	Quarantined
134b	-----	<u>Cannabis sativa</u>	FHB 20621
135b	-----	<u>Abutilon avicennae</u>	" 20622

In his letter of January 15, 1917, Mr. Meyer wrote:

I have a few suggestions to make, viz., No. 1281 are roots of Pyrus ussuriensis, which I had dug up at Shinglungshan; I suspect that only very few of them will grow, since they are too old and have no fibrous roots. However, I would like to see Prof. Reimer supplied with a few of the young roots, even those without stem, so that he can graft on them. The rest might be kept at Yarrow in a frame for one year, keeping them with confined air and with much shade in summer. Do not plant them out in the open field for they will surely die.

These roots were ordered grown in quarantine and at the time of writing this report had not been released. Mr. Meyer's letter continued:

No. 2356a is a cultivated pear of the P. ussuriensis type and Prof. Reimer should have a sufficient share of this number.

Nos. 2357a and 2358a are the real wild P. ussuriensis and the same remark applies to them as to the preceding number. These pear seeds I all packed in with sifted, damp moss and I trust they will germinate much better than when kept dry.

Of these three numbers of Pyrus ussuriensis, two ounces of each were sent to Prof. Reimer, one ounce of each to Mr. Wight, and the remainder, in each case, to the Chico Station. These distributions were made on March 7, 1917.--Mr. Meyer continued:

When we have not the opportunity to grow No. 2359a, acorns of various oaks, they had better be sent to the Arnold Arboretum.

These fourteen acorns were ordered grown in quarantine. Fourteen plants from them were released and ordered sent to

Yarrow on August 7, 1917.--The Cannabis and Abutilon fibre samples under Nos. 134b and 135b were sent to Mr. Dewey for his specimen files.--The closing paragraph of Mr. Meyer's letter of January 15, 1917, reads:

I have still a few more seeds and specimens at hand and they will be forwarded within a few days. The large shipment of 1300 cattles of Davidiana peach stones and 1000 cattles of jujubes, for seeds, is still awaiting a steamer in Chingwangtau, for on account of the very severe winter here, the greater part of the Yellow Sea is frozen over and in the mouth of the Yang tze kiang there is so much floating ice, so as to impede navigation. This surely is something unheard of.

On January 16, 1917, Mr. Meyer wrote, also from Peking, that he was sending via diplomatic pouch one parcel containing several small botanical and entomological specimens and the following seeds:

FNM No.	SPI No.	Name.	Remarks.
2360a	44274	<i>Pyrus ussuriensis</i>	Divided between Chico and Prof. Reimer March 27, 1917. Chico, dead, Oct 4-17.
2361a	44275	<i>Pyrus ussuriensis</i>	Divided between Chico and Prof. Reimer March 27, 1917.
2362a	44276	<i>Pyrus</i> sp.	One-third each to Chico, Prof. Reimer and Prof. Sargent March 28, 1917.
2363a	44277	<i>Pyrus</i> sp.	One-third each to Chico, Prof. Reimer and Prof. Sargent March 28, 1917. Chico, dead, Oct 4-17.
2364a	44278	<i>Pyrus ussuriensis</i>	One-third each to Chico, Prof. Reimer and Prof. Sargent March 28, 1917.

<u>FNM NO.</u>	<u>SPI No.</u>	<u>Name.</u>	<u>Remarks.</u>
2365a	44279	<i>Pyrus lindleyi</i>	One-third each to Chico, Prof. Reimer and Prof. Sargent March 28, 1917.
2366a	44280	<i>Pyrus</i> sp.	50 seeds to Prof. Reimer and remainder to Chico March 28, 1917.
2367a	44281	<i>Malus spectabilis</i>	1/4 to Prof. Sargent, 3/4 to Chico Mar 28-17. Chico, dead, Oct 4-17.
2368a	44282	<i>Malus</i> sp.	1/4 to Prof. Sargent, 3/4 to Chico, Mar 28-17. Chico, dead, Oct 4-17.
2369a	44283	<i>Malus baccata</i>	1/4 to Prof. Sargent, 3/4 to Chico Mar 28-17.
2370a	44284	<i>Nicotiana tabacum</i>	
2371a	44285	<i>Indigofera kirilowii</i>	
2372a	44286	<i>Ulmus parvifolia</i>	
2373a	44287	<i>Chrysanthemum indicum</i>	
2374a	44288	<i>Spodiopogon sibiricus</i>	

This material was received on February 19, 1917.--On January 19, 1917, Mr. Meyer sent us from Peking two packages of films and prints, Nos. 13226 to 13261 and 12369 to 12387. Prints of some of these photographs are used in this report.--On January 20, 1917, Mr. Meyer transmitted a package of vegetable seeds, his Nos. 2375a to 2378a, SPI Nos. 44291 to 44294. This shipment, received on March 6, 1917, consisted of seed of two varieties of Chinese cabbage, a large winter radish, and a peculiar variety of winter leek.--Under date of January 30, 1917, Mr. Meyer wrote us regarding the shipment of a box

containing his Nos. 136b to 139b, a large pai ts'ai, a leek, four bulbs of garlic and three quinces. The pai ts'ai was badly rotted when it reached Washington and was condemned. The leek was given SPI No. 44247, the garlic, SPI 44248, and the quinces, SPI 44249. The seeds of the latter were divided between the Chico Station and Prof. Reimer.--On January 31, 1917, from Peking, Mr. Meyer wrote Mr. Fairchild as follows in answer to his letter of October 26, 1916, given on page 26 of the 1916 project report:

Concerning the true Prunus pseudocerasus. Yes, possibly there are more than one variety; the ones that we have up here are apparently of one type, that is, selected fruits are larger than the common lot, but there is only a small difference. I am making inquiries though. I sent in material from around here under Nos. 22361, 35640, 36107, and 36108. Should any still be traceable, they may be compared with the Tangsi cherry.--I see you write 'Tang-hsi', well, on the China Inland Mission map it is Tangsi, which way of spelling is to be preferred for a commercial variety of fruit.

About the true wild species, well, I have never come across it and Mr. E. H. Wilson neither, according to the description, under Prunus involu-crata (the former name). Vide Plantae Wilsonianae, Vol. I, Part II.--Dr. Henry, however, found it wild in the mountains of Hupeh. Vide Aug. Henry, Economic Botany of China. Page 49.

Where are we going to keep a collection of all forms of Prunus for breeding purposes? It is about time now for us to tackle this highly interesting group of plants.

On February 2, 1917, we wrote Mr. Meyer that Dr. Stock-berger, of the Office of Drug Plant Investigations, was anxious to get propagating material of as many kinds of

ginger as possible. Mr. Meyer wrote regarding this on March 26, 1917, from Ichang:

Letter of February 3, 1917. Re Dr. Stockberger wanting many varieties of ginger. O.K. I'll keep this in mind. In Hankow and Ichang we have no ginger. The poor rhizomes one sees for sale are said to come from Szechuan, which is a mighty big province and which is considered the California of China.

On February 3, 1917, Mr. Meyer wrote Mr. Fairchild a personal letter which, in view of subsequent events, it is perhaps suitable should be included in this report. It reads in part as follows:

Your most welcome note of Dec. 16, 1916, reached me several days ago. It comes as a token from a world distinct from the one we live here. It does seem strange that space in between people makes such a tremendous difference in feeling toward each other and eliminates the discussion of so many a subject that one would take up when nearer each other. Such feeling has, in my opinion, a great similarity with the one that exists in the minds of the living toward those who have departed.

It grieves me to hear that Mrs. Fairchild is not as well as she could be.....

My own health also is not as good as I wished it to be. The loneliness of life; the great amount of work I have to do, which I can never finish; the paralyzing effects of this never-ending horrible war; and so many another thing, these often rob me of my sleep and make me feel like being a ship adrift. Of course there must be millions of people on this poor world of ours who feel similarly and on a sensitive person all of this reflects again and again.--This new step of Germany as regards ruthless undersea warfare is filling us here with most serious apprehensions.--Had civilization reached her highest point on August 3, 1914? Let us hope not!

I often read in a lonesome hour Walt Whitman's poems; in 'Drum Taps' one lives war's terrible moods.--See how touching is his:

"Come up from the fields, Father."

Surely those who believe in an Almighty, All-good, All-wise Creator must feel themselves strongly shaken up inwardly by events as take place now hourly. Is this the way humanity must make room on this earth from time to time? And if thru wars we could only say "yes, the best of everything persists or is being made even better", but it is not.

The review in the Journal of Heredity of Madison Grant's "The Great Race Passes", awakens strange feelings in one. One breed on earth today, tomorrow another! Move on, boys!

Now a few personal jottings. Since it has become known that I am out again in China many people begin to correspond with me, especially American missionaries, and this correspondence imposes an additional burden upon one and one can not ignore it, since so many have given me of their hospitality and have often materially assisted in getting me what I was after. The looking after all of my correspondence, however, could only be settled by a Buddha with 48 arms.....

The money exchange problems here are becoming more complicated. Silver continues to rise and gold falls consequently. Where formerly one sometimes got for one American dollar \$2.40 Mex. now one receives but \$1.56. For people paid in U.S. gold, like myself for instance and the host of American missionaries, this means a considerable lessening of our incomes for so far as we have to make purchases here. For those, however, being paid in silver and who transmit their money to countries with gold standards this is a boon, also to those who purchase material in their home countries.--So here you have the correctness again of the old saying: "It is an ill wind that blows nobody good".

We have an unusually cold winter here; the ice in the canals is over a foot thick and the Chinese are busy harvesting it for their ice-houses.--On the poor it works out very hard though, and in the country I suppose quite a few people must have frozen to death. One hears so little of such cases thru the newspapers here and perhaps it is better so; there is misery enough to talk about nowadays.

Within a few days I hope to go into the interior and then a rougher sort of life will be mine again.

On February 6, 1917, we wrote Mr. Meyer that Mr. F. W. Wight of our Bureau was particularly interested in the genus *Ribes* and wanted material of any interesting species which he might find in his explorations, but particularly *R. manshuricum*.

Mr. Meyer wrote regarding this from Ichang on March 26, 1917:

Letter of February 6, 1917. Concerning Mr. W. F. Wight wanting species of *Ribes*. All right. I have not got my inventory notes with me, so I cannot look up what numbers I have used in sending *Ribes* material previously. Fotos Nos. 5928 and 13149 show *Ribes macrocalyx* and *R. alpestre* var. *giganteum*. Mr. Wight might be interested to have a look at them. Of both species I also sent seeds.

On February 6, 1917, from Peking, Mr. Meyer advised us of the despatch of a small parcel containing seeds of Nos. 2379a to 2382a. No. 2379a was seed of pai ts'ai and was given SPI No. 44312. The three remaining numbers were leek seed, recorded under SPI Nos. 44313 to 44315. The closing paragraph of this letter reads:

I just received your letter of Dec. 29, 1916, in which you ask me to let you know what time I expect to be in Manila. Well, I thought about early May, but -- with the world as it is today no one can say for sure. I'll write Mr. Merrill right away and will try to keep in touch with him. Perhaps we may meet somewhere in So. China.

Mr. Meyer's next letter, dated February 8, 1917, in Peking, reads in part as follows:

Now I'll answer some letters from you that have been coming in of late.

Letter of Nov. 16, 1916. These matters are all more or less settled now. Did the flowering cherries arrive already from Tokyo?

Letter of Nov. 21, 1916. About Prof. Reimer wanting pear seeds before February. - Yes, he told me about this and I said I would try, tho' I could not tell him for sure that I would be able to get them.

The jujubes you speak about, harvested at Chico, reached me all right. They taste well, having more flavor than the larger ones we have here in China. I gave some to other people to sample and some to a few children and everyone liked them. So the jujube has come already into its own. This lye treatment may possibly displace the slicing with little knives. This would surely save us lots of labor.

I surely am interested in Mr. Popenoe's discoveries of new sub-tropical fruits. I wonder how far north this large-fruited hawthorn will be able to thrive! I see your note about discovering new parasites possibly; well, the fewer the better!

Letter of Dec. 22, 1916. It would be fierce if somebody should find something in these seeds of Pinus bungeana and burn them up. I certainly hope that this idea "kill and burn" is not going to obsess our pathologists. If so, you cannot count any longer on me staying in the Service!

I have not seen as yet any disease on this white-barked pine, but will try to inspect some groves before I go South. If only these Inspectors, with their often very limited knowledge of plants and of localities, will remember that the white-barked pine has 3 needles in one socket and not 5, like Pinus strobus; it therefore belongs into a totally different class of pines!

As regards shipping all material to Washington first, for inspection; well, we all know what that means! Much of my stuff will have to be carried across the continent two times.--I really thought that in a place like San Francisco there would be opportunities for thorough examination. I am very sorry to see that I am mistaken in this.

I see your remarks about small fotos. Is no enlargement possible for fotos of interest, like it used to be? I cannot quite understand this total change of front. When I left you said that small fotos could be enlarged, provided they had been given time exposure, and now it seems as if even such have no value any longer. - As regards

Wilson Popenoe capturing the field and appearing exclusively in Plant Immigrants, well, why not give the poor boy a chance also to become a celebrity? The Government will be very grateful to him when he gets older! -----

Letter of Dec. 23, 1916, with clipping re fearful destruction in white pine forests by Blister Rust. Strange! Why does insane nature tear down with one hand, what has taken her so much pain to build up with the other? Purposeless, apparently!

Letter of Dec. 29, 1916. I wonder what sort of material the Federal Horticultural Board will allow us to send in the future. One may do such a thing as throwing the baby out, together with the wash-water.

I am glad you will try to get the Corvallis Agricultural Expt. Station a collection of hazelnuts for their work. That whole section of N. W. Oregon and S. W. Washington seems to suit these fellows.

Letter of Jan. 3, 1917. Re Mr. Wilson leaving unexpectedly; yes, I suppose he is off for Formosa, Korea and some minor islands so as to link up the Chinese and Japanese floras. This was one of his ambitions. He surely deserves all success in this most interesting piece of work. I'll try to get in contact with him.

.....
Well, this is the last of the lot and I am thru with answering all of your messages. I do not get Plant Immigrants any longer, I wonder why? The last one I received is No. 119 dated March, 1916. Dr. G. E. Morrison of this city expressed his desire to receive such copies where-in Chinese plants are being pictured or described; he probably will write you about it. He has the biggest library in the world on Chinese matters.

I made an arrangement with Mr. Jay C. Huston, Student-Interpreter at the American Legation, to collect for us in the Shing Lung Shan region, this coming fall, from 50 to 100 lbs. of clean seeds of the wild Pyrus ussuriensis, the cost to be about two silver dollars p. pound or p. catty or somewhat more. His intentions are to be there in September and that is the right season to get large quantities of seeds for so far not most of the trees have been cut already. I possibly also may be up

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North again this fall, but I hope Mr. Huston will be also to do this work for us. He is an ex-student of the University of California, has been in the Forestry Service for a term, and is serious, yet enthusiastic. I have told him how to pack and ship, via Diplomatic Pouch, and I hope he will make it a good job.

I suppose I'll be able at last to break up here and go further south, tho' I have so many small things to do that it seems as if one could never leave.

Since the 16 cases with seeds have left Kobe however, I am once more a freer man.

(Sixteen varieties of flowering cherries were received from the Yokohama Nursery Company on March 13, 1917. The material reached us in fairly good condition and has been grafted on stock at Yarrow.) The next day, February 9, 1917, Mr. Meyer wrote as follows to Mr. Bisset:

o See p.
20, 1916
project
report.

These last times I have been sending off large quantities of seeds of walnuts, chestnuts, jujubes, davidiana peaches, etc. In a letter to me from Mr. Fairchild, dated Dec. 22, 1916^o, serious suggestions occur that the Federal Horticultural Board may possibly discover dangerous fungous diseases in these seeds and destroy them. Should this happen, you as well as I know that our work will from then on assume new forms. For my part it will consist in the collecting of some small samples and of herbarium material and our stations will slowly be reduced in size and in staffs for lack of sufficient material. I personally also will send in an application for resignation and allow a botanical collector to take my place. (Vide my letter to Mr. Fairchild, dated February 8, 1917.)

However, should matters be somewhat easier, I am willing to try to collect more seeds this summer and fall and I would appreciate an early memorandum from you, like the one of February 23, 1916, concerning seeds that are wanted in quantity.

Mr. Bisset replied to this letter on March 26, 1917, as follows:

I am in receipt of your letter of February 9 in which you refer to the walnuts, chestnuts, jujubes, and davidiana peaches that you have been forwarding to us. We had your shipments stopped at San Francisco, inspected by Mr. Maskew's force, and then sent to Chico. This saved the long trip across the continent and enabled us to get the seeds into the ground sooner.

Mr. Dorsett has already written you in regard to the chestnuts and other seeds we requested and, therefore, I will not attempt to do so. I am sorry to have to say, however, that a lot of your material has reached us in very poor condition, due, I suppose, to the length of time they have been delayed in China, and, it seems to me, you have been using a little more water in the packing than formerly; as the scions have shown signs of decay and a number of them were entirely dead, as has been previously explained to you. I am happy to be able to tell you, however, that as far as the Federal Horticultural Board is concerned, they are very much more lenient with material that is reaching us and if there is any life in the plants or scions when received we are almost sure to get them to grow. A lot of your material which comes in in a weakened condition is not fumigated or treated, but is put in a quarantine greenhouse where we are saving quite a lot of it. We have another greenhouse known as the detention greenhouse, where material can be held, which is ordered held because of suspicion. Go ahead, therefore, and collect all that you can, and put your mind at rest as far as the inspection of the material is concerned. I know that you do not wish to be responsible for introducing into this country new plant insects or diseases any more than I do, and it is only to try to keep such things out, that the inspectors are as rigid as they are. With all of this inspection, as stated above, we are saving quite a lot of your material and, therefore, I strongly urge that you do not get discouraged but reassure yourself with the knowledge that we here at Washington are looking after the material as it reaches us and doing everything we can to save as much of it as it is humanly possible to do. I am looking forward to the time when you will return and see thousands of young plants that are being grown from seeds that you have collected in China.

Doctor Galloway and I, while at Chico last fall, had the pleasure of looking over several thousand young plants of the Pinus bungii, seed

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of which had come to the office before you left for China. These plants, we hope, will be ready for distribution next spring, and will go to all corners of our country, where there is a chance for them to grow.

It would take too long a letter for me to tell you of our distributions of all of the plants that you collected on your last trip, but I might mention the Ulmus pumila of which we have distributed this year 17,234 plants. The people, especially in the Northern Great Plains region and in other arid states, have begun to ask for these plants in quantity. Nearly everyone wants to get at least from 12 to 100 plants, and of course, we are rather favoring those who are in our great dryland region. The fame of Ulmus pumila has even got across the border into Canada and we have had, within the last 2 or 3 days, requests from two Canadians for these plants, which, I am glad to say, we have been able to fill.

I hope you will put away all thought of resigning your position and stay by it until you finish your trip; and should you go back again I hope that you and Mr. Fairchild will find a good young man who will be able to accompany you, so that you can break him in before you finally withdraw from this exploration work.

As to what seeds we are specially interested in, I would mention the following:

First, Pistacia chinensis. This tree has made a wonderful record for itself and we would like to have several hundred pounds of the seed so that we can make a wide distribution of this tree.

We are also hearing a lot about Eucomia ulmoides and should you be able to get some seeds of this tree we would like to have it. I think you will be interested in the following extract from a letter received from Mr. J. W. Riggs, of the Kansas Experiment Station, relative to Eucomia ulmoides:

Of all the deciduous trees on my grounds this beautiful, rapid-growing Eucomia draws, even from the casual observers, the greatest attention. Its very dark, rich green foliage is fine. A travelling friend of mine who is well acquainted with this tree says it is much more beautiful here than in its native habitat.

You should get for us quite a lot of Ulmus pumila. You were somewhat surprised when I asked you to collect 25 pounds of this seed during your last trip, but I feel like asking you to collect 50 pounds on this trip. Certainly send us as much as you can for we have lots of requests for it and will be able to distribute trees by the thousand, where they are much needed. Then, Mr. Dorsett has mentioned to you in his letter that you should make a special effort to get the large Chinese peach. Many of our cooperators have been badly disappointed at our inability to supply them with propagating material of this peach and I would strongly urge you to make a strenuous attempt to get budwood for us.

The next thing would be to get seeds of any of the wild pear forms, or wild forms of any of our cultivated fruits for the stock problem is beginning to be a very interesting one and one that we believe will demand a great deal of attention within the next few years. Professor Reimer, with his work on Pyrus ussuriensis, has brought forcibly to the attention of our growers the fact that they may find wild stocks for our cultivated fruits superior to the forms that we are now using. We need a better stock for plums and cherries than we now have. There is also quite a demand at the present time for hardy English walnuts, and, in fact, for nut trees of all sorts. We would, therefore, strongly urge you also to be on the lookout for anything along these lines, or, in fact, anything that will help reduce the cost of living for our people.

With kindest regards from all, and hoping that this letter will find you in the best of health, I remain.

Mr. Meyer's answer to this letter was dated June 23, 1917, at Hankow, and reads as follows:

Your letter of March 26, 1917, reached me here a few weeks ago and I am glad to get your hopeful viewpoints concerning plant inspection and plant quarantine. A fellow out here gets out of contact with home-doings and when he receives letters from his own Chief, that the large quantities of seeds he has sent may all have to be burned, he at times thinks it is better to accept another position where one gets more satisfaction out of one's work.

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It is very pleasing to hear that Ulmus pumila increases in popularity and that Pistacia chinensis turns out to be such a desirable tree, notwithstanding a few cases of skin irritation caused by it in Georgia. Maybe I can get hold of one thousand lbs. of seed this fall.

That Eucommia ulmoides is hardy even in central Kansas comes as a genuine surprise to me. I'll see whether I can get more seeds this fall. Could you perhaps tell me who this travelling friend of Mr. J. W. Riggs' is, who has seen this hardy caoutchouc tree in its native habitat? Could it be Mr. E. H. Wilson. If not, could not this gentleman send you a few lbs. of seeds? Please ask Mr. Riggs about this traveller who must be a man who has been much about in China, for Eucommia is far from common here.

Getting better stocks for plums and cherries; yes, that is some problem! For what sections of the United States do you want them? There are many forms of Prunus and Cerasus in Western China, also in Manchuria and Japan; to get seeds, however, in quantity, that is the great question. It is not always easy to find a thing like the dauidiana peach, which happens to be fairly common in and around Peking. Have you tried Prunus mume or P. triloba as stocks for plums and P. lannesiana for cherries? These three might be gotten in quantities from Japan, when special requests are made for them. We surely ought to try to have collections of various species of Prunus, Amygdalus, and Cerasus at our stations, so that we could experiment in a small way on these stock problems.

If anything comes up in the matter of needing material from China, please make the habit of dropping such notes into a special envelope on your desk and you may send them up to me once or twice a year.

On February 9, 1917, Mr. Meyer answered Mr. Stuntz' letter of November 11, 1916, (see p. 27 of the 1916 project report) regarding the Zizania latifolia desired by Mr. Chambliss. The four plants which Mr. Meyer sent in under his No. 1261 reached us on January 3, 1917. They were given SPI No. 44069 and were ordered grown in quarantine. The plants were delivered

to Mr. Chambliss on April 19, 1917. Mr. Meyer wrote regarding them:

For interesting information please call Mr. Chambliss' attention to Dr. Hance's article in the Journal of Botany for 1872, of which article I possess a photostat copy, sent to me in a letter by Mr. Fairchild, dated Oct. 30, 1914.

On February 10, 1917, from Peking, Mr. Meyer addressed the following letter to Mr. Fairchild:

This morning Dr. Reinsch, our Minister, wanted to see me and we had a long talk about Chinese agricultural problems. The Doctor was especially anxious to know what my ideas were as regards publishing a book on Chinese agriculture. I said that, with my present rough field work I could not do much in that line, for I could not even finish the work I am engaged in now, not to speak of writing a book; then as the matter I had written already was not considered to be complete enough by various specialists in our Department, it would be far from easy a task to fulfill. Dr. Reinsch, however, said that even if incomplete, for the Chinese and for the foreigners dwelling here the book would be of inestimable value. He asked me whether as assistant would relieve me of some work; yes, I stated, most decidedly; that is, if he is a capable man. Well, Dr. Reinsch said that he believed at the University of Wisconsin there are some men who would be fit to do this exploration work, and he would write about it. So if you should get applications, you know now how these things have come about. It surely would be a good thing to break in into this work one or two young men, who want to make it their life's aim. I could give them many points and a start and later on allow them to shift for themselves.

How long I myself will be able to travel about in China yet, I do not know, but it seems that I may return sooner than I expected, perhaps in 1918. The loneliness and the hardships of life here are beginning to be more and more distasteful to me and the time is approaching that I'll have to leave further exploration of

China in the hands of younger men. How would Wilson Popenoe like to explore Southern China? He loves the warmer parts of the globe and might possibly do some excellent work in So. Asia. Another fellow, who likes temperate climates better, could take Central, Western and Northern China.

Well, I hope you will consider these thoughts, expressed here with all seriousness and I expect to hear your well-considered opinion about it.

Mr. Fairchild was away from the office when this letter arrived (March 20, 1917), but the following reference is made to it in a letter Mr. Dorsett wrote Mr. Meyer on March 26, 1917:

Replying to your letter of February 10, 1917, we have not as yet received any correspondence whatever from Dr. Reinsch, our Minister at Peking, regarding your visit to him or from any one at the University of Wisconsin, regarding agricultural exploration work.

I note what you have written regarding your present work and how you are feeling regarding it and the possibility of your returning in 1918. All I can say just now is: Don't do it.

In a letter written in Peking on February 12, 1917, the following paragraph occurs:

I am sending tomorrow morning, via Diplomatic Pouch, one small tin case, well soldered up and containing 33 small squares of old bean cheese. It is numbered XXV and the sample bears No. 144b. Mr. Morse again may be the right man to give it to. The quality is not as fine as that of sample 125b, but, still, it is passable. There must be several kinds of this soft cheese here in this land and I'll be on the lookout for them when traveling about. My interpreter informs me that in summer time one has to keep this cheese perpetually under a layer of sesame oil, otherwise maggots get in and eat it all up.

This tin of cheese was received on March 22, 1917, and acknowledged by Mr. Dorsett in his letter of March 26, 1917. It was held for Mr. Fairchild, who mentions it as follows in his letter of July 5, 1917, to Mr. Meyer:

With regard to your bean cheese, it still keeps and every once in a while is served. We had the package opened up and divided into small bottles, and these are stored in the ice chest. Menderson is using some of the cheese to inoculate his bean cheeses with.

In his letter of September 8, 1917, Mr. Meyer commented as follows on the above:

I am quite pleased to hear in your letter of July 5, 1917, that my soy bean-cheese samples have really created so much interest. Mr. Menderson wrote me a long letter on this problem; I cannot give him, however, much more information than what I wrote in my report to Mr. Morse and on the photos. -- Beancurd and bean-milk always taste beany!-- The cheese, however, has lost this unpleasant characteristic. If soft beancurd is beaten up with sugar, it also improves much in flavor.

On February 22, 1917, from Peking, Mr. Meyer wrote transmitting one small package, marked XXVI, containing seeds bearing Nos. 2383a and 2384a, Amaranthus spp. These were received on April 14, 1917, and given SPI Nos. 44566 and 44567. These were divided between Mr. W. E. Safford, of this Bureau, and Prof. I. D. Cardiff, Director of the Agricultural Experiment Station, Pullman, Wash. Mr. Meyer's letter of February 22, 1917, continues:

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I may leave tomorrow for Taianfu, Shantung, then to Feitcheng for peach scions, and then down to the Yangtze, to locate spots where Pyrus calleryana occurs in sufficient quantities to make arrangements with the natives to collect seeds for us this fall.--Then to Canton, Hongkong, and Manila and then slowly thru Kwantung and Fukien Provinces. The political outlook of the world is decidedly bad and in how far I can adhere to plans nobody can foretell.

I have stored my non-wanted rough baggage with the Legation and have about 15 pieces to carry along with me. This baggage problem is a curse here in this country!

Well, I will let you know from time to time how the journey progresses.

On February 26, 1917, we asked Mr. Meyer if it would be possible for him to have a few pounds of seed collected from the Ulmus pumila trees growing in the Temple courtyard at Peking. These were wanted by Mr. D. B. Gurney, of the Gurney Seed and Nursery Company, Yankton, S. D. Mr. Meyer sent six pounds of this seed, which reached us July 24, 1917. It was given SPI No. 45025 and half was sent to Mr. Gurney and the remainder divided between the Yarrow and Chico Stations on August 15, 1917. The Chico Station reported on May 6, 1918, that the seed of this introduction sent them did not germinate.

On March 1, 1917, at Taianfu, Shantung, China, Mr. Meyer wrote transmitting two packages of scions of the authentic large "Fei tao" or Feicheng peach, obtained through the assistance of the local magistrate at Feicheng. He also sent a package to Mr. Beagles direct. To our great

regret all three lots of this peach reached us dead, owing, we believe, to their having been packed in moss which was too wet. Mr. Dorsett wrote Mr. Meyer on June 2, 1917, asking him to secure more material of this peach, if possible. In this letter of March 1, 1917, Mr. Meyer also wrote:

Tomorrow morning we hope to leave for Hsuehowfu (Anhwei) by train, from there again by rail to Chengchow (Honan) where we can catch the train to Hankow and from there on to Ichang.

The weather is very cold here, heavy frosts every night and ponds have still heavy coatings of ice. In the absence of sufficient fuel here in Shantung we find the inns extremely uncomfortable and the more so since we expected it to be warmer here.

On March 12, 1917, we wrote Mr. Meyer that the forest pathologists of the Bureau were very anxious to secure seeds or plants of Pinus armandi for use in their investigations of the white pine blister rust, and asking him to arrange, if possible, to send us five or six plants of this species or a small quantity of seed. We wrote again on May 10, 1917, asking Mr. Meyer to be on the lookout for this white pine blister rust and, if he found it, to send in fresh material for the investigations of the Office of Forest Pathology. We enclosed a few leaves of Ribes showing the two stages of the disease on the host and a colored plate of specimens of diseased pines. On June 14, 1917, from Hankow, Mr. Meyer wrote:

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I sent in seeds of Pinus armandi several years ago from Shensi; I wonder whether they germinated? Professor Sargent or some nurserymen, like Farquhar possibly, can perhaps supply these pathologists. Otherwise they will have to graft a few branches from this 5-needle pine upon P. strabus or on P. pentaphylla. Old Jackson Dawson, if he were alive, could tell us whether it can be done or not.--Should I come this summer in the Fang district of Hupeh, I'll try to collect fresh seeds of the Armand pine.

On March 13, 1917, we advised Mr. Meyer that Mr. Beagles had written us on February 23, 1917, of the receipt at Chico of six cases containing Meyer's Nos. 2323a to 2327a. This material was as follows:

2323a,	SPI No. 43796,	Pinus bungeana,
2324a,	SPI No. 44197,	Castanea mollissima,
2325a,	SPI No. 44198,	" "
2326a,	SPI No. 44199,	Juglans regia,
2327a,	SPI No. 44200,	" "

Nos. 44197 and 44198 reached Chico in such a badly overheated condition that Mr. Beagles thought he would not get much out of them in the way of germination.--Mr. Meyer sent us the following very interesting letter from Ichang, China, under date of March 23, 1917:

Since a few days I have been here in Ichang and vicinity working upon the Pyrus calleryana problem, that is, we are trying to get a responsible party who is willing to contract for the collecting of a hundred cattles of clean seeds of this wild pear, during the coming late summer and early fall. Up till the present time we have not found the right man as yet, but -- we may! The trouble with this calleryana pear is, that, altho' not rare in the hills around here, the trees are very widely scattered, they are often quite small and as such produce individually but little fruit; then the nature of the country is quite rugged and the collecting

of as large a quantity as 100 catties means many weeks of toilsome work and then last not least, the natives eat these little, pea-sized pears as early as in June, when they are full grown but still green and as they are too acrid to be eaten raw, they are boiled. It is said they persist on the trees until October, but they are ripe in September. The local name for this pear is Tang li and they are sparingly used as stocks for improved varieties of pears, tho' this region here is not a pear-section.

There are some strange types of Citrus fruits here, big warty things, of orange-red color; most of them are too sour and bitter to be eaten, but the Chinese use them as ornaments, like ornamental squashes and the rind is used medicinally and as a flavoring material for spirits.

Mr. Edward Gilchrist, a native of Boston, Commissioner of Customs here, told me that he had forwarded types of citrus fruits to Mr. Swingle; he is, however, unable to obtain a few hundred pounds of Pistacia chinensis seeds which Mr. Swingle also wants, as this tree is not common enough here to collect seeds in quantity. Should you see Mr. Swingle kindly communicate this to him.

We have been very unfortunate with the weather ever since we left Peking; in Shantung we had cold, dusty winds; in North Kiangsu (Hsuchowfu) overcast, dusty weather and in Hankow rain practically all the time. From Hankow by boat to here took 4 days and 3 nights, for the water in the Yangtze is low and on account of the many sandbanks the steamers stop during the night; we had rain about every day and here also the weather is dull almost every day. Bad of course to take fotos. In Hsuchowfu we had been in hopes of getting some fine varieties of jujubes and of haws (Crataegus pinnatifida) as the town is famous for these products; upon inquiry, however, we found that the jujubes they manufacture into "Mitsao" come from Honan and the haw fruits come from Taianfu, Shantung. For some reason or another this town formerly had cheaper sugar than other places and they found it profitable to import fruits from other provinces and to manufacture sweetmeats from them.

We took a newly built R.R. from Hsuchowfu, Kiangsu, to Kaifengfu, Honan, which is not on maps yet and from the car windows I saw plantations of a new shrub, which I recognized as a Pueraria. Upon inquiries we were told that the flowers are eaten as

a delicacy fried in flour and oil. The plant looks like a non-climbing form of the kudzu vine. It is called "Ko hua". That is the worst about going on trains and boats, one cannot go up to things one passes en route and some things one never sees again.

I am now on "Terra Sancta" here as regards plant localities are concerned. Dr. Henry and Mr. Wilson had Ichang as headquarters for many years and when one sees Primula obconica and P. sinensis as wild roadside plants, one gets a sort of feeling like a Christian who wanders thru Palestine or a Mohammedan when he sees Mecca and Medina. Just now we got a lovely wild plant in full bloom, Daphne genkwa, its purple-blue thyrses are seen all over the hillslopes and in banks. This really is a gorgeous spring flower and of such a striking color!

They had a very severe winter here; many bamboos are entirely brown; tangerines lost all their leaves, so did Nandina domestica and tender succulent plants, such as Musas, Cannas, some Cactae, etc., were very hard hit.

My interpreter from Peking is picking up the dialect here and is getting more useful; a guide I have engaged in Hankow and who pretended to know all about the country turns out to be a rather bad specimen and needs lots of training to become of real use. We may find some of the men Dr. Henry and Mr. Wilson employed, but these men have flown to all sides of the compass and they are hard to locate.

I just think of Prof. Reimer and his idea of getting a hundred pounds of seeds of a wild pear straight away here in Ichang. I wish I could bring him here and have him size up the situation. It may take a white man a few months to bring together a hundred pounds of seeds. When a Commissioner of Customs cannot even do this, a man who has so much standing with the natives, what can an ordinary mortal do?

Well, I am also busy in getting details about Chinese bean-cheese making; it is getting to be a very interesting process in which fungi and personal experiences play their parts. I do not know as yet enough about it to be able to write it all down.

Under date of March 25, 1917, from Brooksville, Fla., Mr.

Fairchild wrote Mr. Meyer the following letter:

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Dear Friend Meyer:

I am here in the quiet little laboratory just beside the bamboo plantation upon which you and I have spent so much thought and about which we have talked so many miles of sentences and I sit down in the sunset to tell you of the ghastly discovery which I have just made and which will make you almost shed tears, I think.

In looking for a scale insect which Mr. Morrison found here last month and which is scattered over the plantation somewhat but is doing little injury, I found signs of ill health which made me unlimber my microscope and sit down to the task of unravelling the mystery of why our bamboos have done so poorly here all these years.

This is what I found. If you pull apart the leaves so that the leaf sheaths are all exposed. You can do this by successively pulling on the leaves (leaflets) from the bottom upwards, i.e., beginning lower down in a botanical sense and working towards the tip of the leaf you will find in about 60 per cent of the cases that the inner leaf sheaths are covered with a very small orange colored mite which is so tiny that it is hard to see with the naked eye. These mites cover the surface and at this time are working to beat the band and the result is that the leaves instead of having a lot of leaflets have only a few, for the terminal ones do not come to maturity at all and the other leaflets turn a rusty color and even turn yellow and fall to the ground.

Now this mite is everywhere scattered all over the plantation and it is doing a lot of harm, I think, although I find it now on leaves which to all appearances are perfectly healthy. Unless you tear the leaves apart you would never suspect their presence and this is the reason I think why during all these years we have none of us found it.

The F.H.B. inspectors when they were here never found it at all and they inspected thousands of plants to be sent out in the distribution.

Now the question is this. Does the disease or rather the beast exist over there in China or is it one of those miserable things that has crept in on our plantation here in Florida coming from the wild species of bamboo-- the so-called switch canes which occur everywhere in the low lands. So far as I know the thing is new but it may be old to the entomologists for all that.

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Now, what is the thing to do, I am wondering. I think I will thin out the whole plantation, have Morrow buy several carloads of stable manure, and scatter it around in the grove before the rains come on, which will soak the food material from the manure into the ground. You know I have always contended that the bamboos were starved. I still think so.

I see I have not made it clear that the tender light-green leaf-sheaths turn a brownish color which later becomes almost black and over this blackened area which is sometimes an inch or so long you will find under a hand lens thousands of the pinkish-orange mites. I wish you would look for this rascal wherever you go in China and let me know if it is there and how much damage it causes to the groves.

Isn't it disgusting to have a thing like this come on the grove after all that we have done for it?

Now I have another bit of news which I must ask you to keep in confidence until you hear from other sources that it is true. Do you remember wanting to go to Formosa? And do you recollect that your reason for wanting to go was in order that you might look for the citrus canker on the native Zantoxylum species that occur there? Well, the man at the Citrus Canker Laboratory at Homestead, a Mr. Jehle, has produced the canker on the native Zantoxylum fragara by inoculating it with the bacteria from grapefruit leaves. He has gone further and discovered the same kind of cankers as those produced artificially on Zantoxylum fragara in considerable numbers scattered over the Zantoxylum fragara plants growing wild in the Royal Palm Hammock below Homestead and in another hammock near there. Now, the canker was first found in the region where this wild Zantoxylum occurs so that the case looks very suspicious to say the least. Of course to make the thing certain it will be necessary for Jehle to inoculate the organism which he has already isolated from the cankers of the wild Zantoxylum onto the grapefruit and get the disease there. Until he does this the case is not definitely decided and he would rather we said nothing about it.

I have spent several weeks in Miami this spring. I was there through the great freeze which scorched the gardens as though a fire had swept over them. Nearly everything turned grey or brown and a good many things were killed back to the ground. The temperature went to 26.5 F. for an hour or so,

February 3d, and in the northern part of the State it crept down to 13 F., killing citrus trees to the ground.

I made a herbarium of the frosted leaves and it is the first time I believe that such a thing has been done. The difference in the behavior of the different species was amazing. Things which we thought were killed outright have sprouted again and are as fresh and vigorous as though no freeze occurred. Others, like the litchi, which I even photographed because I thought it had come through uninjured, except for the young growth which was killed back, when I came to cut into the bark I found had gone down to the ground and a young sprout just above the surface of the ground was starting up. It is too bad but the litchi seems to be a tender plant in Florida. I don't know yet whether Taylor's litchi lived through or not, but I imagine it did not.

The jaboticaba is a hardy thing and was uninjured. The Mexican avocado was unhurt and the Guatemalan was much hardier than the West Indian, although it was scorched pretty badly and lost some of its leaves, whereas the West Indian such as the Trapp lost all its leaves and had to be cut back to 3 inch wood in many cases.

The mangos were of course cut badly but they will all recover and some of them will have fruit on them this year although the Sandershaw which was in bloom was cut back to 4 inch wood or even worse. Some time I will show you the oil paintings which I had made of the gardens after the freeze.

It is late, my dear Meyer, and the newspaper says that we are going to have real war with Germany, horrible as it seems to us all, and this may be the last letter written to you before we rush into the horrible flames of this world's conflict.

The frogs are croaking in the swamps about here and the occasional mosquitoes are humming and it is quiet here and I wish you were with us instead of way out there in China but life is that strange thing which none of us understand and so we drift along in its stream and try our best to keep our heads above water and so it goes.

If conditions stop your work you will of course cable me and we will arrange for your return to America. I hope they will allow you to go on exploring for we have only one life to live and we

want to spend it enriching our own country with the plants of the world which produce good things to eat and to look at.

Of course the funds which we have been given this year for our work may be reduced to such an extent that we will have to retrench and then I will notify you of any change in our plans. At the present time nothing of this kind has been suggested and I think they may let us go ahead with our work.

Good-night, my dear Meyer, and may the spirit of goodness watch over you through the coming months which look so full of uncertainty.

I shall be back in Washington in a few days but I wanted to have this quiet chat with you before the rush of new things overwhelmed me there in Washington.

Mr. Meyer wrote again from Ichang, China, on March 26, 1917, part of which letter reads as follows:

Dear Mr. Dorsett:

Several letters from you have come into my possession of late and I'll answer them herewith.

Letter of Jan. 10, 1917. I see your remarks re getting seeds of Pyrus ussuriensis. Well, I hope the small quantity I have sent has been received lately. It certainly is no small job to get seeds in quantity of wild plants; without a competent interpreter who knows humanity, it is almost an impossibility. We are now at the Pyrus calleryana problem and are up against some difficulties. One fruit shop will take the contract to collect 100 cattles of seeds at \$4.00 per catty, but they want \$200.00 in advance and can not promise that they actually will be able to get hold of as much as 100 cattles. I am not sure that the deal will be thoroughly sound!

I am first going out on a few weeks' trip, investigating localities where these wild pears occur in greater quantities than here, after that we will draw up a binding contract.

I sure am glad to notice that our Office has obtained additional funds; we are growing to be some institution! Whenever Chico gets her allotment of more land, please let me know.

Re citrus canker! Yes, we may see the time

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that an employee will be discharged from the service when he confesses he has handled an orange that hadn't a big blue Government stamp on it, showing it was pronounced free from cancer-spores by a well-paid Federal inspector. Ye Gods, beware of Doctors! I am glad you all will try to save as much as possible of my introductions. You know of course, what stand I have taken upon this whole problem, that is, for so far as my own personal work is concerned.

.....

On April 11, 1917, Mr. Fairchild wrote Mr. Meyer the following letter:

Mr. Cordley was just in here, and I have just received a letter from Mr. Reimer. They are both very much disappointed that you did not secure a large quantity of seed of Pyrus ussuriensis, and I think they cannot avoid the impression that, if you had been able to get in there earlier, you would have secured them. Mr. Reimer wants very much indeed to go over and see for himself what the different species of Pyrus look like in China and Japan. Personally, I think he should be allowed to go, and I am sure that if arrangements are made next summer for him to spend several months over there, you will do all you can to assist him to see these different species of Pyrus and study them with a view to the resistance they may have to the pear blight.

We are in the midst of preparations for the great war and none of us know exactly what we are getting into nor how long it will last, but the general consensus of opinion is that it is likely to last for some time yet. I think the thing to do is to keep cool and make no rash jumps and do what we can to bring the war to a speedy close. Everybody here is busy trying to increase the food production of this country, and any suggestions which you can make from your store of knowledge of how the Chinese produce large quantities of green vegetables from small areas of land will be very welcome indeed. A careful study of typical small farms in China would be very interesting to our large land owners, although the differences in the price of labor make them only partially comparable.

Trusting that your health has improved

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and that you are not contemplating any rash moves, I remain, with kindest regards.

P. S. Remember, Meyer, that you are a very valuable man to America just now. If a commission is sent to Siberia it might be advisable for you to assist it. Nothing is definite yet.

Mr. Fairchild wrote again on April 11, 1917:

I am enclosing herewith a copy of a letter, dated January 8, received from Mr. G. Weidman Groff, of the Canton Christian College, Canton, China, during my absence in Florida. I have not been able to find out as yet whether Mr. Groff is coming to this country this spring or not. I surmise that he is, however, in which case I will talk the whole situation over with him, if he can get down to Washington. It strikes me that there is something feasible in his proposal to place a Chinese collector with you, whom you can train and whom you can leave at the College as a permanent asset. We could pay part of his salary and get in return the collections - our share, at least - which he would make. Please discuss this thoroughly with the authorities of the Canton Christian College and give me your opinion with regard to the matter. Let me know definitely how much money would be involved in such an undertaking and what you think the country would get out of it. Do not forget that the Canton Christian College is largely an American institution designed to help China.

The enclosure, Mr. Groff's letter of January 8, 1916, reads as follows:

You doubtless know that Mr. E. D. Merrill, botanist of the Bureau of Science in Manila, is cooperating with us in a thorough botanical survey of the regions near Canton. This will doubtless grow into a complete survey of South China. Mr. Merrill visited the college last fall and helped to establish the herbarium. We now have full equipment and have already collected more than 700 species. These are to be identified by Mr. Merrill of the Philippines. Mr. C. O. Levine, our representative from the Kansas State Agricultural College, whom you met last summer, is in charge of this work. He has an assistant, a native collector who is continually working in field or herbarium. Students and friends

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of the college are also greatly interested and are bringing in plants from various sections of the country.

Mr. Merrill has recently written that Mr. Frank Meyer is now in northern China and that he is planning a botanical-agricultural exploration of southern China. We trust that Mr. Meyer will make the college a center for his work. We shall be glad to cooperate in any ways which may be open to us.

Now that we have the herbarium started we feel that we should establish in connection with it an arboretum where we could grow and study many of these interesting and economic plants of South China. We now have land on which this could be done. Considerable effort has been made during the past four years to drain and improve the fertility of this land. We believe we could now bring plants in and establish them here with promise of success. We have placed on our agricultural budget for this year, under normal development, an item of \$350 gold for this purpose. The idea is approved in general but the college is unable to appropriate funds for anything except things imperative, such as staff and general expenses. If we undertake this work we should have some promise of a yearly appropriation of this amount for some years so that we shall be able to assure the conservation and continuation of the effort.

Our estimated budget for \$350.00 gold per year is as follows:

Salary of native plant collector	\$125.00
Travelling expenses	50.00
Purchase of plants	100.00
Labor and sundries on ground	75.00
	<u>\$350.00</u> gold

We have thought that you would be especially interested in this proposition and that it is an undertaking which should be begun at once in view of Mr. Meyer's botanical-agricultural explorations. For example, if we had funds in hand we should send with Mr. Meyer the native plant collector we propose to employ and train for this work. He could secure duplicates of everything Mr. Meyer gets and we could establish them here on our own campus where you could refer to them later if you so desired. Our system of classification and numbering should be such as to enable you to call on us

for information or specimens. This could be worked out while I am in America. We believe cooperation in this effort very desirable.

If your Department of Foreign Exploration would undertake to finance this work as outlined above, we shall be willing to contribute land and the time of our American staff to supervise and develop the arboretum. If it is not possible for your department to assume this responsibility you may know of someone who would be glad to make the college a gift for this particular piece of effort. It would not only be a great asset to the work in agriculture we are now doing with the students, but the results would be made fully available to your department and thus be of benefit to the United States in the work you are doing.

If this suggestion for cooperation appeals to you, or if you have any other, we shall be glad to hear from you.

If it seems desirable that we should send a man with Mr. Meyer, and there is a way for arranging finance, you can advise us direct or if necessary cable through our New York office at 156 Fifth Avenue.

On April 13, 1917, we cabled Mr. Meyer to ship immediately fifty pounds Chinese cabbage seed and one hundred pounds viable poppy seed. We wrote Mr. Meyer on April 17, 1917, explaining that this cablegram was a result of a conference with Dr. Stockberger in which he stated that, in view of a threatened shortage in opium, it seemed advisable to get a quantity of viable poppy seed and encourage the growing of opium poppies in this country. We added the request for Chinese cabbage seed in order to be able to supply the demand for this vegetable for use in backyard gardens. Mr. Fairchild also asked in his letter of April 17 that Mr. Meyer secure a considerable quantity of ginger roots for more extensive experiments in the South. On April 17, 1917, from

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Ichang, Hupeh, Mr. Meyer wrote as follows regarding the request for cabbage and opium seed:

Yesterday afternoon I received a telegram, which had been forwarded from Peking to Hankow and from there to Ichang, reading as follows:

Meyer, Amlegation, Peking. Ship immediately fifty pounds Chinese cabbage and hundred pounds viable poppy seed.

This telegram puzzles me somewhat. Firstly the demand for this seed must be very urgent, otherwise no cablegram would have been sent. Secondly, you possibly know by this date that I had left North China (Chihli and Shantung) where the best strains of pai ts'ai are raised; (I suppose you do not mean any kinds of Chinese cabbages) and thirdly, you probably know that poppy cultivation has been totally prohibited in all China and that poppy seed is absolute contraband for which farmers have been beheaded who had it in their possession. Only in the most out of the way mountainous places of Szechuan, Kansu, Yunnan and Hupeh one possibly could get hold of a few ounces here and there, but a hundred pounds! Ah! that would be something! I certainly would require very special permits to carry this seed with me thru China. You may remember that my assistant and I were nearly executed at the Kansu Shensi border in December, 1914, merely because the rowdy soldier suspected us to be opium-smugglers and the three questions done to me by the Chinese inspector were: Have you got any opium with you; have you got any poppy-heads; have you got any poppy seed? Upon answering all three questions in the negative we were released again and could proceed our way. You may imagine what would have happened if I actually had carried a hundred pounds of seed with me; enough to sow half a province again with this drug plant. I am making careful inquiries along this line, but if the Department is in a special hurry for this seed, the Government of British India could possibly furnish a certain quantity. The Russian Government might also be appealed to, since poppy-culture occurs in Russian Turkestan and in Persia.

As regards pai ts'ai seeds, I suggest that the American Consuls in Tientsin, Chefoo and Tsingtau each be asked to send a man out to collect 10 pounds or more of the best strains of cabbage. The price of seed ranges from \$3.50 to \$5.00 Mex. silver p. catty and the Consuls might be made acquainted with

this fact. I could write these Consuls myself and advance them the money, but then, I am not sure that it is the pai ts'ai you want and whether special northern strains are desired. Here in the Yangtze Valley we have loose varieties of Chinese cabbage, far different from those up North and lacking flavor and substance.

Pai ts'ai seed ripens in North China toward the end of June and is not sown until August, so there is some time yet.

I am sorry I cannot write you anything more positive this time concerning these two problems mentioned in the telegram. Perhaps later on we can get things.

Mr. Fairchild replied to this on June 7, 1917, as follows:

With regard to the poppy seed, I owe you a dinner in a Chinese restaurant or any other place you desire to name. The thought never occurred to me that you might be nabbed and put in prison for trying to buy poppy seed in China. I should have reasoned it out, but it did not occur to me that an American agricultural explorer would lay himself liable to arrest on this account. I had totally forgotten that the soldiers, when they arrested you before in the Kansu Province, accused you of being an opium smuggler. Since this is the case, you will be obliged to carry this poppy seed business in the back of your head, and unless some particularly favorable opportunity arises for you to secure a good quantity of poppy seed, you will not need to make any further attempts with regard to the matter. Doctor Stockberger thinks he can produce enough seed here this coming season to supply any possible demand which may arise.

The next letter from Mr. Meyer was his of April 16, 1917, also written at Ichang, Hupeh, China, as follows:

The day before yesterday I returned here from a sixteen days' trip into the mountains and plains of this section of the immense Hupeh Province, investigating mainly problems connected with Pyrus calleryana, Pistacia chinensis, Aleurites fordii, and some minor things.

We had changeable weather, real hot and sultry days followed by chilly, dark and windy weather and at the end of the journey for four days rain off and on. I find Hupeh a terribly

over-crowded province.

Man has become so plentiful here as to have become a nuisance, a pest. There is no room for all these people here and yet they keep on a breeding. Everywhere there are scores of children and the one has even less chance than the other. In the mountains whole villages are syphilitic; people without noses are often met with and syphilitic blindness and deafness are very common. In the inns the vermin is exceedingly plentiful and bloodthirsty and ordinary travellers have to sleep three abreast in one bedstead or on one broad bench and the stinkingly dirty bedcovers are kept in use until they fall to pieces. No wonder that 80% of the population suffers from all sorts of skin diseases, being inoculated by lice, fleas, and bedbugs. I slept most times with my hunting boots on, for the vermin bites one especially at one's feet and legs, having learned no doubt that they are less easily caught there. I think it actually is dangerous to sleep in some of these "holes" we staid in, but what else can one do? There are most times no clean open places around Chinese towns and villages to put up tents and the insatiable inquisitiveness of the natives would necessitate some watchmen around all the time.

We went with one chair with two bearers and six carrying coolies. I did not sit for one minute in the chair, but my interpreter and the guide made use of it whenever they were tired. The walking for 6 to 8 hours every day almost did me much good and I feel much better than some weeks ago.

Now as regards my observations on various things. Pyrus calleryana is simply a marvel. One finds it growing under all sorts of conditions; one time on dry, sterile mountain slopes; then again with its roots in standing water at the edge of a pond; sometimes in open pine forest, then again among scrub on blue-stone ledges in the burning sun; sometimes in low bamboo-jungle in the company of Pistacia chinensis, Vitex negundo, Cudrania triloba, Ziziphus jujuba, Ulmus parvifolia, Rosa multiflora, etc., and then again along the course of a fast flowing mountain stream or on the occasionally burned-over slope of a pebbly hill. The tree is nowhere found in groves; always as scattered specimens, and but very few large trees were seen. There are reasons for that,

namely, the natives cut down the larger specimens for their lumber, from which fine furniture is made, while if a young tree occurs at a suitable place it is most times used as a stock for an improved variety of pear.

We made a trip of three days to the N. W. from here to look at a very large specimen of a wild pear from which a large village had obtained its name (T'ang li shu ya) but the tree had become old and had been cut down 40 to 50 years already. It was said to measure something like 11 or 12 feet in circumference. The largest trunk I measured was 6 feet in circumference, but it was as a stock for an improved pear.

The name of this wild pear is everywhere around here "T'ang li", meaning "Crab-apple-pear", on account of the resemblance of its fruit to wild crab-apples (Malus baccata). There is very much variation in the trees as regards appearance, pubescence of leaves, size of fruits and of flowers, etc. Some trees present a silvery-gray appearance while others are quite green. Whether all of these strains will be equally immune to blight will be an interesting problem to solve.

This pear will be of immense value as a stock for the very greater part of the United States, but more especially so for those parts where the summers are hot and the winters only moderately cold.

As a factor in hybridization work it offers but little prospect since the fruits are ridiculously small, often only of the size of a small chokeberry. (Pyrus ussuriensis, however, offers much better promises for breeding work, that is, to obtain a hardy pear for cold regions, but as a stock it probably cannot be grown in regions where summer temperatures go high. Professor Reimer stated to me last September that the leaves of it got slightly scorched at Talent during a hot spell in July, I believe. In China, to my knowledge, I have never seen a specimen of P. ussuriensis in a real hot part of the country; it always occurs there where the real Malus baccata thrives and Juglans mandshurica, both of them plants that love relatively cool summers, just like I do myself.)

And now as regards collecting a large quantity of seeds of the wild calleryana pear, for which purpose I made this special 16 days' trip. Well, around Ichang itself there are too few trees and

they are too small; around King men, however, 4 to 5 days' march due northeast, we found many trees and I have advanced my interpreter 100 Hupeh dollars, which he has been paying out as bargain money to various parties around King men, and in the early days of September of this year the natives will try to bring to us in King men c.a. 5,000 cattles of fresh ripe fruits and we will have to arrange about prices and about cleaning methods.

So we have to be again here in early September and if not, the advance money is spent in vain and of course no seeds will be received by anybody.

The climate around King men is much more continental than in Ichang, as the cold winds from Honan strike right down there on their way into Hunan. The Rev. J. S. Johnson, of the Swedish-American Missionary Covenant, who is stationed at times in King men, told me that this winter the ice was 7 to 8 inches thick and his mandarin-orange trees had suffered very severely. In fact, one tree on an exposed place I looked at critically and gave but little hope for recovery except possibly for sprouts from near the base.

Evergreens like Ligustrum lucidum, Pittosporum tobira, Euonimus japonica, Eriobotrya japonica, and Cupressus funebris had not suffered at all. The climate struck me as being very similar to that of S. W. Louisiana and N. E. Texas. Rice, cotton and soy beans are the main summer crops, while field and green peas, broad-beans, lentils, rape, barley, wheat and various strains of Brassica are the main winter crops.

Well, this is about all about Pyrus calleryana. I may add that I took several interesting fotos and collected herbarium specimens of various types. The small quantity of dried-up fruits I found had no living seeds in them, since they had been subjected to seven months exposure to the elements since they were ripe.

If you think fit you might send Prof. Reimer extracts from this letter and show it to Dr. Galloway, Mr. Waite, and others interested in pear problems.

In another letter I'll treat the Pistacia chinensis situation.

On April 17, 1917, from Ichang, Mr. Meyer wrote reporting on pistache, wood oil, and bamboo, for which accounts see the respective project reports. He also wrote:

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I have been on the lookout for Davidia involucrata, of which you wanted seeds, but-- I did not come across a single specimen. The plant seemed to be unknown in the districts we passed through.

We also saw no mustard cultivated anywhere, tho small quantities of seeds pass through Ichang. This crop seems to be grown further west from here in eastern Szechuan.

My intentions now are to finish my correspondence here; then leave for Changsha, Hunan, by boat, to investigate special kinds of bean-cheese there; then via Hankow and Nanking to Shanghai, from where I'll send off a few sacks of seeds and specimens. Then via Foochow, Canton, and Hongkong to Manila to meet Mr. Merrill and others and see So. Chinese collections of herbarium material, and then back again to the Tangtze regions for these calleryana pear seeds, Pistacia chinensis seeds, and other material. I probably will have a hot summer to pass thru, but as yet I see no means of escape.

I suppose you received the copy of Mr. Merrill's letter under date of February 19, 1917, which is self-explanatory.

I received as usual several letters from correspondents here and there and everywhere. One Chinese student in Iowa wants me to write him how the Chinese raise pigs in his native land. I ought to write back: by their tails!

Trusting the Pacific will remain open for traffic in this most deplorable condition of the world's affairs, I remain.

On May 2, 1917, Mr. Fairchild wrote Mr. Meyer the following letter:

It is difficult to imagine just what conditions surround you, and I imagine it is more difficult even for you to imagine what changes are taking place here in America. Congress has passed the conscription bill and officers are rapidly making a census of the country, getting statements from every male citizen. A bill has been drafted and will be introduced in a day or two in the House and Senate simultaneously, which will give the Secretary of Agriculture \$25,000,000 to expend in the food campaign. You will see by the bill enclosed just what it is proposed to cover by

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this bill, and you will notice that it is a very drastic and powerful one and concentrates a tremendous amount of power in the hands of the Secretary. The general feeling in Washington and the feeling that is spreading from here throughout the country is that there is no use going into this war in a half-hearted way. It would only prolong it and might lead to a disaster, the gigantic effect of which it is impossible now to foresee. I think you can count on a united America and, when the hysteria has quieted down, you will find a degree of efficiency which will be encouraging to say the least. We have the advantage of the mistakes of the Allies and, if we can arouse the intelligent people of the country, and we have such means of doing this which the world has never dreamed of before, through our press and moving pictures, we need not make the same mistakes, at least, that they have made.

You may be able to assist very materially in this war business. As yet no plan has come through which will involve any changes in your plans, but by the time this reaches you, something may have come up on which we would need your advice or assistance. The greatest possible stress is being laid upon the most economic production and conservation of food in this country. The increase in the acreage through numerous garden patches and through encouragement and perhaps enforced enlistment of workers on the farm is being discussed. Thousands of inexperienced gardeners are trying to raise something in their back yards. If you were here, undoubtedly you would be interested in encouraging the Chinese intensive vegetable garden cultivation.

Unfortunately, the manure question is a very serious one and one which we have not fully grappled with. On the one hand we are throwing away through the sewers enormous quantities of fertilizer, and on the other hand we are cutting down through the increase in our automobile manufacture the manure supply from our animals, and the result is that it is almost impossible to get anything but commercial fertilizer in our cities, and you know what this means. The use of liquid manure, made by throwing fresh manure into barrels of water, is being considered to some extent. If you have any data on this subject, send it through to us.

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Mr. Menderson is taking up the question of summer greens for the southern vegetable growers and is concentrating on the Chinese mustards and Chinese cabbages. There is a dearth of these summer vegetables, as you perhaps remember. Now is not the time to experiment with highly problematical food crops, but with such as are of decided promise we are in a position to experiment as usual.

I cabled you the other day, asking for 100 pounds of poppy seed. After a conference with Doctor Stockberger, who has kept closely in touch with the poppy situation, I discovered that there was a threatened serious shortage in the opium supply of this country. The use of morphine in the army may become a very extensive one at any time, and the shortage in morphine would lead to a tremendous amount of unnecessary suffering. You remember, some time ago we were forbidden from investigating the poppy industry. As a result, there is a shortage of poppy seed in this country - so great a shortage that it is very doubtful whether we can do much this year in the growing of poppies for opium purposes. I realize that the poppy industry has been given a tremendous setback in China but thought it was worth while to chance a cablegram to you, in the hope that you could discover somewhere in your travels a supply of opium poppy seed of good quality.

At the same time, I thought we might as well be prepared for the big demand which there will be for Chinese cabbage. We can, of course, grow a good quantity of seed, but this takes time and costs more, perhaps, than it would cost to get the seed from China.

There is another phase of the whole question of the preservation of foods which relates to the drying of vegetables, fruits and meats. Any suggestions which you get in your travels, with regard to cheap home methods of drying fruits and vegetables, I wish you would send through to us as soon as you can. The development of the home drier or home methods is important at this time and will be, probably, for several years to come.

I presume after this reaches you I shall get a letter from you which will put me more closely in touch with the conditions which surround you. Everyone in the Office sends very best regards. We have all been deeply saddened by the sudden death

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of Miss Reynolds, whom you remember as one of the sunniest, loveliest girls in the world. She died after a brief illness and operation for appendicitis, and perhaps the saddest part of it all is that she was engaged to be married to a fine young fellow in the Interstate Commerce Commission. This is the second sudden death we have had. You remember poor Groves' death two years ago.

Mr. Meyer wrote as follows from Hankow, China, on May 22,

1917:

Yesterday morning I landed here in Hankow and found a pile of over 50 pieces of mail awaiting me, among which also several letters from you. I'll answer those later on.

Now the thing is this: I have changed my plans of travel. Instead of going further East and then to So. China and Manila, I'll first finish my correspondence here in Hankow, ship off seeds and specimens, and then go back to Ichang and from there to the North in high mountains.

The reason of this change is that in Ichang while I tried to write for a few nights and days in succession, so as to finish all of this troublesome correspondence, nature stepped in and I got an attack of nervous prostration and could not sleep, rest or eat any more. Dr. A. Graham of the Church of Scotland Mission, who was called in, considered the case as serious and I had to abstain from reading and writing and to walk as much as I could stand. Well, then I slowly improved, but writing tires me very much. Dr. Graham said that this thing was brought upon me thru over work, loneliness and worries and should I get a few more of such attacks I would have to give up this work! So here we are! The change from "roughing it" to sedentary work seems harder and harder to over-bridge as a person gets older.

If one could only get a bath from time to time while travelling in the interior and if one only could have a congenial fellow white man with one, it would not be so hard on one.

I have been thinking much about various things I have to do: getting more seeds of Pyrus ussuriensis seeds in the Shing lung shan region in early September; getting 50 lbs. of seeds of Ulmus pumila, if possible in Manchuria, in early summer;

getting 50 lbs. good pai ts'ai seeds in Chihli

and Shantung Provinces in midsummer or early fall;
getting 50 lbs. of seeds of Brassica juncea
in Peking in the fall;

getting a few authentic grafted Fei peach
trees in early winter in Feicheng, Shantung;

getting at least 100 lbs. of seeds of Pyrus
calleryana in Hupeh this early autumn;

getting a few hundred lbs. of seeds of Pistacia
chinensis in Hupeh this fall;

getting a few hundred lbs. of good nuts this
fall in Hupeh and Eastern Szechuan of Castanea mol-
lissima; Castanea henryi (which grows into a state-
ly tree) and Castanea seguinii (a Chinese chinqua-
pin);

getting seeds of Davidia involucrata in Western
Hupeh;

getting seeds of the wild Citrus ichangensis in
Western Hupeh;

meeting Mr. Merrill in Manila and study in the
herbarium there;

investigating lytchis (which freeze even in So.
Florida every so many years) and other So. fruits
and crops in Kwantung and in Fukien Provinces; train-
ing a Chinese collector for South China;

getting fresh nuts of Aesculus chinensis for
Professor Sargent;

getting 100 lbs. of opium poppy seeds in China,
for which I will need a special passport from the
President of the Chinese Republic himself and which
he in all probability will not give, since China
nominally does not tolerate any longer the culti-
vation of this drug plant.

Then Mr. Reimer wants me to meet him in Peking
in early September this year; the University of Nan-
king wants me to visit them this spring; a Chinese
millionaire land owner in Hunan wants me to advise
him re crops and problems this fall. Professors
L. H. Bailey in Shanghai and F. C. Reimer at Talent,
Ore., want full instructions how to explore in China.

My, this is only a partial list of all that
is in my mind just now. Is it strange that a man
at times gets very tired? And the more so now,
since my adopted country has seen fit to join in
with others in this monstrous world-war and we will
get our lists of wounded and killed from now on
regularly in our lopsided and mis-information-giving
daily and other papers.

Well, all of these afore-mentioned matters will
show you that I can never finish my work this year
and rather than overdo things again by going to
Manila and Southern China and then having to be
back again by Sept. 1st in Kingmen to get several
thousands of pounds of fruits of the calleryana pear
and seeds of Pistacia chinensis, I will travel

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around in the Hupeh Province and locate plants of which I later will collect seeds.

I suppose you will agree with me in these matters; "it is better to get half an egg than an empty shell" as the saying is and should I become seriously ill by overwork, people would only say: how foolish! I have spoken with many doctors and other residents here in Hankow, Wuchang, Shasi, Changsha and Ichang and all say that the Yang tze River climate is mentally depressing and often people have to move away to more bracing localities. Climate influences one more & times than one thinks!

Yes, we'll try to keep cool and with the aid of much exercise, cold baths, sedative medicines, and a decent proportion of constructive work we hope to be able to do so.

I am terribly sorry that so many of the things I shipped this fall and winter arrived in such bad condition in Washington, D. C., and even in Chico. Delays and uncongenial places, where mail pouches and freight have been kept, surely are at the base of it. With the immense reduction in sea-going vessels thru' submarine activity, any freight boat is put into commission and any empty space on such steamers is filled up; whether near engine-rooms or alongside steam-pipes, kitchens and what not. On river steamers here on the Yang tze I recently saw even the W. C.'s packed full with bags of sugar and charcoal. Prosit!

Heavens knows where these boxes with chestnuts were stored; for seeds have never been received steaming hot before, as Mr. Beagles wrote me.

The rate of silver stands still remarkably high and to some of us, who are paid in gold, this means no small official as well as personal difference. The State Department has taken this in consideration and has raised allowances to its people here in China considerably.

Well, later on I'll write about many things more in detail.

A copy of parts of this letter was sent to Prof. Reimer on June 27, 1917, who replied on July 12, 1917:

I am very sorry to learn of Mr. Meyer's nervous breakdown. I really believe that it will do him much good to have a white man with him for a few days, and I will do everything

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possible to cheer him up. I think that I understand his trouble pretty well. I do not believe that any man in this country realizes more fully than I do the great service that he has rendered American agriculture and especially American horticulture. I regard his introduction of Pyrus ussuriensis as worth many millions to our future pear industry.

Mr. Fairchild answered Mr. Meyer's letter of May 22 on June 29, 1917:

We are all much grieved to hear that you have had a nervous breakdown. We can none of us believe but that with your unusual physique you will rally from your nervousness and get back on your feet in a short time, providing you can shake off your worries with regard to things to be done, responsibilities that have come as a result of the war, etc. Your letter reaches me just in time for me to notify Mr. Reimer, and I have a hope that you can get together with him and that you will find the kind of companionship which you evidently need more than anything else. I realize to some extent what continued isolation among a people whose language you do not understand means and the nervous strain which it throws upon you. I have just made the acquaintance of two young men who have spent over a year in Belgium and the devastated regions of France, where they were continually under guard, so to speak, and could make no move without taking with them German officers. They told me that the strain became unbearable, and they show it in their faces. One young fellow has gone into the army. We had him out to our place "In the Woods" last Sunday, and he told us that the twenty-four hours spent with us were the first quiet hours he had known for over a year and a half.

Affairs here in Washington are tuning up rapidly and it is marvelous to see the way in which our industries are rallying and arranging themselves under small committees which keep in touch with government activities and direct those activities of their various cooperators and companies which have a bearing on this whole great war problem. The proposal to throw half a billion dollars into aviation has met with general approval, and it is believed that in this way the war can be most

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quickly brought to an end.

We are working on foods and food problems which have been brought up by the war conditions, and I imagine that this kind of work will increase as time goes on.

Mr. Popenoe is still in Guatemala and, I am pleased to say, has been doing excellent work there, and we now have growing a number of most valuable new avocado varieties which are the result of his explorations.

I have written you at length with regard to Reimer's trip, and I need not repeat here that we hope you will be able to assist him with your wide knowledge of conditions in China in a very effective way. His problem is a large one, as you know, and the time which he can spend over there is not very long.

Do not forget that we consider the knowledge which you have accumulated a most valuable asset. You have begun a great work, and it would be a tremendous pity not to carry it further, particularly during these strenuous times. If you get to a point where you think you should return to this country and take up quieter work, do not hesitate to let me know, and we will arrange for your return. The information which you have in your head is the most important thing now to consider, and that means, in other words, your health. Be guided by the best doctors you can get and, if anything happens which you think I can assist you in, cable me, and I will do my best.

Everyone in the Office sends hearty greetings to you and warmest sympathy.

On May 24, 1917, Mr. Fairchild wrote Mr. Meyer in part as follows:

I do not know where you are, but I presume you are at Shanghai on your way south, since you give us the above address in your letter of March 23 from Ichang.

I am sending to Mr. Reimer a copy of your remarks with regard to Pyrus calleryana. Mr. Cordley came to see me, and it has been decided that Mr. Reimer will be given an opportunity to study the Oriental pears in Japan and China. He expects to leave some time in July. While it is quite true that the stay over there will probably be too short to enable him to get very large

quantities of seed, I realize, and I am sure you do, that a man who has spent so many years working on a problem like that of Reimer's will never be satisfied until he sees for himself these wild forms growing in their native habitat and makes up his mind with regard to the botany of these different species from first hand information. For this reason and because all those who know Reimer, yourself included, have given him a good name as a thorough investigator, I am planning to put up \$500 out of our funds to assist him in carrying out this expedition, providing this is sanctioned by the Chief of the Bureau and the Secretary.

.....

On June 5, 1917, from Hankow, Mr. Meyer transmitted under separate cover sixteen films and sixteen prints, his negative Nos. 12388 to 12391 and 13262 to 13273. He wrote:

There are 14 pictures relating to Pyrus calleryana and should there be an opportunity I wish they could be shown to Dr. B. T. Galloway and Mr. M. B. Waite. I do not know your policy as regards this whole affair, but I myself think that Prof. Reimer should be asked to write an article in the "Journal of Heredity" on his discoveries and he should be allowed to use, besides his own fotos, such of mine and yours as would be most interesting. What is your opinion about it? Of course, should Mr. Reimer be on the eve of his departure for the far East, then the thing will have to be postponed.

Fotos 13272 and 13273 might be shown to Mr. Swingle and he could be asked at the same time how many pounds of seeds he wants of this Pistacia chinensis. He wrote Mr. Cunningham, our Consul-General in Hankow, to procure 200 lbs. for him. The rumor is that Mr. Swingle may be out here himself this summer; should this be so, he possibly will arrange such matters himself.

I have quite a stack of other fotos still, but not relating to Pyrus or Pistacia, tho some very interesting ones on soy-bean products, of which we are discovering every few weeks some new preparations. These pictures I'll send in hunches these coming weeks, if conditions allow, for -- China is again in the embrace of internal troubles.

Now that I am writing about the pear problems I can just as well answer a few points in

your letter of April 11, 1917.

Yes, I realize that Messrs. Cordley and Reimer were very much disappointed at I not getting any large quantity of seeds of the wild Pyrus ussuriensis. So I am myself too! Could I have left Washington, D. C., in early July I probably could have gotten quite a quantity; as it was now, with late leaving, sickness and delays, I simply was more than two months too late. I now realize that it might have been better for Prof. Reimer to have gone himself in 1916 and to have tried his own hand at this game of collecting large quantities of seeds of wild trees here in China, without having made previous arrangements. I surely hope he will come over this early fall; we have made it easy for him, since I have written about him to Mr. J. C. Huston, of the American Legation in Peking, who will collect from 50 to 100 catties of seeds of Pyrus ussuriensis for us. In how far Prof. Reimer will command these seeds I cannot say; he needs them more than we do, so I am in favor of letting him get them. I'll try to stick to the calleryana pear here, which is a much better all-around stock and out of which some nurserymen may make a handsome amount of money one of these coming years.

Prof. Reimer sent me a very pleasant letter, dated March 23, 1917, and which I answered in a 12 page message on May 24, 1917, giving him full directions. I am enclosing his letter herewith for your perusal, but I like to get it back again.

.....
 In your letter of April 11, 1917, you ask me for a few suggestions how to produce more food from the land. Well, I cannot give you much news in this line, but here are a few hints:

Conserve all night soil by modern and by primitive methods and bring it to the land.

Let the people buy large jars and pots, in which they can preserve various vegetables when they are abundant. The Dutch country people preserve in such jars various varieties of string beans, endive, white cabbage, cucumbers and purslane. The Chinese pickle all sorts of strains of Brassica and Sinapis, eggplant, young Lagenaria and Luffa fruits; garlic, chives, chili-peppers, peanuts, apricot kernels, turnips, succulent lettuce stems and what not. The Russians pickle various species of edible fungi; the Italians tomatoes and olives.

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For vegetables in winter, raise bean sprouts from mung beans and from small soy beans; these even can be produced in northern Alaska and throughout Canada.

Close up all breweries and distilleries, so as to conserve the grains for bread making.

Kill all unnecessary animals and can their meat.

Start fish ponds all over the land.

Drain swamps wherever possible.

Raise guinea pigs in the home for food.

Allow pigs, goats, chickens, etc., to be kept in city yards.

Fine housekeepers in whose waste barrels food is found.

Drive weedy races, like many Indian tribes, into other territories.

Put incurable criminals, hopelessly insane people, etc., out of the way by a painless method.

Reduce size of newspapers; prohibit the publication of society news and gossip; cut out all advertisements which are not necessary to the welfare of the human race.

Prepare for long periods of misery, something like here in China, as long as the peoples believe in yellow-journal-patriotism; in narrow nationalism; in military, naval and other glories; in the efficiency of secret diplomacy and other clap-trap like such.

However, tell people that they ought not to uproot flowers and shrubs in their front yards and plant cabbages instead; life is dreary enough anyway and when once the taste for things beautiful is on the wane, humanity will drop again in mediaeval conditions, such as 95% of the Chinese live in today.

Well, these are the things I had to say now.

The weather in the Yangtze valley is not bracing! Last week very hot and dry besides and now again rain and mists for three days and nights.

The political outlook is decidedly serious. Grave rumors are in the air. A military anarchy may be at hand within a few days. The Chinese nation is not ready yet for a republican form of government; the people lack purpose, honesty, discipline and cooperation, four cardinal principles that make or break nations as well as individuals.

Mr. Fairchild's reply, under date of July 5, 1917, reads:

I have your letter of June 5 and am very much pleased to catch a tone of cheerful optimism in it which was lacking in your last letter. I hope your health has improved and will continue to do so until you are back to your normal self again.

Thank you very much indeed for your suggestions regarding the production of food. I am asking Mr. Menderson to carry on some experiments with bean sprouts of the Mung bean and soy beans. He is now working on the production of bean cheeses from soy beans, in cooperation with Mr. Morse. As I have already written you, Mrs. Kin is on the way over to China to investigate this whole soy bean cheese business for the Bureau of Chemistry. Anything you can do to help her in her investigations will be keenly appreciated.

I am glad to get this letter from Mr. Reimer to you. It indicates a friendly relationship between you which I hope will ripen into a mature and deep friendship. If you can arrange to meet him in Peking and help him with his collection of pear seeds and tie up with him, it will be perfectly agreeable to me. You are one of the few men who are capable of burying their own personalities in any work which will assist the country, even though some one else gets the major credit for it. In these days such a spirit as this is the only thing that will save democracy from the ruin which threatens it in case this war is won by the military autocracies.

Mr. Dorsett is out at Chico getting up the inventory for next year. We are planning to put Mr. Russell on the jujube proposition. He has carried on some experiments already in the germination of the seeds, and I think has become very much interested in the whole proposition.

Your letters of June 5 and 6, one addressed to me and the other to Mr. Dorsett, both arrived on July 2, and the package of films has also been received. The prints, however, have not yet come in.

I note what you say with regard to Mr. Reimer's writing an article for the Journal of Heredity, but I am afraid this will be quite out of the question now, as he expects so soon to leave for the Orient. I hope you will urge him to prepare an article of not too technical a

character, which we can publish in the Journal of Heredity, directing attention to this most interesting and valuable discovery of his that these Chinese pears are resistant to pear blight.

There is one question with regard to the Chinese cabbage which this haste for large yields of spring vegetables has brought up. Do the Chinese cut the leaves from the spring varieties of cabbage and use them, as people in southern Europe cut the leaves from their tall growing varieties of cabbage, or as people handle Swiss chard in this country? My impression is that this Chinese cabbage is about the most rapidly growing green vegetable which I have ever seen. I planted some side by side with lettuce, and it produced about ten times as much material in the same length of time as did the lettuce. This was on rather stiff clay soil, which constitutes, around Washington, at least, the city home garden. Any information you can give us with regard to the adaptability of the Chinese cabbage to different kinds of soil and any photographs showing its uses will be of value. We propose next year to push the Chinese cabbage in a vigorous manner, because of the quickness with which the first greens can be secured. I am speaking now of the spring variety. We shall also give the fall variety a boost, inasmuch as it is a very excellent kraut producer and is liked by many people who are not fond of the ordinary cabbage.

With regard to the dwarf peach which bears edible peaches, why would not this be as interesting to many people as your Chinese lemon, which, by the way, is winning favor wherever it goes?

With regard to your bean cheese, it still keeps and every once in a while is served. We had the package opened and divided up into small bottles, and these are stored in the ice chest. Menderson is using some of the cheese to inoculate his bean cheeses with.

Your mention of lilies reminds me that those I have of your red lilies bloomed and were very beautiful this year. I am saving seed for Dr. Griffiths.

.....
 With regard to the Chinese walnuts, we are very glad indeed to get material of these, for a hardy type of walnut which is a good bearer ought

to be the result, and walnut growing should certainly be given more attention than has heretofore been given to it. What Mr. Dorsett meant in his letter to you, however, was that he believed it would be better to send cuttings instead of seeds. We will send to Mr. Thomas Proctor, of Topsfield, Mass., within a short time, plants of the walnut. Mr. Piper will also be sent plants of Spodiopogon sibiricus, S.P.I. No. 44288.

On June 9, 1917, from Hankow, Mr. Meyer transmitted 26 films and prints under Nos. 13274 to 13289 and 12392 to 12401. Mr. Meyer requested that the soy bean photographs be shown to Mr. Piper and Mr. Morse, the tung oil photographs to Mr. Young, and certain others, regarding vegetables, to Dr. Shoemaker. Mr. Meyer added:

Prof. L. H. Bailey has arrived here and we had some solid talks; it does one good to meet again a man interested in our work and who knows something besides! The Professor will make a short trip into Honan and Kiangsi and on account of the war will return to America early in August.

On June 14, 1917, from Hankow, Mr. Meyer wrote a long letter, the following extracts from which are of interest:

This frost there in Southern Florida must have been a nightmare to visitors and natives alike. Your frosted herbarium must be a real curio. I wish I could see it. We surely have our disappointments in plant introduction. After adventurous collecting trips after long journeys over lands and seas, after having stood personal and other treatments by "doctors", after months of tedious nursing and final successful establishment, then "King Frost" steps upon the scene and tells the immigrant that he or she had no business in getting where they were. Life is a cruel affair!

You are asking me whether these Chinese cabbages are preserved in any way. Yes, some of the loose-headed varieties are dried in the sun and

wind, some are pickled with salt and spices; some are salted and dried, and the German R. C. missionaries in Yen chow foo, Shantung, make a fine "sauerkraut" (am I allowed to use this word nowadays?) out of them. The dry-salted variety, cut into small strips, is very appetizing; the wet-salted ones, however, are rather "rich" in odor and look at times peculiar, to say the least. In King's "Farmers of Forty Centuries" on p. 129 you'll find a picture of wet "salted cabbage" such as is made from loose-headed pai ts'ai and from some species of Sinapis.

Of all things, however, good pai ts'ai is not a vegetable to be grown by an amateur in some old back-yard. Neither is broccoli and similar high-class vegetables; they can only be grown by those "who mix brains with the soil".

As regards ginger-rhizomes, yes, we will send some this fall, when the right shipping season has arrived. I am surprised that a few plants of Shantung ginger pulled thru' the whole winter at Brooksville. I suppose they were covered up like sugar-cane stumps in Louisiana. Northern ginger needs less heat and less moisture than the ordinary Louisiana sugar-cane.--If only I could nurse some of my own plant introductions! Perhaps late in life it may yet come about!

Letter of May 2, 1917 (the last that has come in), together with enclosures. I notice the general preparedness spirit and the groping about what-to-do-idea. I do wonder what may come up in which you need my advice or assistance. The thing America is in now is so gigantic that a few words of an individual somewhere in China have less effect than the braying of an ass in some desert.

As regards conservation of manures, I wrote you already. The bucket system, on the farm and in suburbs, and tank system, in cities and towns, have to be introduced with the utmost speed. Instead of washing everything away with water, dry, sifted soil and dry ashes have to be used. Tank R.R. cars and tank-wagons should bring the mal-odoriferous material from the towns to the country. Intense cultivation, long hours of work, little recreation, these are the things that make for great harvests of luscious vegetables. As regards using liquid manures, - yes, in China their use is universal, but they are quite dangerous on

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vegetables that are eaten raw. Compost is the best form in which various substances can be brought back to the land. It is no mean work to make a good compost heap. It requires strong muscle and back, and the carting and carrying away of the material from the yard to the field is a time consuming work. As you realize, not all people can do this work. Those doing office and factory work will find out that they cannot combine the two.

As regards growing vegetables in midsummer; well, I suggest for the Southern States some of the following: Dolichos sesquipedalis for its long pods; Lagenaria vulgaris var. clavata, for its tender young gourds, Benincasia cerifera for its gourds; Ipomaea aquatica on low lands, for its greens, like spinach; Amaranthus blitum and A. tricolor for their greens, like spinach. New Zealand spinach (Tetragonia expansa), the ice-plant (Mesembryanthemum crystallinum) for sea-shore gardens, as spinach; Portulaca oleracea, on alkaline lands, as spinach. Jack beans, Canavallia ensiformis, for its tender young string beans. Pods of both the cowpea and the yard-long bean can be dried and kept for winter use. Sweet potatoes can be sliced, frozen hard, then dried in the sun and kept for a long time (the Chinese in Shantung do so when their sweet potatoes have produced an abundant crop). Please call these few items to the attention of Mr. Menderson, who, as you state, is working on these problems.

I am perfectly amazed at your statement that the Department was forbidden to investigate the opium-poppy industry. Who gave that order? I do hope some wholesale drug firm profited by such an assinine order!

Drying of vegetables, fruits, meats, etc., for home uses is no small thing. In cities it really can not be done; in suburbs and the country it will go up to a degree, but, in the Western United States, far better than in the humid East. In moist climates salting and canning for vegetables and salting and smoking for meats are the methods that will give better results than drying or evaporation. In Amsterdam, my mother found out that evaporated vegetables for soups, etc., were too dear to be used as an everyday affair; celery, sorrel, carrots, cabbage, parsley, all these fresh winter vegetables gave more flavor and were far cheaper.

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IS MISSING

It grieves me to hear of the sudden death of Miss Reynolds; so much to live for yet!

I wish I could have a talk with you on many a subject; I often think that this life I am leading here, with its many worries, its loneliness, its lack of contact with people of similar aims and thoughts as mine, etc., etc., is perhaps not the thing I ought to continue much longer. The difficulty is, who will give me solid advice and council?

We are just in the midst of the loquat season and there is a great lot of variation in size and flower of these fruits. I have not found a seedless one yet, neither any one with a red color, like Mr. Taylor told me to look out for, twelve years ago.

Quite a lot of "Wong tsai" (*Ipomaea aquatica*) is on the market; also lots of "Han tsai" (*Amaranthus blitum* and *A. tricolor*). The last tastes and looks, when boiled, very much like spinach.

We are also having peaches of the honey type but so hard and sour that they have to be boiled; the Chinese eat them raw and enjoy the crushing of the flesh between their teeth. The weather is sultry and rainy these last weeks, and far from bracing. My interpreter feels it even more so and is by far not as bright as up north. He also cannot get along so well with the people here, who have no use for northern people and they refuse often to give him information.

Hankow is one of the great coolie towns in China, and culture throughout Hupeh is at a very low ebb. Thanks to wars, revolutions and long periods of isolation, intellect has not been at a premium and coolie breeding keeps everything down to a dead level. The heads of great firms here are mostly Cantonese and Ningpo-men, who are among the most enterprising of all Chinese.

One question I like to do, - what will Wilson Popenoe do when he is through with Guatemala? Have you discussed with him the South China problem and Indo-China, Siam and Burma?

Another problem, - has anyone ever attempted to cross *Prunus serrulata* and *P. lannessiana* with *P. avium* and others of the *Cerasus* type? If not, it ought to be done, so as to get new hardy types of flowering cherries.

I have quite a few fotos still on hand which I'll describe, number, and index and send them at

intervals to you. Then I also have 150-200 lbs. of beans, rices and vegetables seeds which have to be described and shipped. I never get through with work as long as I remain here in this strange land, which fascinates and repels at the same time.

On June 18, 1917, from Hankow, Mr. Meyer transmitted 20 films and prints, Nos. 13290 to 13309, and on June 20, 1917, from the same city, 28 films and prints, Nos. 12402 to 12429. As usual Mr. Meyer made certain requests regarding these photographs, all of which were complied with. His photographic albums were brought up to date. In the letter of June 20, 1917, Mr. Meyer closed with the following paragraph:

Prof. L. H. Bailey is botanizing in So. Honan, about 5 hrs. by train from here; he writes me that it is very wet there and he has charcoal fires going all day long to dry his specimens. The Prof. will not stay long in China this time and has engaged accommodations on a S.S. leaving Shanghai for the U.S.A. in early August. I do not think he is entirely in love with this land and its inhabitants. I would like to hear him give a lecture on Chinese agriculture; it would be of profound interest to an old hand like I.

In a letter of June 22, 1917, from Hankow, explaining his cable regarding the unexpended balance on his letter of authorization, Mr. Meyer included the following paragraph, so foreign to his general tone:

Suppose I become ill here in China or I should meet with an accident, would my per diem stop entirely?
 Would my salary also stop entirely after being unable to do any official work?
 Formerly I never wrote about such items and in the rush and grind of Washington life

I did not come to talk about it either; now however, in these serious times, grave thoughts come up from time to time.

On June 23, 1917, from Hankow, Mr. Meyer wrote in part as follows to Mr. Stuntz:

I studied the leaflet on the genus Amygdalus by Mr. Ricker and I am not satisfied with it. A. dehiscens is a synonym of A. tangutica; the last name is not even given, though I sent in many seeds of it. Why is A. davidiana left out, while a variety of it has been listed? A. persica potanini does not exist; A. potanini is quite distinct from a peach. My material will prove it, if it still exists. A. petzoldii does not exist; it simply is Prunus triloba.

What is the real difference between an Amygdalus and a Prunus? I had talks about this problem with Messrs. Rehder and Wilson at the Arnold Arboretum but we all agreed that Amygdalus, Prunus, and Cerasus flow into each other thru intermediate forms. Should Mr. Ricker have any publication on this subject I'll be pleased to receive it.

.....
As regards sending in Chinese characters with the material I have collected, I'll try to do. Who is there in our Office who can compare them with those in Giles' Dictionary? As regards Anglicizing of Chinese characters, you know that it can only be done partly and then Giles gives only Mandarin dialect while for instance here in Hupeh the pronunciation is quite different in many cases. For instance, the character for green is pronounced in Peking as "lü"; here in Hupeh it is pronounced "loh". "Beechi" of Peking becomes "Peechi" here (Eleocharis tuberosa). Now, are we going to give Peking names to Hupeh and Hunan products? We ought to have had a conference about this, like we ought to have had about so many a thing.

No, Mr. Rehder cannot identify these Chinese pears from my fotos alone; it will assist him, but - very much work remains to be done on these pears here in China.

As regards my future exploration trips here in this land, who will be able to predict them? The world is in such a terrible state of chaos that anything may happen, even that what was least expected.

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So. China, of course, can never give us as much as the north and central parts have done. Her climate is too mild for that; witness the destruction done by the last freeze in the South, which seems to show that lychees probably never can be grown on the mainland of the United States; that is, never commercially.

Another problem: I would like to get a list of subjects on which photographs are desired, so as to guide me here in China in taking photos of such things only as are desired. (This list to be made up in cooperation with Messrs. Fairchild, Dorsett, Bisset, Young, Menderson, and others who work on field problems.)

I hear but little any longer from Mr. Fairchild. His long periods of absence from the Office and the great amount of accumulated work he has to wade thru when he returns explain of course his inability to write. I wish I was in closer contact with various specialists who could ask me specific questions; it would give me a lot of guidance.

Some very well-to-do friends of mine in Holland want me to go to Sumatra in a highland district where it is cool enough to raise potatoes and I would become some sort of a lord there; that is an Agricultural Advisor, and I would be given liberty to collect specimens, perhaps wherever I wanted to go.

Mr. Wm. Purdom is in Peking, where he has a three years contract with the Chinese Government as a forestry expert, at the salary of \$600.00 Mex. per month, which at the present rate of exchange is close to \$5,000.00 U. S. gold per annum.

My intentions are to leave for the Mountains of N. W. Hupeh, above Hsing chan, within a week or so, when I am thru with my extensive administrative labors and when the seeds and specimens have all been shipped off. It will be hot, I know that! We are having here the mercury up to between 85 and 95 every day and when one has to march over slippery cobblestones at that temperature all day long and has to sleep at night in inns infested with vermin and having syphilitic people all around, observing one's habits, one does not always feel happy. Well, that's exploration work and should one meet with an accident one is kicked out of the service without a pension, like naval and military people at least receive.

Should anything of importance happen, please keep me advised.

Mr. Stuntz replied to this letter on July 31, 1917, as follows:

In reply to your letter of June 23, I will try to answer some of your queries.

Mr. Ricker's leaflet on *Amygdalus* was not in any way an attempt to study the genus, but simply aimed at bringing together as *Amygdalus* spp. the numerous *Prunus* spp. which have been placed in the section *Amygdalus* of that great genus. I do not believe that it is going to be possible to draw any definite line between *Amygdalus* and *Prunus*, yet it is convenient for departmental purposes to consider the plum and the peach as belonging to distinct genera, or at least what I call "horticultural genera". In other words, for horticultural purposes it is convenient to consider these plants as not congeneric. In view of his method of handling the genus, Ricker is of course warranted in leaving out *Davidiana*. As it was based entirely on the literature of the genera and not on plants, I suppose that he was warranted in including certain doubtful species.

The Chinese characters as you send them in will be checked with Giles' Dictionary by myself in accordance with the suggestions made by Mr. Swingle. He believes that while the native form of the name is desirable, yet the local name is so frequently a mere variation of the Mandarin name widely known throughout China that the Mandarin name based on the characters should be the one used. There is no doubt that there is considerable variation between the Mandarin and Cantonese, - for instance, the "Haak yip" variety of litchi is entirely distinct in sound at least from the "Hei yeh", which is the Mandarin for the same name. I believe that the best thing for us to do would be to use the Mandarin name with the local form of the name in parenthesis thereafter. For instance, "Hei yeh" with "Haak yip" in parenthesis, with the name of the province added where the local form is used. A number of inventories have gone to press with simply the Mandarin form of name except when the colloquial form is widely different from it, in which case both are given.

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As soon as I can I will try to get the list of photographic subjects desired, but it is pretty difficult to get the various members of the office force together on account of summer vacations, field trips, and the general low ebb of office affairs. Our force is materially reduced by resignations and transfers to other offices, the latest transfer being that of Mr. H. H. Howell to the Bureau of Foreign and Domestic Commerce.

Although we are having temperatures of 104° in the shade here in Washington, I do not envy you your work in central China in the slightest, as we can at least keep free from contact with the conditions which you are finding there.

On September 27, 1917, in a letter from Kingmen, Hupeh, Mr. Meyer wrote:

As regards Mr. Swingle's idea that a local name is frequently a mere variation of the Mandarin one, well, that's a startling viewpoint. I personally know that the Mandarin simply is an attempt to render the name of a southern product acceptable to the tongue of a large number of people who could not pronounce the real name. For real southern products, such as varieties of lychees and lungans, I certainly would not give a Mandarin name, for they are not known by such names in the localities where they grow. What you ought to give in the inventories are the Chinese characters for the products, that ties them up to the country of origin, irrespective of pronunciation, etc., etc.

On June 23, 1917, from Hankow, Mr. Meyer wrote Mr. Bisset in part as follows:

Getting better stocks for plums and cherries; yes, that is some problem! For what sections of the United States do you want them?

There are many forms of Prunus and Cerasus in western China, also in Manchuria and Japan; to get seeds, however, in quantity, that is the great question. It is not always easy to find a thing like the Davidiana peach, which happens to be fairly common in and around Peking.

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Have you tried Prunus mume and P. triflora as stocks for plums and P. lannesiana for cherries? These three might be gotten in quantities from Japan, when special requests are made for them. We surely ought to try to have collections of various species of Prunus, Amygdalus and Cerasus at our stations, so that we could experiment in a small way on these stock problems.

Mr. Bisset answered this letter on August 2, 1917, as follows:

As to stocks for plums and cherries, you ask for what sections of the United States do we want them. We want them for all sections where it is possible to grow such things. For instance, we need better stock than we now have in any of our fruit-growing sections and we would like to get a good stock for the plum in Florida. As for the cherry - you know cherries do not do well south of the northern Georgia line and, while we have no report, we are in hopes that the Tang si cherry - pseudocerasus - will extend the cherry line a little further south. We are advised by Mr. Harry Stabler, of Yuba City, Calif., that the wild forms of serrulata have proven a very good stock for the cherry in the vicinity of Yuba City and Marysville; proving in fact to be a better stock than the forms they have been using heretofore. One thing we are not sure of, however, which is, how long-lived this stock will be, hence almost any wild cherry that you run across will be of great interest to us and to fruit-growers in general. Again, I am not sure that you know that the cherries do very poorly in Minnesota and others of our Middle North States, so that a hardier cherry would be extremely valuable for our colder states.....

No, we have not tried personally the Prunus mume or P. trifoliata for the plums, nor P. lannesiana for the cherry. We have orders out for 100 pounds of seed of Prunus mume, however, and this will give us a number of stocks for making the test. Of the other two we shall order some seed and see what we can do with them.

You are quite right in saying that we should have a collection of the various species of Prunus, Amygdalus and Cerasus at our stations. We are getting together quite an interesting collection of these plants at our Chico and Yarrow stations, and hope that we shall secure many more interesting forms to add to these collections.

Mr. Wight, of Prof. Corbett's office, is also

deeply interested in the stock question and is doing some special work in regard to the congeniality of the various stocks for our commercial fruits, so that before long, if the good work is kept up, we should know more than we do at the present time about the great stock question.

Mr. Meyer wrote Mr. Bisset on September 27, 1917, from King men, Hupeh:

Your remarks concerning various stocks wanted for plums and for cherries I am digesting. I am positive that the Tangsi cherry will do well in So. Georgia, Florida (northern and eastern sections), So. Alabama, So. Louisiana, Eastern Texas and well into Mexico. It occurs here in Central China (on its own roots!) together with the coir palm (Trachycarpus excelsa) with pomeloes, loquats, Cupressus funebris, Ligustrum lucidum, Osmanthus fragrans, Ficus repens, Trachelospermum jasminoides, Pittosporum tobira and more of such plants. It suffers from borers, gum-disease, aphid and certain caterpillars, so it has not an easy time in a land like China, where sprays are unknown.

Then you need a good stock for plums in Florida. Have you asked Mr. Weidman Groff what they use around Canton? In Central China it seems that Prunus salicina is used, but perhaps P. mume also, altho' I could not say for sure.

As regards cherries for our cold and dry Northern states, - no, there are no cherries on this earth for these sections; we will have to breed them out of many species and the bush species will give the best satisfaction. The only bush-cherry that I know which is cultivated in the Ural and in Western Siberia, is Prunus chamaecerasus (syn. P. fruticosa). (See my fotos 5785-5788 incl.). It stands 40° F. below zero and dry hot summers.

On June 26, 1917, Mr. Fairchild cabled Mr. Meyer in care of the American Consul in Shanghai as follows:

Reimer sails July 12 Nippon Maru. Cooperate fully.

Mr. Fairchild wrote the next day, June 27, 1917, explaining the cable and enclosing copies of certain of Prof. Reimer's letters regarding his proposed trip to Japan and China after Pyrus spp. Part of Mr. Fairchild's letter of June 27 to Mr. Meyer reads:

Of course, I do not expect you to sacrifice everything in order to get these seeds for Mr. Reimer, but I do think that the subject is a very important one, and, inasmuch as you have already made your plans to get them, you should by all means leave no stone unturned to secure a considerable quantity of seed for these experiments in Oregon. You know Reimer and I do not, but from what I hear of him I think you will have no trouble in cooperating to the fullest extent possible with him.

I am very glad to see that Pyrus calleryana is such a remarkable species. A really immune stock for the pear, which will grow in our hot summer climate, may be a tremendous factor in the pear industry. If the tree is a tremendous bearer and is used only for a stock, it may bring down the price of pear seedlings materially.

It is rather unfortunate that the ripening season of the calleryana coincides so closely with ussuriensis, for if this were not the case, Mr. Reimer could doubtless arrange to visit the calleryana region first and later the region occupied by Pyrus ussuriensis. Perhaps he can do this anyway.

In a letter of June 26, 1917, to Prof. Reimer, Mr. Fairchild suggested that Mr. Meyer might go after P. ussuriensis and he (Reimer) might secure P. calleryana at the same time. He added:

You will understand, of course, my dear Mr. Reimer, that Meyer will not feel like dropping all his own plans to help you get what you want, neither do we think that necessary, but he will go so far as to secure the seeds he has started out after. You must not be surprised to

find that he feels his own arrangements are adequate to insure the collection of large quantities of seeds. Professional pride would come in here. I have felt that your mission was more for the purpose of studying the trees and their variation than for the actual getting of large quantities of seeds, which I am sure Meyer with all his Chinese experience could probably get as easily or more so than you could. I have traveled with other scientific men in foreign countries, and I caution you, as I have always cautioned Meyer, not to expect too much of the other fellow.

Mr. Reimer's introductions of Pyrus spp. are recorded under our Nos. 45820 to 45850, received February 15 and 16, 1918. (See our project report "Pyrus Introductions for Stocks, Breeding, and Other Purposes".)--Mr. Meyer's next letter was dated June 28, 1917, written at Hankow, and transmitted his Nos. 2385a to 2392a. These reached us September 18, 1917, and were given SPI Nos. 45182 to 45189. The material consisted of two numbers of Amaranthus gangeticus, one of Ipomoea reptans, and five of Brassica pekinensis.

On July 27, 1917, also from Hankow, Mr. Meyer wrote transmitting a box of seeds and specimens, his Nos. 2393a to 2445a. This box reached us on October 6, 1917. The specimens were distributed according to Mr. Meyer's suggestions. The seeds, given SPI Nos. 45263 to 45320 and 45605, included the following:

45263, Brassica sp.,
 45264, Perilla nankinensis,
 45265, Perilla frutescens,
 45266, Oryza sativa,
 45267, Oryza sativa,
 45268, Oryza sativa,

45269 to 45295, Soja max,
 45296, Phaseolus vulgaris,
 45297, Phaseolus vulgaris,
 45298, Phaseolus angularis,
 45299, Phaseolus angularis,
 45300, Phaseolus aureus,
 45301, Vigna sinensis,
 45302, Vigna cylindrica,
 45303, Pisum sativum,
 45304, Pisum sativum,
 45305-7, Vicia faba,
 45308, Lentilla lens,
 45309, Indigofera tinctoria,
 45310, Brassica sp.,
 45311, Citrus sp.,
 45312, Citrus sp.,
 45313, Citrus grandis,
 45314, Citrus grandis,
 45315, Citrus sp.,
 45316, Oryza sativa,
 45317, Holcus sativa,
 45318, Phaseolus aureus,
 45319, Amugdalus persica,
 45320, Amygdalus persica,
 45605, Polygonum tinctorium.

Mr. Meyer wrote in this letter of July 27, 1917:

Would you please write Mr. Schmitz how to dispose of this case, but by all means not by the Galveston route! It may be some months possibly before it arrives in San Francisco, for there is almost no space available for cargo for Trans-Pacific steamers.

I am in possession of several letters from you, which I'll answer in due time.

The weather here is at times so sultry and hot that one can hardly keep body and mind together; most foreigners have left Hankow and are up in the mountains here and there. I also might have left ere this, but -- my interpreter first felt unwell for some days and was worrying about his family in Peking during the fighting there a few weeks ago and now he has simply left me and probably will not return any more. He did not like the people, the climate and the food down here and never thinking about his employer's difficulties, simply "threw up the sponge".

Life here certainly makes one at times

disheartened!

I got another man, but he will need lots of training again before he knows about my work what the other one did!

Mr. Fairchild wrote Mr. Meyer the following interesting letter on July 27, 1917:

My dear Meyer:

It will be hard to give you a reflection of conditions here in Washington, - streets filled with soldiers, the town filling up with people, probably 50,000 new residents here since the first of January, auto traffic congesting every important street corner, and the whole town as busy as it is in the busiest week of Christmas time, and here we are nearly the first of August.

On account of the war, and the need for space here in this building by branches of the service more closely connected with the war program, we are to move our offices up to 13th and F Sts., a new large office building where we get nearly twice as much floor space as we have here, though not twice as much light. We will probably get up there about the 1st of September. We shall feel the move very keenly, but I have come to feel that all changes of location have compensating advantages, as I believe we will find when we get up there. A fewer number of interruptions from unimportant callers will be one thing, and more time to give to the serious questions of plant introduction work.

I am very sorry that I have had to neglect my personal contacts with you through letters as of old. I realize keenly that you must feel the need of suggestions for your exploration work, but I assure you that the crowd of daily duties make these long distance calls for suggestions very difficult to handle. This is increased of course as the years go by, by a decreasing familiarity with Chinese conditions gained by personal experiences in China. It is now fifteen years since I was there, unfortunately, and many of my memories are becoming dim. I can give you, however, a reflection of a change in the attitude

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of the public towards all these questions of foods which is taking place in America. There never was such an awakening of interest in all kinds of foods as there is in this country now. Of course the question which every one asks in regard to the new foods is whether they will be cheaper than something with which he is familiar. The question of expense is naturally uppermost in everyone's mind.

You will do a real service if you will investigate and report, with excellent photographs, of any of the uses of the soy bean. I have encouraged Mr. Menderson to try experiments in sprouting the soy bean, the mung, the lima and other beans. I believe there is something to be done along this line, and I believe that people can easily be taught how to sprout these beans and use them in the winter in place of fresh vegetables. If there are any other Chinese methods than those which you have already described, we would like to have them. In looking over the descriptions which you sent in, Menderson failed to find that they completely covered the whole process, and he had to work out certain methods of his own, better adapted perhaps to our own conditions.

I have written you about soy bean cheese, and I think I have also written you about the dried fruit proposition. I do not know that I mentioned a study of the preserved fruits, canned fruits and vegetables used by the Chinese, - I am not sure that there is anything in their methods that is applicable to American conditions.

There is one big subject of interest that we have overlooked. I was reminded of it the other day when I took my friend Mr. George up to show him some of our flowering mume trees. I found on the ground a handful of ripe fruit, - not a single one of these fruits had been attacked by curculio and not one of them showed any signs of rot. I understand there are a great many varieties of these mumes in Japan, and that they came originally from China. I think a thorough study should be made of this whole question of Prunus mume and its introduction into America as a fruit tree. The fruits produced on my place were delicious; they were not sour as I expected to find them. They reminded me more in flavor of the American wild plum, and my friend was delighted with them.

What we want is a quantity of seed for stocks, and budwood of the best varieties of mumes, photographs of the mumes themselves, and full accounts of the methods of preparing them. You will remember sending some beautiful green mumes which had been prepared in a peculiar way, and which we all thought were very good. A thorough investigation such as you made of the jujube ought to be made of the mumes, and it would be well on your return from China to stop over in Japan long enough to round up the question there. We ought to have growing in this country all the principal varieties of this remarkable fruit tree. It is a commentary on our work that the Japanese army should recognize the mume as an invaluable part of the army ration, and that we have not growing in the United States anywhere even a small test orchard of this remarkable fruit tree. We should like to have specimens of all the different kinds of preserved mumes that you can lay your hands on, with full accounts of how they are made.

I have just gone over with Mr. Bisset the Chico inventory, and have asked Mr. Russell to prepare a full statement of all of your introductions of jujube which are represented by living trees in this country and all that have been lost. I am afraid this will be a discouraging list to you, but it may enable you to secure through your friends or possibly through your own efforts, some of the most valuable varieties which have been lost. You will be glad to know that Mr. Mills, who owns a large estate not far from Chico, wants to put out five or ten acres of jujubes next year, provided we can supply the trees. The work of propagation has not progressed as rapidly as I wish it might, - the difficulty seems to be to get a sufficient quantity of budwood.

You do not say anything in your letter about bamboos. Do not forget that we have before us the big problem of establishing in the delta of the Mississippi large groves of the edible bamboo and other species which have been introduced. It is very unfortunate that we did not start our plantation on that great delta, or near Savannah, where the large plantation of Indian bamboo is growing. I had dinner last night with Mr. McIlhenny's brother, who is Chief of the Civil Service Commission, and he told me

that he felt convinced from seeing the plantations which his brother has at Avery Island, and knowing the conditions down there, that we were quite right in estimating that thousands of acres of bamboo could be grown on the delta of the Mississippi. On the day that I visited the Savannah plantation in company with Mr. Barbour Lathrop with the idea of finding out whether it would make an appropriate gift from him to this Government, I received a telegram ordering me back to Washington on account of the war. Since then things have gone from "bad to worse", and I have no idea whether that plantation will ever come into the hands of the Government. It ought to be owned by us and be operated as an experiment station for bamboos.

You speak in one of your recent letters of wishing you had some one to advise you. My dear Meyer, these are times when we all need advice, but unfortunately there are times when those who try to advise feel peculiarly incompetent to do so. I might easily advise you to come back to this country and take up the breeding of plants, but I do not feel sure that a man of your restless disposition will be contented with the necessarily quiet life of a plant breeder. There will always be a place for you here, - there will always be work for you to do at the Field Stations, and I will do my best to make arrangements so that you can move from place to place in connection with the development of any of your "pets". I think you can feel perfectly confident, provided this war does not entirely upset all our plans, of returning to a position in the Department where you will be taken care of as long as you continue to do conscientious work. While it is true that the Government has not a pension system for its employes, it has not in my experience thrown them out without giving them an adequate opportunity to save up enough to make a comfortable annuity in their old age. There is a strong sentiment now for a pension of superannuated employes and I would not be surprised if it were enacted into a law.

I must now stop and take up other pressing duties. Hoping that you are recovering from your temporary indisposition, and with kindest regards, I remain.

On August 1, 1917, from Hankow, Mr. Meyer wrote as follows:

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Dear Mr. Fairchild:

A number of letters from you have come in of late and I'll answer them before I disappear for some time in the wilds.

Letter of May 10, 1917, together with enclosures, all relating to the white pine blister rust. Yes, I'll be on the lookout for this fungus on either Ribes or Pinus armandi. It is only in the higher mountains that one finds these plants here in Central China. It is remarkable that this fungus is so extremely widely spread over the globe!

Letter of May 24, 1917. About Prof. Reimer going to Japan and China. Yes, it is the best thing he could do; nobody could tell him exactly how pears behave in their native countries and since he is a man who has done independent investigation work, he surely deserves support. I am somewhat afraid, however, that he overestimates the ease and facilities of travel, especially in China, but we will see.

As regards seeing Mr. Merrill, well, I'll postpone that until possibly this winter. Matters are so unstable all over the world that we are only able to make plans a few weeks or a few months ahead.

Letter of June 7, 1917. About the 200 lbs. of seeds of Pistacia chinensis for Mr. Swingle. Well, I saw a letter in Mr. Gilchrist's possession, at Ichang, in which the number 200 occurred and I believe Mr. Cunningham, our Consul General here, wrote it. Now it is just possible that the stenographer made 200 out of 20. No, I did not make exactly a contract for 200 lbs.; as such I will only send 10 to 20 lbs., although the tree really is well worth while disseminating on a large scale. Your remark, that 200 lbs. would be more than you care to handle under war conditions, seems to show that our gardens and office may be short of funds and of help. I hope the large quantities of Amygdalus davidiana, Pinus bungeana, walnuts and jujubes I sent in this winter can be handled, otherwise enterprising nurserymen might take them over.

As regards a climatic phenomena, known as the February thaw in America, no, I do not think we have anything like it here in China. There are too many mountain ranges running from the east to the west and bodies of air cannot move freely north and south, as in America. One therefore finds a slow cooling off in the fall and a slow warming up in the spring of almost

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the whole climate of Asia and especially in China.

The vegetation does not awake prematurely and it seems that only at rare occasions blossoms of early flowering trees get frozen. Dry winds however at times do much damage to the setting of fruit and as regards the tung oil trees, the Chinese say that there will be a short crop this year on account of an unusual dry and windy spring in Szechuan and Western Hupeh, which made the flowers dry up without making them set. As a result tung oil is rising steadily in price and just now is 15 Hankow Tls. p. picol (about U.S. gold \$14.75 p. 125 lbs.) Three years ago it was Tls. 6.00 p. picol, as Mr. Mann, of Gillespie, told me a few hours ago.

Tung oil tree cultivation in America borders on gambling. It may, it may not, become a success! From an official standpoint it is somewhat risky to advise private parties to go in for it! Mountain slopes in Porto Rico might be fine places for this tung oil tree; they also have cheap and abundant human labor there.

I am certainly very much interested to hear that Mrs. Kin has obtained a commission from the Bureau of Chemistry to investigate the bean-cheese industry. I hope to see her observations one of these days. Perhaps I ought not to have spent as much time and labor upon this subject as I have done, but then -- a subject like this is too fascinating to leave it alone.

I do not think Mrs. Kin will find that bacteria play much of a role in this bean-cheese affair; it seems a mould does the work.

Strange to say, my new interpreter tells me that in the Kiangsu province a vegetable cheese is made from pounded taro, which is stronger than bean-cheese. What do you think of that? If it is correct then we can make cheese from potatoes also and from peanuts, from grains and from what not. What a new series of food-products we are going to obtain then. Please give these suggestions to the specialists in the Bureau of Chemistry.

It pleases me very much that you and almost everybody to whom you served the bean-cheese, like it. Here in the East foreigners consider one a little bit peculiar if one happens to like a Chinese preparation and everything Chinese is kept away from their tables. Strange!

Did Mrs. Kin put you in touch with a N. Y. firm of Chinese products where this bean-cheese can be obtained?

As regards finding recipes for drying and pickling of fruits and vegetables, I suggest to have one of the many Woman's Clubs in America to go thru old-country cook books; gardening and farming papers and similar publications. They may find lots of things which the present generation has never heard of.

The discovery of Dr. Lippmann that the var. of organism in the nodules on the roots of the soy bean has a whole lot to do with the amount of protein in the bean is of extreme interest, but, why is it then that one can, by selection, increase the amount of protein also? I'll try to collect some samples of soil, however, and some bean roots. For the making of bean-curd apparently only yellow and greenish-yellow varieties of soy beans are used. I never heard as yet that other kinds were employed!

Letter of June 27, 1917 (the last of the lot). Yes, I received the cablegram all right: Reimer sails July 12 Nippon Maru. Cooperate fully.

The American Consul-General at Shanghai, Mr. Thomas Sammons, forwarded it by letter to me thru the Consul here. I have written Prof. Reimer a letter of welcome to the Far East and I think we will meet here somewhere.

Thank you for these copies of correspondence with him; they are giving me a pretty good idea of the trend of this whole affair. Prof. Reimer is apparently afraid that we will not supply him with enough seed. Well, to give all of the nurserymen in the United States seeds enough to supply blight-resistant stocks is some problem. I would not be a bit surprised if some enterprising fellows are going to come out to China to collect large quantities of these wild pear seeds. Of course then it gets out of our sphere of work, altho with Amygdalus davidiana and with jujubes our office has done a whole lot of plain nursery work.

Prof. Reimer has not cabled me yet but he surely will write me some details of his plans and we can see then how we can cooperate. I am not going to leave central China until I have at least 100 lbs. of clean seeds of this Pyrus calleryana and he can collect a lot of seed of P. ussuriensis at Shing lung shan in cooperation with Mr. J. C. Huston, altho the last seems to have been given notice to leave for a post as Vice-Consul at Nanking. I have written him, concerning this rumor, but have not received any

reply.--You see, Mr. Fairchild, we have many, many matters to keep in consideration all the time and all of my work is only a one man's job and without having the benefit of the stimulating influences of enthusiastic fellow-workers in the same field.

My old interpreter, who knew so much about this work, has left me since a fortnight already. He didn't like the climate, the people and the food and the easiest way to get rid of such things is to quit, of course, and he did so. What would become of our social structure if we all did the same! Of course no one can stand hardships forever and I long to have a garden of my own in a cool, bracing region, but,--I'll first try to finish a few pieces of work that have been entrusted to me.

The overcrowded conditions here in Hupeh are due to indiscriminate breeding of human beings, not having much brains. China has had wars enough and bloody revolutions by the hundreds, with the results that the better families have been exterminated all the time by the rabble, and coolies only have been left to perpetuate a non-intellectual race.

How Science in the future will treat such over-crowded countries, alive with human weeds, I have no idea. Professor L. H. Bailey and myself have had some solid talks about this subject, but -- we had to admit that at the present we have no means of effecting a cure.

I wonder whether you received my cablegram stating that I had \$150.00 balance. I sent it off from here on June 22; your letter is dated June 27, and was stamped June 29, 6:30 p.m., but you didn't mention a word about the receipt of it.

I am intend to leave Hankow Saturday August 4 by train for a station in the mountains in So. Honan, Chikungshan, by name. It is 5 hours by rail from here and there are many missionaries assembled there for the hot season and some know a whole lot about wild vegetation in the mountains. Then I'll cross into Hupeh to the S. E. and pass thru' a mountainous district until I strike the Han River and from there to Kingmen, where my contract for wild pear seeds compels me to be in early September.

After that we'll see again what will happen. The weather is hot and at times extremely

sultry and depressing; I do not hope to be compelled to spend another summer in this region.

Political conditions are very unsettled in this whole land. Robbery is rife in many provinces and if Europe wasn't in her death struggle, some attention would have been paid to this country here long ago.

I am enclosing a letter concerning lumbang and perilla oils; I answered it to Mr. Cunningham, but both oils are rarely or never met with in China. Perhaps the oil specialist of our Department can inform these people where to get exact information.

I also enclose a set of duplicate inventory notes, belonging to a shipment I wrote Mr. Dorsett about a few days ago. I have not heard from the shipping agency in Shanghai as yet whether it has been received or not. Mail routes are upset in China just now. Communication by rail with Peking is impossible, since big stretches of roadbed have been washed out and S.S. service on the Yang tze has become quite irregular since several boats have been withdrawn and drafted into war service.

On August 18, 1917, from Suichow, Hupeh, China, Mr. Meyer sent us a post card on which he wrote the following message:

After a march of 2-1/2 days from Kwang sui, on the R.R., I am now here, en route for the Ta hung shan; after having explored that little known range, I'll leave for An lu foo and then on to King men for my wild pears. The days are quite hot, but the nights are turning cool, thank heavens!

On September 8, 1917, from King men, Hupeh, Mr. Meyer wrote the following very interesting letter:

Last night a bulky envelope came to me from Hankow and among the contents I also found some welcome letters from you.

I feel very grateful for your kind words in your message of June 29, 1917. Yes, such things as being unwell come to a man from time to time, just like periods of bad weather; one

has to face them and take care of one's self. Some day the world will be in happier conditions and it will reflect upon all of us.

Of course, this exploration work with its continuous absence from people who can inspire one, gets pretty hard on one's nerves. One must be some sort of a reservoir that carries along all kinds of stores. Soldiers in the field have more dangers to face, but they get at least companionship and often recreation supplied to them. For about one month now I haven't seen a white person, for all of the missionaries are at the mountain and seaside resorts and travellers one rarely meets here in these parts of Hupeh.

My new interpreter is of the sponge variety, that is, absorbing all and giving back little or nothing and this special work of mine is very hard to understand for Chinese anyway. They seem to consider it somewhat in the order of a silly thing to spend so much money for a few seeds or plants.

Well, I have become so calloused to opinions of Chinese, that it matters but mighty little what they think, the whole race has become too weedy for lack of healthy contact with outside people during all of these past centuries. With the exception of a few they are quite satisfied with the ways their forefathers did things; unless capable foreigners are allowed to supervise things, all sorts of innovations run again to nothing in a few years' time; even the main railroad from Peking to Hankow is getting to be in a truly deplorable state of condition and it would not surprise us out here if the services would be stopped altogether not very long from now.

I am quite pleased to hear in your letter of July 5, 1917, that my soy bean cheese samples have really created so much interest. Mr. Menderson wrote me a long letter on this problem; I cannot give him, however, much more information than what I wrote in my report to Mr. Morse and on the fotos. Beancurd and bean milk always taste beany! The cheese, however, has lost this unpleasant characteristic. If soft bean curd is beaten up with sugar, it also improves much in flavor.

I have not heard from Mrs. Kin as yet; she surely will get along without my assistance, for she "knows the ropes" here in her own land.

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I am not quite satisfied with Mr. Reimer's ways. He has written me only one letter from Talent, in duplicate, and I enclose herewith one of them to you, to be filed. Then on September 3d, in the evening, I received the following telegram: "Keyo-Seoul. F. N. Meyer American Consulate Hankow retransmitted Kingmen arrive Hankow October 1. Letter follows. Reimer."

He certainly ought to have written me from Japan about his work, for it is no small amount of time and funds we are spending in getting these pear seeds.

As you see by his letter from Talent and his telegram from Chosen he must have changed his mind considerably while in Japan.

Now in the meantime Mr. J. C. Huston has been transferred from Peking to Nanking and I hope young Mr. Tenney from our Legation at Peking can accompany Mr. Reimer to the Shing lung shan region. I have written so to Mr. Reimer.

I am not sure in how far he can rough it in this land and get what he wants. When he attends, however, to the collecting of seeds of Pyrus ussuriensis for the North, I am doing my share in getting seeds of the calleryana pear for the mild wintered sections of the United States.

I got already over 25 lbs. of clean seeds of a cultivated form of P. calleryana, called the "Chia t'ang li" or "Family" or "Tame crab-apple pear". And an American Missionary at Chikung shan, (extreme So. Honan, a mountainous resort near Sin tien, on the Peking-Hankow R. R.) is also collecting seeds for me. I suppose of this same domesticated t'ang li, although I told him distinctly I wanted the real wild one. I hope to hear from him almost any day, but mail takes 6 to 7 days from Hankow to here as the Railroad is in disorder.

I am somewhat in a dilemma here with these pear seeds; my former interpreter made the contract with some parties here and the understanding was that the wild pears ripened in early September. Now, however, we find that the cultivated type of calleryana pear ripens in this time and that the wild ones come 3 to 4 months later. Now here we are again. "Never do a thing for the first time" was the favorite saying to me of Prof. Hugo de Vries, while I ran his experimental garden in Amsterdam, and I find it as true a saying as the American advice: "Select your ancestors". However, this pioneer work of ours has this advantage that we can tell others what to avoid.

I could get more of this domesticated t'ang li, but -- suppose the tree should not be immune, what then? In 25 lbs. there are many thousands of trees and I think it is enough. After a few weeks I'll get 100 lbs. at least, of the real wild type. How many pounds of fruits it will take, I have no idea; for the domesticated type, which is perpetuated by grafting, we bought over 2,000 lbs. of pears at the rate of one to two cents p. lb., according to quality and supply; we could not clean them ourselves of course and some 20 to 30 people have been at work on them and were much pleased to make some money and be allowed to keep the cut-open little pears besides.

Now the collecting of all of this pear seed brings up one big problem, viz., as soon as it becomes known among American nurserymen that the calleryana pear is an immune-to-blight stock, there will be many requests for seeds, -- not only one year but also in many years to follow. How shall we handle this problem?

Of course some groves must be set out in suitable localities in California and Texas, so as to make us independent of the Chinese supply and such groves must be away from other pears and the trees at least 50 feet apart in all directions, for this pear grows to large size and loves exposure to sun and winds. Since it flowers toward the end of March and early April it must be planted in sections where no late frosts occur. It stands adobe soils and thrives at the edges of terraced rice fields as well as on dry and sterile hill-slopes, so there has not much care to be exercised as regards finding suitable locations for some groves. For needs of the coming 8 to 10 years we could inform the Yokohama Nursery Company about this pear and they surely could attend to this business, since they have got a branch office in Hankow.

I'll have a solid talk about this problem with Mr. Reimer when he comes here and I wish you would have a conference with Mr. Waite, Mr. Dorsett and others interested in this important problem.

I am in receipt of a personal letter from Mr. F. T. Ramsey at Austin, Tex., in which he tells me about the unusual value of the jujube and the Davidiana peach for Texas. The jujube grows even on poor adobe land and bears well and February grafts on suckers were literally

loaded with fruits late in the fall of the same year (1916).

The Davidiana peach as a stock makes very early bearers.

I trust Mr. Ramsey will be given a quantity of calleryana pear seed, since he is a man who has his heart and soul in all of these new things from China.

I am very glad that Mr. Popenoe has had so much success in Guatemala. In Plant Immigrants 128 I see his discovery of a new sp. of Persea in details; quite interesting! I wonder how this coyo has escaped the attention of travellers for all these centuries! Verily, this old earth can be combed over a few times before all of the good things have been gathered in.

In this same No. 128 I find that my hickory is called a tall tree, 40 to 65 feet.-- Well, I never called it tall. I also did not know that Castanea vilmoriniana occurred in Shantung, as is stated; I hardly think so! Mr. Wilson told me he found it in Western Hupeh and Eastern Szechuan. What do they say about this in *Plantae Wilsonianae*?

In No. 120, that has just reached me: this letter from Mr. J. H. Cameron is fascinating; it opens one's eyes to the highlands of Central Africa. Lions beneath 25 ft. heather and natives that worship their "tummy"; it beats old China all hollow! Where on earth did Mr. Beagles find this Prunus glandulosa, which is pictured. -- Probably in some Cantonese store in San Francisco. Up to this day I do not know the difference between Prunus glandulosa, P. japonica, P. japonica glandulosa, P. bungei and P. humilis. -- This whole lot seems to run together.

In this No. 120 I think that behind the names of towns in China the provinces ought to have been placed, for instance I do not know where Shanghang is (42567). And in No. 42429 instead of India, Africa ought to have been written. Is Chung-ching the new way for writing Chungking in Szechuan (42533)?

Thank you for the Farmers' Bulletin, "Drying Fruits and Vegetables in the Home". It is very instructive and novel-reading; running about, visiting movies, etc., ought to diminish when its suggestions are carried out.

Your multigraphed paper, "The Call of the Great War" reached me also. It sounds like a trumpet

call from another world or from this earth a few thousand years hence, when possibly humanity will be crowded together like eels in a tub.

Behind all of this terror-inspiring literature, on which the so-called civilized world feeds today looms up this vast spectre: Failure! It assumes many forms but remains the same throughout.

Do you know what the Chinese do when they have to deal with a bold pirate or a daring brigand they cannot conquer? They offer him a high post in their council and -- peace returns!

Diplomacy of the international type could have prevented all of this suicide of the white nations, but it, like religions, 'isms, etc., they all failed and now the passions, pride, gains, etc., all call for more slaughter of the opposite parties; no voices of conciliation, fraternization, consideration, nothing but the red-hot blast of: Down with what we think is wrong. -----

As regards your question whether the Chinese cut the leaves from their spring and early fall varieties of cabbage; yes, they do or rather they sow the seeds thickly and pull up the young plants and tie them up in bunches for sale. The consumers then cut off the roots, chop the greens up in short pieces, boil it and one eats it like endive or spinach. These spring and early fall or late summer types do not head and do not blanch, but are of dark or of light green color and of loose, open growth. They thrive best in a rich, well-aired soil and wither when great heat is experienced. The Dutch have a form of rape, called Raapstelen-Turnipsprouts, which they use in this way; this, however, is only an autumn vegetable.

Here in this town we have been unlucky to find good vegetables; there is only a small supply to be had of lotus-rhizomes, fall pai ts'ai, summer and winter squashes, young snake gourds (Luffa acutangula), balsam gourds (Momordica charantia) mung -- and soy bean sprouts and a few poor wax gourds (Benincasia cerifera). The last is not bad eating when cut in squares and served in meat stews. It needs lots of heat to mature fully and would thrive best in our southernmost states. Mr. Menderson might experiment with them on trellises next summer in Brooksville.

I found an interesting new dish on my last

trip from Kwangsui to Suichow. One takes the dried seeds of Ficus repens, together with a few bars of agar-agar, puts them in a muslin bag and pours boiling water over them, then let them steep in the water until it becomes cold; by this time one has a gelatinous mass, which is served as cold as one can keep it, with sugar and some peppermint flavoring sprinkled over it. It is a light and wholesome dish, especially when one is tired and thirsty. The seeds can be used only once and are thrown away after use.

Then I was informed by the Rev. J. U. Statts, an American missionary at Chikungshan, Honan, that the Chinese use the tea of sliced dried root-bark of the Pride of India tree (Melia azedarach) as a remedy against intestinal worms and they say it is much better than Santonin. Please inform pharmacists about this.

I also was shown in a village how the leaves of Eucommia ulmoides are used on open sores as a cure for same. Whether it is very effective I cannot believe.

In An lu we found in several shops a root-bark for sale, which is used sprinkled, when pulverized, as an insecticide on leaf-vegetables, like cabbage, beans, etc. The plant it is derived from is apparently Celastrus orbiculatus, but in one place I was shown Alanguim chinense as the source of supply.

As regards Actinidia chinensis, I have to say that this is decidedly a mountain plant; it thrives to perfection in the Chikungshan range at elevations between 1500 to 2000 feet; it likes cool nights and rocky slopes with pockets of rich soil. In dry spring weather it sets fruit very much more than in rainy times. The fruits, when ripe, are skinned, placed in a bowl and sugar sprinkled over them an hour or so before they are served. They form then a delightful, sub-acid dish, tasting in between gooseberries, rhubarb, and pineapple.

The plant ought to do well in the foothills of California and in hilly sections down South; exposure to winds tends to dwarf it and induces heavier fruiting!

I found the chestnut blight, Endothia parasitica, on Castanea mollissima, but not on C. seguini, at Chikungshan near Sin tien, Honan, and in the Ta hung shan range, half way between Suichow and An lu, Hupeh.

Please convey this information to Dr. C. L. Shear, showing the very wide distribution of this parasite here in China.

Dr. G. E. Morrison at Peking, has sold his famous library on Chinese matters to a Japanese baron for \$35,000. The whole collection will be transferred to Tokyo. A great pity this is! Of course, China as she is today, could not guarantee the safe intact of such a valuable collection; her coolie soldiers might burn it at any time.

Too sad, this death of M. Philippe de Vilmorin! And so young yet for a man of his type, 45! I had some interesting hours with him at Verrieres le Buisson.

I am sitting now in a Chinese house, for the inn I lived in at first was too noisy and dark and there was no room to dry seeds or specimens. Some mice are running about, mosquitoes buzz, a cricket sings in an old wall and the policeman, who is stationed to spy upon me, snores on a bench, for it is well into the night.

Tomorrow we may go to see a lot of wild pear trees, 15 miles away from here.

On September 14, 1917, Mr. Fairchild asked Mr. Meyer to be on the lookout for legumes with leaves that had a pleasant flavor and if he found such to dry a goodly quantity and send them to us for the use of Prof. E. V. McCollum, of the School of Hygiene of the Rockefeller Institute in Baltimore. Prof. McCollum's investigations into the food value of the alfalfa plant convinced him that it might be possible to find a forage crop which could at the same time, by being ground into flour and mixed with wheat to the amount of 25%, be used for human food. In alfalfa, the peppery flavor could not be eliminated, hence the search for other legumes. Mr. Meyer wrote on October 25, 1917, from King men, Hupeh:

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Letter of September 14, 1917, with enclosure of letter of Prof. E. V. McCollum concerning herbs to be used as human foods in flour mixtures.--Yes, this is a new field. One question! Do all varieties of alfalfa have a peppery flavor? I personally think not. Can this flavor be bred out? It might be worth while making experiments that way.

It may be that certain bur-clovers can be used that way. The Chinese eat Medicago denticulata maxima as a pot-herb. Should you ever have a piece of alfalfa bread please send it on, so I can taste it.

On September 18, 1917, from King men, Hupeh, Mr. Meyer wrote transmitting nine packages, his Nos. 2446a to 2448a. These were received on November 16, 1917, and proved to contain 18-1/2 lbs. of seed of a cultivated form of Pyrus calleryana, given SPI No. 45586, 8 lbs. of seed of Pterocarya stenoptera, SPI No. 45587, and 12 lbs. of seed of Acer trifidum. In the last lot of seed a new scale insect was present and the seed was condemned by the Federal Horticultural Board. The seed of Pyrus calleryana, SPI No. 45586, was sent to the Chico station on January 18, 1918. Mr. Meyer wrote regarding it as follows:

I would like to see Mr. Reimer receive at least 1/3 of the seed, together with a copy of the inventory note. The rest may be divided between Chico and Yarrow; it should be stratified in moist sand as soon as it has been examined and fumigated, so as to ensure a speedy and uniform germination.

On September 20, 1917, Mr. Fairchild wrote Mr. Meyer the following letter regarding the fruiting of his Feicheng peach:

Mr. Beagles has sent me four fruits of your Feitcheng peach, SPI No. 38178. Mr. Young took two of the fruits over to Mr. Waite, and I am enclosing herewith a copy of Mr. Waite's statements with regard to them. I have also just had a talk with him about this peach and find that he is of the opinion that it may have decided possibilities in this country, and he recommends that it be tried out as a canning peach primarily, in the various regions along the Pacific Coast and in the Eastern peach belt where canning peaches are in demand. When you return, you can have a long talk with Mr. Waite about it. If this Feitcheng is adapted to the Eastern United States, it may take a place by the side of the other peaches of Chinese origin which have really built up the peach industry of the Eastern States. Of course, the whole question remains to be settled as to whether this excellent variety will fill a particular niche in the peach industry so far as season is concerned. It will require several years to determine this fact, but I think you are to be congratulated in any case in having launched the Feitcheng peach and having secured the enthusiastic report in regard to it which Mr. Waite gives. I look upon him as unusually competent to give an opinion on the commercial prospects of this peach.

Mr. Waite's statement, as recorded by Mr. R. A. Young, regarding the specimen (dead-ripe) of the Feitcheng peach, SPI No. 38178, from Chico, Calif., reads as follows:

It is similar to one of the very best California canning peaches; very sweet and rich. It is one of the sweetest peaches of this type I have ever tasted. There is complete absence of bitterness or twang. The fruit is of good size, - plenty large enough. It has a slight blush, and a little red in the flesh next to the pit. The flesh is creamy white. This peach is a typical, full cling, in flavor and texture. It is of the late type and in California would, so far as season is concerned, be a rival of the Phillips, Tuscan, Orange and Lemon, - all of which, however, are yellow peaches and all of Persian ancestry. The California canning peach is of this type.

In the East the Feitcheng would be a rival of the White Heath, which is also of Persian ancestry. It is difficult to say whether one of these two is better than the other. (The White Heath is a superb canning peach.) If the Feitcheng is of the Chinese type it would probably be adapted to the eastern United States, but there are several important questions in this connection which need to be answered:

How far north is Feitcheng (the origin of the peach)?

What is the vigor, the productiveness, and the resistance of the trees to cold?

How tender is the bud?

How resistant to leaf-curl, brown-rot and peach scab?

For California, a very important question would be its resistance to the gumming fungus.

The maximum size of the peach fruit is not usually attained until the trees are ten or twelve years old, and the Feitcheng may become larger when the trees become older.

In his letter of October 25, 1917, from King men, Hupeh, Mr. Meyer made the following comments:

Is it really so that this peach has fruited? It began to look as if we should never get the genuine article. I wonder whether they were born on one of the eight trees which I sent in 1914?

Now will see how popular it becomes with the general public. Well, anyway, I am glad I have succeeded in getting it introduced into the United States.

On September 27, 1917, from King men, Hupeh, Mr. Meyer wrote in part:

I am now at the collecting of these wild pears, but here we also have troubles. My former interpreter who deserted me in July had made a contract for 4,000 cattles of wild pears, to be gotten in early September; now, however, upon coming here, I find that he and the fruit merchant have been misunderstanding each other and it was

the domestic form of the wild pear which ripened in early September. The real wild one has not started yet to become soft and when hard one can not get the seeds out. They are much like wild persimmons in this respect, only they need no frost to blacken and become soft.

I'll surely get 100 lbs. of clean seed of this Pyrus calleryana, but this pear-business really cost more time than I like, it keeps me away from collecting so many other interesting things. Mr. Reimer seems to be in Peking just now and he wrote from Japan that he'll visit me here in King men in early October. Well, I wonder what new discoveries he has made this summer; he surely has not written me too much.

On October 6, 1917, Mr. Meyer wrote from King men transmitting five parcels containing his Nos. 1283 to 1285, 2449a to 2451a, 143b and 145b, later recorded under SPI Nos. 45525 to 45534. All of this material was received in Washington on November 21, 1917, with the exception of No. 45532, which Mr. Meyer sent to the Chico station and which arrived there November 14, 1917. These parcels contained the following material:

SPI No.	45525,	<i>Pycoris aurea</i> ,
	45526,	" "
	45527,	" <i>radiata</i> ,
	45528,	" "
	45529,	<i>Brassica pekinensis</i> ,
	45530,	" "
	45531,	" "
	45532,	<i>Aesculus wilsonii</i> ,
	45533,	<i>Allium</i> sp.,
	45534,	<i>Citrus ichangensis</i> .

As usual, Mr. Meyer made suggestions regarding the disposition of this material. He added:

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The wild calleryana pears are ripening slowly and irregularly and this job to get 100 lbs. of dry, clean seeds is going to take up a whole lot of time. It will make me late for many other good things in the mountains North of Ichang.

The weather here is very changeable. We are getting a good deal of rain and dark, gloomy skies, something like in Central and Western Europe; it makes us people from the North intellectually more active, but on the Chinese it seems to act the other way.

Persimmons are coming in in good numbers, but nothing very special among them; some strange tangerines are also seen, with a wrinkled skin, but they are like condensed vinegar globes to the palate. This whole King men district does not stand out for anything very superlative and one cannot even get potatoes, onions or beef, but of course, it could be much worse.

On October 17, 1917, we sent Mr. Meyer the following cable through the State Department:

Confer as soon as possible with Consul and report by cable on available tonnage and price castor oil, also castor beans. Ship immediately hundred pound lots of best oil varieties. Aviation need estimated at four million bushels.

In confirming the cable the next day, October 18, 1917, Mr. Fairchild wrote:

I trust that you will be able, without having it seriously interfere with your work on the pear, to give immediate attention to this problem of castor oil. My reason for cabling you is that there appears to be a strong probability that the use of castor oil will be found essential to the operation of the thousands of aeroplanes which are now being built as rapidly as possible in this country. Castor oil seems to be the heaviest oil and, of all the vegetable oils, the only one which will retain its viscosity at the high temperatures necessary in the powerful

light motors of the aeroplanes. It is, furthermore, the only oil which is insoluble in gasoline. These properties of castor oil make it the best lubricant for aeroplanes, and although mineral oils are used, they are not as good as castor oil, and the American aeroplane constructors who are at work on this gigantic problem want, if possible, to give the American aviators every possible advantage over those of our enemies. This advantage castor oil will give them, and you can understand that it may be one of the most important points in the war.

I think every one here is convinced that the aviation program is the most important one now, and its growing importance is evident every day. When I tell you that they are planning to put out a hundred thousand aeroplanes, you can get some idea of the magnitude of this program. Aviation has unquestionably come to stay, and I would not be surprised at all to see in our lifetime traffic of a tremendous nature across the Atlantic in these heavier than air machines. They are now flying eighteen thousand feet in the air, and the flights in this rare atmosphere with the same power are much swifter than at sea level. In fact, the possibilities of three hundred miles an hour are what the experienced aviators are looking forward to. One hundred and twenty miles have already been accomplished.

In explanation of the cablegram I would say that what we want in the first place is a general statement as to the available amounts of castor oil which could be secured in China and the probable prices that would have to be paid. I am trusting to your excellent judgment to understand the purport of this cablegram, although I realize that it may be difficult to convey to you the correct idea. I should not have thought of cabling you had it not been apparent from your descriptions connected with certain shipments of castor beans which you sent in several years ago that the Chinese use castor oil for human food. This being the case, I assume that there are somewhere in China large supplies of this oil and that possibly these supplies might be secured quickly. Of course, I realize that the Allies may have already canvassed this whole situation. If so, I feel sure you will report on what you find.

With respect to plantings in this country, the seed supply is very short, and it may be advisable to import from China very large quantities of seed of the best varieties. I have felt that we should certainly get together as quickly as

possible collections of the best types of castor beans which can be obtained anywhere in the world, and those from China, I imagine, are likely to prove as high in their content of oil as any. In fact, I have an idea from looking over the literature on the subject that the Chinese beans are likely to be best suited to our conditions.

My reason for asking you to ship one hundred pound lots at once was to be prepared for the emergency which apparently is coming.

Upon receipt of your cabled report, I can tell better what steps to take, and I may cable you again just what to do. It is interesting to contemplate the changed situation with regard to the castor bean, the market for which has been so poor that the industry has practically died out in this country.

Mr. Meyer wrote regarding this cable on October 25, 1917, from Kingmen, Hupeh, as follows:

Now the Consul General at Hankow writes me "that immediately upon receipt of this cablegram they investigated the conditions as to the local market and ascertained that practically no shipments of either castor oil or castor beans are made from this port. Local exporters state that Newchwang and Dalny act as the chief centers for these products although Shanghai exports small quantities".

What I personally have seen here in Central China of the castor bean I should say it plays a very small roll. One finds it here and there around the edges of the fields, grown for home consumption only apparently. However, should I come across promising varieties I'll send you seeds in as great a quantity as I can get them.

On October 23, 1917, Mr. Fairchild wrote Mr. Meyer the following letter regarding Castanea mollissima:

Doctor Galloway, Mr. Bisset and I spent a day looking over Doctor Van Fleet's fascinating place at Bell, Md. You would be immensely interested to see his dwarf hybrids between the chinquapin and the Japanese chestnut, but you would be particularly interested

in his rows of Castanea mollissima, some of which, though only six or eight feet high, are already in fruit.

The success of Castanea mollissima, the sweet character of the kernels, the precociousness of the tree, and the fact that many of the seeds which were distributed through the Pennsylvania chestnut bark disease organization have failed, make me feel that we ought to make a drive on this Castanea mollissima as a nut producing species for orchard purposes. This being the case, would it be possible for you to collect or have collected a considerable quantity of seed - several hundred pounds - and ship them through by the shortest route to San Francisco. Now that Doctor Van Fleet has broken up Castanea crenata and Castanea pumila and has hybrids of these species, if they behave anything like Citrus trees do, it may be possible to work into these hybrids all the other forms and species of Castanea, at least, such as will add valuable characteristics. This being the case, would it not be advisable during your stay in China to get, if you can, any species of chinquapin which exists there and particularly the large species of Castanea which Wilson pictures in his album and which I believe was described as Castanea vilmoriniana. I will leave to your judgment the amount of these to secure, assuring you, however, that we shall be in a position to handle a good many thousand seeds of any species of chestnut which you may secure out there.

On October 24, 1917, from King men, Hupeh, Mr. Meyer wrote:

There are times that a person writes letter after letter and there are periods that one but scribbles a few lines in a long time.

Well, I have been in one of these last mentioned periods. I have had great difficulties with this pear-seeds problem, with much uncongenial weather and with personal indisposition. There is at the present much malaria and dysentery here in this district and I have had an attack of the last; I am about over it now but it is an unpleasant disease. Mr. Johnson, a Swedish-American missionary here, has it very serious and a

doctor is on the road coming 4 days away from here. That's the trouble in these interior places, medical help is not to be had. The missionaries here have been very kind to me and by supplying me with the right sort of food I was able to shake it off after a few days only.

The pear troubles are more serious. I cannot get pure Pyrus calleryana; P. betulifolia in some of its forms is so much like the other that only when there are leaves attached to the fruits can one distinguish between the two. Now since the fruits were all brought in while still hard, it is only now that they are getting ripe, that one can say which is which, for the true calleryana turns dark brown when ripe and soft, while P. betulifolia becomes perfectly black. You may imagine what a work it is to go thru 5,000 lbs. of fruits and pick out those that are not wanted. However, we are doing it the best we can. This is a new work and one has to learn how to do it best. I got already c.a. 20 lbs. of clean dry seeds, but we want at least 5 times as much.

Prof. Reimer also had bad luck up at Shing lung shan, almost no fruit at all, he wrote me. I am very glad, therefore, I went there last winter and got what little I sent in. This calleryana-pear problem prevents me from doing almost anything else and the more so since my interpreter is not fit for such a big task like this.--Well, we will get thru it again.

Prof. Reimer is now on the way to see me and tomorrow he will arrive. Then we'll settle a few points and both of us will feel relieved, I dare say.

I am in receipt of several letters from you and I'll answer them chronologically.

Letter of July 27, 1917. I see your remarks concerning Washington being so busy on account of the war. It must be interesting to watch the change.

And our office removed to 13th and F Streets. This is a bad thing. It takes us further away from plants and the out-of-doors than ever before and besides, far away from all the other workers. I consider it a bad piece of business.

About your contact with us being not as intimate as formerly. Yes, this is to be regretted most strongly. To a man far away, like myself, cordial letters, full of suggestions and information, are about the only things that keep him in

contact with his head office and when one's chief is so busy with other things then naturally one gets that feeling that one's work is of not much account any longer and one gets that loose feeling of a homeless child in the street. And from other members of the Office one also receives but little information. Even explorers notes are not sent out any longer, I suppose on account of shortage of help in the Office, but the effect is the same.

As regards bean-products, I am still on the lookout for novelties; a clever assistant I need to bring in more information. I have written already to the University of Nanking for a good man, but Mr. Reisner wrote back that they hadn't any one suitable for this work of mine. However, I'll keep at it.

As regards the drying of fruits and vegetables by the Chinese, these things are done in such primitive ways and under such appallingly unsanitary conditions that one marvels that this race has not been exterminated long ago. On one place one sees a lot of hides laying, coming from animals that have died from anthrax and which are covered with flies and next to it strips of squashes lay on a tray and the same flies alight all the time on these drying strips of squash. Next to a cess-pool cabbage and rape leaves hang on a line, etc.

I notice your remark concerning mumes as used universally in Japan. This will be a nice piece of business for a young fellow who wants to explore Japan. Here in China the mume or "Ching mae", as it is called, is not as much in use. One gets it as a high class delicacy, when preserved in syrup and it is eaten here and there in season as an appetizer, when salted, but it is not a common article of food. In the Chekiang Prov. especially there are big orchards of these plums and I'll see what I can find out when down South.

I suppose you took several fotos of your mumes and of the various types of fruits. If so, I would like to receive a few copies.

You want various types of preserved mumes; there are several in these small bottles in the collection that Mr. Young used to take care of; please let them be gotten out. Then in Chinese stores one can get several types also, perhaps Mr. Menderson, when he is on the hunt for bean cheese and bean sprouts, can lay his hands on some of these things at the same time.

I'll be glad to receive this list of jujubes that Mr. Russell is working upon.

You say that I do not say much about bamboos. Well, the Hupeh Prov. is not exactly a bamboo region; the land at large is too sterile for the better types of bamboo. You say it is very unfortunate that we didn't start our plantation somewhere on the Mississippi delta or near Savannah. Well, Mr. Fairchild, it is not too late yet. If you get hold of a suitable piece of land and of a man who is willing to stick to this bamboo problem, please go ahead. I considered Brooksville mainly as a propagation station and when once hundreds of groves had been set out then our main object would have been fulfilled. The economic end means the devotion of a man's life to this problem entirely.

I am really sorry you felt obliged to go back to Washington, D. C., after you once were in Savannah. Couldn't somebody else have attended to the war program in Washington? The acquisition of a bamboo grove is fully as important, in my opinion, as many a war-program item.

I see your considerations about what I might do when once back again. True, no one but one's self knows what things would suit one best, but still -- some advice, some suggestions, they often show one roads where one didn't expect them. One thing is sure and that is that the office life pure and simple is not in my line. I must have plants around me and must be able to visit collections of living plants frequently for study and inspiration. I'll see what comes up in the next few years.

Since the Government does not give pensions and since living expenses are getting to be higher and higher, what are the chances for advancement in my line of work? To what limit can an explorer in the field climb up in this service? Please let me hear a few lines about this in a next letter.

Letter of August 8, 1917. I am very glad to hear that Mr. Groff was in Washington for some time, but -- I myself would like to have seen his pictures and listen to what he has to say on lychee and other fruit problems. I trust to meet him in Canton some day this winter. Should his interviews with you have been of such a nature as to inform you about matters which are of high interest to me also, then I would be much pleased to receive a copy of some notes in your desk-book

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on subjects he discussed.

About bringing out a young Chinese genius out of any of these colleges and schools that abound in China. Yes, this would be of high and lasting interest. I myself am very doubtful, however, whether it soon will be done. In medical lines they are getting already some very smart Chinese doctors; in our work, however, no, not yet. They are still groping what to do! What I have seen of young Chinese scientists was, that they had no grasp of world-wide affairs; when they are left alone they fall upon unimportant details like counting the hairs on the tail of a mouse, while studying the color of its skin in connection with surrounding places of hiding.

I see your remark concerning Wilson Popenoe and South China exploration. Well, any time you and he discuss this theme, please let me know. Or, any time you come across a young fellow who wants to take up this exploration work as a life's devotion, please mention South China and the Himalayan countries as possible fields.--I feel the evening of life slowly descending upon me and the fearful sorrow which hangs all over the earth does not make life the same it once used to be. The loneliness and responsibilities, therefore, seem to become to me heavier and heavier and some time, not too far distant, I'll lay down this heavy cloak and will suggest a younger man to take it up.

Well, I'll break off here for the time being, for I have to receive more pear seeds. We are having a wondrous beautiful day, quite warm and so different from what it has been these last weeks with rainy and dark weather.

The new beeches are coming in, also Ichang lemons in many varieties and Tamopan persimmons, measuring over 12 inches in circumference.

In a letter written the next day, October 25, 1917, at King men, Mr. Meyer wrote:

We here in China also live in troublous times; fighting going on everywhere; Szechuan full of robber-bands; Canton and surroundings in rebellion, outlaws in all provinces, just now it is unsafe to go outside Jehol even, so

many robber-bands there are there. Then these terrific floods in the valley of the Yellow River and the North River; there surely will be famine here this winter in many districts.

And now China has given permission to export all of the rice and grains that the Allies are able to get out of China. This means that speculators will transfer all these foodstuffs to some of the ports and hold them there awaiting favorable opportunities. What this means here in this land the future only can tell, but -- it forebodes ill!.....

Then I am enclosing a clipping from the Am. Florist on Chinese cabbage, which Mr. Stuntz sent me, but which I think important enough to be filed. To grow pai ts'ai in greenhouses is indeed well worth trying on a big scale.

Then I was informed that the Chinese here and there make a curd from ground acorns, which is eaten by the people.--It seems that especially acorns of Quercus serrata are used. Is there anybody interested in making new foods out of acorns, horse-chestnuts and buckeyes?

Under date of October 27, 1917, Dr. Galloway wrote Mr. Meyer the following interesting letter:

Dear Friend Meyer:

I have just read your last letter to Mr. Fairchild.....

We are just cleaning up the last shipment you sent in--the big box with soy beans, rice, bean cheese, bean curds, mustard seed, entomological and pathological specimens, etc. This shipment was somewhat difficult to handle on account of the large number of small lots. The box was a long time on the road and had evidently been shifted about in many and devious places before it reached us. Shipping conditions are so very unsatisfactory now that it is quite remarkable that we are having so little trouble as we are actually experiencing. There is one fact in connection with shipping which is of interest, and that is, direct traffic has now been established between Java and the Pacific coast, so that we are in a position to get material more readily from Java than ever before.

All the material in the box has finally been passed upon by the various inspectors and it will

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soon be ready for disposal in accordance with the general instructions in your letter. Some of the rice samples are pretty badly infested with several species of grain weevils, one of which according to the entomologists, appears to be new in this country. Under the regulations of the Federal Horticultural Board it is necessary to treat all material coming from regions where citrus grows or is likely to grow, so that materials sent in from any warm section of the world must undergo the prescribed treatments for insects and also the so-called precautionary treatments against citrus canker. When it comes to treating large quantities of mustard seed, for example, or cabbage or radish seed, we have difficulty in carrying out the treatments and at the same time not injuring the material.

In a good many of the seeds that come from China, especially seed like mustard and perilla, or any seed that is likely to be threshed or cleaned on the ground, considerable quantities of sclerotia are frequently found. These sclerotia are somewhat puzzling to the pathologists, as it is difficult to understand why they should be so abundant. The last lot of mustard seed you sent contained considerable quantities of the sclerotia. Professor Whetzel, of Cornell, is spending the winter here and the sclerotia are being turned over to him. He has been working on this group for several years.

I note what you say regarding Professor Reimer and his securing pear stocks. Prof. Reimer must have spent considerable time in Japan. A short time ago there was published as an Associated Press dispatch a cable from Tokio giving a somewhat remarkable statement regarding Prof. Reimer and his work. We have not yet been able to determine whether the weirdness of the dispatch was due to the imagination of some newspaper reporter or whether it originated from other causes. The dispatch stated that Prof. Reimer had discovered, at some point in Japan, just where I do not recall, the original home of the blight-proof pear. We figured that what he had probably found was a large plant of the true Pyrus ussuriensis. Ever since our visit to Professor Reimer's station last fall we have been accumulating information and data on the pear, with particular reference to the best manner of assembling, propagating, and distributing blight-resistant or supposedly

blight-resistant stocks. We believe that one of the first steps should be the location of all available material in this country that is definitely known to be a true Pyrus ussuriensis and P. calleryana, and to take steps for the rapid propagation of both of these species as early as practicable. To this end we have taken steps to locate all introductions of Pyrus from the Orient, with a view to following them up and knowing their true relationships. We are not entirely clear as to whether there is likely to be any great demand for the stocks. We are inclined to believe that the method of utilizing a blight-resistant body as a sort of sub-structure for the rest of the tree needs to be given careful study in many parts of the country. The use of a blight-resistant sub-structure may prove advantageous in sections of the West, especially of the Northwest, where Prof. Reimer is now located, but it is a question as to whether the use of such methods in the East and South would be of any material advantage. We believe that it is highly important that all the cultivated strains of P. ussuriensis and P. calleryana should be thoroughly tested out here, both as to blight resistance and fruiting value.

As you know, Dr. Van Fleet is now at work on the hybridization of the pear, with a view to seeing if he can secure something in the way of a good fruiting variety that will have blight resistance.

If P. ussuriensis, especially the cultivated forms which you sent in last winter, manifests blight resistance we will have made quite a long step in giving Dr. Van Fleet a start over the ordinary species, with its very small, insignificant fruit. We are planning, therefore, to put into Dr. Van Fleet's hands next spring grafting wood of all the cultivated forms of P. ussuriensis that you have sent in. If you send any more in this year, and if you send any P. calleryana, as you indicate in your letter, these will be included in the work planned for Dr. Van Fleet. By grafting wood from seedlings grown this year into old trees, either here or at Chico, we can probably get flowers of the P. ussuriensis types soon, perhaps the second year.

Speaking of Dr. Van Fleet brings up the very interesting work he is now doing in connection

with his little breeding station at Bell, Maryland. He is situated where he is under almost ideal conditions for good work. He is not bothered with administrative detail and is a sort of free lance to go and do as he pleases. He is certainly getting results with his chestnuts, roses, raspberries, and a number of other things. I am sending you herewith a memorandum setting forth some of the points we noted on a recent visit to the little station. Since writing this memorandum we have made another visit in company with Mr. Fairchild and Mr. Bisset, went over the work carefully, and are making plans to distribute some of Dr. Van Fleet's best chestnuts through our office. Dr. Van Fleet is strongly of the opinion that we should push the distribution of Castanea mollissima further. I must say that of all the chestnuts we tested at the Doctor's, C. mollissima was, to our taste, about the head of the list. It was fruiting about as freely as any of his hybrids and was resisting blight very well. The Doctor's little orchard is only a short distance from a large grove of old chestnut trees that are badly blighted. There was a little blight on some C. mollissima, but it was the blight and not the trees that was having the struggle. Insofar as the chestnut fruit is concerned it looks as though the Doctor had practically solved the problem, even though all of our American chestnuts disappear with the blight, as is likely to be the case in the next decade. The problem of a suitable tree for wood, and telephone and telegraph poles, however, is still an open one, and as more than twenty-five per cent of all our telephone poles are chestnut it is important that a substitute be secured.

Mr Fairchild is writing you in regard to Castanea vilmoriniana and the securing of seeds of this valuable species. Getting seed through to us is somewhat of a problem. Of chestnuts and chinquapins Dr. Van Fleet says only about fifty per cent germinate. The shipment of C. mollissima which you sent in last winter was, I understand, all lost. Dr. Van Fleet is interested in all chinquapins and particularly in anything in the way of dwarf chinquapins from China. I hope you may be able to run across something of this nature and again send us some of the seed.

.....

You may be interested in knowing something of the success of Wilson Popenoe's avocado work. All of his material has been sent here and practically all of his budwood has been handled by Mr. Goucher in our detention house here in Washington. Mr. Popenoe has collected altogether about thirty different types from sea level to as high as 8,500 feet elevation. He has finally sifted out the collection to about sixteen to eighteen fine types. Of these we now have from twelve to fourteen hundred good plants growing in our detention houses. At first we had considerable difficulty in handling the buds, but later, by improved methods of packing, they came through in better shape, with the result that early in the next year a systematic plan will be inaugurated for fruiting out the desirable types. Half a dozen or more reliable men will be selected in Florida and the same number in California, and they will be furnished with sufficient material for the thorough fruiting out of the varieties, and until this is accomplished no further distribution will be made.

In all these new industries there is the danger of exploitation by the professional nurserymen and others. Where there is a demand for certain types of fruit or other plant materials the more so-called varieties a nurseryman can develop the more opportunities there are, of course, for money making. The avocado is a good example of one fruit that has been exploited in this respect. There are probably a hundred to a hundred and fifty so-called varieties being grown by nurserymen and others, while as a matter of fact all of the desirable varieties could probably be sifted down to eight or ten good types. The California Avocado Association is taking steps in this direction and has named eight varieties as standards.

I am not sure whether Mr. Fairchild has written you regarding the interest aroused in this country in the castor bean. The remarkable development in aviation and the manufacture of thousands of aeroplanes have created a demand for a lubricant which it is thought can best be met by the use of castor oil. You probably know of the enormous sums of money that have been appropriated for aviation work in this country, aggregating within the last year

something in the neighborhood of a billion dollars. I was told some time ago that the War Department was making every effort to secure castor-oil beans and was still many millions of bushels short. China has long been growing this crop and you have already sent in some interesting types. Under existing labor conditions and under labor conditions that are likely to exist after the war we are of the opinion that if this crop is to be successfully grown in this country it will have to be more or less on a machinery basis, that is, hand picking and hand threshing of the crop will be too costly for practical purposes. With these points in mind it would seem highly desirable to secure if possible good dwarf castor beans, which could be cut and harvested like cowpeas or soy beans and threshed after somewhat the same fashion. We have one or two dwarf kinds growing this year. Of course along with the dwarf habits there should necessarily be prolificacy, so far as the beans are concerned, and also prolificacy so far as oil-producing capabilities are concerned.

Prof. J. B. S. Norton, of the Maryland Agricultural College, has just turned over to the Office his valuable set of castor bean seed, which he has been bringing together and collecting for the last five or six years. There are 290 different types. It is planned to test these out in a preliminary way at Yarrow and place the best types where they can have more extensive testing in the field.

Anything that you might find, therefore, in the way of castor beans having special value would be very useful to us.

Hoping that you are well and that you are prospering so far as one can prosper in a far-distant country among strangers, I remain,

On October 29, 1917, from Kingmen, Hupeh, Mr. Meyer wrote as follows regarding Prof. Reimer's arrival and his work:

Prof. Reimer arrived here on the 26th of October and ever since we have discussed the pear situation and gone out to look at wild and at cultivated pear trees.

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Many are the problems that arise in connection with these pear questions. I'll touch upon a few. See here a few points.

I probably will get between 100 and 150 lbs. of clean seeds of Pyrus calleryana, but -- a small percentage of P. betulaeifolia will be mixed among this lot.

Mr. Reimer says that we cannot sow it any thicker than 10 lbs. p. acre, also this quantity of seeds means 10 to 15 acres of good land.

Since there is P. betulaeifolia among it, the field must be gone over by a man who knows the difference between the two species and rogue out all P. betulaeifolia and doubtful looking specimens.

Prof. Reimer is willing to point out the differences between the desirable and the undesirable specimens and he would prefer to have the place where these pears are being grown not too far away from Talent. Chico would be an ideal place in his opinion. This pear seed should under no consideration be distributed to various parties, since it is not all of one species.

The rows between these pear seedlings can be 2-1/2 to 3 feet apart.

Around here there are a few specimens that seem to be hybrids between P. calleryana and P. betulaeifolia, but they are rare.

Where P. calleryana occurs one also finds P. betulaeifolia and cultivated varieties of P. serotina, P. calleryana and perhaps P. serrulata; the chances for hybridization, therefore, seem very great.

Prof. Reimer found P. calleryana in So. Japan and in So. and Central Korea where no other species of pears occur and he has arranged with a representative of the Yokohama Nursery Co. to have seeds collected in these localities.

Prof. Reimer has but little space available at his station and since I am giving him some seeds he does not desire any more from our Office.

He collected but a few ounces of seeds of the wild P. ussuriensis, since the crop was a failure, not only at Shing lung shan, but also in Manchuria.

Prof. Reimer has followed my footsteps mainly while in search for pears here in China; he considers the Ya kwam li (SPI 17724, 17725, and 21253) of extreme value as a eating pear and for hybridization work. He is of the opinion that it is P. ussuriensis or if not pure ussuriensis, certainly for a very great percentage so.

He states that nowhere in Japan where he came did he see any Pyrus ussuriensis or not even hybrids of the last. All Japanese pears belong to P. serotina.

I took him out today to see cultivated forms of P. calleryana, but he is not sure that my discovery is what I claim it to be, viz., that the calleryana pear here in China has actually given rise to cultivated forms. He will wait and see how seedlings are going to behave of these forms; (my number 2446a.)

We both agree that these pear problems cannot be settled in one season; his coming out only makes him realize the bigness of the whole proposition.

He also feels that to be absolutely sure of the right sort of immune stock and to be certain that no obnoxious insects are being imported, the seeds should be grown in the United States, but at such isolated localities where no hybridization is possible.

We are having uncongenial weather, rainy, cold and dark, not at all pleasant to go out and take fotos. The cleaning of the 5,000 lbs. of pears proceeds all right and I have already over 25 lbs. of clean, dry seeds.--Our intentions are to leave for Ichang on the 31st of October. There we'll investigate more about wild P. serotina and P. serrulata and I'll go N. W. to collect various things, while Prof. Reimer wants to return again to Peking and the Shing lung shan region to collect scions of various pears. We'll see how much luck he has in taking these scions home and passing the quarantine regulations.

Whether on the whole his coming out has been worth the expenditures and the efforts is a question which is debatable.

Well, this is about all for the present.

On November 2, 1917, from King men, Hupeh, Mr. Meyer transmitted 8 parcels of seeds, his Nos. 2453a and 2454a, SPI No. 45592, wild Pyrus calleryana, and SPI No. 45593, Pistacia chinensis. This shipment also contained 39 lbs. of wild pear seed, given SPI No. 45594, and 20 lbs. of wild peach seed, given SPI No. 45595, both lots collected at Mr.

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Meyer's request by Mr. G. C. Schlosser. This material reached us on December 19, 1917. Mr. Meyer wrote in this letter of November 2, regarding his work with Prof. Reimer on the pear problem, as follows:

Prof. Reimer is strongly of the opinion that we should not grow these pears at more than one locality and he would prefer Chico, since he could visit it easily from his station at Talent. Have we got there c.a. 15 acres available for this work? If not, could arrangements be made to rent additional land?

We are not sure of course that the Pyrus betulaeifolia from around here is fully as susceptible to blight as the northern forms are, but, on the other hand, there is no valid reason to suppose that it is not less so.

Mr. Reimer and I have been discussing some interesting facts, for instance, how far North does Pyrus calleryana occur and how far South does P. betulaeifolia run. Wilson apparently never found the last in Hupeh, for it is not mentioned in *Plantae Wilsonianae*. In the Inventory No. 38 I see under No. 37500 that P. calleryana occurs in Shantung; where was this information obtained? I notice that Hupeh has been left out, so has Chekiang and Japan and Korea. I wonder who made up that note?

Another problem we went over is this: who is going to prevent nurserymen from selling any old stock as the true calleryana or the true ussuriensis? P. Calleryana may get winter killed in cold localities while P. ussuriensis may be totally unfit for southern sections, and the damage done to fruit growing might be very considerable should these stocks be mixed up.

Another fact is this: Prof. Reimer has stated to representatives of the Yokohama Nursery Co. in Japan that American fruit growers were in great need of quantities of seeds of the true calleryana pear, as occurs in Southern Japan and in South and Central Korea where no P. betulaeifolia is found, and of the true ussuriensis as occurs in Central and North Manchuria, and to members of the American Legation he has stated that we want a lot of seeds of the ussuriensis from the Shing lung shan region. Now who is going to receive these seeds and who will pay for them?--These problems may come up already next fall and winter.

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Another matter is this: where are we going to find in America suitable locations for seed-bearing groves of trees of both the calleryana and the ussuriensis? In wild sections we cannot protect the trees or prevent animals from carrying away the fruits and in settled districts there are nearly always some cultivated pears nearby which may pollinate our wild-type trees and render the seeds of inferior value.

Prof. Reimer brought up some more arguments; one is this: will the calleryana pear be a suitable stock for all cultivated varieties of pears? Will the true ussuriensis pear be a congenial stock for all cultivated varieties of pears? Will they give their hosts long life or will they not? Will the union be so perfect that storms will not blow them off, like happens to pears that were grafted on quince-stocks in California? Will soils influence the root-systems of these pears more than they do those of the Japanese forms of Pyrus serotina or the French P. communis, which are used now so commonly all over the United States.

Concerning hybridization experiments he asks these questions: will hybrids between P. communis and P. ussuriensis and with P. calleryana produce trees that bear fine quality fruits and are immune to fire-blight at the same time?--Only long and careful experiments can settle these questions, he says, and we are just at the very beginning of most interesting lines of most constructive work; I certainly think that we all have to agree with him in this matter.

Concerning the very great amount of time that I have been giving these pear-problems during the last year especially, Prof. Reimer is of the opinion that it is well worth while. He thinks my work alone is worth several hundreds of thousands of dollars to pear-growers all over the United States. The collecting of seeds of Pyrus calleryana alone will supply him and hundreds of others with sufficient material for experiments for many years to come. This appreciation from him pleases me quite well; it offsets some of the sorrow that I have at the loss of most of my former introductions of species and varieties of pears.

I showed Prof. Reimer my note No. 2446a (SPI No. 45586) of this cultivated P. calleryana. He remarks that he would not advise inoculating one year old seedlings with the blight-virus, since

the trees might die down entirely. The young growth of calleryana is quite susceptible to blight; in greenhouse experiments he has had it that from 2 to 3 feet of branch died back below the point of inoculation. (This occurred with the type from Oroville, Calif.)

He also advises us to grow this No. 2446a by ourselves for some time until its value as regards resistancy to blight can be determined. Should it be distributed it should be done so with reserve concerning its value.--I trust you'll inform Mr. Bisset about this matter.

One question I would like to have answered, if possible. How many stocks for pears are used annually in the United States by nurserymen? Are statistics available? How many plants of P. calleryana would be wanted annually for the mild-wintered regions of the United States? How many P. ussuriensis would be desired every year for the colder pear-growing sections of the United States?

I am giving Prof. Reimer unreservedly all of the information on pears and connecting problems that I have collected in all of these years and around here I have taken him to special trees which often has taken me a few weeks to spot. He is taking many fotos and I suppose his observations may appear quicker into print than mine; it is a somewhat painful task to give away all of one's information, but then -- pioneer work, like I am doing, is a missionary work, one is the sower and others are the reapers! -- It is all for a good purpose and the benefits fall to all humanity.

Our intentions were to have left several days ago for Ichang, but it has been raining again for many days and nights and not only that all our baggage would get ruined but the condition of the trail beggars description. We hope that the revolution, which rages in Szechuan and Hunan, is not carried into Hupeh, but,-- things do not look bright here in China.

P. S. Please discuss some of the questions mentioned with Mr. Waite and Dr. Galloway, should you have the time. Mr. Dorsett may know whether we have the land available at Chico for all of this pear seed.

On November 8, 1917, Mr. Fairchild wrote Mr. Meyer as follows:

Replying to your letter of September 8 from King men, I am glad to read between the lines that you are in good spirits. I had not thought of the effect of the war on the railroad conditions in China. Evidently the ramifications of this war reach to every part of the planet.

Mrs. Kin is back again from China, with a lot of information in regard to soy sauce, bean curds, etc. I have only had a short talk with her, but she is more enthusiastic about the soy bean than ever. She is writing a report for the Bureau of Chemistry, and I believe she then goes on the stump as a lecturer. I am urging her to talk about these bean cheeses and arouse our people's interest in them.

I am rather surprised that Mr. Reimer did not let you know why he could not reach Hankow in September. I know, however, that a man's first experience in a foreign country somewhat upsets his plans, and he is not entirely responsible. Do not be discouraged in regard to the amount of time and funds you have put into these pear seeds, for there are others as well as Mr. Reimer interested in them. The work of producing better hybrids between the Chinese and European pear is an important one and is being pushed by Doctor Van Fleet, as you will see by the long letter which Doctor Galloway has just written you.

I am glad to see that you have twenty-five pounds of clean seed of Pyrus calleryana. I believe these will hardly fail to have in them something of extreme value for this country.

The collection of these wild species of Pyrus reminds me to inform you that one of Doctor Harper's students has discovered a Xylaria disease which attacks the apple. He is now working out methods for testing the immunity of different apple stocks to this Xylaria disease. He says that 25% of the trees in Virginia are often attacked by this parasite and that 75% of replants succumb to it. He finds no orchard where the replants are successful. He is planning to put out, just as Reimer did, an orchard of different species of Malus and other closely related genera, such as Pyrus and Crataegus, which are promising as stocks for the apple, and by means of inoculations test the immunity of these different species. If you run across any wild species of

Malus, do not fail to get seeds of them for this experiment at Blacksburg, Va.

In regard to the demand for the calleryana seed, by American nurserymen, I think we should look ahead and plan for a grove somewhere in California or Texas where the seed could be home-grown. It would be a dangerous thing to keep on introducing from China the seeds of any species for stock purposes. I am glad you called my attention to this necessity.

I should like to know more about this branch of the Yokohama Nursery Company in Hankow. Are they going into the Chinese nursery business extensively, to supply China with plants, or is this simply the buying office for their own Japanese and European trade?

You will be interested to know that Mr. Russell is struggling with the processing of the jujube at Chico, and that it is a contest between Beagles and Russell as to who will get the fruits. We are pushing Beagles for plants and Russell for candied fruits. Mr. Mills has set his heart on putting out five acres, and we are considering the planting of acre plantations at various points in the Southwest. Dorsett and I have considered the Mills proposition, the Yuma Experiment Station, at Indio with Drummond, Austin, Texas, with Ramsey, College Station, Texas, with Youngblood, Waterloo, Kansas, and possibly Augusta, Georgia. Have you any suggestions to make as to these localities?

In regard to Ramsey's getting seed of the calleryana pear, we shall attend to that.

Thanks very much for your criticisms on Plant Immigrants. Mr. Stuntz has already written you regarding these.

In regard to these early spring varieties of Chinese cabbage, are they not a little strong? I have tried to eat some of them and found them so strong in flavor that it was difficult to do so. The winter forms, which are delicious, are selling regularly on our markets here for \$.25 apiece.

Your description of the new dish made from Ficus repens and agar-agar sounds very interesting. We make jellies here, using agar-agar, but I have never tasted the seeds of Ficus repens. What do they taste like?

I think it would be well to investigate

further, if you can, the rumor that the leaves of Eucommia ulmoides are useful in the cure of sores. They are making some remarkable discoveries in connection with these matters, and the most recent is the isolation of a substance contained in the pituitary gland, which is the gland controlling the growth of human beings. This has been patented, and the owner of the patent has turned his patent over to the University of California. The use of this substance is said to start recalcitrant wounds into activity.

The discovery of the chestnut blight on Castanea mollissima is another knock at this species which we hoped would be entirely immune. I will let Doctor Shear know about this.

I am sorry to hear that Mr. Morrison has sold his library, but what else could we expect?

Under date of November 10, 1917, from Ichang, Mr. Meyer wrote Mr. Fairchild the following post card:

Prof. Reimer and self have been here three days and we are leaving again today for a week's trip in the mountains north of here in search of wild Pyrus serotina, P. serrulata and Citrus ichangensis. I despatched again c.a. 25 lbs. of seeds of Pyrus calleryana from here to the Consul at Shanghai. I hope it will reach you O. K. The weather is clear today for the first time in weeks and we expect to have a pleasant and successful trip.

The Pyrus calleryana seed referred to is a portion of that recorded under SPI No. 45592.--On November 27, 1917, Mr. Meyer wrote the following very interesting letter at Hsing shan hsien, six days' march west of Ichang, Hupeh, China:

Here I am sitting in a hole of a town, all surrounded by high mountains, on which a slight snowfall has been deposited during the past night. The flanks of these mountains are brown with the withered vegetation but here and there a tall tree stands out as a bit of flaming red and purple, some scrub of Rhus cotinus is blazing carmin, and a few bushes of Rhus javanica are of an indescribably warm hue of orange-red. The Indian summer is speeding to its close and

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soon winter will set in. I am trying to round up several things which we ought to have collected long ago had these wild pears not kept me down at King men.

Prof. Reimer has come and has gone again and is now collecting scions of desired pear varieties around Peking. Our sojourn was quite interesting, tho' of course he is a narrow specialist and takes very little interest in things outside of pears. Specialists are apt to be selfish and are at times sponge-like, and an all-around man gets of course at times "fed up" with the same sort of a dish served morning, night and noon.-- Well, I have given him all the information and assistance I was able to and I trust it has been of considerable help to him.

There is one thing that Mr. Reimer and I did not agree upon, viz., the fact that I thought that the one hundred pounds of Calleryana pear seeds should not go entirely to Talent, like he wished it to be and I suggested to him to straighten this matter out with you. A small station like Talent, whose support depends so much on the good will of a community of fruit growers, naturally wants to get in well with such people and present them with immune stocks but -- my time given to this problem, - and do not let people think it was a small amount either, - has been Federal time and I think other pear growers also should be supplied with plants of the seeds that I got together. What is your own opinion about it and that of others interested in immune pear stocks?

Now since Pacific Coast nurserymen and fruit-growers will watch Prof. Reimer's demonstration with close observation, it would be well for you to have Chico give extra care to these pear seeds! They should be soaked in water for 24 hours and stratified, if possible. Do not wait until all seeds have arrived. I sent off circa 65 lbs. and maybe another quantity is waiting me in King men when I get there.

Prof. Reimer was afraid he wouldn't get seeds enough from us and he has collected himself a few hundred pounds of fruits of P. calleryana when we were on the Chin kang shan, a day's journey N. W. of Ichang. He has taken these with him to Peking to have them cleaned there. He thought that these fruits coming from an elevation of over 3000 ft. a.s. would be of a hardier type than

those from King men, which is circa 800 ft. a.s. But -- in these high elevations one finds coir palms and loquats doing well, but in King men these plants have a hard time, as the winters are more severe there than in those sheltered high mountain regions.

And as regards chances of hybridization, they are fully as bad there in the mountains as at King men for we found next to the calleryana trees wild specimens of Pyrus betulae-folia and this doubtful P. serrulata Rehder, which may be a hybrid, in Mr. Reimer's opinion.

What I have seen now of wild pears in China I must say that no place in the North beats the Shing lung shan district for this invaluable P. ussuriensis, while there is but one King men for quantities of P. calleryana. Of course I may still discover better localities!

Prof. Reimer and I discussed some of the following problems: does Pyrus serotina hybridize with P. calleryana and with P. betulae-folia, with whom it grows in close company.

Is my improved P. calleryana a hybrid? Prof. Reimer thinks so, but I doubt it, since all the leaves are crenulated on the whole tree and not some serrated while others are crenated like on P. serrulata.

Actual experiments only will solve these problems and this means time, funds, land and the right men to do this work conscientiously.-- And this brings me to this subject.-- -- Prof. Reimer acknowledged that his work really had grown to be too big already for his little station and he doubted whether Oregon could properly be called upon to give him all what he desired in his pear breeding work. I suggested that he might either enter Federal Service or solicit Federal aid for his work. He is undecided as yet what would be best. He is of the opinion that he should talk over his pear problems with some of you there in Washington and he wants to give advice as how to handle our pear problems. The month of February would suit him well. I leave this problem now in your hands.

Prof. Reimer is of the southern type of men, tho born in Michigan. He will stick to his problem thru thick and thin, but when older he

might get somewhat sordid, like so many an elderly fellow, especially those in Government employ. High pay has no special attraction for him, but he likes to be left alone in his investigations. Voila tout, as our French friends are in the habit of saying.

Same day; 5 p.m.

A few hours ago I delivered to the local P. O. here a small wooden box, made to order, addressed to the American Consul-General at Shanghai, marked D.A. 29 and containing 12 fruits of the wild Citrus ichangensis, 2455a, and some fruits of a smooth variety of Yang tao, 2456a. How these specimens will arrive after their long journey in winter time I have no idea. It only is an attempt, like so much in life is. Mr. Swingle might be given most of the citrus fruits, but we should also plant out a few at Chico for seed-bearing purposes.

I am highly pleased with the Yang tao and the more I see of them the more do I come to the conclusion that it is a coming fruit for the Southern United States. The fruits keep well into winter, they ship well, especially after having been subjected to a few frosts. They are of excellent flavor, being a combination of gooseberry, rhubarb, pineapple and guava. They have the habit of setting one's teeth on edge, just like pineapples and blueberries do and they are laxative. Only the vines are not very hardy. Where one finds them grow well, one notices coir palms, loquats, lucidum privets and bamboos around the farmsteads. Zero temperatures may hurt them badly, I am afraid. The plants also will have to be grown like muscadine grapes, that is, on high arbors and they might have to be bruised to make them bear heavy. In the wild state at least I noticed that plants subjected to strong mountain winds that twisted them around at times bore much heavier than those growing well sheltered. I am sure that in the rolling sections of the Carolinas, Georgia, northern Florida, etc., where loquats survive for ten or more years the Yang tao will do well and of course in many parts of California it should thrive too.

I am now specially trying to get wild Ichang lemons for Mr. Swingle. He wrote Mr. Edward Gilchrist, Commissioner of Customs, at Ichang, under date of July 11, 1917, to get him fruits and herbarium specimens of wild Citrus ichangensis, but

Mr. Gilchrist cannot give these problems any of his time and has turned over the whole thing to me.

Later on I will write more on this subject, but it will suffice to say that Citrus ichangensis is like the Yang tao, - it is not very hardy. Altho' one finds it at 4000 ft. a.s. one finds coir palms, pummeloos, loquats, candle-berry trees, lucidum privets, tall bamboos in gardens nearby. These high altitudes in a very mountainous country are misleading, - it is not as cold there as further south in level regions.

Mr. Swingle wants a large quantity of seeds for stock purposes. Well, I may come across great masses yet, but as far as I have seen already this wild Citrus ichangensis is decidedly a rare plant! To get large quantities of seeds we shall have to grow them ourselves in the United States. Parts of Texas might suit this plant well and I suggest to Mr. Swingle to have arrangements made to set out a few groves far away from any other citrus trees.

I discovered today that a true citron is being cultivated around here. It is quite rare and I think it might have been introduced from abroad. The large ribbed fruit is delightfully fragrant, and the strawberry-like odor of a basket of Yang taos, the pungent aroma of a few cultivated Ichang lemons, the spicy-sweet scent of this citron, and the bitter-aromatic exhalation of a very large pummelo, make my room like a bed of "waldmeister" (Asperula odorata) on a fresh morning in May.

Tomorrow we shall leave for a high mountain 1-1/2 days N. W. from here, the Wan tiao shan, elev. 8100 ft. a.s. where Wilson found Davidia involucreta, Tetracentron sinensis and many more interesting plants. Then I'll go to Patung on the Yang tze and from there to the S.E. over Chang yang back to Ichang where I'll find a goodly stack of mail, I surmise. Then I must go back to King men for pear and pistache seeds, then thip them off from Hankow, then I may go by boat to Kiukiang, walk to Foochow in Fookien, and from there take a boat to Canton and later on to Manila.

The seed of Citrus ichangensis, Meyer's No. 2455a, was given SPI No. 45945, and his No. 2456a, the smooth variety of Actinidia chinensis, SPI No. 45946. This material reached

us on February 25, 1918; additional amounts were received on March 14, 1918.

This letter of November 27, 1917, was the last one we received from Mr. Meyer written in 1917.

A number of Mr. Meyer's 1917 photographs are used in this report.

Agricultural Explorer in Charge.

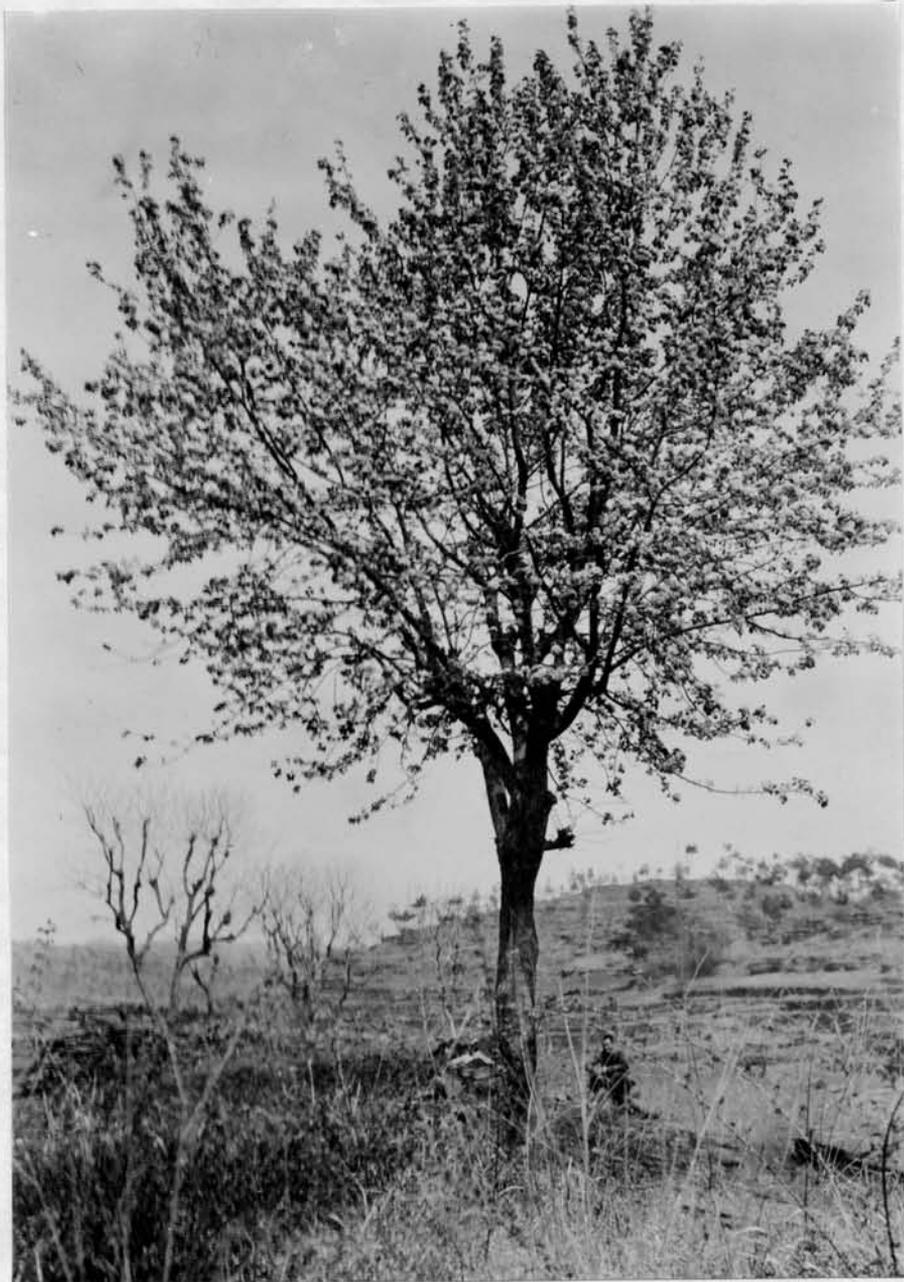
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December 31, 1917.



Pyrus calleryana, natural size. A somewhat small-flowering type of a wild Calleryana pear, with rather tomentose foliage, which isn't full grown yet. Three fruits of last year's crop had persisted on the tree during the whole winter and spring. Note the very small size, on which account the Chinese call it the "T'ang li" or crab-apple pear, as these small fruits, with deciduous calyx, resemble the tiny apples of Malus spectabilis and M. baccata to a surprising degree. (Meyer.)

Neg. No. 13262, King men, Hupeh, China, April 7, 1917.



Pyrus calleryana. A medium large specimen of wild Calleryana pear in full bloom, found at the edge of an abandoned millet field in a mountainous country, full of old terraces and where the soil consists of a poor variety of decomposed porphyrious granite rock. When such a tree occurs near a dwelling it often is grafted over with an improved variety, but otherwise it is cut down, when large enough, and the wood used in fine furniture manufacture. (Meyer.)

Neg. No. 13263, near Nan chang yen, Hupeh, China, March 31, 1917.

December 31, 1917.



Pyrus calleryana. A fairly large specimen of a Calleryiana pear, found growing brotherly together with a pine tree, Pinus massoniana. Very few trees find pine trees congenial mates, but this remarkable Calleryana pear occurs at times quite plentiful in open pine forests, on sterile mountain slopes. (Meyer.)

Neg. No. 13264, near Nan chang yen, Hupeh, China, March 31, 1917.

December 31, 1917.



Pyrus calleryana. Wild Calleryana pears found in crevices of shale rocks, together with wild peaches, Caesalpinia sepiaria, Pinus massoniana, Rubus sp., and various scrub. Elevation c.a. 2,000 ft. a.s. This vegetation is cut down by Chinese mountaineers every few years, but the pears, together with the competing other woody growth, sprout up from the old stumps as lustily as ever. (Meyer.)

Neg. No. 13265, near Nan chang yen, Hupeh, China, March 31, 1917.



Pyrus calleryana. Wild Calleryana pears found in a jungle of bamboo (Phyllostachys sp.) with Pistacia chinensis, Vitex negundo, Ziziphus sativa var. spinosa, Ulmus parvifolia and Rosa laevigata around the edges. A mat of bamboo rhizomes is about as effective in keeping plant intruders away as a cemented courtyard, but this brave wild Chinese pear tries to hold its own, though the struggle is hard. (Meyer.)

Neg. No. 13266, near Gho yong, Hupeh, China, April 8, 1917.



Pyrus calleryana. Dwarf wild Calleryana pears, only a few feet high, growing in sterile, decomposed porphyrious rock on a badly eroded mountain top, elevation c.a. 2,000 ft. a.s. This photo certainly illustrates the marvellous drouth-resisting capacities of this wonderful wild Chinese pear. (Meyer.)

Neg. No. 13267, Nan chang yen, Hupeh, China, March 31, 1917.



Pyrus calleryana. A specimen of Calleryana pear in full flower, with its divided roots standing in water, a few feet deep, although a strong horizontal root may be seen firmly anchored in the earth bank. Compared with photo 13267 it seems almost beyond belief that the same species of pear can thrive under such widely different conditions. (Meyer.)

Neg. No. 13268, Koo moo shu, Hupeh, China, April 4, 1917.



Pyrus calleryana. An improved variety of Chinese pear, called "Ching li", grafted upon Calleryana stock, which seems to be an ideal host, as seen by the fine union. The trunk of this pear measures six feet in circumference, three feet above the ground, and the age of the tree is said to be over 50 years. (Meyer.)

Neg. No. 13270, Gho tang ko, Hupeh, China, March 30, 1917.



Pistacia chinensis. A very large staminate Chinese pistache tree in full flower and surrounded by bamboo canes. The buncy panicles are produced in such masses that at a distance the trees look as if they were Ailanthus glandulosa in late autumn, when full of fruits. Male trees are invariably larger than the female ones and seem to be of stronger constitution. (Meyer.)

Neg. No. 13273, near Gho yong, Hupeh, China, April 8, 1917.



Soya max. A large bamboo tray full of various kinds of bean-curd of the drier types; in the little wooden tubs on the ground the watery kinds are kept immersed in somewhat saline water. At the corner of two narrow streets where hundreds of people pass every hour. Soft bean-curd keeps, in very hot weather, only a few hours, but the drier kinds last longer. (Meyer.)

Neg. No. 13280, Hankow, Hupeh, China, May 30, 1917.



Soya max. The five pots in front are filled with broken soy bean cake from which a cheap sauce is made; the pots wholly open contain vinegar which is made here from wheat and millet bran. Great heat and great cold are both detrimental to the good quality of both sauce and vinegar, therefore the best products are obtained in spring and fall. (Meyer.)
Neg. No. 13284, Ichang, Hupeh, China, May 5, 1917.



Aleurites fordii. View into one of the storing sheds of the firm of L. C. Gillespie & Co., Hankow. The bamboo baskets mostly come from Szechuan, while the tubs generally come from Hunan. The casks, made of American white oak, are waiting for a steamer, to be shipped. A tank steamer is expected within a few days which will take away a few thousand tons of tung oil in bulk, carrying it to Tacoma, Washington. (Meyer.)

Neg. No. 13289, Hankow, Hupeh, China, May 29, 1917.



Phyllostachys sp. Bundles of bamboo strips, cut to a length of c.a. five feet and delivered at the mill for paper making. The bamboo thickets occur wild on the mountain slopes and the canes are cut and split by men, women, and children, who make but a meagre living at this work, which is very fatiguing, since the territory these bamboos are found in is extremely rough. (Meyer.)

Neg. No. 13290, Hui ma po, Hupeh, China, April 2, 1917.



Phyllostachys sp. Drying bamboo paper on the dry sandy and pebbly part of a mountain stream. These oblong squares of paper measure 6 x 8 inches and sell locally at the ridiculously low price of fifty for one cent (Mex.). They are rolled up and used instead of matches to light the tobacco in the water pipes of the Chinese. (Meyer.)

Neg. No. 13296, Hui ma po, Hupeh, China, April 2, 1917.



Juniperus chinensis. A remarkable pyramidal form of juniper, seen around Hankow and Wuchaw, Hupeh Province. This variety apparently never bears seeds. The Chinese multiply it by cuttings only. Photo taken on the old International Cemetery at Hankow. (Meyer.)

Neg. No. 13299, Hankow, China, China, May 30, 1917.



Paeonia suffruticosa. A very large specimen of tree peony, having 75 flowers of a beautiful blush-rosy color. The plant is between fifty and sixty years of age and tho an old stalk dies off at times, new ones come up again every year. The Chinese hold these old "Mootan", as they call them, in very high esteem. (Meyer.)

Neg. No. 13300, Yu chuan temple, near Tang yang, Hupeh, China, April 12, 1917.



Pyrus calleryana. A somewhat large flowered type of a Calleryana pear. Said to produce fruits the size of plums; found in company of Cupressus funebris along a mountain trail. (Meyer.)

Neg. No. 12388, made across the Yangtze River from Ichang, Hupeh, China, March 21, 1917.



Pyrus calleryana. An improved variety of pear upon Calleryana stock. Note the almost perfect union. (Meyer.)
Neg. No. 12390, near Tang yang, Hupeh, China, April 11, 1917.



Soya max. Large blocks of freshly made bean-curd, "To-fu", ready to be cut up into squares and sold for breakfast. This bean-curd industry by no means requires a large investment of money. It is something like dairying with the Caucasian races; one can do it on a very large or on a very small scale. Some enterprising Chinese women supply fresh bean-curd in the late afternoon, while the large factories make it only in the morning. (Meyer.)

Neg. No. 12392, Changsha, Hunan, China, May 16, 1917.



Aleurites fordii. A small plantation of tung oil trees in a corner of the race course grounds at Hankow. The trees have been planted in rows which are 12 feet apart, while the distance in the rows is 8 feet. As can be seen by the absence of lower branches, these distances are far too close. (Meyer.)

Neg. No. 12394, Hankow, Hupeh, China, May 27, 1917.



Soya max. The basket to the left of the photo contains sprouted, small yellow soy beans, while the one on the right holds sprouted mung beans (Phaseolus aureus). Sprouted soy beans are larger and finer than sprouted mung beans, but their flavor is by far not as fine as the latter. Bean sprouts can be raised as a home winter vegetable even in the bleakest sections of the world, such as northern Alaska, Labrador, Northern Siberia, etc. (Meyer.)

Neg. No. 12395, Hankow, Hupeh, China, May 30, 1917.



Daphne genkwa. A lovely spring-flowering little shrub, producing masses of fragrant blossoms, mostly of a deep lilac color, though there is quite some variation in the shade of the hue. This shrub is found anywhere on banks and hill-slopes and is apparently not eaten by grazing animals. Chinese name, "Men to hua", meaning "Bad-for-the-head flower", since people get headaches from keeping the flowers in the room. (Meyer.)

Neg. No. 12428, near Ichang, Hupeh, China, across the Yangtze River, March 21, 1917.

South China Explorations,

Supplementary Report, September 21, 1918.

The first letter in 1918 to Mr. Meyer was Mr. Bisset's letter of January 4, in part as follows:

I find on my desk your letter of September 27, which apparently has not been answered. I regret very much indeed that this letter has not received earlier attention. I have been away from the office for some time, however, and this accounts for part of the delay.

I note that you are very much surprised that we asked you to collect for us 200 lbs. of seeds of Pistacia chinensis. You need not consider this request further, however, as we received something like 300 lbs. of this seed from the American Consul at Chefoo, and will not, therefore, require any more for some time to come. In regard to our asking for such large quantities, you know that it is impossible for us to make any very large distribution of these new things unless we get them in quantities. A few ounces, or a pound or two, would make very little showing, specially if we are unable to propagate a tree either by cuttings or grafting for lack of a proper stock.

You state that the war has no doubt interfered with our propagations. This is true of purely ornamental stock only. Mr. Fairchild has asked, and I believe rightly, that we limit our propagations of such plants to only such an extent as is necessary to protect the stock from loss. We are going ahead with the propagation of any plants that have economic value. We did grow, at our Yarrow station, last summer, large quantities of cowpeas and soy beans, and we are intending to go into this bean work more extensively next year.

I have just returned from a visit to the Brooksville station and am glad to be able to tell you that your Tangsi cherry is doing splendidly there. The plants that were sent to Brooksville in the spring of 1917 have made a growth of from 3 to 5 feet, with large handsome leaves. It looks to me as if this cherry was

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going to be quite at home in that section. If this proves to be true, it will give them a fruiting cherry which should prove very acceptable for the Gulf States.

You ask that we supply Mr. F. T. Ramsey, of Austin, Texas, with young plants of Amygdalus davidiana, and you may rest assured that we shall help him all we can, and supply him with such stock as he may be interested in, whenever it is available. We have, however, many requests on file for the davidiana and it does not at this time look as if we would have any more trees that we can use. We are distributing this tree not only in California as you seem to think, but all over the United States and, specially in the semi-arid sections of the South West. The tree does extremely well in the last-named sections of the country and, while it is not all that could be desired in the Eastern sections, I am a little doubtful if it has received as good care in the East as it has in the West.....

The Eucommia ulmoides that was sent to J. R. Riggs, of Waterloo-Murdock, Kansas, was raised from seed sent in by E. H. Wilson.

We enclose a copy of our inventory card regarding the jujube which failed to grow, and regret that it is the one which you state would not be easy to get again, from Pinchow, Shensi, China.

Mr. Meyer's first letter of the year was written at Ichang, Hupeh, on January 25, 1918, and reads as follows:

It is a long time since I last wrote you and there are very many reasons for that. You know probably that we are living in the midst of a revolution here; soldiers everywhere, looting and burning going on in many places around here and of course we are under strict martial law.

When we arrived here on December 15 we might possibly have skipped through and obtained my stored baggage and the rest of the cleaned pear seeds and castor beans at Kingmen, but my interpreter had incurred on the 10th of December a slight inflammation of one eye which soon became so serious that on the 13th he became wellnigh blind and had to be led by the

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hand. When we were in Ichang it first went better and then worse and I had Dr. Graham of the Scotch Mission treat him and it has certainly taken a couple of weeks to get him in shape again. Well then the revolution and the brigandage had spread so well that we could not leave Ichang and now we are cooped up for the moment. The worst is that the soldiers have commandeered all coolies and one cannot have one's belongings carried and how some of the villages will look thru which the soldiers of various factions have past I have no idea. I do hope that the seeds and my baggage which I have stored with the missionaries in Kingmen are safe. But even then I need note-books and papers to complete my work here.--I have worried a great deal and sleep stays away from me.--Well, all we foreigners here have been living under a strain these last months.--China could be such a peaceful land, but there is a desire for lawlessness among this people that breaks out wherever opportunities are given.

Now these last weeks I have sent to our Consul General at Shanghai, eighteen parcels, numbered from D.A. 30 to D.A. 47. I trust that they have reached you safely.

I am enclosing the inventory notes covering the contents, except for the samples, for I am out of inventory note-books here; they are at Kingmen.

I wonder in what state the material will arrive? Many things probably will be found to be frozen en route, like fruits of citrus, etc., and citrus scions may all have to be burned. Well, it is trying anyhow, like so much is on this world nowadays.

When once in Hankow, where one at least can get suitable working quarters, I'll be able to describe collected material in detail.

The material mentioned reached us on February 25, 1918, and was numbered as follows:

45930,	Citrus	nobilis	
45931,	"	ichangensis	
45932,	"	nobilis	
45933,	"	"	deliciosa

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45934, Citrus sp.,
 45935, " sinensis
 45936, " ichangensis
 45937, " "
 45938, " nobilis
 45939, " ichangensis
 45941, " aurantium
 45942, Schizophragma sp.
 45943, Ulmus sp.
 45944, Prunus glandulosa
 45945, Citrus ichangensis
 45946, Actinidia chinensis
 45947, Castanea mollissima
 45948, " "
 45949, " seguinii,
 45950, Eucommia ulmoides
 45951, Citrus ichangensis
 46119, Eucommia ulmoides
 46120, Actinidia chinensis,
 46121, Citrus grandis
 46123, " medica
 46125, " sp.
 46126, " aurantium
 46127, " sp.
 46128, " ichangensis
 46129, Chaenomeles lagenaria cathayensis
 46130, " sinensis
 46132, Citrus sp.
 46139, " "

Ten more lots of material in this shipment were given S.P.I. numbers but the numbers were cancelled on July 16, 1918, because the material died. Some of the citrus fruits in this shipment were so badly decayed that it was impossible to decipher the labels on the fruits. The Meyer numbers of these are believed to be 151b to 154b, 156b, 157b and 162b. Meyer Nos. 149b and 150b were entirely rotted, fruits and seeds. Dr. Galloway wrote Mr. Meyer on March 9, 1918, regarding this shipment as follows:

Just as we were on the point of writing a letter, telling you of the arrival of the

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Ichang citrus, chestnuts, etc., we received a copy of your letter of January 25 written from Ichang. The last letter we had from you was dated November 15, and we notice that most of the labels in the packages received were dated November 15. The packages arrived here February 26 and during the last eight or ten days we have been going over them, getting them into shape and trying to salvage as much of the material as possible. Most of the material arrived in very poor condition. It had evidently seen hard usage en route.

With the growing facilities here and a sympathetic gardener like Mr. Goucher to handle the material, we are holding more of the foreign shipments than formerly. As a matter of fact, the inspectors will not permit any of this material to be widely distributed at present. For the most part, we are required either to hold and handle it here at the quarantine house or detention house, or else send it to Yarrow where it will be under supervision.

The citrus fruits unfortunately were in a very bad condition. They had evidently been heated or frozen, and possibly both, and in most instances were pretty thoroughly decayed. The decay was so far advanced that in a number of instances it has not been practicable to identify the specimens. The labels on the top of the box came through in very good shape. The numbers on the papers around the specimens, however, had all disappeared with the rotten paper and rotten citrus material. However, we managed to salvage considerable of the seed and have practically all of the lots you sent growing in our quarantine house. After the citrus fruits had been treated we asked Mr. Swingle and Mr. Robinson, who is now assisting him, to come down and look them over. Mr. Swingle is very much interested in what you sent in. He thinks you have probably some new material. We managed to get from a few of the fruits some sections or parts of tissue, including some of the skin, which we have preserved in formaldehyde for Mr. Swingle.

The citrus scion wood was in better condition than might have been expected under the circumstances. Without looking up the records, my recollection is that we have saved wood of all of your numbers except possibly one. One of the numbers I recall was completely dead. Mr. Goucher has put

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in ten good grafts of each of the numbers you forwarded, with the exception, of course, of those that were dead. We believe that we are going to get most of your material through in good shape. We have also saved samples of this wood for Mr. Swingle to study.

Mr. Swingle, by the way, is sailing in a few days for the Orient. He will go first to the Philippines and then to Japan, but whether he intends to go to China I am not certain. Mr. Robinson, who at one time was with Dr. Kellerman, is in charge during Mr. Swingle's absence. Mr. Wester of the Philippines was here this winter and visited us several times. He gave us a good many interesting points on litchis, mangos, and some other Philippine crops. We are making a special feature of litchi and will endeavor to bring together a collection of different varieties, some good material for stock, and we are also getting some good developments in the matter of more rapid propagation.

To proceed with the comments on your material, the ginger you sent was unfortunately completely rotted and we could do nothing with it. Of the Actinidias we shall be able to save some seed. I was very glad indeed to get the chestnuts. This is another crop in which we are especially interested, and have already assembled a considerable collection with the help of Doctor Van Fleet and some others. Our chestnut work and Pyrus work we propose to do mainly at Yarrow. The litchi work and avocado work we must necessarily do here under glass. The greater portion of the chestnuts you sent were so badly rotted that they had to be burned. I think we shall get some plants from all of the numbers you forwarded, however. Last fall we secured from Doctor Van Fleet large quantities of the fruits of all of his best resistant types, and these have been growing during the winter in one of our detention houses. We now have a fine lot of young seedlings which we shall hold over this summer in pots and next fall line out at Yarrow. Doctor Van Fleet has also kindly provided us with a large quantity of good grafting wood, which, if we are successful in getting stocks from Japan, we hope to graft this spring. We want to graft several thousand mollissima in order to have enough stock to establish four or five small plantations of this promising chestnut, so as to get a real reading on its value here in the East. Through Mr. Beattie, one of the Federal

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Horticultural Board Inspectors, we have secured a very promising chinquapin from the South, which may be valuable as a resistant stock. We are not familiar with your Castanea sequinii. It may also prove valuable as a stock. This is your No. 2459a (SPI 45949). Unfortunately most of these nuts were decayed. Some had sprouted, and these we shall save. Others had some new kinds of insects, so that we had to put all of them not only in the detention house but cover them with wire screens, in order to satisfy the inspectors.

Evidently, from your letter, ^{the} curse of war is reaching out even into remote parts of the world. We greatly regret that you have been tied up and trust that matters will adjust themselves so that you can move about once more. This would appear rather doubtful from all indications as to conditions in the Orient.

Mr. Fairchild is away and will probably be absent for a number of weeks. Yesterday we received through him a big box of rhizomes of Savannah bamboo. It is the finest lot of rhizomes of this wonderful bamboo that we have yet received. When Mr. Bisset and I were in the grove something over a year ago, we secured some rhizomes after a little difficulty, but unfortunately we have not been able to get many plants from them. We are going to handle the rhizomes here in order to avoid probable infestation of the mite and a new bamboo scale at Brooksville. I presume Mr. Fairchild has written you about the mite he found there last year.

Mr. Popenoe has been back for a number of weeks and is now in California. His avocado introductions are being handled here and at Yarrow. We have nursed them here until assured of saving the authentic set he desires to have fruited out. There are twenty-three numbers in all. We now have at Yarrow something like 8,000 or 9,000, possibly 10,000, stocks ready for budding. We have already budded several thousand and are budding more as rapidly as we can secure budwood of the rare sorts. The avocado does not thrive under glass, so that the securing of buds here in our little houses has been rather a slow job. However, we are glad that we have been able to bring through one complete set and have provided Mr. Simmonds at Miami with a complete set. It is rather encouraging, too, to find that we are now getting to a point where we are cutting

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and sending out budwood, so far the wood has proved absolutely clean, despite the fact that when it came it was infested with a good many kinds of Guatemalan scales.

We have had an extremely severe winter here; in fact, one of the worst that I have experienced during thirty years in Washington. The snow has been frequent, and the ice in the River was something even the oldest inhabitant had not experienced. We had a grand break-up two or three weeks ago, and it is almost like spring now.

On February 1, 1918, from Ichang, Hupeh, Mr. Meyer wrote as follows:

Herewith I am enclosing a letter to Mr. Walter T. Swingle, concerning Citrus ichangensis. Would you kindly see to it that it reaches him; possibly a copy of it might be retained in our Office.

I am also enclosing a letter of mine, to Mr. Edward Gilchrist, Commissioner of Customs here, which has been returned to me by Mr. Gilchrist, since he cannot go in for any more work on citrus problems.

A few days ago Mr. Geo. D. Schlosser, an American missionary at Ki hsien, Honan, wrote me that he had delivered a large quantity of wild pear seeds to the American Consulate-General at Shanghai. Have these seeds been received together with various other seeds? I hope they were properly labeled. I sent a check for \$65.00 Mex. to Mr. Schlosser on Dec. 24, 1917, and trust he has received it since. The bill for these seeds is included in my accounts for the quarter ending Dec. 31, 1917. Should these seeds not be labeled, the enumeration on the bill might help out.

I was not given a chance to inspect these wild pears and suspect that a goodly number of Pyrus betulaeifolia is mixed with the P. calleryana. The seedlings therefore should be carefully rouged by a person who knows both kinds.

The Belgian missionaries at Hui hsien, Kansu, have been sending parcels with Eucommia seeds and so has a Miss Stotts at Chikungshan, Honan. Have these seeds arrived? The mail service has been interrupted here for the last weeks and very little reaches us, tho mail from here has

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been leaving by an occasional steamer. I know therefore little or nothing whether shipments have reached our Consulate at Shanghai, with the exception of the wild pears from Mr. Schlosser, of which Mr. Sammons wrote me and sent me the bill, which had been presented to him.

As regards some things I had in mind to do on my last trip, I am presenting the following:

For the collecting of quantities of wild chestnuts I was too late; the supervision of wild pear collecting and cleaning and the waiting for Prof. Reimer at Kingmen are to blame for that.

I noticed plenty of Endothia parasitica in cultivated as well as in wild Castanea mollissima right from Ichang to beyond Hsing shan hsien. On some places it was very serious, especially one day's journey West of Ichang in cultivated trees and two days' journey N. W. of Hsing shan hsien in wild trees. Please communicate this to Dr. Shear.

I got some wild chestnuts tho' for which please see No. 2458a and 2459a.

Of Davidia involucrata I only saw a few trees and these had no fruits on them. The district where they seem to be more numerous is South of Patunghsien, where I did not go to, as the revolution in Hupeh had commenced already. (They murdered the magistrate of Patung a few weeks ago.)

Wild Citrus ichangensis, which was one of my main objects on this last trip, proved to be so rare, that I saw only three trees on the whole journey and only one bore fruits. Of the last I have sent 12 fruits in a box from Hsing shan hsien on Nov. 27, 1917, and a small package of cleaned seeds I despatched from here by R'g'd sample post on Jan. 30, 1918. They bear the number 2455a. This wild Ichang lemon may be possibly the very hardiest of all true citrus species, tho' I am afraid it does not stand very low temperatures. Possibly something like 10° F.

Concerning yang taos, I am amazed at the great difference in looks between the smooth and the hairy varieties. Which is the one that Mr. Coolidge from Pasadena sent in to our Office and of which Mr. Stuntz writes me under date of October 25, 1917?

Yang taos will be grown in the So. States like Muscadine grapes in the near future.

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Beechees (Eleocharis tuberosa) can be harvested in midwinter, after the land has dried out; it is hard work, however, since the clayey soil becomes quite hard.

Tung oil trees, Aleurites fordii, do not grow very old; the oldest tree standing I saw was 26 years of age; a cut-down specimen, however, showed 32 year-rings, which surely is a maximum age. The trees keep on bearing till death, but the fruits in general are considerably smaller on old specimens than on young trees, tho some old trees seen were very heavy bearers. When between 20 and 25 years old the lower branches die off first, then borers and fungi get at them and before the tree has gone entirely, the ever-watchful Chinese farmer cuts it down and chops it up for fuel. The tungoil tree delights in rich soil, but on account of such soil giving high returns in grains they are relegated to mountain and hill slopes too steep or too poor to plant to other crops. One notices however a tremendous difference in growth between specimens on poor decomposed granite soil and those in pockets of rich red clay. Where the trees look best one generally finds around the farmsteads coir palms, pummeloes, tall bamboos and lucidum privets, showing that the plant delights in high summer temperatures and withstands but very moderate winter cold.--Please call these observations to the attention of Mr. R. A. Young.

Pyrus betulæfolia occurs all around Ichang, contrary to our expectations, since Wilson didn't collect it in Hupeh. It also grows around Chang yang and at several points in between this place and Ichang. Often P. calleryana is associated with it making it exceedingly difficult to obtain seeds of the last which have not been subjected to cross-pollination.

Gingko biloba undoubtedly is a wild tree in certain districts between Ichang and Hsing shan hsien. The trees are much used as poles and as lumber; they sprout up again from the stumps, just like Cunninghamia lanceolata and Cryptomeria japonica.

Cunninghamia lanceolata occurs here and there in blue varieties, like Araucaria excelsa glauca. They would make fine evergreens for Southern parks; they do not thrive however on level lands.

Rhus verniciflua was seen in large specimens at elevations of about 4,000 ft.; most trees had

the characteristic incisions made in their bark to obtain the varnish. A Roman Catholic Father told me that when natives get a touch of poisoning they immediately take rape or radish leaves and rub the spot thoroughly with them. Then no effect results. (Could the volatile oil in various cruciferae be an antidote to poisoning from poison ivy?)

Then I heard that oil from hemp seeds (Cannabis sativa) does not become solid even in very cold weather. If so, would it be fit to lubricate machinery of aeroplanes?

Around Chang yang, S. of Ichang, the tea-olive, Osmanthus fragrans, is cultivated for its flowers. These flowers are packed fresh in dry powdered alum, also in dry powdered sugar, and carried away for long distances. A delightful perfume is made from them; they are used to flavor tea with and a very delicately perfumed preserve is made from them. The trees grow to be over 100 years old and its cultivation seems to be a paying one from the Chinese point of view.

Well, these are a few observations I have to record.

The more I travel around in Hupeh, the more I am impressed with its immenseness, nothing but mountains and valleys and hills and dales. Put the State of Montana across Georgia and neighboring States and you have some idea of topography and climate of Hupeh. No one man can ever cover this whole province on foot and really one cannot travel otherwise; there are no real roads, nothing but trails and accomodation and food-supplies of the poorest imaginable.

As I am writing we hear the rickety noise of rifle fire, for Northern and Southern troops are at battle only a mile or so North of the city. That we do not live "at ease", you can easily imagine.

Well, possibly this letter reaches you O. K.

The wild pear seeds received through Mr. Schlosser arrived on December 10, 1917, and were recorded under SPI Nos. 45594 and 45595. Four bags of Eucommia seeds were received on May 9, 1918, and given SPI No. 46061. The wild chestnuts were received on February 25, 1918, and given Nos. 45948 and 45949.

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The wild Citrus ichangensis under Meyer's No. 2355a was also received on February 25, 1918; it was given SPI No. 45945.-- Just before leaving Washington for a trip to Florida, Mr. Fairchild dictated the following letter to Mr. Meyer, the same going forward under date of March 6, 1918:

Things have happened so fast and so many changes have taken place since I last wrote you that I hardly know where to begin. You know by this time of poor Stuntz's death, and you can appreciate how we miss his friendly assistance in the very important branch of the work which he was doing. We have not filled his place yet, nor do I know that we can ever fill it, but we have in view plans which will take care of it at least until the right person can be found.

The war is making great changes in our plans, and although we have succeeded in getting Mr. Popenoe exempted, I do not feel sure that he may not get restless and, as they say "fly the coop". I hope not, however, as he is too valuable a man where he is.

Mr. Rankin and Mr. Dorsett are at the present time making plans to put in 300 acres of soy beans and are getting a tractor for that purpose, the idea being to increase the best varieties which we have for seed purposes next year. The increase in interest in the soy bean is one reason for this unusual activity. During the next three months we are likely to see the most acute food shortage in our history, due to the congested conditions on the railroads as a result of lack of cooperation between the government and the railroads themselves. However, things are moving along in a truly American fashion, and we believe we see coming out of these confused conditions accomplishments which will make you proud of having become an American citizen.

So far as your own contributions are concerned, I think you can render a distinct service by giving us the result of a careful analysis of the Chinese food situation. For example, I was talking with Dr. McCollum the other day with respect to the extent to which the Chinese use green vegetables. He has taken the stand that leafy green vegetables

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are essential to any diet for human beings. It has been reported to him by certain travellers that the Chinese diet is essentially a seed one. It is my impression from your investigations and from my own observations that the Chinese are great users of fresh vegetables, particularly leafy vegetables. Could you not make a study of the diets of the Chinese where you are and send us representative menus, so to speak, which will clear up this doubt in the minds of dieticians in America in regard to the proportion of green vegetables which are used by the Chinese?

The dairy industry in America appears to be in somewhat of a critical stage, owing to the extremely high price of food stuffs from which the cattle get their vegetable fats which they manufacture into butter fats. Inasmuch as the Chinese do not have a dairy industry, can you not give us a report of your wide observations in regard to the substitutes used by the Chinese for dairy products? I assume that these are in themain the products of the soy bean and that they furnish the principal source for fats and proteins. The excellent photographs which you took of the soy bean industry, particularly the cheese and curd manufactures, have been very useful indeed. I have shown them to some of the most important people in this country who are studying the subject, and I cannot help feeling that at the present time photographs along this line will be of unusual interest to the American public.

I realize that it is very difficult indeed to give you much of an idea of the situation here in America in regard to this whole question of what we are going to eat, but be assured, my dear Mr. Meyer, that people are asking this question with an insistence that I never dreamed would come.

In regard to the Feitcheng peach, you will be interested in the following statement from Tribble Brothers, Elk Grove, Calif., which will appear in the next number of our Plant Immigrant bulletin:

21989. Fei tao seedling peach, four trees. Each tree bore identically the same fruit. Fruit averaged 1 pound each. Tree good grower and shows that it will bear heavily. This is the finest white peach we have ever seen. It is far super-

ior to the White Heath Cling and much larger. We use this nearly exclusively for home canning. Ripens early August, blooms full March 1st.

Evidently the Feitcheng peach has come to stay.

I am reading a very interesting book on China, called "China From Within". It is a missionary's view-point but evidently closer to the truth in many respects than the superficial views of transient travellers in the country.

In regard to the rust which you found on leaves of Zanthoxylon bungei, I understand you have been informed. You will have to hunt further, I imagine, for the citrus canker on Zanthoxylon. Apparently, almost every time you send in some diseased Chinese plant, you astonish the pathologists with something new and interesting.

With respect to the making of curds from ground acorns, the question is where we would get the acorns. I understand that there are places in the South where large quantities are obtainable. Do you know where the acorn curds were made? If you find out, let me know and I will put the information in the hands of those who are interested in this cheap kind of food in the oak growing regions of the South.

You will be interested to know that the program for the growing of large quantities of the castor bean is in full swing. Contracts have been let by the War Department, and it looks as though we were going to get all the oil we need. I am glad to get your size-up of the Chinese situation, which is important. I had an idea from what you wrote in your previous correspondence that the castor bean might be much more abundant in China than we had come to think. If it is necessary to get any further information in regard to this matter, of course, I will let you know.

I think it would be wise for you to write me as soon as you can in regard to your immediate plans, so that by the first of July I will be in possession of all the information necessary in regard to your prospective movements for the following year. I have been spending so much time on war work that I find it a little difficult to hold together all the lines which developed previous to the war. It was our idea, as you will remember, that you should go into southern China,

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from which region we expect many important plants to come.

The injection of Professor Reimer and the pear seed proposition into our program is now a thing of the past, and I am wondering whether it will be possible for you now to carry out the plan as we outlined it previously, when you were here.

I trust that you are well and that the affairs in China will not interfere with your movements.

Further, in regard to your letter of November 27 and what you have to say respecting the hundred pounds of seed of the calleryana pear, I think what Professor Reimer was talking about when he advocated the sending of all of his pear seed to Talent was with respect to a plan which was talked over with the Federal Horticultural Board. The Board insisted that it was a dangerous thing to plant the seed anywhere near existing orchards of pears or apples, inasmuch as insects infesting the seeds could easily escape and get into the orchards. They advocated, and I agreed, that if they still felt this was necessary when the seed arrived, it would be put at some station far removed from any apple orchards. Professor Reimer discovered such a station and described it to me, and I presume he had an idea that this would be the best place for all of the seed. The Federal Horticultural Board have changed their minds, however, in regard to the necessity in this particular instance and after a careful inspection they have decided to let this seed go out and be planted at Chico. I think I understand perfectly the result of the specialist's environment. I have been very liberal always in encouraging the specialist in his particular field, for the reason that in general one of the great dangers in the handling of these plants is that they fall between fire, so to speak. The worst thing that can happen to a plant/immigrant is to be batted around between rival camps and lost because no one feels a proprietary right in them. Of course, if there are any who want to experiment with these pears other than Professor Reimer, they have a perfect right, and we are obliged by law to assist them. There can be no such thing as a monopoly on our plant introductions by anyone. It is dangerous to make general rules in regard to certain matters and much more satisfactory, I believe, to handle each case on its own merits.

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At least, this is the result of the experience of the past twenty years. It would be easier, of course, to make a general rule and stick to it, but it would not fit conditions in many cases and would lead to estrangements, confliotions, and friction, all of which as you know should be avoided.

I am much interested in your discussion with Professor Reimer in regard to the hybrid character of your improved calleryana. I wonder if Professor Reimer has looked at the pollen and whether that would not give a clue to its hybrid character. You probably have read Doctor Jeffrey's article on the hybrid character of Crataegus sp. In my opinion this is an important article.

In regard to talking over with Professor Reimer the pear problems and as to whether he should come into the federal service or get federal aid, I have heard nothing from him. I imagine that his illness has made some great changes in his plans. The month of February is pretty nearly over, and he has not indicated his desire to come east and talk the matter over. If I can, next summer I mean to get out to the Coast again, and I will make it a particular point to see Professor Reimer and size up the whole situation. Things are changing so rapidly, that it is difficult to know whether such a plan as might suit him would be along the most practical lines.

I am glad you like the looks of the Yang tao. You remember our visit to the back-yard vine in Chico. In its dusty condition it did not look like much there, but fruits which were received last summer certainly made a great impression on my mind, and I am inclined to agree with you that the Yang tao should be carefully considered as a fruit vine for the United States. I gave one to Mr. Bell and also gave some of the fruits to several of my friends here, and they all liked them without having to learn to appreciate their taste.

I never had any idea that the region around Ichang would furnish hardy fruits, even though the altitude might be 4000 feet. I always imagined a climate similar to that of Florida.

The package containing twelve fruits of the wild Citrus ichangensis, 2455a, and some fruits of a smooth variety of Yang tao, 2456a, has just arrived, and we will write you in a few days as

to the condition of the material.

If you get into the region of Davidia involu-crata, I hope you can get a considerable quantity of seed. It is a shame that so little has been done in the dissemination of this wonderful plant which will grow anywhere from here southward. Although it is an ornamental, it is such a striking one that I think we ought to be associated with its dissemination.

The increasing activities here in Washington sometimes make me long to get off where I am out of hearing of the honk of automobiles and the noise of street cars.

Referring to your letter of October 24, I am sorry to hear that you had an attack of dysentery. It is a very uncomfortable and depressing malady. I hope you will convey to the missionaries who have been so helpful to you the personal thanks of this Department. We owe much to the missionaries, and I am one of those who appreciate the great work which they are doing in China.

In regard to the similarity between Pyrus cal-leryana and P. betulaeifolia, we have made a careful study of cross sections of these fruits, longitudinal sections I mean. Mr. Wight has discovered that different varieties vary greatly in the markings of the carpels of the fruit, which can be seen plainly by cutting them in two longitudinally. I wonder if it is not possible that you could detect a reliable difference between the two species by cutting them open. Of course, I realize that this suggestion is going to get to you long after the difficulty you are talking about is over.

Please do not form the impression that, because letters do not come to you as regularly as they used to, your work is not just as important as it was before - in fact it is more so. Everyone during these war times is so busy with his own particular work that the interchange of ideas and courtesies have been cut down to the limit. If you were here in Washington, I could explain this to you in a few minutes, and I think you could understand it.

You will be particularly grieved, of course, over Mr. Stuntz's death and its effect on the explorers' notes, although we can remedy this effect shortly, for I have in mind a man who I believe is peculiarly fitted for that part of Mr. Stuntz's work.

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With respect to the bamboo situation, I am leaving for the South tonight and am going to hunt for a certain piece of land in the Mississippi delta on which to plant a grove of bamboos which will really show what the bamboo is capable of doing in this country.

In regard to your question respecting chances for advancement, I do not know what to say. Things are in something of a tangle, as you may well imagine. The men drafted for the army are getting small pay and the unskilled laborers employed by corporations are getting unheard-of wages. The whole question of the adjustment of the scale of services is in the air. Very few increases of any character whatever are being made by the government at this time. In fact, we are now on a war basis and are not expecting any changes immediately along the line of promotions. Your work, however, has been so satisfactory, and you have made such a name for yourself, that I shall see to it that you are given the regular advancement and as rapid advancement as can be arranged for through the Committee, of which I am a member. There is no set limit for the pay of an explorer.

In regard to Groff's visits here in Washington, they were not entirely satisfactory so far as the outlining of any definite program was concerned. I have felt very strongly that we should cooperate with Mr. Groff in the building up of the best facilities possible in Canton through which later we can get material from southern China. Anything you can do to assist in the creating of a center of botanical and horticultural interest there will be along the line of our work. The particular subject with which Mr. Groff has concerned himself, the litchi, is a fascinating one. I only wish that the plant were a hardier species, for it is now limited in its distribution to various small areas in Florida and possibly in southern California. I do not know that this fact should deter us from making a thorough study of its possibilities, however.

When I was in southern China, I had my attention attracted to the Chinese species of yams. Do you suppose there is any possibility of growing those commercially and utilizing them for flour production? My attention has been attracted to the quick changes which have come in Trinidad as a result of the war and the shift which has been made by the inhabitants from rice and corn-meal to the tropical yam, *Dioscorea*, probably *D. alata*. If

there is anything in the Chinese yam, we ought to know it, particularly from the standpoint of its being turned into a flour or meal.

There is a big propaganda on now for the manufacture of sweet potato flour as part of the dried vegetable program for which an item of \$250,000 has been added to the agricultural bill. This opening up of the dried vegetable program in an American way ought to make some difference in our point of view in regard to vegetables. Those vegetables which are highly flavored and when dried still retain all the flavor necessary should win out in this race which is coming.

In regard to Popenoe's coming out to south China, this will not be possible at the present time, I am sorry to say.

I am very sorry to have you talk as you do about the "evening of life descending upon you". I realize the lonesomeness and induced introspectiveness of your life, my dear Mr. Meyer, and my fondness for you and the great responsibilities which become heavier each day make me wish at times that you could be here with us, although I know that your stays in Washington have not always been the most agreeable. However, if you should come back, we could arrange for a place where you would be within the call, so to speak, and yet could carry on your work in the hybridizing of plants in a way that would make your knowledge available to the country and prevent what I am always afraid might happen, the loss of your great store of sifted observations and reflections which you have gained by these years of travel. Please do not look upon this lightly. You really owe it to your adopted country to make this information available, putting in on paper so that it would be a source of inspiration to the next generation.

Please write me freely and frequently and do not become despondent in any case, for, regardless of the fearful sorrows and the horrible features of the life which is around us, we must push on to bigger and grander things before life really closes in on us.

On the same day, March 6, 1918, while still at Ichang, Hupeg, Mr. Meyer transmitted one parcel containing roots and cuttings of a rose and a bush-cherry. SPI No. 46002 was

given to the rose and SPI No. 46003 to the Prunus glandulosa, both of which reached us on April 25, 1918. Mr. Meyer wrote:

Herewith I am forwarding to the American Consul-General at Shanghai, one parcel, marked D.A. 48 and containing roots and cuttings of a rose and a bush-cherry, Nos. 1302 and 1303.

Please find enclosed the two inventory notes describing these finds.

Prunus glandulosa as a future fruiting shrub is a novelty; we haven't got it up in North China.

I wonder whether these parcels will ever reach you! I have not received mail now for a few months. Conditions here are as upset as ever; travel is pretty near impossible, except by an occasional Japanese steamer. Food supplies are running low, fighting occurs near and around the city almost hourly for all these last weeks and everybody feels depressed from this long-drawn state of suspension.

The foreigners here have formed a defense committee, but of course a mere handful of white residents can do nothing against brigands in uniforms, as nearly all of these Chinese soldiers are, and there are several thousands of these parasites all around us. I saw last week how some of these fellows took out the hearts of some fellows they had shot and mutilated the corpses in unspeakable ways. They were going to eat these hearts to get courage! One loses all confidence in this whole race, by witnessing such acts of barbarism and cannibalism.

Of late I have been assisting many of the foreign residents in changing their gardens and transplanting large and small trees. It took us last week 25 coolies in removing one large tea-olive (Osmanthus fragrans). A thing like this had never before taken place in Ichang and should all of these various trees pull thru my work will be tied up with this city for a hundred years to come.

We are having a moist spring here after a mild, dry winter; insect life is commencing already. Peas and broadbeans are in flower; Prunus mume in varieties are about over and cherries (P. pseudo-cerasus) are just commencing to dot the countryside with blotches of white.--Trade is utterly at a stand-still and the losses to everybody run into millions.--As a whole people around here take life philosophically, which is the best one can do.

With hopes of a more encouraging letter to you the next time, I remain,

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Mr. Meyer did not write again until April 15, 1918, when he sent, from Ichang, the following comment on his accounts:

Herewith please find my accounts for the past quarter; they are, I suppose, the most meagre expenditures I have made for a long time, all due to the extremely unsettled conditions here in this part of the Yang tze Valley.

I had to discharge my interpreter since he did not take the slightest interest in my work any longer. My present guide will be able to manage things until I find again a better fellow. It seems however that exploration work in China may have to be stopped altogether, for brigandage, local famines and the awfully upset conditions everywhere do not allow travel any longer.

Fighting has been going on around here for over four months and foreigners are not allowed to travel freely in Szechuan and in Hupeh. Soldiers are drilling in the streets with machine guns these last days and we have been warned not to go into the mountains one day West of here, where bands of uniformed bandits are plundering to their hearts' content.

Well, enough for this time.

He wrote again on April 23, 1918, still from Ichang, as follows regarding his itinerary report:

Herewith please find enclosed my itinerary report for the quarter ending March 31, 1918. I am compelled to make several remarks with it. Firstly it is somewhat belated, due to the fact that these last days we had another crisis here and I felt out of sorts. You also will notice the running form of the dates and not put down on separate weekly sheets as the regulation form is. This I did for reason that desirable writing paper is getting to be quite scarce here and I want to reserve my supply for more valuable purposes than a mere itinerary report.

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You'll notice that I have done a whole lot of transplanting trees. I wonder how this will be taken by the authorities, but -- if it hadn't been for that, an active person simply would get crazy in conditions as we have been experiencing here these last four months. The various military camps have been fighting each other at intervals of days and of weeks and all sorts of atrocities are being committed. Foreigners and Chinese alike are often for several weeks durance virtually prisoners of war. In fact you may picture us here as if we were somewhere in Mexico or in some Central American Republic when a periodical revolution was going on.--I trust the authorities in charge will accept these explanations, after you have laid them before Mr. Fairchild. If not, the American Minister at Peking and our various Consuls in China could add interesting details.

These long continued disturbances here are a tremendous loss to thousands of foreigners and millions of Chinese. How long things can go on no one dares say, but -- some power might step in any time and stop this senseless game here of rival generals chasing one another and destroying all commerce and progress.

I am awfully sorry that Mr. Stuntz has died, as I saw in a paper that Mr. Dorsett kindly sent me, some days ago. It surely hits our office hard! We must be getting very short of competent helpers in the good work!

On April 27, 1918, Mr. Fairchild wrote Mr. Meyer:

It is strange to think of you as shut in there in Ichang and as forming one of a defense committee, but, of course, you are accustomed to great changes such as are going on all around us here. The atrocities have not yet reached us, but we are in touch with those who have experienced them and seen them, all the time. The unspeakable character of these atrocities are little short of as terrible and unbelievable as those which you describe there in China.

There is one great field of investigation which I see coming, and I wish I could have a week or so with you to stir you up and get you interested in it. It is so difficult to explain

things in a letter. The whole great problem of food is being investigated from every angle and particularly from the actual value in calories of the food itself. Every investigation which I make in different food dietaries of the Orientals convinces me that they have learned to live on extremely cheap foods, whereas we are living on the most expensive foods the world has ever known. What I think you could do while you are over there which would be of very great interest to us here is to get the dietaries of the different peoples, photograph what their meals consist of, and give us an idea through photographs, for example, of the physical condition of these people who live on these cheap foods, and then an idea of the prices, in terms of American money, of the food which they eat. I learned the other day that a small office holder in Japan could get good Japanese board for \$4.00 a month. This \$4.00 a month represents the wages of a farm worker in America for a day and a half, and this farm worker would spend for his day's food at least a quarter or perhaps a half of what the Japanese office holder would spend for his whole month's board. It is these striking contrasts that we must have to awaken us to this food problem. We grow in this country over three billion bushels of corn or one hundred and sixty-eight billion pounds. One pound of corn has one thousand six hundred and fifty-three calories. The average office holder can get along easily on three thousand calories per day, or about two pounds of corn-meal would supply all of these calories, and yet we are short of food. You see, the difficulty is we make our corn-meal into pork and then eat the pork, or we make our skimmed milk into pork, taking a hundred pounds of milk, which has nine pounds of dried protein in it, which is perfectly good food, into one pound of pork. It is this kind of process going on all over this country which we simply must study out and understand. I am going to send you a copy of the book by Graham Lusk on "Food in War Times", which I think will interest you and give you one of the lines of study upon which you can throw a great deal of light during your stay there in China. I am also sending you a copy of the paper which I read before the Franklin Institute in Philadelphia, on the "Palate of Civilized Man and its Influence on Agriculture", together with

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one or two articles in the Journal of Heredity upon which I should like your criticism.

Do not forget that we are all watching your movements as keenly and as interestedly as we can during these trying war times and are glad of any scraps of information you can give us which will show where the cheapest foods are and how we can live on them.

Mr. Fairchild wrote Mr. Meyer again on May 8, 1918, as follows:

By the time this letter reaches you you will doubtless have heard of Mr. Swingle's departure for China. He expected when he left here to spend some time in Japan before going over to China, and he may at the present writing be in Tokyo or Yokohama. If you get back in Peking, you are sure to get in touch with him, and I am confident that he can give you a very good idea of conditions over here, which have changed mightily since you left.

Since Mr. Stuntz's death the work of searching for new things in the literature has pretty nearly come to a standstill, but we have decided to put young Russell on the job and give him a chance to show what he can do. I am in hopes that in the course of a few weeks he will be able to get in shape a memorandum for you respecting the things which we want from China, beginning with reintroductions of plant material which you got and which failed to grow.

It is almost impossible to give you in a letter any idea of the radical changes which are going on around us. The boys are all getting into the army as fast as they can and before you get back here, in my opinion, the women will be, as they are in England, making aeroplane parts, magnetos for engines, shells and other destructive apparatus. This work of the women has scarcely begun, but we can all feel it coming with the increasing severity of the fighting on the Western front.

As I wrote you in a recent letter, the things of greatest interest to us are those connected with the dietary of the Chinese. Everyone is asking how it is possible for people to live as

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the Chinese do on a few cents a day and how they can get along without meat, eggs, milk, cheese, butter, and wheat, the things which seem to every man quite essential for the maintenance of health.

Trusting that your health remains good and that I will hear from you shortly that you have escaped from the isolation of Ichang, I remain, with kindest regards.

Mr. Meyer wrote us on May 18, 1918, from Hankow, as follows:

At last I have been able to break thru the lines of soldiers around Ichang and walked to Kingmen, got the stored seeds and baggage there and settled the payments for the pear seeds; then we marched down to Shasi and took a steamer from there and arrived here on the 15th. We were held up by soldiers a few times and some unpleasanties were indulged in, but on the whole we could have fared far worse.--Of course we passed thru villages that had been looted and burned and food was hard to obtain, but to an old hand out here, like myself, these things have so often been encountered that one is used to them.

I did not write you from Ichang of late because I was not sure that I really could make the trip.--The whole country is so fearfully upset that travel has become a perfect gamble. Sometimes travellers get thru, but often they have been held up for days and weeks. From Ichang westward all traffic is stopped and products from Szechuan do not come thru any longer for months and months. The losses the people at large suffer must be gigantic; right now tung oil does not reach Hankow any longer, neither do hides, drugs, silks, etc. If tung oil should not be able to get thru at all then some industries in America will soon feel the effects.

Well, personally I am awfully glad that I got away from Ichang; the situation began to depress me. One cannot live for months in an atmosphere of suspension without feeling the effects. And as I had cheerless, uncomfortable quarters and lack of substantial food at times, one had both mental and physical discomforts.

Well, I just received your very sympathetic letter of February 26 (which was opened by the censor) and I see how this long drawing war is effecting things slowly but surely. Yes, Mr. Fairchild, it often seems that we do not live ourselves any longer but that we are being lived. Uncontrollable forces seem to be at work among humanity and final results, or possibly purposes, are not being revealed as yet, that is, for so far as I can look into this whole titanic cataclysm.

Now concerning my own plans of which you want an outline by about the 1st of July, well, I can say this, that my ideas are to leave here within a day or two, visit Kiukiang for tungoil plantations which have been set out nearby, then go down to Nanking possibly and from there to Shanghai, where I may stay many weeks shipping off seeds and specimens. Then when the heat gets too intense I may move up to some quiet place on the coast of Shantung and work up the herbarium specimens I have collected these past 18 months. When chestnuts commence to come in by the end of September or early October I may purchase several hundreds of pounds and ship them and possibly seeds of Pyrus ussuriensis might be brought to us, unless Prof. Reimer comes out again, as he had intentions to do; in this last case I shall not intrude into his special field.

Concerning exploration work in Southern and Western China, well, prospects for the present are far from bright. A gentleman who just returned from a several weeks' trip into Fookien Prov. informed me yesterday that brigandage is so rife there that in whole districts the ordinary farmers have given up planting rice and are joining robber bands. And you know of course from newspaper items that Americans have been kidnapped by bandits in Honan and Shantung and missionaries have been killed, injured or molested in Shansi, Szechuan, Honan and Fookien. The outlook therefore of interior exploration is decidedly gloomy.--Of course Japan is hard at work trying to bring stableness out of chaos, but -- whether her ideal of tranquillity here in China agrees with that of the people themselves, "voila la question", as our French confreres would say.

So I am very sorry to have to state, we are not able to make fixed plans until political conditions take a turn for the better.

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I now shall try to answer various items which your many letters contain.

I am taking your letter of February 26, "the last but not the least",-- yes, I am truly shocked by the death of our friend Stuntz. And only a young man yet! Mrs. Clime informed me, a few weeks previous, of our chum Charles Mansfield's departure which affected me most sorely and now we have this sad loss again. "The dead are becoming as numerous as the living."

There is one thing that hangs both over the death of Stuntz and the consumption infection of Mr. Knight and that is, that Mr. Stuntz loved an over-heated, unventilated room and forced those who worked with him to share his beloved state of atmosphere. It is up to you, Mr. Fairchild, to see that from now on warnings should be given to coworkers, that proper ventilation should be put above the feeling of being snug and warm, irrespective of the condition of purity of the air some people feel inclined to inhale.

I trust that Wilson Popenoe will come to see the point that in developing new supplies of food and especially of creating commercial reservoirs of vegetable butter, as the avocado undoubtedly does, that he assists his fellow men more than by merely going to try to kill a few who happened to be born somewhere else on this globe and who are, believe me, not all in sympathy with those who drive them on!!

Your item of putting 300 acres in soy beans at Yarrow interests me greatly. It shows how food supplies slowly crowd out mere ornamental propositions.

Concerning I giving you a careful analysis of Chinese food situations. Well, as you realize China is a big land and feeding the multitudes presents problems that are at times purely local. As a rule one can say that the poor live on a vegetable diet exclusively and are thereby nothing but human animals; the well-to-do, who rule and manage the masses, include considerable meat into their daily meals and therewith apparently find their brain cells stimulated sufficiently to lift themselves above the phase of being only beasts of burden.

As a whole, however, I can say that from my personal observations I can testify that here in

Central China rice forms $\frac{3}{4}$ of the total amount of food the ordinary people take in; meat and fish supply a mere fraction and the rest is taken into the form of beans, peas, lotus-rhizomes, various roots and tubers and in leafy vegetables, the last in bulk often looking predominant, but being only coarse matter, really amount to a small percentage of the total.

Concerning Dr. McCollum's idea that leafy green vegetables are essential in the human diet, well, this is a mooted question. The Russians at large use but few leafy herbs, and thousands of cowboys, especially in the Argentine, live on an almost pure meat diet. Of all of the leafy greens the Chinese love especially those belonging to the cabbage and mustard group; it seems that the race has found out that they supply some essential factors. Spinach also is in great demand but it is a much dearer vegetable than various cabbages. Concerning Chinese substitutes for dairy products, well, the 101 different manufactures of the soy bean supply this protein, but I must admit that it will take some time for the white races to acquire the taste of the very large majority of these products.--We are still at it, but being without an interpreter I don't find out as much as I would like.

I am glad to notice your statement re the long-wanted Feitcheng peach. And having come true from seed surely surprises me.

Concerning curd made from acorns, I have not come across it yet; it seems to be rather a country product.

Concerning lubricants for aeroplanes the Chinese say that hemp oil (Cannabis sativa) does not congeal even in very cold weather. Has it been tried to your knowledge?

I see your remarks concerning Prof. Reimer and the pear situation. Cooperation with outside people always presents peculiar problems. If Prof. Reimer had come down quicker to Kingmen I would have escaped the revolution in Hupeh and life would have been far more satisfactory.-- The pear seeds which I now have with me may not germinate to a great extent, but -- by keeping them cool and possibly stratified in cold storage they may still give fair returns.

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Concerning obtaining quantities of Davidia involucreta, it seems that the tree is especially abundant South of Patung, but with all the fighting going on there no one knows what time a collector could travel in that district.

Concerning similarity of fruits of Pyrus calleryana and P. betulaefolia, well, that has been some problem. I found out that the first, when fully ripe, turns into a brown color and the last becomes black. However, when ignorant natives bring in several thousands of pounds of fruits and not all entirely ripe, then you may realize what a job we had in trying to separate the two kinds.

I see your remarks re possible promotion; it really seems that laborers in factories and yards are slipping over a point or two over those who are at fixed salaries.

Growing Chinese yams for flour-production in America; well, the digging of yams is a very laborious process and right here they are really in the nature of a luxury. This whole hunting for new food products is really a trying situation. So much experimenting is needed to establish a new crop that often a person's whole life might have to be devoted to it.

I think that soy bean flour might come to the front and all sorts of beans should be tried, especially in the So. States.

Your very sympathetic remarks are surely appreciated by me. Times certainly are sad and mad and from a scientific point of view so utterly unnecessary.

Well, later on I'll answer more correspondence from you and from others in our Office.

This letter was received at the Office in Washington on June 20, 1918, and proved to be Mr. Meyer's last letter to us. On the afternoon of June 4, 1918, the State Department telephoned us the following cablegram from the American Consul at Nanking, China:

Frank Meyer, Department Agriculture, disappeared from a steamer in this consular district en route Hankow to Shanghai June second.

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On June 7, 1918, the Consul at Nanking sent a second cablegram, reading as follows:

Yours June fifth. Proceeding with Chinese up river to search for Meyer. Steamer captain states Meyer normal but complained of headache. Have telegraphed Legation and requested Swingle come to Nanking to assist in search.

On June 9, 1918, the Consul cabled again:

Found Meyer's body thirty miles above Wuhu.

Under date of June 12, 1918, the Consul at Nanking made the following report:

The Secretary of State,
Washington.

Sir:

I have the honor to enclose herewith a confirmation of my telegram of the 9th inst., informing you that I had recovered the body of Frank N. Meyer, Explorer for the Department of Agriculture, who disappeared from the Japanese vessel S. S. Feng Yang Maru, en route from Hankow to Shanghai, as reported to you in my cable of the 4th inst. and in my despatch No. 291, of the same date.

Upon receipt of the Department's telegram of the 5th of June, instructing me to spare no effort in ascertaining Mr. Meyer's whereabouts, I proceeded to Wuhu, which is about sixty miles above Nanking on the Yangtze River, intending to organize a number of small search parties of Chinese boatmen. I reached Wuhu at ten o'clock on Friday evening, the 7th inst., and went to the home of the representative of the Standard Oil Company of New York, by whom I had been invited to spend the night there. With me was an interpreter, who was also invited to spend the night at the home of the Standard Oil CO's representative, which was fortunate, for it was there that the servants

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in the house told him that they had been informed by the crew of the Standard Oil Co's launch that they had seen the body of a bearded foreigner picked up in the river at a point thirty miles above Wuhu, and that he had been buried the same day. A peculiar circumstance was that the representative of the Standard Oil Co. returned on the launch from the place near where the body was found, and the crew mentioned the fact that they had seen the body of the foreigner; this is probably due to the fact that they were frightened.

The next morning at 7 a.m. I boarded the launch of the Standard Oil Co. and started for the place where the body had been buried. The crew took me to the exact spot where the body had been buried, on a hill about one hundred yards from the shore of the river. I was taken to the place by two inhabitants and there saw a mound, which always signifies in China a "grave". Chinese really do not dig graves; the coffin is placed on the ground and covered by a mound of earth, which is in some cases concreted. In this case, the mound was made of turf, and was not a very high one. After some difficulty I persuaded three Chinese laborers nearby to open the mound. Chinese are very adverse to tampering with a grave in any way; in fact it is a very serious offense to move a grave without the permission of the local official. The mound was finally removed, and the body disclosed. The body had been placed on two planks, and one plank covered it; it was not a coffin in any manner. The head was already badly decomposed, but a beard was seen, and the body was attired in a white undershirt and a pair of grey trousers. I had the body covered again, and then went into town to make arrangements regarding the purchase of a coffin and the removal of the body.

I had been informed that the body had been picked out of the river by a boatman living in the town of Ti-Keng, Anhui Province, where the body had been buried, and that the life saving station (Chinese characters) had taken over the body and had given the boatman \$.80 (cents) and had permitted him to take the pair of shoes on the body as a further reward. The officer in charge of the life saving station is also the customs officer, and was a very amiable Chinese and disposed to assist me in every way. The

boatman was summoned, and I questioned him as to the finding of the body. I particularly questioned him as to any marks of violence, but he and others emphatically stated that there were none. The life saving station made a statement as to the finding of the body, the condition of same, place of burial, etc., and I have translated same as per the enclosed copies of translation. The shoes were produced, and appeared to be American shoes. There was also produced a part of the suspenders, which were of American manufacture. The writer had seen Mr. Meyer in Peking several years ago and remembered that he wore a beard, and the fact that the body had a beard and had American shoes and suspenders appeared to be sufficient proof of the identity of same.

After questioning the boatman and others, I purchased a coffin and hired two coolies to prepare the body for placing in the coffin which I intended to ship to Shanghai for reasons mentioned below. The task of preparing the body for the coffin was decidedly an unpleasant one, but was well done by the Chinese, and about six o'clock in the evening the coffin was placed upon a small sampan and towed by the launch to Wuhu, which was reached by 10 o'clock. I immediately arranged with the custom authorities at Wuhu for permission to ship the body to Shanghai, and the next morning the coffin was placed on the S.S. Ngankin, sailing the same morning for Shanghai. I went as far as Nanking by the same boat and then took train to Shanghai in order to make all arrangements for landing the body in case of any difficulties, before the body actually arrived. The body arrived in Shanghai 1 p.m. on Monday, and no difficulty was experienced in landing the coffin.

My reasons for taking the body to Shanghai are as follows: I felt that it would be very possible that the Department of Agriculture would ultimately request that the body be shipped to the United States, in which case all details in connection therewith could be very conveniently handled in Shanghai, far more so than in Nanking. Another reason for taking the body to Shanghai was that the writer on two occasions had been informed that Mr. Meyer was of the Jewish faith, but I was not at all sure of the fact. However,

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in case he was, I felt that Mr. Meyer's relatives would naturally desire that he be given a Jewish burial. I enquired at the Legation at Peking, where he was well known, but Mr. Meyer's religion was not known, and I finally decided, because of the doubt, to bury him in the Protestant Cemetery in Shanghai. The services are to be conducted today by the Rev. John Hykes, a very well known clergyman (American) in Shanghai.

While in Shanghai I made an inventory of the personal effects which had been taken off the S.S. Fengyang Maru on its arrival in Shanghai. His papers disclosed the fact that the value of the estate was over Gold \$500.00, and I immediately turned the administration of the same over to the United States Court for China. Mr. Meyer had a considerable amount of seeds ready for shipment to the United States, and I presume these and Mr. Meyer's notes will be handed over to Mr. Swingle, also of the Department of Agriculture, who will arrive in Shanghai about the 27th of this month, as I have been informed by the Embassy at Tokyo. No will was found, but it is possible that Mr. Meyer left a will which may be in the possession of the American Security Trust Co., a bank in Washington, D. C., as it appears that this institution handled Mr. Meyer's financial affairs in the United States.

Several letters in Dutch, in which Mr. Meyer was addressed as "Dear Brother", and in which reference was made to "father", were found among his effects. The address of the sender is A. Meyer, 11 Lod. Tripstraat, Amsterdam, Holland, and a report of Mr. Meyer's death has been sent to this person.

There is enclosed herewith a report in duplicate of Mr. Meyer's death. Under "Cause of Death" I have noted "due to drowning". It is impossible to state whether Mr. Meyer fell off the boat accidentally or whether it was a case of suicide. Mr. Meyer had not been feeling well for some time, according to the statement of servant, whom I interviewed in Shanghai, and he had been considerably depressed. Among his effects were a number of notes he had made at various periods in China. He complained constantly of his loneliness, and appeared to be

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depressed a great deal of the time. A gentleman who occupied the same cabin with Mr. Meyer from Kiukiang to Anking (Mr. Meyer was missed after the vessel left Anking) stated that Mr. Meyer seemed to be very much depressed because of the war, as he (Mr. Meyer) did not favor war under any conditions. It appears certain that Mr. Meyer had been depressed for some time.

I understand that the Consulate General at Shanghai is forwarding the Department the statements of Mr. Meyer's boy and of the Captain of the Feng Yang Maru.

The shoes and the piece of Mr. Meyer's suspenders which I procured from the Chinese were identified by Mr. Meyer's boy as those which Mr. Meyer had worn on the day he disappeared.

I have the honor to be, Sir,

Your obedient servant,

(Sgd) Samuel Sokobin

American Vice Consul in Charge.

The following is the translation, referred to above, of the statement of the officer in charge of the Life Saving Station at Ti Keng, Anhui Province:

On June 5, 1918, at 12 o'clock a.m., a boatman, named Chen Yu-yuan, who sailed from Feng Hwan Ching to Ti Keng, saw a body floating on the River near Shih Pan Chow. The body was swollen, the face was black with dirt. The body wore a white shirt, a pair of grey trousers, with black socks and a pair of yellow shoes. The boatman towed the body to the bank at Ti Keng, where it was seen by everybody in this town. The boatman reported the matter to this office, and a coffin was given for the burial of the body on the same day on the San Ti Miao Hill.

Signed and Sealed by the
Life Saving Station at Ti Keng.

June 8, 1918.

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The following is the report dated June 14, 1918, received from the American Consul in Charge, Shanghai, China:

I have the honor to report the action taken by this office in connection with the death of Mr. Frank N. Meyer, Plant Explorer of the Department of Agriculture.

It appears that Mr. Meyer while traveling down the Yangtze from Hankow to Shanghai on the S.S. "Feng Yang Maru" of the Nisshin Kisen Kaisha, was drowned near Wuhu. Whether he fell off the ship accidentally or committed suicide in a fit of depression will probably never be known.

Upon the arrival of the Feng Yang Maru at Wuhu, Mr. Meyer's disappearance was reported to the Customs and a telegram sent to the American Consulate at Nanking. The ship then continued on its way. Upon its arrival at Nanking, however, it appears that the telegram to the Consulate had not been received in time to permit of any action being taken, in consequence of which the vessel arrived at Shanghai on June 3d with Mr. Meyer's effects still on board. The Captain of the ship at once notified the Japanese Consulate-General, which, on the following day, turned over all effects to this office.

A thorough investigation was then made of all the sources available in regard to Mr. Meyer's disappearance; the Commissioner of Customs was requested to telegraph the Customs authorities at Wuhu to search the river for the body; and telegrams were sent to the Consulate at Nanking and to the Legation. In connection with the investigation made, the following statements are enclosed:

Affidavit of the officers of the
"Feng Yang Maru",

Statement of Mr. Meyer's servant,
Statement of Consul R. P. Tenney.

A few days after the Feng Yang Maru reached Shanghai, a telegram was received from Mr. Sokobin, the Vice Consul in Charge at Nanking, stating that he had discovered the body near Wuhu and was shipping it to Shanghai. On June 9th Mr. Sokobin arrived and took charge of the effects. Mr. Meyer's body arrived on June 10th and was interred at the Bubbling Well Cemetery on June 12th, the funeral being attended by the Consul in Charge and other members of the Consular Staff.

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The following is the statement of Mr. Meyer's servant, mentioned above:

My name is Yao Feng T'ing. I am a native of Ichang. I have been ship's compradore on H.M.S. "Woodlark" and "Woodcock", 2d compradore on S.S. Shutung, and No. 1 Boy and interpreter for Mr. Platt of the British American Tobacco Company at Wanhsien, Szechuan Province. After Mr. Platt's departure I returned to Ichang. I entered Mr. Meyer's employ last year in the 7th moon (August 19 - September 15, 1917) and have been with him for ten months. He always treated me very well and was of a very quiet disposition.

On May 2d Mr. Meyer and I left Ichang for Kingmen to collect t'angli seeds. From there we went to Shasi. We left Shasi May 4th or 5th for Hankow. We stayed at the Hankow Hotel 14 days and then moved to the Ti-Erh-Pin Hotel where we stayed for 3 days. The reason for changing hotels was stomach trouble and the fact that sailors from the gunboat were constantly annoying Mr. Meyer by asking him to drink with them. His illness was not serious, being stomach trouble accompanied with vomiting. He said he was coming to Shanghai on account of the heat at Hankow, that he would be at Shanghai a month and then go on to Chefoo.

We left Hankow Friday, May 31st, going on board at 7:00 P. M. The boat left at 9:00. The same morning Mr. Meyer had stated to me that he had dreamed that his father and old friends had come to see him and that he considered it a bad omen. This was the first time he had ever mentioned any dreams. On Friday he was not vomiting but he looked a little thinner than he did at Ichang.

I waited on Mr. Meyer on Saturday and saw him several times. He asked me how I was getting on and said that he felt better. He ate gruel in the morning. He had tiffen and dinner - all Chinese food, as he was travelling in the Chinese 1st Class, on account of its being cheaper than foreign 1st Class.

At Kiukiang, on Saturday morning, a foreign insurance man got on board and occupied the same cabin with Mr. Meyer, leaving the ship the same

day at Anch'ing about 4:00 P.M. The two were together during the day.

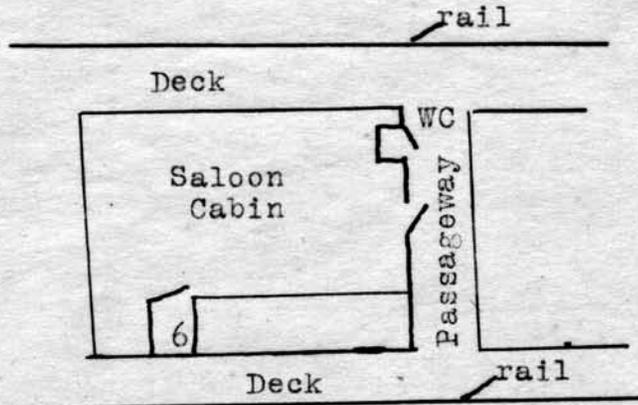
Mr. Meyer went to his room at six o'clock after having dinner in the saloon. I went into his room at six and poured out tea for him and did not see him afterwards. He appeared and spoke as usual at this time. He mentioned that we had passed Anch'ing and asked me how I was getting on. I asked him how we was getting on and he said he felt better than when he was at Hankow.

About 12 o'clock the compradore's boy called to me and said that my master could not be found. He said that at about 11:30 he had seen Mr. Meyer come out of his cabin and supposed that he was going to the W. C. I looked into Mr. Meyer's room and found only his coat so that he must have had his shoes on and have been otherwise dressed. The Captain then appeared and a search was made of the ship.

There were no bad characters, to my knowledge, on the boat and Mr. Meyer had not offended any one as he was of a very quiet mature. He never showed any signs of insanity.

The following is the statement of Mr. R. P. Tenney, Consul detailed to the American-Consulate, Shanghai, in regard to Mr. Meyer's death:

On June 5, 1918, I went on board the S.S. "Feng Yang Maru" and secured the signatures of the officers of the ship on the affidavit attached to this report. I questioned the 1st Class Chinese steward, whose signature appears on the affidavit. He stated that he was on duty in the saloon in the evening of June 1st and had seen Mr. Meyer leave his room and supposed that he had gone to the W. C. I examined the room that Mr. Meyer had occupied and found the arrangement to be about as shown in the following sketch:



As shown in the sketch, the W. C. opens onto a lateral passageway between the decks and is only a few steps from the rail.

I questioned the Captain but he had nothing to add to his affidavit. He said he had not seen Mr. Meyer during the trip at all.

I took a copy of a form Mr. Meyer had been required to fill out on board ship, as follows:

Name and title	F. N. Meyer, age 42
Occupation	Botanist
Nationality	American
Address	Hotel Kalee, Shanghai,
Port of embarkation	Hankow
Port of disembarkation	Shanghai
Class	1st
Room No.	6

Another form had also been filled out for the same room by a Mr. Islay F. Drysdale, a British insurance agent, who had travelled between Kiukiang and Anch'ing (see statement of Mr. Meyer's servant). It is understood that the American Consulate at Nanking is endeavoring to secure a statement from Mr. Drysdale, who was apparently one of the last persons to have any conversation with Mr. Meyer.

The following is the affidavit of the officers of the S.S. Feng Yang Maru, subscribed and sworn to the 5th day of June, 1918, before Mr. R. P. Tenney, the Consul in Shanghai:

An American by the name of Frank N. Meyer, travelling from Hankow to Shanghai by the S.S. Feng Yang Maru, Chinese first class room No. 6, disappeared from his room about 11:20 on the night of June 1st, 1918. No trace of him could be found, the ship being searched below and above and all along the guards and rails to see if there was any mark or trace of him left, but none was found. The position of the ship at this time was abreast of Barker Island light boat. The occurrence was reported to the Wuhu Harbor-master and also telegraphed to the American Consul at Nanking from Wuhu.

We, the undersigned, to hereby make affidavit that the above statement is true to the best of our knowledge and belief and that it is a correct translation of the ship's log of that date.

We notified Mr. Meyer's father by cable and by letter of the death of his son, but up to the time of writing this report no reply had been received from him. We also sent a copy of the Consul's report to the American Security and Trust Company, of this city, which Company was Mr. Meyer's financial representative. The Office held a memorial meeting at Mr. Fairchild's residence on the evening of July 31, 1918, when Mr. Fairchild gave a short talk on Mr. Meyer's work and showed a number of lantern slides made from Mr. Meyer's photographs. He also read the following clause from Mr. Meyer's will:

Unto David Fairchild, or such other person as may then be in charge of the Office of Foreign Seed and Plant Introduction, of the Bureau of Plant Industry,

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of the United States Department of Agriculture, the sum of One Thousand Dollars (\$1,000.), which I desire to be divided equally among all of the persons then connected with said Office, or else, if such persons shall so prefer, to be used for some outing or entertainment for them; but the receipt of the said David Fairchild, or of such other person as may then be in charge of such Office, as the case may be, shall be a full discharge and acquittance of my executor in respect of the payment aforesaid.

At the time of writing this report the estate had not been settled.

It is the purpose of the Office to erect a memorial to Mr. Meyer, but the form of this memorial has not been decided upon.

Many newspaper clippings regarding Mr. Meyer's work and his death have been received by the Office; also many letters, extracts from some of which follow:

Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass., from Chosen Hotel, Chosen, Korea, July 22, 1918:

I am much distressed over the sad end of poor Meyer and also deeply puzzled. By his untimely death you have lost a faithful, hard-working man, whom it will be difficult to replace, and plant exploration one of the most energetic and enthusiastic servants it ever had. Surely his work is worthy of recognition by a memorial tablet or something of the kind, and Peking would be the fitting place to erect one.

Mr. D. MacGregor, Superintendent of Parks, Shanghai, China, June 25, 1918:

It was with deep regret that I followed the remains of the late F. N. Meyer to his last resting place. His death must be a

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considerable loss to your Department, as he undoubtedly knew more about the economic vegetation of China than any other man. Further, he was such a slave to his calling that he never knew what it was to rest when he thought there was another chance to acquire further knowledge. Probably living in China I understand better than people at home can the amount of hard work he put in to be able to traverse such a large section of this country as he did, where conditions for travelling are as bad as can be, except when it is possible to travel on the water by house boat which is very slow.

I informed the American Consul General that if when Mr. Meyer's collection came to hand it looked as though it required repacking to insure its arrival in the States in good condition, that I would be glad to give him full assistance. Possibly, however, he may have shipped from Hankow.

Mr. F. C. Reimer, Southern Oregon Experiment Station,
Talent, Ore., July 9, 1918:

I have your letter of July 2 and note what you say regarding Mr. Meyer. I am sending you herewith a clipping which I have just received from Japan. This was published in the Japan Advertiser for June 10th. I am certainly very sorry to learn the sad news. Recently a notice of Mr. Meyer's death appeared in a paper published at Portland, Ore., and this states that a body resembling his was found in the Yangtze near Wuhu a short time after his disappearance from the boat.

Nothing has affected me so in a long time as this sad news. Oh, what a pity that this great man should lose his life in China, and especially central China. Certainly a remarkable man and a remarkable character has fallen. Mr. Meyer was one man in many thousands. He possessed a great brain and also a great heart. His great qualities were best known by those who knew him intimately. His great energy, his training, and his roving disposition fitted him admirably for the great work he was doing.

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While those of us who know his work appreciate it greatly, I think that few of us can fully appreciate its great possibilities. The remarkable new field that he has opened up, the vast quantities of material that he has introduced, will always remain as a great epoch in American agriculture and horticulture. I am certain that future generations will appreciate his work even more than we can today. During the three weeks that we worked together in far away China we became very intimate and he told me of his life's struggles and of some of his great disappointments and sorrows. I know that few people ever realized the tremendous battle that was raging within his soul. For this reason few people could console or comfort him. My prayer is, may his soul find the companionship, the rest, the comfort, and the peace that it so well deserves.

Private A. C. McCormick, Ordnance Supply School, Camp Hancock, Co. F, Augusta, Ga., formerly of So. Oregon Station, July, 1918:

Through recent news despatches I have noticed the sad ending of Mr. Frank N. Meyer in the Orient. Mr. Meyer certainly did splendid work in China and I know that your Department will feel his loss most keenly. He made great sacrifices in his work and it is hardly fitting his career should have ended thus.

Mr. A. B. Conner, Acting Director, Texas Agricultural Experiment Station, College Station, July 12, 1918:

I have your letter of July 5 relative to the report of Mr. Frank Meyer's death. I am sure it is a great loss to the whole country. He was a very likeable man, and the people here at College who knew him felt a great interest in him and his work.

I am sending a copy of your letter to Mr. Youngblood, who is spending part of the summer in Madison, Wis., and I am sure he will regret very much that the original

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report was correct. We had hoped that there was some mistake in the report of the matter.

Dr. C. L. Shear, Pathologist, Fruit-Disease Investigations, Bureau of Plant Industry, Department of Agriculture, July 2, 1918:

I was much grieved at the news of Mr. Meyer's death. This certainly is a great loss. Mr. Meyer was exceptionally fitted for botanical exploration and I fear it will be difficult to find a man to take his place. I trust some permanent record and recognition of his life and work is being arranged for.

Prof. L. H. Bailey, Ithaca, N. Y., June 19, 1918:

It is indeed sad news that you give me from China. The tendency to discouragement and the problems concerned with the difficulties of life that I noticed in Meyer come back to me with renewed force. Whenever you have any further news as to his death, I wish that you would let me have them. I should like to know whether it was an accident or whether there is any likelihood of foul play. I take Millard's Review of Shanghai, weekly, but not yet has there been any account of it. I suppose that I will receive information from that end in due course, but that will be some time yet.

I shall never cease to regret his untimely end; and I am more than ever glad that I had the two opportunities with him last summer not only because I liked him personally but also because he gave me so very many interesting points of view and so much information about China.

Mr. Henry Hicks, of Hicks Nurseries, Westbury, L. I.,
N. Y., June 19, 1918:

I herewith regret to hear of the death of our friend Frank Meyer. Is this correct? I should like to hear from you before I leave for the Nurserymen's Convention at Chicago.

September 21, 1918.

My address after June 23d will be c/o Hotel Sherman, Chicago. I should like to ask the Resolution Committee to take action on his death, if you think best.

I am on the Arboretum Committee of the Association, and will suggest that in the proposed National Arboretum a suitable Memorial be made for Frank Meyer. This might take the form of a properly inscribed collection or an administration building.

Mr. Curt G. Pfeiffer, 1 West 81st St., New York City,

June 12, 1918:

It seems incredible that our friend, Frank Meyer, who was so full of life and activity and the spirit of adventure should indeed be dead. I can readily imagine that as you say the news just made you sick. It did me too. Since he returned to China, I had seen his name from time to time appear in your journal in connection with various specimens he had sent over and every time I saw his name, I could see the aggressive personality it stood for.

I asked him on one occasion whether he ever had any fear of assassination in his wanderings, on which he was so frequently almost alone, but he did not seem to give it a thought. It does look, however, as if his falling from the steamer, can hardly have been an accident.

If you have a photograph of him, I should very much like to have a copy.

Mr. Pfeiffer wrote again on June 19, 1918:

I was very glad to see one or two short notices of Mr. F. N. Meyer's death in some of the evening papers today. Meyer, admittedly, amongst those who know, has done excellent work, but the fact of his lone travels for so many many years in Asia, has a picturesque quality which I think should be brought to the attention of wider circles. Couldn't you get an article in the National Geographic Magazine, detailing to the general public what he has accomplished, something about the manner of the man, with some pictures from his wonderful collection? It would make an interesting article for all readers and it would be something of a posthumous acknowledgment of his work.

I know you will take this suggestion in the spirit in which I make it.

September 21, 1918.