

Issued April 17, 1922.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF PLANT INDUSTRY.

WILLIAM A. TAYLOR, *Chief of Bureau.*

INVENTORY

OF

SEEDS AND PLANTS IMPORTED

BY THE

OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION
DURING THE PERIOD FROM OCTOBER 1
TO DECEMBER 31, 1917.

(No. 53; Nos. 45221 to 45704.)



WASHINGTON:
GOVERNMENT PRINTING OFFICE.
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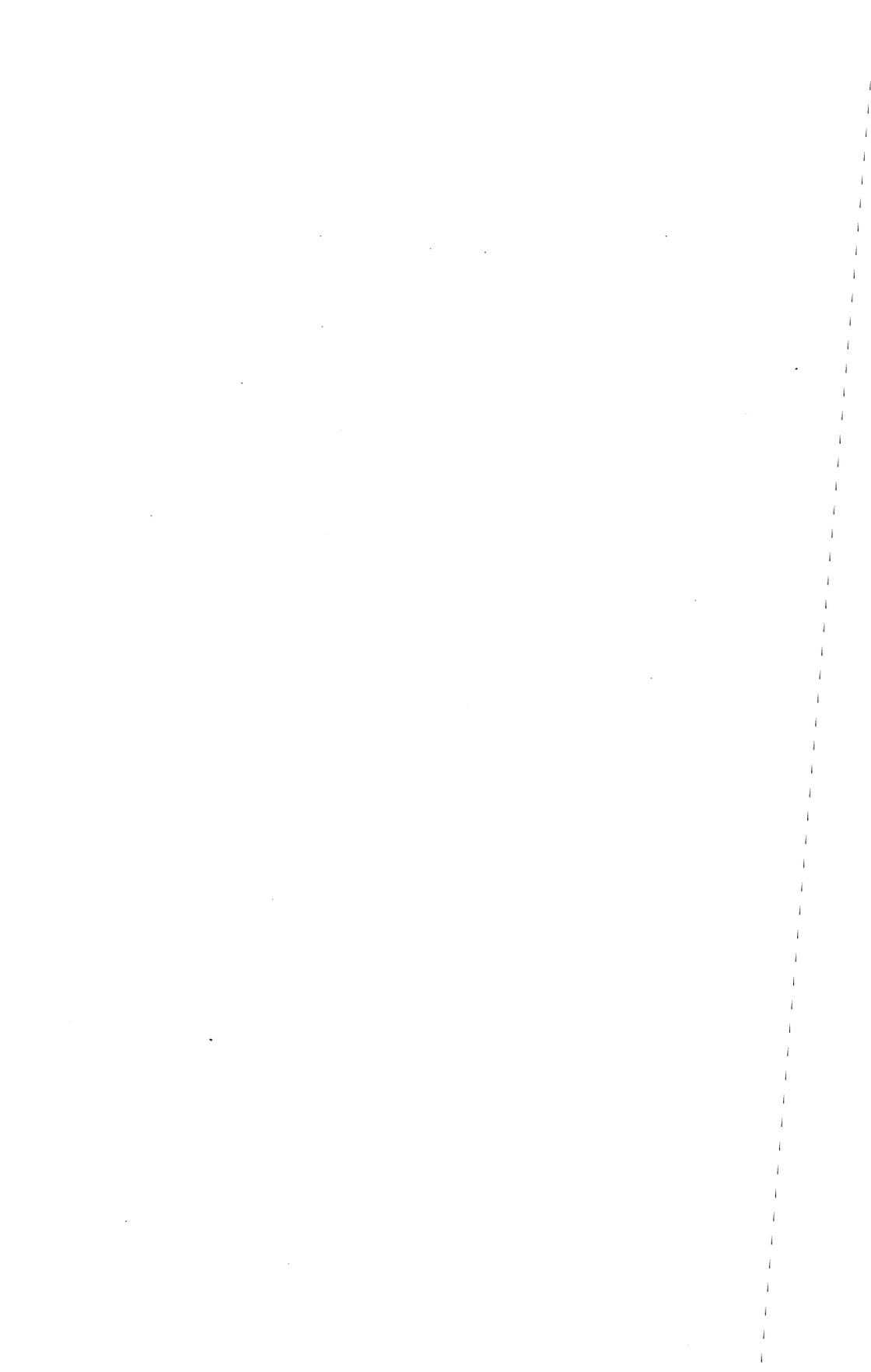
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INVENTORY OF SEEDS AND PLANTS IMPORTED BY THE OFFICE OF FOREIGN SEED AND PLANT INTRO- DUCTION DURING THE PERIOD FROM OCTOBER 1 TO DECEMBER 31, 1917 (NO. 53; NOS. 45221 TO 45704).

INTRODUCTORY STATEMENT.

This inventory covers the period from October to December, inclusive, 1917. During this time Agricultural Explorer Frank N. Meyer was on his last trip, exploring the upper Yangtze River around Ichang, and Agricultural Explorer Wilson Popenoe was in the Vera Paz region of Guatemala (fig. 1). The collections of these two men form a substantial addition to the new plants of this country.

Mr. Meyer found about 40 varieties of citrus fruits in the region around Ichang; of these he sent in some interesting varieties of mandarins and pummelos (Nos. 45311 to 45315) and a large-fruited Wampi (*Clauцена lansium*, No. 45328), which is closely related to Citrus but has small pubescent fruits. As yet this fruit is practically unknown in America, although a great favorite with the Chinese. Mr. Meyer's suggestion that the large ocher-yellow flowered *Lycoris aurea* and the carmine-red flowered species *L. radiata*, together with its yellow variety, ought to thrive throughout the South is worth emphasizing. He found these in great abundance in Hupeh Province (Nos. 45525 to 45528). The Ichang lemon (No. 45534) he thinks may be distinctly hardier than the common lemon, and the rare Chinese horse-chestnut (*Aesculus wilsonii*, No. 45532), which has narrower leaves than the common species grown by us, is now well established in America through the seeds which Mr. Meyer procured.

It seems probable that few of the introductions by Mr. Meyer will be of greater value than some of his cultivated varieties of that blight-resistant species of pear (*Pyrus calleryana*, No. 45586) which he calls the domestic crab-apple pear and which he found in many varieties near Kingmen, Hupeh. The pioneer work of Dr. Reimer has brought this species of pear to the foreground because of its peculiar resistance to blight, and some of these cultivated sorts bid fair to become of great value for stocks upon which to work the

more luscious varieties of *Pyrus communis*. Under No. 45592 Mr. Meyer sent in 100 pounds of seed of the small-fruited wild pear of the same species, and specialists are experimenting with these.

Wilson Popenoe sends in from the Vera Paz region a small-fruited chayote no larger than a hen's egg (No. 45350); the inga, which he says is a fruit worthy of a place in the gardens of the amateur in southern Florida (No. 45351); an interesting tropical walnut (*Juglans mollis*, No. 45352), which makes a small tree only 45 feet

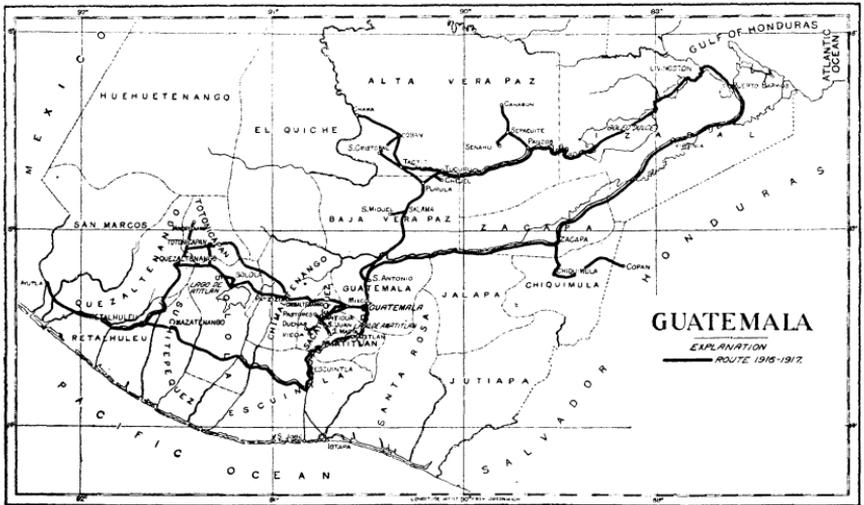


FIG. 1.—Wilson Popenoe's routes of exploration in Guatemala from September 6, 1916, to December 13, 1917. The search for hardy avocados which Mr. Popenoe made during the 16 months of his agricultural exploration of Guatemala constitutes a noteworthy horticultural accomplishment. His journeys on muleback and on foot traversed over 2,000 miles of the mountain trails and roads of that Republic and resulted in the successful introduction into this country of 36 distinct types of the hard-shelled hardy avocado. Each one of these represents the successful importation of bud sticks from a selected seedling avocado tree from which he collected the fruits and of which he took record photographs, not only of the fruit itself but of the tree as well. The collection is further remarkable in that each number in it is backed up by a careful description, written on the spot, of the characteristics of the tree from which the budwood was taken. This precaution will make it possible years hence to study the variation which takes place in the fruit, as well as the trees which are grown from the imported buds. In addition to this, which was Mr. Popenoe's main quest, he discovered and introduced two wild relatives of the avocado, the *anay* and the *coyó*, both worthy of the careful attention of tropical horticulturists, and also 190 other especially selected rare and useful species of plants which he believes can be grown in the warmer sections of the United States and similar regions throughout the world.

tall, but which fruits abundantly and bears nuts with even thicker shells than those of our own black walnut; a species of tropical *Rubus* (No. 45356) with soft seeds and of good flavor, which fruits abundantly and should be tried in the Southern States; and seeds of the *coyó* (*Persea schiedeana*, No. 45354), on which will be grafted his large-fruited variety of this new fruit, which he declares is more highly esteemed by the Indians of the Vera Paz region than the avocado itself and deserves to be brought to the attention of all

tropical horticulturists as a hitherto entirely neglected tropical fruit tree. From the valley of the Rio Polochic he sends in seeds of a handsome flowering shrub (*Pogonopus speciosus*, No. 45360) with brilliant scarlet bracts suggestive of the poinsettia; and from the vicinity of San Cristobal a wild grape (No. 45361) with fair-sized berries, which he thinks is the largest fruited grape he has yet seen in the Tropics and should be capable of development by selection.

Six of Mr. Popenoe's selected avocados are described in this inventory, including the Akbal (No. 45505), which he considers, on account of its earliness, one of his promising sorts, the Manik (No. 45560), Kaguah (No. 45561), Ishim (No. 45562), Kanan (No. 45563), and Chabil (No. 45564). Under No. 45506 he describes the fruit of a species of *Malpighia* called the *azerola*, which may be hardier than its relative, the Barbados cherry, and if so would be well worth distributing as a dooryard shrub in southern California and even in southern Texas.

The possibility of a terrestrial orchid which would produce a good flower for use in the house is emphasized by Mr. Popenoe in his introduction, from an altitude of 4,000 feet, of the *Sobralia macrantha* (No. 45547), which grows there to a height of 4 feet and has a large showy flower. His "ilama," a species of *Annona* (*A. diversifolia*, No. 45548), which appears to be adapted to the lower levels of the tropical coastal plain, can not fail to be of interest to tropical horticulturists, for it has fruits as fine in flavor as the cherimoya and will thrive on the coastal plain where the cherimoya refuses to grow. Dr. Safford has named after Mr. Popenoe a new species of *Dahlia* (No. 45578), which in his opinion is in all probability the ancestor of the cactus dahlia and to which the breeders may have to turn to rejuvenate their stock of this wonderful flowering plant.

With the introduction of the large-fruited tropical hawthorn (No. 45575), which Mr. Popenoe found growing in the mountains of Guatemala and which is used for the production of a distinctive and delicate preserve by the people there, we now have in this country the material for the breeding of new types of hawthorns, which should be adapted to a wide range of conditions. Our numerous native species, the Chinese *Crataegus pinnatifida* with its large-fruited strains, and this Guatemalan tropical species, *C. stipulosa*, should attract some one to the problem.

The remarkable breeding work of Dr. Walter Van Fleet is well known to the rosarians, but his activities in other fields are less well known. This inventory gives descriptions of selections and hybrids (Nos. 45330 to 45342) which he has produced by the breeding of the chinquapin (*Castanea pumila*), the Chinese chestnut (*C. mollissima*), the American chestnut (*C. dentata*), and the Japanese species (*C.*

crenata). He has been working with these for many years and has a remarkable collection of bearing trees at his place in Maryland. The selections of the Chinese species are so resistant to the bark disease as to make it safe to recommend them for orchards, where with careful watching they ought to be as safe investments as peaches or pears or others of our fruit trees. They are not large forest trees. The fate of that other Chinese chestnut (*Castanea henryi*, No. 45670), which grows to a height of 75 to 100 feet on the upper Yangtze River as far west as Mount Omei, remains to be seen. If it should prove resistant to the bark disease it might in a measure take the place of our forest chestnut in certain localities. Although the barberry has been given a jolt through the association which its rust disease has with the rust of wheat, there are species that are perfectly safe from attacks of rust and may be grown freely as doorway shrubs. Let us hope that this is the case with Dr. Van Fleet's cross (No. 45477) between *Berberis wilsonae*, which E. H. Wilson found in China, and *B. aggregata*. The hybrids are very handsome plants for borders, having a spreading low-growing habit, and are hardy in Maryland.

We are so accustomed to think of our own cereal crops as always having been the great food-producing plants of the world that it is a surprise to find in Mexico under cultivation to-day a relative of our common pigweed which in the times of Montezuma formed one of the staple cereal foods of the Aztecs. The seeds of this amaranth (*Amaranthus paniculatus*, No. 45535) filled 18 granaries, each holding 9,000 bushels, in the time of the great ruler. It was made into cakes known as "alegría" and was so highly valued that it had a part in the religious ceremonies of that time. Our present interest in it arises from the fact that it has a most remarkably low water requirement and consequently has distinct possibilities in our Southwest, where water is precious. It may be hoped that our predilection for other but no more palatable grains will not be so strong as to make it impossible to market this ancient one of the Aztecs, which Mrs. Zelia Nuttall sends in from Mexico.

Lamb's-quarters (*Chenopodium album*) has been used in this country by many people, and those who know it declare it is more delicate than that introduced vegetable, spinach, which is now the fashion. The huauhtli of the Aztecs (*Chenopodium nuttalliae*, No. 45536), which Mrs. Nuttall sends in from Mexico, is there used when the seeds are "in the milk," and she considers it a most delicate vegetable.

One of the most interesting of recently introduced vegetables is the mitsuba of Japan (No. 45247), sent in by Mr. Barbour Lathrop as one of the commonest vegetables among the Japanese. Botanically it is *Deringa* (or *Cryptotaenia*) *canadensis*, and curiously enough

this species, although it occurs from Nova Scotia to Texas and was known in the old days as honewort, has never been cultivated or even used as a vegetable by Americans. It is easily grown and deserves to be carefully studied by amateurs. Its food value is probably similar to that of celery.

The success of the Japanese flowering cherries makes the introduction of the pink-flowered wild forest cherry (*Prunus serrulata* var. *sachalinensis*, No. 45248) of particular interest. The cherry-wood timber from it is said to be excellent, and if some one would plant a hillside with this tree it would not only make a place to which we should all sooner or later want to make a pilgrimage as one does to the Azalea gardens near Charleston, but in the years to come it would furnish for market an excellent quality of cherry wood.

So remarkable as money producers have been some of the new grasses introduced through the Office of Foreign Seed and Plant Introduction that cultivators are watching with a great deal of interest the behavior of the Napier grass of Rhodesia (*Pennisetum purpureum*, No. 45572). According to Harrison, the agrostologist of South Africa, it promises there to be one of the most remarkable drought-resistant fodder plants yet introduced into cultivation, making a yield of 27 tons of green fodder per acre and remaining green even during six or eight months of drought. It must be remembered that the South African dry season comes in the winter, when it is cool. It is very different from the scorching droughts of our own Plains. However, Napier grass is already making its mark in this country.

It is always with keen satisfaction that one records the arrival of the second generation of an imported plant in the New World. That loveliest of all flowering legumes *Camoensia marima* (No. 45608), from the coast of Portuguese West Africa, was introduced in 1901 and scattered in vain in Florida. A plant was sent to Dr. R. M. Gray, in charge of the Harvard Experiment Station at Cienfuegos, Cuba. This has grown and flowered and produced fruit, so that this liana, named after the great Portuguese poet, Camoens, is successfully established in the West Indies. It deserves to be grown wherever it can be in the tropical forests of the New World.

The species of crab apple which was formerly much cultivated in Japan (*Malus prunifolia rinki*, No. 45679) but was driven out by the American varieties, according to Prof. Sargent, of the Arnold Arboretum, may prove as hardy as *Pyrus baccata*, and he suggests that it be crossed with the Siberian crab-apple varieties and new hardy varieties of apples procured for trial in Canada.

Dr. Trabut's suggestion that the wild Moroccan pear (*Pyrus mamorensis*, No. 45612), which inhabits the dry sandy noncalcareous soils of the Mamora, should be considered as a stock is well worthy of trial.

There is a place for a peach in the southern part of Florida, if only the tree suited to that region of tropical southern rains can be found. A freestone variety (No. 45662) of the peen-to type from the French West Indies, which is said to resist decay, may furnish this southern peach.

It has seemed a little strange that so excellent a fruit as that of the passion vine, which ranks among the best fruits of Australia, should still be practically an unknown fruit on our markets. The hard-shelled sweet granadilla of Guatemala (*Passiflora ligularis*, No. 45614), which instead of being purple in color is a deep orange-yellow and instead of shriveling keeps its plump form, may attract people more than the commoner species, *P. edulis*.

Mr. Frank N. Meyer's introduction of the grafted varieties of the Chinese jujube has resulted in the development of that very heat-resistant fruit in Texas and California. The introduction of 34 distinct varieties of jujubes from the island of Mauritius, which belong to a different botanical species (*Ziziphus mauritiana*, Nos. 45625 to 45658), may make the creation of new forms possible. This Mauritian fruit is said to be sold in the villages of the island in large quantities and to be appreciated by the Europeans as well as by the native inhabitants of the island. This inventory announces also the introduction of a third species from Argentina (*Ziziphus mistol*, No. 45227). Since no breeding has ever been done in this genus, it will be interesting to see what can be done in the crossing of these different species. News comes of the existence in the Punjab of jujubes of large size, whether of one of these species is not yet definitely known here.

The wide use of *Casuarina equisetifolia* as a street tree in southern Florida has engendered considerable discussion as to its benefits. It is possible that the Sumatra species (*C. sumatrana*, No. 45659), which is more handsome, may prove hardy enough and beautiful enough to warrant its substitution for the "Australian pine."

The breeders who are working with the genus *Ribes* will be glad to get the Chinese form, *Ribes fasciculatum chinense* (No. 45689), which is unique in that it ripens its bright-red fruits in the fall of the year instead of in the summer.

The Smyrna fig industry is an established thing in California, but apparently much work remains to be done in getting the best series of caprifig varieties which will harbor the *Blastophaga*. Dr. Trabut's hybrid (No. 45235) between the Abyssinian or Erythrean fig (*Ficus palmata*) and the common fig (*F. carica*) may play a rôle in this respect, since the Abyssinian species makes excellent caprifigs.

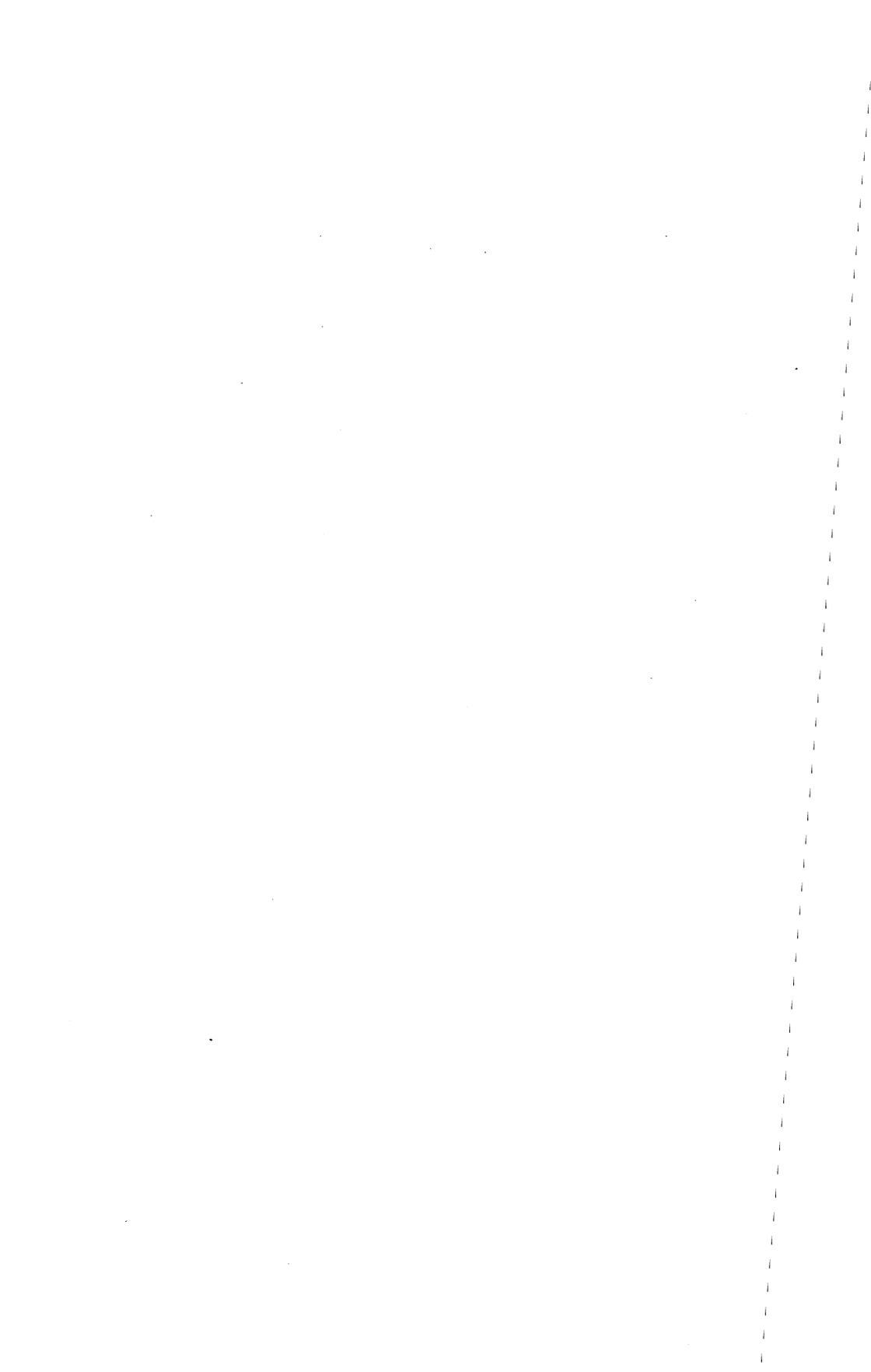
The botanical determinations of seeds introduced have been made and the botanical nomenclature revised by Mr. H. C. Skeels and the descriptive and botanical notes arranged by Mr. G. P. Van Eseltine, who has had general supervision of this inventory, as of all the publications of this office. The manuscript of this inventory has been prepared by Miss Esther A. Celander.

DAVID FAIRCHILD,

Agricultural Explorer in Charge.

OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION,

Washington, D. C., June 15, 1921.



INVENTORY.¹

45221 to 45225. TRITICUM AESTIVUM L. Poaceæ. Wheat.
(*T. vulgare* Vill.)

From Guatrache, Pampa, central Argentina. Presented by Señor Juan Williamson, Estacion Agronomica, through the Office of Cereal Investigations. Received October, 1917.

45221. *Barletta* (Pampa).

45223. *Barletta* 24.

45222. *Barletta* 77.

45224. *Barletta* 44.

45225. *Barletta* from a farm in the vicinity of the experiment station (not from the fields of the station).

45226 and 45227.

From Oran, Argentina. Seeds presented by Mr. S. W. Damon. Received September 6, 1917.

45226. *PASSIFLORA* sp. Passifloraceæ.

Granadilla.

"A yellow-fruited, acid type which I consider superior to the purple type." (*Damon*.)

45227. *ZIZIPHUS MISTOL* Griseb. Rhamnaceæ.

Mistol.

A spiny tree, native to Argentina, up to 30 feet in height, with oval, leathery, short-stemmed leaves about an inch long and edible, black fruits about one-third of an inch in diameter.

For previous introduction and description, see S. P. I. No. 44436.

45228. NEPHROLEPIS sp. Polypodiaceæ. Fern.

From Finca Chejel, Baja Vera Paz, Guatemala. Plants collected by Mr. Wilson Popenoe, Agricultural Explorer for the Department of Agriculture. Received October 19, 1917.

"(No. 175. October 1, 1917.) A common fern found along watercourses in the vicinity of Purula, Baja Vera Paz, at altitudes of about 5,000 feet. It forms dense masses in open places among scrub." (*Popenoe*.)

45229. PRUNUS NIGRA Ait. Amygdalaceæ. Plum.

From Ottawa, Canada. Seeds purchased from Mr. W. T. Macoun, Dominion horticulturist, Central Experimental Farm. Received October 1, 1917.

"The cultivated trees of *Prunus nigra* in this district practically never have mature fruit on them, as the fruits become diseased before they become fully

¹ All introductions consist of seeds unless otherwise noted.

It should be understood that the varietal names of fruits, vegetables, cereals, and other plants used in this inventory are those under which the material was received when introduced by the Office of Foreign Seed and Plant Introduction; and, further, that the printing of such names here does not constitute their official publication and adoption in this country. As the different varieties are studied, their identity fully established, their entrance into the American trade forecast, and the use of varietal names for them in American literature becomes necessary, the foreign varietal designations appearing in this inventory will be subject to change with a view to bringing the forms of the names into harmony with recognized American codes of nomenclature.

grown. It has been this way as long as I can remember—at least for 25 years. There might occasionally be a year with a few good fruits; but, as a rule, there are none. However, there is one man about here who has been cultivating these fairly extensively and keeping his trees thoroughly sprayed, and I am getting the seed from him. There is just a possibility of these being crossed with *Prunus americana*, as he has a few trees of the latter in his orchard.” (*Macoun*.)

45230. BRUNSFELSIA HOPEANA (Hook.) Bentham. Solanaceæ.

From Para, Brazil. Seeds presented by Senhor J. Simão da Costa. Received October 1, 1917.

“A slender twiggy free-branching shrub; leaves lanceolate-oblong, thin in texture, rich dark green, paler beneath. Flowers small but freely produced, solitary or in pairs all along the leafy growths; limb light violet-blue on first opening, fading to almost pure white with age; tube very slender, curved upwards, nearly white, 1 inch long; calyx three-fourths of an inch long, teeth obtuse.” (*Bailey, Standard Cyclopedia of Horticulture, vol. 1, p. 582.*)

45231. ANNONA MARCGRAVII Mart. Annonaceæ.

From Caracas, Venezuela. Seeds presented by Mr. Henri Pittier, director, Estación Experimental y Catastro de Baldios. Received October 4, 1917.

A tree with the trunk, form of the branches, and color of the bark resembling those of the orange, but with different leaves, flowers, and fruit. Its leaves are about half a foot long, deep green and glossy above, pale green beneath, and tongue shaped. The yellow flower is large and conspicuous, and has a sickening sweet odor. It is followed by the fruit, which ripens in December and January. This fruit, which is conoid in shape and about 5 inches in greatest diameter, is green and white mixed or pale green on the outside, and the surface is areoled, with a brown tubercle in each areole. Not until the fruit falls of its own accord is it eaten, and then it is so soft that it can be peeled with the fingers. The yellowish pulp has an odor like fermenting bread dough to which honey has been added, with a sweetish subacid and somewhat bitter taste. The seeds are oval, golden yellow and glossy, smooth, and hard. This tree is a native of Brazil and Venezuela. (*Adapted from Safford, Contributions from the National Herbarium, vol. 18, pt. 1, p. 25.*)

45232. LYCOPERSICON ESCULENTUM Mill. Solanaceæ. Tomato.

From the Philippine Islands. Presented by Mr. O. D. Conger, U. S. N., Washington, D. C. Received October 5, 1917.

“From the Province of Cavite, near the municipality of Alfonso. Seeds of a tomato growing wild in the Philippines. The vine should spread out in every direction and climb up on any near-by house or tree. I found these vines growing in the jungles usually in places where there had been habitations in former times. The fruit grows to the size of a large cherry.” (*Conger.*)

45233 and 45234. TRITICUM AESTIVUM L. Poaceæ. Wheat.
(*T. vulgare* Vill.)

From Tokyo, Japan. Presented by Mr. Teizo Ito, chief, Plant Industry Division, Imperial Department of Agriculture and Commerce. Received October 12, 1917.

45233. *Iga-chikugo.*

45234. *Aka-komugi.*

45235 and 45236.

From Algiers, Algeria. Seeds presented by Dr. L. Trabut. Received October 13, 1917. Quoted notes by Dr. Trabut.

45235. *FICUS PALMATA* × *CARICA*. Moraceæ.

Fig.

"I am sending you seeds of *Ficus palmata* fertilized by *F. carica*. *F. palmata*, originally from Abyssinia and Erythrea, appears interesting; first, as one of the probable ancestors of *F. carica*; second, the male plants are excellent caprifigs to supply the Blastophaga. The autumn figs (Mammoni) now have the male flowers and at this moment it is still possible for the Blastophaga to carry the pollen. The female plants yield mediocre edible fruits. The hybrids should be interesting for desert regions."

45236. *VITIS VINIFERA* L. Vitaceæ.

Grape.

"*Cabernet* × *Malbec* No. 2. *Cabernet* is, in my opinion, the best vine for red wine of the Bordeaux type; but it is a light bearer. I have interesting hybrids. The seeds which I am sending you come from a number which have given us an excellent wine."

45237 and 45238. *PRUNUS ARMENIACA* L. Amygdalaceæ.

Apricot.

From Chefoo, China. Seeds presented by Mr. A. Sugden, Commissioner of Customs, through Mr. Lester Maynard, American consul, Chefoo. Received October 13, 1917.

45237. Seeds sent in as a supposed cross between apricot and plum, resulting from grafting plums on apricots. The seeds do not appear to differ from those of ordinary apricots.

45238. "Seeds of some very good apricots, which were of fair size, good flavor, and looked well; there was a lot of red about them." (*Sugden*.)

45239. *DEGUELIA* sp. Fabaceæ.

(*Derris* sp.)

From Luzon, Rizal Province, Philippine Islands. Fruits presented by Mr. E. D. Merrill, Bureau of Science, Manila. Received October 15, 1917.

"*Tugli* or *tubli*. This is supposed to be one of the species of *Derris* used here for fish poison. The seeds are not so used, only the bark and roots." (*Merrill*.)

45240. *CYNARA HYSTRIX* Ball. Asteraceæ.

From Algiers, Algeria. Seeds presented by Dr. L. Trabut. Received October 15, 1917.

"Seeds of *Cynara hystrix* from Morocco, a species near to *C. cardunculus*, interesting to study and to hybridize. The seeds are large." (*Trabut*.)

45241. *ACTINIDIA ARGUTA* (Sieb. and Zucc.) Planch. Dilleniaceæ.

From Bronx Park, N. Y. Cuttings from Mr. George V. Nash, New York Botanical Garden. Received October 18, 1917.

"There is no finer climbing shrub for porches in this latitude than *Actinidia arguta*. Its foliage, which is of a beautiful dark-green color with reddish midribs, seems to be practically free from diseases. Its flowers are large, greenish white, and attractive. It is a very vigorous grower and will

cover a trellis 20 feet long and 10 feet high in two or three years. The flavor of the fruits is very sweet and pleasant, reminding one of figs. They are about the size of damson plums, have very thin skins, and are filled with extremely small seeds. A climbing plant which deserves the widest distribution." (*Fairchild.*)

45242 to 45245.

From Honolulu, Hawaii. Seeds presented by Mr. J. F. Rock, botanist, College of Hawaii. Received October 19, 1917.

45242. *HIBISCADELPHUS GIFFARDIANUS* Rock. Malvaceae.

"The *Hau kuaivi* is a remarkable tree. At first appearance one would think it to be the common *Hau* (*Hibiscus tiliaceus*), but at closer inspection one can not but wonder at the most peculiar shape of the deep magenta flowers and the large yellow tuberculate capsules. It is a rather low tree, with not erect but rather inclining trunk a foot in diameter, with a many-branched round crown. It differs from the genus *Hibiscus* in its very peculiar flowers [which are curved and convoluted] and mainly in the calyx, which is not persistent with the capsules but drops together with the bracts as soon as the capsules are formed." (*Rock.*)

45243. *HIBISCADELPHUS HUALALAIENSIS* Rock. Malvaceae.

A tree, 16 to 23 feet high, with erect trunk, white bark, somewhat reniform leaves, and small ovate capsules. It belongs to the almost-extinct genus *Hibiscadelphus*, of the three species of which two are represented by a single tree each and the present one by a dozen or so living trees. Seedlings of all the species are growing, however, in various Hawaiian gardens.

This exceedingly interesting and distinct species was found by the writer in the year 1909 on the lava fields of Mount Hualalai, in North Kona, Hawaii, and in the forest of Waihou of the same district, where about a dozen trees are still in existence. The writer revisited the above locality in March, 1912, and found the trees in flower, while on his previous visit, June 18, 1909, only a few worm-eaten capsules could be found. The trees are badly attacked by several species of moths which feed on the leaves and mature capsules. Mr. Gerrit Wilder, however, succeeded in growing a few plants from healthy seeds collected by the writer. (Adapted from *Rock, Indigenous Trees of the Hawaiian Islands, p. 301.*)

45244. *PITTIOSPORUM HOSMERI LONGIFOLIUM* Rock. Pittosporaceae.

The variety differs from the species in that the leaves are very much longer and the capsules are smaller. The tree is quite common at Kapua, South Kona, Hawaii, on the lava flows, and occurs also at Kilauea and Hualalai, but does not reach such a height and size as at Puuwaawaa. The trees of the latter locality are loaded with fruit during June and July, while those of Kapua bear mature fruit during the month of February. However, the fruiting season of these, like nearly all the other Hawaiian trees, can not be relied upon. The fruits of *Pittosporum hosmeri* and variety are a source of food for the native crow, which pecks open the large woody capsules and feeds on the oily seeds within. (Adapted from *Rock, Indigenous Trees of the Hawaiian Islands, p. 161.*)

45242 to 45245—Continued.**45245.** *VACCINIUM RETICULATUM* J. E. Smith. Vacciniaceæ. Ohelo.

"Seeds of *Vaccinium reticulatum*, a species which grows up to an altitude of 10,000 feet on the big islands (Maui and Hawaii). It is the well-known *ohelo* of the natives, and the fruits are eaten and used similarly to your eastern Vacciniums." (*Rock.*)

A low erect shrub, 1 to 2 feet high, the stiff crowded branches angular and densely foliose; leaves coriaceous; flowers solitary; berry globose, one-third to one-half an inch in diameter, pale rose or yellow, covered with a waxy bloom. Found in the high mountains of Hawaii and eastern Maui from about 4,000 up to 8,000 feet, where it grows gregariously, often covering large tracts of open ground. The shining fleshy berry, the *ohelo*, is the principal food of the wild mountain goose. Although astringent, it is not unpleasant to the taste, and makes a good preserve. (Adapted from *Hillebrand, Flora of the Hawaiian Islands, p. 271.*)

45246. *CARICA PAPAYA* L. Papayaceæ. Papaya.

From Honolulu, Hawaii. Seeds presented by Mr. G. P. Wilder. Received October 6 and 19, 1917.

"Seed from selected fruit." (*Wilder.*)

45247. *DERINGA CANADENSIS* (L.) Kuntze. Apiaceæ. Mitsuba.
(*Cryptotaenia canadensis* DC.)

From Brooklyn, N. Y. Plants presented by Mr. C. Stuart Gager, director, Brooklyn Botanic Garden. Received October 26, 1917.

"Mitsuba is a common wild plant of the American continent, being scattered pretty well over America from New Brunswick to South Dakota and southward to Georgia and Texas. It belongs to the family which has furnished a number of our good garden vegetables such as celery, the carrot, and the parsnip.

"Mr. Lathrop writes from Japan regarding mitsuba: 'Udo costs more than mitsuba, and far less of it is consumed by the poor. Every part of the mitsuba is edible, and its leaves, stems, and roots are cooked as desirable vegetables. Like udo, it is grown from seed and in rather light soil. It requires less time for maturing than udo and is procurable on the market at far less expense. Mitsuba is popular with everybody from the highest rank to the lowest. Besides being cooked, the stems are eaten as we eat celery.'

"Pai ts'ai has found its niche in our agriculture, and large quantities are being consumed; and udo is being grown by a large number of amateurs who have learned to like it. This new vegetable, mitsuba, also from the Orient, may find its place beside them. The ease of culture of mitsuba; the fact that the plant can be grown over such a wide range of territory; and the excellence of its green leaves, blanched shoots, and roots, for use in a variety of ways, should appeal to our practical sense and induce us to give it a careful test under widely varying conditions and through a number of seasons. Especially should it be tried on celery lands—in the Northern States, along the Gulf coast, and in California—to determine its possible economic importance and to see if it has any points of advantage over celery." (*Fairchild.*)

45248. *PRUNUS SERRULATA SACHALINENSIS* (Schmidt) Makino.
(*P. sargentii* Rehder.) [Amygdalaceæ. **Sargent's cherry.**

From Tokyo, Japan. Seeds purchased from the Tokyo Plant, Seed, & Implement Co. Received October 19 and 22, 1917.

A large tree, attaining a height of 60 to 80 feet, which produces valuable wood; the bark is reddish and lustrous, the branches becoming chestnut brown in age. The leaves are large, ovate, glabrous, and lustrous, turning to crimson and yellow in autumn. Flowers two to four together, very showy, rose pink, about $1\frac{1}{2}$ inches across, appearing before the leaves. Fruit the size of a pea, bright red, becoming black and shining at maturity. A valuable timber tree of great ornamental value which is hardy in New York and Massachusetts and bears its handsome broad flowers in great profusion. Native of northern Japan, Sakhalin, and Chosen (Korea). (Adapted from *Bailey, Standard Cyclopaedia of Horticulture*, vol. 5, p. 2839.)

45249 and 45250.

From Kerman, Persia. Seeds presented by Capt. J. N. Merrill, First Regiment of Cavalry, Persian Army. Received October 10, 1917.

45249. *CITRUS GRANDIS* (L.) Osbeck. Rutaceæ. **Pummelo.**
(*C. decumana* Murray.)

"Seeds of the Persian 'pumaloe,' a fruit like that of China and the Philippines, about 8 or more inches in diameter, with a skin that is spongy, very thick, and oily. The fruit is slightly bitter and acid, but not disagreeable to the taste. Used by the Persians as a decorative fruit; a preserve made by boiling the skin with sugar is highly esteemed. The fruit is grown at Khabis, some 65 miles east of here, elevation 1,800 feet, near the edge of the great desert of Persia. Personally, I found the fruit, when eaten with powdered sugar, a good dish, though the Persians do not eat it." (*Merrill.*)

45250. *LAWSONIA INERMIS* L. Lythraceæ. **Henna.**

"A shrub bearing very fragrant, small, white, rose-colored, or greenish flowers. It is readily propagated from cuttings, grows in the form of a bush sending up shoots, and is suitable for hedges. When kept clipped it is not unlike privet. Its odor at short range is rank and overpowering, but from a distance it is like that of mignonette. On the shores of Central America the land breezes frequently waft the odor out to sea. This species is the 'sweet-smelling camphire' of Solomon. It is a native of western Asia, Egypt, and the African coasts of the Mediterranean, and now grows wild in some parts of India. It is also cultivated in many countries. It has been a favorite garden plant in the East from the time of the ancient Egyptians to the present day." (*W. E. Safford.*)

45251 to 45262.

From China. Seeds presented by Dr. Yamei Kin, Peking, China. Received October 23, 1917. Quoted notes by Dr. Kin.

45251 to 45254. *BRASSICA PEKINENSIS* (LOUR.) Gagn. Brassicaceæ.
Pai ts'ai.

45251. "*Mi sze pai ts'ai.* Especially useful for salting down."

45252. "*Yu ts'ai.* Light variety, from Yuyao, Chekiang Province. Said to be a very rapid grower, coming to maturity in four weeks

45251 to 45262—Continued.

or, at most, not more than six weeks from the time of germination. It is specially prized for its sweet 'buttery' flavor which I have heard is characteristic of certain varieties of lettuce. It is not eaten raw or for salad purposes; but, dropped into boiling hot water after being cut up in fairly large pieces, it makes a staple green vegetable. The rapid growth struck me as being valuable, for if in the same time as is necessary for growing lettuce one can obtain a good cabbage green, it will undoubtedly be as popular here as it is in China."

45253. "*Pai ts'ai*. From Taianfu, Shantung Province."

45254. "*Yu ts'ai*. Dark-colored, late variety from Yuyao, Chekiang Province. Grows taller than the very early kind, and while also good for greens, is of a darker color, it is said; and the seed is used largely for the production of the so-called rapeseed oil that is used so largely in food all through Middle China and South China."

45255 and 45256. *CASTANEA CRENATA* Sieb. and Zucc. Fagaceæ.

Chestnut.

"Japanese chestnuts from Hangchow, Chekiang Province."

45255. A variety with large nuts.

45256. A variety with medium-sized nuts.

45257. *CUCUMIS MELO* L. Cucurbitaceæ.

Muskmelon.

"White melon from Tientsin, Chihli Province."

45258. *CUCUMIS SATIVUS* L. Cucurbitaceæ.

Cucumber.

"Early cucumber from Taianfu, Shantung Province."

45259. *CUCURBITA PEPO* L. Cucurbitaceæ.

Squash.

Parti-colored squash from Taianfu, Shantung Province."

45260 and 45261. *RAPHANUS SATIVUS* L. Brassicaceæ.

Radish.

45260. "Round radish. Will not stand frost. Plant about July."

45261. "Long radish. Hardy. Plant later than the round variety."

45262. *SPINACIA OLERACEA* L. Chenopodiaceæ.

Spinach.

"*Mi sze Chi Yien*. From Woosung, Kiangsü Province. Spinach, to be planted the last of August. Cover with soil 1 inch thick; will sprout in a month. Can cut one crop in January and another in March."

45263 to 45320.

From China. Seeds collected by Mr. Frank N. Meyer, Agricultural Explorer for the Department of Agriculture. Received October 6, 1917. Quoted notes by Mr. Meyer.

45263. *BRASSICA* sp. Brassicaceæ.

Mustard.

"(No. 2393a. Hankow, Hupeh Province. June 5, 1917.) *Chieh tzü*. Mustard seeds, said to have come from the north, where mustard is a summer crop. However, it might have been grown as a winter crop in the Yangtze Valley. Price, 37 cents, Yuan silver, per catty [$1\frac{1}{2}$ pounds]. Test this mustard as a summer crop where flax thrives; as a winter crop in the Gulf States."

Received as *Brassica juncea*, but apparently not this species.

45263 to 45320—Continued.

45264. *PERILLA NANKINENSIS* (Lour.) Decaisne. Menthaceæ.
(*P. arguta* Benth.)

“(No. 2394a. Hankow, Hupeh Province. June 5, 1917.) *Hei su tzū* (black perilla). An annual herb, germinating very early in the year; generally with purple foliage, though green plants are seen also. The young plants are eaten as a potherb or are used to give flavor to soups. The odor, however, is not pleasing to most people, since it resembles that of the bedbug (*Cimex*). The seeds are used medicinally for coughs and in throat troubles, together with other preparations.”

45265. *PERILLA FRUTESCENS* (L.) Britton. Menthaceæ.
(*P. ocymoides* L.)

“(No. 2395a. Hankow, Hupeh Province. June 5, 1917.) *Pai su tzū* (white perilla). An annual herb grown entirely for its seed, from which is extracted an oil that is used in waterproofing. The seeds are also used medicinally, like the preceding number, and as a bird food.”

45266 to 45268. *ORYZA SATIVA* L. Poaceæ. Rice.

45266. “(No. 2396a. Hanyang, Hupeh Province. March 6, 1917.) *Ching shui mi ku* (clear-water rice grain). A fine local variety of rice, said to be prolific and early ripening. On account of its earliness to be tested primarily in California.”

45267. “(No. 2397a. Changsha, Hunan Province. May 12, 1917.) *Li ku* (corn grain). A fine variety of rice, said to be an early ripener. To be tested like the preceding number.”

45268. “(No. 2399a. Hankow, Hupeh Province. March 9, 1917.) *Ching shui mi* (clear-water rice). A fine quality of early ripening rice. To be tested like the preceding numbers.”

45269 to 45295. *SOJA MAX* (L.) Piper. Fabaceæ. Soy bean.
(*Glycine hispida* Maxim.)

[Note: These numbers are nearly all said to be late-ripening varieties of soy beans; they come from a region greatly resembling in climate the Gulf States (southern parts). They should therefore be tested in districts where cotton and rice are grown.]

45269. “(No. 2401a. Hankow, Hupeh Province. March 7, 1917.) *Huang tou* (yellow bean). A small to medium-sized, yellow soy bean, used mostly as a human food in the form of bean curd.”

45270. “(No. 2402a. Wuchang, Hupeh Province. March 9, 1917.) *Huang tou*. A small to medium sized, yellow soy bean.”

45271. “(No. 2403a. Changsha, Hunan Province. May 16, 1917.) *Huang tou*. A small, yellow soy bean, used almost exclusively for bean-curd production.”

45272. “(No. 2404a. Ichang, Hupeh Province. March 24, 1917.) *Huang tou*. A small, yellow soy bean, said to ripen in early August. Used like the preceding number.”

45273. “(No. 2405a. Changsha, Hunan Province. May 16, 1917.) *Huang tou*. A small to medium-sized, yellow soy bean. Used like the preceding numbers.”

45274. “(No. 2406a. Ichang, Hupeh Province. May 24, 1917.) *Huang tou*. A medium-sized, yellow soy bean with a dark hilum. Said to be a medium late ripener.”

45263 to 45320—Continued.

45275. "(No. 2407a. Ichang, Hupeh Province. March 24, 1917.)
Huang tou. A large yellow soy bean."
45276. "(No. 2408a. Changsha, Hunan Province. May 16, 1917.)
Huang tou. A medium-sized, yellow soy bean."
45277. "(No. 2409a. Ichang, Hupeh Province. March 24, 1917.)
Huang tou. A very small variety of yellow soy bean."
45278. "(No. 2410a. Wuchang, Hupeh Province. March 9, 1917.)
Hsiao huang tou (small yellow bean). A very small variety of yellow soy bean."
45279. "(No. 2411a. Ichang, Hupeh Province. March 24, 1917.)
Huang tou. A small, greenish yellow soy bean."
45280. "(No. 2412a. Ichang, Hupeh Province. March 24, 1917.)
Huang tou. A small, greenish yellow variety of soy bean, used almost entirely in bean-curd production."
45281. "(No. 2413a. Shuichaipang, Hupeh Province. April 2, 1917.)
Hsiao huang tou (small yellow bean). An exceedingly small variety of yellowish soy bean, used in making bean curd."
45282. "(No. 2414a. Changsha, Hunan Province. May 12, 1917.)
T'ien ch'ing tou (field green bean). A medium-large, pale-green variety of soy bean; rare. Eaten as a sweetmeat when roasted with sugar; it is then a very tasteful, wholesome, and nourishing product."
45283. "(No. 2415a. Changsha, Hunan Province. May 16, 1917.)
Ch'ing tou (green bean). A dull pale-green variety of soy bean."
45284. "(No. 2416a. Changsha, Hunan Province. May 16, 1917.)
Ch'ing tou. A small, green soy bean, often used as an appetizer with meals, when slightly sprouted, scalded, and salted. Also eaten as a fresh vegetable when having firm sprouts 3 inches long."
45285. "(No. 2417a. Ichang, Hupeh Province. March 24, 1917.)
Ch'ing pi tou (green skin bean). A dark-green soy bean of medium size, used like the preceding number. The beans are also eaten fried in sweet oil with salt sprinkled over them, as an appetizer before and with meals."
45286. "(No. 2418a. Hankow, Hupeh Province. March 7, 1917.)
Ch'ing tou. A medium-sized, dull-green variety of soy bean, used in the same way as the preceding number."
45287. "(No. 2419a. Ichang, Hupeh Province. March 24, 1917.)
Ch'ing p'i tou. A medium-sized variety of green soy bean, often speckled with black. Eaten like No. 2416a [S. P. I. No. 45284]."
45288. "(No. 2420a. Changsha, Hunan Province. May 16, 1917.)
A rare variety of soy bean, of pale-green color, with brown splashes."
45289. "(No. 2421a. Changsha, Hunan Province. May 12, 1917.)
Ch'a hua tou (tea-flower bean). A peculiar variety of soy bean, of dull brown color, said to ripen very late. Locally much eaten when roasted, with salt sprinkled over, like salted peanuts. Very nourishing and appetizing. Well worth introducing to the American public as a new, wholesome, and nourishing sweetmeat."

45263 to 45320—Continued.

45290. "(No. 2422a. Ichang, Hupeh Province. March 24, 1917.) *Hei tou* (black bean). A medium-large, black soy bean, used when boiled, as a food for hard-working field animals and for oil production; it is also eaten by the poor."
45291. "(No. 2423a. Hankow, Hupeh Province. March 7, 1917.) *Hei tou*. A medium-sized, black soy bean, used like the preceding number."
45292. "(No. 2424a. Wuchang, Hupeh Province. March 9, 1917.) *Hei tou*. A medium-sized variety of black soy bean; said to be an early ripener. Used like No. 2422a [S. P. I. No. 45290]."
45293. "(No. 2425a. Wuchang, Hupeh Province. March 9, 1917.) *Hsiao hei tou* (small black bean). A small, flat, black soy bean, used when boiled, salted, and fermented as the main ingredient in a sauce; also fed, when boiled, to water buffaloes."
45294. "(No. 2426a. Changsha, Hunan Province. May 16, 1917.) *Hei tou*. A small, flat soy bean of shining black color, used like the preceding number."
45295. "(No. 2427a. Changsha, Hunan Province. May 16, 1917.) *Hei tou*. A small, round variety of soy bean of dull black color; used like No. 2425a [S. P. I. No. 45293]."
- 45296 and 45297. *PHASEOLUS VULGARIS* L. Fabaceæ. **Common bean.**
45296. "(No. 2428a. Ichang, Hupeh Province. March 24, 1917.) *Hua ssü chi tou* (mixed or variegated four seasons bean). Multi-colored strains of garden beans, much cultivated as summer vegetables. To be tested in the southern sections of the United States."
45297. "(No. 2429a. Ichang, Hupeh Province. March 24, 1917.) *Ssü chi tou* (four seasons bean). A reddish variety of garden bean, used like the preceding number. To be tested like No. 2428a."
- 45298 and 45299. *PHASEOLUS ANGULARIS* (Willd.) W. F. Wight.
Fabaceæ. **Adsuki bean.**
45298. "(No. 2430a. Hankow, Hupeh Province. March 7, 1917.) *Hung tou* (red bean). A large, red, adsuki bean eaten boiled with dry rice and in soups; also pounded with sugar into a paste and used as a filling in certain cakes. Produces bean sprouts of excellent juicy quality, which can be raised at home in winter."
45299. "(No. 2431a. Hankow, Hupeh Province. May 30, 1917.) *Hung lü tou* (red-green bean). A rare variety of adsuki bean, of red color. Utilized like the preceding number. Said to ripen in August."
45300. *PHASEOLUS AUREUS* Roxb. Fabaceæ. **Mung bean.**
"(No. 2433a. Hankow, Hupeh Province. March 7, 1917.) *Lü tou* (green bean). Mixed strains of dull and shining green mung beans; utilized like No. 2430a [S. P. I. No. 45298]."
45301. *VIGNA SINENSIS* (Torner) Savi. Fabaceæ. **Cowpea.**
"(No. 2434a. Hankow, Hupeh Province. March 7, 1917.) *Pai Chiang tou* (white precious bean). A black-eyed, white cowpea eaten as a human food; boiled with dry rice generally, but also much used in stews and soups. The young pods are used a great deal as a vegetable; they are also dried for winter use, and in some localities are pickled in brine."

45263 to 45320—Continued.

45302. *VIGNA CYLINDRICA* (Stickm.) Skeels. Fabaceæ. **Catjang.**

“(No. 2435a. Shuichaipang, Hupeh Province. April 2, 1917.) *Hung chiang tou* (red precious bean). A small, red-brown cowpea grown on pebbly river flats. Used as human food.”

45303 and 45304. *PISUM SATIVUM* L. Fabaceæ. **Garden pea.**

45303. “(No. 2436a. Ichang, Hupeh Province. March 24, 1917.) *Wan tou*. A medium-sized, pale yellow variety of pea, grown as a winter crop throughout the Yangtze Valley on rice lands which have been drained for the winter months. Sown in October and harvested in April. The peas are boiled either with the pods, when very tender, or after shelling, when old. When dry they are used in stews or soups and baked into cakes. In the winter the sprouted peas are eaten after having been scalded. A fresh gelatine is also made from them, much eaten during the hot summer months, with sauce and pickles, as a ‘pick-me-up’ between meals. To be tested as a winter crop in the southern sections of the Gulf States and in California.”

45304. “(No. 2437a. Hankow, Hupeh Province. March 7, 1917.)

Wan tou. A small, pale-yellow variety of pea, grown and used like the preceding number.”

45305 to 45307. *VICIA FABA* L. Fabaceæ. **Broad bean.**

45305. “(No. 2438a. Ichang, Hupeh Province. March 24, 1917.)

Ts’an tou (silkworm bean). A medium large variety of broad bean, much grown as a winter crop on rice lands which have been drained for the cool season. The beans are much eaten when fresh, like green peas, and they form a very tasteful and nutritious dish. After soaking in water over night the dry beans are often fried in oil, and salt is sprinkled over them; they are then eaten as a delicacy, like salted peanuts. The Chinese name is possibly given on account of the silky hairs covering the outside and the inside of the pods. To be tested as a winter crop in the southern parts of the Atlantic and Gulf States and on the Pacific coast; as a summer crop in the intermountain regions and along the northern Pacific coast.”

45306. “(No. 2439a. Hankow, Hupeh Province. March 7, 1917.)

A somewhat smaller variety than the preceding number, otherwise the same remarks apply to it.”

45307. “(No. 2440a. Ichang, Hupeh Province. March 24, 1917.)

Hsiao ts’an tou (small silkworm bean). A very small variety of broad or horse bean. Grown like the two preceding numbers. A meal is made from this bean, which is eaten by the poor in the form of noodles and dumplings. To be tested like No. 2438a.”

45308. *LENTILLA LENS* (L.) W. F. Wight. Fabaceæ. **Lentil.**

(*Lens esculenta* Moench.)

“(No. 2441a. Ichang, Hupeh Province. March 24, 1917.) *Ching tou* (capital bean). A small brown variety of lentil, grown as a winter crop on rather poor lands in the mountain districts of western Hupeh. The seeds are eaten boiled in stews and soups, but are not much appreciated. To be tested like No. 2438a.”

45263 to 45320—Continued.

45309. INDIGOFERA TINCTORIA L. Fabaceæ. **Indigo.**

“(No. 2442a. Hankow, Hupeh Province. June 14, 1917.) *Huai lan* (blue legume). A plant from which a blue dye is obtained; said to be grown on well-drained land. The seed is sown in April, and the twigs with leaves are harvested in August.”

45310. BRASSICA sp. Brassicaceæ. **Mustard.**

“(No. 2444a. Ichang, Hupeh Province. March 26, 1917.) *Chieh tzú*. A mustard said to be cultivated in the mountains of Szechwan, possibly as a summer crop, but perhaps also as a winter crop. See notes under No. 2393a [S. P. I. No. 45263] for suggestions.”

45311. CITRUS sp. Rutaceæ.

“(Ichang, Hupeh Province. March 22, 1917.) *P'ing t'ou kan* (flat-head mandarin). A peculiar variety of mandarin orange, of dark orange color and medium size, with heavy, loose, warty, and corrugated rind. Segments closely adhering to each other. Bitter-sweet taste; of tonic properties apparently. Some specimens contain far more seeds than others. Said to grow around Itu, on the Yangtze River, south of Ichang.”

45312. CITRUS sp. Rutaceæ.

“(Ichang, Hupeh Province. March 27, 1917.) *P'ao kan* (spongy mandarin). A large variety of mandarin orange, often over 4 inches in diameter; skin of bright orange color, somewhat wrinkled, but not very rough. Segments small, easily separated; seeds large and many. Taste sour and bitter. The fruits keep a very long time and are used as ornaments in rooms; the heavy rind is used in flavoring spirits. Said to be grown around Peisha, southwest of Ichang, and is considered one of the hardiest of all local varieties.”

45313 and 45314. CITRUS GRANDIS (L.) Osbeck. Rutaceæ. **Pummelo.**
(*C. decumana* Murray.)

45313. “(Ichang, Hupeh Province. March 27, 1917.) A large pummelo of somewhat conical shape.”

45314. “(Ichang, Hupeh Province. March 27, 1917.) A pummelo of medium size; shape flattened, flesh juicy, sweet, and of good flavor; contains few seeds.”

45315. CITRUS sp. Rutaceæ.

“(Ichang, Hupeh Province. March 21, 1917.) *Shih t'ou kan* (lion's head mandarin) or *Nai t'ou kan* (nipple-head mandarin). A large and heavy mandarin orange, of round-oblong shape, often with a neck close to the peduncle. Skin very warty and rough, deep orange in color; it separates very easily from the segments, which are also easily separated; seeds large, not many. Taste bitter and sour; used only medicinally by the Chinese. Said to be cultivated around Yitoo (or Itu) on the Yangtze River. About 40 different varieties of citrus fruits are said to be in cultivation in the region around Ichang; many of these are quite local products, and it seems that extensive hybridization has taken place between many species of citrus and crossing between various varieties.”

45316. ORYZA SATIVA L. Poaceæ. **Rice**

“(No. 2398a. Hankow, Hupeh Province. June 7, 1917.) *No mi ku* (sticky rice grain). A glutinous variety of rice, said to ripen early

45263 to 45320—Continued.

It is much eaten boiled like dumplings, with sugar sprinkled over; also eaten with boiled jujubes. This is a good type of rice for making puddings. This sample is to be tested like Nos. 2396a and 2397a [S. P. I. Nos. 45266 and 45267]."

45317. *HOLCUS SORGHUM* L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

"(No. 2400a. Yuanan. Hupeh Province. April 3, 1917.) *Kao liang* (tall grains). The heads are used to make brooms. It is grown but sparsely, here and there, in western Hupeh. It should be tested in a region with warm, moist summers."

45318. *PHASEOLUS AUREUS* Roxb. Fabaceæ. **Mung bean.**

"(No. 2432a. Ichang, Hupeh Province. March, 19, 1917.) Mixed strains of mung beans, grown mostly in Hupeh Province for bean-sprout production.

"In the future, bean sprouts may be much more widely eaten than they now are. In very cold and bleak regions, such as Labrador, northern Canada, northern Siberia, etc., and on sailing vessels a long time away from ports, bean sprouts from adsuki, mung, and small soy beans, together with seedlings of cress, mustard, and amaranth, are about the only fresh vegetables that can be raised. A dark, moist and warm place, like the inside of a cupboard, box, large jar, tin, etc., kept near a source of continuous, gentle heat, is necessary."

45319 and 45320. *AMYGDALUS PERSICA* L. Amygdalaceæ. **Peach.**
(*Prunus persica* Stokes.)

45319. "(No. 2445a. Hankow, Hupeh Province. June and July, 1917.) Mixed types of Chinese peaches to be tested by specialists."

45320. "(Feicheng, Shantung Province. February 27, 1917.) Stones of various varieties for specialists."

45321 and 45322.

From Manchester, England. Seeds presented by Mr. I. Henry Watson. Received October 11, 1917.

45321. *LAPEYROUSIA CRUENTA* (Lindl.) Benth. Iridaceæ.

African bulbs somewhat resembling freesias, though *lapeyrousia* will probably never have anything like the popularity enjoyed by freesias because of their later season of bloom and lack of fragrance. *Lapeyrousia cruenta* is probably the most popular kind, growing 6 to 10 inches high and blooming in summer and fall. The thin linear leaves, usually six, are erect from a basal tuft, 6 inches to a foot in length, and the bright carmine flowers with three darker spots at the base of the three smaller segments are an inch across. (Adapted from *Bailey, Standard Cyclopedia of Horticulture, vol. 4, p. 1821*, and *Thiselton-Dyer, Flora Capensis, vol. 6, p. 96*.)

45322. *LILIUM RUBELLUM* Baker. Liliaceæ. **Lily.**

This fine Japanese lily is nearest to *Lilium japonicum* (*L. krameri*), from which it differs by its broad speciosumlike leaves and its smaller pink flowers with obtuse segments. The bulb is quite similar to that of *L. japonicum*, but more oval in shape; the stem is 1 to 2 feet high, smooth, green, spotted and tinged with purple, and the lower part is

45321 and 45322—Continued.

bare. The leaves, usually 15 to 20, are 4 to 5 inches long and from three-fourths of an inch to an inch wide. The flowers are 3 to 4 inches long and as wide, fragrant, and of the same color variations as *L. japonicum*, with yellow or orange anthers. It blooms in June and early July. It possesses a better constitution than does *L. japonicum*, being rather more robust and permanent. (Adapted from *Gardeners' Chronicle*, May 21, 1898, p. 321, and from *Bailey, Standard Cyclopaedia of Horticulture*, vol. 4, p. 1869.)

45323 to 45325. TRITICUM AESTIVUM L. Poaceæ. **Wheat.**
(*T. vulgare* Vill.)

From Urumiah, Persia. Presented by Mr. Edward C. M. Richards. Received October 17, 1917. Quoted notes by Mr. Richards.

"Wheats from near the village of Bend, southwest of Urumiah."

45323. "Wheat from irrigated land."

45324. "'Dame,' or unirrigated wheat."

45325. "'Dame,' or unirrigated wheat."

45326. GOSSYPIUM OBTUSIFOLIUM Roxb. Malvaceæ. **Cotton.**

From Algiers, Algeria. Seeds presented by Dr. L. Trabut. Received October 22, 1917.

"A variety cultivated by the natives of the oases of the Sahara Desert." (*Trabut.*)

45327. ANNONA CHERIMOLA Mill. Annonaceæ. **Cherimoya.**

From Brisbane, Australia. Presented by Mr. L. G. Corrie. Received October 6, 1917.

Seeds sent in for stock purposes.

45328. CLAUCEA LANSIUM (Lour.) Skeels. Rutaceæ. **Wampi.**
(*C. wampi* Oliver.)

From Yeungkong, Canton, Kwangtung Province, China. Presented by W. H. Dobson, M. D., The Forman Memorial Hospital. Received October 29, 1917.

"Seeds from the largest *Wong pi* I have ever seen. The *Wong pi* is a grapelike fruit with large green seeds and evergreen leaves." (*Dobson.*)

A low spineless tree with spreading branches, spirally arranged evergreen pinnate leaves, and 4 to 5 parted small white flowers in large terminal panicles. Fruit ovoid-globose, about 1 inch long; skin glandular, pubescent; seeds green. The wampi is a native of South China, where it is commonly grown for its fruits. It is cultivated to some extent in Hawaii and California. It can be grafted on grapefruit and other species of Citrus, which makes it desirable to test it as a stock for common citrus fruits. (Adapted from *Bailey, Standard Cyclopaedia of Horticulture*, vol. 2, p. 786.)

For an illustration of a fruiting branch of the wampi, see Plate I.



A FRUITING BRANCH OF THE WAMPI (*CLAUCENA LANSIUM* (LOUR.) SKEELS,
S. P. I. NO. 45328).

The wampi fruit is a great favorite with the Chinese, but is little known in America. It has a tart flavor a little like that of the gooseberry, but is closely allied to the citrus fruits and can be grafted on grape fruit and other citrus species. It would be desirable to give it a test as a stock for these fruits. (Photographed by Wilson Popenoe, Santa Barbara, Calif., October 30, 1914; P1624FS.)



AN INDIAN BOY HOLDING A CLUSTER OF WILD TROPICAL GRAPES (*VITIS TILIAEFOLIA* HUMB. AND BONPL., S. P. I. NO. 45361).

The problem of producing a table grape which will grow and fruit well in the Tropics is probably one of plant breeding. The existence of this strictly tropical species of *Vitis*, which bears clusters of fruit of fair size and quality, should encourage the plant breeders to hybridize it with the larger fruited cultivated grape. The photograph is of a cluster from a vine found near Vera Cruz, Mexico, but the inventory description is of a form which, according to Wilson Popenoe, is very juicy, very sour, and contains only two seeds. It bears heavily and the fruits are of fairly good size and only need to be sweetened to be fit for table use. (Photographed by Wilson Popenoe, Puerto Mexico, Vera Cruz, June 15, 1918; P17494FS.)

45329. × *CASTANEA NEGLECTA* Dode. Fagaceæ.**Hybrid chestnut.**

From Madison County, Va. Presented by Mr. Daniel Grinnan, Richmond.
Received October 29, 1917.

"One of these hybrids (*Castanea pumila* × *dentata*) was discovered some 40 years ago in Madison County, Va., on the Rapidan River. It was preserved and now stands in a pasture. The tree is quite large and vigorous, about 40 or 50 feet high, and nearly 2 feet in diameter near the ground. It bears a large crop of nuts like the chinquapin, but somewhat larger." (*Grinnan.*)

45330 to 45342. *CASTANEA* spp.

From Bell, Md. Seeds presented by Dr. W. Van Fleet. Received October 29, 1917. Quoted notes by Dr. Van Fleet, unless otherwise indicated.

45330 to 45337. *CASTANEA CRENATA* Sieb. and Zucc. Fagaceæ. **Chestnut.**

45330. No. 1. "Cross within species. Third generation of variety selection. From Arlington Farm, Va."

45331. No. 12. "Cross within species. Third generation of variety selection. From Arlington Farm, Va. Same as S. P. I. No. 45330, but from a different tree."

45332. No. 1-a. "Fourth generation. Mixed lots of seed too small to be separated. Grown at Bell, Md."

45333. No. 1-d. "Mixed stock from Arlington Farm, Va. Variable in size."

45334. Bell No. 1. "Fourth generation by straight selection. Started by a variety cross between two early prolific types of *Castanea crenata*. A very large nut, with good cooking qualities, but poor eating qualities when raw. The tree has a good habit; the trunk is clean and bright, with thin handsome branches and very narrow leaves."

45335. Bell No. 2. "Fourth generation by selection. Tree about 7 feet high, with clean limbs. It is a prolific bearer. The fruit is very large and is good for cooking, but not for eating when raw. It is more bitter than S. P. I. No. 45334."

45336. Bell No. 3. "Fourth generation. Much like S. P. I. No. 45335."

45337. Bell No. 4. "Fourth generation by selection. The trees have very much the same habit as S. P. I. Nos. 45334 to 45336, and the nuts are about the same size—very large. The nuts have good eating qualities and are better than those of the numbers referred to above."

45338. *CASTANEA MOLLISSIMA* Blume. Fagaceæ.

Chestnut.

This is the common chestnut of China. It is distributed from the neighborhood of Peking in the northeast to the extreme limits of Szechwan and Yunnan in the west and southwest. Near villages and towns, where the woody vegetation is continually cut down to furnish fuel, this chestnut is met with as a bush or a low scrub; but in the thinly populated areas it is a tree from 15 to 20 meters tall, with a trunk from 1.5 to 2 meters in girth. The nuts are a valued article of food. The Chinese name for this chestnut is Pan-li. (Adapted from *Sargent, Plantae Wilsonianae, vol. 3, p. 194.*)

45330 to 45342—Continued.**45339 to 45342.** *CASTANEA PUMILA* × *CRENATA*. Fagaceæ.**Hybrid chestnut.****45339.** No. 1-b. "Mixed lot of seed for stocks. Grown at Bell, Md."**45340.** Bell No. 5. "A very attractive nut of fair quality, which looks as though it would be a good commercial nut."**45341.** Bell No. 8. "Second generation. A very prolific tree, yielding from 3 to 4 pounds of nuts this season. The tree is about 7 feet high. The nuts are of very good flavor and of good size for chinquapin, but small for chestnut."**45342.** Arlington No. 6. "Second generation. Part of a lot of 15 pounds of seed grown at Arlington Farm, Va. The nuts are 1 inch in diameter and are of good quality."**45343 to 45345.**

From Kingaroy, Queensland. Seeds presented by Mrs. R. A. Pearse through Mr. Dudley Harmon, Washington, D. C. Received October 30, 1917.

"I am sending several packages of seeds, some of which you may already have but you may get different results from these, since they are acclimatized to Queensland." (*Pearse.*)**45343.** *CUCUMIS SATIVUS* L. Cucurbitaceæ. **Cucumber.**

"Mammoth."

45344. *PHASEOLUS VULGARIS* L. Fabaceæ. **Common bean.**

"Zebra Runner."

45345. *VIGNA SESQUIPEDALIS* (L.) Fruwirth. Fabaceæ. **Yard Long bean.**

"Snake bean."

45346. *CARICA PAPAYA* L. Papayaceæ.**Papaya.**

From Honolulu, Hawaii. Presented by the Hawaii Agricultural Experiment Station. Received October 29, 1917.

Selected seeds sent in for breeding work.

45347. *CORYLUS COLURNA* L. Betulaceæ.**Hazelnut.**

From Rochester, N. Y. Presented by Mr. John Dunbar, Superintendent of Parks, through Mr. C. A. Reed, of the Bureau of Plant Industry. Received October 30, 1917.

"The plants from which these nuts were obtained came from L. Späth, Berlin, Germany, 25 years ago. They began to bear fruit about 6 years ago. The trees are now about 25 feet tall. It took these nuts 2 years to germinate." (*Dunbar.*)The tree is well worth growing for its stately form, so remarkable for a hazel, and for its curiously enveloped nuts. Native of southeastern Europe and Asia Minor; introduced to England about the middle of the seventeenth century. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 1, p. 402.*)

45348. HOLCUS SORGHUM L. Poaceæ.**Sorghum.***(Sorghum vulgare Pers.)*

From Johannesburg, Union of South Africa. Presented by the Agricultural Supply Association, Ltd., through Mr. J. Burt Davy, botanist. Received November 1, 1917.

"Kafir corn grown by the natives in the Vereeniging district of the Transvaal, and claimed by them to be earlier in maturing than any other sorts grown in the neighborhood. This strain may prove of immense value in areas having a short growing season. The rainfall at Vereeniging averages about 27 inches and comes almost entirely in the summer." (*Davy.*)

45349 to 45357.

From Guatemala. Collected by Mr. Wilson Jopenoe, Agricultural Explorer for the Department of Agriculture. Received November 6, 1917. Quoted notes by Mr. Jopenoe.

45349. CHAMAEDOREA sp. Phœnicaceæ.**Pacayito.**

"(No. 174a. Finca Chejel, Baja Vera Paz, Guatemala. October 15, 1917.) Seeds of the *pacayito*, of which plants have been sent in under No. 174 [S. P. I. No. 44994]. These seeds are from the garden of Doña Ines Dieseldorff, in Coban, and are from the taller, more slender, and more graceful of the two probable species included under No. 174 [S. P. I. No. 44994]."

45350. CHAYOTA EDULIS Jacq. Cucurbitaceæ.**Chayote.***(Sechium edule Swartz.)*

"(No. 181a. Finca Chejel, Baja Vera Paz, Guatemala. October 15, 1917.) Seeds of a rather small variety but little larger than a hen's egg. It is a waxy white in color, oval or subpyriform in shape, spineless, and considered by the Guatemalans a very choice vegetable.

"This variety of güisquil or chayote from San Cristobal Vera Paz is known as *perulero*, or as *chima* in the Kekchi dialect, which is that spoken in the Alta Vera Paz region."

See notes under S. P. I. Nos. 43393 to 43401 for further data in regard to the various forms of chayotes found in Guatemala.

45351. INGA sp. Mimosaceæ.

"(No. 183a. Finca Chejel, Baja Vera Paz, Guatemala. October 15, 1917.) *Cojiniquil*. Seeds of an indigenous species of Inga common along watercourses in Alta Vera Paz and also planted for shade in coffee plantations. The tree is medium sized, reaching about 40 feet in height, with a broad, open crown and scant foliage. The leaves are large, compound, with three to four pairs of leaflets. The fruits, which are produced in abundance during September and October, are slender pods about 6 inches in length. They contain 6 to 10 irregularly oblong, dark-green seeds, each surrounded by white, jellylike pulp of sweet, aromatic flavor, strikingly suggestive of the lychee (*Litchi chinensis*). While the quantity of pulp is not great, the flavor is really excellent, and the fruit seems to be popular among the inhabitants of the region.

"Though it is not anticipated that this fruit will become of commercial importance in the United States, the species is well worthy of trial by plant fanciers in Florida for the interest which it possesses."

45349 to 45357—Continued.

45352. *JUGLANS MOLLIS* Engelm. Juglandaceæ.

Walnut.

“(No. 180a. Finca Chejel, Baja Vera Paz, Guatemala. October 15, 1917.) Seeds of the wild walnut of the Vera Paz region. It is not a common tree, but it is seen occasionally on mountain sides and along watercourses at altitudes of 1,500 to 4,500 feet. So far as my own observations go, the tree is only moderately large, rarely reaching a greater height than 40 to 45 feet. The nuts, which are sometimes produced very abundantly, are as large as a good specimen of *Juglans nigra*, but have a thicker shell and consequently less kernel.

“This species is of interest in connection with the attempt now being made to obtain good nut-bearing trees for the Tropics. It should be planted in such regions as southern Florida and Cuba. Since it appears to thrive in Guatemala under a rather wide range of climatic conditions, it may succeed in many parts of the Tropics and Subtropics.”

45353. *LOBELIA FULGENS* Willd. Campanulaceæ.

“(No. 186a. Finca Chejel, Baja Vera Paz, Guatemala. October 15, 1917.) Seeds of a handsome herbaceous plant commonly found along roadsides and in meadows of the region between Tactic and San Cristobal Vera Paz. It resembles the larkspur in habit, sending up a single stalk to the height of 2 or 3 feet, and producing toward the summit numerous bright scarlet-crimson flowers. These appear to be tubular at first glance, but are split along the upper surface and deeply five lobed at the mouth; three of the lobes extend downward and the remaining two upward. As the lower flowers wither and turn brown, new ones are produced at the apex of the stalk; the plant thus remains in bloom for a long period.

“The stalk and leaves are softly pubescent or pilose; the leaves are linear-lanceolate in outline, 4 to 6 inches long, one-half to three-quarters of an inch broad, entire or finely and irregularly serrate, adnate to the stem, with the margins extending down the stem some distance in the form of two prominent ridges.”

45354. *PERSEA SCHIEDEANA* Nees. Lauraceæ.

Coyó.

“(No. 179a. Finca Chejel, Baja Vera Paz, Guatemala. October 15, 1917.) Seeds of the coyó from San Cristobal Vera Paz and Tactic, both in the Department of Alta Vera Paz.

“These were taken mainly from fruits of inferior quality and are intended to serve for the production of seedling plants on which to bud or graft superior varieties of the coyó.

“Among the hundreds of coyó trees which are found throughout the Vera Paz region, an exceedingly small number produce fruits of excellent quality. Up to the present time I have found only two which seem worthy of vegetative propagation. The vast majority of trees produce small, often malformed fruits, with a large seed and fibrous flesh of poor quality and unattractive color. The best varieties, however, such as that found in the property of Padre Rivera, of Tactic, are as large as a good avocado of the West Indian race. The seed is no larger in proportion than the seed of a good budded avocado, and the flesh is creamy white, free from fiber, and of a very rich nutty flavor. If a variety like this can be established in the United States, it seems reasonable to believe that it will become popular. The fruit so strongly resembles an avocado

45349 to 45357—Continued.

in general appearance that it would not be taken by one unfamiliar with avocados for a distinct species, but the flavor is so distinct that the difference can be recognized at once.

"In general, the coyó does not seem to be nearly so productive as the avocado. Occasionally trees bear heavily, but most of them do not produce good crops. The season of ripening is much shorter than with the avocado; mature fruits will rarely hang on the tree more than six weeks, while avocados often remain three or four months. When picked and laid away to ripen, the coyó requires only three or four days to soften, while the avocado sometimes takes eight or nine days. Among the Indians of the Vera Paz region the coyó seems to be preferred to the avocado."

45355. *PIMENTA* sp. Myrtaceæ.

"(No. 185a. Finca Chejel, Baja Vera Paz, Guatemala. October 15, 1917.) A small tree grown in the gardens of San Cristobal Vera Paz for its aromatic seeds, which are known as *pimienta* and are much used by the natives for seasoning. This is possibly the common allspice, *Pimenta officinalis*, but on the chance that it may be a different species a few seeds have been obtained."

45356. *RUBUS URTICAEFOLIUS* Poir. Rosaceæ.

"(No. 186a.) Seeds of a very interesting species of *Rubus*, which I have seen only in the Vera Paz region. It is common about Purula, Tactic, and San Cristobal, and I have seen it as far east as Sepacuite. It occurs at altitudes of approximately 3,000 to 6,000 feet. There is another wild *Rubus* in this region which is more common, but its fruits are much more seedy and of acid flavor.

"This plant sends up strong, rather stiff canes, sometimes 10 or 15 feet in length. They are covered abundantly with reddish spines, the young branchlets appearing coarsely hairy. The leaves are trifoliate (distinguishable by this means from the other species, whose leaves are composed of five leaflets) and velvety in texture. The leaflets are ovate acuminate, about 3 inches long, and finely serrate.

"The flowers, which are rather small, are produced in large terminal racemes. The fruits are not as large as in many wild blackberries, being scarcely more than half an inch in length; but they are of delicious flavor, and the seeds are so soft that they are scarcely felt in the mouth. In this latter respect the species is a marked contrast to the others seen in Guatemala, the seeds of wild blackberries being usually very large and hard.

"The plant bears abundantly, and the sweetness of the fruits makes them very desirable for eating in the fresh state. This *Rubus* can be strongly recommended for trial in the southern United States."

45357. *SOBRALIA* sp. Orchidaceæ.

"(No. 187. Finca Chejel, Baja Vera Paz, Guatemala. October 15, 1917.) Plants of a handsome terrestrial orchid found on rocky banks in the vicinity of Tucuru, Alta Vera Paz. It grows about 3 feet in height, and produces at the apex of each stalk a handsome lilac-purple flower, 2 to 3 inches in diameter. Should be tried in southern Florida."

45358 and 45359. CASTANEA ALNIFOLIA Nutt. Fagaceæ.

From Gainesville, Fla. Plants and scions collected by Mr. J. E. Morrow at the Agricultural College. Received December 10, 1917.

A low shrub, up to 2 feet in height, and forming wide patches by means of the underground stems. The nut is solitary and very small. (Adapted from *Small, Flora of the Southeastern States*, p. 377.)

To be grown for experimental purposes.

45358. An erect form.

45359. A prostrate form.

45360 and 45361.

From Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer for the Department of Agriculture. Received November 6, 1917. Quoted notes by Mr. Popenoe.

45360. POGONOPUS SPECIOSUS (Jacq.) Schum. Rubiaceæ.

"(No. 191. Finca Chejel, Baja Vera Paz, Guatemala. October 15, 1917.) Cuttings of a handsome flowering shrub from the valley of the Rio Polochic, near Tucuru, Alta Vera Paz. The brilliant scarlet bracts make the plant a striking object among the vegetation along the slopes of the valley, suggesting the poinsettia in color. The plant is bushy in habit, reaching 15 feet in height, the leaves broadly lanceolate, acuminate, 3 to 5 inches long, with margins entire. The flowers are tubular, about an inch long, produced in corymbs 2 to 4 inches broad. Many of the flowers are subtended by ovate, acute bracts, 1 inch to 1½ inches in length, and of brilliant crimson-scarlet color. This species should be tested as an ornamental shrub in Florida and California."

45361. VITIS TILIAEFOLIA Humb. and Bonpl. Vitaceæ.**Grape.**

(*V. caribaea* DC.)

"(No. 182a. Finca Chejel, Baja Vera Paz, Guatemala. October 15, 1917.) Seeds of a wild grape from the vicinity of San Cristobal Vera Paz, where it is known simply as *uva silvestre* (wild grape). Numerous inquiries have failed to bring to light any Indian name for it.

"This seems to be a different form from that sent in under S. P. I. No. 44060; at least, the fruits are much larger and of a different color.

"The plant makes slender growths, with forked tendrils and cordate subserrate leaves 3 to 4½ inches long by 3 to 3½ inches broad. The racemes are 2 to 3 inches long, and compact; the berries are three-eighths of an inch in diameter, dull or rather pale purplish maroon in color, with abundant, very acid juice and only one or two seeds. The fruits seem to be little used in the Vera Paz region as they are too sour to eat out of hand, and the Indians are not accustomed to make jelly or other products of similar nature.

"This grape impresses me as the best which I have seen in the Tropics, and its use in connection with the development of a really choice grape for tropical regions suggests itself. It bears heavily, and the fruits are of fairly good size. They need only to be made sweeter to be of value for table use."

For an illustration showing a cluster of these grapes, see Plate II.

45362 to 45364.

From Puerto Bertoni, Paraguay. Seeds presented by Dr. Moises Bertoni. Received October 15, 1917.

45362. CYPHOMANDRA sp. Solanaceæ. **Tree-tomato.**

"*Aguará-ihvá.* July, 1917. A perennial shrub, up to 50 cm. high, with large leaves and large, edible, depressed-globular fruits. Found on the plains or savannahs in this vicinity, at altitudes of 170 to 270 meters." (*Bertoni.*)

45363. SOLANUM CHACOENSE Bitter. Solanaceæ. **Potato.**

"Collected July 25, 1917. A tuberous species found in stony and sandy places at the edge of woods." (*Bertoni.*)

It is related to *Solanum tuberosum* and its varieties, but is distinguished from them by having the calyx divided up to one-third of the length. The tubers are globose or subglobose, three-fifths of an inch in diameter, with thin yellowish skin. (Adapted from *Bitter*, in *Fedde Repertorium*, vol. 9, p. 145, 1911.)

45364. SOLANUM VIOLAEFOLIUM Schott. Solanaceæ.

"August, 1917. When fully ripe the fruit is edible and of excellent flavor. Found in partly shady places at altitudes of 170 to 230 meters. Used as a cover crop between coffee trees, etc." (*Bertoni.*)

45365. RUBUS GLAUCUS Benth. Rosaceæ. **Andes berry.**

From Manizales, Colombia. Seeds presented by Mr. M. T. Dawe. Received October 20, 1917.

"The Andes berry is found in the highlands of tropical America from southern Mexico to Ecuador and Peru. In character of growth and foliage it is an extremely vigorous raspberry, but in fruit it more closely resembles a blackberry, since it does not 'pull off' or come away from the receptacle when ripe. The plant grows to 15 feet in height, with slender, half-trailing canes; the berries are oblong to heart-shaped, an inch long, dark maroon, soft and juicy, with small soft seeds. In flavor they resemble our loganberry, but they are somewhat sweeter and better. The plant should be tested throughout the southern and western United States." (*Wilson Popenoe.*)

45366 to 45447.

From Pretoria, Transvaal, Union of South Africa. Seeds presented by Mr. I. B. Pole Evans, chief, Division of Botany, Department of Agriculture. Received October 15, 1917. Quoted notes by Mr. Evans.

45366. HORDEUM INTERMEDIUM CORNUTUM (Schrud.) Harlan. Poaceæ. **Barley.**

"No. 18. A rust-resistant barley from Fauresmith, one of the important wheat-growing areas in the Orange Free State."

45367. SECALE CEREALE L. Poaceæ. **Rye.**

"Rust-resistant rye-wheat from one of the most important wheat-growing areas in the Orange Free State."

45366 to 45447—Continued.

45368 to 45440. TRITICUM AESTIVUM L. Poaceae. Wheat.
(*T. vulgare* Vill.)

Varieties of rust-resistant wheat which came chiefly from the most important wheat-growing areas in the Orange Free State.

45368. "No. 1. *Early Beard*, from Edenburg, Orange Free State."
 45369. "No. 3. *Du Toit's* wheat, from Klipfontein, P. O. Austens Poort."
 45370. "No. 4. *Australian* wheat."
 45371. "No. 5. *Klein root koren*."
 45372. "No. 6. *Defiance*, from Edenburg, Orange Free State."
 45373. "No. 7. *Beard* wheat, from 'Melkbosch,' Bethulie District."
 45374. "No. 8. *Red Egyptian*, known also as '*Stromberg rooi koren*,' from Lifton."
 45375. "No. 9. *Transvaal wolhaar*, from Tagelberg, Bethulie District."
 45376. "No. 10. *Talawair*, from Klein Zuurfontein."
 45377. "No. 11. *Cilliers* wheat, from Hammonia, Orange Free State."
 45378. "No. 12. *Wit baard koren*, from Hammonia, Orange Free State."
 45379. "No. 13. Unnamed variety, from Zastron."
 45380. "No. 14. *Colony Red* wheat, from Fauresmith."
 45381. "No. 15. *Ou baard*, late, from Klein Zuurfontein."
 45382. "No. 16. *Gluyas*, early, from Mr. F. Jooste, Rietfontein, Edenburg."
 45383. "No. 17. *Rooi kaal koren*, from Teurfontein, Fauresmith."
 45384. "No. 19. *Sibies koren*, from Fauresmith."
 45385. "No. 20. *Klein koren*, from Bethulie District."
 45386. "No. 21. *Wolhuter* wheat."
 45387. "No. 23. *Early Beard*, from Mr. F. Jooste, Rietfontein, Edenburg."
 45388. "No. 24. *Early Beard*, from Mr. F. Jooste, Rietfontein, Edenburg."
 45389. "No. 25. *Defiance*."
 45390. "No. 26. Unnamed variety, from Koffyfontein."
 45391. "No. 27. *Stromberg rooi*, from Mr. A. G. W. van der Merwe, Tagelberg, Bethulie District."
 45392. "No. 28. Unnamed variety, from Mr. J. L. Combrink, Springbokflats, Bethulie District."
 45393. "No. 29. *Early Beard*, from Mr. A. J. Grisel, Kleinzuurfontein."
 45394. "No. 30. Unnamed variety, from Mr. P. Richie."
 45395. "No. 31. *Early Beard*, from Mr. G. J. Saaiman, 'Schuinshoogte,' Bloemfontein."
 45396. "No. 32. *Transvaal rooi wolhaar*, from Mr. P. D. Jacobs, 'Koksfontein,' Fauresmith."

45366 to 45447—Continued.

45397. "No. 33. Unnamed variety, from Koffyfontein."
45398. "No. 34. *Transvaal wolhaar*, from Messrs. de Villiers & Adams, Belgium Farm, Bethulie District."
45399. "No. 35. *Transvaal wolhaar*, from Glass Bros., Lifton."
45400. "No. 36. *Early Beard*, from Fauresmith."
45401. "No. 37. Unnamed variety, from Mr. T. J. van der Merwe, Maritzburg."
45402. "No. 38. *Early Beard*, from Mr. H. J. Joubert, Middelfontein, Bethulie District."
45403. "No. 39. *Red Egyptian*, from Messrs. de Villiers & Adams, Bethulie District."
45404. "No. 42. *Transvaal wolhaar*, from Mr. F. J. de Jonge, Zastron."
45405. "No. 43. *Early Beard*, from Mr. F. J. de Jonge, Zastron."
45406. "No. 44. *Ou baard*, from Fauresmith."
45407. "No. 45. Unnamed variety, from Fauresmith."
45408. "No. 46. *Early Gluyas*, from Fauresmith."
45409. "No. 47. Unnamed variety, from Fauresmith."
45410. "No. 48. Unnamed variety."
45411. "No. 49. Unnamed variety, from Holland, Posthumus."
45412. "No. 50. Unnamed variety."
45413. "No. 52. Unnamed variety."
45414. "No. 53. Unnamed variety."
45415. "No. 54. *Red Egyptian*, from Mr. Ferdinand Wande, Hammonia, Orange Free State."
45416. "No. 55. Unnamed variety."
45417. "No. 56. Unnamed variety."
45418. "No. 57. Unnamed variety."
45419. "No. 58. Unnamed variety."
45420. "No. 59. *Rooi wolhaar*, from Posthumus."
45421. "No. 60. *Ekstein* wheat, from Holland, Posthumus."
45422. "No. 61. Spring wheat, from Holland, Posthumus."
45423. "No. 62. *Bob's* wheat, from Mr. H. Stubbs, Corunna."
45424. "No. 63. *White Australian*, from Mr. H. Stubbs, Corunna."
45425. "No. 64. Unnamed variety."
45426. "No. 66. *Ijzerrark*, from Mr. H. J. Joubert, Middelfontein, Bethulie District."
45427. "No. 67. *Delaware*, from Mr. H. J. Joubert, Middelfontein, Bethulie District."
45428. "No. 68. *Early Beard*, from Mr. H. J. Joubert, Middelfontein, Bethulie District."
45429. "No. 69. *Primrose* wheat, from Burghersdorp."
45430. "No. 70. Early spring wheat, from Burghersdorp."
45431. "No. 71. *Bosjesveld* wheat, from Burghersdorp."
45432. "No. 73. *Early Gluyas*, from Burghersdorp."

45366 to 45447—Continued.

45433. "No. 75. *Transvaal wolhaar*, from Mr. Andries L. Lombard, Grootfontein, P. O. Dewetsdorp."
45434. "No. 76. *Transvaal wolhaar*, from Mr. G. van Tonder, waterworks, Bloemfontein."
45435. "No. 77. *Wol koren*, grown without water; from Mr. J. J. Badenhorst, Verliespan, P. O. Dewetsdorp."
45436. "No. 78. *Geluks koren*, grown without water; from Mr. M. L. Badenhorst, Klipfontein, Dewetsdorp."
45437. "No. 79. *Baard koren*, grown without water; from Mr. J. J. Badenhorst, Verliespan, P. O. Dewetsdorp."
45438. "No. 80. Early wheat, from Mr. A. L. Lombard, Grootfontein, P. O. Dewetsdorp."
45439. "No. 82. Early rust-proof wheat, from Mr. A. D. J. Taylor, 'Killarney,' Harrismith District."
45440. "No. 83. *Malan's*, a spring wheat grown in black soil; from Mr. C. J. Pieters, 'Nox,' Harrismith District."

45441 to 45446. TRITICUM DURUM Desf. Poaceæ. **Durum wheat.**

"Varieties of rust-resistant wheats which came chiefly from the most important wheat-growing areas in the Orange Free State."

45441. "No. 2. *Blue Beard* from Klipfontein, P. O. Austens Poort."
45442. "No. 40. Unnamed variety, from Mr. D. J. C. van Niekerk, Davidsrust, Jacobsdal."
45443. "No. 41. Unnamed variety, from Mr. W. J. Lubbe, Ramsdam, Honey Nest Kloof."
45444. "No. 65. *Bengal* wheat or *Zucaart baard*, from Mr. P. van Aardt, Broekpoort."
45445. "No. 72. *Media* wheat, from Burghersdorp."
45446. "No. 74. *Golden Ball* wheat, from Mr. W. H. Webster, Vallbank, P. O. Dewetsdorp."

45447. TRITICUM TURGIDUM L. Poaceæ. **Poulard wheat.**

"No. 81. *Louren's* wheat, sown in March, 1915, reaped in January, 1916. From Mr. P. J. Moolman, Beulah, Harrismith District. A rust-resistant wheat which came from one of the most important wheat-growing areas in the Orange Free State."

45448. CUDRANIA TRICUSPIDATA (Carr.) Bureau. Moraceæ.

(*C. triloba* Hance.)

From Augusta, Ga. Seeds presented by the P. J. Berckmans Company. Received October 24, 1917.

"This tree is very easily propagated from suckers. The tree that we have in our nursery is about 12 feet high and about 6 feet broad. It would have been considerably larger than this but for the fact that some four years ago we headed it back to about 3½ feet from the ground. This tree had at least 1½ bushels of fruit which matured from the middle of August up to November. It is most prolific, the fruits on this one tree running up into the thousands." (*Berckmans.*)

The fruit much resembles in appearance a dense cluster of very large red raspberries of the strigosus type, and when fully ripe has much the flavor of

an overripe red raspberry. It has possibilities for jelly making. The numerous seeds are large, but, as considerable variation has been noted in their size, selection may ultimately reduce them sufficiently to make the fruit a popular one.

45449 to 45476.

From Soochow, China. Seeds presented by Prof. H. Gist Gee, of the Soochow University, through Dr. Yamei Kin. Received October 27, 1917. Quoted notes by Prof. Gee.

45449. *BENINCASA HISPIDA* (Thunb.) Cogn. Cucurbitaceæ. Wax gourd.
(*Benincasa cerifera* Savi.)

"*Tung kua* (tree melon)."

45450 and 45451. *CITRULLUS VULGARIS* Schrad. Cucurbitaceæ. Watermelon.

45450. "*Hsüeh jang hsi kua* (snow-flesh watermelon)."

45451. "*Hci p'i hsi kua* (black-skin watermelon)."

45452. *COIX LACRYMA-JOBI MA-YUEN* (Rom.) Stapf. Poaceæ. Ma-yuen.
"*Hui jên*."

45453 and 45454. *CUCUMIS MELO* L. Cucurbitaceæ. Muskmelon.

45453. "*Sheng kua* (fresh or raw melon)."

45454. "*Niu chiao kua* (ox-horn melon)."

45455. *FAGOPYRUM VULGARE* Hill. Polygonaceæ. Buckwheat.
(*F. esculentum* Moench.)

"*Ch'iao mai*."

45456 to 45458. *HOLCUS SORGHUM* L. Poaceæ. Sorghum.
(*Sorghum vulgare* Pers.)

45456. "*T'ang hsin lu chi*." 45458. "*Kao liang lu chi*."

45457. "*Kao liang*."

45459 to 45461. *HORDEUM VULGARE COELESTE* L. Poaceæ. Barley.

45459. "*Hei liu shih lai mai* (black upland seasonal wheat)."

45460. "*Pai liu shih lai mai* (white upland seasonal wheat)."

45461. "*Sang chên hung lai mai* (mulberry-red wheat)."

45462 and 45463. *HORDEUM VULGARE PALLIDUM* Seringe. Poaceæ. Barley.

45462. "*Tsao ta mai* (early barley)."

45463. "*Ju ku ch'ing ta mai* (mushroom blue barley)."

45464 to 45466. *ORYZA SATIVA* L. Poaceæ. Rice.

45464. "*Yu mang pai han tao* (awned white upland rice)."

45465. "*Wu mang hung han tao* (awnless red upland rice)."

45466. "*Wu mang pai han tao* (awnless white upland rice)."

45467. *PANICUM MILIACEUM* L. Poaceæ. Proso.

"*Huang chi* (yellow millet)."

45468. *PISUM SATIVUM* L. Fabaceæ. Garden pea.

"*Hsiao han* (small, cold)."

45469. *RAPHANUS SATIVUS* L. Brassicaceæ. Radish.

"*Lo p'u*."

45449 to 45476—Continued.

45470. SOJA MAX (L.) Piper. Fabaceæ. **Soy bean.**
 (*Glycine hispida* Maxim.)
 "Ya tou (soy beans for sprouts)."
45471. SPINACIA OLERACEA L. Chenopodiaceæ. **Spinach.**
 "Po ts'ai."
- 45472 and 45473. TRITICUM AESTIVUM L. Poaceæ. **Wheat.**
 (*T. vulgare* Vill.)
45472. "Ssü shih t'ou wu mang hsiao mai (four-season head awnless wheat)."
45473. "Ssü shih t'ou yu mang hsiao mai (four-season head awned wheat)."
- 45474 to 45476. VICIA FABA L. Fabaceæ. **Broad bean.**
45474. "Ta ch'ing ts'an tou (large green broad bean)."
45475. "Ch'ing ts'an tou (green broad bean)."
45476. "Hung ts'an tou (red broad bean)."

45477. BERBERIS WILSONAE × AGGREGATA. Berberidaceæ.

Barberry.

From Bell, Md. Cuttings presented by Dr. W. Van Fleet. Received October 29, 1917.

"Hybrids of *Berberis wilsonae* and *B. aggregata* grown from seeds secured by pollination under glass in May, 1914. Both species are late bloomers when grown outside. *Berberis aggregata*, the pollen parent, is an upright grower with larger foliage than *B. wilsonae* and with very short flower clusters. The hybrids, however, are even more spreading in growth than *B. wilsonae*, with very thick foliage that turns deep purple at the approach of frost and holds on until midwinter. All the hybrids are quite uniform in appearance and are very handsome and hardy. Flowers and fruits have not yet appeared on these seedlings." (*Van Fleet.*)

45478. ARECA CATECHU L. Phœnicaceæ.

Betel-nut palm.

From Porto Rico. Seeds presented by the Agricultural Experiment Station, Mayaguez, Porto Rico. Received November 6, 1917.

This palm is grown very widely in the Tropics. When mature it forms a graceful tree 40 to 100 feet tall. The fibrous spathes and the covering of the fruits are used in packing. The seeds contain a dye and are the source of the betel nuts used so nearly universally in the East for chewing with lime and pepper leaves. In India alone, where 17 varieties are recognized, the trade in the nuts exceeds \$30,000,000 yearly. The cultivation of *Areca* is not difficult, and with a little care it can be grown in a greenhouse. The young plants are very decorative, and when old are probably the most graceful palms in cultivation. (Adapted from *Bailey, Standard Cyclopedia of Horticulture, vol. 1, p. 387.*)

45479. INDIGOFERA sp. Fabaceæ.

From Costa Rica. Seeds presented by Mr. George T. Carter, of Paraiso, Costa Rica, through Mr. Benjamin F. Chase, American consul, San Jose. Received November 6, 1917.

This plant, *Pico de pajaro* (Bird's beak), grows wild in Costa Rica. It is commonly found growing beneath the trees in orange groves, where it forms a

bush about 3 feet high, resembling our common locust in its foliage, but having no spines. The plants are cut away at each clearing of the ground about the orange trees, but soon grow again. This plant is said to be a good producer of the nitrogen-fixing bacteria; it is said that the roots show more nodules than either clover or bean roots. (Adapted from *report of Mr. Chase, October 19, 1917.*)

45480. ALEURITES TRISPERMA Blanco. Euphorbiaceæ.

Soft lumbang.

From the Philippine Islands. Seeds presented through Mr. Adn. Hernandez, Director of Agriculture, Manila. Received November 20, 1917.

"Soft lumbang is one of the Philippine names given to this species to distinguish it from the true lumbang, *Aleurites moluccana*. It is a strictly tropical species of very limited distribution and is reported to fruit rather irregularly. The shell of the seed is much thinner and more easily broken than that of *A. moluccana*, and the oil obtained from the kernel is said to be very similar in drying properties to that of *A. fordii*, the tung-oil tree of China." (R. A. Young.)

45481. COLOCASIA ESCULENTA (L.) Schott. Araceæ.

Taro.

From Japan. Seeds purchased from the Yokohama Nursery Co., Yokohama. Received November 22, 1917.

"*Kinukatsugi*. A Japanese taro of the dasheen type, producing a considerable number of small cormels, or tubers. It is considered by the Japanese to be one of their finest varieties. The cormels are similar in appearance to those of other Japanese taros tested in this country; but, though small, they are of better quality." (R. A. Young.)

45482 to 45485.

From Porto Murinho, Matto Grosso, Brazil. Seeds presented by Mr. C. F. Mead. Received November 5, 1917.

45482. ARACHIS HYPOGAEA L. Fabaceæ.

Peanut.

"This peanut, in Guarani called *mandui guazu*, is planted by the Indians and is customarily eaten, shell and all, after boiling. Plenty of space (2 feet square) must be allowed each plant, and the main crop will come from branches, which should be covered up from the main plant to the end, leaving the tip of each branch uncovered." (Mead.)

45483. ACROCOMIA TOTALI Mart. Phœnicaceæ.

Palm

"This palm, *coco cordillero* (mountain coco), was found on hills between Sapucoy and Caballero, in Paraguay. The plant is small, rarely over 1 meter in height, with fruit clustered at the base." (Mead.)

45484. ATTALEA GUARANITICA Barb.-Rodr. Phœnicaceæ.

Palm.

"*Coco mbocaya*, the base stock for oil, is a very valuable crop even as harvested here, and I see no reason why it should not do well in your southern sections where citrus fruits thrive." (Mead.)

A palm, native to tropical South America, with large, pinnate leaves and with fruits that hang in large clusters; each nut consists of three cells and contains as many seeds, a circumstance which serves to distinguish the genus from all its allies. (Adapted from *Lindley, Treasury of Botany, pt. 1, p. 109.*)

45482 to 45485—Continued.

45485. *PTEROGYNE NITENS* Tulasne. *Cæsalpiniaceæ*.

"*ÿbyrá-ró*. In many ways this timber is the most useful found hereabouts, especially for hulls of boats, coach work, etc. You have no timber at all like it." (*Mead.*)

A tall, stout, unarmed tree, abundant in parts of Argentina and Brazil. The wood is very strong and resistant and is used in the construction of carts, excepting the spokes. It is considered an excellent wood in Misiones, whence it is exported. It is also highly valued in Salta and is used in coach making. (Adapted from *Venturi and Lillo, Contribución al Conocimiento de los Arboles de la Argentina, p. 57.*)

45486 to 45489.

From Sao Paulo, Brazil. Seeds presented by Comte Amadeu A. Barbiellini. Received November 8, 1917.

45486. *ANNONA* sp. *Annonaceæ*.

Sent in as *Araticum ponhé* (*Annona marcegravii*), but it does not agree with other material of this number already received. It is to be grown for identification.

45487. *ANNONA CHERIMOLA* Mill. *Annonaceæ*. Cherimoya.

A Brazilian horticultural variety of cherimoya.

45488. *STREPTOCHAETA SPICATA* Schrad. *Poaceæ*. Grass.

A very rare South American grass, the morphology of which is not well understood. It is to be grown for the studies of the Department agrostologists.

45489. *ZORNIA DIPHYLLO GRACILIS* (DC.) Benth. *Fabaceæ*.

A tufted annual with wiry stems, lanceolate leaflets dotted with black glands, 3 to 12 flowered racemes 1 to 3 inches long, and pods with two to six densely prickly joints. It is stacked by the Foulahs for horse provender. The variety *gracilis* is a slender form of this species. Native to tropical America and Brazil. (Adapted from *Martius, Flora Brasiliensis, vol. 15, pt. 2, p. 83*, and from *Lindley, Treasury of Botany, pt. 2, p. 1352.*)

45490 to 45499.

From Montevideo, Uruguay. Seeds presented by Señor Ricardo Salgueiro Silveira, for the secretary of the Association of Agriculturists. Received November 9, 1917.

45490. *ARACHIS HYPOGAEA* L. *Fabaceæ*. Peanut.

"*Mani Brasileira.*" Said to be excellent varieties, acclimated in Uruguay.

45491. *AVENA SATIVA* L. *Poaceæ*. Oats.

"1888." Reported as a superior variety.

45492. *HORDEUM VULGARE PALLIDUM* Seringe. *Poaceæ*. Barley.

"1551." Said to give excellent yields.

45493. *LINUM USITATISSIMUM* L. *Linaceæ*. Flax.

"1961." Said to be a superior form under Uruguayan conditions.

45494 and 45495. *MEDICAGO SATIVA* L. *Fabaceæ*. Alfalfa.

Two lots sent in as Argentine and Peruvian strains, but not distinguished in any way.

45494. Alfalfa "1697."

45495. Alfalfa "1994."

45490 to 45499—Continued.

45496. PHALARIS CANARIENSIS L. Poaceæ. Canary grass.

Said to be a heavy-yielding variety.

45497. RICINUS COMMUNIS L. Euphorbiaceæ. Castor-bean.

Reported to be an excellent variety as grown in Uruguay.

45498 and 45499. ZEA MAYS L. Poaceæ. Corn.

Two lots of corn received as common maize and Cuarenteno maize, but not distinguished in any way.

45498. Corn "1898." **45499.** Corn "1645."

45500. JUNIPERUS CEDRUS Webb. Pinaceæ. Juniper.

From Teneriffe, Canary Islands. Seeds presented by Dr. George V. Perez, Santa Ursula, through the Forest Service, United States Department of Agriculture. Received February 2, 1917.

"No. 1. From Palma, one of the Canary Island group." (Perez.)

"It is native to the Canary Islands, where it ascends the mountains to a height of 7,000 to 9,000 feet, sometimes attaining a large size. Dr. G. V. Perez, of Teneriffe, considers it might be planted with advantage under forest conditions for its timber." (*Irish Gardening, Feb. 17, 1917.*)

For previous introduction, see S. P. I. No. 41463.

45501. PHASEOLUS ACUTIFOLIUS LATIFOLIUS G. F. Freeman. Fabaceæ. Tepary bean.

From Lakeside, Calif. Seeds presented by Mr. R. B. Kanady. Received November 2, 1917.

"This bean yields heavily and has been found to be excellent for canning. The quality is fine and the bean swells in cooking more than any other that we have tried. It should be tested in a bean-growing section, as it may prove a valuable addition to the list of varieties already widely used." (*Kanady.*)

45502. DROSOPHYLLUM LUSITANICUM (L.) Link. Droseraceæ.

From Edinburgh, Scotland. Seeds presented by the Royal Botanic Garden, through Prof. Isaac Bailey Balfour. Received November 12, 1917.

An interesting insectivorous plant from Europe. This is a subshrubby plant, with a simple stem, 2 to 6 inches high, bearing at the top long, linear glandular leaves. It is an interesting fact that these leaves are revolute, rather than involute, as in the Droseras and other such plants. The bright-yellow flowers, about 1½ inches across, are borne on a stalk about a foot high. The glands on the leaves are purple, some stalked and some sessile, viscid, and not motile as in Drosera. (Adapted from *Bailey, Standard Cyclopedia of Horticulture, vol. 2, p. 1077.*)

45503. DIOSPYROS KAKI L. f. Diospyraceæ. Kaki.

From Felton, Del. Scions collected by Mr. Peter Bisset on the property of Mr. J. W. Killen. Received November 14, 1917.

"This tree has lived through several winters at Felton, Del. This type of persimmon, as is well known, is rather susceptible to low temperatures, and a tree which has stood the winter of Delaware should receive the attention of growers." (*Bisset.*)

45504. CASTANOSPERMUM AUSTRALE Cunn. and Fraser. Fabacææ.
Moreton Bay chestnut.

From Dominica, British West Indies. Seeds presented by the Botanic Garden through the curator, Mr. Joseph Jones. Received November 16, 1917.

The *Moreton Bay* chestnut is a large ornamental leguminous tree, native to Queensland and New South Wales, where it is said to grow abundantly along rivers. The large evergreen leaves and the racemes of bright orange-yellow flowers make an attractive picture in any subtropical garden. The pod, 8 to 9 inches long, bears four to five globular seeds larger than Italian chestnuts. These seeds are roasted and eaten like chestnuts. (Adapted from *Bailey, Standard Cyclopedia of Horticulture, vol. 2, p. 688*, and *Gardeners' Chronicle, 3d ser., vol. 38, p. 244*.)

45505 and 45506.

From Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer for the Department of Agriculture. Received November 17, 1917.

45505. PERSEA AMERICANA Mill. Lauracææ. **Avocado.**
 (*P. gratissima* Gaertn. f.)

"(No. 195. Avocado No. 32. City of Guatemala, Guatemala. November 6, 1917.) *Akbal*. This is a variety noteworthy for earliness, and bud wood has been included in the set primarily for this characteristic. It is, however, of very good quality and has no visible defects except a somewhat undesirable shape. Judging by its behavior in Guatemala, it should be the earliest variety in the collection, but it is not safe to depend upon its retaining this characteristic in the United States, since slight local variations in soil or climate sometimes affect the time of ripening very noticeably and its earliness may not be altogether an inherent characteristic.

"The parent tree is growing in the grounds of Eulogio Duarte, near Amatitlan. The location is known as Los Rastrojos and is about 2 miles from the plaza of Amatitlan, on the road which leads past the cemetery toward the hills. The altitude is approximately 4,200 feet. The tree is about 40 feet high, spreading but of compact growth, the crown being fairly dense. The trunk is about 20 inches thick at the base, and it branches 10 feet from the ground. According to the owner, the tree is 6 years old, but to judge from its size it can not be less than 20. It seems to be vigorous and in good condition. The bud wood which it yields is fairly satisfactory, the growths being well formed though not very stout, while the eyes are vigorous and do not drop quickly.

"This is a rather warm region; hence, there is nothing to indicate that the variety will be unusually hardy.

"The crop harvested in the fall of 1917 was a good one. According to the owner, it was 600 fruits, but it seems probable that it was considerably more. The bearing habit of the tree gives promise of being very satisfactory. The flowering season is in November and December, and the fruit ripens from the following August to November. It is fully ripe and in perfect condition for picking by the middle of October, whereas the average variety of the same region is not mature until January at the earliest.

"In two characteristics this variety does not seem to agree with the Guatemalan race. It has a thin skin, and the seed coats do not adhere

45505 and 45506—Continued.

closely to the cotyledons. A few other varieties showing these same characteristics were seen in the same locality, and it is possible that they may not be true Guatemalan avocados, though in most respects they appear to belong to this race.

"In form the fruit is long and slender, sometimes slightly curved, and sometimes becoming pyriform. It is medium sized, weighing about 12 ounces. The surface is smooth and deep green in color. The skin is thin and surrounds deep-yellow flesh of good quality, without fiber or discoloration. The seed is medium sized, and while it never rattles in its cavity it does not fit as snugly as in nearly all other Guatemalan varieties.

"A formal description of this variety is as follows:

"Form elongated to slender pyriform, sometimes curved; size medium, weight 12 ounces, length $5\frac{1}{2}$ to $6\frac{1}{2}$ inches, greatest breadth $2\frac{1}{4}$ to 3 inches; base narrow, rounded, the short, stout stem (2 to 3 inches long) inserted obliquely; apex quite smooth, uniformly bright green in color, with very numerous minute yellowish dots; skin very thin, less than one-sixteenth of an inch, but firm and tough; flesh rich yellow near the seed cavity, changing to light green near the skin, firm, of fine texture, free from fiber, and of rich, nutty flavor; quality very good; seed medium sized, weighing about $1\frac{1}{2}$ ounces, conical to slender conical in form, the cotyledons smooth, with the seed coats adhering loosely." (*Popenoe.*)

45506. MALPIGHIA sp. Malpighiaceæ.

"(No. 196. City of Guatemala, Guatemala. November 6, 1917.) Cuttings of *azerola*, from Amatitlan (altitude 3,900 feet). The name *azerola*, which properly belongs to species of *Crataegus*, is applied, in central Guatemala, to a large Malpighia the fruits of which are not unlike those of the Barbados cherry (*Malpighia edulis*). I have seen the plant only in a few places; it is most abundant at Amatitlan, where it is seen in a large proportion of the gardens and dooryards.

"This species is much larger than *M. edulis*, often becoming a small bushy tree 20 feet in height, but more commonly seen as a large shrub, spreading in habit, with a dense crown. When young, the leaves are covered with a thick whitish tomentum; when mature, they are membranaceous, elliptic-acuminate in form, about 4 inches long, cuneate at the base, bright green and glabrous above, heavily pubescent with the venation prominent below. The flowers are produced in small axillary clusters. Individually, they are scarcely an inch broad, with clawed crapelike petals of lilac-pink color. The fruits, which ripen mainly during August and September, are the size of a large cherry, but flattened and sometimes pointed toward the apex. They are bright red when fully ripe, with a tender skin and juicy, whitish flesh of peculiar sub-acid flavor. The seeds, three in number, are roughly winged. The character of the growth suggests that this plant may be slightly hardy. It has not been seen in the lowlands, but is grown at altitudes of 4,000 to 5,000 feet where the climate is comparatively cool, but not cold enough to experience severe frosts. The plants produce abundantly. While not a fruit likely to become of great importance in the United States, it possesses sufficient interest and value to merit a trial. The regions in which it seems likely to succeed are Florida, southern Texas, and California." (*Popenoe.*)

45507. CASTANEA CRENATA Sieb. and Zucc. Fagaceæ.**Japanese chestnut.**

From Felton, Del. Seeds purchased from Mr. J. W. Killen. Received November 16, 1917.

"Seeds to be grown as stock on which to graft Chinese chestnuts and also Dr. Van Fleet's selected hybrids. The trees from which these nuts were gathered were interplanted about 20 years ago with American chestnuts, which have all been killed by the chestnut bark disease, while the Japanese trees are still thriving and bearing excellent crops of nuts. The blight has attacked some of the branches of the Japanese trees, but has not proved serious." (*Peter Bisset.*)

45508 and 45509.

From Paraguay. Seeds presented by Mr. Thomas R. Gwynn, Concepcion. Received November 19, 1917.

45508. CECROPIA ADENOPUS Martius. Moraceæ.

A tall tree which grows on river banks, both on the mainland and on the islands. The large leaves are whitish beneath, rough, and give the tree its name of *Palo de lija* (sharkskin wood). The leaves are considered a remedy for coughs. It is native to Misiones, Corrientes, Chaco, Formosa, and northern Argentina. (Adapted from *Venturi and Lillo, Contribución al Conocimiento de los Árboles de la Argentina, p. 63.*)

45509. DIOCLEA REFLEXA Hook. f. Fabaceæ.

A climbing shrub, called in Paraguay *Liana de flores moradas*, with beautiful reddish purple flowers. It may be distinguished from the related *Dioclea violacca*, which has straight, erect, violet-colored bracts, by its reflexed, reddish bracts. (Adapted from *Hooker, Niger Flora, p. 306.*)

45510. CAJUPUTI LEUCADENDRA (Stickm.) Rusby. Myrtaceæ.

(*Melaleuca leucadendron* L.)

Cajuput tree.

From Madagascar. Seeds presented by Mr. E. Jaeglé, director, Agricultural Station of Ivoloïna, through Mr. James G. Carter, American consul, Tamatave. Received March 31, 1917.

"The wood of this tree shows a most beautiful combination of light and darker shades, which may be compared in appearance to ripple marks. It is hard, heavy, and close grained, excellent for shipbuilding and for posts in damp ground; it is said to be imperishable under ground. The papery bark also is worthy of notice for its great durability and for being impervious to water, instances being known where it has been used for dam and drainage purposes in conjunction with timber, and it has been found that the bark was quite sound although the timber was decayed." (*Maiden, Useful Native Plants of Australia, p. 569.*)

45511. RICINUS COMMUNIS L. Euphorbiaceæ.**Castor-bean.**

From Montevideo, Uruguay. Seeds presented by Señor Ricardo Salgueiro Silveira, for the secretary of the Association of Agriculturists. Received November 22, 1917.

Received as *Ricinus sanguinalis* which is considered a horticultural form of *R. communis*.

45512. CITRULLUS VULGARIS Schrad. Cucurbitaceæ. Citron.

From Bell, Md. Presented by Dr. W. Van Fleet. Received November 22, 1917.

"A preserving citron, 6 to 8 inches long and 3 to 4 inches in diameter. Skin green and smooth; flesh white and solid; seed in green fruit soft. May prove valuable for marmalades and preserves, also for cooking with fish or meat." (*B. T. Galloway.*)

45513 to 45522. SACCHARUM OFFICINARUM L. Poaceæ.**Sugar cane.**

From Mauritius. Presented by Mr. H. A. Tampany, Director of Agriculture, Reduit, Mauritius. Received November 20, 1917.

45513 and 45514. "Var. *M. P. 55*. Foliage broad, canes stout and tall, inclined to trail, 10 to a stool; internodes cylindrical, rather long, dark purple with waxy coating, no channel; eye bud rather large, broad, and slightly bulging at base, apex flat and adhering." (*Tampany.*)

A widely grown variety, exceeded only by *White Tanna* in area under cultivation in Mauritius. Of all the land devoted to sugar-cane raising 12 per cent is occupied by this variety. In Mauritius this variety seems to prefer the lowlands, two-thirds of the area devoted to it being below 600 feet in altitude. The origin of this variety is traced to Mr. G. Perromat, manager of the Clemencia estate, Flacq, who began to grow canes from seed in 1891. *M. P. 55* is the best of the varieties he succeeded in raising. (Adapted from *Henri Robert, Sugar-Cane Varieties in Mauritius.*)

45513. "Cuttings."

45514. "Seeds."

45515. "Cuttings of *M. P. 131*. Foliage narrow; canes tall, inclined to trail, of medium size, 10 to 15 to a stool; internodes zigzag, of medium length, dark violet, slightly waxy, the channel slightly marked in some cases, apparent in others; eye bud broad, pentagonal, flat, base straight, sides perpendicular, apex adhering." (*Tampany.*)

A variety of minor importance on the island of Mauritius, occupying only a small part of the land devoted to sugar cane. It is a variety which prefers the lowlands, most of it being grown below 600 feet altitude. This is one of the varieties grown from seed by Mr. G. Perromat, manager of the Clemencia estate, Flacq. It ranks second in value of all the varieties that he originated. (Adapted from *Henri Robert, Sugar-Cane Varieties in Mauritius.*)

45516. "Cuttings of *M. 1237*. Foliage rather broad; canes erect, rather tall, of medium size, 10 to 12 to a stool; internodes straight, of medium length; reddish purple, waxy, the channel deeply marked, running almost the entire length of the internode; eye bud of medium size, pentagonal, bulging at the center, apex adhering." (*Tampany.*)

45517 and 45518. "*D. K. 74*. Foliage broad; canes medium in size, fairly tall, inclined to trail, 11 to a stool; internodes cylindrical, of medium size, yellow, sunburns red, no channel; eye bud of medium size, triangular, slightly bulging at base, apex not quite adhering." (*Tampany.*)

A variety of minor importance on the island of Mauritius. It occupies 5.48 per cent of the land devoted to sugar-cane raising. It is a

45513 to 45522—Continued.

variety which grows best on the lowlands, almost all of it being grown below 600 feet in altitude. This variety was introduced in 1905 by the Forest Department of Mauritius, from Barbadoes. Through an error at the time of introduction, this variety has been given the wrong name. It has been found that this is the well-known Demerara seedling properly known as *D.74*. (Adapted from *Henri Robert, Sugar-Cane Varieties in Mauritius*.)

45517. "Cuttings."

45518. "Seeds."

45519 and 45520. "*White Tanna*. Foliage broad; canes rather stout, erect, medium height, 10 to a stool; internodes cylindrical, greenish red with characteristic cracks, medium size and height, no channel; eye bud of medium size, flat, circular, apex not quite adhering." (*Tampany*.)

This is the widest grown of all the sugar-cane varieties on the island of Mauritius, occupying 47 per cent of all the land given over to sugar-cane raising. It is a variety which is grown equally well on the highlands or lowlands. There are two sources from which this variety came: It arose as a sport on several estates of the colony, and has since been widely cultivated; it was also received from the Department of Agriculture of New South Wales in 1895. The present variety is probably descended in part from each of the sources mentioned above. (Adapted from *Henri Robert, Sugar-Cane Varieties in Mauritius*.)

45519. "Cuttings."

45520. "Seeds."

45521. "Cuttings of *16804*. Foliage broad; canes stout, medium height, inclined to trail, seven to a stool; internodes cylindrical, purple-black, rather short, slightly channeled; eye bud of medium size, slightly bulging, base about twice as long as the distance of the apex from the base." (*Tampany*.)

45522. "Cuttings of *Striped Tanna*. Foliage broad; canes very stout and fairly tall, very erect, eight to a stool; internodes cylindrical, rather short, reddish black with light-red stripes and characteristic cracks, no channel; eye bud of medium size, bulging and prominent, apex blunt." (*Tampany*.)

Of all the land used for raising sugar cane in Mauritius, 8.76 per cent is devoted to the growing of this variety. It stands third in importance on the island of Mauritius, being exceeded in area planted only by the varieties *White Tanna* and *M. P. 55*. This variety will grow on high or low land, as much being grown about 600 feet as below. The *Striped Tanna* was received from Queensland in 1890. (Adapted from *Henri Robert, Sugar-Cane Varieties in Mauritius*.)

45523. PRUNUS MUME Sieb. and Zucc. Amygdalaceæ.**Japanese apricot.**

From Yokohama, Japan. Seeds purchased from the Yokohama Nursery Co. Received November 28, 1917.

A tree with somewhat the appearance of the common apricot, but with greenish or gray bark and duller foliage. The leaves are relatively small, long pointed, light colored beneath; and the fragrant flowers are sessile or nearly so. Various forms (such as the white, double white, double rose, and weeping) are in cultivation. The double-flowered form is especially valuable in gardens for its early and profuse blooming.

The fruit is about an inch in diameter and is used in Japan as a pickle. The fruits are picked just before becoming ripe and soaked in water for 24 hours; then they are mixed with salt and the leaves of the red-leaved variety of *Perilla nankinensis* and allowed to stand a week or less, depending on the temperature. After this, the fruits are spread in the sun to dry and while drying are sprinkled with the juice of the *Perilla* leaves. After three to five days they are put up in weak brine, in which they will keep indefinitely. The pickled fruit is exceedingly sour; it often forms a part of the ration of the Japanese soldiers. For best results the trees should be grown in a shady place. (Adapted from notes of Frank N. Meyer.)

45524. CHENOPODIUM AMBROSIODES L. Chenopodiaceæ.

From India. Seeds presented by Mr. H. G. Carter, director, Botanical Survey of India, Calcutta. Received November 28, 1917.

"Obtained from plants grown near Calcutta." (Carter.)

Especially developed strains are said to afford a high percentage of an essential oil, to which tonic and antispasmodic properties are attributed. In Europe it has a reputation as a useful remedy in nervous affections, particularly chorea. (Adapted from *The National Dispensatory*, p. 1067.)

45525 to 45534.

From Hupeh Province, China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for the Department of Agriculture. Received November 21, 1917. Quoted notes by Mr. Meyer.

45525 and 45526. LYCORIS AUREA (L'Her.) Herbert. Amaryllidaceæ.

45525. "(No. 1283. Chienchingshan, near Kingmen. September 21, 1917.) Seeds of a bulbous plant, flowering in late summer, with large ocher-yellow flowers borne on stems often over 2 feet tall. The foliage dies down in summer, but comes up again in early spring or late winter where the climate is mild. Apparently withstands zero temperatures. Collected in pockets of humus soil beneath tall trees on a rocky, mountain slope at an altitude of more than 2,000 feet above sea level. May possibly be hardy at Washington, D. C."

45526. "Bulbs of No. 1283 [S. P. I. No. 45525]."

45527 and 45528. LYCORIS RADIATA (L'Her.) Herbert. Amaryllidaceæ.

45527. "(No. 1284. Kingmen. September 26, 1917.) Bulbs of a plant, with large masses of carmine-red flowers, which flowers in late summer and early autumn. The foliage dies down in spring, but the leaves sprout up again after flowering has ceased. It loves partial shade, does well on dry banks, debris, and beneath trees, but seems to withstand less frost than the preceding number. This ought to thrive throughout the whole southern United States, and possibly in California. Chinese name *Lung chiào hua* (dragon's-claw flower.) Obtained from the garden of Rev. J. S. Johnson, Swedish American Missionary at Kingmen."

45528. "(No. 1285. Kingmen. September 26, 1917.) Var. *flavescens*. Bulbs of a dragon lily, with pale-yellow flowers borne on stalks considerably taller than those of the preceding number [S. P. I. No. 45527], of which it seems to be a variety. This and the three preceding numbers [S. P. I. Nos. 45525 to 45527] can

45525 to 45534—Continued.

possibly be grown for cut flowers in greenhouses in the northern United States, while in the South they might even become weeds, as they are here and there in central China. They also deserve to be taken in hand by plant breeders, for they certainly are amenable to selection and possibly to hybridization, and they seem to suffer from very few natural enemies."

45529 to 45531. BRASSICA PEKINENSIS (LOUR.) Gagn. Brassicaceæ.

Pai ts'ai.

45529. "(No. 2449a. Kingmen. September 13, 1917.) *Tung pai ts'ai* (winter white vegetable). A variety of *pai ts'ai*, said to grow into large solid heads when planted in the fall and given sufficient space in rich, moist soil. When sown thickly in beds in spring or fall and not transplanted, it is pulled up with the roots and eaten, chopped up and boiled like spinach. Can also be employed in sauerkraut making. To be tested especially in the southern sections of the United States."

45530. "(No. 2450a. Kingmen. September 13, 1917.) *Hei pai ts'ai* (black-white vegetable). A variety of *pai ts'ai* with very dark green, bullate foliage, not making a closed head. Sown in the fall and transplanted at distances of half a foot or more in all directions. It needs a moist, muck soil to grow to perfection, and in mild climates it keeps on growing throughout the whole winter. It is eaten in soups, chopped up like spinach. To be tested mainly in the southern United States."

45531. "(No. 2451a. Kingmen. September 14 and 15, 1917.) A variety of *pai ts'ai*, said to resemble No. 2449a [S. P. I. No. 45529] in most ways; but it grows taller and larger. It is cultivated in the same manner. Chinese name *Hsiangyang pai ts'ai*, apparently denoting that this variety originally came from the city of Hsiangyang, 100 miles north of Kingmen."

45532. AESCULUS WILSONII Rehder. Æsculaceæ. Horse-chestnut.

"(No. 2452a. Kingmen. September 24, 1917.) *So lo shu*. The interesting and beautiful Chinese horse-chestnut, a tree deserving to become widely planted in the southern United States. Not as charming as the European horse-chestnut, but better able to withstand hot summers and long periods of drought. To be planted in those sections of the United States where temperatures do not fall much below zero."

For an illustration showing this horse-chestnut in its native habitat, see Plate III.

45533. ALLIUM sp. Liliaceæ.

Onion.

"(No. 143b. Anlu. August 28, 1917.) Bulbs of a small onion, pickled in vinegar and used as a relish with meals; said to promote good health and to aid the digestion."

45534. CITRUS ICHANGENSIS Swingle. Rutaceæ.

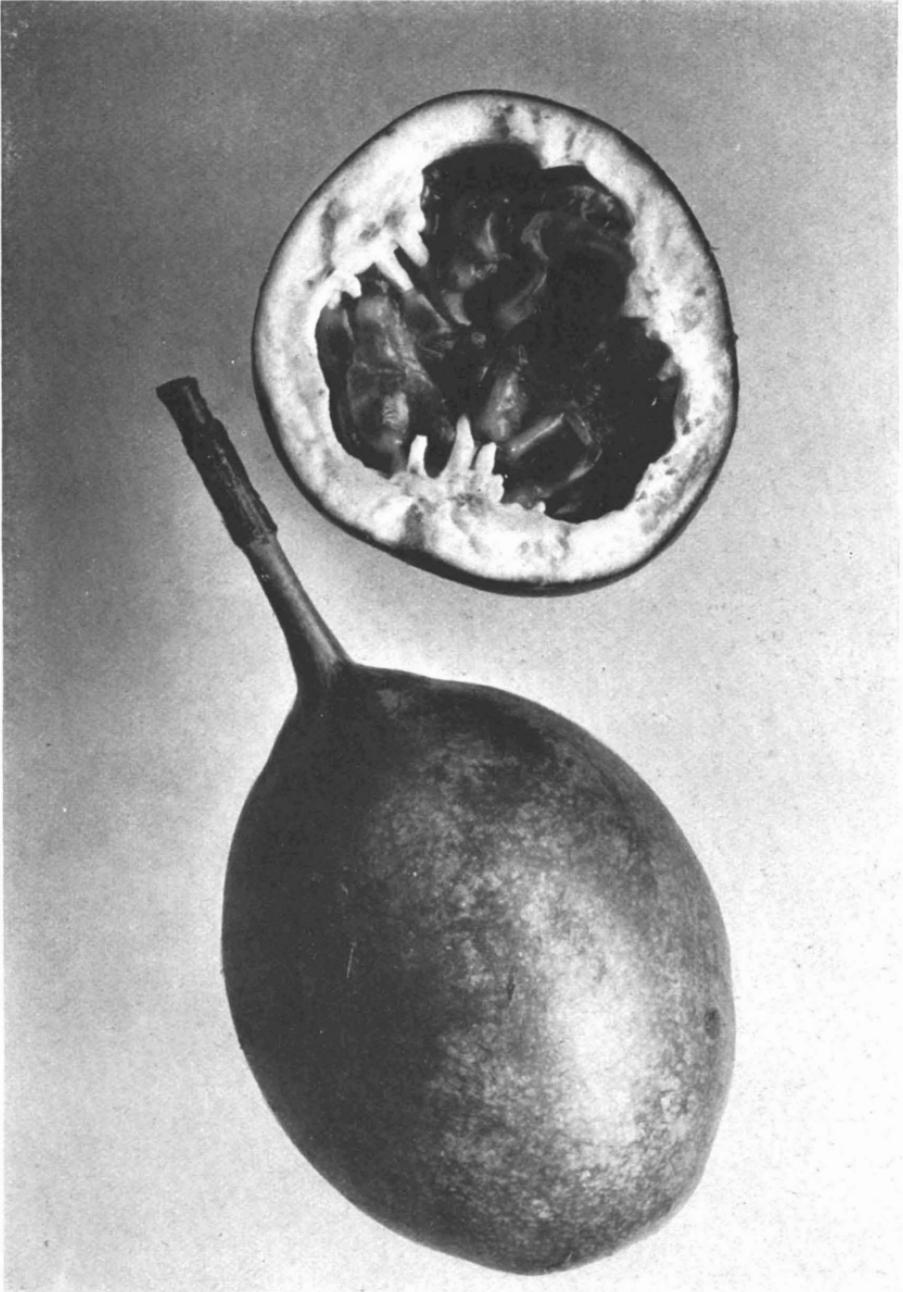
Ichang lemon.

"(No. 145b. Kingmen. September 26, 1917.) Fruits of a citrus species called *Hsiang yuan* (fragrant, round). It exists in many varieties and is able to withstand colder temperatures than the tangerine and kumquat, but is not as hardy as *Poncirus trifoliata* (*Citrus trifoliata*). The rind exhales a delightful fragrance, and the Chinese use the fruits



THE CHINESE HORSE-CHESTNUT IN ITS NATIVE HABITAT. (AESCULUS WILSONII REHDER, S. P. I. No. 45532).

Although Frank N. Meyer, the agricultural explorer, did not find this tree so charming as the European horse-chestnut, he predicted that it would prove better able to withstand hot summers and long periods of drought. It has narrower leaves which do not appear to be whipped by the wind so easily as do those of the European species. Specimens are growing near Seattle and promise to be successful there, but it deserves a trial in the parks of the eastern United States. (Tree 80 feet high, in flower, photographed (No. 96) by E. H. Wilson, Hsinwenping, Szechwan, China, June 1, 1908.)



THE SWEET GRANADILLA OF GUATEMALA. (*PASSIFLORA LIGULARIS* JUSS.,
S. P. I. NO. 45614).

One of the best of the granadillas. According to Mr. Wilson Popenoe, this plant grows in parts of Guatemala apparently too cold for the avocado. It is strikingly different from the common species (*P. edulis*), which is grown in California and cultivated extensively in Australia, being orange-yellow instead of dull purple in color, with a rind so hard that it does not wrinkle but protects the fruit, so that it is transported as much as a hundred miles over the mountains by native carriers. It brings relatively high prices on the markets. The aroma of the fruit is delightful, and the flavor is not so acid as that of other species. It deserves to be grown and crossed with *P. edulis* and with the sour maypop (*P. incarnata*), which is hardy as far north as Washington, D. C. (Photographed by Wilson Popenoe, San Lorenzo del Cubo, Guatemala, October 19, 1916; P16825FS.)

45525 to 45534—Continued.

as room perfumers and carry them about instead of a perfumed handkerchief. Since they possess an abundant juice of good quality, foreign residents use these fruits for making lemonade. If it were not for the many very large seeds, this fruit could well be substituted for the ordinary lemon; as it is, it may be grown considerably north of the true citrus belt to supply a home product from which to make refreshing drinks."

45535 and 45536.

From Mexico. Seeds presented by Mrs. Zelia Nuttall, Casa Alvarado, Coyacan, City of Mexico. Received December 5, 1917.

45535. *AMARANTHUS PANICULATUS* L. Amaranthaceæ. **Huauhtli.**

An annual, with entire leaves, bearing the abundant grainlike edible seeds in dense panicles. Some plants produce white seeds, and some produce black. The white seeds are those chiefly used by the natives. This plant is found both in cultivation and growing wild. The seeds are ground and cooked in the form of small cakes known as "alegria," these cakes being eaten in large quantities by the poorer classes, especially during a time of scarcity of corn. This plant was cultivated by the Aztecs before the discovery of America. It occupied an important place in the fare of the people, and accounts show that every year 18 granaries, each with a capacity of 9,000 bushels, were filled by Montezuma. Often the tribute exacted by the Aztecs from the people they conquered would take the form of a certain quantity of this grain. It was so closely connected with the life of the people that it figured in religious observances. Spanish historians, writing in the first half of the seventeenth century, give accounts of how the ancient Mexicans made figures of their gods out of the flour obtained from the seed. The figures were carried in processions, and at the end of the ceremony were broken up and served to the people as a form of communion. (Adapted from *Safford, Proceedings International Congress of Americanists, p. 286, 1917.*)

45536. *CHENOPODIUM NUTTALLIÆ* Safford. Chenopodiaceæ.

Huauhtzontli.

"Huauhtzontli combines the properties of a cereal and a vegetable, and furnishes a substantial meal. When fresh and the seeds are 'in milk,' the food is, to me, delicious. I am told that it is almost as good when prepared from the dried inflorescence." (*Mrs. Nuttall.*)

45537 to 45539.

From Panama, Republic of Panama. Seeds presented by Señor Ramon Arias Féraud. Received November 30, 1917.

45537 and 45538. *CARICA PAPAYA* L. Papayaceæ. **Papaya.**

"A fine oblong papaya, with tapering ends, about 12 to 18 inches long and 5 to 6 inches in diameter." (*Arias Féraud.*)

45537. Male.

45538. Female.

45539. *CUCURBITA PEPO* L. Cucurbitaceæ. **Squash.**

"An edible squash, which, when well mashed and mixed with olive oil and vinegar, makes a splendid salad." (*Arias Féraud.*)

45540 to 45553.

From the city of Guatemala, Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer for the Department of Agriculture. Received November 24, 1917. Quoted notes by Mr. Popenoe.

45540 to 45546. CHAYOTA EDULIS Jacq. Cucurbitaceæ. **Chayote.**
(*Sechium edule* Swartz.)

45540. "(No. 197a. November 7, 1917.) *Güisquil de Santa Maria.* Locally considered one of the very best varieties. It is a short, broad fruit, compressed on the sides, and weighing 12 ounces to a pound. The surface is smooth, free from corrugations, and pale to bright green in color. Green-fruited *güisquiles* are considered by the Guatemalans to have more flavor than the white-fruited varieties.

"All smooth, small to medium-sized *güisquiles* are called *peruleros*; the spiny or rough fruits are termed simply *güisquil* in most instances. Occasionally they have distinguishing names, such as *güisquil de Santa Maria.*"

45541. "(No. 198a. November 7, 1917.) Large white *perulero*. Probably the best of the *perulero güisquiles*. A pear-shaped, waxy white fruit without prickles and with a surface free from wrinkles or corrugations. Weight about 5 ounces. One of the rarest varieties in the market."

45542. "(No. 199a. November 7, 1917.) *Güisquil de Santa Maria.* A large form similar to No. 197a [S. P. I. No. 45540], but somewhat more prickly. It is considered a very good variety. For cultivation in the United States, however, varieties without prickles seem preferable, as they are more attractive in appearance and easier to handle. In Guatemala a large proportion of *güisquiles* are prickly, but the presence of the prickles does not seem to make any difference to the natives when purchasing the fruits in the market."

45543. "(No. 200a. November 7, 1917.) Large pale-green *perulero*. A pear-shaped fruit about 8 ounces in weight, with a smooth surface pale green in color. Somewhat larger than the large white *perulero*. No. 198a [S. P. I. No. 45541], but said to be slightly inferior in flavor."

45544. "(No. 201a. November 7, 1917.) Small white *perulero*. A popular *güisquil*, considered of good quality. It is pear shaped, 2 to 3 ounces in weight, waxy white in color, with a smooth surface free from spines."

45545. "(No. 202a. November 7, 1917.) Small pale-green *perulero*. Practically identical with the small white *perulero*, No. 201a [S. P. I. No. 45544], except in the color, which is pale waxy green."

45546. "(No. 203a. November 7, 1917.) Small green *perulero*. A common variety in the markets, and apparently a favorite. Nearly round in form, about 2 ounces in weight, with a smooth surface deep green in color. Almost a miniature *güisquil de Santa Maria* No. 197a [S. P. I. No. 45540]."

45547. SOBRALIA MACRANTHA Lindl. Orchidaceæ.

"(No. 204a. November 7, 1917.) A terrestrial orchid found in the vicinity of the city of Guatemala, at altitudes of 4,000 to 5,000 feet. The

45540 to 45553—Continued.

plants sent under this number are from the barranca near Chinautla, a few miles north of the city.

"The fact that this handsome species grows in a cool climate suggests that it may be sufficiently hardy for open-air culture in California and Florida. Here in Guatemala it is often planted in gardens, where, during October, it makes a fine showing with its large flowers. The plant sends up several stems 3 to 4 feet in height. At the summit of each, two or three flowers are produced, only one opening at a time. In size and color the flowers resemble some of the fine cattleyas; they are 2 to 3 inches broad, deep lilac in color, deepening to lilac purple in the throat."

45548. *ANNONA DIVERSIFOLIA* Safford. Annonaceae.

Ilama.

"(No. 205a. November 8, 1917.) The *anona blanca*, from Chiquimula (altitude 1,400 feet).

"This species is not known in the highlands of Guatemala, nor have I seen it elsewhere except in the vicinity of Chiquimula and Jocotan, both in the southeastern part of the republic, close to the border of Honduras.

"The tree strongly suggests *Annona squamosa* in appearance, but is easily distinguished by the leaflike bracts at the bases of the branchlets. The fruit is much larger than that of *A. squamosa*, resembling more closely that of *A. reticulata*. It is generally heart shaped, up to 5 or 6 inches in length, with the carpellary areas indicated by incised lines on the surface, which is pale glaucous green in color. The skin is nearly a quarter of an inch thick, the flesh is said to be tinged rose color when ripe, and the seeds are much larger than those of either *A. squamosa* or *A. reticulata*. The season of ripening in southeastern Guatemala is September.

"While I have not been able to test this fruit thoroughly, it seems to be far superior to *A. reticulata* and to approach the cherimoya in quality. If it succeeds at low altitudes in the Tropics, as seems to be the case, it may prove to be a valuable species for cultivation in regions which are too hot for the cherimoya. It should certainly be given a careful trial in such regions as southern Florida, Cuba, and Porto Rico. I do not know how productive the tree may be, since I have seen only two specimens in fruit, and these were growing under rather unfavorable conditions.

"The seeds forwarded under this number were taken from fruits purchased in the market of Chiquimula by Mr. B. B. Williams, of the Friends' Mission."

45549. *CRANIOULARIA ANNUA* L. Martyniaceae.

"(No. 206a. November 8, 1917.) *Uña de gato* (cat's-claw). A large herbaceous annual, common in central and eastern Guatemala at altitudes of about 2,000 feet. The seeds forwarded under this number came from the valley of the Rio Motagua near La Canoa, on the Guatemala-Coban trail.

"The plant grows about 4 feet high, with large, soft leaves. It produces along the stem numerous gloxinialike flowers, white in color, with a purplish blotch in the throat."

45550. (Undetermined.)

"(No. 207a. November 8, 1917.) Seeds of a small, flowering tree from the mountains of Baja Vera Paz, between Salama and Purula. I have

45540 to 45553—Continued.

seen it cultivated in Antigua and am told that it occurs wild in that region as well.

"The wild trees, which grow on rocky, rather dry slopes, reach 20 feet in height. In April and May they produce numerous flowers 2 inches in diameter, white upon first opening, but later becoming bright pink. When in full bloom the tree is very decorative in appearance and worthy of a trial in the warmest sections of the United States."

45551. (Undetermined.)

"(No. 208a. November 8, 1917.) A flowering vine from the summit of the Cachil Mountains, north of Salama, Baja Vera Paz; altitude 5,250 feet.

"This plant is occasionally seen climbing over shrubs and small trees. It does not make very luxuriant growth, but produces clusters of small red flowers which are very attractive. The flowers are followed by winged seed capsules. For trial in California and Florida."

45552. GLIRICIDIA MEISTOPHYLLA (DODD. SM.) Pittier. Fabaceæ.

"(No. 209a. November 8, 1917.) Seeds of a leguminous shrub from the mountains of northern Baja Vera Paz."

45553. PERSEA AMERICANA Mill. Lauraceæ.

Avocado.

(*P. gratissima* Gaertn. f.)

"Avocado seeds to be grown for stocks."

45554 to 45557.

From Buitenzorg, Java. Seeds presented by the director of the Botanic Gardens. Received November 30, 1917.

45554. PAVETTA ZIMMERMANNIANA Valet. Rubiaceæ.

A small rubiaceous tree or shrub, with opposite, nearly elliptic leaves and clusters of small, slender-tubed white flowers.

"The remarkable researches of Zimmermann and Faber detailed in the *Jahrbücher für Wissenschaftliche Botanik*, vol. 51, p. 285, 1912, and vol. 54, p. 243, 1914, make this species of unusual interest. Faber has proved that the leaves of this and of several other species of Pavetta, Psychotria, and possibly other genera of the Rubiaceæ contain colonies of a nonmotile, nitrogen-fixing bacterium which he names *Mycobacterium rubiacearum*. The bacteria of this species almost invariably inhabit the micropyle of the young seed and, when the seed germinates, grow through certain stomata of the very young leaves and into the intracellular spaces formed in the leaf tissues around these stomata. Cavities are formed through the growth of the epidermal cells, which later close entirely and make bacterial nodules which are deeply embedded in the leaf tissues. A single leaf may have several dozen of these symbiotic bacterial nodules. Faber was able, by treating the seeds with hot water and a sublimate solution, to kill the inhabiting myco-bacteria and, later, to infect part of the seedlings grown from these seeds with pure cultures of the bacterium. The artificially infected seedlings grown in soil free from combined nitrogen grew well and remained healthy for four months, whereas those not so infected turned yellowish white and died in three or four weeks. The plants from unsterilized seeds produced leaves bearing many more bacterial nodules than did those from sterilized seeds which were later artificially inoculated. In view of the facts that these rubiaceous plants with

45554 to 45557—Continued.

bacterial nodule-bearing leaves occur in many parts of the Tropics and that in India, at least, the value of their leaves for manure has long been recognized, and considering the value of nitrogen-fixing legumes as fertilizers, the suggestion of Faber that we may have in these tropical trees and shrubs plants of positive agricultural value for the tropical planter is well worthy of consideration. The value of the mulch formed by the leaves of leguminous and other plants is keenly appreciated by the best cultivators, and it may be possible to find suitable small shrubs of Pavetta or other rubiaceous plants which will be worth while growing for their nitrogen-fixing leaf bacteria in the orchards of our semi-tropics or wherever else the climate will permit of their cultivation." (*Fairchild.*)

45555. MACROZANONIA MACROCARPA (Blume) Cogn. Cucurbitaceæ.
(*Zanonia macrocarpa* Blume.)

"This is one of the most remarkable climbing vines or lianas of Java; remarkable because of the size of the fruits, which are as large as medium-sized pumpkins and are borne high in the tops of the forest trees. As the fruits ripen they open at the bottom, and through the triangular opening the great winged seeds fall out and, like flocks of aeroplanes, sail away in a most spectacular manner. No seed that I know of illustrates more perfectly the principles of the aeroplane than the seeds of this plant; and if for no other purpose than that of instructing the youth in our schools with regard to the principles of seed dissemination, this interesting plant is worthy of cultivation in our own tropical regions. It should be experimented with in Porto Rico and Hawaii; and it might succeed in the hammocks of Florida." (*Fairchild.*)

45556. MANGIFERA ODORATA Griffith. Anacardiaceæ.

"A large tree from Malacca, Java, and probably other islands in that region, where it is known as *kuwini*. The leaves are about the size of those of the common mango; like the latter, the flower possesses but one or, at most, two fertile stamens. The fruit is described by Griffith as oblong, yellow-green with yellow spots, ill-smelling, and filled with sticky gum; flesh yellow, fibrous, sweet, not turpentine; stone compressed, fibrous. This species of *Mangifera* is little known in horticulture and seems nowhere to be held in great esteem as a fruit. It is of interest in connection with studies of the cultivated mangos." (*Wilson Popenoe.*)

45557. CEIBA PENTANDRA (L.) Gaertn. Bombacaceæ. **Kapok.**
(*Eriodendron anfractuosum* DC.)

A moderate-sized, quick-growing, upright thornless tree, indigenous to tropical Asia and Africa. A striking peculiarity is the manner in which the branches stretch out horizontally in whorls at right angles to the stem. Around the base of the tree are produced thin buttresses or flanges which sometimes extend for 30 feet or more from the base. The tree is deciduous in the dry season, January to April, the greenish white flowers being produced in clusters shortly after the leaves have dropped; the fruit pods which follow are ripe about three months later. The latter contain a quantity of silky cotton (kapok), and when ripe burst open and disperse their contents. The pods should therefore be collected before they are quite dry and then dried in the sun. Kapok

45554 to 45557—Continued.

is largely used for stuffing pillows and mattresses and for upholstering, etc., both in the countries where it is grown and in those to which it is exported. The largest supply comes from Java, where the trees are grown as a secondary product. The wood is used to some extent in interior construction, but it is soft, white, and brittle. The tree is readily propagated from seed or cuttings and thrives from sea level up to 2,000 feet. (Adapted from *Macmillan, Handbook of Tropical Gardening and Planting*, p. 518, and *Bailey, Standard Cyclopedia of Horticulture*, vol. 2, p. 700.)

45558 and 45559.

From Berkeley, Calif. Seeds presented by Mr. E. B. Babcock, Division of Genetics, Department of Agriculture, University of California. Received November 30, 1917. Quoted notes by Mr. Babcock.

45558. *AQUILEGIA TRACYI* × *CHRYSANTHA*. Ranunculaceæ. **Columbine.**

“Unguarded seed from F_1 hybrids between *Aquilegia tracyi* ♀ and *A. chrysantha* ♂. Cross made in 1915. Parents and F_1 plants now in plant-breeding garden of the Division of Genetics, Department of Agriculture, University of California. This seed may produce extremely variable offspring, some of which may be of greater ornamental value than either of the parents.”

45559. *DELPHINIUM CARDINALE* × (?). Ranunculaceæ. **Larkspur.**

“Unguarded seed from an F_1 hybrid between *Delphinium cardinale* [a red-flowered species from southern California] and a garden hybrid with deep-blue flowers. Cross made in 1915. F_1 plants now in plant-breeding garden of Division of Genetics, Department of Agriculture, University of California. This seed may produce extremely variable offspring, some of which may be of greater ornamental value than either of the parents.”

45560 to 45564. *PERSEA AMERICANA* Mill. Lauraceæ. **Avocado.**
(*P. gratissima* Gaertn. f.)

From Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer for the Department of Agriculture. Received November 24 to December 19, 1917. Quoted notes by Mr. Popenoe.

45560. “(No. 212. Avocado No. 26. City of Guatemala. November 13, 1917.) *Manik*. Bud wood of a productive and rather early variety of excellent quality. It is a medium-sized fruit of pleasing form and clear yellow flesh of unusually rich flavor.

“The parent tree is growing in the finca La Polvora, in Antigua. The altitude is about 5,100 feet. While it is growing among coffee bushes and grevilleas, the tree is not crowded and has developed to a large size. It stands about 50 feet high, with a rather slender trunk and a dense crown, the trunk being 2 feet thick at the base and branching about 8 feet from the ground. The age of the tree is probably 30 years or more. It is badly attacked by leaf-gall, but in general has the appearance of a strong, vigorous variety, the branchlets being well formed, long, round, and stout. The bud wood is good, having strongly developed eyes well placed for cutting.

“Antigua does not experience severe frosts; hence, it is impossible to determine in advance of a trial in the United States whether or not the variety is any hardier than the average of the Guatemalan race.

45560 to 45564—Continued.

"The flowering season is February and March. The tree blooms profusely and in some years sets enormous crops of fruit. In 1917 a very heavy crop was ripened. In general, the bearing habits of the tree give promise of being unusually good, there being a tendency for the fruits to develop in clusters. The season of ripening is properly from February to June, but fruits picked early in December develop fairly good flavor upon being ripened in the house. The season may be termed early to midseason.

"The fruit is more variable in form than that of most other varieties. The range is from oval to slender pyriform, nearly all the fruits being of the latter shape, without, however, a well-defined neck. The weight varies from 8 to 12 ounces. The surface is slightly rough and green in color. The skin is moderately thick, the flesh rich yellow, quite free from all fiber or discoloration, and of very rich and pleasant flavor. The seed is a trifle large in some specimens, small in others, being medium sized or rather small on the average. It is tight in the seed cavity.

"The variety may be formally described as follows:

"Form oval to elliptic-pyriform; size below medium to medium, weight $8\frac{1}{2}$ ounces to 12 ounces, length $3\frac{1}{4}$ to $4\frac{1}{4}$ inches, breadth $2\frac{1}{4}$ to $3\frac{1}{4}$ inches; base rounded to pointed, the stem inserted slightly to one side without depression; apex rounded to broadly pointed; surface sparsely pebbled, uniformly so, bright green in color, with comparatively few small yellowish dots; skin not very thick for this race, one-sixteenth of an inch near the stem and slightly more toward the apex of the fruit, hard and coarsely granular; flesh rich cream yellow in color, free from fiber and with no discoloration, firm and unusually dry, of rich and pleasant flavor; quality very good; seed ovoid-conical, medium sized, weighing 1 ounce more or less, tight in its cavity, with both seed coats adhering closely to the smooth cotyledons."

45561. "(No. 211. City of Guatemala. November 13, 1917.) *Kaguah*. Bud wood of avocado No. 33 from the finca La Polvora, in Antigua. A promising variety in appearance, but since ripe fruits were not tested it should be held for limited distribution in California and Florida.

"The parent tree is about 30 feet high, slender, the crown fairly dense but not broad. The trunk is 8 inches thick at the ground, branching at a height of about 15 feet. The crop this season is satisfactory, though not to be termed heavy. The growth seems to be vigorous and healthy, the branchlets being round and well formed, with the buds conveniently placed for cutting and of large size, indicating that the variety will probably be easy to propagate. The wood is not unusually brittle.

"The location of the tree is in the finca La Polvora, at Antigua, Guatemala. The altitude is about 5,100 feet. The tree stands among coffee bushes, but has room for good development.

"The fruit, judging from slightly immature specimens, will be about 24 ounces in weight, long and slender in form, with a thick neck. The surface is rough and is said to be deep green at maturity. The flesh shows no fiber nor discoloration, and its deep-yellow color indicates that it will be of good quality. The seed is medium sized and tight in the cavity. The season gives promise of being late."

45560 to 45564—Continued.

45562. "(No. 214. Avocado No. 34. November 20, 1917.) *Ishim*. Cuttings of a tree from the sitio of Ignacio Hernandez, at San Lorenzo del Cubo, near Antigua.

"While most avocados in the Antigua region do not ripen their fruits until February or March, this one matures its entire crop by the end of November. It can be considered, therefore, a very early variety, and as such is worthy of a trial in California, where early varieties of the Guatemalan race are needed. Its only visible defect is its somewhat large seed. The quality is good, and the fruit is attractive in appearance.

"The parent tree is growing in a small coffee plantation belonging to Ignacio Hernandez, situated on the hillside above San Lorenzo del Cubo, a village some 3 miles from Antigua. The altitude is about 5,500 feet. The tree is about 35 feet high, broad and spreading in habit, with a fairly dense crown 40 or 45 feet broad, slightly inclined to droop. The trunk is divided into two main branches, one about 1 foot thick at the base, the other 9 inches. The larger branch divides 8 feet from the ground into two main limbs. The growth seems to be reasonably vigorous and the branchlets are well formed and stout. The bud wood appears to be quite satisfactory.

"This location is not sufficiently high to experience cold weather, hence the variety must be assumed to be of average hardiness for the Guatemalan race until it can be given a trial in the United States.

"The productiveness of this variety is somewhat in doubt. The crop harvested in 1917 was not large. The tree bloomed heavily in December and was setting a good crop when last seen. The season of ripening extends from October to the first of December. Probably the fruits would remain on the tree later than December if given an opportunity to do so, but as avocados are very scarce at this season of the year they are picked as soon as mature.

"The form of the fruits, pear shaped to obovoid, is attractive, as is the deep maroon color which they assume upon ripening. They are of convenient size, about 12 ounces, and the flesh is yellow and of good quality. The seed is larger than in the best late varieties, but not unreasonably large. It is tight in the cavity.

"Following is a formal description of the fruit:

"Form most commonly pyriform, but sometimes obovate; size below medium to medium, weight 10 to 12½ ounces, length 4 to 5 inches, greatest breadth 2¾ to 3¼ inches; base narrow to rounded, the stem inserted obliquely almost without depression; apex rounded or obtusely pointed, somewhat flattened around the stigmatic point; surface almost smooth, sometimes pitted, deep dark maroon in color, with numerous small light-maroon dots; skin unusually thin for this race, slightly less than one-sixteenth of an inch, soft, tender, peeling fairly readily when the fruit is ripe, but leaving some purplish coloration on the flesh; flesh fine grained, buttery, cream yellow in color, with slight fiber discoloration in some specimens, but no actual fiber, the flavor moderately rich and nutty; quality good; seed large, broadly conical to nearly spherical in form, weighing 1½ to 2¼ ounces, tight in the seed cavity."

45563. "(No. 215. Avocado No. 35. November 20, 1917.) *Kanan*. From the sitio of Ignacio Gonzales, at San Lorenzo del Cubo, near Antigua.

45560 to 45564—Continued.

An early variety from the Antigua region, of rather large size, desirable form, and excellent quality. Although a round avocado, the seed is not large in proportion to the size of the fruit, but on the contrary is rather small. On the whole this seems a very promising variety.

"The parent tree is growing in a small coffee plantation belonging to Ignacio Gonzales, situated on the road to San Lorenzo del Cubo. The altitude is approximately 5,300 feet. The tree is about 35 feet high, with a trunk 30 inches thick at the base, dividing 2 feet above the ground to form two main limbs each 1 foot in diameter. These give off their first branches about 12 feet from the ground. The bud wood is excellent, the branchlets being stout and well formed, with vigorous buds conveniently placed.

"The tree did not produce a heavy crop from the 1916-17 blooms, but is said to have borne heavily in past seasons. It flowers in December and January and commences to mature its fruits the first of the following December. They are not at their best until January.

"The climate of this location is not sufficiently cold to test the hardiness of the variety; hence, it must be assumed, pending a trial in the United States, that it is of about average hardiness for the Guatemalan race.

"In form the fruit resembles the Trapp, of Florida, being round to oblate. It also resembles the Trapp in size and color, but the surface is somewhat rough and the skin thick and hard. The flesh is cream yellow, free from discoloration, and of a rich and pleasant flavor. The seed is small and tight in the cavity.

"The variety may be formally described as follows:

"Form nearly spherical, varying to slightly oblate and more rarely to broadly obovoid; size above medium to very large, weight 16 to 20 ounces, length $3\frac{1}{2}$ to $4\frac{1}{2}$ inches, greatest breadth $3\frac{1}{2}$ to 4 inches; base rounded, the stem inserted very slightly to one side and almost without depression; apex flattened; surface pebbled, bright green in color with a few large yellowish dots; skin moderately thick, nearly one-eighth of an inch, coarsely granular, woody, and brittle; flesh cream color, greenish close to the skin, free from fiber or discoloration, of rich and pleasant flavor; quality very good; seed rather small, weighing about 2 ounces, oblate in form, tight in the cavity, with both seed coats adhering closely to the smooth cotyledons."

45564. "(No. 223. Avocado No. 36. December 10, 1917.) *Chabil*. A small, early variety of attractive appearance, desirable form, and excellent quality. It is similar to No. 6 [S. P. I. No. 43560] and is from the same region.

"The parent tree is growing in a small coffee plantation belonging to Ignacio Hernandez, situated on the hillside above San Lorenzo del Cubo, about 3 miles from Antigua. The altitude is approximately 5,500 feet. The tree is 45 feet high, the crown round, of good form, 45 feet broad, formed high above the ground. The trunk is 2 feet thick at the base, and the branches are 15 feet above the ground. The age of the tree is not known.

"The altitude of this location is not sufficient to show whether the variety is unusually hardy or not. It may be assumed to be of average hardiness for the Guatemalan race until it has been tested in the United States.

45560 to 45564—Continued.

"The crop ripened at the end of 1917 was a very large one, indicating that the productiveness of the variety is likely to prove satisfactory. The flowering season appears to be December and January, the fruiting season November to March.

"The fruit is round, weighs about 9 ounces, and is deep purple when fully ripe. The skin is thick and woody. The flesh is yellow. The seed is rather small for a round fruit, and is tight in the cavity.

"Following is a formal description of the variety:

"Form spherical or nearly so, usually slightly oblique; size below medium, weight averaging 9 ounces, length $3\frac{1}{2}$ inches, greatest breadth $3\frac{3}{8}$ inches; base slightly flattened, the stem inserted somewhat obliquely without depression; apex obliquely flattened, but not prominently so; surface practically smooth, deep dull purple in color when fully ripe, with scattering large yellowish dots; skin thick, sometimes more than one-eighth of an inch, very coarsely granular, hard and woody, rather unusually so; flesh rich cream yellow in color, with a few fine and almost unobjectionable fibers running through it, flavor rich and nutty; quality good; seed medium sized, averaging about $1\frac{1}{2}$ ounces in weight, oblate in form, tight in the cavity, with both seed coats adhering closely to the smooth cotyledons."

45565 to 45567.

From Paris, France. Presented by Vilmorin-Andrieux & Co. Received November 30, 1917.

45565. AVENA SATIVA L. Poaceæ.

Oats.

"*Hybride noir très hâtive* [very early black hybrid]. This variety was obtained about 10 years ago at the experimental farm at Verrieres by crossing the *Australia* and *Joanette* varieties. It has been carefully selected and has proved itself to be a well-fixed variety which is vigorous, tillers well, and attains a height of 4 to 5 feet, according to cultural conditions. The panicle is well filled and perfectly continuous, and the spikelets contain two and often three beautiful, black, full, faintly awned grains.

"In our comparative studies this variety has constantly ripened 8 or 10 days in advance of the earliest, established varieties, giving a greater yield. Sown the first of March it heads early in June, and ripens about the 20th of July. In brief, it is highly profitable, uniting the best qualities—extreme earliness, abundant production, and resistance to rust and to shattering." (*Vilmorin-Andrieux & Co.*)

45566 and 45567. TRITICUM AESTIVUM L. Poaceæ.

Wheat.

(*T. vulgare* Vill.)

45566. "*Aurore*. The earliest and most productive of spring wheats.

May be sown up to the 15th or 25th of March. The spike is pale reddish, and the grain is large and reddish." (*Vilmorin-Andrieux & Co.*)

45567. "*Hybride des Allies*." This is a variety of wheat which was being planted in France to help relieve the food situation during the war. The following is an extract from a letter sent to the United States Department of Agriculture by M. Louis de Vilmorin: "We have been trying to help the farmers on this side with our new wheat '*Blé des Allies*,' which is on its way to prove itself a

45565 to 45567—Continued.

very valuable asset as a spring as well as a fall wheat. It can be sown under our climate until the end of March, and its earliness and heavy yield recommend it for war-time cultivation."

45568. ALBIZZIA WELWITSCHII Oliver. Mimosaceæ.

From Loanda, Angola, Africa. Seeds presented by Mr. John Gossweiler, Servicos de Agricultura. Received December 3, 1917.

Tree of 40 to 50, occasionally 80, feet in height, with a spreading truncate crown. The flowers are yellowish green or from whitish to pale straw color, and the silky puberulous petals and sepals are almost entirely united. The tawny puberulous peduncles are 1 to 2 inches in length, and proceed from the upper axils, or form short leafless terminal corymbs, sometimes scarcely overtopped by the leaves. The wood is durable, very light, and rather smooth. Reported from Upper Guinea, Lower Guinea, and Nile Land. (Adapted from *Oliver, Flora of Tropical Africa, vol. 2, p. 362*, and *Horn, Catalogue of Welwitsch's African Plants, pt. 1, p. 317*.)

45569 to 45571.

From Manila, Philippine Islands. Presented by Mr. Adn. Hernandez, Director of Agriculture. Received December 4, 1917.

45569 and 45570. LILIUM PHILIPPINENSE Baker. Liliaceæ.**Benguet lily.**

"This new white trumpet lily seems destined to become of very great value to both private and commercial growers. The short time necessary to flower it after potting surprises all who are growing it for the first time. We found last year that it was all the introducers claimed for it, and from a batch of small bulbs potted September 8 we cut flowers December 3 this year. These bulbs were grown in a coldframe for nearly half that period, or they would have flowered earlier.

"The long, pure-white, sweet-scented flowers arrange beautifully in vases. The stems are sufficiently strong, without being too rigid, as is the case with other forcing *Liliums*, and the foliage is so much more graceful than that of other lilies that any flower lover would not hesitate a moment which variety to select when both were purchasable. For floral designs this lily is superior to any other white variety, and we fully expect it will in a few years be as much a market necessity as *Lilium harrisii* and *L. longiflorum* now are. Six or seven bulbs may be grown in a 6-inch pot or pan, and a dozen or more in an 8-inch pan for a good effect." (*Florist's Review, December 13, 1917*.)

45569. "Seeds."

45570. "Bulbs."

45571. ANNONA CHERIMOLA × SQUAMOSA. Annonaceæ.**Atemoya.**

"Bud sticks of No. 12." This cross has produced a hybrid, the fruit of which is small and weighs on an average 175 grams, with a length of 65 millimeters and a transverse diameter of 60 millimeters. The shape of the fruit is cordiform, regular, and the carpels end in a more or less pointed protuberance. The surface is green with reddish dots on the sun-exposed side and covered by a white bloom. The skin is quite thick and tough. The pulp is white, juicy, sweet, faintly aromatic, and devoid of the cherimoya flavor, but it is of good quality. (Adapted from *Wester, Philippine Agricultural Review, third quarter, 1915*.)

45572. PENNISETUM PURPUREUM Schum. Poaceæ. Napier grass.

From Rhodesia. Seeds presented by Mr. J. Burt Davy, Johannesburg, Union of South Africa. Received December 5, 1917.

"The great value of prolific and drought-resistant fodder plants, which are generally very difficult to procure, is well known to stock owners, and this species, which is but little known as yet, can be most highly recommended for both of these qualities. During the last season, which was very dry and most disastrous for stock, this grass grew to a height of nearly 11 feet and produced a large quantity of succulent, nutritious, and fattening fodder. This is greatly relished by the stock and is, according to analysis, much richer than green maize. A reliable official says: 'There is a consensus of opinion that in this plant we have found a fodder of great value and one which remains green even during such long periods as from six to eight months when other herbage is parched up or destroyed.' It grows rapidly to the height of 12 feet or more in favorable weather, thrives well in various soils, and resists both frost and drought to a remarkable extent. At a height of 7 feet it has produced 12 tons of green fodder per acre, and a few months later 15 tons, making a total yield of 27 tons per acre. It is everlasting when once established, and the tufts or stools increase in size after each cutting or when grazed off. It should prove of untold value to farmers in South Africa, who suffer much loss through frequent and protracted droughts, and in the East Indies and other countries where light rainfall and semiarid conditions obtain. As a prolific and drought-resistant plant it promises to prove one of the very best brought into cultivation." (*B. Harrison.*)

See S. P. I. No. 43241 for previous introduction.

45573. ARALIA CHINENSIS MANDSHURICA (Rupr.) Rehder. Araliaceæ.

From Jamaica Plain, Mass. Plants presented by the Arnold Arboretum. Received December 5, 1917.

This is a small hardy tree from Japan, resembling *Aralia spinosa* (Hercules'-club), but it is more treelike, has fewer spines, and does not sucker, which makes it a much more desirable lawn tree. It does not form many branches, but the large bipinnate leaves cast a good shade. The greenish white flowers are borne in large panicles. The berries are dark red when ripe, producing a very pleasing effect. Like all other aralias, *A. mandshurica* grows freely from pieces of root. (Adapted from *The Florists' Exchange, November 6, 1915.*)

45574. MEDICAGO SATIVA L. Fabaceæ. Alfalfa.

From Novelda, Alicante, Spain. Seeds presented by Mr. Elias Rizo. Received December 11, 1917.

45575 to 45578.

From the city of Guatemala, Guatemala. Seeds collected by Mr. Wilson Popenoe, Agricultural Explorer for the Department of Agriculture. Received December 15, 1917. Quoted notes by Mr. Popenoe.

45575. CRATAEGUS STIPULOSA (H. B. K.) Steud. Malaceæ. Manzanilla.

"(No. 216a. November 20, 1917.) A native species of *Crataegus*, well known in the Guatemalan highlands where it occurs both wild and cultivated. Seed previously sent in under No. 32a (S. P. I. No. 43430).

"The manzanilla is a large shrub or small, erect, slender tree about 20 feet tall, sometimes having a thick trunk a foot or more in diameter at

45575 to 45578—Continued.

the base, but never developing to a great height. In spring it produces white flowers resembling apple blossoms. In early fall, commencing about October, the fruits ripen, and from this month are abundant in all the markets until after Christmas. They are much used for decorative purposes, after being strung on long threads. They are eaten in several ways, principally stewed and in the form of jelly. For stewing they are first boiled with wood ashes, after which the skin is easily removed; they are then placed in hot sirup and boiled for a short time. Their flavor somewhat suggests that of the apple and is very pleasant.

"The fruits look like small apples, being nearly spherical, yellow with russet dots and a blushed cheek, and having a slender stem. The largest ones are 1½ inches in diameter. The ordinary size is about 1 inch. The thin skin surrounds a rather dry, yellowish, mealy pulp and three large seeds. The plant is easily grown and should succeed in California and Florida."

45576. ANNONA CHERIMOLA Mill. Annonaceæ. **Cherimoya.**

"(No. 217a. November 22, 1917.) Seeds from exceptionally fine cherimoyas, the largest ones weighing more than 4 pounds. These were purchased at the market in the city of Guatemala. It seems worth while to grow these seeds and bring the trees into fruit, in the hope that choice varieties may be obtained. They should be tested in southern California."

45577. BURSERIA sp. Balsameaceæ. **Copal.**

"(No. 218a. November 22, 1917.) One of several species which furnish the copal gum so extensively used in Guatemala as incense. The burning of this incense in religious ceremonies is a custom which has come down from the earliest times and is still practiced, mainly by the Indians. The gum is obtained by making incisions in the bark of the tree, which is rather small in size and is common in the highlands, both wild and cultivated."

45578. DAHLIA POPOVII Safford. Asteraceæ. **Dahlia.**

"(219a. November 22, 1917.) Collected near Santa Maria de Jesus, Department of Sacatepequez, at an altitude of about 6,800 feet.

"This species is common in the region around the city of Guatemala and as far north as the Chuacus Mountains. It has been seen as high as 7,000 feet and as low as 5,000, but is most common between 6,000 and 6,500, frequently in open places along the roadsides and ravines. The plant grows about 4 feet high. It flowers abundantly during September and October, the flowers being 2 to 3 inches broad, with 8-ray florets. The latter are all infertile, long and slender in form, and orange-brown to crimson in color. This species is of interest to those engaged in breeding or studying the cultivated dahlias. Mr. W. E. Safford considers it the probable ancestor of the cultivated cactus dahlias."

45579. PSIDIUM FRIEDRICHSTHALIANUM (Berg) Niedenzu. Myrtaceæ. **Costa Rican guava.**

From Matania el Saff, Egypt. Seeds presented by Mr. Alfred Bircher, Middle Egypt Botanic Station. Received December 18, 1917.

"This is a very sour but very aromatic guava which might be used in addition to other fruits. It is medium sized, yellow, with yellow flesh. The glossy

red-stalked leaves are in two rows on the pendulous twigs. This tree is a shy bearer in Egypt, probably on account of the heat and the dry air." (*Bircher*.)

45580. PERSEA AMERICANA Mill. Lauraceæ. Avocado.
(*P. gratissima* Gaertn. f.)

From the city of Guatemala, Guatemala. Seeds collected by Mr. Wilson Popenoe, Agricultural Explorer for the Department of Agriculture. Received December 19, 1917.

Avocado seeds introduced for stock purposes.

45581. IRIS ORIENTALIS Mill. Iridaceæ. Iris.
(*I. ochroleuca* L.)

From Bellingham, Wash. Bulbs presented by Mr. C. T. Canfield. Received December 20, 1917.

"A species from high table-lands of Turkestan. I admire it more for foliage effect. It delights in stiff clay loam." (*Canfield*.)

One of the largest of the irises. The plants grow in strong clumps; the leaves are 2 to 3 feet long, 1 inch or more broad, and slightly glaucous. The stem is 3 feet tall, stout, terete, about as long as the leaves, with two to three spicate clusters of flowers, the outer segments of which are obovate, 1 inch broad, as long as the claw, yellow, paler or white toward the margin, and the inner segments oblong, 1 inch broad, lemon yellow to whitish. It grows in almost any situation. Native to Asia Minor and Syria. (Adapted from *Bailey, Standard Cyclopaedia of Horticulture, vol. 3, p. 1678.*)

Received as *Iris gigantea*.

45582 and 45583.

From Madrid, Spain. Seeds presented by the director of the Botanic Garden. Received December 11, 1917.

45582. CONVULVULUS SCAMMONIA L. Convolvulaceæ. Scammony.

The plant has a large, tapering, fleshy root, 3 to 4 feet long, 9 to 12 inches in circumference, and abounding in a milky juice. It is this juice, in a concentrated form, which constitutes the drug called scammony. In its medicinal action scammony is a violent purgative and is therefore seldom used except along with other cathartics, by which its action is mitigated and theirs promoted. Native to Syria and the Levant. (Adapted from *Hogg, Vegetable Kingdom, p. 536.*)

45583. PARIETARIA OFFICINALIS L. Urticaceæ.

A bushy plant from 12 to 18 inches high, with reddish brittle stems, oblong-ovate dull-green leaves, and tufts of small greenish flowers in the axils of the upper leaves. It is sometimes used as a potherb. While the ashes of the plant are said to contain a quantity of niter, its medicinal properties are almost negligible. The proportion of potassium nitrate which it contains is really too inconsiderable to enter seriously into account; nevertheless, it passes for an emollient and diuretic and as such has sometimes been prescribed in diseases in which inflammation is to be reduced. (Adapted from *Lindley, Treasury of Botany, p. 846; National Standard Dispensatory, p. 1613; and Heraud, Dictionnaire des Plantes Medicinales, p. 458.*)

45584. LILIUM sp. Liliaceæ.**Lily.**

From Soochow, China. Seeds presented by Prof. N. Gist Gee, Soochow University. Received December 12, 1917.

Introduced for bulb-culture experiments by Department of Agriculture officials.

45585. VITIS VINIFERA L. Vitaceæ.**Grape.**

From Algiers, Algeria. Seeds presented by Dr. L. Trabut. Received December 18, 1917.

A hybrid between the *Cabernet* and *Cot* varieties of the common European grape, produced at the Botanical Station at Algiers.

45586 and 45587.

From Kingmen, Hupeh Province, China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for the Department of Agriculture. Received November 16, 1917. Quoted notes by Mr. Meyer.

45586. PYRUS CALLERYANA Decaisne. Malaceæ.**Pear.**

"(No. 2446a. September 1 to 8, 1917.) About 20 pounds of seeds of a cultivated variety of Chinese pear, called *Chia tang li* (domestic crab-apple pear). This variety exists in several forms, ranging in size from that of a cherry to a small-sized hen's egg; in shape from flattened globular to pyriform; in color from greenish yellow to russet brown; in taste from somewhat astringent sour to mealy sweet, while some have a decided *Sorbus* afterflavor. They are all covered with a multitude of small specks and have a deciduous calyx. The trees are very productive, some branches breaking under the load of small fruits which occur singly, in pairs, and in bunches of three to six.

"They are almost all perpetuated by grafting upon the wild *Calleryana* pear which occurs along edges of rice fields. It is said that seedlings from this domestic *Calleryana* pear are not as vigorous and not as well suited for stock purposes as the real wild type. This, however, will have to be confirmed by actual experiment, as will its resistance to blight.

"Some groves of these pears should be planted for seed-bearing purposes in localities where no late spring frosts occur. All seedlings raised should be inoculated, to weed out possible nonimmune types."

45587. PTEROCARYA STENOPTERA DC. Juglandaceæ.

"(No. 2447a. September 5, 1917.) An ornamental tree, belonging to the walnut family, growing to a large size. The foliage is pinnate and of fresh green color. In early spring, before the leaves are out, the trees are loaded with long greenish brown, staminate catkins which give them a festive appearance; these are followed by racemes of small winged fruits which persist on the trees until September. The young foliage is covered with small yellow-brown glands and when rubbed smells like sour apples.

"The trees love moist situations, especially near running water and in porous soil; however, they also thrive on dry fields, but do not grow so fast nor so large as when near water. It is one of the best flowering trees in the foreign concessions at Hankow and Shanghai, and is called by foreigners the Chinese ash on account of its resemblance to a *Frax-*

45586 and 45587—Continued.

inus. Chinese name *Ma liu shu* (fiber willow tree), often abbreviated to *liu shu*.

“This is a very promising shade tree for streets, parks, and gardens in those sections of the United States where the summers are moist and warm and the winters but moderately cold. It does well where rice and cotton mature fully and where the large-leaved privet (*Ligustrum lucidum*) and the tea olive (*Osmanthus fragrans*) remain out of doors the year round.”

45588. ACTINIDIA CHINENSIS Planch. Dilleniaceæ. **Yang-tao.**

From Kuling, Kiangsi, China. Seeds presented by Rev. John Berkin. Received December 13, 1917.

The *yang-tao*, as this deciduous climber is known in Szechwan Province where it is native, has attracted considerable attention from travelers and missionaries in China, because of the high quality of its fruits and the ornamental value of the plant. Single plants often grow 30 feet in length, so that the vine will cover large areas of trellis. The leaves have a plushlike texture and an unusual dark-green color. The young shoots are bright pink and villous pubescent. The size and regular spacing of the leaves make this climber valuable where large areas of foliage are desired. The flowers are buff yellow to white, fragrant, and of large size, being from 1 to 1½ inches in diameter. The abundance of these flowers adds greatly to the beauty of this plant and enhances its value as an ornamental.

Fruits abundantly produced, ovoid to globose, 1 to 2½ inches long, 1 to 1¼ inches across; epicarp membranous, russet brown, more or less clothed with villous hairs. Flesh green, of most excellent flavor, to my palate akin to that of the gooseberry, but tempered with a flavor peculiarly its own.

The fruit is excellent when fresh and also makes very fine jam and sauce. Full information is lacking in regard to the fruit grown outside of China; some fruits received from California, however, bear out the high praise given the fruit by travelers. While this plant is not hardy in regions of severe winters, the rapid growth in the spring will make it a valuable ornamental, even in those regions where it is killed to the ground each winter. (Adapted from Fairchild, *Some Asiatic Actinidias*, Bureau of Plant Industry Circular No. 110, *Miscellaneous Papers*.)

45589 to 45591. LIVISTONA spp. Phœnicaceæ. **Palm.**

From Buitenzorg, Java. Seeds presented by the director of the Botanic Garden. Received November 30, 1917.

45589. LIVISTONA SUBGLOBOSA (Hassk.) Mart.

This palm differs from *Livistona olivaeformis* in its longer, more graceful rachis and less deeply cut lacinations of the leaves. The fruits are solitary or in twos or threes, subglobose, blackish violet. (Adapted from Hasskarl, *Tijdschrift voor Natuurlijke Geschiedenis en Physiologie*, vol. 9, p. 177.)

45590. LIVISTONA ALTISSIMA Zoll.

A palm with graceful trunk two-thirds of a foot in diameter and 80 feet or more tall, with globose fruits about the size of small cherries. The natives value the exceedingly hard wood very highly and use it especially for rafters, which last for three generations. (Adapted from Zollinger, *Natuurkundig Tijdschrift voor Nederlandsch Indië*, vol. 14, p. 150.)

45589 to 45591—Continued.

"An East Indian palm 20 to 30 feet in height, with a thick, round crown, commonly met with throughout Assam, but most plentiful in the Nowgong District. The leaves are in universal use throughout Assam for covering the tops of doolees (palanquins) and the roofs of boats, also for making the peculiar umbrella hats (jhapees) of the Assamese. For all these purposes the leaves are admirably adapted by their lightness, toughness, and durability. The leaves are similarly employed by the Lepchas for thatching and umbrellas." (Watt, *Dictionary of the Economic Products of India*, p. 86.)

45592 and 45593.

From Kingmen, Hupeh Province, China. Seeds collected by Mr. Frank N. Meyer, Agricultural Explorer for the Department of Agriculture. Received December 19, 1917. Quoted notes by Mr. Meyer.

45592. *PYRUS CALLERYANA* Decaisne. Malaceæ.

Pear.

"(No. 2453a. October, 1917.) Over 100 pounds of seed of a small-fruited wild pear which has proved to be highly resistant but not totally immune to fire-blight in the inoculation experiments of Prof. F. C. Reimer, at Talent, Oreg. This pear grows in a variety of habitats, as at edges of ponds, in dense thickets, on rocky mountain slopes, in crevices, etc. It is used by the Chinese as a stock for improved pears and seems to make a good union. When left alone it grows into a large tree, reaching an old age. Where this pear occurs around Kingmen, *Pyrus betulae-folia* also is found, and since the latter resembles *P. calleryana* to a striking degree, it is impossible when collecting a large number of fruits to keep out the first entirely. A certain percentage of seed of this pear therefore is mixed with the true *P. calleryana* pear.

"As *P. betulae-folia* is highly susceptible to blight, roguing in the seed beds or nursery plantings should be carefully done.

"To insure pure seeds for future stock purposes, groves should be set out here and there away from other species and varieties of pears, so as to minimize hybridization, and in localities where spring frosts are of rare occurrence.

"Where *Pyrus calleryana* occurs wild, one finds it associated with *Ligustrum lucidum*, *L. quihoui*, *Pistacia chinensis*, *Xylosma racemosum*, *Celtis sinensis*, *Ulmus parvifolia*, *Ziziphus jujuba*, *Pinus massoniana*, *Vitex negundo*, *Cudrania tricuspidata*, *Phyllostachys* sp., *Poncirus trifoliata*, *Zanthoxylum alatum*, etc. In gardens with it one finds cultivated *Citrus ichangensis*, *C. grandis*, *C. nobilis*, *Osmanthus fragrans*, *Meratia praecox*, *Prunus pseudo-cerasus*, *Hovenia dulcis*, *Eriobotrya japonica*, *Paulownia tomentosa*, and others.

"The fruits of *Pyrus calleryana* when ripe become soft and assume a brown color, while those of *P. betulae-folia* also become soft but turn quite black. When not soft, however, the fruits of the two species can not be separated when once mixed unless there are leaves attached to them. Chinese name *Yeh T'ang li* (wild crab-apple pear)."

45593. *PISTACIA CHINENSIS* Bunge. Anacardiaceæ. **Chinese pistache.**

"(No. 2454a. October, 1917.) Over 200 pounds of seeds of the Chinese pistache, a very promising shade tree for those sections of the

45592 and 45593—Continued.

United States where the summers are warm and the winters but moderately cold. The young leaves are carmine red and the fall foliage gorgeously scarlet and yellow. The wood, which is very heavy and not often attacked by insects, is employed in the manufacture of furniture. From the seeds an oil is obtained which is used for illuminating purposes. The young expanded foliage buds are sparingly eaten boiled, like spinach. The staminate trees invariably grow larger and more symmetrical than the ones that bear the pistillate flowers. Chinese name *Huang lien shu.*"

45594 and 45595.

From Chi Kung Shan, Honan Province, China. Seeds collected by Mr. G. D. Schlosser and sent by Mr. Frank N. Meyer, Agricultural Explorer for the Department of Agriculture. Received December 19, 1917.

45594. PYRUS CALLERYANA Decaisne. Malaceæ. Pear.

For description, see S. P. I. No. 45592.

45595. AMYGDALUS PERSICA L. Amygdalaceæ. Peach.
(*Prunus persica* Stokes.)

Seed of wild Chinese peaches introduced for experimental purposes.

45596 and 45597. LITCHI CHINENSIS Sonner. Sapindaceæ.

(*Nephelium litchi* Cambess.)

Lychee.

From Canton, China. Purchased from Mr. C. O. Levine, Agricultural Department, Canton Christian College. Received December 19, 1917.

45596. Variety *Hak ip* (black leaf).

45597. Variety *Kwai mi*.

45598 to 45604.

From the British West Indies. Seeds presented by Dr. O. L. Fassig, Weather Bureau, United States Department of Agriculture. Received October 15, 1917.

45598. ORYZA SATIVA L. Poaceæ. Rice.

From St. Lucia.

45599. CARICA PAPAYA L. Papayaceæ. Papaya.

From St. Lucia.

45600 and 45601. GOSSYPIUM BARBADENSE L. Malvaceæ. Cotton.

45600. Sea Island cotton from the experimental station at King's Mount, St. Croix, developed by Dr. Longfield Smith, director, who presented this seed to Dr. Fassig.

45601. *Anna's Hope No. 1.* Variety of Sea Island cotton developed at the experimental station at King's Mount, St. Croix, by Dr. Smith, who presented this seed to Dr. Fassig.

45602. PHASEOLUS VULGARIS L. Fabaceæ. Common bean.

(Trinidad, British West Indies, July 31, 1917.) Seeds presented to Dr. Fassig by Mr. J. B. Rorer.

"A very nice salad bean which is commonly grown here and known as the 'Seheult' bean. It is a climber and is very prolific." (Rorer.)

45598 to 45604—Continued.**45603 and 45604. RHEEDIA LATERIFLORA L. Clusiaceæ.**

(Trinidad, British West Indies, July 31, 1917. Seed presented to Dr. Fassig by Mr. J. B. Rorer.)

"The hatstand tree is a name which is said to be given to *Rheedia lateriflora*. It is common in the woods of Trinidad and is noted for its regular branching character when young. A small tree of 8 or 10 feet will often have as many as 20 or more branches of even size thrown out at regular and close intervals, at an angle of 45 degrees from the main stem. It is frequently cut, placed in a heavy base, and used as a hatstand; and when shortened into a pyramidal form and nicely trimmed and polished, it serves exceedingly well for the purpose." (*J. R. Jackson, The Garden, July 25, 1903.*)

45605. POLYGONUM TINCTORIUM Lour. Polygonaceæ.

From China. Seeds collected by Mr. Frank N. Meyer, Agricultural Explorer for the Department of Agriculture. Received October 6, 1917.

"(No. 2443a. Hankow, China. June 14, 1917.) An annual herb, much cultivated throughout northern and central China for the blue dye it produces, which, however, fades easily. It is sown on rich lands toward the end of February, and the first cutting is made during June, and a much smaller one during August. Farther north the sowing takes place later and but one cutting can be obtained. To procure the dye material the plants are deposited in plastered pits, water is poured over them, and they are allowed to decay for several weeks; then the stems are taken out and the water is allowed to evaporate. When at last the slimy mass in the pit has become sufficiently dry, quicklime is added and thoroughly mixed, and the material is allowed to dry out until it can be well worked. It is then taken out and kept in tubs, barrels, and other vessels until needed for dyeing. The freshly dyed cloth possesses a most unpleasant odor which can often be detected for a considerable distance. Gradually, however, the wind takes away the odor and the cloth can then be made into garments. The dye seems to be used almost exclusively for the dyeing of coarse cotton cloth. Chinese name of the plant *Liao lan*." (*Meyer.*)

45606. PYRUS BETULAEFOLIA Bunge. Malaceæ. Pear.

From Jamaica Plain, Mass. Seeds presented by the Arnold Arboretum. Received November 28, 1917.

A slender, quick-growing, graceful tree, 20 to 30 feet high, with gray-felted young branches and round-ovate, long-pointed, coarsely toothed, lustrous leaves. The white flowers, three-fourths of an inch across, are borne in clusters of 8 to 10 and are followed by grayish brown, white-dotted fruits the size of peas. The Chinese use this species as a stock for the larger fruited pears. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 279.*)

45607. SMILAX sp. Smilacaceæ. Sarsaparilla.

From Kingston, Jamaica. Roots presented by Mr. W. Harris, Hope Gardens, Department of Agriculture. Received December 20, 1917.

This plant is used in Jamaica as a source of the sarsaparilla of commerce.

45608 and 45609.

From Cienfuegos, Cuba. Seeds presented by Mr. R. M. Gray, Harvard Experiment Station. Received December 18, 1917.

45608. CAMOENSIA MAXIMA Welw. Fabaceæ.

This vine, which adorns the tops of lofty trees in tropical Africa, bears probably the largest and most beautiful flowers of any plant in the world. These deliciously fragrant flowers, sometimes 8 inches in length, have petals of pure white margined with gold which becomes darker with age; they are borne in pendulous clusters of nearly a dozen individuals. The 3 to 4 seeded pod is 6 to 8 inches long, nearly straight, and clothed with ferruginous woolly tomentum. The leaves are digitately trifoliolate, the leaflets obovate-oblong, 5 to 6 inches long. One drawback to the cultivation of this plant is that it has been so extremely slow in coming into bloom, blooming only in hothouses of considerable size. Regarding the possibilities of this plant in the United States, Mr. George W. Oliver states: "Very likely this plant will flower oftener and more profusely in this country than in Europe, particularly England, because of our higher summer temperature, which enables the plant to grow rapidly and ripen its wood." (Adapted from *The Garden Magazine*, vol. 7, p. 229, and *Oliver, Flora of Tropical Africa*, vol. 2, p. 252.)

45609. GOSSYPIUM BARBADENSE L. Malvaceæ.

Cotton.

"Native tree cotton, called purple cotton by the natives." (*Gray.*)

45610. CHENOPODIUM AMBROSIOIDES L. Chenopodiaceæ.

From Bahia, Brazil. Seeds procured by Mr. Edward Higgins, American consul at Bahia. Received December 20, 1917.

Known in Brazil as *herba de Santa Maria* or *Mastruz*. A viscid glandular, rankly smelling perennial herb, native to tropical America, but widely naturalized and growing abundantly in North America, especially in the eastern United States, as a coarse weed of the roadside and waste places. Its medicinal importance is due to the volatile oil which it contains. A very active anthelmintic is obtained when the bruised fruit or the expressed juice of the plant is used. It is frequently employed for the expulsion of lumbricoid worms, especially in children. (Adapted from *The National Standard Dispensatory*, p. 402.)

45611. SACCHARUM OFFICINARUM L. Poaceæ.

Sugar cane.

From Trinidad, British West Indies. Seeds presented by the St. Clair Experiment Station, Department of Agriculture. Received December 21, 1917.

"*Louisiana 511*. One of the sugar-cane seedlings tested in 1908 at the Louisiana Sugar Experiment Station at Audubon Park, New Orleans; it is particularly noteworthy because of the unusually high sucrose content (16.3 per cent) for Louisiana conditions. The parent cane was *Trinidad 189*." (*H. P. Agee, Louisiana Bulletin No. 127, May, 1911.*)

45612. PYRUS MAMORENSIS Trabut. *Malaceæ.* **Pear.**

From Rabat, Morocco. Seeds presented by Commandant de Beaucondrey, Inspector of Forests, at the request of Dr. L. Trabut, Algiers, Algeria. Received December 22, 1917.

"Seeds of a Moroccan pear which occurs with the cork oak in the forest of Moroccan Mamora. It is very resistant to dryness in the sandy noncalcareous soils. The vigorous tree will probably form a good stock. The fruit is rather large, and the seeds are very large." (*Trabut.*)

45613 and 45614. PASSIFLORA spp. *Passifloraceæ.* **Granadilla.**

From Caracas, Venezuela. Seeds presented by Mr. H. Pittier. Received December 26, 1917.

45613. PASSIFLORA sp.

Possibly a hybrid between *Passiflora edulis* and *P. maliformis*, as the seeds do not agree with either, although somewhat resembling each.

45614. PASSIFLORA LIGULARIS Juss. **Sweet granadilla.**

"Unquestionably one of the best of the granadillas. In Guatemala it is common at altitudes of 4,000 to 7,000 feet, but I have never seen it in the lowlands; it appears, therefore, that it is adapted to subtropical climates and, judging from its presence in portions of Guatemala almost too cold for the avocado, I feel that it ought to succeed in California. The behavior of other species, such as *Passiflora edulis*, in that State indicates that conditions in general are favorable to the passifloras, and the question has generally been one of hardness. Many species tested in California have proved to be too tender. *P. ligularis*, with slight protection during the first winter or two, certainly ought to thrive in the southern half of the State.

"In Guatemala it is a rampant climber, scrambling over trees and buildings and covering them with a canopy of green. It goes to the tops of trees 35 or 40 feet in height. Its foliage is bold, the large cordate leaves being as much as 6 or 8 inches in length.

"The ripening season commences in early fall and extends through the winter. Large plants bear abundantly, yet I have never seen a vine so laden with fruits as some of the plants of *Passiflora edulis* which grow in California gardens. The fruits are commonly 2½ inches in length and deep orange-yellow in color. Sometimes a purple-fruited variety is seen. The brittle outer shell or pericarp, when broken away at one end, exposes the small elliptic seeds individually inclosed in a juicy, white aril. The aroma of the fruit is delightful; it may properly be termed perfumed. The flavor is equally pleasant and, unlike many other passifloras, is not unduly acid. The fruit is commonly eaten out of hand, for which mode of use it seems best adapted. One can consume a large number of them without any ill effects.

"The fruits are often brought into the markets of Guatemala upon the backs of Indians from distances of a hundred miles. The pericarp is so tough that it is not easily bruised, hence the fruit can be transported without difficulty. It is attractive in appearance and so popular in Guatemala that it realizes higher prices in the markets than most other fruits which compete with it.

"The term granadilla (diminutive of granada, Spanish for pomegranate) is applied in tropical America to the fruits of various passi-

45613 and 45614—Continued.

floras. It is an attractive name, and it seems desirable to retain it; but an additional word is necessary to distinguish between the various species. The one under consideration might well be called the sweet granadilla." (*Wilson Popenoe.*)

For an illustration of a granadilla fruit, see Plate IV.

45615 and 45616.

From Manila, Philippine Islands. Seeds presented by Mr. Adn, Hernandez, Director of Agriculture. Received December 26, 1917.

45615. PHASEOLUS LUNATUS L. Fabaceæ.

Lima bean.

Patani. "A perennial twining vine of vigorous growth, commonly cultivated as an annual, of wide distribution, and in general cultivation; grown on a trellis, arbor, or bamboo poles for support. Indigenous to tropical America. There are at least seven distinct 'native' forms, of which the white-seeded varieties are the best for culinary uses; the colored or variegated beans should be boiled and the water changed two or three times to render them wholesome." (*Wester, Food Plants of the Philippines, p. 176.*)

45616. LANSIUM DOMESTICUM Jack. Meliaceæ.

Langsat.

"This, like the mangosteen, is a delicious oriental fruit not yet well established in America. While it is not so famous as the mangosteen, it is highly esteemed throughout the Malayan region and is praised by many travelers. To judge from our limited experience with it, the langsat is slightly harder than the mangosteen, and there seems to be no reason why it should not succeed with us. A few plants have been grown in the West Indies and other parts of the American Tropics, but I have yet to hear of its fruiting outside the Orient. The langsat has two allies in America: One, the well-known umbrella tree (*Melia azedarach*) of the United States; the other, the tropical mahogany (*Swietenia mahagoni*). The genus *Lansium*, to which the langsat belongs, is a small one; and this species is the only one cultivated for its fruit. The duku, a fruit closely resembling the langsat, is commonly considered a botanical variety of *Lansium domesticum*.

"The tree is rather slender in habit, with a straight trunk and compound leaves composed of three or more pairs of elliptic to obovate leaflets three or four inches in length. The fruits, which ripen in the Straits Settlements from July to September, are produced in small clusters; in general appearance they suggest large loquats, the surface being straw colored and slightly downy. The skin is thick and leathery and does not adhere to the white, translucent flesh which separates into five segments. The flavor is highly aromatic, at times slightly pungent; each segment of the flesh normally contains an oval seed, but some of the segments in each fruit are usually seedless. The fruit is commonly eaten while fresh, but it is said also to be utilized in various other ways.

"The name lanzon is applied to this fruit in the Philippine Islands, langsat or lanseh being the form used in the Malay Peninsula." (*Wilson Popenoe.*)

45617 and 45618.

From Buitenzorg, Java. Seeds presented by Mr. P. J. S. Cramer, chief, Plant-Breeding Station. Received December 26, 1917.

45617. CROTALARIA USARAMOENSIS Baker f. Fabaceæ.

An herbaceous plant used in Java for green manuring. Leaves compound, remote; leaflets narrow elliptical, apex subacuminate, base cuneate, 4 to 6 centimeters long, 10 to 16 millimeters wide; stipules none. Flowers pedicellate, numerous, in elongate terminal racemes. (Adapted from Baker, *Journal of the Linnean Society*, p. 346.)

45618. MIMOSA INVISA Mart. Mimosaceæ.

A plant which is used in Java for green manuring. The stems are prostrate or ascending, the foliage sensitive to the touch. The flowers are described as rose colored. The species is distributed from Mexico to central Brazil. (Adapted from Micheli, *Flore du Paraguay*, p. 59.)

45619 to 45622.

From Concepcion, Paraguay. Seeds presented by Mr. Thomas R. Gwynn. Received December 27, 1917.

45619. DIOCLEA REFLEXA Hook. f. Fabaceæ.

Ornamental, woody, climbing plant, up to 20 feet in length, with compound leaves composed of three thickish leaflets and rather dense racemes (4 to 6 inches long) of red flowers. The broad-oblong leathery pod, 3 to 4 inches long, is densely covered with yellowish gray silky hairs. (Adapted from Oliver, *Flora of Tropical Africa*, vol. 2, p. 189.)

45620. HOVENIA DULCIS Thunb. Rhamnaceæ.

Raisin tree.

An ornamental, deciduous Japanese tree with leaves often 4 to 5 inches long and white or greenish white flowers that make little display. After flowering, the peduncles thicken and become edible, being red, pulpy, and of sweetish taste. Strange as it may seem, the thickened reddish peduncles form the main attraction of the inflorescence. Successfully propagated by cuttings of soft wood under glass. (Adapted from *The Florist's Exchange*, January 22, 1916.)

45621. SCHIZOLOBIUM PARAHYBUM (Vell.) Blake. Cæsalpiniaceæ.(S. *excelsum* Vog.)

A very large, quick-growing tree, up to 120 feet in height; native of Brazil. The fine leathery leaves are bipinnate. The bright-yellow flowers are borne in large erect racemes during February or March when the tree is quite bare of leaves. The flowers are at once followed by beautiful young foliage. It thrives up to 1,500 feet altitude in the moist region of Ceylon. (Adapted from Macmillan, *Handbook of Tropical Gardening and Planting*, 2d ed, p. 300.)

45622. TIPUANA TIPU (Benth.) Lillo. Fabaceæ.

Tipu.

(T. *speciosa* Benth.)

Ornamental, unarmed tree for the extreme southern United States. Flowers yellow, showy, in loosely branched terminal panicles; standard broadly orbicular, wings very broadly half-ovate, much longer than the keel; leaves unevenly pinnately compound, leaflets 11 to 21, oblong, entire; pod stipitate, indehiscent, 1 to 3 seeded, samaralike. (Adapted from Bailey, *Standard Cyclopedia of Horticulture*, vol. 6, p. 3351.)

45623. PHASEOLUS COCCINEUS L. Fabaceæ. Scarlet Runner bean.

From Deming, N. Mex. Seeds presented by Miss Ruth I. Grover. Received December 27, 1917.

"These beans were found in an old Aztec Indian grave in old Mexico in 1916. They are of the bush variety and I believe very hardy if irrigated." (*Miss Grover.*)

A bean with a twining stem which, if supported, will rise to a height of 14 feet. The leaves are smaller than those of the common kidney bean, and the flowers, which are in long spikes and of a deep scarlet color, are larger. The pods are large and rough, and the seeds are purple marked with black, although sometimes pure white. This bean was formerly cultivated for its flowers only, and was first mentioned as being edible by the gardener, Philip Miller. (Adapted from *Miller, Gardeners' and Botanists' Dictionary, 9th ed.*)

This is a white-seeded form.

45624. LITCHI CHINENSIS Sonner. Sapindaceæ. Lychee.

(*Nephelium litchi* Cambess.)

From Canton, China. Purchased from Mr. C. O. Levine, Agricultural Department, Canton Christian College. Received December 11, 1917.

"Cuttings from trees of variety *Wai Chie* growing on the college campus." (*Levine.*)

45625 to 45658. ZIZIPHUS MAURITIANA Lam. Rhamnaceæ.

(*Z. jujuba* Lam. not Mill.)

From Port Louis, Mauritius. Seeds presented by Mr. G. Regnard. Received December 19, 1917.

Thirty-four varieties received. The following is an extract from a letter from Mr. Regnard:

"If the *Ziziphus* trees are not cultivated in the strict sense of the word, they are to be found in large numbers in the villages inhabited by Indians and Africans in the warmer localities of the island. The fruits are well appreciated, not only by these people but also by Europeans, and are sold in great quantities in the fruit markets during June, July, and August (the cold season). On having fruits gathered from different trees, I have noticed that there are many varieties, probably more than one hundred, of different size, shape, taste, and color. The fruits on ripening may be green, pink, red, or yellow. The majority is of a certain shade of yellow. When overripe, that is, when the fruit softens, all the fruits have the same uniform yellowish brown color.

"The fruits are eaten before they become what I call 'overripe,' and except for some varieties have a very good taste. Usually those fruits which have the lower extremity slightly pointed are considered to be the best, but this is not always the case.

"The tree rarely attains more than 20 feet in height, with a trunk 6 to 8 inches in diameter. It grows all around the island, from sea level to 500 or 600 feet altitude; but it appears, save a few exceptions, that the best products are obtained from the regions where the heat is more regular, because they are sheltered from the winds which blow from the southeast during most of the year."

45625 to 45658—Continued.

45625. 1.	45632. 8.
45626. 2.	45633. 9.
45627. 3.	45634. 10.
45628. 4.	45635. 11.
45629. 5.	45636. 12.
45630. 6.	45637. 13.
45631. 7.	45638. 14.
45639. 15. "Seeds of a small fruit, long and pointed, excellent to eat." (Regnard.)	
45640. 16. "A variety with very large fruits, pointed at the lower end, and of most excellent flavor." (Regnard.)	
45641. 17.	45650. 26.
45642. 18.	45651. 27.
45643. 19.	45652. 28.
45644. 20.	45653. 29.
45645. 21.	45654. 30.
45646. 22.	45655. 31.
45647. 23.	45656. 32. Large-fruited variety.
45648. 24.	45657. 33. Large-fruited variety.
45649. 25.	45658. 34. Mixed varieties.

45659. CASUARINA SUMATRANA Jungh. Casuarinaceæ.

From Buitenzorg, Java. Presented by the director of the Botanic Garden.
Received December 31, 1917.

"Introduced as a better form of Casuarina, forming a larger and more graceful tree than *Casuarina equisetifolia*, which is so commonly used as a street tree in Florida." (Fairchild.)

45660. MIMUSOPS KAUKI L. Sapotaceæ.

From Lawang, Java. Seeds presented by Mr. M. Buysman. Received
December 29, 1917.

The genus *Mimusops* is composed of handsome evergreen trees which are cultivated in the Tropics for perfumery, oil, rubber, and other products. This species grows 20 to 35 feet in height, is native to the Malay Peninsula, and is cultivated in the West Indies. The young branches are gummy; the long-petioled leaves, 4 inches in length, are crowded at the ends of the branches; the flowers are clustered on twin or solitary pedicels; and the fruit is an obovoid, smooth berry, up to 1 inch in diameter, and usually four seeded. (Adapted from *Bailey, Standard Cyclopaedia of Horticulture, vol. 4, p. 2056.*)

45661. PRUNUS SERRULATA Lindl. Amygdalaceæ.

Flowering cherry.

From Jamaica Plain, Mass. Cuttings presented by the Arnold Arboretum.
Received November 16, 1917.

This cherry is well known in our gardens and nurseries in its double forms, which are grown under various names. These double-flowered forms vary in the size of the blossoms and in the depth of the rosy tints that suffuse the

petals. Although 80 years have passed since the first plants were introduced, it would be difficult even now to name a more beautiful or desirable flowering tree. Perfectly hardy, easily accommodated, and never failing at the flowering time, the species combines in itself almost all the qualities that one asks for in an ornamental tree.

Of the new single-flowered varieties not much can yet be said, but although so different from the big double blossoms to which we are so accustomed, the flowers possess all their charm and delicacy of color, and if they are not so large they have an even daintier gracefulness. (Adapted from *The Garden*, vol. 56, p. 300.)

This is apparently the variety *Ochichima*, a form with pale-pink, double flowers of large size. (See *Wilson, Cherries of Japan*, p. 54.)

45662. AMYGDALUS PERSICA L. Amygdalaceæ. Peach.
(*Prunus persica* Stokes.)

From Guadelope, French West Indies. Scions presented by Mrs. E. St. George Lough, Trois Rivieres Plantation. Received December 31, 1917.

Peach scions imported for experimental purposes.

A freestone peach described as somewhat resembling the peen-to peach in shape and flavor. It is round, however, not flattened, and is reported as being larger and having more "perfume and savor" than the peen-to. It resists decay well, even in the heat of the French West Indies.

For a more complete description, see S. P. I. No. 34131.

45663. STADMANNIA OPPOSITIFOLIA Lam. Sapindaceæ.

From Port Louis, Mauritius. Seeds presented by Mr. G. Regnard. Received December 7, 20, 22, and 31, 1917.

"The fruits make an excellent jelly, very much like that of the quince. This tree grows in a wild state, and the pulp of its fruit, unless made into a jam or jelly, is only fit to be eaten by monkeys." (*Regnard*.)

A large hardwood tree, once frequent in the primeval forests of the island of Mauritius, but now becoming scarce. It has alternate pinnate leaves, dense panicles of inconspicuous flowers, and hard spherical fruits nearly an inch in diameter. (Adapted from *Baker, Flora of Mauritius*, p. 60.)

45664 to 45669.

From Zacuapam, Vera Cruz, Mexico. Presented by Dr. C. A. Purpus. Received December 31, 1917.

45664. CHAYOTA EDULIS Jacq. Cucurbitaceæ. Chayote.
(*Sechium edule* Swartz.)

"The chayote is becoming known in the United States as a useful vegetable belonging to the squash family. In some parts of tropical America it is eaten as commonly as are the potatoes in North America and is stewed with meat, creamed, and so on, in the same manner. It has not the food value of the potato, but is more comparable in this respect to the squash. In an effort to extend and improve its culture in this country, varieties are being introduced from as many regions as possible." (*Wilson Popenoe*.)

45665. CAPSICUM ANNUM L. Solanaceæ. Pimento.

Var. *grossum*. The pimento of tropical America. Dr. Purpus states that this variety is a plant for a hot country and should be planted in a sunny place in light soil.

45664 to 45669—Continued.

45666. *LYCOPERSICON ESCULENTUM* Mill. Solanaceæ. **Cherry tomato.**

Plants of the variety *cerasiforme*. It differs from the ordinary garden tomato in having small fruits, either red or yellow, and leaves which are smaller, grayer, and less dense. The fruits are used for pickles and preserves. (Adapted from *Bailey, Standard Cyclopedia of Horticulture, vol. 4, p. 1931.*)

Introduced to test for wilt resistance.

45667 and 45668. *VANILLA PLANIFOLIA* Andrews. Orchidaceæ. **Vanilla.**

45667. "Cuttings of the true vanilla from Misantla, Mexico. Should be planted at the foot of small trees or shrubs, in leaf mold." (*Purpus.*)

45668. "From Zacuapam." (*Purpus.*)

45669. *VANILLA POMPONA* Schiede. Orchidaceæ. **Vanilla.**

"Plants of wild vanilla, which grows in brush woods and half-shady places in the low country at the limits of the tierra caliente. Should be planted at the foot of small trees or large shrubs, in leaf mold." (*Purpus.*)

"A native of Mexico, yielding an inferior quality of vanilla known by the name of 'Vanillon' and 'Vanilloes.' This is claimed to have advantages over proper vanilla, its pods not having a tendency to wilt, as well as being easily cured, whilst the vines are said to flower and fruit three or four times during the year." (*Macmillan, Handbook of Tropical Gardening and Planting, 2d ed., p. 282.*)

45670 to 45691.

From Jamaica Plain, Mass. Presented by the Arnold Arboretum. Received November 16, 1917.

45670. *CASTANEA HENRYI* (Skan) Rehd. and Wilson. Fagaceæ.

Chestnut.

(Cuttings.) A tree, 75 to 100 feet in height, distributed through the valley of the Yangtze River as far west as Mount Omei. It is common in woods on the mountains of western Hupeh and eastern Szechwan. The leaves are green on both surfaces, caudate-acuminate, and broadest below or at the middle. The shoots are dark colored and quite glabrous. The fruit is usually a solitary nut. (Adapted from *Sargent, Plantae Wilsonianae, vol. 3, p. 196.*)

45671 and 45672. *CORYLUS CHINENSIS* Franch. Betulaceæ. **Hazelnut.**

(Cuttings.) A tree native to western China, which grows to a height of 120 feet. The ovate-oblong leaves are cordate at the base, doubly serrate, and 4 to 7 inches long. The fruit is borne in clusters of four to six. The involucre is constricted above the nuts, with recurved and more or less forked lobes. (Adapted from *Bailey, Standard Cyclopedia of Horticulture, vol. 2, p. 859.*)

45671. Vilmorin No. 1200.

45672. Wilson No. 1453.

45673. *CORYLUS HETEROPHYLLA SUTCHUENENSIS* Franch. Betulaceæ.

Hazelnut.

(Cuttings.) A bush, 1 to 4 meters tall and widely distributed in China, having been reported from Szechwan, Hupeh, Kiangsi, and Hunan Provinces. The branches and petioles are sparsely pubescent. The

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involucres are deeply cleft and shorter than the very finely pubescent nutlets. There is a large variation in the involucres and in the pubescence of the leaves, petioles, and branches. (Adapted from *Sargent, Plantae Wilsonianae, vol. 2, p. 455.*)

45674. × MALUS ARNOLDIANA Rehder. Malaceæ.

(Roots.) A plant which is evidently a hybrid of *Malus floribunda* appeared spontaneously in the Arboretum several years ago and has been named *M. arnoldiana*. This plant promises to remain a smaller tree than *M. floribunda*, but its long, spreading, and arching branches are very graceful and the flowers produced on long stems are more than twice as large as those of its parent. The flowers of this interesting tree are considered by some persons more beautiful than those of any other crab apple. (Adapted from *Arnold Arboretum Bulletins of Popular Information, Nos. 3 and 22.*)

45675. MALUS BACCATA MANDSHURICA (Maxim.) C. Schneid. Malaceæ.

Crab apple.

(Roots.) *Malus baccata mandshurica* is the earliest of the crab apples to open its flower buds in the Arboretum. A native of Manchuria, Chosen (Korea), and northern Japan, it is the eastern form of the better known *Malus baccata*, the Siberian crab apple, which reached Europe more than a century ago and for a long time was one of only two Asiatic crab apples known in western gardens. The Manchurian form as it grows in the Arboretum is a tree 12 to 15 feet tall and broad; the flowers, which are produced in profusion, are pure white, rather more than an inch across, and more fragrant than those of any other Asiatic crab apple. The fruit is round, yellow or red, and not larger than a large pea. This crab apple, which is still rare in this country, for the fragrance of the flowers alone should find a place in all collections. (Adapted from *Bailey, Standard Cyclopedia of Horticulture, vol. 5, p. 2871.*)

45676. MALUS FUSCA (Raf.) C. Schneid. Malaceæ.

Apple.

(Roots.) A shrub or small tree, sometimes 30 to 40 feet tall, with ovate-lanceolate sharply serrate leaves. The white flowers, an inch in diameter, are borne on slender pubescent pedicels, and appear when the leaves are nearly or quite full grown. The fruit is oblong, three-fourths of an inch or less long, and yellowish or greenish in color. According to Sargent, this tree "grows usually in deep, rich soil in the neighborhood of streams, often forming almost impenetrable thickets of considerable extent, and attains its greatest size in the valleys of Washington and Oregon." The range extends from northern California to Alaska. (Adapted from *Bailey, Standard Cyclopedia of Horticulture, vol. 5, p. 2875.*)

45677. × MALUS MAGDEBURGENSIS Zimmerm. Malaceæ.

Apple.

(Roots.) *Malus magdeburgensis* is considered to be a hybrid between *M. spectabilis* and *M. dasycphylla*, which was found among a collection of trees planted in the city gardens of Magdeburg and supposed to have been originally imported from Japan. (Adapted from *Möller, Deutsche Gärtner-Zeitung, vol. 20, p. 254.*)

45670 to 45691—Continued.

45678. *MALUS NIEDZWETZKYANA* Dieck. Malaceæ. **Apple.**

(Roots.) One of the most curious apple trees in the collection, *M. niedzwetzkyana* has deep purplish red flowers and fruit, even the flesh being purple, leaves purple (at least early in the season), and dark bark. It comes from central Asia and is probably a form of *M. pumila*, one of the parents of the common apple tree, as seedlings raised in the Arboretum have sometimes purple but more often green leaves. (Adapted from *Arnold Arboretum Bulletin of Popular Information No. 22.*)

45679. *MALUS PRUNIFOLIA RINKI* (Koidz.) Rehder. Malaceæ. **Apple.**

(Roots.) It is a tree in its wild state with greenish yellow fruit, sometimes with a reddish cheek, or rarely entirely red, rather longer than broad and not often more than $1\frac{1}{4}$ inches in diameter; it is juicy and has an acid flavor. This tree was early introduced into Japan, where it was formerly cultivated in many forms as a fruit tree. Its cultivation in Japan was given up after the introduction of American and English apple trees and it is now a rare plant there. Judging by the climate where this tree grows naturally in western China, it should prove as hardy as the Siberian *Malus baccata*, which is one of the parents of the hardy race of apples now much cultivated in the extreme north as Siberian crabs; and it is not improbable that by crossing the Rinki with some of these hybrid crabs or with the hardiest varieties of the common apple a race may be obtained more valuable for the cold parts of North America than any of the apples which can now be grown in some of the Northern States and in the northwestern Provinces of Canada. (Adapted from *Arnold Arboretum Bulletin of Popular Information No. 3.*)

45680. *MALUS SYLVESTRIS* Mill. Malaceæ. **Apple.**

(Roots.) "A wild form of the cultivated apple secured in Turkestan." (*Sargent.*)

45681. *MALUS THEIFERA* Rehder. Malaceæ. **Apple.**

(Roots.) *Malus theifera* from central and western China is closely related to Hall's crab. It is one of Wilson's introductions through seeds sent in 1900 to Veitch and in 1907 to the Arboretum, where it is now 12 feet high. It has upright, spreading, rather zigzag branches which are densely studded with short spurs which bear numerous clusters of flowers rose red in the bud, becoming pale and almost white when fully expanded. In central China the peasants collect the leaves and from them prepare the palatable beverage which they call red tea. From this fact the specific name is derived. (Adapted from *Arnold Arboretum Bulletin of Popular Information No. 4.*)

45682. *MALUS TRANSITORIA TORINGOIDES* Rehder. Malaceæ. **Apple.**

(Roots.) This plant looks quite distinct from typical *Malus transitoria* with its larger, partly entire leaves and larger fruit and may turn out to be a distinct species, but as long as we do not know the mature fruits of the type and the flowers of this variety we must rely on the difference in the leaves, which is not sufficient for specific separation, as intergradations seem to exist. (Adapted from *Sargent, Plantae Wilsonianae, vol. 2, p. 286.*)

45670 to 45691—Continued.

45683. *PRUNUS MAACKII* Rupr. Amygdalaceæ.

(Cuttings.) A Manchurian bird cherry up to 40 or more feet high in a wild state, very distinct through the bark of the trunk being smooth and of a striking brownish yellow color, and peeling like that of a birch. It is different from ordinary bird cherries in the racemes coming on the year-old wood and from the laurels in being deciduous. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 241.*)

45684. *PRUNUS SERRULATA* Lindl. Amygdalaceæ. Flowering cherry.

(Cuttings.) *Forma rosea* Wilson. Cultivated cherry which has been grown at the Arnold Arboretum. It was received from Spath in 1912 as *P. pseudo-cerasus shidaresakura* Koehne.

"Flowers rather small, inodorous, pink, and very double, known to me only as a cultivated plant in this Arboretum. It is fortunate that Koehne's name is a synonym, since in Japanese it signifies hanging cherry and in Japan is applied only to *P. subhirtella* var. *pendula* Tanaka." (*Wilson, The Cherries of Japan, p. 27.*)

45685. *PRUNUS THIBETICA* Franch. Amygdalaceæ. Plum.

(Cuttings.) An ornamental tree 15 to 20 feet in height, bearing oblong convolute leaves which have crenate margins. The bluish pink flowers appear with the leaves on pedicels one-third to three-fourths of an inch long. Native to western China, where it commonly grows in thickets. (Adapted from *Bailey, Standard Cyclopedia of Horticulture, vol. 5, p. 2327.*)

45686 and 45687. *PYRUS CALLERYANA* Decaisne. Malaceæ. Pear.

(No. 556a Wilson.) This is a widely distributed species and, according to Wilson, is common in western Hupeh from river level up to 1,500 meters altitude. It has comparatively small glabrous crenate leaves and small flowers with two, rarely three, styles. The fruit is about 1 to 1.4 centimeters in diameter. (Adapted from *Sargent, Plantae Wilsonianae, vol. 2, p. 264.*)

45686. Seeds.

45687. Fruits.

See also S. P. I. No. 45586.

45688. *PYRUS SERRULATA* Rehder. Malaceæ. Pear.

(Fruits.) A tree native to western Hupeh at altitudes from 600 to 1,600 meters.

"This species seems to be most closely related to *Pyrus scrotina* Rehder, but differs chiefly in its serrulate, not setosely serrate, generally broader leaves and in the smaller flowers with usually three or four styles and shorter sepals, and in the smaller fruit." (*Sargent, Plantae Wilsonianae, vol. 2, p. 263.*)

45689. *RIBES FASCICULATUM CHINENSE* Maxim. Grossulariaceæ. Currant.

(Plants and fruits.) "In the shrub collection the leaves of two currants are just turning scarlet [November 1, 1912]. These are *Ribes curvatum* and the Chinese form of *Ribes fasciculatum*. The beauty of the Chinese currant at this season is increased by the bright-red fruits which are still on the branches. It is the only representative of the genus in the collection with fruit which ripens in the autumn and is

45670 to 45691—Continued.

well worth a place in every collection in which handsome autumn fruits are valued." (*Arnold Arboretum Bulletin of Popular Information No. 34.*)

45690 and 45691. *VITIS VINIFERA* L. Vitaceæ. **Grape.**

45690. "Cuttings of a wild grape of the *vinifera* type from northern China." (*C. S. Sargent.*)

"This is a very hardy plant, enduring the winters of Boston, Mass., with little injury." (*Peter Bisset.*)

45691. (Plants.) "This grape is largely cultivated in Peking. There are white-fruited and purple-fruited varieties. In Peking the vines are laid down and covered in the winter; at the Arboretum they have so far generally proved hardy and have occasionally produced fruit. This vine may prove valuable to cross with some of the hybrids or varieties of American grapes." (*C. S. Sargent.*)

45692 to 45704.

From France. Scions presented by Mr. Edmond Versin, St. Jean le Blanc, par Orleans, Loiret. Received November 28, 1917.

45692 to 45701. *CORYLUS AVELLANA* L. Betulaceæ. **Hazelnut.**

45692. *D'Alger.* This is a well-known hazelnut, and because of its many hundreds of years of cultivation it has received many different names. The bush is of low, much-branching habit, spreading widely by means of suckers. It is a very prolific shrub and is one of the most fruitful of all the varieties of hazelnut. The leaves are of medium size, roundish or oval-elliptic. The nut is medium sized, 20 to 22 millimeters long, and very long pointed. It seldom grows singly, but is found in groups of three to five. The shell is dark brown, later even becoming brownish black. The upper half is covered by a grayish woolly tomentum which becomes stronger toward the tip. The kernel, which has a sweet almondlike taste, is oval and entirely fills the shell. Blooms in midspring; ripens early, from the middle to the end of August, depending on the climate. Older pomological workers state that this nut comes true to seed, but more recent workers state that only about one-fifth of the seed planted comes true to the variety. It is a nut to be universally recommended. (Adapted from *Goeschke, Die Haselnuss, p. 78.*)

Received as *Corylus macrocarpa*.

45693. Received as *Corylus macrocarpa du Bearn.*

45694. Received as *Corylus macrocarpa fertile.*

45695. Received as *Corylus avellana folius aurcis* (golden-leaved filbert).

45696. Received as *Corylus macrocarpa de Brunswick.*

45697. Received as *Corylus macrocarpa à coque tendre.*

45698. *Cob filbert.* "Involucre nearly smooth, longer than the nut, and very slightly cut around the margin; nut large, oblong, and somewhat compressed; shell rather thick, brown; kernel full and of very rich flavor. This is perhaps the best of all the filberts. The tree is a most abundant bearer. Some of the nuts are upward

45692 to 45704—Continued.

of an inch in length, and they have with care been kept for four years. It is only after being kept for some time that their full richness of flavor is obtained. Mr. Hogg says this nut was first brought to the notice of the Horticultural Society by A. B. Lambert about the year 1812. It is improperly called *Kentish Cob*. The true *Cobs* are roundish thick-shelled nuts." (*Thomas, The American Fruit Culturist, p. 448.*)

45699. *Emperor.* This variety was grown in England by Richard Webb, breeder in the Calcot Garden at Reading. A prolific bush of low but strong growth, with small to medium leaves, 9 to 10 centimeters long, round-oval, and narrowed toward the base. The nuts are conspicuously large, 20 to 22 millimeters long, of irregular shape, and grow singly or two or three together. The shell is light brown, with distinct dark-brown stripes, and is softly pubescent near the apex. The large kernel is broadly oval and of good flavor. Blooms rather late; ripens early, late August or early September. This is a very valuable nut which, because of its beauty and heavy bearing, is widely grown. (Adapted from *Goeschke, Die Haselnuss, p. 60.*)

Received as *Corylus macrocarpa*.

45700. Received as *Corylus macrocarpa à gros fruits*.

45701. Received as *Corylus macrocarpa des Anglais*.

45702. CORYLUS COLURNA L. Betulaceæ. **Turkish hazelnut.**

The nuts of this species are small and somewhat flattened, with the deeply cut roundish involucre several times longer than the nut. The plant is treelike, with upright branches which are corky when young. The leaves are shiny, becoming broad and pointed as they mature. (Adapted from *Goeschke, Die Haselnuss, p. 41.*)

45703. CORYLUS MAXIMA Mill. Betulaceæ. **Hazelnut.**

Received as *Corylus macrocarpa du Piemont*.

45704. POPULUS INCRASSATA Dode. Salicaceæ. **Poplar.**

A dense tree of irregular habit of growth, with short ascending branches. The appearance of some of the leaves suggests the fossil species *Populus latior* Heer. The prefoliation is ragged, as in the group *Caroliniensis*. Habitat the western portion of North America. This is a species of doubtful validity. (Adapted from *L. A. Dode, Genre Populus, p. 41.*)

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