NEW INTRODUCTIONS.

Amygdalus persica L. (Amygdalaceae.) 41395. Seeds from Kia ying chau, Swatow, China. Presented by Mr. George Campbell, through Mr. George C. Hanson, American Consul, Swatow. "Peach pits from a curious little tree grown here only in pots as a house plant. The leaves are like other peach leaves but its manner of growth is quite different. This particular tree is now just 15 inches high and had five full-sized peaches, somewhat smaller than American ones. I broke off two or three other fruits when quite small. They are borne on the main trunk on stems about a quarter of an inch long and make one think of Papayas. The lowest was 6 inches from the earth of the pot and the highest 8 inches, so the five were closely crowded together. The trunk at this point is little if any larger than a lead pencil. The fruit is of a good color, as Chinese peaches go, and taste better than any I have tasted in China. The flesh is white and it clings to the pit. It hangs on the tree a very long time and is quite ornamental. The blossom is quite showy too. The Chinese say it comes true from the pits. I picked the last one yesterday and the first was ripe a month ago. The ordinary peaches here are very poor, not fit to eat unless cooked." (Campbell.)

Annona sp. (Annonaceae.) 41384. Seeds from Cajabon, Guatemala. Presented by Mr. Walter F. Curley. "*Tzumuy Pac*, so called here in the Indian language. I had never seen them before, until some Indians brought them in, they say they are quite common in the mountain Chaal near the British Honduras border, they are quite small, the outside yellow with skin corrugated and resembling the larger fruit *Sincuya*, there is very little inside to eat, but of fine flavor, the seeds are very abundant. Ripe in the district of Cajabon, Guatemala, in September." (Curley.)

Castanea pumila x *crenata*. (Fagaceae.) 41357-41360. Plants of hybrids between the American chinquapin and the Japanese chestnut. Produced by Dr. W. Van Fleet, at Little Silver, N. J. Grown at the Plant Introduction Field Station, Chico, California. "Bear at from one to three years from seed. Good producers and quite resistant to the chestnut bark fungus. Nuts large, of fair quality, with rather hard shells. 41357 and 41358 somewhat larger than an ordinary American chestnut and somewhat sweeter. 41359 and 41360 are much larger than the American type; about the size of a Spanish chestnut, the flavor being very sweet, while the latter is more tender." (Van Fleet.)

Chayota edulis Jacq. (Cucurbitaceae.) 41426. Seeds of chayote from San Jose, Costa Rica. Presented by Dr. Carlos

Wercklé, through Mr. J. E. Van der Laat, Director, Department of Agriculture. "Fiberless cocoros. Very small, entirely coreless and fiberless. I do not know if of all the fruits the seeds are without testa, but the only one I could examine and ate was so; simply the cotyledons in a very small cavity in the center without a shell." (Wercklè.)

Citrus southwickii Wester. (Rutaceae.) 41387. Seeds from Manila, Philippine Islands. Presented by Mr. P. J. Wester, Lamao Experiment Station. "*Limao*. A thorny tree, with dense head and drooping branches, attaining a height of 6 meters. The *limao*, though rare, is not uncommon in Bohol, where it is cultivated and has also been collected by the writer in Baganga, Mindanao. The flowers appear late in April and during the early part of May, with the fruit ripening in January and February; a few fruits nearly full grown were collected in May. Has flowered irregularly from May to December. The fruit is not eaten, but used in washing by the Boholanos and is of no economic importance. The tree is evidently quite drought resistant and succeeds well in very scanty soil underlaid with limestone. The *limao* belongs in that group of the citrus fruits having free filaments, the most conspicuous characters being the compact growth of the crown, the dark-green, thick and distinct leaves, the almost sessile stigma, and the attractive, oblate, regular-shaped fruit with its many locules, exceeding in number those in all other citrus fruits known to the writer. This species has been named in honor of Mr. E. F. Southwick. For full description see The Philippine Agricultural Review, First Quarter 1915. Fruit scarcely edible, plant may make a good stock." (Wester.)

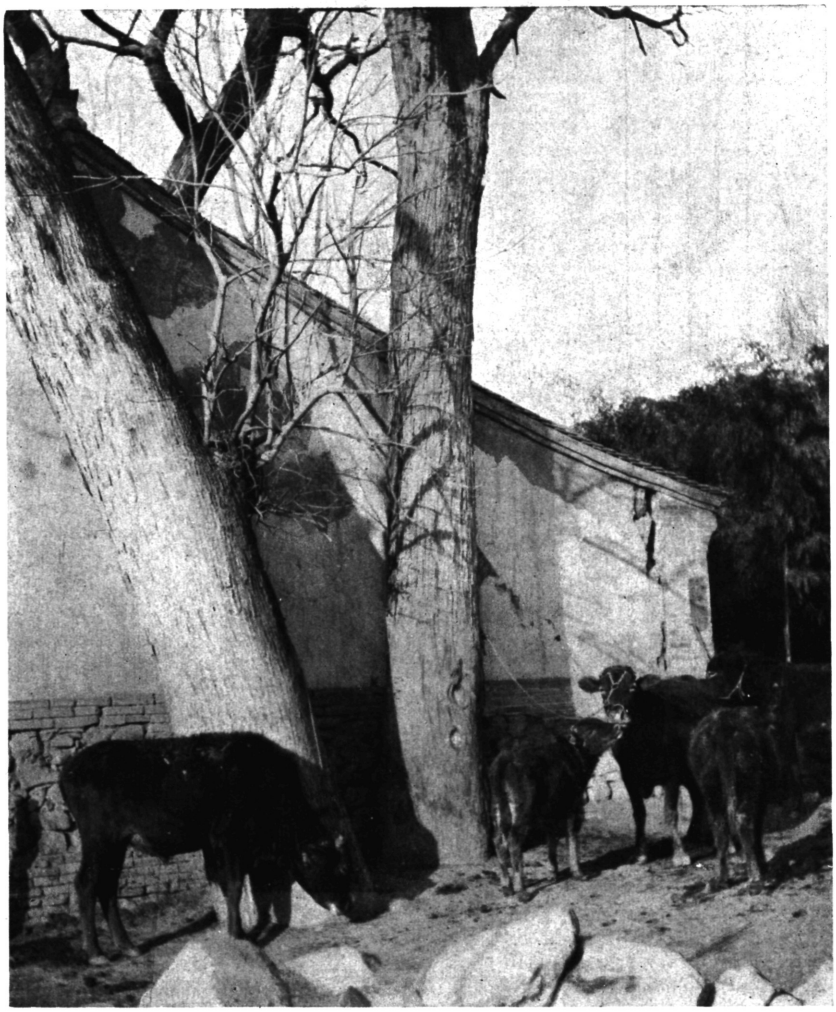
Citrus webberii montana Wester. (Rutaceae.) 41388. Seeds of *Cabugao* from Manila, Philippine Islands. Presented by Mr. P. J. Wester, Lamao Experiment Station. "Fruit makes a fair 'ade. A shrubby tree with slender branches and small, weak spines sometimes absent; young growth green; leaves 8.5 to 14 cm. long, 3 to 3.5 cm. broad, ovate to ovate oblong, crenate, dark green above, shining; base broadly acute to rounded; apex blunt pointed, usually retuse; petiole 24 to 38 mm. long, with narrow wing margin, in large leaves sometimes 17 mm. broad; flowers not seen; fruit roundish oblate, about 45 mm. across, somewhat corrugate, 8 loculed. The general character of the plant and fruit indicate that the *cabugao* is a form of the *alsem*." (Wester, The Philippine Agricultural Review, First Quarter 1915.)

Diospyros kaki L. f. (Diospyraceae.) 41361 to 41371. Cuttings of persimmons from Okitsu, Japan. Presented by Professor Ishiwara, Horticultural Experiment Station.

Diospyros kaki L. f. (Diospyraceae.) 41456. Cuttings from Glendora, California. Presented by Judge Charles Silent, through Mr. Wilson Popenoe. "In the fall of 1914, when in California, I visited Judge Silent's place and noticed this persimmon tree that I became interested in, as the young twigs of all the branches were bearing the old pedicels of staminate flowers in great numbers, and after a careful search of the tree I could discover the remains of only three pedicels of pistillate flowers. If this character should hold good, and we have every reason to believe it will, we have at last found the long looked-for male *Kaki* persimmon tree, and one that should be planted in every orchard of *Kaki* persimmons as a pollinator, for by careful experiment, Professor H. H. Hume has demonstrated that the lack of pollination is the cause of the immature fruits dropping." (Mr. Peter Bisset.)

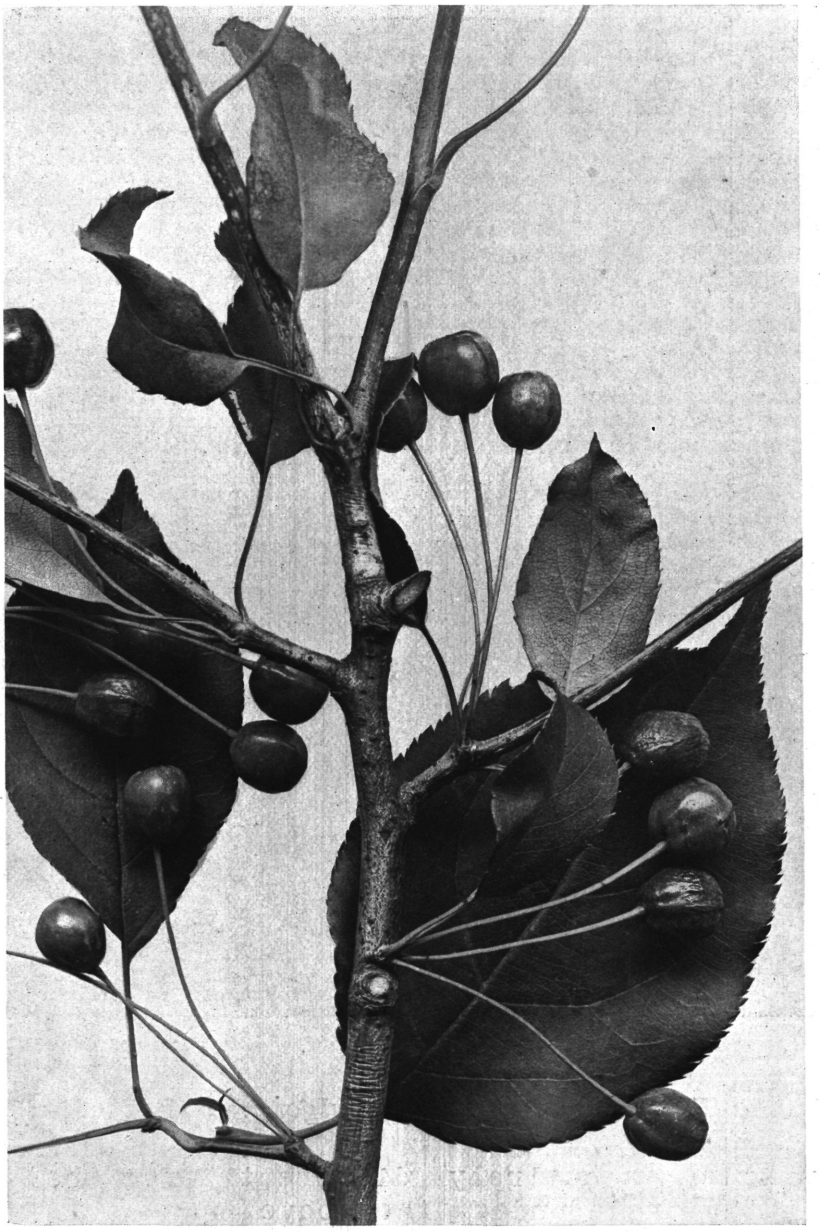
Escallonia resinosa (R. & P.) Persoon. (Escalloniaceae.) 41326. Seeds from Peru. Collected by Mr. O. F. Cook. "A handsome tree bearing clusters of white flowers. It is common in the valleys about Ollantaytambo at altitudes of 9,000 to 11,000 feet. In the lower valleys, where the climate is dry, the *chachacoma* grows intermingled with cacti and other desert vegetation, and seldom attains a height of more than 12 to 15 feet. In the upper valleys where the climate is cooler and the supply of moisture is ample, the *chachacoma* trees grow to much larger size, often attaining a height of 40-50 feet and a diameter of 2-4 feet. The largest trees were seen in the valley below Panticalla Pass, on the south side, but none were found on the north side in the region of Yanamachi." (Cook.)

Escallonia sp. (Escalloniaceae.) 41324. Seeds of *Tasta* from Pinasniocj, Peru. Collected by Mr. O. F. Cook. "A fine-leaved tree, comparable to the boxwood in foliage but with a more open habit of growth and horizontal branches, often giving an artistic effect like some of the dwarfed Chinese evergreens. The appearance is also somewhat similar to that of the *Chachacoma*, but the foliage is much finer, and of a dark and more shining green. Like *Chachacoma*, the trees will endure cutting back to any extent and the new crown soon takes a graceful rounded shape. This may render the *Tasta* very useful for ornamental planting in situations where space is limited, and it should also serve well as a hedge plant. Old trees have deep red heart wood of the same texture and appearance as the wood of *Chachacoma*, and are said to be used in the same way. The form of the fruits also suggests affinity with *Chachacoma*, and the habit of growth is similar, but the flowers are solitary instead of clustered. The color of the flowers



A Chinese Catalpa. (*Catalpa bungei*). S.P.I. No.38254.

This tree is entirely different from the one that passes in the trade under the above name. This species grows to be a tall tree, sometimes 100 ft. in height, with a trunk some 3 to 4 ft. in diameter. It is very ornamental when covered with masses of spotted mauve colored flowers appearing in early summer. The Chinese plant it extensively here and there for its fine timber which is light, strong and durable and is in special demand for table-tops and fine furniture on account of its non-warping nature. Chinese name "Ch'iu shu". Photographed by F. N. Meyer, near Puchow, China, February 9, 1914. No. 5996.



Crabapple. Malus baccata mandschurica.

This crabapple is common in the hills of Manchuria and Eastern Siberia where the thermometer often drops to -45° Fahr. It is remarkably hardy, drouth-resistant and of vigorous growth. The fruits are very small, of sharp sour taste and borne in great masses. The plant often attains the size of a bush only but in favorable localities it grows into a tree 20 to 25 feet tall. The fruits are used as preserves by the inhabitants of Eastern Siberia. Of value as a hardy stock for apples, as an ornamental, and as a fruit tree for the Upper Mississippi Valley regions. Photographed by R L. Beagles, Chico, Calif., July 24, 1915. No. 546.

is said to be white, as in *Chachacoma*. The leaves of young vigorous shoots are much larger than those of mature branches, and are distinctly dentate. Like *Chachacoma*, the tree has the power of rooting from cuttings and layered branches. It ascends to higher elevations than *Chachacoma*, and may be expected to have greater resistance to cold, but less resistance to heat. It may thrive along the California coast as far north as San Francisco and might become popular as an ornamental or hedgeplant." (Cook.)

Homoioceltis aspera (Thunb.) Blume. (Ulmaceae.) 41391. Seeds from Augusta, Georgia. Presented by P. J. Berckmans Company. An ornamental ulmaceous tree up to 60 feet high, with the appearance of a hackberry (*Celtis occidentalis*), with the slender branches forming a dense head. Leaves ovate to ovate-oblong, broadly wedge-shaped at the base, tapering at the apex, 2-3 $\frac{1}{2}$ inches long, serrate with straight veins ending in the teeth. (This last character easily distinguishes this tree from *Celtis sinensis* with which it has often been confused.) The greenish flowers and small black drupes are inconspicuous. Not hardy north of Georgia. (Adapted from Rehder in Bailey, Standard Cyclopedia of Horticulture, Vol. 1, p. 308.)

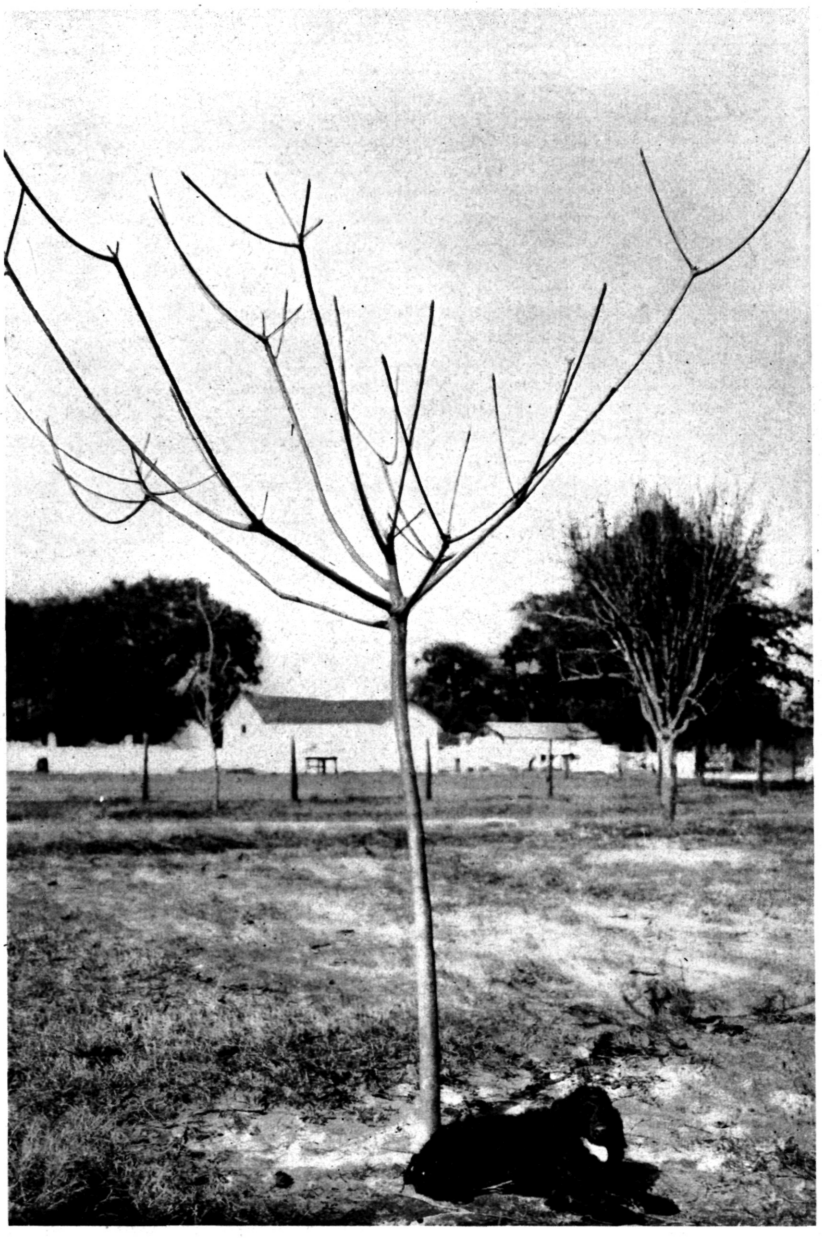
Juglans sp. (Juglandaceae.) 41334. Seeds of *Nogal* from Ollantaytambo, Peru. Collected by Mr. O. F. Cook. "A native walnut cultivated sparingly at Ollantaytambo and in the valleys above and below. Its chief use is to furnish a dye for giving sheep's wool the brown color of the high-priced vicuna ponchos. The leaves and bark of the tree are used for dyeing, the coloring material being extracted by beating and boiling. The nuts are as large as English or Persian walnuts, but the shell is much thicker. The tree is rather small and slender, with large graceful leaves, reminding one of a sumac or Ailanthus. Of possible interest for breeding purposes or for ornamental planting along the Pacific coast or in Florida. Probably a native of the valleys of the eastern slopes of the Andes." (Cook.)

Licania sp. (Rosaceae.) 41393. Seeds of Sansapote from Orotina, Costa Rica. Presented by Dr. Carlos Wercklè, Department of Agriculture. "Inferior to the species from the Atlantic coast, as it has little flesh; still it sells even here in Orotina, 1$\frac{1}{2}$ leagues from where it grows wild, for five cents apiece, and smaller two for five cents. One of the most beautiful of all forest trees; of gigantic size; timber nearly as good as *Cedrela*." (Wercklé.)

Lucuma sp. (Sapotaceae.) 41332. Seeds from Ollantaytambo, Peru. Collected by O. F. Cook. "The *Lucuma* is a popular fruit tree in Peru. It is closely related botan-

ically to the Sapote and Injerto of Central America, but the quality of the fruit is entirely different. The flesh is very rich and mealy, more like a cooked sweet potato than like the related fruits. The tree is also of a very compact habit with the rather small obovate leaves clustered closely near the ends of the branches. Another difference is that the *Lucuma* grows and produces fruit at a much higher elevation than the *Sapote*, attaining about 9,500 feet at Ollantaytambo. Thus there would seem to be a much better chance for the *Lucuma* in California or Florida than with the *Sapote*." (Cook.)

Osteomeles sp. (Malaceae.) · 41325. Seeds of *Lengli* from Pinasniocj, Peru. Collected by Mr. O. F. Cook. "A tree growing at high elevations,10,000 to 12,000 feet, found in the valleys of two streams tributary to the Urubamba river, one the stream that enters at Ollantaytambo, and the other the stream that comes down from the Panticalla Pass, a few miles below Ollantaytambo. On the other side of the Pass in the upper part of the Lucumayo valley the *lengli* appears to be absent. In unfavorable places where the trees remain stunted they have an appearance somewhat like our Thorn-apple or Hawthorns, but in some of the sheltered ravines and reforested terraces where the conditions are favorable the *lengli* trees attain a height of 30-40 feet with trunks 1 to 2 feet in diameter, and have a very attractive appearance. The foliage is very fine, the leaves being of a very regular elliptical shape with slightly dentate margins. The upper surface is of a fresh deep green color with neatly impressed veins, while the lower surface has a warm reddish brown tomentum, affording a very pleasing contrast. The fruit clusters give a festive appearance like holly, the mature berries being deeply and richly colored. They begin by changing from green through various shades of pink to scarlet red and then pass on through the darker shades of red, becoming eventually almost black. The berries are distinctly flattened instead of round and have the appearance of very small apples. They hang on the trees for a long time, probably all through the winter, with the effects of the Christmas holly. A botanical peculiarity, perhaps of this species, is that the lowest branch of the fruit cluster is usually subtended by a very much reduced, oval, sharp-pointed leaf, or bract, but like the other leaves in color, texture, and persistence. The small leaf adds a little touch to the appearance of a twig with its cluster of berries. This might prove attractive for ornamental planting along the California coast or wherever it will grow. In view of the high altitude where the tree is native it may be expected to stand cold weather, if not actual frost." (Cook.)



THREE-YEAR-OLD TUNG OIL TREE AT TALLAHASSEE, FLA.

A young tree, planted Jan. 7, 1913 as a one year seedling, in the experimental plantation of Dr. Tennent Ronalds. In 1914, in its third year from seed, it bore 17 fruits, and the next year its fourth, it bore 107 fruits. Records are being kept of the yields of the individual tung trees in this plantation to discover if some trees do not yield more regularly and heavily than others. If especially productive strains are found, it will doubtless be possible to top-work the grove with budwood from the productive individuals and to use the latter for general propagation purposes. Photographed by David Fairchild, January 31, 1915, at Tallahassee, Fla. No. 15585.

Sesame. (*Sesamum orientale*).

A field of sesame, carefully pulled out and stacked up. The pods of the sesame plant do not all ripen at once and when fully ripe they open and allow seeds to fall out to a considerable extent, making the crop a very difficult one to handle. If a variety could be found which kept its pods closed up, as the opium poppy does its head, it would be a tremendous gain to all sesame growers. The oil expressed from the seeds is among the most important of food products of China and always commands a good price. The seeds themselves are made into candies in the nature of peanut brittle; and are also baked on thin cakes giving the latter a rich, nutty flavor. Photographed by F. N. Meyer, near Pang Kwan chen, Shensi, China, Sept. 3, 1914, No. 13180.

Primula spp. (Primulaceae.) 41404, 41406, 41408-41412, 41416. Seeds of eight primroses from Bhutan, India. Collected by Mr. R. E. Cooper. Presented by Bees Limited, Liverpool, England, at the request of Mr. A. K. Bulley.

Prunus sp. (Amygdalaceae.) 41455. Two plants of a plum from Tsao chou fu, Shantung, China. Collected by Mr. F. N. Meyer. "A flowering plum, much beloved by the Chinese for forcing purposes. Generally being trained in grotesque shapes and always grafted on *Amygdalus davidiana*, as the last one stands drouth, transplanting and neglect better than the plum's own roots. Chinese name *Mei*." (Meyer.)

Tamarix sp. (Tamaricaceae.) 41413. Seeds from Bhutan, India. Collected by Mr. R. E. Cooper. Presented by Bees Limited, Liverpool, England, at the request of Mr. A. K. Bulley. "Scrubby plant with spike of heather colored flowers, growing on gravel by stream in bed of glacial valley at elevation of 12,000 feet. Plant 6 inches to 1 foot high, in masses with woolly fruits." (Cooper.)

NOTES ON BEHAVIOUR OF PREVIOUS INTRODUCTIONS.

Amygdalus davidiana (No. 34515). At the Truckee-Carson Experiment Farm, Fallon, Nevada, Mr. Fairchild found a tree 6 feet tall that had hardened its growth, whereas the mahaleb was still green. This tree has withstood alkali better than any other stock at Fallon.

A. davidiana (No. 36664) recently sent to Mr. N. M. Ross, Chief of Tree Planting Division, Forestry Branch, Indian Head, Saskatchewan, Canada, is now 2½ feet high and in promising condition. In this connection it might be noted that *A. davidiana* has attracted the attention of the Oregon Nursery Company. The budders are very much pleased with the way in which it takes the bud. As this Company is budding from one million to a million and one-half plants each year, the discovery of a seedling stock which takes the bud unusually well is a very important item.

Blighia sapida. The Akee has fruited for several years at Miami. The tree in the laboratory grounds there bore a good crop of fruits in February of this year. These February fruits are not so highly colored as those fruiting later. The arillus, however, was of good quality and had a delicate flavor. It is good when eaten raw, or cooked like sweetbreads.

Fraxinus sp. (No. 30414) from Khotan, Chinese Turkestan. When Mr. Fairchild visited the Forestry Branch at Indian Head, Canada, he found this Khotan ash frozen at

the top, but promising to be a success there. He also found this plant doing remarkably well under extremely trying climatic and soil conditions at Fallon, Nevada. Mr. Headley desires as many plants of this ash as he can get.

Macadamia ternifolia has fruited out on the campus at Berkeley, California, and at the Miami, Florida, Plant Introduction Field Station. This shows the range which can be expected of this interesting introduction.

Populus suaveolens (No. 22363) sent to Mr. F. B. Headley, Superintendent, Truckee-Carson Experiment Farm, Fallon, Nevada, leaves out two weeks earlier than any other Populus that he has. A three-year old tree in his possession is 20 feet tall.

Pyrus sp. (No. 26485) A popular pear in Chinese markets described as being of medium size, shaped like the American Bartlett, of yellowish white color, with rather coarse flesh and good keeping quality, has proven very resistant to drying winds and drought at our Introduction Field Station at Chico, California, and is recommended for trial in North and South Dakota.

Ulmus glabra suberosa (No. 34805). An elm purchased from Mr. A. Woeikoff by Mr. F. N. Meyer, which seems to be making excellent growth at the Northern Great Plains Field Station, Mandan, North Dakota. From its more spreading habit and more proliferous branching, it promises to be better adapted for shelter planting than even *Ulmus pumila*.

Ziziphus jujuba. (No. 22683) Bottle jujube from Shansi, China. Mr. F. L. Ramsey of the Austin Nursery Company, Austin, Texas, sent in ripe fruits of this number for three consecutive years. Many of the fruits are as large as full-sized commercial dates.

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P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
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S. C. Stuntz, Botanical Assistant, in charge of Explorers' Notes, Foreign Correspondence and Publications.
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Nathan Menderson, Assistant, in charge of Chayote Investigations.
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H. Klopfer, Plant Propagator.
J. M. Rankin, Assistant Farm Superintendent in charge of Rockville Md., (Yarrow) Plant Introduction Field Station.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
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