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About the Institute
The Hunt Institute for Botanical Documentation, a research division of Carnegie Mellon University, specializes in the history of botany and all aspects of plant science and serves the international scientific community through research and documentation. To this end, the Institute acquires and maintains authoritative collections of books, plant images, manuscripts, portraits and data files, and provides publications and other modes of information service. The Institute meets the reference needs of botanists, biologists, historians, conservationists, librarians, bibliographers and the public at large, especially those concerned with any aspect of the North American flora.

Hunt Institute was dedicated in 1961 as the Rachel McMasters Miller Hunt Botanical Library, an international center for bibliographical research and service in the interests of botany and horticulture, as well as a center for the study of all aspects of the history of the plant sciences. By 1971 the Library's activities had so diversified that the name was changed to Hunt Institute for Botanical Documentation. Growth in collections and research projects led to the establishment of four programmatic departments: Archives, Art, Bibliography and the Library.

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the 1939 movie, but Bruce doesn't play the stuffy scholar about it all. Actually, he thinks the casting of Ameche in the title role wasn't too bad. His book notes that the young Bell was black-haired, black-eyed with the dark complexion of a Latin and a natural ebullience.

Bell died in 1922 at the age of 75. During half his lifetime, he was a public figure, world traveler, lionized alike by royalty and the man in the street. Yet Bell was a very private man and one son-in-law said of him soon after his death: "Mr. Bell led a peculiarly isolated life; I have never known anyone who spent so much of his time alone."

From the letters and the pages of the notebooks, Bruce has lifted a fully-developed portrait of a man. Bell was cheerful, bothered by nervous headaches, had to fight to balance his need for isolation against his love for a convivial, close-knit family. He was a man who loved to work during the night hours, had moments of inventive inspiration that flashed on like the proverbial light bulb, and liked to sunbathe in the nude.

He was a man with an ever-curious mind, who worked on a bullet probe after Garfield was shot, a "vacuum jacket" that pointed the way to the iron lung, helped devise the flat phonograph record, built planes, and designed hydrofoils. The last notation in his notebooks is an observation on multiple-nipple sheep and breeding.

But there is a villain in the book.

"The villain is fame that

See BRUCE, G5, Col. 1

[TLS: 8 June, n.y., Kew, from L. H. Bailey to WP removed and placed in correspondence series, WP]

"The Cherimoya in California."

THIS is the title of the latest of a series of splendidly comprehensive bulletins on our semi-tropic fruits, by F. W. Popenoe, each bulletin containing all necessary scientific and popular data to interest and instruct both professional and amateur horticulturists. These bulletins are reprints from that valuable new publication, the Pomona College Journal if Economic Botany. The writer believes that much valuable knowledge of these fruits for local use has passed away for lack of record. In the early summer of 1891, when the writer left the old Germain nursery to spend two years in the northern part of the State, he had seen more cherimoyas in Los Angeles than he has seen since. Down on San Pedro street, between Third and Fourth streets(?) there were then several groups of fair-sized trees, differing greatly in fruits and foliage. At that time one grower said he had two varieties (or species) which he readily distinguished by the foliage, that on one being smooth, and on the other woolly. Not being much interested in the subject at that time the writer did not investigate, but believes the trees were introduced earlier and more extensively than is recorded or intimated in Mr. Popenoe's excellent monograph.

Ralph Cornell of this city is spending the week at Santa Barbara with a college friend, F. W. Popenoe. The latter is an authority on subtropical fruits and the latter part of this month will sail for India, where under United States government auspices he will study tropical and subtropical fruit conditions.

PASADENA MEN TO SPEAK BEFORE CONVENTION

F. W. and Paul B. Popenoe to Deliver Addresses at Santa Barbara.

FRUIT GROWERS TO HOLD CONVENTION

Excellent Papers by Many Experts Will Be Read and Discussed.

F. W. Popenoe and Paul B. Popenoe of Altadena, are programmed to speak at the forthcoming state fruit growers' convention to be held at Santa Barbara June 12 to 14. These two clever Pasadenans are experts in their line. The former has made a thorough study of the avacado, which some people persist in calling the "alligator pear." He will give information regarding this fruit, the cultivation of which is interesting quite a number of persons. Paul B. Popenoe, who has just returned from a trip to Europe, parts of Asia and Northern Africa, during which he studied date culture in the original home of the date, will speak regarding this fruit, which is found to do exceedingly well in some parts of Southern California.

Dr. C. F. Franchesi of Santa Barbara and a not infrequent visitor to Pasadena, will call attention to new and valuable semi-tropical fruits.

FORTY-FIRST

CALIFORNIA STATE FRUIT GROWERS' CONVENTION

under the auspices of

STATE COMMISSION OF HORTICULTURE

Held at

POTTER HOTEL ASSEMBLY ROOM

SANTA BARBARA - - - CALIFORNIA

June 12, 13, 14, 1912

Friend Wm. Richardson, Superintendent State Printing

New or Rare Winter Bloomers

By Dr. F. FRANCESCHI

In the March number of the Pacific Garden Mr. W. N. Campbell gave a most interesting essay on "Winter Bloomers," mentioning all the "staple" kinds which, since many years, have acquired undisputed citizenship in the gardens of Southern California.

But there are others, too, which have already taken their first papers and need only to become a little more known in order ... time favorites ... tioned below, ... their colors.

Yellow, of c...

and in the lig... ACACIA ACI... A. LINIFOLI... blooming from... and very suita... grounds, grow... form and stan... very pale yello... parent blosso... PRAECOX, th... very showy, b... delightful frag... early as Nove... LIS and T. S... them shrubby, ... the older know... the first name... of keeping we... of the second a... For extensive ...

... be more picturesque than BUDDLEIA MADAGASCARIENSIS with its long spikes of orange yellow blossoms, extra vigorous growth and striking foliage, snow white underneath. Another very showy plant is MIRASOLIA DIVERSIFOLIA, a sort of "shrubby sunflower," clothed with bold, halbert shaped leaves, its very large, golden yellow flowers appearing in December. CAL-

... a very long name for a shrub only a few feet high, is a pretty sight with its shining foliage and bunches of snow white, pea shaped flowers. RAPHIOLEPIS OVATA makes a compact shrub with dense, deep green leaves, and pretty heads of white flowers, and will bloom also at other seasons. RAPHIOLEPIS INDICA, only lately introduced, grows taller, with willow like foliage, tinged with red when young, and bears long panicles of white and rosy pink flowers.

More decidedly rosy white are the ...

FIRST PRIZE
First Annual Flower Festival
SIERRA MADRE

SHEET NO. ______ ACCOUNT NO. ______

EASTER LILIES.

TENGWALL FILE AND LEDGER CO., CHICAGO

1908

Aug 30 Rec'd from G. W. Oliver Expert Propagator, U. S. Dept of Agriculture, Washington D. C., Package of Lily Seed. He says "The seed is the result of a cross between Giganteum & Multiflorum, two of the best forms of the Easter Lily. There is enough seed to plant out about an acre of ground."

Sep 3 Seeds planted in seed bed in Lath House.

Oct 5 Lily seedlings.

EXPLORING PLANT GROWTH OF PANAMA CANAL ZONE

Professor Pittier, in Charge of Botanical Work for Smithsonian Institution, Writes of Discoveries.

FINDS RARE FLORA

Forests of El Boquete Are Regarded as Beyond Compare—New Giant Elm Attracts Expert's Attention

WASHINGTON—An account of the work being done in the Panama Canal Zone by the men sent there by the Smithsonian Institution to make a complete survey of the animals and plants of that territory, is contained in the following letter just received from Prof. H. Pittier, who is in charge of th ebotanical work:

I have the pleasure to report our return from Chiriqui, after a successful expedition of six weeks. We located at El Boquete and found the middle and upper valley of the Caldera river very interesting floristically. The district is wonderfully rich in orchids, some of which are beautiful, and as Mr. Maxon has made a good collection of them, we hope to have soon in Washington the living specimens of many of the specific types of the Warszewicz collection, made in the 60s in the same region.

The forests of El Boquete are simply magnificent and I wish I could find English words to give you even a short description. One of the dominating species is a giant elm, which I never met in other parts of Central America. Of course, it is very difficult to get botanical samples of these trees, but I have been rather successful in that line and hope to be able to fill gaps in the United States national herbarium.

We ascended the Chiriqui volcano and the Cerro de la Horqueta, which I found to be respectively 3374 and 2208 meters high. The former is entirely in the semi-arid region of the Pacific. At about 1800 meters the oaks have become the dominating element of the forest, and they remain so up to about 2600 meters, although mixed still in the lower belt with a gregarious Persea very closely related to the common alligator pear. On the side we ascended the upper limit of the [illegible] on the northeastern flank.

We camped at the bottom of an old crater north of the peak on March 12, and at 7 a. m. the temperature was about 31 degrees above zero. Every drop of water was congealed and the ground covered with a fine white frost. That day we ascended to the summit. The volcano is absolutely extinct and the highest peak is on the northern side of the ridge corresponding to the most recent crater, where sulphur is still found and the vegetation very scarce.

We had intended to spend a few days at our upper camp and to explore the upper part of the mountain as thoroughly as possible. But on returning to the camp we were greeted with the news that there was not a drop of water left, and that a careful search of the neighboring gorges had failed in revealing a new supply of it. Under such circumstances the only thing to do was to go home.

That night we went to bed without dinner and thirsty. Early in the morning we started without breakfast, and were glad when we found the first wild pineapples, in the foliai axis of which there is almost always a small supply of water.

We went to Cerro de la Horqueta March 17-19, which is as wet as the volcano is dry, although not 10 miles distant on the opposite side of the Caldera valley. Here the forest is very dense. The upper part of the peak is buried under a low, scrubby forest, very much mixed as to families, and three when it comes to cut a trail through the tangle of distorted trunks, vines and tamboos, all uniformly clad in a thick dripping mantle of mosses and allied plants.

This was a paradise for Mr. Maxon, who collected an end of rare ferns. I think we were the first people to ascend that peak, as no traces of an old trail could be discovered in the upper part of the peak.

My collection in that region consists of about 600 species and besides I have a large amount of interesting data. I left Boquete on March 21 and walked about 40 miles to David, passing to the village of Caldera, well known to ethnologists on account of its "piedra pintada" (painted, i. e. carved, stone). My object in walking, despite the excessive heat, was to study as closely as possible the vegetation of the vast expanse of savanas. But I found them dry and parched, and so could see but little.

12 ALLIGATOR PEAR TREES SELL RANCH

Denver Broker Acquires Beginning of New Industry at Whittier

WHITTIER, Feb. 11.—Twelve alligator pear trees on a five-acre orange grove were the principal inducement for H. A. Woodworth, a Denver broker, to buy the place. The grove was owned by G. M. Ganter and the price was $14,500. Mr. Woodworth, who, with his wife, has been visiting here, will return to Denver and then come to Whittier to live.

The twelve alligator pear trees, one of which has been bearing for two seasons now, has proven that it is possible to raise that very valuable fruit in Whittier and vicinity. These trees were set out by A. R. Hideout seven years ago as an experiment and this season G. M. Ganter has taken more than $170 worth of these pears off one tree, which is bearing, besides selling three limbs for budding purposes for $110.

Several of the other trees are in full bloom and will undoubtedly bear next season. It has been found on investigation that in the Southern California climate some of these trees will commence to bear at the age of four years, while others may be ten or twelve years old before any pears will appear. They grow to the height of more than thirty feet and resemble the Magnolia tree to a great extent.

Owing to the fact that almost all alligator pears which are on the market in the United States are shipped in from the Hawaiian Islands or Mexico their price is very high, and they retail from 50 cents to $1 each.

Besides the bearing tree on the beautiful Whittier orange grove, there is one at Hollywood which is twenty years old and which produced more than $400 worth of these valuable pears last season. The crop next season is expected to bring $900.

Bauhinias

By DR. F. FRANCESCHI

A most interesting group of flowering trees or shrubs which during these last fifteen years have gained foothold in the gardens of Southern California, mostly through the efforts of the S. C. A. A. of Santa Barbara, Bauhinias attract the attention of everybody, even when out of bloom, on account of their curiously-shaped leaves, which are generally composed of two lobes, more or less deeply divided, but joined together at their bases, which feature inspired the French botanist Plumier to commemorate with this class of plants the name of John and Caspar Bauhin, brothers and botanists of the sixteenth century.

To persons familiar with the flora of the Eastern states, Bauhinias are sure to appear like the glorification of the "red bud," CERCIS CANADENSIS, to whom they are in fact very closely related.

There have been named and described at present more than 200 different species of BAUHINIA, but hardly one-tenth of that number was introduced to cultivation up to the present time.

Their geographical distribution is very wide, species being found in every tropical and sub-tropical country both of the old and of the new world, while a few are found in tropical Australia.

Not less wide is the range of colors of their flowers, from pure white to pink and crimson, to different shades of purple, to bright yellow and to orange red, many of said colors being often combined.

Most of the introduced kinds have persistent leaves, a few are deciduous, and for this reason are likely to prove hardier than the others.

In regard to culture, Bauhinias are not particularly exacting; they will grow and bloom well in any ordinary garden soil, and on our coast appear to do better right in the open sun. A liberal supply of water during the summer months is sure to improve their blooming.

In the enumeration of the species introduced to Southern California which follows, the degree of hardiness of each is marked by * for those which need the same climate as the lemon, and by ** for those which are likely to do well only in frostless localities.

*BAUHINIA ACUMINATA, India. Spiny and not very tall growing; lobes of leaves sharply pointed; flowers white with rather narrow petals.

*BAUHINIA CANDICANS, River Plate. Very likely one of the hardiest kinds: flowers white, much like the preceding.

*BAUHINIA DIPHYLLA, India. Spiny: lobes of the leaves quite deply cleft: flowers white.

**BAUHINIA FORFICATA, Brazil. Very vigorous growing: lobes of leaves much spreading: flowers purple red. Only lately introduced.

*BAUHINIA GALPINI, Natal. A perfect gem, growing quite compact and bushy, with its branches spreading over the ground: leaves small, hardly bilobed, dark green, the new growth of bronze color: flowers very profuse, for eight months in the year, of a fine, brick red color, at some distance to be mistaken for "nasturtium" flowers.

*BAUHINIA GRANDIFLORA, Peru. Makes quite a spreading tree, with spiny branches and deciduous, light green foliage. The flowers appear in great profusion at the end of the branches, during all summer; they are quite large, snow white, and have the appearance of giant butterflies.

**BAUHINIA HETEROPHYLLA, West Indies. Climbing: foliage rather delicate, the new growth tinged bronze color: flowers light purple. Just introduced by the S. C. A. A.

**BAUHINIA HOOKERII, Queensland. Attains great size in its native country but keeps dwarf and grows exceedingly slow here: leaves are quite small, almost round: flowers white, edged with pink.

**BAUHINIA KRUGI, West Indies. There called "flamboyant blanco" and also "varital," yellow, white and pink blending in its flowers. Leaves are quite large, light green, with rounded lobes and quite prominent nervation; pods very large. Introduced in 1907 by the S. C. A. A.

**BAUHINIA MONANDRA, India. Similar in general appearance to B. PURPUREA, but of more spreading habit, and its flowers being striped and mottled in white, crimson and yellow. Introduced in 1905 by the S. C. A. A.

**BAUHINIA PICTA, Colombia. Of rather small size and with small leaves, almost rounded and deeply cleft. Said to have the finest flowers of all American Bauhinias. Offered for the first time in 1908 by the S. C. A. A.

*BAUHINIA PURPUREA, India. Probably the first kind ever introduced to California, and more generally known. Also one of the hardiest. Grows quite tall, sending up upright branches: leaves persistent, coriaceous, of a dark green color: flowers large, slightly fragrant, beautifully striped with crimson on purple ground. A thirteen year old specimen in the grounds of the S. C. A. A. at Santa Barbara is about twenty feet high and bears flowers almost all the year round.

*BAUHINIA TOMENTOSA, India and Ceylon, and there called "St. Thomas flower" from the red blotch (like of blood) on its clear yellow flowers. Now cultivated and very popular in all tropical countries. Only grows in a shrub: its leaves are light green, fragrant, and much used for medicinal purposes.

*BAUHINIA VAHLII, India. The "camel's foot climber," as it is called from the shape of its very large leaves. An immense "vine" which may attain 300 feet in length, and mostly known on account of the extra long and strong fibers of which ropes are made in India for native suspension bridges. Flowers are white, but I do not think it has ever bloomed in California, although introduced about fifteen years ago.

*BAUHINIA VARIEGATA, India. For general purposes, and taking all in all, probably the best of the kinds as yet introduced in California. Attains large size, with fine, spreading habit: leaves shaped like those of B. PURPUREA, but with a slightly glaucous tinge. Blooms most profusely for many months in the year: the flowers are large, delightfully fragrant, white, rose, crimson and purple being harmoniously mixed together, and in shape and color resemble quite closely to AZALEA or CATTLEYA blooms, while a large bush of this kind is truly a magnificent sight when in flower.

BAUHINIA YUNNANENSIS, China. Quite interesting for its comparatively northern habitat. Leaves small, bright green on long petioles. Introduced only this year by the S. C. A. A. of Santa Barbara.

Vincent Davin
Chef de Culture au Jardin Botanique
Professeur d'Arboriculture Coloniale
Remerciements & félicitations
Marseille 571 rue Paradis

On a South Sea Isle.

WHO has not, at some time in his life, when the "demnition grind" has begun to wear upon the nerves, yearned to hie away to a Pacific island, where the skies are always blue, and bountiful nature supplies almost all your needs. A few white men have tried such a life, and have stayed with it, but a gerat majority who have essayed it have returned sooner or later—usually sooner—to the "flesh pots of Egypt."

It is easy of comprehension why one living in the eastern part of this country, with its severe winters and trying summers, should yearn for something milder and more agreeable in the shape of climate and surroundings, but it is difficult to understand why any one so favored as to live in this land of California should have any desire for a "change of venue." Here we have a climate that is as near perfection as anything to be found on earth. A wonderful range of climate and scenery may be found in the thousand miles extending from San Diego to Siskiyou. There are altitudes from 250 feet below sea level to 10,000 feet above, long stretches of sandy shore, laved by the waves of the placid Pacific, foothills dotted with live oaks, mile after mile of fragrant orange groves, and mountain summits clothed with magnificent pines. Here, in California, a man may live without seeing a human being for six months, if he so desires, and yet be within a few hours' journey of civilization. Moreover, he may find a ready market for anything he raises, whereas on a Pacific island he will usually have to give away his products that he cannot consume himself.

Remember also, you who yearn for a life of vegetation on a Pacific island, that

"It is not all of life to live,
Nor all of death to die."

Man is—or should be—something more than an ox. Any ordinary animal can, and does, eat, and drink, and go naked. A man living in the slums of Chicago, eating tripe, wearing woolen underwear and not taking a bath twice a year may be of much more service to humanity than one who wanders about, undressed like John the Baptist, and lives on fruit.

About six months ago there was published in the Care of the Body an illustrated sketch of Ernest Darling, who for a short time dwelt in Los Angeles, now a resident of Tahiti, and called by some the "nature man." A few months later half a dozen Los Angeles people left for Tahiti, with the intention of settling there. Two of them have already returned to California, and one other was, at last report, working his way home, by a circuitous route, on a steamship to New Zealand. One of those who returned reports that Darling's mountain land is not at all suitable for colonization purposes.

Here are extracts from a letter received a few weeks ago from Darling, by the editor of the Care of the Body:

"Bananas cost 10 cents for a seven-pound basket; oranges 5 cents a dozen; plantain 20 cents to 30 cents a bunch; avoca pears 20 cents to 30 cents a dozen; cocoanuts 2 cents each; tree melons (papias) 10 cents for a ten-pound basket. Clothing, tools and all imported goods are somewhat dearer than in the United States.

"Land (along the beach,) partly improved, costs from $50 to $100 per acre. First-class improved land with buildings, fences, etc., may be bought for from $150 to $300 per acre, according to improvements, and location. From two to four acres is an abundance for a naturist family. Indeed, a person of very simple wants can with $300 or $350, buy an acre or so, furnish it complete, and have a little income to pay all expenses. . . .

"People in poor health or with weak lungs would better be cautious in coming here. There is some malaria along low-lying parts of the beach land, and the atmosphere is rather damp on the island. [illegible] the world. Insect pests are about the same as they are in similar locations on the continent. They are rather thick in [illegible] and in low places. [illegible] pests. Centipedes are common on my place, but are no more trouble to me than the earth worms. I kill them if directly in my way, but I often hoist them aside with my ho[illegible]

"There are missionaries and churches galore. Schools are not up to date. The government does fairly well in administering law and keeping order. I enjoy so much liberty that I won't complain at the usual faults. I wear practically only a pair of pants, as I go about my errands in town in ordinary weather. The little net I wear over my breast and back is too thin to be called a shirt. Thus hatless, shirtless and shoeless I generally go unmolested. . . . There are three or four of us whites who enjoy this freedom of undress. 'Vags' don't do well here. We have fairly good police.

"Tahiti exports cocoanuts, copra pearly-shell, vanilla and curios, and imports vast quantities of foodstuffs of all kinds, canned meats, butter, eggs, fish, breadstuffs, drygoods, plain and expensive, perfumery, fine clothes and machinery. In 1905 we imported $100,000 worth of breadstuffs alone from the United States. Nine-tenths of what we import we might produce ourselves. This pitiful squandering of our much-needed money on imported luxuries is what keeps us too poor to buy plenty of good books, build suitable libraries, gymnasiums, etc. The missionaries are generally so well fed that we couldn't expect them to become athletic gymnasium teachers. Besides, God never told Moses to give out the eleventh commandment—'Thou shalt have good health and a little fun.'

"There is no duty on machinery or books. No land tax, but a poll tax of $6.50 after the first year. All this is comparatively reasonable. On the other imports the duty varies from 20 to 40 per cent. Bicycles and phonographs are taxed 30 per cent. duty. There is no duty on household goods and tools brought with home seekers. . . .

"The good old-time generosity of the Kanakas has been worn threadbare by the whites' influence. Many of the natives have become rather dishonest and unreliable, though they are good workers when properly fed, paid and watched. Some of them are as companionable as some of the whites, but I marvel they are not totally extinct, when I observe their acquired habits of eating, drinking and dressing, and when I see their lack of judgment in spending their hard-earned dollars.

"Since the whites came, the beautiful forests have almost disappeared. Cooks must have charcoal to make the natives' coffee.

"The industrious Chinamen are fast gaining hold in the islands. They multiply in business and in numbers, bringing over their multipliers from Hongkong—little women who can bear a child every year or two, and keep it up for fifteen or twenty years.

"People wishing to try the 'nature life' would better try it a few weeks or months first in their own country, get browned, and hardened to camp life, and raw food, get familiar with the best health magazines, and culture books.

"Immigrating naturists should not expect too much of Tahiti, nor of us naturists who are settled here. We will do what we can to help people get located. Don't be discouarged by reports from n'er-do-well tenderfeet and beach combers, who came expecting to find plenty of health food growing wild, and expecting the natives to shelter them. The steamship company formerly sent out pamphlets to the effect that work was almost needless here!

"Instead of the climate debilitating, it is very vitalizing to me, and to all the naturists who work, bathe, and eat moderately and regularly, and who dress accordingly.

"The water is always refreshing, so are the cocoanuts, oranges and other delicious and nutritious fruits. Don't let uninformed, prejudiced, paid tourist writers 'stuff' you with tales about the tropics. Their sensational crooked stories were made to sell.

"The [illegible] from $40, third class, and up from San Francisco. It is a safe and delightful trip. Get away from your mother's apron strings; save up enough for a round-trip fare and some [illegible] money besides; and see these enchanting South Sea Isles for yourself."

"To business that we love we rise betime
And go to 't with delight."—*Antony and Cleopatra*

Pittosporums

By DR. F. FRANCESCHI

Among the host of evergreen trees and shrubs which have convened from all parts of the world to beautify our California gardens, a most interesting and most useful group is that of the Pittosporums, on account of their neatness of habit, their hardy constitution, their ability to stand heavy winds, as well as of their diversified appearance which affords most valuable resources to the landscape gardener if acquainted with the nature of plants to be employed in his work.

The name of PITTOSPORUM (accent on the first o) is derived from two Greek words meaning "pitch" and "seed," on account of their seeds being coated with a sticky substance which efficiently helps their dissemination. In size Pittosporums will vary from lofty tres to prostrate shrubs; they all have entire, coriaceous leaves, and five petaled flowers generally white or yellowish and very sweet scented, in a few species chocolate colored and scentless.

No Pittosporums are found native in Europe nor in the whole American continent, but one species is found in Madeira and the Canary Islands, several in South Africa, quite a number in India and in China, while most kinds cultivated in gardens come from Australia and New Zealand, and a few species belong to the Philippines, the Malayan Archipelago, Tahiti, Fiji, and the Hawaiian Islands.

In the enumeration which follows I will mention only those species which have been introduced and cultivated in California, some well known and popular since many years, others, and not the least valuable, only recently introduced:

PITTOSPORUM TOBIRA. Northern China and Japan. Without doubt the hardiest of all, and very likely the first to be introduced to California, having been very popular for a hundred years or more both in Europe and in the Eastern States. Will grow compact and bushy as a rule, but there are some from 18 to 20 feet high at Santa Barbara; its foliage is of glossy dark green color, and it is literally covered in April and May with a profusion of snow white, orange smelling flowers. A variety with variegated leaves is also much prized, and it generally grows not quite as tall as the plain green type. Very extensively used on the coast of the Mediterranean for planting on the sea shore, as it will stand the violent saline winds better than most other shrubs. To be highly recommended for our Pacific coast, from Vancouver down to San Diego.

PITTOSPORUM EUGENIOIDES. New Zealand, where it bears the Naori name of "tarata;" grows up to 30 or 35 feet, but in such case its stems and branches becoming rather bare; leaves 2 to 4 inches long, often in whorls and with undulated margain; flowers white, sweet scented with reflexed petals, 1-4 to 1-3 inch diameter. More extensively planted in the north of California than in the south, where P. undulatum takes its place with advantage.

PITTOSPORUM UNDULATUM. New South Wales and Victoria, where it is said to reach 90 feet in height; here our oldest plants are not over 40 feet. If properly trained it will make a first-class street tree with a naturally rounded and compact head, very thick foliage and highly fragrant white flowers in spring. It will stand clipping even better than the preceding and makes admirable hedges or screens, while, if alowed to grow with its branches droopnig to the ground, it makes one of the finest ornaments for large lawns.

PITTOSPORUM CRASSIFOLIUM. New Zealand. May attain 30 feet, and grows quite different than the others, its outline being upright and columnar like a Lombardy poplar, while its foliage is decidedly gray all over, the underneath almost white, so as to make a silvery effect when moving in the wind. Its flowers are of a curious reddish chocolate color and not showy. It has proved most valuable for covering the sandy hillsides of Golden Gate Park, where it will stand better than most trees or shrubs the almost continual and strong cool winds which are blowing along the coast of Northern California.

PITTOSPORUM TENUIFOLIUM. New Zealand, probably identical with P. NIGRICANS and P. COLENSOI under which names it is found in many gardens. Said to grow as high as 40 feet, but generally much lower and bushy; leaves of a light green color, not over 2 inches long, on branchlets of blackish color; flowers, solitary, chocolate color, scentless.

PITTOSPORUM RHOMBIFOLIUM. Queensland and New South Wales. Will attain 80 feet, and, for its regularly pyramidal shape, glossy foliage, very prominent umbels of whitish, fragrant flowers in summer, and of orange yellow berries during all winter, may deservedly be considered as the king of all true Pittosporums, and among the very best avenue and shade trees which can be grown in this country. It was first planted at Santa Barbara some 35 years ago, but it is only these last ten years that it has become generally known, mostly through the efforts of the S. C. A. A.

PITTOSPORUM PHYLLIRAEOIDES. desert region of Central Australia. May attain 20 or 30 feet. A most interesting species, not only for its desert habitat, but for its appearance, quite different from any other; in fact, to be mistaken for a weeping willow, over which it has the advantage of being evergreen and of standing any amount of drought. It offers also the peculiarity of being the only Pittosporum (to my knowledge) which sends out suckers, which, however, one must dig down very deep before finding any roots, and no wonder in view of its native habitat. This kind also was first planted at Santa Barbara, some 35 years ago, before any other place in California, and as far as I am able to ascertain, even in Europe. Until a short time ago it has remained quite scarce for the reason that nobody ever succeeded to root cuttings, suckers were unfrequent and hard to transplant, and seeds, although produced freely, were very seldom fertile. These last few years, however, the S. C. A. A. has succeeded in raising a considerable stock of seedling which will permit to divulgate it in our gardens. In cemeteries, in public parks, or in private grounds, wherever the effect of a "weeping" tree is desired, and not much moisture is available, P. PHYLLIRAEOIDES is just the one to use. Its flowers, although not large, are of a bright yellow color and distributed all along its drooping branchlets, and the golden yellow, olive shaped berries persist on the tree for several months.

PITTOSOPORUM VIRIDIFLORUM. South Africa, 20 to 30 feet. First introduced to California by the S. C. A. A. in the year 1894, a few specimens in Santa Barbara having already become quite good sized trees. Its leaves are very much alike those of the Chinese P. TOBIRA, but of a brighter green color. Its flowers, as its name implies, are greenish yellow, but they are delightfully fragrant, and appear in the greatest profusion during the winter months. A very desirable kind altogether, and sure to prove qnite suitable for a street tree.

PITTOSPORUM TETRASPERMUM. Nilghiri mountains in India and mountains of the Island of Ceylon; 20 feet or more. Introduced by the S. C. A. A. in 1894. Quite distinct for its broad foliage, in the young stage resembling the common "loquat." Flowers yellowish white in very large umbels, slightly fragrant. More tender than other kinds in cultivation.

PITTOSPORUM HETEROPHYLLUM. South Africa. Attaining only a few feet in height and mostly spreading over the ground. Leaves are small, of various shape and of a light green color; flowers, solitary, light yellow, berries same color. Eminently adapted for large rockeries and embankments and sure to stand drought well. First introduced by the S. C. A. A. in 1904.

PITTOSPORUM HAWAIENSE, Hawaiian Islands. Called "hohawa" by the natives; not over 15 feet; leaves silvery white beneath; flowers of brown color. First introduced by the S. C. A. A. in 1907.

PITTOSPORUM PROCERUM, known also as P. LAURIFOLIUM, Madeira and Canary Islands. Only quite recently introduced by the S. C. A. A. Will grow up to 20 feet, with rather large leaves, and white flowers with a bluish tinge.

Although now separated from Pittosporum, on account of the very different conformation of its fruits, I cannot abstain to mention here HYMENOSPORUM (formerly PITTOSPORUM) FLAVUM, a native of Queensland and New South Wales, which may attain the height of 100 feet in favorable conditions. This is a truly magnificent tree, admirable for avenues or for isolated specimens, on account of its quick and symmetrically pyramidal growth, of its gracefully drooping branches, of its glossy, thickly set foliage, and of its large, bright yellow, very fragrant flowers, which appear in April and May. This very desirable tree must have been at first introduced many years ago, judging from two large specimens in Golden Gate Park and in the cemetery of Berkeley, but it had not found its way to Southern California before it was reintroduced there by the S. C. A. A. in the year 1895. One specimen in the grounds of the S. C. A. A. on State street and another of same age but larger in the grounds of Mrs. C. B. Hale, corner Laguna and Pedregosa, are both now quite splendid trees and greatly admired.

It is quite possible that in the above enumeration some species of Pittosporum may have escaped my notice, and I shall be grateful to anyone who will kindly advise me of any such omission.

Santa Barbara, Cal.

The Mango.

IN considering this fruit, one should eliminate from the mind any and all impressions previously formed by direct or indirect contact with the fruit generally known by the name of mango in countless numbers of varieties of mongrel seedlings that have spread throughout all tropical countries from their native country, the East Indies. These fruit we do not consider at all from a commercial standpoint. The cultivation of the commercial varieties of this fruit has previously been defeated by difficulties in propagating true to variety. Prior to my discoveries in the beginning of the present century there had been no way to accomplish this except by the slow and expensive method of inarching, as is still practiced by the Hindoos and all others except myself, other than a few trees, largely accidents in experiments of budding. The methods we apply are similar in results to those applied to all commercial fruits in civilized countries, except that some peculiar habits of the plant make it still more expensive, but fully as progressive.

The Mulgoba mango was introduced into this country in 1889 by the importation of an inarched tree from India, and up to the close of the year 1900 there were less than 100 inarched trees in South Florida of this variety, and about the same number of inarched trees of this and other fine varieties from the East Indies, growing in government gardens and botanical collections on the western hemisphere. Since that time and now growing in orchard places, there are less than 500 trees of this variety except those produced in our operations.

The Mulgoba we consider the only standard commercial variety of mango tested in this country, and there are several thousand trees now planted here in commercial orchards. There were only about 200 of these of bearing age and producing fruit this season, which have given us sufficient fruit to establish in market in the largest cities, and only among a few of the fancy dealers. I find it the easiest fruit product to sell that I have ever offered to the fruit trade. We now consider ourselves over the pioneer days in this, the most promising industry of modern horticulture.—[Rural New Yorker.

California Bana as.

"CAN bananas worth eating be grown in Southern California?" is a quite common question thrown at the writer. None have been grown on a commercial scale, but bananas of fine quality have occasionally been grown locally and on Santa Catalina Island. They are still better with ordinary care.

"What are the proper cultural directions?" is next asked.

It is evident from the rank growth of the banana plant that it must have an abundance of nitrogen, and it is a gross feeder. It will grow splendidly on an old pile of stable manure, without any admixture of soil, ers each spring, just as soon as they showed vigorous growth. A mulch of several inches or even a foot of stable manure will help much. Bananas need an abundance of potash, and some of this may be supplied by using wood ashes, perhaps a sufficient quantity. Yet by reason of the large amount of lime ashes they contain, it will perhaps be wise to experiment with potash from some other source.

Formal Garden in Pasadena

By R. SCHIFFMAN

A garden to be beautiful should harmonize with its surroundings. A natural style of arrangement cannot always be followed, on account of the environs of the landscape to be improved, therefore each place calls for individual treatment. In semi-tropic Southern California, where the landscape presents mountains, hills, valleys, woodland and distant vistas and where the colonial mansion near by. In order to improve this conspicuous spot and at moderate cost, both as to construction and subsequent maintenance, it was decided to install a pool for water lilies and other aquatic plants. The fountain is of Japanese origin and of bronze. Four large beds and four small ones were laid out, surrounding the pool. The large ones, bordered with buxus, are planted solid to white, scarlet, pink and blue verbena, with a magnolias and Italian cypress, is planted with canna, abutilon, hollyhock, dahlia and nicotiana properly arranged, with a border of santolina. When the plants named in the beds and borders are at rest, bulbs and stocks will be planted to keep up the floral display during the winter months. At the base of the columns of the pergola blue wistaria is planted. The view obtained from the seat in the pergola extends from Old Baldy mountain, 70

a luxurious vegetation so rapidly responds to appropriate culture, it is not likely that the "formal," or geometric garden will ever become very popular, but there are individual cases like the one illustrated, where its application has resulted in appropriate and harmonious combination.

The site is that of a former tennis court for which I had no use. It was oblong in shape, two sides were flanked by a low concrete wall and presented a bleak and dry aspect from large specimen of pittosporum in the center of each bed. The small beds, bordered with euonymus, are planted solid to silver and golden leaved geraniums and at each corner of the beds arbor vitae is planted, the smaller ones on the inner side of the walks surrounding the pool. The outer border, next the wall, is planted solid to delphiniums, penstemons, digitalis, coreopsis and aquilegia, each variety by itself; while the south border, having a background of tall Monterey pines, miles away in the east, to Eagle Rock and the coast chain of mountains to the west, Mounts Lowe and Wilson to the north and Garvanza to the south. The photograph was taken at the end of last month (November), and vividly portrays to our eastern friends the blessings we receive in Southern California. While reading of a threatening coal famine, snow and cold weather in the northern and eastern states, we are enjoying ideal sunshine and flowers as yet untouched by cold or frost.

SPONGE FISHING IN FLORIDA.

A VACATION AMONG THE KEYS THAT CAN BE MADE TO PAY FOR ITSELF.

[New York Sun:] "One of the most enjoyable of my winter vacations was spent in sponge fishing among the Florida keys," declared a young married woman. "We went down to Key West and there made arrangements to take a trip with a sponger who owned his own boat, which was also his family home. When I asked what supplies we must take along in the way of food the question brought a hearty laugh from both the sponger and his wife, with a chorus of giggles from their two young daughters.

"The wife explained that food was the one thing they never thought about down there. All they had to do was to drop a line overboard for their meat and take a walk along some beach for fruit, while at any habitation vegetables were always to be had for the asking.

"The mistake I made was not thinking to ask about the water. Before we were out a week that very necessary commodity became uncomfortably scarce. You see the sponger had depended on replenishing our supply from a cistern on a certain key. When we reached that key it was found that something or somebody had not only emptied the cistern but destroyed it. That meant going without water for another six hours, and was not at all enjoyable for me at least.

"As that was the only time it happened and was the only thing that was the least bit unpleasant on the cruise I always tell it first and then go on to the charming and unusual incidents.

"To begin with the boat we were in was both commodious and comfortable. When it was recommended to my husband by a merchant he told us that unless we could go in a good new boat we might find the odor of the sponges rather unpleasant before we finished the trip. We didn't, not because there weren't enough sponges taken, but because we gradually became accustomed to the odor.

"The actual fishing is done by two or sometimes three persons in a skiff. On our boat the wife and each of the girls had a skiff. During the second week a skiff was assigned to me, and I can truthfully say I never enjoyed any possession more thoroughly. All we women did was to scull, while the man who accompanied us did the fishing. This man was supplied with a water glass and a sponge hook.

"It is one of the oddest sights to see these sponge fishers being sculled about with their heads in these wooden buckets, which are thrust almost rim-deep in the water. The fisherman's hand goes back, reaching for the sponge hook, the sculler stops the boat until the hook is adjusted about the roots of the sponge and it is pulled up and into the skiff.

"Looking through the water glass at the sponges growing on the bottom of the bays and rivers some of them are like fairy trees in a fairy forest. It almost seems a pity to tear them up. Once they are out of the water much of their beauty disappears, though they are not a bit more unsightly than seaweed. The odor that so many people object to is produced by the decomposition of the gelatinous matter.

"So far as the cost of such a trip is concerned it can be made to pay for itself. We paid our way, though my husband had not planned that we should. We were taken on the sponger by the owner for a stipulated price, not very much to our northern ears, but when one considers the cheapness of all food supplies and the simplicity of our accommodations it was doubtless quite ample to the boat owner and his thrifty wife.

"There was the understanding that we were to have all the sponges we took. As I have been accustomed to handling a canoe and rowboat all my life it was not long before I could manage to scull my husband around in our skiff. On two occasions we brought in more sponges than any of the other skiffs, and you may be sure were praised.

"The skiffs always return to the large boat for [illegible] and to sleep. The three meals a day are [illegible], and in our boat one would not have found better cooking in any first-class restaurant, that is of the articles we had. Fish we had in an almost [illegible] variety, [illegible] was abundant as fish, and vegetables were usually served for dinner.

Tropic and Semi-Tropic Fruits for Sou. California

By DR. F. FRANCESCHI

"What cannot we grow?" was for a long time the enthusiastic outburst of all lovers of plants who had the fortune of settling in this privileged country of Southern California. And the wonderful result was attained of amassing here, in a comparatively short time, an immense number of plants from all quarters of the globe. By degrees, experience was gained, failures were met, and every day we are acquiring knowledge which we did not possess twenty years ago.

Speaking of tropic and semi-tropic fruits only, we are well aware now that, while almost every fruit bearing plant, from any part of the world can be raised and grown in Southern California, quite a considerable number of them cannot be expected to bear plentifully or to perfectly ripen their fruits, principally for the reason of insufficient heat during the summer months, and more particularly so all along our coast belt, where other conditions are eminently favorable for the development of tropical and semi-tropical plants.

Consequently, in the enumeration which follows I shall confine myself to mention only such fruits as have undoubtedly acquired the citizenship of Southern California, together with others of more recent introduction, concerning which we cannot entertain any reasonable doubts.

An intense fascination there is in raising and in watching the growth of any new plant, and such interest is intensified by awaiting the appearing and the ripening of a new fruit, and there is also a feeling of satisfaction in contributing with our own experience towards the welfare of our fellow citizens and towards the increase of the productiveness of California. Old and new settlers in Southern California, whether you possess thousands of acres, or only a modest city lot, plant some fruit trees and you shall be repaid tenfold for your cares, while the value of your property, small or extensive, as it may be, will be considerably increased.

ABERIA CAFFRA, "Kei apple" of the South African Colonists, is a thorny, tall-growing shrub, making impassable hedges; fruits size of a small apple, bright yellow and very sweet. Does well also in Northern California.

ANONA CHERIMOLIA, "cirimoya," by some wrongly called "custard apple," which names belongs to the West Indian A. RETICULATA(never been a success in California). A small, bushy tree, with broad, aromatic leaves, and greenish flowers, not attractive, but exhaling a most delicious allspice fragrance, mostly during the night. It will begin to bear when about three years old, its large, variously shaped fruits, of a dull green color, attaining over one pound in weight and of the consistence of ice cream when ripe; taste hard to describe, but generally relished by everybody. It grows easy and fast, and ought to be in every garden for the merits of its foliage, flowers and fruits combined. To the present date only seedlings are grown, but now that more attention is being paid to this delicious fruit, improved varieties are sure to be noticed and propagated by grafting or budding.

BYRSONIMA CRASSIFOLIA. A very recent introduction from Mexico, where it is very popular and goes under the name of "nanche." It is a small evergreen tree, with thick leaves, yellow flowers, and large bunches of reddish black berries of very good taste.

CARISSA GRANDIFLORA, from Natal, South Africa; growing not over 6 feet; very bushy and compact, with thick, dark green leaves and curious, double-pointed thorns, quite suitable for hedges. Flowers look like large, pure white Jasmines, and have the same scent; fruits oval shaped, size of an ordinary plum, dark crimson in color, and full of a crimson pulp which makes delicious jelly. Also this possesses so many points of merit that it ought to be in every garden.

CASIMIROA EDULIS, "zapote blanco" of the Mexicans; the first semi-tropic fruit ever introduced in California, there being one large tree in Santa Barbara, coeval with the Old Mission, and more than 100 years old. This grows to quite a large size, very much spindling up in the young stage, but, with time making a spreading, dome-shaped, umbrageous tree. Leaves trifoliate, shining, generally dropping about August, but coming out again at once. Fruits size and shape of an apple, yellowish, containing a very sweet pulp, which in Mexico is said to make one go to sleep if partaken of too freely.

CITRUS FRUITS. A comprehensive name, originated, I believe, in California, and including Oranges, Lemons, Mandarins, Citrons, Limes and Pomelos, of which all so many different varieties are grown. A selection of the best adapted to each locality ought to be planted even on very limited grounds; one or two Lemon trees will supply the needs of any family, and what can be more pleasant and more ornamental than a few Orange and Mandarin trees about the home grounds? With proper care they will come into bearing only two years after planting.

ERIOBOTRYA JAPONICA, the very popular "loquat" from Japan, which can stand more frost than we have anywhere in California, and has also the advantage of standing heavy sea winds better than other fruit-bearing trees. Of late years some much-improved varieties were obtained in California, and we can reasonably expect to be enriched pretty soon with still larger, sweeter and seedless varieties.

EUGENIA PITANGA, from Brazil and Argentina; a tall, compact growing shrub, with myrtle-like glossy leaves and pretty white flowers; fruits ribbed, shaped like a small tomato, of the brightest scarlet color, and having a peculiar taste, by most people preferred to any of the guavas. They make also a first-class jelly. Other species of Eugenie from the same region are being introduced also; among them E. EDULIS having fruits of the size of an Apricot, and said to be of delicious taste. All of them make also very ornamental shrubs, and ought to be seen in every garden.

FEIJOA SELLOWIANA, from Uruguay, Argentina and Southern Brazil. It is a matter of great satisfaction to the writer that this plant which he was the first to introduce to the United States a few years ago, is beginning to attract attention and to be appreciated, as he felt sure it would. A symmetrical growth; good sized leaves, silvery white underneath and glossy green above; white petaled flowers with a tuft of bright crimson stamens, make it one of the finest ornamental shrubs of recent introduction; while a few privileged persons who have been able as yet to taste its plum-shaped, green-skinned, highly-perfumed fruit, all agree that it is the best introduction in the fruit line of these last few years. And it will have also the great advantage of being hardy all over California, and that the fruits will stand shipping well.

To Try Alligator Pears.

PORTERVILLE, May 8.—Citrus growers of this district are planning to experiment with the avocado, or as it is more familiarly known, the alligator pear. A shipment of the avocados from Southern California nurseries were inspected out at the Wells, Forgo express offices yesterday in the shipment being a small number of trees for Wesley Burton, Dr. Emory, I. Jay Boothe and others. Up to the present time the demand for the trees has been greater than the supply, perfect fruit having sold last fall as high as $9 to $12 per dozen. It is the general belief among the citrus growers of this district that soil and climate are well adapted to the culture of the avocado.

TROPIC AND SEMI-TROPIC FRUITS FOR SOUTHERN CALIFORNIA

By DR. F. FRANCESCHI

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Tropic and Semi-Tropic Fruits for Southern California

By DR. F. FRANCESCHI

(In Conclusion)

CYPHOMANDRA BETACEA, "tree tomato", from Peru, introduced many years ago, but not grown as much as it would really deserve. A very fast grower, attaining in a short time the size of a small tree, and can easily be trained with a symmetrical, round head. Its foliage is rich, shining, copper colored when young: flowers will appear within one year from seed, they are in large, drooping bunches, rosy white in color, and exhale the most exquisite rose scent, chiefly towards evening: the fruits, which are freely produced, hang down on very long pedicels, of oval shape, pointed at both ends, bright orange colored when ripe. They will hang from the plant for months, and are quite ornamental. Try to stew them with sugar, and you are sure to like them.

LUCUMA SALICIFOLIA, "zapote borracho," from the warm regions of Mexico, which only of recent years has become generally known, and highly prized. This is a free growing tree, with glossy, willow like leaves, and large, oval-shaped, one seeded fruits. Their taste is described as unusually fine, and by many they are considered as the best fruit in Mexico. If partaken of in large quantity they are said to produce symptoms of a mild intoxication, and thence its native name "borracho."

MANGIFERA INDICA, the "mango," originally from India, now extensively grown in all warm regions of the globe. Everybody knows or has heard of it, but it is not generally known that in the warmest sections of Southern California it is likely to bear first class fruits, although the tree will never attain here the immense size it reaches in tropical countries. For the sake of its foliage alone, richly colored with red in the young stage, it is well worth growing; it begins to bloom quite young, and keeps on blooming all the time. Numberless varieties of Mango are grown in India and elsewhere, and now that more attention is brought upon this fruit, it is very likely that some particular variety will be found specially suited to Southern California.

MUSA PARADISIACA. For scenic effect nothing surpasses a clump of the tall growing, ordinary "banana,' and more specially so, if one can dispose of some corner sheltered from winds, and give them extra rich soil, and plenty of water. In such conditions one can also expect to obtain fairly good fruits. Still better results may be obtained with the dwarf "banana," MUSA CAVENDISHII, which is more easily protected from the wind, but is, however somewhat more tender than the first named.

PASSIFLORA EDULIS, "edible passion vine" and "grenadilla" of the Spanish Americans, is a vigorous growing vine, with deep green foliage generally immune from the caterpillars, and pretty, light colored flowers, less showy however than other kinds. The plum-like, dark purple fruits under their leathery skin are full of a juicy pulp, of very pleasant taste, capital for making a refreshing beverage. The more tropical PASSIFLORA LAURIFOLIA and P. QUADRANGULARIS have richer foliage and gorgeous flowers, powerfully scented, but it is only occasionally that they happen to ripen any fruit with us.

PERSEA GRATISSIMA, called "ahuacate" by the Mexicans, and "palta" in Peru and other parts of South America, where it appears to be indigenous, "avocatier" in the French colonies, "avocado pear" and, by corruption, "alligator pear" in the British; also "midshipman's butter," has become a great favorite in all tropical countries, and does remarkably well in Southern California. In very few years it will make one of the most shapely and noble looking trees that can be imagined, its broad, persistent foliage is never attacked by scale or other insect pests; its flowers, appearing mostly during the winter, are greenish, and similar to those of our native California "laurel"; the fruits vary in shape from more or less oval to decidedly pear shaped, and in color from bright green to deep purple; they also vary considerably in size; but the greatest range of variation lays in the time that seedling trees will take to come into bearing. Personally I know of trees having yielded a good crop of fruits when only three years old from seed, as well as of other trees which did not even bloom until about twenty years old. Fortunately, more attention is bestowed now to the culture of this valuable tree, and grafted plants are now being offered in the trade. The more it is known the more popular it is sure to become. The firm, whitish, or greenish pulp of the fruit is cut in slices, and preferably eaten with salt, pepper and lemon, making, as it does the most exquisite "mayonnaise" very nourishing, and at the same time never known to affect the most delicate stomachs.

PSIDIUM CATTLEYANUM, ordinary "strawberry guava" well known to everybody in California, once supposed to be a native of China, because from there introduced to England, but afterwards recognized to hail from South or Central America, like all other kinds of guavas, is now planted in Southern California probably more widely than in any other country. It grows so freely, it is not affected by any disease, it bears so profusely, that it is no wonder that one sees it everywhere, in extensive ranches and in small city lots. Everybody likes the fruit, and more so the jelly which is made of it in immense quantities. The "yellow strawberry guava," PSIDIUM LUCIDUM, introduced by the writer some years ago, looks very much like the first-named, but its fruits are yellow and generally of finer flavor. PSIDIUM ARACA has larger and thicker leaves, also larger fruits than the two preceding, of yellow color and of superior taste. Several other kinds of guavas are now on trial in the grounds of the Southern California Acclimatizing Association at Montarioso, Santa Barbara. The so-called "lemon guava," PSIDIUM GUAJAVA, very like the first kind ever introduced to California, is very seldom met at present, its fruit not being much liked, and possibly also for the reason that it happens to be severely attacked by "black scale," from which the above-named kinds are completely immune.

MULGOBA MANGOES.

The Times-Union acknowledges the welcome receipt of a box of fine mangoes from the tropical grove of George B. Cellon at Miami. The large, smooth fruit gives promise of excellent eating and when the mangoes have been duly tested the agricultural editor will be glad to make further report. The following letter accompanied the box:

Gentlemen: I am sending you today—express prepaid—one dozen Mulgoba mangoes. We finish this week the shipments of our second shipping season of this fruit on the markets of the country, which is so far the only variety of mango which we consider of commercial grades that has so far fruited here in sufficient quantities for shipment to the fruit trade.

All the Mulgoba mangoes so far shipped to the fruit trade, numbering about 250 boxes, have passed through my hands, except a very few boxes, and I have sold this fruit on orders among the fanciest fruit trade in the large Northern cities, f. o. b. Miami, as follows: Fancy at $3; choice, $2.50; culls, $2 per dozen, and it is my opinion that I could have sold many times more fruit at the same price this season if we had it to sell.

GEORGE B. CELLON.

ROYAL HORTICULTURAL SOCIETY,

Vincent Square, Westminster, S.W.

31st Oct. 1911

Dear Sir

I have the pleasure of informing you that you have been duly elected a Fellow of the Royal Horticultural Society. On receipt of your Next years Subscription and the enclosed Obligation Paper, signed, your name shall be at once entered on the books of the Society, and you will be entitled to exercise all the rights and privileges of a guinea * Fellow, a summary of which is herewith enclosed.

It would be a great convenience if you would kindly fill up and return to this address the enclosed Banker's Order, for payment of your Subscription in future years.

I am,

Yours very faithfully,

W. WILKS,

Secretary.

To Mr. F. W. Popenoe.

* "Every Fellow (not a *bonâ fide* gardener or permanently resident abroad) shall, if he elect to pay an Annual Subscription of £1 1s. only, also pay an entrance fee of £1 1s. with his First Subscription."

P.S. New Fellows now pay next year's [illegible] privileges of Fellowship for the current year

Japanese Art of Gardening

By DR. F. FRANCESCHI

In all ages and in every country we find that the art of gardening was evolved by an advanced state of civilization and that it was necessarily moulded after the physical environments of each particular country.

As little as we know of Assyrian and Egyptian gardening points to the greatness of the far stretching desert, and to planting trees and flowers where they will be sheltered from scorching winds and from the inroads of roaming wild animals.

In the Greek and in the Roman civilization, public life was everything; the forum overruled the home, and the esthetic feeling of art reigned supreme. So, what gardening was done, it was principally in the public spaces of meeting, architecure and statuary being not accessories, but the main features of the art of gardening.

During the dark ages, gardening remained confined within the precincts of cloisters; other people being too busy in robbing and slaying each other.

When the dawn of "renaissance" appeared, Italy, France and Spain, the leading representatives of European civilization, resurrected the art of gardening along parallel lines as the art of Rome and Athens. It was in the 18th century that England, who was fast becoming the ruler of the seas, evolved, through her rolling, emerald green, majestic timbered meadows, and through the introduction of foreign trees and flowers, the natural style of gardening (no matter if originated in China), which was to spread so rapidly all over the continent of Europe and elsewhere. No wonder, then, that Japan, with its ancient and secluded civilization, with its mountainous, well watered islands, with its most peculiar flora, and, above all, with the unsurpassed patient and persevering nature of its inhabitants, had to evolve a most peculiar art of gardening, quite distinct from the art of other countries.

The four large islands which form the empire of Japan (let aside its recent enlargement), stretch from 30 degrees to 45 degrees latitude north, and consequently must present considerable variations in their climate. However, as Tokio is situated about half way between those two extreme points, its climatic conditions may be safely taken as an average of the whole empire. At Tokio, July and August are the hottest months, January and February the coldest, and extremes of temperatures may range from 18 degrees to about 100 degrees Fahr. Rainfall will average there about 80 inches, hardly any month being without rain, but about half of the yearly rainfall coming between May and June. Different from California, they have in Japan colder and drier winters, and much moister summers. In consequence of the well marked period of winter rest, all sorts of deciduous trees and shrubs like cherries, plums, magnolias, weigelias, etc., burst out in wonderful bloom at the first appearance of spring, and make such a prominent feature both in Japanese wild landscapes and in artificial gardens. In the same way the never lacking moisture during summer keeps in prime condition of growth the numberless evergreen trees and shrubs which form the bulk of the flora of Japan, while these summer showers favor also the successive blooming of peonies, hydrangeas, irises, lilies and other herbaceous plants until the advent of the religiously worshipped chrysanthemums.

Closed as Japan remained to foreign intercourse up to scarcely half a century ago, it is quite obvious that all material for Japanese landscape gardening had to be drawn exclusively from the native wild flora, so rich and so beautiful in every respect. One must acknowledge, however, that Japan is indebted to China for many trees and shrubs introduced, how many centuries ago, nobody knows. But, it is only since a few years that plants from Europe and America were introduced in Japan and with them new ideas in regard to landscape gardening. The typical Japanese garden is appropriately depicted in the following words of James H. Veitch, the prominent English horticulturist, written in 1892:

The Nozawaya garden (near Yokohama) is a large place, full of little hills, little forests, a river, very little summer houses, little paths all covered with mats about two feet wide, which wind around the little hills, and by little bridges over the little river. The whole big garden is little and most curious; one cannot help smiling in going round it.

Robert Fortune, another English horticultural traveller, to the memory of whom we Californians are perennially indebted, as he was the lucky introducer from China of the "Gold of Ophir" rose (correctly "Fortune's double yellow") in his delightful account of his visit to Japan in 1860, speaks of the commonest gardens as being exceedingly small, some not much larger than a good-sized dining room; but the surface is rendered varied and pleasing by means of little mounds of turf, on which are planted dwarf trees kept clipped into fancy forms, and by miniature lakes, in which gold and silver fish and tortoises disport themselves. Wealthy people, says Fortune, have larger gardens, some about a quarter of an acre in extent! Not quite as much as an ordinary California city lot, and all laid out, like the smaller ones, with undulated surface, turfed over, with little mounds and little lakes, and, as an inevitable sequence, only naturally or artifically dwarf growing plants are admissable in such conditions.

The imperial residence and some of the largest and oldest temples boast of more extensive grounds, where the same features are reproduced on a larger scale; but there the majestic beauty of stately forest trees, large masses of feathery bamboos, gorgeous flowering thickets of camellias and azaleas will appeal better to our tastes.

In fact, it is not the reproduction of the noblest and most attractive features of nature that the Japanese landscape artist has in view, but instead their reduction in size, just as if bringing them under the small end of a telescope. But, whatever we may think of the results, we cannot help but admire the inconceivable amount of patient care which is needed to complete such work.

The almost religious worship of the Japanese for the spring blooming trees, and for the fall blooming chrysanthemums leave no doubt that they feel, just like us the charm of color in flowers, while they certainly excell all other nations in their taseful and minute analysis of "green," which in varied shades forms the harmonious ground of all their gardens, large or small.

In no other country will you be able to find under culture such a number of varieties of herbaceous and shrubby plants, differing simply from each other in their different shade of green. And there is hardly any plant of which cannot be seen forms with striped, spotted or otherwise variegated leaves. To mention one example, only, of Rhodea Japonica, a most humble rockery plant, hardly known in California, there are claimed to exist more than a hundred varieties, each one with differently shaped or differently variegated leaves, some of them selling at fabulous prices.

Reproductions of Japanese landscape art have been attempted with various success in California, but they will never be perfect and complete, for the reason that we do not possess the "greenness" which form the essential basis of Japanese gardens. Still, there are several things that we Californians have to learn from the Japanese, namely, their intense love for flowers, their close study of natural conditions of vegetation, and their untiring persevering way of carrying on the object they have in view.

No 655

Local Department of Agriculture.

Barbados.

March 25, 1911

The Avocado in Southern California

Sir,—

I have the honour to acknowledge the receipt of the contributions mentioned in the margin made by you to this Department, for which I beg to tender my best thanks.

I am,

Sir,

Your obedient servant,

John R. Rowell

Supt. of Agriculture.

To F. W. Popenoe, Esq.,

Pasadena,

California,

U. S. A.

Most Interesting Letter From Hawaii

KILAUEA VOLCANO HOUSE, Hawaii, Jan. 11, 1909.—Dear Mr. Coolidge: As you requested, I will try to send you a few notes on the plants seen, for "THE PACIFIC GARDEN;" if you think them of not enough interest, do not print them. Upon landing from a long journey by sea, vegetation always appears particularly luxuriant; how much more so must this be the case in first viewing the long-dreamed-of-glories of the foliage of the tropics! Our cheery little home in Honolulu seemed almost smothered in magnificent plant life; lofty, granite-like shafts of royal palms (Oreodoxa Regia) stood sentinel at the doorway, waving their long plumes in the trade-winds; graceful cocoanut palms (Cocos Nucifera), laden with nuts, leaned their tall trunks here and there; bananas and two species of sago palms (Cycads) lent their charm; an immense vine of Beaumontia overflowed the trellis at the door, fairly heaped up with pryamids of great white, five-pointed, monopetalous blossoms, and numberless other vines, shrubs and plants, as well as superb ferns, stood about everywhere, in the grounds or in pots. Many of these one is familiar with in hothouses, but some we had never seen. This garden is typical of that of the average pretty Honolulu home. Of the trees, the one called the "monkey-pod" is by far the finest, aside always from those princes, the palms. It looks like a locust in leaf and pod, is of glowing, emerald green; its spreading, branching, dome-like top, and strongly marked boughs suggesting the peculiar type of picturesqueness of the Italian stone-pine. The royal palms alone are worth crossing to see, long avenues of them, straight or curved, leading up to the more pretentious homes, their pale gray columns and green, bulbous-looking top, out of which the long plumes spring, marking them off from all other palms. The grace of the always leaning cocoanuts, "dusting the sky with their feather dusters," no pen can write. The common hedge-plant is the scarlet Chinese Hibiscus, deep green, brilliant with flowers, while along many a wall of volcanic rock stretch hundreds of feet of the long streamers of the night blooming Cereus, crowning the wall in a mat; alas! not now in bloom. A few pepper trees one sees, and a few Eucalyptus; also oranges; they do not look at home. The lemon does not thrive. But the Bougainvilleas are even more resplendent than in Pasadena; they are thrilling, spectacular; one sees the terracotta one, B. lateritia, I think, quite often, and there is a greater range of tints than at home. One cannot help being envious of the power to grow the Allemanda out doors, on seeing these great blooms of mellowest yellow. Bignonia venusta is about as with us, smothering the cottages. We note the fig, but it does not look happy; the pomegranate and oleander are also here, as well as the traveller's tree (Ravenala) and the handsome great round-headed mangoes, a noble tree, the leaf suggesting that of the Eucalyptus, the young foliage pink; these have long fruit clusters, not now ripe. We have seen five or six banyan trees. The red and yellow Crotons are ten or twelve feet high. Bermuda grass is everywhere; one sees no lawns of blue grass. The only strange fruit we have had, so far, is the papaia (Carica Papaya), as they call the papaw, queer tall trees of which are seen all about. The pumpkin-colored flesh is sweet and pleasant, served for breakfast with a squeeze of lemon. Fried bananas are also good; the cooking banana is different from the usual one. One sees pineapple patches, this fruit being here most delicious. The rice crop is brilliant green; they plow it with the water-buffalo, imported from China, closely related to the buffalo one sees at work in southern Italy. The fields of sugar-cane are a great feature, looking in the distance like emerald moss. All about are little patches of taro, resembling small plants of our "elephant's ear" (Caladium Esculentum); it grows in water. From it is made the, to us, insipid dish of poi, a palish lavender starchy paste, dear to the native Hawaiian. The root of the taro is also eaten boiled, but is tame and poor; taro tops are said to be nice. We see breadfruits, not now ripe.

When one leaves Oahu, upon which Honolulu is, and travels to Hawaii to see the great volcano, an opportunity is obtained of seeing something of the wild flora. But this is so strange to us that I can hardly describe it intelligently. Banana and papaya grow wild, there are enormous greenbriars, and whole cascades of Bromeliads (?) tumble from the trees. But to most tourists the ferns are the great feature, and they are of many kinds; they perch in trees, clothe the trunks with green, nestle everywhere in damp nooks. What looks like our "Boston" fern is exceedingly abundant all through the thickets; but the kings of all are the tree-ferns. So far as we can tell these are all of one species, but how elegant! how majestic! how huge! And they are abundant enough to fill one's wildest dreams. A large part of the nine miles' drive from the end of the railway up to the Volcano House is lined with them; back of the hotel is a forest of tree-ferns, under many of which one can stand and gaze up into the intricate and exquisite lace-work of the great fronds. The tallest trunk observed looked about twenty-five feet from earth to leaf-tips. The young uncoiling fronds are enveloped, in their babyhood, in the softest, impalpable silk, amber colored, called pulu, of which the natives make pillows and mattresses; one can gather a boaful in a few minutes. On the outer edge of the great crater here, at an elevation of 4000 feet, much of the forest vegetation is Ericaceous; there are many pleasant berries, but these are sacred to the Goddess Pele, whose home is Kilauea, now in a state of great activity. The beautifully grained Koa tree grows here in forests, and other interesting trees and plants there are, of which I can learn nothing but their strange native names. Yours sincerely,

EMILY G. HUNT, M. D.

AGRICULTURAL EXPERTS HERE

David Fairchild and P. H. Burnett Visit Friends on the Northside.

ARE PLEASED WITH ALLIGATOR PEARS

Dakota Street Fire Horse Is Injured While Running to Mountain St.

NORTHSIDE, Aug. 20.—On a tour of inspection of the Pacific coast, David Fairchild, agricultural explorer in charge of foreign explorations, and P. H. Dorsett, in charge of seed and plant introduction and distribution, both of the department of agriculture, visited friends on the northside yesterday.

They have just come from the Chico propagating gardens in Butte county, which the government established several years ago, and which it is now planning to enlarge by the addition of sixty acres. The two men have been making arrangements for this enlargement, and stopped in Pasadena to inspect the plants which have been sent here in the past under their supervision to a number of local experimenters.

Mr. Fairchild was obleged to continue his trip today, while Mr. Dorsett will remain a short time longer in this vicinity, visiting D. W. Coolidge, of Pasadena, and others who have been doing experimental work for the government.

The two men were very much pleased with conditions in Altadena. They admired Santa Rosa avenue, with its rows of cedrus deodora, and were particularly struck by the patio in the F. S. Allen residence, which Mr. Fairchild pronounced the finest he had ever seen.

The two experts are particularly interested in the avocado, or alligator pear, which is now becoming well known in Southern California. They declared that conditions here seemed very favorable for the fruit, and expressed the opinion that within a few years it would rank as one of the most important fruits grown here.

They also declared that the propagation of feijoa sellowiana, a tropical fruit which has proved successful here, was destined to become an important industry, because of the quality of the fruit and the fact that it was so well adapted to local conditions.

Much improvement in the quality of the loquat is expected by Mr. Fairchild. He says the department has taken up the matter of improving this fruit both in size and quality, and that it will hardly be known, when improved, as the fruit now grown.

Mr. Fairchild has traveled all over the world, particularly in out-of-the-way places, seeking new varieties of plants, shrubs and trees which promise to be adaptable to conditions in the United States. In this way the department has introduced varieties of alfalfa, durum wheats and other economic plants which have added mill-

Introductions from Australasia

By DR. F. FRANCESCHI

Bathed by the same waters of the Pacific Ocean, of which the mighty expanse had been first explored by the Spanish flag, to the Spanish settlements in California the vast continent of Australia and the numberless islands between this coast and the Philippines remained however entirely unknown. Similar conditions prevailed until the annexation of California to the United States, and not one plant was introduced before that date to California from the countries now included under the comprehensive name of Australasia.

But, what a wonderful change took place in the space of only 40 years! In the year 1894 there were grown in California at least sixty different genera of plants from Australia and New Zealand, represented by a much larger number of species, of which the great majority was composed of ACACIA and EUCALYPTUS.

It has been stated that the first EUCALYPTUS were planted in California in the year 1856, but, it was only towards 1870 that their planting became generalized. It is to the energetic and cosmopolitan propaganda of Baron Von Mueller, powerfully seconded at Santa Barbara by the Hon. Ellwood Cooper, that California, not unlike other countries, is indebted for the introduction of EUCALYPTUS, which it is safe to assert has benefited California more than any other country. When such introduction was started the extensive forests of live oaks which covered the largest part of California over a century ago, had, most unfortunately, disappeared, chiefly through fires intended to clear the ground for grazing purposes. Without the introduction of the EUCALYPTUS the wonderful development of this country would have been altogether impossible.

It is estimated that not less than seventy different species of EUCALYPTUS were grown in California in 1894, which number was considerably increased since, and it is safe to predict that the planting of kinds yielding the best class of timber is going to make great strides in the next few years.

The different species of Australian ACACIA, which had been introduced mostly for their tan producing properties, were not much utilized in this way, but they have become one of the most conspicuous ornaments of our gardens, where they bloom most profusely during the winter months. Not a few of the most ornamental kinds were first introduced by ourselves, like A. BAILEYANA, A. ELATA, A. GRANDIS, A. OBLIQUA, A. PODALYRIAEFOLIA, and others.

We have now growing at Santa Barbara not less than 18 different species of Palms from Australasia, some of them being among the choicest ornaments of our gardens. It was our privilege to be first to introduce the very peculiar "red palm," LIVISTONA MARIAE, from the interior of South Australia, quite striking for the coppery red color of its fan shape leaves. Other Australian plants worth of special notice and of our own introduction are, among fruit bearing trees, ACHRAS AUSTRALIS, OWENIA CERASIFERA and SPONDIAS SOLANDRI; among shade and ornamental trees, FICUS CUNNINGHAMII, RHUS RHODANTHEMA, STERCULIA BIDWILLII and S. GREGORI. In addition to the Acacias mentioned above, we have also introduced the famous "waratah," TELOPEA SPECIOSISSIMA, STENOCARPUS SALIGNUS; also several species of HAKEA, MELALEUCA, MYOPORUM, and PIMELEA, all of them much welcome additions to our garden flora.

From New Zealand we have introduced the pretty CARMICHAELIA GRANDIFLORA, HYMENANTHERA CRASSIFOLIA, MACROPIPER EXCELSUM, and SOPHORA TETRAPTERA.

From New Caledonia, the pure white, winter flowering OXERA PULCHELLA; from the island of Guam the most remarkable local "screw pine," PANDANUS FRAGRANS; and from the group of the Hawaiian islands the very pretty and most interesting OSTEOMELES ANTHYLLIDIFOLIA, with foliage of ANTHYLLIS and flowers and fruits of CRATAEGUS; also SANTALUM FREYCINETIANUM, now almost extinct in those islands, MYOPORUM SANDWICENSE with wood scented like the true "sandal wood," MYRSINE LESSERTIANA, PITTOSPORUM HAWAIIENSE, SOPHORA CHRYSOPHYLLA, and others.

With increased facilities of transportation a much larger number of interesting plants from Australia and from other parts of Australasia are sure to be added in the near future to our garden flora.

From the above summary of the work of introduction done here since 1894 it will appear evident to everybody that the statement which I made in my booklet "SANTA BARBARA EXOTIC FLORA," namely: "that, as far as experience goes, **Santa Barbara possesses the privilege of wider comprehensiveness and adaptability to growing plants of the most disparate climates, over any other locality on earth,**" did receive a thorough and full confirmation by the experience of these last fifteen years.

Encouraged as I feel by the results obtained, for which I wish to express my thankfulness to the friendly assistance and co-operation of all lovers of plants, both in California and abroad, I shall continue in the work of gathering at Santa Barbara, from all parts of the world, all sorts of plants which are worth growing, thus preparing the ground for what may become one day the first Botanical and Horticultural Institution on the coast of the Pacific.

The Brazilian Guava.

AMONG the plants of comparatively recent introduction, Feijoa Sellowiana from Southern Brazil and Uruguay, is of great value both as an ornamental and as an economic. When its double use is considered, it is quite evident that it should find a place in all local gardens.

To be precise, it is not a Guava, that is, it does not belong to the genus Psidium, though it has an equal right to the name guava except on the grounds of priority. It belongs to the same order as Psidium and Eugenia, and both are supposed to bear edible fruits, though the writer never found a fruit on any species of Eugenia that was delicious when eaten raw and as Feijoa fruits are the finest of all, we will call it Brazilian Guava.

The shrub or small tree is an ornate evergreen with small, oval, green leaves which are white on the under surface. The flowers are large, reddish-purple, very showy and lasting. The fruits are oval, one to two inches in diameter and two to three inches long, which has had its taste variously described as being a comingling of one or more of the following: Pineapple, banana, strawberry and strawberry guava. The writer has eaten them for several years past, getting the first five years ago from two quite removed stations—Scott Way's, Altadena, and C. P. Taft's, Orange. The fruits when ripe are juicy and mellow, and a few will perfume, with a pleasant fragrance, a large room. No mistake will be made if you plant a Feijoa in your garden.

THE PAPAW

(Photographs by G. E. McColm)

THE papaw is a singular and interesting native fruit. It varies in length from three to six inches, and the color of its skin is yellowish-green when ripe. The color always seems lighter because of the whitish bloom. It resembles the banana in its lack of acid and in its fine-grained pulp, but possesses a peculiar flavor and fragrance. The pulp is of a light-yellow color, and two rows of dark-brown seeds alternately arranged extend the length of it. Our native papaw is known to botanists as *Asimina triloba*, and should not be confused with the

The fruit of the papaw resembles the banana in its lack of acid and in its fine-grained pulp. Many people do not relish its highly aromatic flavor

papaw of Old World literature, which is a tropical plant (*Carica Papaya*) that is sometimes grown in northern greenhouses for its beauty and economic interest.

It is only within the last few years that papaws have been carried by the fruit dealers of the section in which that fruit is common. They are retailed at from five to ten cents per dozen, and the demand for them is very limited. But since they are taken to market in half-bushel baskets, the ripe fruit is much bruised and blackened; so it is not surprising that the fruit, so damaged, appeals to few purchasers. It has a highly aromatic flavor which is not relished by people as a rule, and the large seeds are a disadvantage in eating.

It seems probable that if this handsome fruit were placed on the market in prime condition, there might be a ready sale for all that are found in the wild thickets; and perhaps the demand might increase so that the commercial planting of the trees might be profitable. The papaw, or custard apple, is listed in nursery catalogues, but I doubt if it is planted to any extent. In the

The papaw is interesting in April on account of its beautiful flowers of purplish-brown color, and deeply veined satiny surface

woods we find an early variety the fruit of which is large. There is no interval between the ripening of the last of the early ones and the first of the late ones, the season of ripe papaws lasting about six weeks.

It is noticeable that the flourishing papaw thickets are established in rich, moist portions of the woodland. Unless given plenty of room, the papaw sheds its lower branches, so in a thicket each tree has only a canopy of green. In April the tree is interesting with its inconspicuous but beautiful flowers of purplish-brown color, and deeply veined, satiny surface. But in autumn it is most attractive with its fruit-laden branches.

The papaw is well worth cultivating. The tree has proved hardy as far north as Massachusetts and Ontario. The transplanting of small trees from the native thickets is not often attended with success. But it is claimed that well-selected seeds in a garden pot containing well-worked soil and under slight shade will soon give excellent results. The plant is delicate and requires careful attention, but when the third leaf appears the plant may either be pricked out into a larger bed or, better, potted off in fairly rich soil. The "Cyclopedia of American Horticulture" states that the papaw may be propagated by seeds sown in autumn, stratified and sown in spring or by layers in autumn. It may also be grown from root-cuttings. In temperate climates the pawpaw has been found to be a good decorative plant for both conservatory and summer bedding. For the latter, select open, sunny exposure with perfect drainage and give them a soil of rich leaf loam. Constant cultivation will cause a luxuriant growth under these conditions, and the planter will be amply repaid for his trouble by beautiful, shapely specimens.

VIOLA MCCOLM.

Bucklin, Kans.

The papaw is hardy as far north as Massachusetts and Ontario, and is well worth cultivating. The fruit weighs down the branches. Natural size of fruit is from two to six inches

Fifteen Year Experience in Southern California

By DR. F. FRANCESCHI

The fact that many of the plants which come under our eyes, not only in our gardens, but out in the open country, all over California, are of foreign extraction, beginning by barley, oats, burr clover and alfalfa, which cover our pastures, up to the deciduous and citrus fruits, the greatest wealth of this country, and to the Australian Eucalyptus, our almost exclusive supply of firewood, most inevitably impress upon everybod's mind that this is the ideal country for the work of Acclimatization. **True meaning of acclimatization**...This word is of modern coinage, probably not older than the foundation of the French **"Societe d' Acclimatation"** some 50 years ago. It was not very fortunate, however, as to many people it will convey the wrong idea that any given plant may be accustomed, through many years culture and through reproduction from seed, to thrive and bear under climatic conditions different from its native country. This is far from being true in such a sweeping way; wheat, the staple food of the white race, has been grown for thousands of years, and the range of its profitable culture has never changed materially, either northwards or southwards; the "citrange" recently and very industriously evolved by our Department of Agriculture, nobody expects that it will revolutionize the industry of citrus fruit growing; in a word, man will never be able to grow in the arctic regions the plants of the torrid zone, nor vice versa; but, if, for acclimatizing we must understand simply "to introduce plants from other countries having climate similar to ours, and, through appropriate culture, make them thrive and bear," we may accept the word for lack of a better one.

Hardiness of Plants... Every group and every specie of plants has its own constitution; there are extreme limits between which it is possible for them to live, but they are also endowed of a certain power of "adaptation," although generally, in a lesser degree than man and many animal beings. We know that, in order to properly develop and reproduce itself, a given plant must absorb a certain amount of heat, and we may have other notions concerning the intimate life of plants; but, what comes more obviously under the general comprehension is just what temperature is necessary to preserve life in a given plant. This is what is called "hardiness of plants."

Variation of Climates...Climate is not modified simply by increased distance from the Equator, but also by elevation above sea level, by vicinity to the ocean or to arid deserts, by ocean currents, by prevailing winds and by other causes, which, at times, may be very strictly localized. Naples, New York, San Francisco and Pekin are on the same parallel, and their climates certainly are not alike.

Climate of Southern California. Where, in consequence of more or less local conditions, the climate of a country offers a smaller range between extremes of temperature, there are found the most favorable chances for the introduction of plants from other countries. The temperate regions of both hemispheres possess such privileged localities, as in Southern France, on the Riviera, at Naples, in Sicily, and in other parts of the Mediterranean basin, at the Canary Islands, at Madeira and the Azores, in the Caucasus and in the Himalaya, as well as in Southern Africa, on the eastern and southern coast of Australia, and in some parts of New Zealand and of South America. There, introducing and experimenting upon exotic plants has been worked up with large expenditure of care and money, an immense amount of experience has been accumulated, and has proved that in many of the mentioned localities, some kinds of plants have failed to succeed, owing to some uncongenial conditions. The climaate of Southern California (which finds its higher denominator at Santa Barbara), has shown no such total failures, although it is not so much artificial care that was made to contribute, but nature was mostly allowed to work by itself, undisturbed.

Plan of work done. The work which I have been carrying on these last fifteen years, at Santa Barbara, was principally confined to woody and half woody plants, which have an indefinite duration of life. Almost all countries of the world being opened to us for desirable introductions, I found this field large enough, and did not attempt to enter the unlimited one of artificial hybridization.

The first step was to compile a careful census of all plants introduced to California previous to 1894, the results being consigned in a booklet which I published under the title "Santa Barbara Exotic Flora." This was not a mere check-list of names of plants, but contained a good deal of information and plenty of suggestions for future introductions. In 1895 I became the sole owner of the Southern California Acclimatizing Association, which had been established two years before, and, since that date, the work of introducing, propagating and

No.

ROYAL BOTANIC GARDENS,

KEW,

January 22, 1912.

SIR,

2 copies

A copy of your paper:-

"The Mango in Southern California."

I have to acknowledge the receipt this day of the contribution mentioned in the margin, made by you to the Royal Botanic Gardens, for which I beg to tender my best thanks.

I am,

SIR,

Your obedient Servant,

D. Prain

Director.

To Mr. F. W. Popenoe,

Altadena.

California,

(40,691). Wt.3939—47. 2000. 5/11. A.&E.W. U.S.A.

Brazilian Aquatics.

BY EDWARD S. RAND, BRAZIL.

In the Amazon region, which comprises such vast extents of water, there must necessarily be a large number of aquatic plants and some of these are very ornamental. In voyaging by canoe through miles upon miles of the water ways which thread all of the "*varzea*," for so the land subject to overflow with the annual rise of the river is called, one finds many curious species. In the main Amazon there are few, though at times one sees bays full of the pretty "*Eichornia speciosa*," for the banks are constantly changing, the current is rapid and there is little opportunity for any permanent growth to establish itself. But the "*varzea*" is full of lakes, many of which are very large and even where the banks of the Amazon are high, there are usually some miles back from the river clear water lakes. All of these lakes communicate with the main river, either directly or indirectly by streams connecting one with another. These streams are called "*igaripes*;" often they are broad and generally very deep and navigable for canoes. When the river is falling the water runs from the lakes into the Amazon; when the water rises these "*igaripes*" run up stream. One can easily lose himself in these intricate water ways. This "*varzea*" region is not permanently habitable and only serves for pasturage, where not wooded, or for summer plantations. It often is covered, especially on the upper river, with gigantic Bamboos, sometimes with a very tall grass, and if low enough to be permanently wet, is an inextricable tangle of vines, prickly Palms, generally species of Bactris, and stinging grasses. Where it is high and only flooded for a short time, it forms in summer a very attractive region. We have seen stretches of thousands of acres which looked like a well kept park; immense trees scattered over it; the ground covered with short grass; no undergrowth; clear water lakes here and there; the whole forming a most charming landscape.

It is in the lakes and "*igaripes*" that water plants abound, though in the main river the voyager often finds plenty floating on their way to the distant ocean, they having been torn from their homes and borne from the lakes by the current, dislodged by a falling bank, or uprooted by a rise of the river. In low water the shallow bays of the Amazon grow up with grass, which, with long floating root stocks, covers vast areas. As the river rises these masses are torn away and go floating down the river. We have seen them at least half an acre in area, and at times the whole river is covered with them and looks like a green field. In these masses are many aquatic plants, but, beyond some pretty yellow Utriculárias and the Eichornia which we have mentioned, we have noticed nothing with bright flowers. The cattle owners put out in canoes and gather

Some-

times one sees a big *Victoria regia*, its leaves all torn, rolling over and over in the turbid flood. It has come from some broad "*igaripe*" or inland lake, for the Victoria is never found in the main river.

We well remember our first sight of this noble plant in its wild state. Living in a little inland village, we had for weeks been planning an excursion to a large lake in the neighborhood where it abounds, and whence we had often received the great flowers, but, as one often puts off doing what he can do at any time, our trip had been delayed. One lovely morning, just about Christmas, we had paddled across the broad arm of the river to wander in the vast stretch of park-like "*varzea*," which lies between the parana-miri Juruty and the main Amazon, and which, in fact, is a great island. It was early; the sun was slanting amid the great trees and everything seem green and gold; bright butterflies f all around, or a great night morp with beautifully marbled wings, disturbed in his sleep in the recess of some huge buttressed tree, took a short flight to the shade of another. Birds were singing; great green beetles basked in the sun on the great white trunks of the Munguba trees (*Cecropia*) and the whole world had just awoke into life. We were familiar with the region, but our tramps had hitherto been north and west; we now turned to the east. After a time we saw an irregular belt of large trees, which evidently were on the shore of a lake, and heard the hoarse bark of the lontras, an otter-like animal, who had already become aware of our approach. Drawing nearer we saw them in the middle of a little lake, plunging up and down, uttering their short bark, showing their white teeth in their anger at being disturbed. The water of the lake was low and the banks projected over it. Reaching the lake we lay down and looked over, and just below in a little bay was a plant of *Victoria regia*. It was not large, we have seen thousands larger, but it was as perfect a little specimen as one could wish. Five dark leaves, perhaps two feet in diameter, with the upturned rim and one great white flower already beginning to close in the sunlight. We were far away from any house; probably there was not a human being within five miles, but that flower was better company than anything else could be. How long we lay there we never knew, but it was until the Victoria wholly closed to a prickly bud. Never more would that pure white flower open; at sunset it would again expand, but it would be a delicate rosy pink, and again on the third day, but then a deep red and then it would bury itself to perfect its seed. Since then we have often seen the Victoria; we have under the light of the full moon seen hundreds, perhaps thousands, of flowers of all the three colors expanding as the sun set; we have crashed our canoe ruthlessly through acres of the great leaves, but that first sight

Voy-

aging by night we would often put an opening bud of the Victoria in a great calabash and place it in the bow of the canoe to enjoy the rich fragrance, as it floated to us with the motion of the boat, as we lay under the *tolda* in the stern.

The perfume of the Victoria is not continuous, but is given off in puffs; one moment the flower is scentless, but soon comes a puff of fragrance which, if one is too near, is almost suffocating, for it is very powerful and fully inhaled makes ones head spin round merrily. The seeds of the Victoria are ground, or rather pounded, into a fine flour by the Indians and make a not unpalatable bread.

One would suppose that the Amazon would furnish many species of Nymphæas or Water Lilies, but such is not the case. There is one, *Nymphæa ampla*, which is very common; there are acres upon acres in the flats; it is a coarse grower with large, dark, reddish green leaves, and flowers of medium size, varying in color from white to yellowish. It is a most disappointing species, for, though the flowers are handsome and have a rich Pineapple fragrance, one must sit up all night with them to smell it, or see the Lilies in perfection, for the flowers do not expand until very late and close in the very early morning, long before daylight. We had seen thousands of buds before ever we saw an expanded flower. The flowers stand up out of the water like the other tropical species. It is so large a grower that the plant would soon fill any pond, to the exclusion of everything else. It is plentiful around Para, being often seen in the roadside ditches.

In Curtis' Botanical Magazine a beautiful little yellow Nymphæa is figured under the name of *Nymphæa Amazonica*, but we have never been able to see or hear of such a plant and doubt its existence. Possibly it may be the Mexican species, or even that of Florida, with a misnomer. There is, however, we believe, on the far river Purus an immense Nymphæa with golden yellow flowers, for so many have told us of it, that we cannot doubt the fact. Once a steamer captain brought it for us. Arriving late at night, he put the plants in a tub of water in his yard to be sent to us in the morning. Unfortunately his wife kept ducks and when, on receiving his message to come for the plant, we arrived at his house we found that the ducks, who are very early risers, had destroyed every vestige of our Lily. In time we shall again receive it, but nothing in Brazil is ever hurried and the first lesson one has to learn is "*patiencia*."

Eichornia speciosa, the old *Pontederia crassipes*, which is now much cultivated under the not inappropriate name of Water Hyacinth, is a very beautiful plant. On the Amazon it covers acres with its showy flowers. While the plant is floating, the petioles are curiously swollen, but this regularity disappears when the plant becomes rooted. Once we found a white flowered variety and several times we have seen plants

Unfortunately these occasions were always when we were far from home on some long excursion and the plants were lost before we could get them where they could be properly cared for. The other species, *Eichornia azurea*, also a very pretty plant, is not Amazonian.

Some of the Utricularias have very bright yellow flowers, and we have seen reaches of marsh a mass of color. The Water Lettuce, *Pistia stratioides*, is a very common plant. It is handsome and interesting. It propagates so rapidly that a single plant will soon cover a very large area. The flowers are white, sessile and small, in a little spathe at the base of the leaves, each spathe containing one male and one female flower. This plant is the favorite food of the "*peixe-boi*," the Manatee or sea cow which lives upon the long roots. This animal is not uncommon on the Middle and Upper Amazon and is much sought, for its flesh makes an excellent dinner; it is white with streaks of green fat, very tender and tastes like chicken. Boiled in the oil it forms "*mixira*" which, when fresh, is a very nice provision for a long voyage, but Heaven help the man who has to live on old "*mixira*," hard as iron and of a rancidity which has no comparison, as we once had to do.

Salvinia brasilensis a very pretty little plant, often seen in aquaria, is very common. There is a species of Pontederia which closely resembles the common United States species, which in some places forms large masses; it is very common round Para. The flower is in appearance just like the North American plant, only not quite as handsome. There are doubtless many undiscovered aquatics on the Amazon. We have described a few of the most common. During our voyaging we did not give this class of plants especial attention, and at our house we had no facilities for their culture. They are difficult to transport, for, if found in the lakes it is no easy matter to keep them alive during a homeward tramp, which may last for days, and, even in a canoe voyage they suffer much. In a future paper we may describe some of the smaller species which are worth growing.

Société d'Horticulture d'Algérie

Réunion mensuelle du 14 janvier 1912

Présidence de M. le Dr TRABUT, président

Après la lecture et l'approbation du procès-verbal de la dernière séance, les 18 nouveaux membres présentés à la dernière réunion sont admis à l'unanimité ; de nombreuses présentations ont lieu au cours de la séance.

L'assemblée décide l'envoi à titre gracieux de la « Revue Horticole de l'Algérie », bulletin mensuel de la Société, à 120 instituteurs désignés par l'Académie.

Concours agricole de Paris

Au sujet du concours agricole de Paris, l'assemblée constate, comme tous les ans, que les formules d'adhésion ne parviennent à la Société que quelques jours avant l'expiration des délais prescrits ; dans ces conditions, il est matériellement impossible de décider les sociétaires à y prendre part.

Poivre rouge

La question du poivre rouge doux est soulevée à nouveau par un industriel d'Alger, créateur d'un moulin, qui se plaint de ne pas être suffisamment protégé par les droits de douane de 20 fr. par 100 kilos. La Société constate qu'il semble peu pratique de rechercher l'augmentation de ces droits, mais elle pense qu'il y a encore beaucoup à faire au sujet de la répression des fraudes sur cette matière ; d'un autre côté, il faut songer à l'exportation : l'Amérique du Nord s'approvisionne en Autriche à des prix très élevés. La consommation en Europe est encore très faible, parce que ce produit n'est pas connu, il est confondu bien à tort avec de la poudre de piment fort.

Comptes rendus annuels

Le secrétaire général rend compte des progrès de la Société pendant l'année écoulée, 298 membres nouveaux ont adhéré, ce qui porte à 1.600 le nombre des membres de la Société.

Le trésorier fait connaître l'état de la caisse, les dépenses se sont élevées à la somme de 10.797 fr. 10, somme couverte par les cotisations et les subventions.

Les orangeries d'Espagne

M. le Dr Trabut, de retour d'un voyage dans le sud de l'Espagne, fait connaître l'état des orangeries dans ce pays et aussi les ravages considérables du pou rouge. Dans le sud de l'Espagne, on se défend peu contre cet ennemi qui a causé de nombreuses ruines.

Pou rouge

A Malaga, l'invasion est complète, les grands « ficus » qui ornent la principale promenade de la ville perdent régulièrement leurs feuilles pendant l'été et presque toutes les plantes d'ornement dans les jardins sont contaminées.

A Séville, le bigaradier est la base des orangeries, les arbres déjà âgés sont envahis par le parasite, depuis plusieurs années ; les fruits sont petits, couverts de pou rouge, ce qui nécessite un brossage énergique avant l'expédition en Angleterre. Les traitements par les pulvérisations ne sont pas sans efficacité quand ils sont nombreux et bien faits, mais les cultivateurs n'y ont pas souvent recours.

Datte du Tafilalet

Le président appelle l'attention sur la haute valeur commerciale d'une grosse datte très sucrée du Tafilalet : la « medjoul ». Cette datte est exportée en grande quantité en Espagne, où elle est vendue 2 fr. 50 la livre. Elle est aussi acheminée de Tanger sur les marchés de Londres, où elle est très appréciée. Il est à désirer que ce fruit vienne par un trajet plus court rejoindre notre réseau de chemins de chemins de fer du sud-oranais et transite par Oran au lieu de Tanger. Cette datte, bien présentée, trouvera certainement un débouché important aux Etats-Unis. Il y aurait lieu d'essayer sa culture dans nos oasis algériennes et tunisiennes.

Importation de végétaux

Un membre de la Société fait connaître que [illegible] courriers, il nous arrive du Midi de la France des plantes vertes : palmiers, orangers, etc., couverts de pou rouge [illegible] phylloxérique [illegible] de plantes [illegible] avec énergie les arbustes contaminés. Ce soin mérite d'être encouragé par des félicitations.

Un sociétaire fait observer que le service phylloxérique serait utilement [illegible] fection des plantes contaminées à leur arrivée dans les ports d'introduction.

Récompenses

Sur la proposition du président, un diplôme d'honneur est décerné à Don José, jardinier du square Larrios, à Malaga, obtenteur d'une belle race de dattier d'ornement.

Conformément au règlement intérieur, la Société décerne, sur le rapport du Conseil d'administration, des récompenses aux jardiniers ayant de longs services dans la même place.

Pour l'année 1911 :

Une médaille d'or, d'une valeur de 100 fr., est attribuée à M. L. Giraud, chef de carré au Jardin du Hamma, au service de cet établissement depuis 47 ans.

Une médaille de vermeil, d'une valeur de 50 fr., à M. P. Mercadal, jardinier, villa Richard, à Hussein-Dey, depuis 26 ans.

Une grande médaille d'argent, d'une valeur de 25 fr., à M. M. Pons, jardinier, villa Richard, à Hussein-Dey depuis 10 ans.

Apports

M. Salom (El-Biar) présente trois nouvelles variétés de primevères de Chine, aux coloris superbes et une race très intéressante de pied d'alouette à floraison précoce, provenant des graines distribuées par la Société.

M. Guéry (l'Arba) présente d'énormes chayotes, quelques-uns de ces excellents fruits atteignent 1 kilogramme.

SOCIÉTÉ DE GÉOGRAPHIE D'ALGER
ET DE L'AFRIQUE DU NORD

Le samedi, 13 courant, la section coloniale de la Société de Géographie a entendu une communication de M. F. Lambert, chef du service des douanes de la côte d'Ivoire, sur cette riche partie de notre empire ouest africain.

M. Rivière, qui présidait la séance, a tout d'abord présenté le conférencier : habitant depuis neuf ans la côte d'Ivoire, M. Lambert connaît parfaitement ce pays, ses ressources, ses besoins. Il est membre du conseil d'administration de la colonie et cumule, avec ses fonctions officielles, le contrôle général des exploitations forestières, ce qui a déterminé le ministre des colonies à lui confier pendant son congé une mission spéciale d'études des marchés de bois exotiques et de caoutchouc en Allemagne et en Angleterre.

Le conférencier montre sur une carte, au tableau, la côte d'Ivoire physique et politique, avec ses limites, ses montagnes, ses fleuves, ses villes, son immense forêt. Puis, en une suite de tableaux pittoresquement brossés, il nous fait faire avec lui les diverses escales d'un voyage de Bordeaux à Grand-Bassam. Il nous promène confortablement installés sur un bateau des Chargeurs Réunis, au milieu des enchantements de la nature tropicale, le long de ces grandes lagunes côtières, qui n'ont rien des marécages que leur nom évoque et qui sont plutôt de véritables mers intérieures.

Il passe ensuite aux ressources forestières et agricoles de la côte d'Ivoire : bois d'ébénisterie et d'industrie, caoutchouc, huile de palme, kola, karité ou beurre végétal, prassava, corozzo ou ivoire végétal, dents d'éléphant, raphia, cire et miel. Certaines plantes telles que le riz, le maïs, les arachides peuvent donner deux récoltes annuelles. On cultive encore le cacao, le café, la vanille, la canne à sucre, le coton, le sisal, le coprah, l'igname, la banane. L'ananas est subspontané. Presque tous les légumes d'Europe réussissent. La faune est moins riche et le gibier abonde. La maladie du sommeil est inconnue. Enfin, le sous-sol contient de l'or et du pétrole.

L'état social et les mœurs curieuses des indigènes passionnent ensuite vivement l'auditoire, qu'intéressent de nombreuses projections.

Puis c'est un exposé substantiel de notre œuvre de relèvement des populations et de mise en valeur du pays, œuvre qui, sous la remarquable impulsion du gouverneur Angoulvant, a eu pour résultat de faire passer en cinq ans son commerce extérieur [illegible] de le doter d'un chemin de fer, de routes, cotes, d'hôpitaux et prochainement d'un port en bien outillé. L'alcoolisme a diminué, le paludisme a disparu des villes et la fièvre jaune n'est plus qu'un souvenir lointain.

Sur demande de MM. Mesplé et Rivière, le conférencier ajoute que 50 millions sont prévus pour la continuation des grands travaux publics à la côte d'Ivoire, qu'on y trouve une [illegible]

THE CULTURE OF CRINUMS

BY IDA D. BENNETT

The somewhat extensive advertising of Crinums ornatum and Kirkii of late years has led to their extensive purchase and to much subsequent disappointment. The greater part of the complaints of failure in this connection are based on an entire ignorance of the proper culture of the bulbs and what may reasonably be expected of them. It is to be regretted that florists send out bulbs requiring special treatment without cultural directions.

Many of the inquiries that come in show that the questioners have made little if any effort to study into the matter for themselves. Had they done so they could scarcely have failed to arrive at the conclusion that an immense bulb like the Crinum must have a generous amount of roots to sustain it, and that these roots must have time to grow—time commensurate with the length of time the bulb has been out of the ground—and that not much can be expected from it until these conditions have been fulfilled.

The Crinum shows its root growth in large quantities of thick, white roots the size of a lead pencil. These roots are very impatient of disturbance, and may be left practically undisturbed for years with wonderful results in the matter of blossoms. These roots, when a bulb is prepared for market, are entirely removed. It is not strange, then, when called upon to not only rally from the shock of dismemberment but also to replace the entire root growth, that the plant should ask your indulgence for a time until it has sufficiently recovered to be in a condition to bloom. Often only a portion of the former roots start again, and this must be taken into consideration in anticipating bloom.

When a dry bulb is received from the florist it should be potted at once in a pot, allowing an inch of space between the bulb and pot all around. Good potting soil—fibrous loam, muck, sharp sand and well-rotted manure is a suitable soil. Though I do not consider muck absolutely necessary for Crinum ornatum, or Kirkii, the fibrous loam and sharp sand should be supplied. Place an inch of drainage material, broken charcoal, etc., in the bottom of pot, covered with sphagnum moss to prevent the soil washing down between the drainage and choking it. Fill with earth to within an inch of the top of pot, press the bulb gently into the soil a couple of inches, remove and line the depression thus made with sharp white sand for at least half an inch in depth and replace the bulb. This is important, as the Crinum bulbs are apt to develop a blue mold, inducing decay, when placed in direct contact with earth. Water well with a sprinkler, which will sufficiently settle the earth, and set in a warm place. The bulb may be lifted each day to examine and guard against mold or decay. After root growth has fairly started, however, it should not be further disturbed, as there is then danger of injuring the tender roots.

Place in a warm, sunny window as soon as top growth starts, if in Winter or the early days of Spring. Later it may be plunged into the sand-box, or in open ground, where it will get the full morning sun, but be protected from rough winds. The bulb, you see, is planted on the top of the soil, not in it; but if proper root growth is made, it will hold the bulb as firmly in place as though buried in the ground.

Generally a bulb will bloom in from two to six weeks from starting, often sooner, but one is less liable to disappointment if it is allowed a reasonable time. But few leaves are made up to the blooming time, but after the bloom has faded the foliage grows rapidly, and in the case of large bulbs is really magnificent. When the leaves begin to turn yellow at the tip, the growth for the season is practically over and the plant must be allowed to rest. Withhold water gradually from this time on, giving only enough towards the last to keep it from growing dust dry. Water may be given in the saucer, while resting, sufficient to keep the roots from shriveling, but not enough to encourage top growth. Soon after starting into growth in the Spring, it may have been noticed that the bulb has shrunk and grown smaller and somewhat soft. It will now be noticed that as the foliage dies away the bulbs become again firm and hard. The strength of the top has returned to the bulb from which it came. It is at this period that the bulb adds to its own growth and prepares for the next season of bloom, its readiness for which it will announce by beginning to grow though water may have been entirely withheld. The top earth, which should be quite dry at this time, should be shaken out as far as possible without disturbing the roots and replaced with rich earth. Water freely, and when the buds appear give a little weak liquid manure. This second blooming will be much finer than the first, as the plant has now enough root growth to support both bulb and blossom.

Should the bulb really outgrow its quarters it may be shifted into a larger pot without disturbing its roots, in this way. Place a quantity of broken charcoal covered with sphagnum moss in the bottom of the larger crock. Fill in enough soil for the difference in the size of pots, working it well up around the sides of the pot with the trowel; press the smaller crock into it, making a hole the size and shape of the ball of earth to occupy it. Slip the Crinum out of the pot by placing the hand on top of the soil, reversing the pot and tapping it sharply against the sharp edge of the bench, which will release the ball of earth. Pick out carefully, without disturbing the roots, the old drainage material and slip the ball of earth into its new quarters. In this way the Crinum may be grown to perfection, shifting it on from year to year and renewing the top soil without disturbing the roots and allowing it regular seasons of growth and rest—complete rest.

MUSHROOM-POISONING.

WHEN one considers the frightful consequences of gathering and eating poisonous mushrooms in mistake for the edible variety, it is little short of marvelous that one without knowledge should dare go into the fields and woods and pick and eat any of the fungi growing there.

If one is thoroughly familiar with some particular variety of edible mushroom, and can distinguish it at sight from all others, however similar in color and form, it is safe to eat that particular variety; but one must beware of other kinds that resemble it, for however slight the difference in appearance, one may be edible and the other poisonous. There is no absolute rule for distinguishing the edible from the poisonous kinds, and it is better, therefore, to give no general rules, but to follow only one: Suspect every mushroom which you do not know positively to be edible. To this rule, perhaps, may be added a second: Learn to distinguish the white-spored agarics and avoid them all; for although there is an edible species, it requires an expert to tell it, and the poison of another species is deadly, and there is no known antidote for it.

The chief poisons in mushrooms are two in number—muscarin and phallin. The first of these produces symptoms resembling those of alcoholic intoxication, followed by convulsions or paralysis, collapse, and death from heart failure. These symptoms come on soon after the mushrooms have been eaten.

In poisoning by phallin the symptoms do not appear until several hours after the meal. They resemble cholera, beginning with severe abdominal pain, soon followed by vomiting, purging and collapse.

In all cases of mushroom-poisoning, vomiting should be induced as soon as possible, and a large dose of castor-oil may be given to hasten the elimination of any as yet unabsorbed portions of the mushroom.

Stimulants are needed to support the heart, and milk containing an abundance of magnesia or bicarbonate of sodium may be given.

Injections of a salt solution into the veins and—in case of muscarin poisoning—hypodermic injections of atropin are often employed by physicians with benefit.

Le Transafricain

Sous le patronage de la Société de Géographie d'Alger le capitaine Cortier fait une conférence à la Mairie

La vieille question du Transafricain, si heureusement reprise ces temps derniers par M. André Berthelot, est aujourd'hui au premier plan de l'actualité. Aussi bien la présence à Alger de la mission qui va partir de notre ville pour aller en poursuivre l'étude ajoutait-elle un intérêt puissant, mêlé d'une vive et très naturelle curiosité, à la conférence qui nous était annoncée par la Société de Géographie d'Alger et de l'Afrique du Nord.

Une assistance très nombreuse et des plus brillantes se pressait donc, hier, dans la salle des mariages de l'hôtel de ville.

M. Armand Mesplé préside, entouré de M. Godard, ingénieur en chef des ponts et chaussées, président de la commission récemment nommée par la Société de Géographie pour suivre les travaux de la mission du transafricain, et des membres du bureau de la Société.

Le président remercie tout d'abord les nombreuses personnalités civiles et militaires présentes : M. le commandant Meynier, de la maison militaire du gouverneur, et M. de Galland, maire d'Alger ; il excuse les présidents de la Chambre de Commerce et du Syndicat Commercial, absents d'Alger, mais qui sont représentés par de nombreux membres de ces deux compagnies.

M. Mesplé dit que cette soirée marquera une date dans l'histoire de l'Algérie, car c'est la première fois qu'on traitera publiquement de la question du transafricain ; il rappelle cependant la conférence de M. Broussais, aujourd'hui député, sur la question du transsaharien, et se félicite de voir cette grande idée, reprise par M. André Berthelot, ancien député, président du Métropolitain, qui ne vise à rien moins qu'à unir la Méditerranée au cap de Bonne-Espérance.

M. Berthelot, à qui le président de la Société avait demandé de faire une conférence sur le Transafricain, a très aimablement répondu en remerciant ce groupement de son adhésion à son projet. Retenu à Paris en ce moment, il espère venir avant deux mois parmi nous et il exposera, dans une conférence, les méthodes qu'il compte suivre pour la réalisation de son vaste projet.

Le président présente ensuite les membres de la mission : le capitaine Cortier, le brillant officier, l'écrivain distingué, l'auteur apprécié : « D'une rive à l'autre du Sahara » ; M. Chudeau, géologue, ingénieur du gouvernement général de l'Afrique Centrale ; MM. Monseron, Némorin et Dubuc, ingénieurs ; M. Tignol, qui fit d'intéressantes conférences sur la Chine d'abord, puis sur le Mont-Blanc ; M. le docteur Niéger, frère du chef de la mission, le capitaine Niéger, que M. Armand Mesplé présente enfin.

Le capitaine Niéger est le neveu du général de Toroy ; par sa carrière il est africain et appartint longtemps à l'armée d'Afrique ; il fut le bras droit du commandant Laperrine ; en France, le capitaine Niéger était attaché à la section de l'Afrique, au ministère de la guerre ; il parle couramment l'arabe et le touareg. Cartographe expert, cet officier était bien désigné pour être le chef de cette mission d'études, dont les travaux feront honneur à la science française et serviront les intérêts économiques de la France et de son empire africain.

Le capitaine Niéger prend la parole : il s'excuse de ne pouvoir faire la conférence annoncée et dit que, débordé par les derniers préparatifs de son expédition, il a prié M. le capitaine Cortier de vouloir bien le remplacer.

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Le capitaine Cortier prend alors la parole. C'est à M. Berthelot qu'il appartenait de présenter ici son grandiose projet de transafricain ; aussi, pour lui laisser cette primeur, laissera-t-il de côté la partie technique et économique du projet. L'orateur réclame l'indulgence du public, car, c'est mal préparé qu'il [illegible]

Est-il possible actuellement de traverser l'Afrique ? Cette traversée est-elle [illegible] [illegible] principaux points qu'il se propose de traiter, laissant à M. Berthelot le soin de traiter les autres questions.

La question du transafricain est ancienne ; le capitaine Cortier rappelle les deux missions envoyées par M. de Freycinet et qui partirent de l'est et de l'ouest de l'Algérie.

La première fut confiée à M. Pouyanne, qui fit le tracé Oran-Tombouctou ; l'autre, à M. Soleillet, ingénieur, qui s'arrêta à Dakar et ne put continuer son voyage. L'orateur rappelle l'exposé très complet de l'ingénieur Choisy et la tentative de la mission Flatters, si tragiquement assassinée.

Tous ces différents projets furent abandonnés à cause de l'insécurité, mais les temps sont changés et la pénétration est aujourd'hui plus facile. Le capitaine Cortier trace alors un aperçu géographique du Sahara et conclut que, s'il peut encore se produire des incidents dangereux comme on l'a vu encore récemment, la traversée du Sahara est néanmoins, actuellement, très possible pour la mission.

Y a-t-il utilité à étudier ce tracé du transafricain ? Il est exact que le centre de l'Afrique se compose de pays très pauvres et que la partie côtière, beaucoup plus riche, a permis la pénétration de nos produits dans ces pays désertiques, grâce aux chemins de fer de pénétration de Kayes (1.500 kilomètres), de la Guinée et du Dahomey.

Quel est donc l'utilité d'un chemin de fer central de l'Afrique ? Le projet primitif a été élargi par la conception de M. Berthelot, qui tend à faire la jonction de l'Algérie et du Cap anglais au sud.

Quel sera le tracé de la ligne que suivra la mission ? De Béchar, elle gagnera les oasis sahariennes, où commencera son véritable travail. Des études ultérieures détermineront les moyens de raccordement des oasis à la côte. Le transafricain sera un chemin de fer journalier ; pour y accéder, on devra le plus fréquemment passer par Alger, à cause de la rapidité des moyens de transport. La prospérité de notre ville n'en souffrira donc pas, quel que soit le point de raccordement.

Plusieurs membres de la mission ont déjà parcouru le Sahara et en connaissent les régions centrales : des cartes du Sahara ont déjà été entièrement levées et suffisent pour donner une idée de ce que sera le tracé. A 20 ou 25 kilomètres de distance, la mission sait à peu près les points de la voie tracée au départ : des oasis, on marchera sur l'Aïr, le Tazernouft, les montagnes d'Anet et de Moudir, l'oued Souf Mellen, brèche par où l'on passera, puis à travers une vaste partie plate jusqu'au massif du Hogar.

La question de l'eau est, on le comprend, primordiale. Alors que sur un parcours de 12 à 1.500 kilomètres on ne trouve que trois ou quatre points d'eau, le ravitaillement sera relativement facile à partir du Hoggar ; puis Fort Motilinsky, le Tazernouft, les territoires de la zone tropicale, l'Aïr, région d'épandage des grands oueds, Agadès, capitale de l'Aïr, relai des grandes routes sahariennes, tête d'étape des caravanes, puis le Tchad, région de brousse avec sa faune extraordinaire, la région des sables enfin où le tracé sera particulièrement difficile à travers les dunes. C'est au Tchad que doit se terminer la mission, mais on sait que le chemin de fer continuera vers l'Oubanghi et dans le Congo belge. Une autre mission, envoyée par le sultanat du Haut-Oubanghi, poursuivra des études rapides sur ce dernier parcours. Des lignes transversales, descendant sur le tracé principal, seront naturellement créées, et le projet Berthelot comporte l'union d'un transafricain et d'un transsaharien, du Hoggar au Niger.

Le capitaine Cortier expose ensuite qu'on s'appliquera à obtenir un trajet rapide et confortable dans l'exécution du Transafricain ; une voie large permettra seule une grande vitesse. On évitera les tracés mouvementés par raison d'économie. On emploiera enfin pour aller rapidement les méthodes qui, en Amérique, donnèrent de si beaux résultats (450 kilomètres par an), en tenant compte avant tout de la question de l'eau qui modifiera souvent le tracé.

La durée de la mission sera de huit mois ; les documents rapportés seront collectés et permettront de tabler sur quelque chose de précis et de présenter un projet suffisamment étudié. La mission ne fera cependant pas de levés de grande précision, pas même d'avant-projet [illegible]

La mission reviendra du Tchad par la Nigeria anglaise et Kano et pourra ainsi examiner les résultats obtenus par les voies ferrées de cette région.

Après quelques considérations sur la [illegible] qui sera employée dans la construction, le capitaine Cortier, dans une heureuse

Selecting Plants for Seed

Those who are to enter upon a system of seed breeding for their farms should begin to select foundation stock for the seed breeding plat next year. It will be of the greatest importance to get the best possible seeds from desirable plants before any attempt be made to improve the quality. Progress will necessarily be slow, even if the best be selected for the foundation. Nature works slowly but surely and she may be expected to do her whole duty when man is willing to co-operate along scientific lines.

All farmers have noticed a great variation in plants. Some produce nothing, some a fair yield, a few are prolific. While a difference in soil must be taken into account it does not explain this variation. One plant may be barren and another two feet away especially fruitful. The seed from these plants may be expected in a general way to reproduce their kind. The progressive planter will endeavor to eliminate as many of the objectional characters as possible in selecting foundation stock and start with specimens that give promise of vigor, high yield and desirable quality.

It will be advisable to study your plants before you select those from which future crops are to be grown. Take time and walk over the fields, making a careful examination of plants that seem likely to stand the test for foundation stock. Make a note of every plant that strikes your fancy, then designate it so it may be studied. When finally your judgment must be passed, eliminate every objectional specimen and reduce the number to the amount sufficient for your needs.

The seeds saved in this way will give you stock for the separate seed plat next spring. It will be important to have the plat large enough so that rigid selection may be continued and the undesirable eliminated. The seed plat should be located on good soil and good cultivation given. An effort should be made to improve the type along definite lines. A few years of careful selection will usually enable the manager to raise the yield and often the improvement in quality of the products is no small item in the price of crops.

JANUARY 6, 1910.

RARE VARIETY OF ANONA IDENTIFIED

Government Will Propagate Tropical Fruit Owned by A. C. Calkins.

LECTURE ON BREAD IS WELL ATTENDED

Much Interest Aroused by Investigation of Horticultural Board.

NORTHSIDE, Jan. 5.—Government experts have identified the rare Anona owned by Albert C. Calkins of Palm avenue as Anona Longiflora, a native of Mexico and one of the rarest varieties known. It is also considered one of the choicest.

Mr. Calkins secured the Anona from Dr. F. Franceschi of Santa Barbara, importer of rare plants and one of the leading authorities of the country on exotics. Franceschi had no record of it, however, and when it was shown to him, on a visit to Pasadena several weeks ago, he was unable to identify it, but thought it must be a natural hybrid.

Specimens of the fruit and leaves were then sent to P. J. Wester, department of agriculture expert formerly in charge of the Florida experiment station, and now devoting his time to the cultivation of the avocado or alligator pear.

Mr. Wester writes, "The flavor of the fruit reminds me very much of the cherimoya we fruited in Florida, and yet has a flavor of its own. In my judgment it is superior in flavor to the sugar apple, the custard apple and the soursop (all varieties of Anona) and will be of value for its fruit and for breeding experiment."

Mr. Wester has already made arrangements to get budwood from Mr. Calkins, and the government will propagate the variety for the benefit of the public.

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HORTICULTURIST VISITS PASADENA

Prof. Walter Van Fleet on Way to Chico for the Government.

Prof. Walter Van Fleet, of the United States Department of Agriculture, visited in Pasadena yesterday, inspecting some of the gardens of the city.

Prof. Van Fleet is on his way to Chico, where he will take charge of the government experiment and distributing station there. He is known as a specialist on irises, as well as an authority on the cultivation and propagation of plants of all kinds.

The horticulturist declared Pasadena was one of the most favored spots in the world and that the gardens here could hardly be surpassed. He called upon a number of the leading gardeners, both amateur and [illegible]

1909

DR. F. FRANCESCHI VISITS PASADENA

Noted Authority on Botany Inspects Show Places of Northside.

DECLARES LOCATION IS UNSURPASSABLE

Washington Heights W. C. T. U. Entertains Tonight for School Teachers.

NORTHSIDE, Nov. 23.—Dr. F. Franceschi of Santa Barbara, one of the best known botanists and plant importers of the coast, was in Pasadena yesterday, and spent the day visiting some of the show places of Altadena.

Dr. Franceschi is the highest authority on exotics in the state, and has introduced a great many of the most desirable new productions, such as feijoa sellowiana, the delicate tropical fruit which is being seized upon by many Southern California growers, as a most promising product.

Dr. Franceschi spent half of Sunday at H. E. Huntington's home near Oak Knoll. He was greatly delighted with the products that Mr. Huntington is procuring, and the way in which he is handling them.

In Altadena he inspected the properties of F. S. Allen, A. C. Calkins and others and declared that the locality appeared admirably adapted to semi-tropic fruits and plants, of which he himself makes a specialty. Dr. Franceschi has traveled all over the world, and knows many of the tropical portions thoroughly. He declared that he had never seen a finer street than Santa Rosa avenue, lined with cedrus deodora.

Mr. Franceschi will visit some of the other gardeners of Pasadena this week, and intends to make a rather thorough inspection of this part of the state before returning to his Santa Barbara home. He is accompanied by his son, Franco Franceschi.

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MAY 3, 1911

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William F. Wight of the United States department of agriculture spent the afternoon yesterday visiting some of the Altadena gardens, collecting material for herbarium use. Mr. Wight is well known for his work in systematic botany, being in charge of the identification and nomenclature work of the division of seed and plant introduction at Washington. He expects to spend considerable time on the coast, and after going north will return to Pasadena and visit all the principal gardens and private places to collect material for the herbarium of which he has charge. He recently completed an exhaustive work on the American species of plums. Mr.

1909

A. C. CALKINS HAS VALUABLE FRUIT

New Species of Anona, Supposedly Natural Hybrid, Is Discovered.

EXPERTS UNABLE TO IDENTIFY IT

Government Asks for Budwood and Will Propagate Valuable Discovery.

NORTHSIDE, Dec. 11.—An apparently new fruit which has puzzled the greatest experts of the United States is the property of Albert C. Calkins, of Palm avenue, Altadena. It is a species of Anona, but not like any known variety.

The plant resembles the sugar apple, Anona squamosa, more than any other anonaceous fruit, but the seeds are quite different and there are other dissimilarities which make it impossible to identify Mr. Calkins' fruit with the sugar apple.

Photographs and leaves were sent to Dr. F. Franceschi, of Santa Barbara, ~~the leading~~ Pacific coast authority on tropical fruits, but he was unable to identify it positively as any known variety of Anona. He sent it on to P. J. Wester, of the department of agriculture at Washington. Mr. Wester is one of the world's authorities on tropical fruits, and has done a great deal of valuable work at government experimental stations in Florida. He is the originator of the Wester avocado or alligator pear.

Mr. Wester admitted that the fruit was new to him, and suggested that it was a natural hybrid between the cherimoya and sugar apple, Anona cherimolia and A. squamosa. In this case it will propagate true to type, and will be of great importance to plant growers. As a natural hybrid, it will rank with the loganberry, a natural cross between the blackberry and red raspberry, which was found at Santa Barbara some years ago in the grounds of Judge Logan.

Mr. Calkins will send budwood to Mr. Wester, and the government will propagate the new species at its Florida stations.

Mr. Calkins secured the hybrid when he bought his home from W. Scott Way. Mr. Way thought he had secured the Anona from Dr. Franceschi, but this the doctor thinks is impossible, and he supposes that it came from some Florida nurseryman.

Dr. Franceschi who visited Pasadena a few weeks ago and inspected the Calkins, Allen and other properties there, has recently published a monograph on the anonaceous fruit trees of Mexico.

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Growing Palms from Seed

THE palms are among the best plants that can be grown in the window garden, or for home decoration generally, as they withstand the vicissitudes imposed upon them by the average living room better than many plants. They are green the year around, all that is necessary to keep the foliage bright and green is reasonably careful culture and the frequent sponging of the leaves.

The easiest way to get palms for home decoration is to step into the nearest florist shop and buy them; but for those who delight in having their plants from babyhood, the growing of palms from seed will be found exceedingly interesting. The larger seedsmen of this country are able to furnish some-thing like a dozen different species of palm seed, and they cost from thirty cents to two dollars a hundred, or from ten to twenty-five cents a packet, the packets holding from ten to twenty-four seeds according to the species and the price.

To be successful in raising seedling palms, the first requisite is to have fresh seeds. Unlike the ordinary vegetable and flower seeds all the seed crops of palm seeds are not put on the market at the same time, for the seeds arrive from the various parts of the world where they are collected at various times throughout the year. To get fresh seed the best way will be to place your order with your seedsman asking him to send you the seeds as soon as he receives fresh supplies.

The big growers usually sow the seeds on benches in the greenhouse where they can have bottom heat, but the window gardener must content himself with sowing them in pots. A 6-inch pot is a good size to use. There should be an inch of drainage in the bottom of the pot, and the pot nearly full of good seed soil — one made of equal parts of a good loam and leaf mold with a little sand and charcoal to insure drainage will give satisfactory results. The seeds should be covered about a half inch deep.

You cannot expect palm seeds to germinate as quickly as the seeds of annuals. It will take anywhere from one to nine months for the seedlings to appear, but most of the seed will come up within two or three months. To insure as rapid germination as possible, keep the seeds in a warm place, with the moisture in the soil as even as possible. If a greenhouse is at your command a temperature of 80 degrees at night with a rise of 10 to 20 degrees during the day time, and a small amount of bottom heat, will insure germination of the seed within a reasonable time.

To avoid frequent waterings when starting palm seeds in the window garden a layer of sphagnum moss over the soil in the pots will be of considerable help. Better results will be obtained if there is a shallow box to contain the pots holding the seeds, over which there is a glass top, making a sort of Wardian case.

There is a great similarity in the first leaves of all the palms when they appear above ground, and it is difficult to tell one species from another.

It will not be necessary to transplant the young seedlings for some time after they appear. If there are many plants in the pot, they should not be left so long as to allow the roots to become intertwined, but where there are only a few in a pot they can be allowed to stand four or five weeks before being transplanted.

The best way to transplant the seedlings, if there are enough plants in the pot to satisfy your wants, is to carefully remove the whole mass from the pot, and wash away the soil from the roots; this will obviate breaking the roots, which is very liable to happen if you dig out the plants as you would take out the seedlings of annuals.

A good soil into which to transplant the seedlings can be made from well rotted sod, leafmold, well decayed horse manure, and sand, but if these various ingredients are not available any good well drained garden loam will answer. You will find when potting these seedlings that the deep pots will be much better than the ordinary flower pots; a deep two and a half inch pot will be plenty large enough for most of the palms. Be very careful not to break the roots when potting the plants, for it is an injury from which the young palms do not readily recover.

After the plants are potted, water the soil to settle it, place the pots in the window garden and shade them with a newspaper. If it is convenient to use the Wardian case made from a box, as previously suggested, a moist atmosphere can be maintained about the plant which will be more conducive to their rapid recovery from the shock of being transplanted, as it will create a more congenial atmosphere.

After the plants have once taken hold of the new soil and are growing they can be removed from the case and given the same treatment as the other plants in the window garden. When the plants have filled the pots with roots, shift them into a pot one inch larger in diameter, using the same kind of soil.

Seeds of the date palm can be secured by buying dates from the fruiter, removing the seeds and washing them before planting. The following table gives some interesting facts:

SPECIES OF PALM	TIME WHEN FRESH SEED MAY ARRIVE	MINIMUM NUMBER OF DAYS TO GERMINATE
Areca lutescens	April, May	30
Corypha umbraculifera	July, August	90
Cocos flexuosa	various seasons	90
Cocos Weddelliana	January	75
Howea (Kentia) Belmoreana	Feb., Sept., Oct.	30 to 100
" *Forsteriana*	Feb., Sept., Oct.	30 to 100
Latania Borbonica	February	75
Livistona rotundifolia	August, Sept.	90
Phoenix Canariensis	January to March	60
" *reclinata*	January to March	60
" *Roebellini*	January	60
Washingtonia filifera	January to March	30
Seaforthia elegans	various seasons	30

Pennsylvania. PARKER T. BARNES.

PLEADS FOR A NAME

FLAGSTAFF, Ariz., March 2.

The "Examiner,"

Los Angeles, Cal.

Gentlemen: I read with interest your notice in the issue of February 25, page 8, part 4, of the bulletin issued by the Hawaii Agricultural station on the avocado or alligator pear.

Permit me to suggest that the true name of this fruit is "ahuacate," and it is desirable in the interests of good language and good taste that the true name should be applied to this luscious fruit, particularly now that it is coming into general use and into actual cultivation in Southern California.

The word "avocado," is a Portuguese corruption of the original Nahautl word, "ahuacatl," which word has been in turn corrupted in Spanish-speaking countries to the word aguacate. The designation, avacado, is absolutely meaningless as applied to this fruit. It is simply the Portuguese term for "lawyer." The other term applied to the fruit, "alligator pear," is an abomination from every standpoint, and it would be a pity not to make the attempt to apply the right name, "ahuacate," to this fruit, now that it is coming into use and into trade in Southern California.

I hope hereafter when you have occasion to refer to this fruit in your paper, you will adopt the use of the term "ahuacate."

Permit me to suggest that you will find the cultivation of this fruit going on, on an extensive scale, right at your front door. The West India Gardens, at Altadena, Cal., has gone into the cultivation of this tree and I understand with great success. I am informed that there are 40,000 or more of these trees started in the nurseries at Altadena. I believe it is the purpose of the people conducting this enterprise to return to the correct name of the fruit and to make the attempt to eliminate the use of the terms "avocado" and "alligator pear" as applied to this fruit. They expect to make the true name "ahuacate" prevail in California, and it is to be hoped that the rest of the country will follow the excellent lead shown by the Pacific Coast.

Yours very truly,

M. J. RIORDAN.

A Letter from Switzerland

The following was recently received from E. C. Reineman, of Pittsburgh, Pa., at present traveling in Europe.

This mountainous country should properly be called Flower Land, for nowhere have I beheld so many flowers as when traveling through this country for the past week. I just struck it right, all flowers are at their best in the meadows as well as on the highest peaks. Such varieties and numbers, I wish I could call them all by name, I would have enjoyed them so much more. The flora of Switzerland is more varied than one thinks; I was much surprised to see the thousands of Narcissus growing in the fields near Montreux and south toward the highest peak in Europe, Mt. Blanc, covered with perpetual ice and snow, a grand sight, I can assure you. One could cut them by the thousands; they would be valuable with us as a cut flower. Then to see all the other flowers growing wild, such as Centaureas, Cowslips, Crocuses, Myosotis, Primulas, Poppies, such bright red ones, Pinks, fancy colored grasses, rich Clover and the Fragaria, or Wild Strawberry, just ripe and in blossom, and hundreds more, strange to me, including such as grow in higher altitudes, which are beautiful indeed.

One of the well-known resorts in this country is Mürren, near Interlaken, a splendid flora garden, so much so that one of the valleys of this wonderful resort is well and justly named Blumenthal, or "Flower Valley." At present Mürren is assuredly a noteworthy flower garden.

Much snow still covers the ground in protected localities but, where the sun shines, the grass is green and flowers are blooming. Close to a heavy snowdrift a lot of Crocus were in bloom; with one hand I made a snowball and with the other picked flowers. Even in the higher altitudes there is an abundance and variety of bloom, somewhat different from that below, not so vigorous and generally short of stem. The Gnaphalium or Edelweiss, as it is better known, I could not find, although I was up higher than it grows.

Of all the wild flowers yellow predominates, but the Forget-me-not, such Forget-me-nots! I shall ever remember. Not the little wild blossom of our fields and meadows but the good large flowering one with fine large stems, which the florists use. And how prolific they are, growing everywhere along the roadside, up the high mountains, and in the meadows, masses of blue intermingled with flowers of all colors, a veritable carpet. They are fascinating, particularly growing in such great numbers in the pasture and meadows where the cows and goats graze. It is not at all surprising that a young lady made the remark that she could at last realize why Sweitzer cheese was so good and famous: because the cows are fed with Forget-me-nots.

The flower stores of the larger towns make fine displays of choice cut flowers, Roses, Carnations, Orchids, etc., and do a fair trade during the rush of visitors in the Summer time. Switzerland is only a small country, a well governed republic, but what it lacks in size it certainly makes up in scenery, the grandest scenery in the world which one could enjoy for months.

About a week ago I was in Frankfurt-on-the-Main where I spent a few hours in the Palmengarten or Palm Garden. This beautiful garden, with its large Palm houses and a fine range of smaller houses, was started only in 1869, when I first visited the city, and was completed about 1871. The company purchased the fine gardens of the Herzog von Nassau, and have much improved them since my last visit here, about six years ago. A fine range of small show houses have been built, which are well stocked with decorative and blooming plants and, in passing through them, I noticed a few things which might be of interest to your readers. Caladium Humboldtii from Brazil, very ornamental with small leaves, richly variegated white; Medinilla magnifica from the Philippines; Anthurium Veitchii with its long leaves, Phalos Wallichii from India. These plants are well suited for private and public conservatories. Begonia hybrida Locerna, R. hy. Bismarck, R. hy. Herzogin von Portland, are strong growing and flowering sorts that are very attractive, particularly for private places. A fine collection of Orchids in one of the houses was most attractive, Dendrobium thyrsiflorum with its fine white and orange spikes and Ladia purpurata were conspicuous. A whole bench of Schizanthus, an annual, was in bloom with many colors. Two good Lobelias, fine for basket, Richardioidi and Hamburgia, splendid for plant growers. The ornamental bedding was just being done and they certainly put enough plants in the beds to get an immediate effect. The outdoor Roses were looking fine, strong with rich green foliage and well budded.

Anyone visiting Frankfurt should not fail to visit this place, right in the heart of the city, where concerts are held every afternoon and evening, which are enjoyed by the Frankfurters who go there daily in the Summer to spend a few hours pleasantly with their friends, eating and drinking, laying all cares aside.

EXPERTS CHANGE THEIR OPINIONS

New Verdict Passed on A. C. Calkins' Strange Specimen of Cherimoya.

REPORT DAM SITE HAS BEEN SECURED

Northsider Gets Interesting Letter in Regard to German Election.

NORTHSIDE, July 28.—After a year of discussion, experts have finally decided that the peculiar cherimoya or custard apple growing on the grounds of Albert C. Calkins of Palm avenue is really the Anona cherimolia, or possibly a natural hybrid of this.

The tree is so unlike the ordinary type, that none was able to identify it. Specimens were finally sent to some of the best authorities, who ventured the opinion that it was Anona longiflora.

Lately more specimens of the fruit and leaves have been sent to these

P. J. Wester, the noted authority of the department of agriculture, writes as follows about the examination he made of the samples sent him:

"After having compared these, the foliage, fruit and seed with material available here, in Miami and the National Museum, I am convinced your tree is Anona cherimolia, notwithstanding its peculiar fruits. It is evidently only a very extreme variation of the "knobby" type of cherimoyas. Judging from the specimens in the U. S. National Herbarium labeled A. longiflora this species is exceedingly closely related to A. cherimolia, and it would not surprise me if it will be found in the future that the knobby type of cherimoya is a natural hybrid between A. cherimolia and A. longiflora."

Dr. F. Franceschi, the expert of Santa Barbara, has come to the same opinion, although he does not consider the possibility that the Calkins plant is a natural hybrid. He says he thinks it is a variety of A. cherimolia, and that he has procured specimens of it and is going to send them out this winter under the name of A. cherimolia, var. mammillaris.

The Anona or custard apple promises to take an important part in the development of tropical fruits in Southern California. The fruit is considered one of the choicest grown, and flourishes readily in any part of Los Angeles county where there is not much frost. It is expected that a great many of the trees will be planted during the next few years.

* * *

Calabash pipe gourds are being grown with great success by a resident of the northside, who thinks that an industry may be created here. The gourds, when made into pipes, now sell at $2.50 each. The market is probably very limited at this price, which is high because of the novelty of the gourds, but the northsider claims that a fairly good permanent trade should be developed. The calabash pipe gourd is being introduced by the department of agriculture, but in the south and east it is attacked by a beetle which bores holes in the fruit and leaves them worthless. This beetle has not appeared in Pasadena so far. Some of the residents of Los Angeles county have been unable to get the fruit to set on the vines, but the northside man has had no trouble of this kind, having a good crop now in process of maturing. The gourds, when the ends are cut off, are just the right shape to make a pipe, and their fiber is one of the hardest vegetable products known, being proof against all injuries. A stem is fitted to the small end of the gourd, the bowl lined with plaster of paris, and the gourd pipe is all ready to be placed on sale.

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CIRCULAR NO. 5.—REVISED.

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF PLANT INDUSTRY,
POMOLOGICAL INVESTIGATIONS.

DIRECTIONS FOR SELECTING, PREPARING, AND SENDING SPECIMENS OF FRUITS.

It is essential that all specimens of fruits sent to this Department to be examined by the Pomologist should be in all respects characteristic and should fully and fairly exemplify their varietal peculiarities. The following instructions should therefore be closely followed:

1st.—Select specimens of average size, typical in shape and color, and ripe, but not too soft to carry safely.

2d.—Cut a small branch showing bearing wood, if possible with one or more fruits and characteristic leaves attached, and another showing the mature wood of the year. It is of the utmost importance, not only to the Pomologist in identifying and comparing varieties, but also to the artist in making illustrations, that the branches and the leaves should accompany the fruit.

3d.—Wrap each fruit separately, whether attached to a branch or not, in several folds of tissue or other soft paper, then pack with moss, or cotton, or very soft paper so as to fill the space between the fruits and the box which contains them.

4th.—In sending specimens liable to shrivel or those having fresh leaves attached, the packing should be very slightly dampened. Wrap the box in several folds of strong paper, and tie securely over all with twine. Under Order 444 of the Postmaster-General, packages mailed under frank MUST NOT EXCEED FOUR POUNDS IN WEIGHT, except in case of a single book.

5th.—Label all specimens of fruit plainly, and see that the name and post-office address of the party sending is marked on each package.

6th.—Send nothing by mail packed so that it may injure the contents of the mail bags.

7th.—While for purposes of identification and nomenclature only typical specimens will serve, the Pomologist will nevertheless be pleased to receive for examination specimens of unusual form, curiously marked, or in any respect abnormal.

8th.—Boxes made especially for carrying pomological specimens by mail, and franks for pasting on the outside of such packages, will be provided on application. When the Department frank is used no postage is required, and such packages may be mailed at any post-office within the United States.

G. B. BRACKETT,
Pomologist in Charge of Pomological Collections.

Approved:
B. T. GALLOWAY,
Chief of Bureau.

CAT FAMINE ONCE MORE BREAKS OUT

Paasdena High School Physiology Class Has to Postpone Work.

Although the cat famine at Pasadena High school was supposed to have been broken, it appeared again in full force today, when the physiology class was ready for specimens.

Because members of the Pasadena Humane society were shutting off the outside supply, Miss May Lewis of the class offered to donate four of her pets. Chris Muckerman and an alda went to catch them today, spent an hour in the chase, and returned baffled.

An offer of 25 cents each for felines brought no response, and the dissection had to be given up.

PHYSIOLOGISTS HAVE LUNCHEON

Pasadena high school physiology class, taught by Miss Martha Winslow, took a variation of its accustomed labors today by holding a fudge luncheon. Fudge was made by scientific methods in the labratory while pie, sandwiches, pickles and other delicatessen were imported. Following luncheon the party adjourned to the assembly hall, where Paul Parr Smith showed his proficiency on the piano. Those present, besides Miss Winslow, were Misses Hill, Dustin, Chisholm, Blanche and Shirley Sydnor, and Messrs. Smith, Manley and Popenoe.

FUDGE IS SCIENTIFICALLY MADE AT HIGH SCHOOL

Physiology Class Devotes Session to Production of Confectionery Delight

PASADENA, Jan. 14.—Fudge fresh from the laboratory and made with scientific exactness. This may be the latest thing in these days of pure foods and drugs if the physiologists of the Pasadena high school have their say, for this afternoon the members of Miss Martha Winslow's physiology class of that institution turned its attention to scientific cookery in the city high school laboratory, fudge, that delight of the dainty school maid, being picked for the first experiment.

There was nothing rule o'thumb about the way it was cooked, either. First the class found out what chemical changes produce the confectionery delight from sugar and the other ingredients, and then the class set about making fudge over Bunsen burners and in retorts and strange looking tubes. To the surprise and delight of the students of the school who partook of the result, the production of science proved just like the kind sister used to make though it was not "artificially colored and flavored."

EFFIGY HUNG ON NEW YORK AVENUE

Boys Use Clothes of Mexican Workmen and Amuse Residents.

A. A. PEARSON BACK FROM SUMMER TRIP

Pastors Will Conduct Their Services in All Northside Churches.

NORTHSIDE, July 30.—Residents of New York avenue received a shock this morning when they opened their sleepy eyes and saw the figure of a man hanging to a telegraph pole. It was at first supposed that it was someone who had been lynched for saying that Oak Knoll was a more attractive place to live than New York avenue, but closer inspection showed that it was merely a dummy.

The Mexicans who have been improving New York avenue are in the habit of leaving some of their superfluous wearing apparel on the ground when they go home for the night. Some boys in the neighborhood had gone over the pile and picked out enough to make a complete outfit from head to foot. A black hat, khaki shirt, blue overalls and an old pair of shoes made the effigy look quite workmanlike.

As the figure was hung in front of the residence of Alvick A. Pearson, it was suggested that it was intended to form a memorial of welcome to him. Mr. Pearson returned last night from a trip of several weeks to the Yosemite.

After finishing with their straw man, the boys apparently had a pair of trousers left over which they did not like to waste, so they hoisted them to the top of a fifty-foot flag pole on the grounds of Commander Ford Brown.

The Mexican workmen appeared shortly before 8 o'clock this morning and were greatly amused at the use which had been made of their working clothes. They spent a great deal of time scrutinizing the garments which flapped in the breeze, in order to determine who should climb the zpole for them, and finally got them all down and started to work on finishing the surface of New York avenue.

* * *

Pollination of Fruits As the season for planting trees will soon be here, those who have the opportunity of recommending to their customers what trees to plant should keep in mind that it is well understood by fruit growers that all fruit trees and bushes set their fruit better when several trees or bushes of a variety are located together. A single tree of a Pear or Apple, for example, is not as likely to set its fruit as well as it would if two of each or more were planted. The exceptions to this are few. There are a few kinds of fruit trees having varieties which set their fruit satisfactorily where fertilized by their own pollen, but experiments time and again have proved that better results always follow when a flower is pollinated from flowers of another tree.

Quite often nurserymen are asked why it is their fruit forms on a tree only to drop off after growing to some size. Though this falling off may be caused by insect or fungus injury, it is often the result of self pollination.

Besides tree fruits, the same results follow in small fruits, and, in fact, in many flowers. A single plant will often entirely fail to produce fruit or seeds. This is well understood by observing florists, who have found that the second plant does not always need to be of a different species or variety. While it is better that the second one should be different, the results are fairly satisfactory when it is even of the same kind.

Observations lead to the belief that there are certain varieties of fruit trees absolutely self sterile, which shows how important it is for those who sell trees to have knowledge of this fact in dealing with customers. If the buyer has not room for two of a kind it may be that a neighbor has trees of the same kind not too far away for the pollen to pass from one tree to the other.

Fruit growers familiar with the facts mentioned, when setting out groves of any particular fruits make a practice of introducing a row of some other variety between the main lot, to insure proper fertilizations.

DINNER AT A HOTEL.

"There wasn't anything she wanted particularly except some asparagus and an alligator pear."

IMPORTANT NOTICE

WE can furnish the following publications concerning subtropical fruits:

THE PACIFIC GARDEN, March 1912 issue, devoted especially to the Avocado. Price 10 cents. (Publishers price 25 cents.)

The following bulletins by F. W. Popenoe, reprinted from the Pomona College Journal of Economic Botany:

FEIJOA SELLOWIANA, its History, Culture and Varieties. A treatise covering the History of the Feijoa in Europe and North America, propagation by all methods, culture, value and use of the fruit, and varieties cultivated at this time. Illustrated. Price 15 cents.

THE DEVELOPMENT OF THE AVOCADO INDUSTRY. A pamphlet describing the progress of the avocado industry in the United States, and especially in Southern California; illustrated. Covers fully the commercial avocado, as follows: Season, hardiness, yield, size, form, uniformity, color, skin, flavor and seed. Should be read by everyone contemplating planting avocados. Price 10 cents.

THE MANGO IN SOUTHERN CALIFORNIA. A treatise covering the importance and value of the mango, its present status in California, future possibilites, propagation, and varieties now grown in this state. Contains also an annotated list of the better-known mangos of the world. Illustrated. Price 25 cents.

WEST INDIA GARDENS,
Altadena, California

SOCIÉTÉ AGRICOLE & INDUSTRIELLE
DU SUD ALGÉRIEN

PRIX COURANT DES DATTES
1ER CHOIX

	PRIX à la direction ou au dépôt	EXPÉDIÉS A DOMICILE en Algérie	EXPÉDIÉS A DOMICILE en France
Caissette de 10 kilos, colis-postal	12 »	13 50	14 50
— 5 kilos, —	6 50	7 75	8 25
— 3 kilos, —	4 »	5 »	5 50
— 2 kilos, —	3 »	4 »	4 50
Grand panier n° 1, le Rouara, 2k. 500	5 50	6 50	7 »
Petit — n° 2, — 1k. 500	4 »	5 »	5 50
Boîte élégante de 1 kilos	1 75	» »	» »
— 500 grammes	1 »	» »	» »

Expédition contre mandat-poste. — Pour l'Etranger, port en sus.

His Excellency the Governor has been pleased to intimate his intention to be present to open the Show.

AGRICULTURAL SOCIETY
OF TRINIDAD & TOBAGO.

President—HIS EXCELLENCY THE GOVERNOR.
Secretary—EDGAR TRIPP.

THE SOCIETY'S TOBAGO SHOW
(IN CONJUNCTION WITH THE SCHOOL SHOW)
WILL BE HELD ON
The Ground of the Tobago Cricket Club,
at the Government Stock Farm.
ON WEDNESDAY, 16th FEBRUARY, 1910.

LOCAL EXECUTIVE COMMITTEE.

The WARDEN.
The Hon. H. L. THORNTON.
Captain SHORT.
Rev. Canon S. R. BROWNE.
H. R. HAMILTON.
THOS. THORNTON.
G. D. HATT.
W. E. BROADWAY.
H. MEADEN.
D. MACGILLIVRAY.
E. C. SEALEY.
Dr. E. G. BLANC.
KENT HECTOR.

C. L. PLAGEMANN.....Secretary and Treasurer.

THE CONSTABULARY BAND WILL BE IN ATTENDANCE.

PRIZES

Supplemented by Local Subscriptions which are hereby invited, and, in cases of Exceptional Merit, by **Diplomas of the Agricultural Society**, will be awarded to **The Peasantry and Working Classes only**, for Exhibits as follows:—

Our Supplementary Illustration.—Corypha umbraculifera, the Talipot Palm, is a native of Ceylon and S. India, and it forms one of the noblest specimens of the vegetation of those regions. Though, like the majority of its allies, it is a slow grower, it attains to a great height, and, when reaching maturity, bears a magnificent crown of enormous leaves. So large are the full-grown leaves, that one or two suffice for the roof of a hut. Indeed, it is no uncommon sight in Ceylon to see a whole family of Tamils marching along in a tropical shower sheltered beneath a single leaf, which serves them as an improvised and gigantic umbrella. Though the Talipot reaches a height of some 90 or 100 feet, it is a monocarpic—that is, a once-flowering plant. For 70 or more years its energies are devoted to building up its massive tissues. Then, bursting into bloom, it forms a splendid spectacle, which attracts curious visitors from far and wide. Its bloom faded and its fruits set, the whole inflorescences topple over, the leaves wither and hang down, and the tree dies. The three photographs reproduced in the illustration represent the youth, maturity, and old age of this remarkable Palm. The cultivation of the species in Europe is attended with considerable difficulty, and at Kew it has never been possible to get specimens of even a moderate size. The present plants are only about 3 feet or so in height, but these are probably equal to any to be found in Europe

Corypha umbraculifera (Talipot Palm).
(An adult palm before flowering, a plant in bloom, and a specimen passing to decay.)

THE

A SALAD F

There is no more delicio
Alligator Pear, as it is comm
pear shaped or round, weighi
even more, green or purple
hard seed the size and shape
yellow, is eaten raw in a ma
very agreeable.

The Avocado offers great
always brings a good price,
each. It stands shipment we
always been in excess of the

The seedling trees grow t
They are prolific bearers, ar
season of fruiting is from Se
extend the season from July
being about the size of large,
from seeds, and can be budde
lings themselves are in gener
years old, the fruits in a sin
as $325.

It is recommended, howe
quality of fruit. Set budded
if space is available at a some
cultivation is necessary the fr
able amount of fertilizer.

No more profitable tree
Avocado, and the increasing d
them in commercial quantitie

Seedling Avocados.—We h
of fruits. The flavor is first c
bear the fourth or fifth year
tree, as well as for the frui
each $1.00.

Budded Avocados.—Our st
summer. Deliveries can be ma
any other grower, as we ha
Price, balled, or in cans, each

WEST IN

F. O. POPE

SUBTROPICAL

ALTA

FEIJOA SELLOWIANA

OR PINEAPPLE GUAVA

THE NEW COMMERCIAL FRUIT

FEIJOA—NATURAL SIZE

IN GROWTH and character the Feijoa (pronounced, according to the Century Dictionary, Fay-zho-a, accenting the middle syllable) much resembles the common guavas. It is, in fact, closely related to the guavas, all being members of the natural order Myrtaceae, or myrtle family. The plant grows to an ultimate height of eight or ten feet, making a very ornamental shrub, with brilliant and attractive flowers, silvery white in color, with a tuft of crimson stamens tipped with golden anthers. The foliage is of a pleasing combination, glossy green

THE AVOCADO PAYS

WE have recently received an inquiry from a HOMESEEKER reader asking for information regarding the avocado or alligator pear. The following editorial, by S. A. Murden, in the current number of *Tropical Topics*, answers our correspondent:

"We look ahead to the time now close by, when the seedling avocado, known commonly as the alligator pear, will be the most profitable crop grown in our section. In the Modello section they can be grown to perfection, and take only four years to produce fine crops of fruit. We have never seen or known avocadoes of good quality fail to bring excellent prices.

"Early last year while we had been buying for our own use nice small fruits at 60 cents per dozen, and we were revelling in the idea that we would certainly have all that we cared for, in a single day they jumped to $1.20 per dozen, and remained there until they jumped again. We will never live to see well cared for avocadoes sell at a low price, when right here where they grow they are in such demand. It has only been of late years, in fact only within a year or two, that our people have thought it necessary to give the trees any attention, but they have learned that potash will more than double the crop, and will increase the value by adding to the delicious nutty flavor that belongs to the avocado alone. We advise all newcomers to plant avocadoes, and we refer to the seedlings. Avocadoes can be budded as easily as the orange, and if there is any need to try to improve a fruit already perfect, it is easy to have the budding done, even if one cannot do it themselves."

* * *

Calabash pipe gourds are being grown with great success by a resident of the northside, who thinks that an industry may be created here. The gourds, when made into pipes, now sell at $2.50 each. The market is probably very limited at this price, which is high because of the novelty of the gourds, but the northsider claims that a fairly good permanent trade should be developed. The calabash pipe gourd is being introduced by the department of agriculture, but in the south and east it is attacked by a beetle which bores holes in the fruit and leaves them worthless. This beetle has not appeared in Pasadena so far. Some of tre residents of Los Angeles county haye been unable to get the furit to set on the vines, but the northside man has had no trouble of this kind, having a good crop now in process of maturing. The gourds, when the ends are cut off, are just the right shape to make a pipe, and their fiber is one of the hardest vegetable products known, being proof against all injuries. A stem is fitted to the small end of the gourd, the bowl lined with plaster of paris, and the gourd pipe is all ready to be placed on sale.

FERTILIZATION OF FRUIT TREES.

It seems strange to the writer that so little, if any, attention has been given to the assisting of fertilization of our fruit bloom, especially of the avacado and the budded mangoes. The avacado blooms freely but drops a very large portion of the bloom before the fruit sets. The Mulgoba mango is avoided by many who are planting groves because of the well known fact that while it blooms profusely, that few of the blooms set fruit. That this has been allowed to prejudice those who have had no experience with fruit-growing may be passed by, but the writer, when a child, knew the fruit growers in New York state to rely on bees to carry the pollen from tree to tree and thus ensure the fertilization of the bloom and make sure of paying crops. There is in no way any objection to keeping bees; honey is salable and is only another source of profit to the fruit grower. Bees are as necessary to the fruit grower as is fertilizer, only more so. We quote from a late issue of Green's Fruit Grower, the following along this line, and hope our Avacado Association, as well as others, will advocate the bee proposition:

Fruit growers are beginning to realize the necessity of bees for the proper fertilizing of fruit bloom, and that the two industries are mutually inter-dependent. If anything, the fruit grower derives much more benefit from the bees than the bee keeper himself. A number of years ago the veteran bee keeper and queen breeder, Harvey Alley, of Massachusetts, now deceased, was obliged to move his bees away, owing to complaints of fruit growers, claiming them to be a nuisance, but after a year or two they were glad to get him back again, because of so little fruit in proportion to the number of blossoms.

"I have in mind an account I read in one of the bee journals of a man in New York state, who bought a farm and set it out to fruit trees, expecting to flood the market with fruit. After a few years' waiting and getting no fruit he was obliged to sell out to another. hTe second man thought he had a bonanza, but soon found out his mistake and sold. The third buyer was a bee keeper and wanted it as a location for his bees, at the same time mistrusting the cause of the barrenness of the orchard. The result was that the first year he harvested thousands of barrels of the finest fruit ever raised in that section, and the orchard has continued to bear since.

PLANT EXPERT IS VISITING FRIENDS

Robert Beagles, Director of Chico Station, Guest on Northside.

MORE MEN NEEDED IN THE SERVICE

Water Question in Society's Territory Is Again Given a Stir.

NORTHSIDE, Oct. 26.—Mr. and Mrs. Robert Beagles, late of Washington, D. C., are visiting on the Northside. They are on their way to Chico, where Mr. Beagles will take charge of the government experiment station there.

The Chico station has been established four years, and has had a new director each year. Mr. Beagles has been with it in one capacity or another ever since it started.

The station now has eighty acres under cultivation, and it is doing a great deal of valuable work. One of its most interesting tasks is the propogation and distribution of a species of spineless cactus, similar to that which Luther Burbank originated. A good many samples of this have been distributed to ranchers, but reports as to its success have not yet been received.

Mr. Beagles is an enthusiast on the avocado, although the climate at Chico is not suitable for it. He prophesies that it will become one of the most valuable products of Southern California within a few years.

"The greatest difficulty in our work is that of getting good men for it," remarked Mr. Beagles today. "There are not enough trained men in the country. It is a great opening for young men who have a liking for horticultural work and will devote themselves to it. We can not get many older men, who are experts in the work, because the government does not offer sufficiently large salaries to attract them from private employment."

* * *

Preparing Exhibits for the Horticultural Show

BY JOHN T. HAMMOND

1. In preparing exhibits for horticultural shows, it is necessary that the intending exhibitor should be conversant with all the requirements set forth by the schedule, and be prepared to abide thereby in letter and spirit.

2. Selection of the best seed it is possible to procure should be made for annuals or vegetables.

3. Preparation of the ground for proper planting and necessary growing of plants until maturity of the flowers, fruit or vegetables intended to be exhibited should be carefully attended to.

4. Do not depend on chance offerings from Nature, but join hands with her and work with her, working with the purpose of doing better than you have been doing.

5. Plants under glass should have all the attention it is possible to give them. Careful potting, watering, heating and ventilation are absolutely necessary, but care should be exercised not to overdo things.

6. In the case of Palms and foliage plants, have them as clean and bright as Nature intended them to be, and not more so. While it may be legitimate to use soaps and mixtures of various kinds, the use of oils and other polishes which impart unnatural brilliancy to foliage should be discouraged. Nothing looks so overdone or unnatural as a Palm or group of Palms or foliage plants burnished to shine like the product of a lacquer plant. Judges should discriminate against such attempts to improve on Nature.

7. After the classes for entering are selected, it should be an exhibitor's object to fill his entries, and he should not attempt to do more than is in his power. He should not have a surplus of entries in order that he may drop one or more if he cannot fill them successfully. Timid, would-be exhibitors should not be deterred from entering certain classes through awe of their competitors. Often such exhibitors could surprise the public by the excellence of their exhibits.

8. Leave nothing to chance; never guess when positive assurance can be made.

9. Don't delay entries with an object in view. Face defeat if necessary. We cannot all win; there must be some losers. If a loser, lose with good grace; show the people that you have at least been doing something. Learn by defeat; failures teach lessons as well as successes—failures are better remembered than successes.

10. A man may have first-class material, fit to compete with all comers, but be, unfortunately, short, say 10 per cent. of stock to fill a certain class. He might purchase it, or secure it in some way, and win, and he alone know how he won, but the draw would not be legitimate; the exhibitor has been guilty and his neighbor who supplied him, equally so with him, of a crime, in the eyes of the law, and an insult to decent society. An opportunity to defeat a rival is a temptation which, unhappily, some natures cannot resist. The mission of a horticultural show is to educate the masses, and, through competition, spur gardeners to their best efforts to the honor and glory of the profession. It is not a field for speculation or an opportunity to increase a bank account. In preparing exhibits for a show, the mind of the exhibitor should be prepared also. Judges are not looking at exhibits with the exhibitor's eyes. They are usually cool, impartial, unbiased gentlemen, and an exhibit may not look as good to them as to the exhibitor.

ALFONSE MANGO.

MIAMI, FLA., June 25, 1906.

Editor of The Homeseeker:

DEAR SIR—The Alfonse mango is now on the Miami market and selling at 50 cents each. This is the first fruit of this variety ever produced in the United States. Three years ago the government imported from Bombay several marched Alfonse mangoes, and Mr. Geo. B. Cellon, of Miami, Fla., succeeded in getting several of the buds to take in a jungle mango, which is now laden with the luscious fruit. To Mr. Cellon is due the credit of our having many fine varieties of mangoes and avocadoes to add to Dade's many resources, and he has the only budded tropical fruit nursery in the world, for which our people should be proud, as Dade county is in the lead of the tropical world in the modern propagation of tropical fruits.

Yours truly,

W. E. MARCH.

New Scale Book.

GREEN'S COCCIDAE OF CEYLON, Volume 4, has just been delivered to subscribers. This volume is more beautifully illustrated if possible than either of the preceding. Prof. Green is becoming an elderly man now, and entomologists all over the world are hoping that his remarkable powers may be maintained for many years more, and until he may complete the series. If there is extant a more delightful work of art than one of his pages of "scale bugs" I have never seen it.

To the citrus-fruit grower a scale is an insect to be hunted and destroyed like a wild beast, yet there is nothing more highly colored, more diversified in form or more strange in construction in all animated nature. A page of Green shows more lovely colors than those in a jeweler's window. From scarlet to delicate pinks, mauves, lavenders, salmon, green of most delicate tints—every conceivable chromatic—all are represented in their natural colors in this remarkable work of forty full-page plates. Working alone on the island of Ceylon, Mr. Green is making an entomological record of his chosen theme of Coccidae, that will hold the students of scale bugs for the next fifty years and where could such a collection be found as that of Ceylon depicted in this delightful publication?

* * *

THE TRAPP AVOCADO

ONE of the most valuable and profitable avocados yet discovered is the Trapp, which is being propagated by George B. Cellon, who owns and operates a tropical nursery near Miami.

Mr. Cellon, soon after arriving here, became greatly interested in the development of the better varieties of the avocado family and spent much time in securing the finest specimens grown in the country. Among them he discovered the Trapp, the latest avocado yet produced. This peculiarity is the chief value of the fruit. In quality it is equalled by few, but the fruit is smaller than many of the early varieties. So far as we know, the Trapp is the only winter avocado grown in Dade county.

The demand for the Trapp is far beyond the production and will be for many years to come.

Mr. Cellon has quite a number of the Trapp trees in bearing, and through the month of November he was supplying the best trade in Northern cities at $4.00 per dozen f. o. b. Orders for the month of December were booked at $6.00 per dozen f. o. b. These prices for fruit seem incredible, yet Mr. Cellon's orders were for a much greater quantity of avocados than he could supply.

For several years Mr. Cellon has been propagating this fruit and many of the planters have secured trees, which will soon begin to bear, and each year the acreage is being increased, but not nearly as rapidly as the demand. The Trapp comes in at a season of the year when the fruit is ready for the holiday trade.

The growing of the avocado family in Dade county will, within a few years, reach large proportions; in fact, we believe that soon the money value of the avocado will be greater than that of oranges and grapefruit. As this fruit becomes known in the Northern markets the demand for it will become almost limitless, and the portion of the country where it can be successfully grown is limited.

In the southern portion of Dade county and in Monroe county the avocado reaches perfection, with no danger of being frozen out. In some other parts of the State a few planters try to grow the avocado, but hardly do the trees reach the bearing size, when a frost comes and cuts them to the ground. In the southern portion of the East Coast they may be relied upon to bring a good crop year after year.

The great majority of avocados grown now are seedlings, but among them are some very choice and rare fruit. Lewis Wagner, at Orange Glade, has a seedling tree which commenced ripening its fruit in July, and from that time until today (December 10) he has had more matured pears than the family could eat and has sold many dollars' worth. The fruit is of good size and when ripe is a dark purple. The stone or seed is small, flesh thick, with a fine nutty flavor. This variety will be extremely valuable for growing for home use, as its time of ripening extends over such a long period.

We advise planting avocados in this southern section and planting large acreages. It is the coming fruit.

Among the countless number of kinds of fruits grown in the

MANGOES AND AVOCADOES

Propagation Easily Done by the Bottle Method of Grafting.

THIS method was discovered by me some two years ago. I would have given it to the public before but have been waiting to try it out thoroughly. After ex-

Flowing Artesian Well.

perimenting, I find it to be a success in every way.

This method is very simple. Take a branch from the tree you wish to make the graft from. Have plenty of wood so you can let the bottom of the graft come down below the union eight or ten inches. Then splice the two together by cutting away the bark and some of the wood of each. Then fit them together carefully, wrapping them with a soft piece of string.

Then fill a bottle with water and stick the lower end of the graft into it, tying the bottle to the tree; this will keep the graft alive until the union between the two barks is made. Then cut off the graft at the lower end of the union and cut the string in places to allow it to fall off.

I have named this the "Bottle Method." In making the union do not let over two inches of the graft stick above your union. This seems to do better on pears than mangoes. It makes the graft on pears with but little care, but the mangoes are harder to graft. Be very careful to match the barks.

Plant your seed where you wish them to stand. When they are about one inch in diameter is when to do the grafting, using grafting wood from near the top of the tree that you wish to propagate from.

I feel that the people of the East Coast should have this method given them as this fruit is now being extensively grown.

This method will give bearing trees two or three years sooner than from the seed. The mango and avocado can be budded but not very successfully.

I have no trees to sell. I am simply giving this to the people for what it is worth. I have given the method to Mr. D. A. Allen, south of this city, who, after trying it, said it was a success.

Anyone who is interested may call on Mr. Allen, who will be pleased to answer all questions; or they may call on me at corner of Rosemary and Fern streets, where I can show them grafts just putting out, and others in good growing condition.

H. T. GRANT.

West Palm Beach, Fla.

NOTE DU TRÉSORIER

MM. les Membres de la Société sont priés, pour éviter les frais de présentation par la poste des carte-quittances, pour faciliter le contrôle et pour simplifier les écritures de trésorerie, d'envoyer à **M. Pellat,** *trésorier, rue Amiral-Coligny, Alger,* leur cotisation ainsi que les dons qu'ils voudraient bien faire à la Société.

Nous publions le nom des membres qui ont envoyé leur cotisation (1). Cet avis leur servira d'accusé de réception. Dans le cas où un mandat ne serait pas parvenu, prière d'en informer le Secrétariat.

LISTE DES MEMBRES AYANT ENVOYÉ LEUR COTISATION POUR 1912

MM. Dr Granja, à Valentia.
Courmes, à Paris.
Serv. Pares, à Alexandrie.
Cap. Legeas, à Constantine.
Popenor, à Pasadena.
Collery, à Alger.
Grégoire, à Tamazirt.
Marty, à Hammam-R'Igha.
Gaucherand, à Alger.
Garrigue, à El-Biar.
Convert, à El-Achour.
Collet, au Tonkin.
Jarvetou, à Alger.
A. Drouot, à El-Biar.
Drouet, à El-Biar.
Floquet, à Kouba.
V. Liagre, Dousouda.
Vimal, à Saint-Eugène.
Laban, à Canrobert.
Collet, à Saint-Eugène.
Tallineau, à Bou-Adam.
Dr Robertson Proschowsky, à Nice.
Randalas, à L'Arba.
Defougères père, à Lamartine.
Carrière P., à Alger.
Malki Mohamed, à Aït-Ouali.
Guiny A., à Boufarik.
Engel L., à Boghni.
Carmelet, à Alger.
Vidal père, à El-Biar.
de Bignicourt, à Fort-de-l'Eau.
Ivar Samzelius, à Birkadem.
Pellégrini, à Aïn-Taya.
Claret, à Chabet-el-Ameur.
Théron M., à Tipaza.
Thomasset B., à Bérard.
Beaugendre, à Ménerville.
Sudaka M., à Alger.
Brachet, à Alger.
Vital, au Fondouck.
Pignodel, à Maison-Carrée.
Gouvernayre, à Jean-Bart.
Mourgue, à Aômar.
Robert, à Orléansville.
Maselli E., à Kouba.
Gueirouard, à Cap-Matifou.
Samson, à Rovigo.
[illegible]
[illegible]
[illegible], à Alger.

MM. Henrion, à Alger.
Aumas, à L'Alma.
Joandel J., à Boufarik.
Mermier-Boyer, à Chabet-el-Ameur.
Mme Noiret, à Staouéli.
MM. l'abbé Cros, à Bouzaréah.
Idt, à Kouba.
Cardot, à Alger.
Willot, à Alger.
Détourbet, à Alger.
Jeancolas, à Alger.
Lassolle et Lavignon, à Alger.
Urios A., à Alger.
Picard, à Alger.
Pasquier, à El-Kseur.
Dionisi, à Tordjman-l'Arba.
Mme Y. Marquer, à Souk-El-Haad.
Mlle Cazalis, à Relizane.
MM. Orlandi, à Dellys.
Kleiber, à L'Alma.
Lloré, à Chéragas.
Balerna, à Miliana.
Chambige, à Cherchell.
Bourlier Ch., à La Réghaïa.
Ségade, à Bougie.
Pomès, à El-Biar.
Dr Legrain, à Bougie.
Henriot à Sétif.
Bordier, à Aumale.
Jacquemont J., à Bérard.
Weibel, à Staouéli.
Ohmer A., à La Ferme.
Roux Jean, à Boghni.
Jachiet, à Bougie.
Rebord, à Saoula.
Poinsel, à Boghni.
Prince d'Annam, à El-Biar.
Guillot, à Orléansville.
Matthiessent P., à El-Biar.
Layer M., à Maison-Carrée.
Maumus, à Sidi-Aïch.
Marthe, à Ammi-Moussa.
Guéry L., à L'Arba.
Gégot, à Beni-Rached.
Boudou, à Alger.
Devaux, à Crescia.
[illegible]
[illegible]
Mlle Claret, à L'Arba.
Mme Plumet, à Villebourg.

(1) Avoir soin de toujours mettre le mandat au nom du Trésorier. La cotisation annuelle est de [illegible] pour les Membres de l'enseignement primaire public, gardes-forestiers, [illegible], gendarmes.

THERE has been a bountiful supply of mangos, both in Palm Beach and Dade counties this season. The fruit is of a superior quality and for table use, when properly prepared, is superior to the peach.

The newer varieties are yet scarce and high in price, as there are comparatively few trees in these counties that have reached the bearing age.

Among the new varieties which have proven to be superior fruit and fibreless, are the Sundersha, Mulgoba, Bennett, Cecil Rajapouri, Amini and others.

The Sundersha trees are proving to be exceptionally heavy fruiters. The fruit is very large, has no fibre and is most delicious. At the Government Sub-Tropical Station there is one tree of this variety that has been in bearing for the past two years. Mr. John Beach, of West Palm Beach, also has this variety of trees in bearing. There are others scattered through the two counties. The young trees are making a rapid growth and in a short time quantities of this delicious fruit will be on the market. Mr. Beach is propagating the Sundersha as well as all other varieties in large quantities.

The Mulgoba has been considered a rather shy bearer until this year. It is evident that the Mulgoba is a class of tree that needs considerable age before it comes into profitable fruiting, as nearly all the older trees are loaded with fruit this season.

The Bennett has been fruited here for several years and has proven to be a good bearer and the fruit is one of the finest grown.

The Cecil is propagated by Messrs. Hickson Bros. of Miami. This variety has proven to be a splendid bearer and of exceptionally good quality and a very handsome fruit. Mr. Hickson is now receiving orders from New York and other northern markets at $7.50 per crate, f. o. b., Miami.

While passing the home of Messrs. Hickson Bros. recently the writer was invited to call and test the Cecil, which invitation was gladly accepted. The grove was visited and a large number of trees were found partially loaded with fruit. Messrs. Hickson have been shipping from these trees for several weeks.

There is no handsomer tree grown than the mango. The foliage is long and tapering and when mature is dark green and very dense. The new growth is a beautiful pink, shading to a dark red, which gives the tree a most charming appearance. Going to the house, Mr. Hickson selected some fine specimens of the Cecil and with a sharp knife cut the pulp from the long tapering seed, passing it around in the skin. Accompanying the mango was a spoon with which the fruit was eaten from the half skin. The Cecil has no fibre; the meat or pulp being of the consistency of a Crawford peach. Years ago it was thought that there was no fruit grown equal to a good, fully-matured Crawford peach, but when the writer ate the mango he concluded that the peach was not in this class. In delicacy of flavor it cannot be surpassed.

Among those growing on the grounds of John B. Beach, the nurseryman at West Palm Beach, are the Fernandez, the Amini the Rajapouri, the Sundersha, the Mulgoba and the Bennet Alphonse, all of which are bearing heavily this year. Some of the trees carried so much fruit that Mr. Beach had been obliged to take part of it off to save the rest, as he uses the trees for propagation.

The original Mulgoba tree, owned by Mr. George A. Gale, is bearing well this year, and the Mulgoba seedling, grown by Mr. Wallace R. Moses, of West Palm Beach, and which produced such splendid fruit last year, is again bearing this year the same quality of fibreless fruit. This tree, being a native, will be an extremely valuable addition to the mango trees of Florida.

When it comes to a preference of kind it is hard to choose, as all of these choice sorts of mangoes are different in character and flavor, and so delicious that the last one eaten seems the best of all. The heavy bearers will undoubtedly become the favorites, and those that have so far shown this characteristic most strongly are the Sundersha, the Cecil, the Amini, and the Fernandez. This last will delight those who are partial to a fascinating sub-acid flavor and a creamy, fibreless fruit of a dainty aroma.

Every settler locating in Florida should set out near his home some of these mangoes, as well as citrus fruits and avocados. They are a most healthy fruit, and give a refreshing change to the diet of the family.

In addition to the benefit to be had in the home there is the financial feature to be considered. For these fruits there is a growing market at high prices that cannot be filled for years to come. Set out by hundreds and in groves no better investment can be made.

Grove of Mango Trees

MANGOES APPEAR IN LOCAL MARKET

Sell at 15 to 25 Cents Apiece; Price of Coffee Going Up Steadily.

Mangoes appeared in the market today, the first time in many months. The shipment now on sale is particularly large and well supplied with juice.

That the mango (Mangifera Indica) can be grown in Pasadena is confidently believed by most of the local horticulturists, and attempts are now being made to prove it. Grafted mangoes adapted to a cool climate are being set out, and Pasadena may some day supply its own demand for this delicious tropical fruit.

Those sold today bring from 15 to 25 cents apiece.

THE FRUITS OF INDIA.

By Helen Baily.

Why should not the luscious fruits of India grow in Southern California? Horticultural science of today could assuredly transplant to this country a greater variety of the fruits too frail for shipping that are now left to squander and waste beneath a tropical sun.

Since the guava, the pomelo, the mango and the eggplant have been successfully established here, thus proving that they can dispense with the heavy rain and excessive heat of their native clime, why are the countless other species of fruit that India can furnish still left unrecognized? Particularly, since many people would be willing to pay high prices to taste these exotic delicacies, which, in their own soil, can be had practically for the asking.

Among others may be mentioned that choice fruit from Burma, the Mangosteen (Garcinia Mangostana.) As the rose is among flowers, so is the Mangosteen queen among fruits. It is smaller than the apple and of a dark crimson color. The outside is all pith, but in the center is found a dainty, pearl-tinted little globe of about an inch in diameter. This is the delicacy worthy a more widespread fame. It possesses, besides, a peculiar satiny softness in the mouth that extends even to the flat crimson seeds, which lie like silk on the tongue to be sucked long after as an added pleasure.

Then there is the delicious Custard Apple (Anona Reticulata,) green, heart-shaped and delicate in structure. What eager spoons would sink into those creamy masses if the Custard Apple found its way to the lunch counters!

The Pepia (Carica Papaya) would be another acquisition. This fruit is shaped like a gigantic green pear, with a soft and very gratifying pulp of a bright orange shade, quite unspoiled by seeds, these being found in a mass running down the hollow center, and can be easily scraped out with a spoon. The Pepia has another strong recommendation, in that it contains pepsin in some quantity. Half a Pepia for breakfast is considered a boon to weak digestions.

Another fruit with medicinal properties is the Bael (Belou Marmelos,) which is hard and pithy and about the size of a grapefruit. Running through the pith is a sticky fluid, which, when extracted and boiled with milk and sugar, makes a very delectable drink, even for those whose internal machinery gives no cause for complaint.

Then there is the Lychee (Litchi Chinensis,) said to have come from China. They know it in England, where it is shipped in little boxes, dried, and looking much like raisins. It grows in large bunches like dates, though the tree is not a palm. Each fruit is double the size of a date, and has a thin, brown, prickly skin that covers a white fleshy substance, more transparent and juicy than the meat of a coconut, and clinging around a large polished seed. Lychees are excellent on a hot day.

The Tamarind (Tamarindus [illegible]) could be exported [illegible] why [illegible] It is brown and sticky, as tart as a lemon, yet sweet and pleasant flavored withal. Tamar[illegible] and [illegible] drinks would be much sought after if once placed within reach. The tree itself is an unusually beautiful one. It is large and wide spreading, like most other tropical trees. The foliage is pale green and very dense, but the leaflets are as small as those of the maidenhair fern. They quiver sensitively at every breath of wind. It is a joy to watch the perpetual delicate excitement among these vast masses of cool exquisite green. The sight always recalled the phrase "A midsummer night's dream" to one's mind, fresh from vague gropings among Shakespeare at school, because of the strong impression it gave of fairies.

The Rose Apple (Eugenia Jambos) is also worthy of mention, though inclined to be insipid, except for its faint, pleasant flavor of the rose. It is about the size of a walnut, and has a rather large seed that rattles loose inside. If that were removed and the space stuffed with something agreeable the Rose Apple would certainly make a desirable confection.

The Sapota (Achras Sapota) is soft, brown and luscious, a little too sweet, perhaps, but much appreciated by the children, and, oddly enough, by the bats, who will scream and flit around the ripening fruit all night unless the trees be protected with netting.

The Reeta is a soap nut unexcelled for washing the hair, flannels and delicate fabrics. If this smacks of an advertisement, it is none the less true. It will keep, if preserved dry, for an indefinite period, and so could be easily exported, but it waits, as do many other commercial possibilities of India, for the enterprising individuals who will turn these things to account.

In line with the above and relating to the deterioration of mangoes and avocadoes in transit, James Birch Rorer, mycologist of the board of agriculture, Trinidad, says that the chief offender in the case of the mango is *Glocosporium mangiferae*, and in that of the avocado is a species of *Colletotrichum*. The disease caused by these fungi is commonly known as anthracnose or black spot. Not only is the fruit attacked, but the leaves of the trees and, in the case of the mango, the flowers as well. On the fruit the disease presents itself as small black spots, which, rapidly increasing in size, soon involve the whole fruit. If the fruit is cut, the black spots are seen to extend right to the center.

Mr. Rorer states that these diseases can be readily controlled by thorough and timely spraying with Bordeaux mixture. In order to protect the flowers of the mango, the first spraying must be done as the trees come into bloom, and successive applications must be made until the fruit is set. Later sprayings are advisable when the fruit is about half grown, the time and number of these depending upon weather conditions. In the case of the avocado, the time and number of sprayings follow quite closely those for the mango, except that the first spraying need not be given so early.

PUBLICATIONS OF POMONA STUDENTS

The Pomona College scientific journals have published the past semester, articles by Pomona students as follows:

THE JOURNAL OF ENTOMOLOGY

David Livingstone Crawford	American Psyllidae
Harry Victor Malan Hall	Studies in Acarina
Blanche Elizabeth Stafford	A New Subterranean Fresh-water Isopod
Vinnie Ream Stout	A New Subterranean Fresh-water Amphipod

THE JOURNAL OF ECONOMIC BOTANY

Charles William Metz	Notes on Scleroplea and Mycosphaerella on Citrus
Ralph Dalton Cornell	Plans and Plants for Small Places
David Livingstone Crawford	Modern Agriculture in Mexico
*F. Wilson Popenoe	The Mango in Southern California

*For his work as evidenced in this Journal Mr. Popenoe has been granted a fellowship at Cornell University.

THE PUBLICATION OF THE ASTRONOMICAL SOCIETY

[illegible]	Determination of the Color Curve of a Spectrograph Objective.
[illegible]	Planets and Brighter Stars of the Summer Skies
Mary Stoddard Roof	
Lloyd Lincoln Stewart	Planets and Constellations
	Some Theories and Facts

European Sweet Pea Notes

The Sweet Pea Annual for 1910 is just received, and like everything else this season is a little behind time. The get-up is similar to last year's annual, but the size has been increased by 16 pages. The contents are amply varied as the following index shows: "A Great Sweet Pea Carnival," by Mr. S. B. Dicks, F.R.H.S.; "Sweet Peas from Cuttings," by Mr. J. Chisholm; "Notes on the Reading Trials," by Mr. Chas. Foster, A.U.C.R.; A Complete Catalog of Sweet Pea Names and Descriptions, compiled by Miss Jessie Cuthbertson and the Hon. Sec.; Report of the Sweet Pea Conference Proceedings, including "Imperfect Seeding of Waved Sweet Peas," by Mr. W. Cuthbertson, J.P., and "Sweet Pea Names and Naming," by Mr. W. J. Unwin; Report of Floral Committee; The Society's Outings; Audit of the London Show, 1909; A Great Sweet Pea Election; Prize Winners at the London Show, 1909; Annual Report and Balance Sheet.

The schedule for the tenth exhibition which accompanies the Annual is drawn up on the same liberal lines as last year, and is certain to provoke very keen competition. For the first time in the history of the Society the exhibition is to extend over two days, July 12 and 13. As the sun does occasionally shine during July, even in London, this will put the value of the flowers for decorative purposes to a severe test.

American members of the N. S. P. S. will receive the Annual on payment of their annual subscription—minimum $1;—to non-members it will be mailed post free for fifty cents, by C. H. Curtis, Hon. Sec., Adelaide Road, Brentford, Middlesex, England.

The additional privileges are worth far more than the other fifty cents, so I suggest to all readers of these notes the advisability of sending along the nimble dollar and thus becoming full-fledged members, with the privilege of putting the M. N. S. P. S. at the end of their names.

There is no lack of literature for Sweet Pea enthusiasts this season.

"Uncle Robert" is well to the fore with the tenth edition of his valuable book "All About Sweet Peas," which, in addition to a mass of useful information, historical and cultural, contains a full description of nearly every variety in commerce. It is sold at 12c. and 25c., plus postage about 6c., and can be obtained from Robert Sydenham Limited, Birmingham, England. The profits on the sale of this book are handed over to the gardeners benevolent institutions.

Walter P. Wright's "Book About Sweet Peas" is the work of the highly respected chairman of the floral committee. The book covers a wide range of subjects and is written in a very free and easy style, which will make it equally serviceable in the drawing room or the gardener's shed.

"The Book of the Sweet Pea," by D. B. Crane, is one of the series of "Handbooks of Practical Gardening," edited by Harry Roberts, and published by John Lane of London and New York. It is a very readable and thoroughly practical treatise, helpful alike to the amateur and the professional gardener. The historical notes are very complete and their source is honestly acknowledged, which is not always the case in these days. The seventeen halftone illustrations are very fine, and the general appearance of the book is highly creditable to the publisher. The published price is 60 cents.

S. B. Dicks, F. R. H. S.

Sweet Peas for Table and Other Decorations

Few flowers lend themselves so readily to the decorator's art as does the fragrant Sweet Pea. They require no wiring or stiffening of the stem—once they are cut they are ready for the deft fingers to create charming effects for any purpose.

Pretty effects may be had by associating two colors that harmonize, though perhaps nothing is daintier than a table decorated with one variety only—say, the beautiful Countess Spencer. A lovely combination may be obtained by using Henry Eckford and Mrs. Collier, or a crimson and a yellow. Lavender and blue Sweet Peas look dull under artificial light though very pleasing at other times. Or, again various shades of pink, from light to dark, form a nice harmony of color tints.

In arranging the flowers let all be as light and airy looking as possible; never jam the sprays closely together; strive to let every flower be seen. Allow a few flowers to stand well above the others, which tends to give all a natural appearance. A few sprays of colored Lycopodium allowed to trail over the sides of the receptacles and arranged on the table, or sprays of Asparagus, Smilax or other light greenery, all help the general effect, while light grasses and a little of their own foliage inserted among the flowers will lend grace and elegance to the arrangement [illegible]

The American Sweet Pea Boom

Everything that is anything is boomed in America, and as Sweet Peas are looming pretty large in these enlightened days they have been subjected to the inevitable, and with the usual result.

Readers of the Sweet Pea Number of the Gardeners' Magazine will naturally inquire how the boom originated, and the object of the present article is to answer the question as fully as the available information permits. So far as the writer is able to learn, there is good reason for believing that its origin was the interest taken by British gardeners who had settled in the Eastern States, particularly Massachusetts, in the important work of Henry Eckford.

Many of these worthies hailed from the Land o'Cakes, and naturally took a sympathetic interest in the achievements of a "brither Scot." The enlightened and important Scotch element in the seed trade of Boston, the center of the movement, was not slow to take advantage of the opportunity thus presented to foster the culture and love of this beautiful flower, and, incidentally, of course, gather in the shekels at the same time. The horticultural societies did all in their power to develop the interest thus aroused, and the comparative ease with which they could be grown soon filled New England with enthusiasts, and thus started the boom.

Among the earliest and most whole-hearted of the devotees at the Sweet Pea shrine was the Rev. W. T. Hutchins, who was located at that time at Indian Orchard, Mass. A fluent speaker, and a prolific writer, full of energy and zeal, his glowing descriptions of the beauty of the flower, and practical demonstrations of its adaptability to the New England climate, soon found their way into the most widely circulated journals and magazines in the Yankee States.

As only a paltry 300 miles separate Boston and New York, the leading seed firms in the Empire City were soon close upon the heels of their confrères in the modern Athens, and the contagion soon spread to the city of brotherly love (Philadelphia). Mr. Burpee having satisfied himself that the Sweet Pea was "all right," by submitting it to severe and practical tests on his Fordhook Farm, with characteristic foresight enlisted the practical sympathy and aid of the Rev. W. T. Hutchins, and from this point the success of the Sweet Pea boom was assured.

For a time the principal source of supply was Europe, and particularly England, but as the possibilities of California as a seed-growing center were becoming more widely recognized every day, experiments were made with Sweet Peas, and the result of the culture is known to us all, it having been demonstrated that some of the best Sweet Pea seed in the world could be produced in that glorious climate.

As the cheap Chinese labor was available, and the crop, at prices then ruling, was extremely profitable, the growers quickly lost their heads, and the market was soon glutted with a huge surplus, which, in the main, had not been cultivated with much regard to quality or purity of stock. As the American market was then practically closed to European growers, save for stock seed of the latest novelties, the culture on this side was naturally curtailed, and as the California growers did not care to continue a culture which threatened to become unprofitable, it appeared, for a time, as if there would be a Sweet Pea famine, but this was prevented by the intelligent action of Morse, Rohnert, and the Sunset Company, who resolutely set themselves to remove the existing reproach which rested on the quality of California-grown seed, and, by winning back the confidence of the buyers, obtain a price which would enable them to grow it at a profit.

The unfortunate seasons which European growers have experienced since that time have been all in favor of the Californian grower, who has once again contracted the Sweet Pea fever, and, but for the European failure, would have been heavily overloaded once more. Nearly 1000 acres in different parts of that vast country were devoted to this crop last year, and so abundant has been the harvest that some of the large commission houses have been able to obtain their supplies at less than half the contract prices. This will, it is to be hoped, check the wild speculation referred to, and place the culture on a sound, profitable, and honorable basis.

As regards the culture of the Sweet Pea in America, by the Americans in their own private gardens, I am pleased to be able to report that it is still going strong. The good work done by the N. S. P. S. in this country is being taken up in America, and a National Sweet Pea Society has been established in New York State, which will carry on the good work initiated in London.

Very interesting testimony to the enthusiastic cultivation of the flower will be found in my article on "A Sweet Pea Carnival," which appears in the N. S. P. S. "Annual" for the present year; doubtless similar conditions obtain in many other places. All this goes to prove that in these days, at any rate, the Sweet Pea is not

THE SIZE, THE SEEDS AND FLAVOR QUESTIONS OF GRAPE-FRUIT.

California grape fruit (Pomelo) is on a profitable basis, but there are several questions as to market pre-eminence on the above three points that are not settled yet.

We are not sure that the seedless with its smaller size and lacking flavor is going to continuously surpass some of the seed varieties now being developed.

On the subject of size we must follow the trade demand.

If the hotel men want 64s give them that size; don't try to convince them that 120s are better. Bear in mind that the caterer who prepares a pamelo for a patron and serves a

A 3-YEAR NECTAR POMELO.
The Pre-eminent Seed Variety on the C. P. Griffith Orchard, Azusa.

half fruit of the 64 size attractively packed in cracked ice, with an enclosure of snowy linen, charges from 25 cents to 50 cents for the half fruit that cost him, probably 10 cents before being cut thus securing from 50 cents to $1.00 a piece for the 64 fruit. If, on the otherhand, a whole fruit of the 120 size was served in two halves, it would not look so attractive and hence would not command such a price, nor give so great a profit.

This extortion by the "swell" hotel and cafe men is encouraged by the middle men who supply them, because they, too, can make a greater profit by handling the large fruit.

Whether it is a "fad" as many growers persuade themselves to think or a suggestion of taste on the part of the consumer matters not. The fact remains that the consumer who pays the final price for the fruit wants what he believes suits his eye and appeals to his appetite, and as he has the last guess, it is up to the grower to cater to the demand, fad, fancy or discrimination.

There's no getting away from the question that the consumer and prospective consumer must be educated to the many virtues of the pomelo. The masses must be taught that the "grape-fruit" listed on bills of fare and offered for sale on fruit stands is a missomer, that it is correctly speaking a pomelo; that there are many varieties of this fruit sold as "grape-fruit" most of which are very inferior and many worthless as an article of daily diet. It should become well known that aside from the appetizing features of the fruit the best physicians recommend it as an absolute specific in all cases of nausea and sick headache caused from biliousness, is a stomachic tonic at all times and can be eaten freely.

But before a campaign of education is begun standards of projection must be fixed and a comprehensive nomenclature must be established that will be authoritative ... so far as present varieties are concerned.

The State Board of Horticulture should appoint a commission of citrus experts with whom the pomelo growers should co-operate. This commission should visit the various pomelo orchards of the State, select specimens of the various merchantable kinds and name them so that fruit identical in color, size, flavor and general characteristics would be classified and arbitrarily named, and inferior sorts be relegated to second grade or unnamed stock just as second crop raisins are classed as "stemmed goods" or "loose muscatels."

This would establish a distinctive California nomenclature and forever put into the scrap heap "John Does Honey Dew" variety of doubtful value and unstable quality. As it now is there is no standard in this State and that is one of the chief drawbacks in pushing California pomelos in the eastern markets.

One of the best posted citrus growers in Southern California, A. P. Griffith of Azusa, who owns a 120-acre orange grove in that fine citrus section, has been an enthusiastic grower of the pomelo and for a long time supplied the Fred Harvey eating-house system and dining cars of the Santa Fe Railway with choice pomelo, is of the opinion that the present demand in the East for the Florida "seedless" is but a fancy, a fad pure and simple. That this taste may change at any time and seed fruit, which Mr. Griffith claims is superior in flavor, be demanded. Mr. Griffith has a five-acre grove of pomelo and a finer or heavier cropper can be found nowhere. He was instrumental a few years ago in inducing the farmer clubs at a convention in Riverside to name the several varieties of pomelo then grown, some varieties were classified and named, but the work was incomplete, nothing official having been attempted since.

Mr. Griffith is a strong advocate of his "nectar" variety, a seed type and the "triumph." [Note: We have one of the nectar trees secured from Mr. G. several years ago and it surpasses anything in the pomelo line that we ever ate. The nectar is superb. Ed. Western Empire.]

Dr. S. S. Black of the Casa Verdugo district near Glendale, grows the Florida type known as "Marsh's seedless," a sport propagated by Marsh of Florida.

"Fagg's improved," named by Dr. Black, the "Melrose" is another variety grown by the doctor. Marsh's seedless is inclined to run to small sizes and must be thinned. Its tendency is to overbear.

He agrees with Mr. Griffith in the matter of demand for the fruit and while he favors and raises sizes from 80s to 120s, he admits the demand is for 64s. He has hopes for the future when the demand comes from the consumer in moderate circumstances.

Mes vifs remerciements par l'exemplaire de votre très intéressant travail sur la Feijoa Sellowiana.

J. Arechavaleta

Directeur du Musée National de Montevideo

23. IV. 1912.

AN OYSTER-SKIFF AUXILIARY

THE oyster-skiff of Raritan Bay and Staten Island Sound is one of those homely useful types allied to the dory and the Seabright skiff, flat-bottomed, with boldly flaring sides and good sheer, burdensome, buoyant and seaworthy for its size. These boats have been built and used for a half century or more by the oystermen of Staten Island and the adjoining shores of New Jersey in gathering the oysters by long tongs from the bottom; they are stiff enough to permit the two men to stand and work, they will carry a big load of oysters, and they are driven easily by two pairs of oars when loaded.

A comfortable cruiser adapted from an oyster skiff 27 ft. length, 7 ft. beam; cost $400

Of recent years nearly all of these boats have been fitted with gasoline engines and many of them have been used as runabout launches. A modern development of the type is shown in the illustration, the old model and the typical lap-strake construction, inexpensive but very durable; with the addition of a deck, a small trunk cabin, an engine and a yawl rig. Thus equipped the skiff makes a very safe and able little cruiser, with accommodation for two or three persons in cruising and a proportionately larger party for short runs. A boat twenty-seven feet over all and seven feet in breadth can be built for about $400 complete, and makes an excellent craft for the young launch-man; what it lacks in style and finish being more than made up in good substantial qualities, including a durability that will give a good sale value when the time comes to replace one by something more costly and elaborate.

POPULARITY OF SWEET PEAS

The best time to create the most interest in a subject is when the object itself is most in evidence. This same reasoning applies to flowers when the planting and blooming seasons come around. Of all cultivated flowers in Southern California none is quite so popular as the sweet pea. Constant care in the last few years in the cultivation for size of bloom and color has produced a distinctively California sweet pea that is attracting attention the world over.

Only a few years ago the small flowered, parti-colored low growing sweet pea was relegated to the back yard to hide some unsightly garden spot, and was little used as a cut flower. Today there is no more generally used flower in all kinds of decorations, and the season extends from early spring to late in the fall.

Between the years 1885 and 1899 the sweet pea craze was at its height, but the demand for seed was so great that slipshod methods of growing it were allowed to creep in, and the result was so much poor seed that amateurs got discouraged and quit growing the flowers in the intensive way they had been doing, with the result that for five years they hardly touched it. The flower carnivals and fairs fell off—and it looked as if the sweet pea had seen its day, to see it no more. And unfortunately California seedsmen were most at fault for flooding the market with poorly grown seed.

But there were a faithful few who knew the possibilities of the flower. The English amateurs did not have the seed troubles that afflicted the American amateurs, and the cult was kept alive across the ocean, the yearly novelties were sent over as usual to the faithful few who still clung to the beautiful flower, and they were destined to receive their reward, for the renaissance of the sweet pea was at hand.

The revival of the modern sweet pea is due to the labors of Henry Eckford of Wem, England, who began twenty years ago to put out a collection of novelties each year which were of such progressively fine quality that they started the sweet pea furore as above described.

The seedsmen and their growers soon saw what had brought the cessation of the craze for the sweet pea, and took measures to see that the seed put on the market was of the highest quality that it was possible to grow, with the result that once more the sweet pea has come into the highest popularity, and it is grown and shown at all the flower carnivals as before. You are safe in buying sweet pea seed of any reliable seedsman now, as it is sure to be good—it was to their interest to assure that.

At the time of the revival of the sweet pea by Eckford there was but one recognized form, that which came afterward and is at present known as the "notched" type. Samples of this type can still be found in cheap seed mixtures, but the elimination from the list of the old analogous varieties by all the seedsmen will in a few years cause it to become extinct. The first effort on the part of the early specialists to improve the form of the sweet pea was along the line of the elimination of the notch at the sides and the top of the standard, which led by selection to the "reflexed," from which the notch was absent, but the standard of which reflexed or leaned backward, giving a stiff, formal appearance to the flowers which was not at all pleasing.

Beside the several foreign specialists Walker of Oregon and Morse of the Pacific coast were working on a new ..., and all achieved practically the same result, but Eckford of England got it first, and in the beautiful white sweet pea, Blanche Burpee, produced the first fine example of the "expanded" type, which remained the standard of quality as to form until the recent introduction of that remarkable "break" in sweet peas of a cross made by a Scotch gardener, which is known as the Countess Spencer, and is probably the most remarkable floral hybrid ever produced, for it has proved to be the mother of a new race, which are exact duplicates in a higher type of flower of the older expanded forms. For instance, when the Countess Spencer was first caught it was supposed that it was simply a variety, and if a seed of it was planted it would simply reproduce the same variety. But from the first it has been erratic. From the planting of one seed might be produced fifteen which when planted would produce from ten to fifteen different colors and shades, all matchable with well known varieties but of the Countess Spencer type. These when planted might reproduce their kind or run the gamut of the colors and shades, so you can see what a deal of selection was involved in producing seed that would come true. In fact, we have very little of it yet, as it all "sports" to some extent. But it is a question of time only until it will all be selected up to trueness of name, and you can get your favorite flower in sweet peas in the Countess Spencer type. However, from the Countess Spencer "break" there have come some new varieties which will delight all lovers of sweet peas as they are put on the market from year to year.

Among sweet pea lovers there are several well defined classes. There is the collector who aims to have a few feet of rows of every known variety, commercial as well as the private novelties of the diffedrent specialists, and who adds each year the introductions of all the growers in both this country and Europe. A collection of sweet peas has an educational value only as a basis for comparison for the student of the cult. The connoisseur grows only the finest of each color or type, and makes a critical study of each year's intruductions in order to compare them with previous ones, so as to place them as to relative merits. He usually grows but one or two of each color class, and drops any of them on the appearance of a new one which he thinks displaces it. This latter class of sweet pea enthusiast has made the sweet pea what it is, and to him the seedsmen are indebted for the most valuable criticisms they receive, and the condemnation of the connoisseurs will practically kill an introduction.

There are many written treatises on the culture of the sweet pea, some of which are fairly good, but it has taken the experience of the expert amateurs to disclose just what is the best method. The modified trench system is the most preferred. The soil should be fine and friable, well enriched the previous fall and summer, and dug in deep, for it is a fact that a well grown sweet pea vine will produce roots eighteen inches long in a deep, loamy soil. The soil must have plenty of humus in it and be well drained.

There has been a great deal of discussion in the English horticultural papers as to the relative merits of wide and close planting. Some of the English seedsmen advise planting eighteen inches apart, one row in a trench, while the custom among our best American growers is to plant in double rows four inches apart, and four inches apart in the row. It is quite likely that the moist climate of England requires wider planting, as tending to the growth of more vine and root than in our hot, dry summer climate. When the vines are grown up to and are attached to the supports fill the trenches level with soil, and tread it hard and keep a straw mulch on all summer. There is no advantage in feeding during the blooming period. Give plenty of water.

There are many clever writers on the cultivation of sweet peas, who give their practical experiences as well as the results of others, and in this class probably the best known is Samuel Armstrong Hamilton.

California has the ideal ...

that the flower is so generally popular improvements and not retrogration will be the rule in the cultivation of this beautiful and fragrant flower.

* * *

The National Sweet Pea Show was a great success. I wonder if my selections will meet with favor from "European Seeds"? The best varieties throughout the show to my mind were Lavender Geo. Herbert (is this "fixed"?), Clara Curtis, Helen Lewis, Constance Oliver, Mrs. C. W. Breadmore, Evelyn Hemus, Earl Spencer, Masterpiece, The Marquis, John Ingman, Audrey Crier, Aurora Spencer and Mrs. Chas. Foster. The finest new thing of all was T. Bolton's (Warton, Carnforth) Charles Foster, a suffusion of opal, Cattleya-mauve and pink, a charming, refined flower. Another novelty from Mr. Bolton was R. F. Felton, a beautiful waved lavender, flushed with red.

J. HARRISON DICK.

CONSIDER the little black plum that grows along every stream and around every pond, here—the one you bite into and find full of a very white cottony pulp without any taste and a hard seed which you crack and taste, hoping to get some payment for your trouble, and then spit out, all disgusted. After ten years of such experience with that plum, we find there is something in it after all.

It is *Chrysobolanthus niger*. "At last," you say, "it at least has a name." It also has two brothers who are pure white, but otherwise quite like it (in size and consistency), and still another several times larger of a beautiful purple red color; this looks like a delicious plum but when tasted seems to be even more worthless than our small black variety,—the coco plum.

Pick a bucketful of these,—it will take little time once you have found the place where they grow. Wash them, place them in a granite ware or aluminum kettle, with water; cover and boil thoroughly. Strain the juice through a sugar-bag (fine ready made jelly-bags those five-pound refined sugar-bags are), add one tablespoonful of lime juice to a pint of it, and one pound of sugar, and boil together rapidly until it jellies. It will jelly, and there you have a dish fit for the gods. It simply melts in your mounth leaving a "taste like more." We think it is the finest jelly there is, though we confess it does not look it.

Again, pick plums, wash, cover with water and boil hard until the flesh separates easily from the stone. Then rub through a colander, add equal parts of sugar (or two-thirds as much if you will cook it longer), one tablespoonful of lime juice to a pint of the resultant pulp, and behold a good marmalade. Or add instead vinegar and spices and make a sweet pickle.

To make a delicious pie add a tablespoon of lime juice or vinegar to the plain pulp, sweeten and bake like a lemon pie.

place on March 23 and at the exercises the founder of the movement in a short address said:

"Neighbors and friends: I am asked by those who have planned it to give the reason for the religious service which has been arranged for the Sabbath following blossom day. It is very simple. There is no fiction about it. Blossom Day started as a religious institution. The drouth of 1898-99 was no trifling matter. It was as

has been always right on these propositions, I cannot say; but I have always noticed that, when some pioneers of science attempt to enunciate a new theory or truth, he often meets a storm of opposition. Galileo was pronounced a heretic, and put in prison for saying what we all acknowledge as an unquestioned fact. There have been more Galileos since, and there will be more to follow.

"Later on Professor Cook took an active interest in spraying fruit-trees to destroy injurious insects and fungi. Indeed, in the language of another, 'the remedies he first recommended are now common; and he was probably the first to demonstrate the efficacy and safety of Paris green for the codling moth.'

"Again, we find that Professor Cook was one of the first to point out the danger to the bees and to the beekeeper from spraying trees while in bloom. He showed that spraying at such times is destructive to bees, and wholly unneces-

Almond Trees in Bloom in the Fairmead Colony, San Joaquin Valley.

preciated by a vast number of farmers, but perhaps all of them do not know all about it. It is not rotation to sow mixed crops. This mixture of crops, sometimes called succotash, generally brings a heavy yield, through some law of nature that is not well understood but which seems to be because each variety is spurred to do its best in competition with other varieties rather than in competition with its own kind. Rotation consists in alternating crops of different habits of growth. The shallow rooted wheat may be followed by the deeper rooted corn, or the earth may be renovated by the sowing of alfalfa. In this way the fertility is drawn from different strata in different years.

Professor Cottrell has shown that peanuts, especially Spanish peanuts, are a most valuable feed plant for farm animals. As they have the advantage of being great drouth resisters and are capable of yielding abundantly on our western plains and as the plant itself makes ecellent hay they are highly recommended for dairy cattle, as well as for beef and pork production. Several of the southern states that are now taking interest in dairy matters have had experiments conducted at their stations which seem to show that peanuts and peanut hay are better feed for dairy cattle than is alfalfa.

A good shiver constitutes violent exercise for some people.

ORCHID HUNTER; CANNIBAL FEAST

Has Remarkable Experience Among the Savages of New Guinea

LONDON, May 18.—An extraordinary letter has just been received from Micholitz, the veteran orchid seeker. The letter was received by Joseph Godseff, English manager for Messrs. Sander, the famous orchid growers and importers of Albans, Bruges and New York.

Micholitz is now exploring Annam, but recently he was hunting for the precious flowers among the cannibal tribes of New Guinea, and he relates a weird experience which befell him when he found great masses of a rare Papuan orchid in one of the primitive burying places of that race, and was afterward invited by a savage chief to join in a man-eating revel.

Micholitz is the dean of professional orchid hunters—a man who could fill columns with absorbing accounts of his travels and adventures if he would; but he is of a modest and retiring disposition, and can rarely be got to speak about his exploits. He is getting on to 60 years of age, and he has been exploring for Messrs. Sander in all the remote and likely orchid haunts in the world for a quarter of a century.

For the last resort he is always well armed, but his medicine chest, his stock of presents and his consummate diplomacy and cool courage generally carry him without scathe through difficult situations. He is also well versed in the languages and dialects of the savage races among which he pursues his life work. It is claimed for him that he knows both the Eastern and Western hemispheres better than any other living man.

In New Guinea his most recent quest was for the giant moth orchid, which grows on the trees that fringe the islands near the seashore, overhanging the limestone rocks on which it is the custom to deposit the skeletons of dead Papuans after the flesh has been eaten from their bones by their brethren.

The branches of the trees are sometimes burdened to the ground with the great masses of the flower, so that they frequently break with the weight and cast their burden of bloom on to the skeletons of the dead natives beneath.

Micholitz found thousands of plants with their roots matted in the Papuan skulls and interlaced in the skeletons in an almost inextricable manner. He remarks that the lime contained in the bones probably afforded the plants a very stimulating food.

In one of the islands (the usual suffrance and assistance having been purchased in Micholitz's own manner) a native fell with a huge mass of the Dendrobium Schrodenium, which he had torn from the rock, and broke his leg in two places. At once, and with great avidity, some of the unfortunate man's brethren rushed to the spot and carried him away to their village, where they deposited him in the chief's hut.

Micholitz, always ready to seize such an opportunity as this mishap, offered to show his good intention and his power, urged his services forthwith as medical adviser. But he was told: "The chief will attend to him."

The chief did attend to him, for on the next morning the orchid hunter received from the hand of that potentate's head executioner an invitation to the feast! Micholitz knew at once what had happened. He says: "I was well aware they were all cannibals and very fond of 'long pig,' as they commonly called their human victims."

He first inquired warily in what capacity he was expected to attend the feast, as a guest or as the dish? After being reassured on the point he thought it best to accept the well-meant hospitality, and prepared a message to the chief that he would be pleased to be present. He had still to consider how he could attend without participating, and was naturally fearful of giving offense in that direction.

However, he finally made the embassador inform his chief that to his (Micholitz's) keen regret he would not be able to partake of the great dish, because his familiar would be highly displeased if he ate anything but fruit and vegetables on that particular day, and he might bring some great calamity upon them all by offending his familiar spirit.

When he arrived on the scene of the feast he found everybody waiting for him. "The yams and taro," he says, "had been nicely boiled, and for the preparation of the 'long pig' a hole had been dug in the ground, in which a big fire had been made and a lot of stones had been heated. The meat, carefully deposited between these hot stones, and the whole was well covered over with leaves and clay.

"Presently the meat was lifted out, and to judge by the relish with which it was eaten and the surprisingly savory odor, the 'long pig' was done to perfection. The hands and ribs, which were considered tit-bits, were reserved for the chief and his honored guest."

The "honored guest's" request to be excused eating of the meat, however, was accepted, the chief evidently being afraid to provoke the anger of the orchid hunter's familiar. Micholitz persevered with his vegetarian meal in the grewsome surroundings of the feast and washed his fruit down with draughts of kava, which had been prepared in the orthodox manner, the women having chewed the kava root first.

During the course of the meal the chief expressed his great regret that he had been unable to offer a roasted baby, which he said he considered superior to sucking pig.

"To tell the truth," the chief explained, "my emissaries have been faring very badly at the hands of some enraged women, whose babies they had thought round and plump enough to appear before me at the feast."

It should be borne in mind when reading this narrative that the incident it describes took place only a few months ago, thus showing that in New Guinea cannibal orgies still go on.

Alligator Pears.

What kinds of soil and what general conditions are favorable to alligator pears? Would they do well here in Exeter, Tulare county?—Subscriber, Exeter.

The avocado or alligator pear will usually do well in all situations where oranges or lemons thrive, at least so far as it has been tried. Some have questioned as to whether the more arid and warmer valleys of the interior could grow this fruit successfully. So far as we know the trees which have done best are within a few miles of the ocean where there is no excessively warm weather. In addition we have heard of trees planted in warm valleys which did well under lath house but died when lath house was removed from them. From these reports we would advise experimenting before extensive planting.

Pollenation in Fruit Production

FRUIT PRODUCTION depends upon sexuality. Sexuality signifies the presence of male and female elements or the transference of pollen to the pistil of the flower is pollenation. Failure of pollenation means failure in fruit production. (There are many orchards where failure has resulted because of this fact. Examples of such are: Blocks of Baldwin and Grening apples; Kieffer and Bartlett pears; and plums and prunes. Such orchards have in most instances produced only three crops in twenty-five years.) Now most flowers of any variety have both male and female organs. Consequently you may immediately come to the conclusion that pollenation must surely occur at all times. This is not the case. Two varieties based upon pollenation exist. They are self sterile and self fertile varieties. A self sterile variety is one which is unable to fertilize its pistil with its own pollen, while a self fertile variety is one which is able to perform this function.

Self sterility and self fertility are not constant with any variety so far as known at the present time. Conditions, such as location, adaptation to soil and climate, and state of nourishment are important factors anyone or all of which may make a variety self sterile. Thus, Bartlett and Kieffer pears are often self sterile, but there are orchards of both which are self fertile. The same is true with many other varieties of fruits.

Experiments have been made with pears, plums, apples and grapes to determine which of these respective fruits are self sterile. I will not attempt to give the varieties of each but only the number. Of one hundred and forty-five varieties of grapes at the Cornell Station, eighty-six were found self sterile, and fifty-nine partly self fertile. At the Oregon Station, of eighty-seven varieties of apples, fifty-nine were found to be self-sterile, fifteen were self fertile, and thirteen were classed as partially self sterile. At the Vermont Experiment Station all classes and varieties of native plums were found to be self sterile with few exceptions, the Japanese plums were often found self sterile but this sterility varied with the season, even being self fertile in some. No experiments were performed with the Domestica group, but enough reports were received to show that these, too, are often self sterile. All orchards of the different classes mentioned have bloomed abundantly and yet may have failed to set fruit.

What then are the factors which have caused non-pollenation? They are these: First, difference in the time of maturity of stamens and pistils; second, disability due to structural conditions (that is, the pollen may be imperfect as with the grapes or the pistil may be malformed as in the case with certain varieties of plums); third, absence of stamens.

strawberry. Those who are familiar with the strawberry well know that pistillate and staminate varieties must be planted alternately if a crop is to be expected from the pistillate sorts, and when this is done the most abundant crops are produced.

There is still another factor which applies to the three factors of non-pollenation already named and also applies to flowers which are seemingly perfect. It is mutual affinity between the pollen and the pistil.

Lack of affinity and lack of simultaneous blooming periods are the two most important causes of self sterility or lack of fruit production. There seem to be different degrees of mutual affinity between the pollenizer and the self fertile variety. Waugh and Kerr found that the mutual affinity between the Whitaker plum and the Wild Goose plum was a zero quantity. Other results obtained were that self sterile varieties demand cross-pollenation also because of lack of affinity. Consequently the conclusion, lack of affinity demands cross-pollenation.

Cross-pollenation demands: Simultaneous blooming, affinity of varieties, proper conditions at blooming, and proper means of transference of pollen. Simultaneous blooming is essential for the only way in which a pollenizer can make a self sterile variety fruitful is by supplying it with pollen. If it is to supply it with pollen it means that the pistils of the self sterile variety must be receptive when the stamens of the pollenizer are ripe, which is possible only with simultaneous blooming. The comparative blooming of varieties is more or less of a local problem, because of local conditions such as climate, altitude and environment. The blooming period may not only be hastened or retarded but the order in which different varieties bloom may be disturbed. The proper conditions at blooming can be best expressed negatively. Long, rainy, cold moist periods of three or four days are not desirable. The transference of pollen is a very important feature in pollenation. The two factors which transfer pollen are the wind and insects. Many think that the wind is the more important of the two. This is not true as demonstrated at the Oregon Experimental Station. For example, only six pollen grains were found at the end of 24 hours on a glass slide one inch wide and three inches long placed twenty feet from the trunk of the blooming tree. Glass slides placed at different distances helped prove the above result. But more conclusive than this is the experiment with two apple trees comparing wind and insect pollenation. Fifteen hundred blossoms in a 7-year-old tree were emasculated and only one set fruit. During the time the pistils remained receptive only eight bees visited the tree. More than twice that number were seen on the tree twenty

evidence enough to show that pollen is not transmitted through the air in sufficient quantities to insure cross-pollenation? The conclusion for every fruit grower should be, have an apiary or let the neighbors have one for his benefit.

I have mentioned thus far benefits of cross-pollenation in self-sterile varieties. What are the benefits of cross-pollenation in self fertile varieties, if any? The experiments at the Oregon Station are conclusive as to the results. In these experiments the self fertile varieties, Spitzenberg and Newton were used. Spitzenberg fruits resulting from self-pollenation averaged only 100 grams; these resulting from cross-pollenation by Newtown, 126 grams; Arkansas Black, 128 grams; Jonathan, 148 grams, and Baldwin 157 grams. Newtown fruits resulting from self-pollenation, averaged 73 grams; cross-pollenized fruits with Bellflower, 104 grams, Spitzenberg 147 grams, Jonathan 162 grams and Grimes Golden, 173 grams. These results show that there is an increase in size due to cross-pollenation due to mutual affinity, Grimes Golden being the most mutual to Newtown and Baldwin to Spitzenberg; and that the affinity of the pollen and the pistil of the same variety is far less than between different varieties. Self fertile varieties then demand cross-pollenation as well as self sterile varieties. Darwin came to this same conclusion in 1859 when he said: "Nature abhors perpetual self-pollenation. It is an interesting fact to note that the seeds of the respective crosses varied and that the variation closely followed that of the fruits; that is, the largest fruit usually contained the largest seeds."

What is the practical application of cross-pollenation? Since self sterile and self fertile varieties are both benefited by cross-pollenation, plan several varieties. The Oregon Station found for apples alternate rows of trees of three different varieties suitable, making orchard management convenient, this being necessary for spraying and harvesting. Again, do not plant solid blocks. Some one may have this question in mind. What varieties shall I plant? Experiment stations are just beginning the study of this question, thus enough evidence is not at hand to give definite answer. All that can be said is make use of what has been done so far as possible and then give careful attention to blooming periods of different varieties in your own neighborhood. With strawberries a definite answer can be given. It is plant at least one male variety alternately with the pistillate variety.

From the discussion of the different factors to be considered in cross-pollenation it is plainly evident that the problem is not a simple one, but one that needs study and skill when it is to become practically applied as well as when scientifically studied. Some one

mastery of just such problems as this that has made the orchardist successful. The applying of the principles involved in cross-pollenation will be just one more step in the direction of success in horticulture.

National Sweet Pea Society of Great Britain

The tenth annual exhibition of this flourishing Society was held in the Royal Horticultural Hall, Vincent Square, London, on July 12 and 13, and, contrary to all expectation, and in spite of a most unfavorable season, was in every respect, save one, the most successful of the entire series. The one exception was a considerable falling off in the number of entries, due to the serious damage done to the flowers by the horrible weather conditions from which we have so long suffered. The blooms staged by more fortunate exhibitors were simply grand, and as there was more room for the display their good points were more easily recognized.

The weather during the show was all that could be desired, and the attendance of visitors on both days was so numerous that the financial aspect is of the most pleasing character. The honorary exhibits of the traders were in many cases fully equal to the exhibition blooms, and, it is pleasing to learn, were the means of securing an abundance of profitable orders for the exhibitors.

The flowers lasted well on to the close of the second day; this, combined with the liberal patronage bestowed by the public right up to closing time, will ensure a continuance of this new feature.

In the class for one bunch of new Sweet Peas, the prizes were taken for the variety Iris (Breadmore), a pale salmon Spencer; Earl Spencer (Cole), a rich orange, waved; and Dazzler (Breadmore), a brilliant flame scarlet. It was an instructive and very useful class.

The novelty section was very interesting. Two hundred and forty-two samples were tested at The Times Experimental Station (Supt. Chas. Foster) and the following awards were made by the Floral Committee: First-class certificate and silver medal, as the best novelty of the year to Stirling Stent (J. Agate), a brilliant orange-scarlet of immense size and splendid substance, quite fixed. Awards of merit were made for Masterpiece (Malcom-Dobbie), clear lavender, waved; Mrs. Hugh Dickson (Dobbie), the finest and best of the cream pink section; Arthur Green (Dobbie), maroon; Cherry Ripe (Gilbert & Son), brilliant cerise, waved.

The usual dinner was held at the Hotel Windsor on the opening day, under the presidency of N. N. Sherwood, V. M. H., who has been president of the Society during the present year. The chairman announced his intention of offering a prize, value twenty guineas, for Sweet Peas at the projected International Horticultural Exhibition in 1912, to become the property of the winner.

S. B. Dicks.

W. A. Burpee and Harry A. Bunyard, secretary of the National Sweet Pea Society, discussing the "Poor Man's Orchid" at the recent gathering of seedsmen at the Burpee trial grounds, Fordhook, Pa. On that day the Sweet Pea trials were examined by many scores of interested men.

Sweet Peas Shown to Best Advantage

Our illustration is that of Dobbie & Co.'s wonderful Sweet Pea exhibit at the R. H. S. meeting, London, Eng., on July 19 last. All the varieties shown were of their own raising, the large pillars depicted being composed of: Masterpiece, lavender; Mrs. Hugh Dickson, cream pink; Isabel Malcolm, cream; Sunproof Crimson; Mrs. A. Ireland, pink bicolor; John Ingman, special stock and The Marquis, mauve.

Photograph forwarded us through the courtesy of William Cuthbertson.

T. A. W.

Propagation of the Avocado

By H. F. SCHULT

Agent in Charge of Subtropical Introductions

We have obtained the best results in the budding of Avocado trees with very young seedlings, the seeds of which are first planted in six inch pots and after four months, are transplated to the homemade boxes manufactured of shingles or thin cypress boards 12 inches long and six inches wide allowing for proper darinage by leaving the bottom of the box partly open and preventing the issuing of soil through this opening by placing a few crocks or small stones over the same. As the majority of the young seedling varieties mature their fruit in August or September, the seedling are about 4 to 6 months old when ready for budding. The best time for this transplanting is from about the last of November to the first of March. If the seedlings have been kept in good condition and well protected from cold they will then be in good condition to receive the buds. The operation is very similar to the method employed in citrus culture. That is, the regular or inverted T-cut is made on the stock, about 6 inches above the soil, taking great care not to push the knife blade into the tender wood. The bark is then slightly loosened to facilitate the entrance of the bud, which is cut to a length of from ¾ inch to 1½ inches. The bud is then wrapped only fairly tightly with a good grade of waxed cloth commencing at the bottom and wrapping upwards. Success in budding avocados depends mainly upon using stock which are in good physical condition, and primarily in the selection of proper budwood. This should not be more than one year old and the buds selected should be plump and stand out distinctly from the wood. Weak-eyed buds should never be used because, even if they should "take" they will rarely, if ever, sprout.

Under favorable conditions the wrappings may be removed and the buds inspected about 15 to 18 days after being inserted. The unwrapping must be done with the greatest care as the eye will frequently be found sticking to the wrapping material and be broken out during this operation. Beginners frequently lose a high percentage of their buds through carelessness in unwrapping them. While not absolutely necessary, it is a good custom to wrap the buds again after inspection but more loosely, in order to get the tender buds gradually used to the influences of light and air. After two more weeks the wrapping may be entirely removed and the stocks are lopped about six inches above the bud. It is necessary to do this in order to [illegible] with full vigor

possible. Under favorable conditions the bud starts out vigorously and should be tied up in order to produce a straight plant. After this growth begins to harden late in the Spring the top may be cut off very close above the union and a good grade of wax applied to keep out fungus diseases which are otherwise apt to enter at this point and work their way below and into the bud, resulting in its death. The plants are ready for setting out in the open ground the same season.

I would state that I have frequently used surgical plaster (oxide of zinc), which comes in rolls, may be torn into convenient strips, and is cleaner to use than ordinary waxed cloth. It is also less liable to be penetrated by rain-water. A sharp, clean knife is of course, essential to the successful budding of the avocado.

In cutting the bud the petiole may be trimmed close to the eye and entirely wrapped with the waxed cloth. With such varieties as have a specially thick and fleshy petiole it is advisable to leave the stem about an inch long in budding, otherwise fungi are liable to enter into the dying tissue.

TROPICAL FRUITS FOR CALIFORNIA is the title of a neat little booklet of 29 pages issued by West India Gardens, Altadena, Cal. It is beautifully illustrated and contains about all the information relative to the Avocado that has been learned in the expensive school of experience during the last decade in this part of the state.

In this booklet is an illustration of the Mango, and a description of a variety known as Alphonse which leads the reader to wish that it might be grown here. Following the description is the suggestive sentence: "But for California such Mangos are a thing of the future,—not of the present." All Mango trees of which we know anything, which were growing in this state before the freeze of January 7th, are but a memory the roots alone remaining. Perhaps, because of the boundless enthusiasm, the tireless energy, the indefatigable labors of the brothers Paul and F. W. Popenoe, a type may be found in India of good quality, that will be hardy in this Southland.

Horticultural Notes from Cuba

BY WM. FALCONER

It was February, a terrible month of snow and frost in Pittsburgh and the North generally, so my daughter and I bled us off to the balmy South, the land of sunshine and flowers; away down through Florida to Palm Beach, Miami and Knight's Key, and thence to the more congenial and frostless island of Cuba. Although we stopped at Richmond, Savannah, Jacksonville, St. Augustine and other cities of Florida, it would be too long a story to tell you about anything except some impressions of the new Republic in the West Indies.

Around Havana

Havana is a large and most beautiful city, busy and clean, and in its interior are many acres of park and prado. These are filled with tropical shade trees and shrubs, a liberal assortment of vines and garden flowers, and, in the prados especially, pretentious attempts at geometrical or carpet gardening. The lawn is Bermuda grass.

Park Bedding

The flower beds are accurately defined, banked 12 to 16 inches high with a slope of about ½ to 1, the banks being of closely shaved grass, but much more frequently of common Portulaca shorn to a dense carpet. On the level above these banks carpet designs are defined in Alternanthera, rose, red and yellow, and lettering in Pilea muscosa. The panels are variously filled, in fact this filling is their weakest point. Instead of using seedlings of Portulaca in the banks, they use cuttings, dibbling them in, four or five together, in holes 2 in. apart. Colon is the most pretentious park and right in the center of the city, but it is not as well kept as the prados, which were scrupulously neat and clean.

The Shade Trees

Most all of the shade trees, especially in the prados, are closely pollarded like Willows along a Dutch canal. What sacrilege, I thought, but it isn't so. Some months ago a cyclonic hurricane passed over the city, breaking the trees so badly that the park gardener pruned them all back to about a uniform height, under the circumstances in my judgment the best thing that could have been done with them, and now they are breaking into vigorous growth.

The commonest shade tree in Havana is Ficus religiosa; they call it "Poplar"; this name they also apply to Thespesia populnea, which is more sparingly planted; frequent also are "Laurel" (Ficus nitida), our common Rubber (Ficus elastica), and a very handsome, glossy, large, brown-rusty Rubber (Ficus ferruginea). In town and country the Cuba Bast tree (Paritium elatum) is much used; it now is in bloom, large yellow and red Hibiscus-like flowers.

Another bold tree is the Ceibo or Silk Cotton (Eriodendron anfractuosum), now full of big crimson-red blossoms. But nowhere did I see a Ceibo tree nearly as large as those I saw near Spanish Town, Jamaica, or in Nassau in the Bahamas. The Horse-Radish tree (Moringa) is also full of small whitish blooms, and the Women's Tongue tree (Albizzia) is laden with dangling, chattering, yellow pods.

Here, still full of lacey foliage and many big brown pods, the Royal Poinciana is at home; later it will be an umbrella of fire. The Soapberry tree (Sapindus) looking not unlike an Ash is esteemed for shade. A frequent and refined appearing evergreen tree is Tecoma pentaphylla. The Sea Grape tree (Coccoloba uvifera), a small tree in southern Florida assumes large proportions here, and so does the tropical Almond (Terminalia Catappa), and both are common as highway shade trees. The Mexican Rubber tree (Castilloa elastica) grows finely in Cuba, and it is a smoldering question with some Orange growers whether to extend their Citrus plantations, or fill in close with Castilloa.

It is generally conceded that the Mexican Rubber is not quite as good as the Para Rubber (Hevea Brasiliensis) but I didn't notice a Hevea plant in Cuba—there may be any number of them there though, for I saw only a small part of anything. Mango trees are as much at home here as in India and are used for shade, also shelter belts in Orange plantations. Cecropia palmata is a very vigorous tree with large palmate foliage white underneath, used in the parks.

The Australian "Pine" or Beefwood tree (Casuarina equisetifolia) so extensively used about Palm Beach and Miami is equally at home in Cuba and a good deal planted. I would strongly urge setting it out as a timber tree, for firewood and timber are scarce on the island. But the everlasting Palms prevail over the face of the whole earth, and the finest specimens of the Royal Palm I ever saw are at the Botanical Gardens, trunks 60 ft. high and as straight as a plummet.

The Smaller Trees

Among lesser trees not at all uncommon in cultivation are the Avocado Pear, the Sapodilla Plum, Mammee Apple, Custard Apple, Ginep, Rose Apple (Jambosa) and the Otaheite Gooseberry (Ucca). The Japanese Loquat does well and the China tree (Melia) grows like a weed. I saw several plants of the Akee Apple (Cupania), but they were not as happy as in more tropical parts. Tamarind trees made fine specimens, Mahogany was at home in a wild state.

Along the roadsides I noted several Calabash trees (Crescentia), and one of the most plentiful and beautiful trees was the Star Apple (Chrysophyllum) its satiny brown and golden leaves glistening in the sunshine. Erythrina umbrosa is a large native tree, and its branches are lopped and stuck into the ground for fence posts, and these posts take root and grow as Poplars and Willows do with us, and are now in full bloom. Although Eucalyptus trees grow fairly well they cannot compare in thrift with those on the Pacific Coast. E. robusta and E. resinifera are the two species I noticed.

Some of the Shrubs

Roses and shrubs hold a prominent place in all Cuban gardens, and there are large Rose nurseries in the vicinity of Havana. Most of the shrubs are evergreen and look well in or out of bloom, and a goodly number of Crotons, Dracenas, Acalyphas, Phyllanthus, Sanchezia and Pandanus are cultivated for their variegated or colored foliage alone.

Here, as in Florida, red Hibiscus and Oleanders are extravagantly planted. The orange Jessamine (Murraya exotica) and Crape Jessamine (Tabermemontana) are among the commonest and best, and little behind is the Pittosporum Tobira. Ixoras, white and red, are in bloom; Meyenia erecta, white and blue, is freely used; the blue Plumbago Capensis makes a big bush; the Frangipanis, with stout fleshy stems, delight in cultivation; and several varieties of Mountain Ebony (Bauhinia) brighten the gardens with large showy purple or whitish blossoms.

Melia floribunda is forever in bloom, and Allamanda Williamsii, Tecoma stans and Thivetta nerifolia all have their quota of yellow flowers. Hamelia patens is a dainty plant with orange flowers, but in the Botanical Garden in Havana I found it a little tree with stem 5 in. in caliper.

Several kinds of true Jasmines prevail, but preference seems to be given to gracillimum and pubescens. Daturas, 8 ft. high, were laden with their big white drooping trumpets, and the scarlet Malvaviscus seemed as happy as on the banks of the Brazos or in Mexico. By the way, Mr. G. W. Oliver of the Bureau of Plant Industry, Washington, showed me a fine specimen in bloom of a new species from Mexico, the flowers of which are very much larger and more showy than those of the old M. arboreus.

Both the day and night blooming Cestrums are among the commonest of garden plants, and have a double value, blossoms and fragrance by day or night, and then a load of Snowberries. Rank as a weed, but pretty and spreading into broad, dense patches, several times I found Clerodendron fœtidum with its purple fragrant flowers and malodorous leaves. A shrubby Morning Glory (Ipomœa fistulosa), 6 or 7 ft. high and full of large purple flowers, was quite interesting, and Jacobinia coccinea, red, and a yellow Justicia, in good bloom, were common in gardens.

Flowering Vines

In the way of vines, purple and red Bougainvilleas, yellow Bignonia, blue and white Clitoria, Balfour's Clerodendron, the great blue Thunbergia (Harrisii), and the little white one (fragrans), the Mexican Mountain Rose (Antigonon), and a few kinds of Morning Glories were in bloom.

Among common garden flowers lots of common annuals prevailed, such as Zinnias, African Marigolds, Drummond Phloxes, Candytuft, Celosias, Salvias, Four-o'clocks, Ageratum and the like. The Globe Amaranth (Gomphrena) judging from the quantity used is a favorite. The white Vinca has run wild. Bryophyllum abounds wherever it once got a foothold, and the same is true of Sansevierias. I saw Impatiens Sultani in splendid form there. Goldfussia isophylla, Eranthemum pulchellum, and Russelia juncea are common and never out of bloom; and one of the brightest plants, wild or cultivated, is the scarlet and yellow Asclepias curassavica. In the park were beds of Begonia ricinifolia doing

As Others See Us

My Dahlias have received first honors wherever shown and have received unanimous praise from press and public, as the following extracts from various papers will prove.

"Dahlias were never better; the colors were gorgeous, the size of some varieties immense, the forms of all beautiful. . . . The displays of J. J. Broomall and ——— were beautiful beyond description. . . . The grower who is thoroughly reliable."—Florist's Exchange, New York.

"A Dahlia expert."—Daily News, Pasadena.

"One of the greatest attractions of the show is the large and beautiful display of Dahlias. The private exhibit of ——— is only second in attraction to the professional display of J. J. Broomall, which is the finest display of Dahlias ever shown in Southern California. Mr. Broomall has staged between 300 and 400 distinct varieties, embracing every color and shade known in the Dahlia family. One of the most attractive flowers shown is one of Mr. Broomall's own raising, a beautiful light pink Cactus Dahlia which he has named Pasadena. This variety when placed on the market will become very popular. Another attractive one is a reecnt introduction from England, 'Snowden,' a beautiful snowy white, very similar in form and size to 'Pasadena.' 'Juarezii,' the original Cactus Dahlia, is shown. This flower is of great interest to Dahlia enthusiasts as being the original of the cactus type which now embraces so many superb varieties. . . . Mr. Broomall's exhibit is certainly one of the most attractive and interesting in the whole show. . . . Mr. Broomall's Dahlias still continue to be one of the chief attractions. The exhibit is admitted by every one to be the finest show of Dahlias ever seen on the Coast."—Pasadena Star (Daily), Oct. 27-28, 1911.

"J. J. Broomall had one of the finest collections in the show."—Eagle Rock Sentinel, Nov. 9, 1911.

"Mr. Broomall has made almost a life study of Dahlias and he has on his farm over 500 varieties, some of the most beautiful specimens one could imagine."—Riverside Enterprise (Daily).

"One of the leading authorities on the Dahlia in this country."—Seattle Daily Times.

Space will not permit me to quote from the many kind letters of my customers.

A BUTTERFLY THAT RESEMBLES AN OWL.

HERE is a photograph of the owl butterfly of South America, shown from its under side. The wings of these butterflies expand to as much as six or seven inches, and the insect derives its popular name from the fact of the two curious eye-like spots on its lower wings making it resemble the face of an owl. This resemblance can be plainly seen in the illustration if viewed upside-down, and when held at about an arm's length from the eyes of the observer. Just what purpose these curious eye-like spots serve in Nature is sometimes difficult to understand, although it is highly probable that in the case of insects their purpose is that of protection. In the present instance, for example, we should remember that when the butterfly comes to rest this under-side aspect of the wings is presented to view, the two wings being closed together—that is to say, an aspect such as appears when one half of the illustration is covered is shown on either side of the insect. It follows that an enemy of the butterfly would be confronted on either side with a startling "eye," and should this not be sufficient to keep it at bay, and an attack should be made, it is this eye-like spot that the bird or other enemy would most probably strike for; with the result that the wing would be perforated at a part that would not inconvenience the butterfly very much, although a similar thrust at its body would mean death to it. Meanwhile, the enemy is probably so much astounded at the unexpected turn of events that it becomes scared, or at least too suspicious for a further attack.—Mr. John J. Ward, Rusinurbe House, Somerset Road, Coventry.

Remains of a Famous Ship.—In scientific annals the *Beagle*, in which Darwin made his first exploring expedition, is almost as sacredly remembered as "Old Ironsides" in American history. This ship has long been lost from sight, and nobody knew exactly what had become of it. Toyozi Noda now writes to *Nature* that the *Beagle* was broken up in Japan, where it was used as a training-ship until 1880, and that a part of its ribs has recently been found in use as a stand for stones piled up near the temple of Suitengu, near the Oaki ship-building yard.

A FLORAL RARITY.

AS it may interest some of the readers of your Magazine, I send you a photograph of what is locally known as the Black Lily of Burma. As far as I have been able to ascertain, only two specimens of the lily exist, one of which is said to be in Kew Gardens, the other being in the possession of a resident of Rangoon, Burma. The specimens were obtained

from the jungles round about "Papun," on the borders of Siam, and are said to be very rare, search having failed in finding any more examples. The flower from which the photograph was taken was four inches across, the petals being very dark green veined with purple and the stamens a dark purple, and somewhat resembled a bunch of violets with leaf background.—Mr. A. Joyce, c/o Bank of Burma, Ltd., Rangoon.

The photograph next reproduced shows the pod of a curious nut which grows in the forest of Brazil, on the banks of the Rio Madeira and the Amazon. It is called the Sapuchia, and contains a large number of nuts, all arranged in circles and having a "key nut" in the centre which holds the others in place. When the nuts are ripe and the pod matured, a round section of the bottom separates from the main part, for all the world like a lid, releasing the nuts, which fall to the ground and are mostly consumed by the monkeys. The huge empty pod remains on the tree until it has the appearance and consistency of very hard, heavy wood, and woe betide the unfortunate on whose head it drops when its stalk finally gives way. The well-known Brazil-nut has a somewhat similar envelope, but this falls to the ground intact, thus preserving the nuts from the depredations of the monkeys.

An extraordinary nut-pod from Brazil—When the pod is ripe the bottom falls out and permits the hundreds of nuts to fall to the ground. [From a photograph.

THE GREAT AMERICAN APPLE

THE development of the apple and apple production for the last ten years illustrate the progress which has been made in different branches of horticulture, for the apple is the ideal fruit, the most popular fruit, the greatest and most valuable creation known to the pomologist of the Temperate Zone. It is the fruit of the masses, and it has no substitute.

The development of apple growing in the last ten years has been truly wonderful. It must be said that this development had its inception long before, but it was during the last decade that so much has been actually accomplished by the application of the vast store of scientific knowledge and by applying business principles to the growing and marketing of the fruit. Must I say that it is this business element which has made the progress possible? Look into the past — the "farmer orchardists" (and by these I mean the men who were farmers and who did not give their orchards reasonable care, neglecting them for other farm work) failed to grasp their opportunity. The size of the crops decreased from year to year, while the demand increased. High prices were the result. The man on the ground was the logical one to meet the opportunities and to make the most of them, but, as a rule, he sat back and said: "We can't grow fruit like we used to, and there is no use trying." It was the business man, the professional man, the trained man who, while he knew nothing about fruit growing, realized the possibilities where knowledge and judgment were applied and haphazard methods discarded. This same man realized he knew nothing of orcharding, hence he was anxious to learn and careful to go to the most reliable sources of knowledge — that is, to the scientific men and practical growers who were showing results, rather than to the ones who sat back and said: "We can't raise fruit any more like we used to."

This development started first in the West, for here there was no half-way point — they either made large profits or failed completely. The farmer in the East, if he failed in his orchard, could probably make a living from live stock and grain.

Some twenty years ago, the Hon. Parker Earle, President of the American Horticultural Society, and myself were discussing the possibilities of apple growing, the need of progress and variety development and improvement. In those days it was nearly all Ben Davis. Poor old Ben Davis! He served his purpose, but his days are past. No longer is he planted. We insisted that there were better apples, the quality kings, that the market would demand them, and when quality was considered, apples of the Ben Davis class must take a seat well to the rear. Commercial orchardists said that was impossible — would never be. The prophecy we then made has more than made good, and almost within a decade.

Black Ben, the modern successor to Ben Davis

Only eighteen years ago, Mr. Earle and myself sought the "land of promise" and we found the sovereign valley of New Mexico and there builded the great Roswell orchard of 1,000 acres, which at that time was the greatest orchard proposition in the West. The enterprise interested a wealthy mine owner of Colorado, a builder of railroads and irrigation projects, and it was but the pathfinder and forerunner for the many great orchard projects following close upon its heels.

Marvelous has been the development in the far West and most surprising the enhancement of orchard lands. Mr. Tenderfoot may ask if the prices are not a little high. They show you the books, proving that fruit growing is more profitable than stocks and bonds, to say nothing of the pleasure, the fascination of the orchard game. Across the continent has swept the wave of orchard progress and after reaching its crest on the Pacific coast there is a recession, a return, which brings good. Immigration is now from westward to eastward. The virgin orchard soils almost untouched in New England and other parts of the East are now coming into prominence.

Mr. Hale of South Glastonbury, Conn., is one of the Eastern men who have been successful fruit growers for many years. He is spoken of as the "Peach King" but he also grows apples extensively and heads the list of the successful horticulturists of the last quarter of a century. During September, I visited Mr. Hale for the chief purpose of beholding with my own eyes the wonderful J. H. Hale peach which will revolutionize peach culture. Great as has been the achievement of the Elberta, it is but a stepping stone of the J. H. Hale peach, which J. H. Hale says is as much better than Elberta as Elberta is better than Hill's Chili.

Mr. Shepard, of Hood River, Ore., editor of *Better Fruit*, that high-class orchard magazine which of itself is a liberal education, was the guest of Mr. Hale, for the same purpose. From the beautiful Hale homestead overlooking the Connecticut River, one of Nature's beauty spots, Editor Shepard asked: "Mr. Hale, is this some peculiar formation here, this pocket, something like our Hood River?" Hale's characteristic reply was: "Mr. Shepard, look beyond into the next township, and you have the same granite formation, and go on and on to the next township, the next county, and on, and travel still onward to the St. Lawrence River and you will have traversed 17,999 "Hood Rivers," virgin soil, waiting for the woodman's axe and the planting of fruit trees."

The past decade has witnessed the advancement of fruit growing, particularly in the West and the beginning of the realization of the possibilities in many sections on east where the right methods are applied.

Our Western friends are returning with Western experience, an invaluable asset and one that is needed where they are now settling in the Central West, throughout the most wonderful Appalachian region, in New England, and in Michigan. The time is coming, and I hope it is not far distant, when all those throughout the world who are hungry for American apples will be supplied at reasonable prices. Quality apples like Stark Delicious, wholesaling at $5 to $8 per box, are most profitable for the grower, but the average grower is not a trust magnate, a monopolist. He is a philanthropist — his experience is at your service. He coöperates with the beginner in the true spirit of philanthropy and helpfulness; he wants a living price, therefore, letting the masses of the world be supplied with apples within reach of the buyer's income. This is the mission, the work of the high class apple grower of to-day and to-morrow.

So much for the last ten years. But what is a knowledge of the past for, but to help guess correctly regarding the future. Hence I trust you will allow me in conclusion to make my "guess." The fruit growing industry, and apple growing in particular, is just beginning. The closing of the last ten years sees it entering upon a new era — the era of good quality fruit, at lower prices. There will be big money for orchardists in the growing of fruit but the speculative feature must be eliminated. The successful orchardist will have to sell better fruit for less money. To do this, he will have to be able to reduce the cost of growing and handling the fruit. To be successful, there must be the right soil, the right varieties, the right methods

The personal element is the one most impor[tant] factor in the growing of high quality fruit. [In] the process of the evolution of the orc[hard] industry there will be thousands of acr[es of] trees cut down or allowed to die because o[ne or] more of the necessary factors have not [been] regarded. Some localities which are gro[wing] a great deal of fruit now will cease to gro[w it] altogether for they cannot meet competitio[n of] other localities which are better adapted t[o the] production of higher quality fruit at a lower [cost].

WILLIAM P. STA[RK]

OROVILLE, BUTTE COUNTY, CALIFO[RNIA]

THIS FRUIT IS A WHOLE MEAL

JUDGE GRAY AND O. W. HALSTEAD INTRODUCT AVOCADO TO BUTTE.

FRUIT IS HALED AS SOLUTION OF HIGH COST OF LIVING.

RECENT IMPORTATION GIVES PROMISE OF BECOMING IMPORTANT PRODUCT.

Judge John C. Gray and Mr. O. W. Halstead have found a new way to reduce the cost of living, and incidentally they are adding a new industry to the already long and varied list of Butte County's industries.

The solution of the problem, as they see it, is to plant the avocado tree, a recent importation into this country, which is credited with being the most marvelous tree in the universe.

The avocado, according to those who are advocating its planting, will not only take the place of meat and vegetables, but it is a most delicious fruit as well. If you want a T-bone steak, all you have to do is to go out and pick an avocado. After you have eaten it you will be just as well satisfied as if you had had the steak, all broiled and planked. If you want vegetables, pick an avocado. It has all the properties of the vegetable. And if you want dessert for your dinner, pass your plate and have another slice of avocado, and you will rise refreshed, strengthened and satisfied.

According to those who have made an expert study of the new plant, a fair sized avocado will make a substantial and appetizing meal for one person. And quoting more exactly from an article dealing with this tree, "Six avocado trees on the home grounds, of varieties to ripen their fruits at different periods and cover the twelve months of the year, will do much to sustain a family and help solve the problem of the high cost of living."

The avocado has been introduced into the United States from Mexico. One tree there is said to be two hundred years old. This tree measures [illegible] feet at the base and [illegible] crop of three thousand [illegible] cados, weighing one pound each.

The planting of the avocado in [illegible] quantities is now being urg[ed] here, and the success with which the culture meets in Northern Californ[ia] will be awaited with interest.

"Greenwood", near Thomasville, Ga.

The Ben Hill residence, LaGrange, Ga.

The columns of "Millwood", near Columbia, S. C.

Portico of McAlpin residence, Savannah, Ga.

The Broughton residence at LaGrange, Ga.

Bond House, known as the Coleman House, Macon, Ga.

AN EDIBLE MEXICAN TUBER.

[From Consul Samuel E. Magill, Guadalajara, Mexico.]

The chinchayote is the tuber of a gourdlike plant grown in the State of Guadalajara, whose botanical name is *Sechium edule*. The year-old tubers are boiled and candied and are sold by street venders, being very popular among laborers and children. The larger, 2-year-old tubers are sliced and fried for table use. The present price is about 1 peso ($0.498) for 25 pounds.

These tubers yield an excellent starch, similar to arrowroot or sago, and an inquiry was recently received at this consulate from an American firm regarding the possibility of their use in starch making. The plant is not extensively cultivated here and it is doubtful if American manufacturers could satisfactorily contract for a certain acreage to be planted. To insure a supply, such a firm would have to do its own planting on its own land. All the starch manufactured here is made from corn, no chinchayote being thus consumed. Cassava is not grown at this altitude.

Above ground the chinchayote is similar to a gourd plant, with a smaller leaf, and the flower develops into a bulbous fruit covered with prickly spines called the chayote. The tubers are the part known as the chinchayote, and these resemble a sweet potato in shape, the color under the skin being white. Each plant produces 10 to 30 tubers, having a total weight of 5 to 30 pounds, varying with age, as some plants are allowed to grow for two years, producing larger and more numerous tubers.

For cultivation, the chayotes are sprouted in a moist place and then planted, sometimes three plants together. The planting season is from February to April, and the plant requires little attention thereafter. The chayotes, or fruit, are gathered in September or October, and the chinchayotes, or tubers, mature from October to December, being taken up when they reach the desired size. The shrubs are planted 7 to 10 feet apart, loose soil that has been used for other crops being the best. The tubers grow in all directions, but mainly perpendicularly. No reliable statistics as to the acreage under cultivation or the amount which one man can cultivate are available.

The average wages now paid to field laborers here are about 50 centavos (25 cents) for a 12-hour day, with two hours off for meals. For the manufacture of starch, water power is available in some places, and electric power can be obtained near Guadalajara for $6 per horsepower per month. Coal for factories costs about $10 per ton on cars here.

[The Department of Agriculture states that the chinchayote is grown in Florida, California, Louisiana, Porto Rico, and the United States' tropical possessions, but that it has no record of its being put to commercial use in this country.—B. of M.]

Alligator Pears Will Be Cultivated on Big Scale Near Whittier

Oranges and Eureka Lemons Will Be Planted in Small Tracts at Orchard Dale

The owners of Orchard Dale, Davison, Smith and Mizener are preparing the ground and have purchased the trees to plant a number of the five-acre tracts to Valencia oranges and Eureka lemons. W. G. Davison, who is the owner of lots 82 and 83, which aggregate nineteen acres, is putting half his land into Eureka lemons and the other half to alligator pears. This is somewhat of a new idea, although there are a few alligator pear orchards in and around East Whittier. It will be, it is said, the largest one in California.

Two sites have been donated by Davison, Smith and Mizener for the building of a church and schoolhouse for Orchard Dale.

Two acres have been sold to Mrs. Lucy Maund for $1265. This tract is one of the very choicest pieces in Orchard Dale, lying close to the La Habra car line and having a very commanding view of the surrounding country. Mrs. Maund will build a country home at once, and will make her permanent home there.

Mrs. Elizabeth Hillmer, who purchased one of the acre tracts some time ago, has doubled her holdings in Orchard Dale by buying another acre tract for $650. Mrs. Hillmer has already commenced the construction of her home.

Many ladies have been investigating Orchard Dale and have been delighted with it, and quite a few have taken land there with an eye to the future.

B4 W T HUTCHINS

Spencer Types of Sweet Peas.

stick we reproduce in part, as follows:

Extending to every lover of Sweet Peas my heartfelt greeting, I want to say I have come to this meeting to pay a just debt of obligation to the men who have had the courage and devotion to say that the Sweet Pea has in America deserved a national society. * * *

I hold that the Sweet Pea in its present range of color, and in its finest Spencer form, yields the first place to no other flower that can be named. And yet I recognize that the originators of this American National Society have shown peculiar qualities of courage and faith in launching the Society and in trying to have an annual show.

I have a very lively recollection of the Sweet Pea shows we held in Massachusetts during the nineties, and have by no means forgotten that before the decade expired we were unable to grow the flower. And it was then that in Great Britain the awakening began that led to the great bicentenary of 1900 and to the conversion of a new body of specialists, and then to the advent of the Spencer race of Sweet Peas. Even if the initial steps in starting this American Society are little more than tentative, I think you could not be mistaken in your duty to set the thing going. If you could fill your tables here today from the original seedling stock that I have seen in California every one of you would say it is high time we got into step with the Society in Great Britain. And if you are having difficulty with the Spencer Sweet Peas then all the more there should be organized action taken to find out why this magnificent new race of Sweet Peas is causing serious trouble.

We were really the first in this country to do honor to Henry Eckford. And now, beyond all question, we have another and more beautiful chapter on this flower to be enthusiastic about. The weekly notes in the English papers show that the Spencer race of Sweet Peas is there exciting the most phenomenal interest. How can we help being at least a close second to them in our intelligent appreciation of the fact that the Sweet Pea has made another historic record for itself? If only a few appreciative men here in New York pay their respects to this fact that this flower has now greatly surpassed the grandiflora beauty which Mr. Eckford spent so many years to reach, that of itself is sufficient reason to organize under the name of the National Sweet Pea Society of America. And if you cannot quite "deliver the goods" here at your annual New York show, you have abundant incentive to meet here and stimulate interest in the subject until it is made perfectly clear why as fine Spencer Sweet Peas are not grown around New York as can be shown anywhere in the world. To me the subject is profoundly pathetic. Has any decree of Heaven said, Thou shalt not grow the finest Spencer Sweet Peas here along the Atlantic Coast? A good motto for this American Society would be, "God wills that we shall grow the Spencer Sweet Peas here on the Atlantic Coast at their very best." It is not going to require any great amount of moral courage to say there is a reason why our rows of Sweet Peas have been less vigorous than they used to, and why they have such a precarious struggle to survive a very much shortened blooming period. There is certainly a reason why the haulm and the flower stem and the blossom do not show the same prompt, vigorous characteristics here now that we used to get twenty years ago. This flower is not an exotic. Its native habitat indicates that it is a coast flower, and the business of this Society is to make its discussions effective in showing just what the trouble is and how to change lamentation into rejoicing. * * *

I have looked in vain today for a single stem of Sweet Peas that graded up to the true Spencer type. You cannot go on giving annual exhibitions and label your vases Spencer this and Spencer that when the best of them are but abortive Spencers. The only thing that kindles interest in England is that they make the popular admiration tingle with the quality of blooms they are showing. To make an annual success here we have got to show the actual thing. Mr. Kerr says they have had as fine Sweet Peas shown at Fordhook as they have in California, but why have the Fordhook vines gone by? Vines that make so short a season of bloom cannot produce blossoms of bold form and good substance. No blossom can be called a Spencer if it is limp and sleazy, even if it came from Spencer seed. It is to the interest of every one of us to hold jealously to the type which nature has set for us as the true Spencer. I want to pay my share of the price of moral heroism that is going to be needed in holding the standard of our exhibitions up to the mark which the English Society has set. * * *

I suppose it is an inevitable incident in high grade floriculture that competition will excite a strained effort to get results by excessive culture, and the next step is to experiment with fertilizers, and the next step is a reaction on enthusiasm. But Nature is absolute. If a plant is not a gross feeder you cannot make one of it. And when you have carried development to its limit, Nature says, "Thus far and no farther." Beyond that we invite disaster.

And now if my paper is to have anything more than conventional value you will allow me to broach what I believe is the crucial Sweet Pea question here on the Atlantic Coast. Heaven wills that you shall duplicate here at their finest exhibition quality every grandiflora and Spencer Sweet Pea that has been shown in England or is being produced in the California workshop. I am sure the English specialists will think it strange if we do not, and taking Lester Morse as a standard California grower of Sweet Pea seed, anything that I can say, no matter how it effects his commercial interest, he will be glad to have said. For well nigh twenty years he has been doing his very best to supply the trade with the best possible seed. And other growers have at least had as conscientious and honest a motive. I do not see how any improvement can be made in the California seed. Lester Morse has put more expense into some of the higher phases of this seed question than he could afford to. And since the Spencers have come in the question of making it pay has sorely tried the generosity of his nature. He can be depended on to hold his methods of selection and roguing up to their uniformly thorough standard. But the duty of the hour requires that it shall be frankly said that you cannot get any better seed from California than you have had, and if you import your seed direct from England you will get even poorer results. The English seed is improved by being put through the California alembic. And setting aside the Spencer novelty question, the California seed has got to be the mainstay of the trade for the future, so far as we can see into it.

Whatever discussion of the growing of Sweet Peas for exhibition purposes we indulge in, the matter of commercial seed growing is left just where it was. The same acreage will be grown and the same general demand will be reported by the trade. Even if we should start a discussion here suggestive of a radical innovation, it will bear only on the matter of somebody's growing a very limited quantity of seed that will ensure the highest exhibition results to those who are ambitious to enter the competitive lists. It is positively an anomaly that we are not today in Boston and New York and Philadelphia showing the American public, on this Atlantic Coast at least, fifty of the finest Spencer novelties, in their most magnificent form and, no matter where this seed is to come from, such exhibits would certainly increase the demand for all other grades of Sweet Pea seed. * * *

I fear if anyone of us should set about doing the thing that must be done, it would take us the best part of ten years to produce a selected strain of seed that will be really indigenous to this part of the world, a strain of seed that will fall into the old fibrous root habit, and will give a vigor of vine sufficient to carry out the splendid quality of bloom that has come to us legitimately in the Spencer type. It seems to me that at present the only practical thing to do is for Mr. A. or Mr. B., somewhere in Mass. or Vermont, or somewhere in N. Y. or Penn., or somewhere else where the soil and climate conditions are similar to this Atlantic region, to start in, and select and grow, strictly for a strain of seed. There is no possible bugbear in the way except the patience and time it would take to get there. It is what I call localizing the seed stock. English seed can be grown in England. The seed stock is localized. * * *

Neither Mr. Burpee nor Mr. Morse, with whom I have all these years had the most friendly relations, will feel that I am saying anything objectionable. There is no place on earth where I am so happy as to drop down at the Gilroy ranches and revel in the seedling stock and the trials there. If I were to tell you about the most interesting things there, I should want to specify in detail one hundred things that have either giant size, or special Spencer quality, or novelty of color? The intensity of interest tires me out in one hour as I feast on them. And at present that is all the workshop we have for making the seed stock that we must depend on for results here.

I have never been able to decide dogmatically why we here do not get a good fibrous root and vigor of vine from this seed. Is it due to hybridization or is it due to California conditions of soil and climate? Has the stiff California soil changed the root habit, or is it because in California the vines go to seed and are harvested in July? They must do things there as the climate and season compel them. And for the past three years I have myself been growing that seed in California, and it has yielded every result I could ask. Give it garden culture, trellis it, keep it well watered, keep the blossoms cut and no words of praise can be too fulsome in expressing the lavish pleasure your vines will give you there in California. Probably that is simply an argument for the localizing of the seed stock. But while waiting at New Haven, I could look out of my window, and there was a spindling row of Sweet Peas; they came from the finest Spencer varieties, seed that I sent East, and they had every care bestowed on them, and they are—what?—the merest scrubs of blossoms. * * *

I feel about the Sweet Pea here on the Atlantic Coast as I should feel about a great campaign of education. Coming as I do from the California Sweet Pea paradise, and keeping up with the weekly reports of the Sweet Pea specialists of Great Britain, the type of this flower that I have been filling my soul with is, of course, the Spencer class at its very best. I made three visits last Summer to Morse's trial grounds and his fields of seedling stock, and each successive visit only filled the cup of satisfaction to fuller excess. The Spencer Sweet Pea as I have seen it there is an actuality. In every color it takes giant form and beautiful character. It does not try to get there, it gets there at a bound. When I went to make my third visit last Summer to gather seed to take home with me, I thought I should find that the blossoms all through the trial fields had gone by their best bloom; but instead they seemed to be in stronger bloom. It was such a feast to look through the rows to select pods where there was still an abundance of stems in full and finest flower. Much of this was original seedling stock, and showed a good many breaks but every break produced a giant Spencer white, or a giant Spencer Primrose, or some other color. Those California fields are the paradise of this flower. But the point I was to urge is that this highest Spencer type must be the goal we shall set on the Atlantic Coast, and I do not for a moment doubt that it is possible to reproduce anywhere within a radius of a hundred miles of New York as fine an exhibition stock of Spencer Sweet Peas as can be grown in either California or Great Britain. I would not listen for a moment to any doubt of this fact. The Sweet Pea has in it all the plant vigor and floral involution necessary to make it here what they make it in Great Britain. We can have two-inch blossoms, and can thrill the popular admiration here as well as those English specialists can. And I feel sorry for the gentlemen who are trying to make the flower worthy of a National Society to have to contend with such serious difficulty in getting up this annual show. * * *

I must tell you that even in California, the Spencer Sweet Pea is but little known. I virtually introduced it this last year at Santa Rosa. But you will be surprised when I say that the reason is that now almost every garden is so infested with snails people generally are disheartened trying to grow such flowers as must come through the tender seedling stage. I suppose I supplied two hundred people with Sweet Pea seed last Fall and this Spring, and the common answer was "I have failed with my Sweet Peas. The snails or the cut worms or the sparrows get them." And yet the old common Sweet Pea seed themselves every year and defy all pests. But a few people this year did bring their Sweet Peas through their infantile dangers, and were enthusiastic in their praise of the Spencer varieties. There is no further secret about growing them in finest form after they are got past the snails and cut worms and sparrows. * * *

Now that I am back on the Atlantic Coast I do not know when I shall see a row of Spencer Sweet Peas at their best, but I shall keep my faith alive with the assurance that just as fine Sweet Peas as the world has ever seen can be grown anywhere between Great Britain and California. If, in suggesting the course we must pursue, I shall seem to be something of an innovator, I shall have the cordial approval of every broad minded seedsman. I have never yet been hired to keep silent, and it has been my great pleasure to meet seedsmen on the most disinterested side of their nature.

I would have no satisfaction in reading this paper tonight if I did not have the most unbounded appreciation and confidence in the possibilities of the Sweet Pea. No temporary setback can effect the question permanently. The Sweet Pea once grew with the greatest vigor and the greatest overflow of florescence all through this Atlantic region. Twenty-five years ago, in Massachusetts and Connecticut, we could give them but scant culture and attention and still have the most thrifty growth of vine and abundance of bloom. I am sure if there is anything in our power that we can do to restore that day we shall all be glad to do it. And what a suggestion it is to think of the Spencer Sweet Pea with that old basis of vigor and of root quality to build our hopes on! * * *

NEW SUNPROOF CLOTH FOR DRESS FABRICS.

IN a recent issue we drew attention to the important subject of tropical clothing, and pointed out the value of a non-actinic coloured dress material, such as red, for breaking down the sun's rays and thereby arresting the disturbance of the spinal nerve-centres of the body therefrom. In tropical climes the white man labours under a heavy disadvantage in the prosecution of his duties as compared with the dusky native, for discriminating nature has accommodated the latter to his peculiar environment by the provision in his skin of a protective pigment which absorbs the injurious actinic rays of the sun, thereby enabling him to fulfil the most exacting and arduous labours without the slightest fatigue or inconvenience. Under these circumstances it is obvious that the white man should endeavour to reproduce nature's pigmentation protection by artificial means—that is, wear a suitably coloured material which will absorb the sun's actinic rays. The general impression, however, is that the wearing of a coloured material such as red, blue, or orange is to court disaster, and that the body will have to submit to unbearable heat. As a result, a flimsy white duck is the favourite clothing medium. Never was there a greater fallacy. The white, being transparent, offers no resistance to the passage of the actinic rays, and the wearer accordingly suffers the usual ill-effects incidental to the tropics, such as sunstroke, prostration, and stomachic maladies. Were the white material lined with a red fabric complete relief would be secured, and the wearer would be able to carry out his duties even in the fiercest sunlight without experiencing the slightest inconvenience. Science having definitely settled this question, an enterprising firm has patented a fabric expressly designed for service in such climes, in which red-coloured backing is provided to the material. By this ingenious arrangement one is able to wear any description of material, pattern, and colour, checks or tweeds, flannel or cotton, with perfect equanimity just as if he were in his native temperate zone. The red or protective colour does not simply adhere to the inner face of the exterior cloth, but is interwoven therewith, so as to constitute a homogeneous textile, but in such a manner that the colour does not show through the outer face. In this way the tropical resident can secure the various ranges of popular blues, browns, or grays with as much facility as his fellow-citizens at home. Great difficulty was at first experienced in preventing the red material from showing through, but this has now been successfully surmounted. The fabric, to which the name 'solaro' is applied, is of the finest quality of wool, made fifty-six inches in width, and compares in price with the good quality cashmere. The red is absolutely fast, being unaffected either by light or wet, and will not shrink. The wearer can have his suits lined or unlined just as he desires, since the virtue of the material lies in the resisting

CORNELL VARIETY TEST OF SWEET PEAS

NAME — Trial No.

SYNONYMS

PARENTAGE

SEED RECEIVED FROM

GROWN California England New York State of

ORIGINATOR — Date

INTRODUCER IN AMERICA — Date

INTRODUCER IN ENGLAND — Date

OBSERVER — Date of Observation

TYPE OF BLOOM Small Open Grandiflora Hooded Snapdragon Waved

COLOR Class Border, Blue, Cerise, Cream Pink, Crimson and Scarlet, Fancy, Lavender, Marbled, Magenta, Mauve, Maroon and Bronze, Orange Shades, Pink, Picotee Edged, Rose and Carmine, Striped or Flaked Red and Rose, Striped or Flaked Purple and Blue, Violet and Purple, White, Yellow and Buff. COLOR Keel

COLOR Standard Uniform Color No. Wings Uniform Color No.

Color shades No. to Shades No. to

Stripes Ground Stripes Ground

Flakes Ground Flakes Ground

Picotee Edge Picotee Edge

Veins Back Veins Back

Fades from to Fade from to

SIZE flower small medium large very large standard small medium large very large

wings small medium large very large

FORM standard flat reflexed hooded hooded slightly hooded much waved (Spencer) waved slightly waved much Unwin

wings crimped keel partly open spreading drooping headed waved upright and pointed

SHAPE standard notched sides notched top round pointed shell narrow base broad base auriculate

wings long short broad narrow

SUBSTANCE stapled burns slightly burns badly wet weather injures slightly badly Lasting quality on plants poor good

KEEPING QUALITY CUT good poor days FRAGRANCE none moderate much

USE home decoration market exhibition BLOOMER shy medium profuse continual intermittent

SEASON first bloom date full bloom date last bloom date

STEM No. fls. on axis to Length short medium long Strength weak medium strong

Position of flowers face variously face one way equidistant irregular close wide apart

PLANT dwarf bush medium tall very tall Growth weak slender stout Vigor healthy diseased Stock pure

mixed true to type not true true to name not true Leaflet narrow broad pointed round Tendril green

colored clinging non-clinging

SEED Color black white mottled dark brown Size small medium large Shape round irregular wrinkled

Condition sound split new old Germination poor good quick slow per cent. germinated

AREA distance between rows distance between plants number of plants length of row

SEED SOWN out in pots plants up plants shifted plants planted

CULTURE field

OVER outdoor under glass thinned supported

United States Department of Agriculture,
Bureau of Plant Industry,
Washington, D. C.

Field Investigations in Pomology.

INSTRUCTIONS FOR PACKING AND MAILING SPECIMENS OF FRESH FRUIT.

1. Specimens should be of average size and in form and color should be characteristic of the variety. They should be "hard ripe" or as mature as would be safe for shipment under ordinary refrigeration. They should be picked, handled, and packed with the utmost care to avoid bruising. The stems should be retained on the fruits whenever possible.

2. When practicable, twigs showing characteristic leaves, young wood, and bark of the variety should be sent with the fruit. This is especially important with peaches, plums, and grapes. These should be wrapped in paper and be so packed as to avoid bruising the fruit while in transit. It is rarely possible to forward tender fruits attached to the fruiting branches without injury. In case this is attempted, the individual fruits or clusters should be separately wrapped with tissue paper and be cushioned in the box with an abundance of cotton or similar soft packing material.

3. Each fruit should be wrapped separately with several thicknesses of the soft paper furnished in the corrugated paper mailing box and packed with an abundance of cotton, moss, soft paper, or other suitable material to fill the spaces between the individual fruits as well as between them and the sides of the box. The contents of the package must be snug and tight to insure safe carriage. Loose packing results in bruising and decay.

4. Do not overcrowd the box with fruit. A single cluster or specimen snugly packed that arrives unbruised and in good order is more useful than several specimens that arrive in bad condition. With grapes it is rarely possible to safely forward more than a single cluster in a mailing box, even with the most careful packing.

5. Do not dampen the packing material that is in contact with the fruit. Dampened moss or cotton may be wrapped about the bases of twigs or leaves to prevent wilting, but the damp material should be so wrapped with dry or oiled paper as to avoid contact with the fruit.

6. Label each variety plainly with name or number either upon the wrappers or on separate slips of paper.

7. After the box is filled, wrap it tightly with strong cord, which should be wound at least three times around the box *across the flaps* that constitute the top and bottom; then wind the cord three times around the box *edgewise*, and tie securely before wrapping it with paper. This stiffens the package and safeguards the contents while in transit. Then wrap with heavy paper and tie again with strong cord in the same way. The wrapping paper and cord used on the boxes when mailed from the Department of Agriculture will usually be found sufficient for returning them by mail.

8. Packages forwarded by mail must not exceed four pounds in weight, except single books, and must not contain articles likely to injure the contents of the mail bags.

9. Before mailing, attach the gummed addressed frank to the box and write upon the package your name and address as sender.

10. Always notify by letter when specimens are forwarded, stating number of boxes and character of contents, together with any other information needed for consideration when the specimens are examined. The addressed penalty envelope found in the box should be used for this purpose.

Fifteen Year Experience in Southern California

By DR. F. FRANCESCHI

(Continued)

INTRODUCTIONS FROM ASIA. During the period of Spanish colonization in California, hardly any plant can be credited to the continent, excepting fruit trees and other cultivated plants which had acquired citizenship in Europe, in times more or less remote. But, with the opening of trans-Pacific navigation, and, later on, of transcontinental railways to the Atlantic, a double stream of introductions was soon established from Japan and China direct, and from India and western Asia through Europe.

In 1894 there was not quite one hundred different genera of Asiatic plants cultivated in California (excluding those already credited to Europe); but, since that time their number has increased very considerably, and is sure to go on increasing for many years to come. We have drawn extensively on the flora of Japan, but it is far from being exhausted, while Formosa is hardly touched, and the immense Chinese Empire has in store numberless useful or ornamental plants which are sure to thrive in California. Manchuria and Siberia have lately contributed a few trees and shrubs, but the Indian and Malayan peninsulas, together with the mountainous Himalayan region have been the principal contributors of recent introductions. We have only a few representatives of Persia and of Arabia and a somewhat larger number from Asia Minor and the region of the Caucasus.

There are at present growing at Santa Barbara some 25 different species of Asiatic Palms, including what is probably the largest specimen in the whole country of the new PHOENIX ROEBELENI (in the grounds of Mr. J. W. Gillespie at Montecito) and also PHOENIX HANCEANA, introduced by us.

Our extensive collection of Bamboos is almost exclusively Asiatic, and comprises several species of BAMBUSA from India and China, four species of DENDROCALAMUS, comprising the majestic D. LATIFLORUS from Formosa and Burmah, which has become such a prominent feature in our gardens, eight or more species of ARUNDINARIA, from the Himalayas, China and Japan, among them the most graceful ARUNDINARIA HOOKERIANA recently introduced by ourselves, and rather a large number of more or less correctly determined Chinese and Japanese PHYLLOSTACHYS. Bamboos produce seeds only occasionally, they are often infertile, and never keep for a long time, but still, with patience and perseverance, and through the friendship of our correspondents, we hope to add to our collection of Bamboos every year. We have raised now a fine lot of the very graceful CEPHALOSTACHYUM PERGRACILE from Burmah, and this year quite a large stock of DENDROCALAMUS STRICTUS, the very best kind for building purposes.

To the number of Asiatic Conifers previously introduced to California we have been fortunate to add not a few, among them PINUS LONGIFOLIA and P. GERARDIANA from the Himalayas, P. SINENSIS from Hongkong, which bears quite young, also P. KORAIENSIS from Korea, and P. KESEYA from Java. We succeeded also in raising seedlings for the first time of the rare DAMMARA ORIENTALIS from an old tree introduced many years ago at Montecito.

Of the very large number of evergreen and deciduous trees native of Asia which are grown here, I must limit myself to mention only the most interesting, and of our own introduction to California. The Indian CEDRELA TOONA and C. SERRATA, together with the hardier C. SINENSIS are very promising also on the forestal standpoint; the gorgeous flowered BARRINGTONIA SPECIOSA and B. RACEMOSA are only recently introduced, BAUHINIA VARIEGATA, PURPUREA, TOMENTOSA, together with other American or African species, are already among the choicest ornaments of our gardens; several species of FICUS are fast growing to large size; MICHELIA CHAMPACA, the sacred "sampige" of the Hindoos builds in a few years a tall pyramid clothed to the ground with the freshest green looking foliage that can be imagined; OROXYLUM INDICUM, STEREOSPERMUM SINICUM and other members of the showy Bignoniaceas have already gained citizenship with us. We have always devoted special attention to fruit bearing and other economic trees, with the view that they may become of commercial importance in California, and we can claim as our own introductions from Asiatic Continent, AGLAIA ODORATA, ALEURITES MOLUCCANA and A. CORDATA, BENTHAMIA FRAGIFERA, CANANGIUM ODORATUM, the true "ylang ylang" from the Philippines, CANARIUM ALBUM, "Chinese olive," and the more tropical C. COMMUNE, the Chinese EUCOMMIA ULMOIDES which promises to yield "guttapercha" in temperate countries, a still undetermined species of FICUS from Cabul with immense leaves and

To Introduce Feijoa Trees

Editor of Sealy News:

Dear Sir: In looking up the new fruits introduced into California to see whether we can raise any of them in this region, I find a number of them, old acquaintainces of mine from South America, flourishing there only below the frost line, and so not adapted to this climate. However the Feijoa (sometimes called Pineapple Guava) which is probably the best of them all, is of a different character. It is native of the parts of South America just as far south of the equator as we are north. It will therefore stand a long season of cold, considerably below freezing. Mr. F. W. Popenoe, probably the best authority there is, says: "The Feijoa will grow and thrive not only in California, but throughout the entire coast region and across the continent from the Atlantic to the Pacific in the southern belt embraced within the Gulf States." It has been grown in California some ten years; in France still longer, and a few trees in England.

The Feijoa is a bushy tree growing ten or twelve feet high and one of the most valuable as an ornamental shrub even if it bore no fruit. The foliage and flowers are highly ornamental.

The fruit in nearly the size and shape of a hen's egg. It is of a green color, but the flesh is a white pulp with a few seeds about the size of those of the fig. In taste it is one of the most delicious fruits in the world, being likened to a mingling of pineapple, banana and strawberry. It has a penetrating and delightful odor so that a basket of the fruit will perfume an entire room. It has excellent shipping qualities and has been sent from France to California in good preservation though a month on the way. The only account I find of its selling value is that some one put a little surplus fruit on the market in Los Angeles last year and it brought fifty cents per pound.

If this fruit should do as well here as it seems to promise, it would be of inestimable value to this region As compared with the orange, the tree seems more hardy and an earlier bearer, and the fruit greatly superior in quality and market value. The Guavas, beside being used in the fresh state, are the great fruit of the tropics for preserves and confections and of course the Feijoa would lead all the rest and probably surpass them all. fruit in the world

A few persons are going to send an order to California, as we are informed that it is not yet too late to get the trees this season. It is desired to have a number unite so as to get enough trees to try the Feijoa here in different conditions of soil and exposure. They are priced at from fifty cents to a dollar and a half, according to size.

We will send off the order not later than the fourth day of May. If any of your readers desire to get some of the trees we will be glad to have them join us in the enterprise. Anyone desiring trees may leave his order at the Sealy National Bank not later than 3 o'clock, p. m., on Saturday, May 4th

Truly Yours, WILLIS WEAVER.
R. F. D. No. 2, Sealy, Texas

AMERICA A FRUIT PARADISE

Green's Fruit Grower thinks that Americans do not appreciate the resources of their own land, and says:

There are few people in this country who realize fully that America is a fruit paradise. There are few who realize how difficult or impossible it is for many other countries to produce such superior fruit as is so freely and economically produced in the United States of America.

It is said that the English people never saw or never tasted of a peach that ripened out of doors until they received a shipment from the state of Washington at a recent date. This is a mistake, for peaches have been sent from here to England and have for more than ten years past, but it is true that peaches grown in England must be grown under glass. These hothouse peaches cannot be compared in quality with those ripened out doors in America. (A correspondent to Green's Fruit Grower in a later issue protests against this statement. He says: "I have gathered exquisite peaches in the North, near the Scottish border, commonly known as the 'Lakes country'; these are invariably trained on walls, as is frequently the case with cherries and apricots; also some species of plums. Hothouse peaches are in another class entirely.)"

It is not widely known that there is no other country in the world that will compare with this country in the production of apples and other hardy fruits. When we consider the growing of tropical fruits, such as the orange, lemon, pineapple and many others, America still leads the world. This is a great country for the production of nuts of almost every kind, from the cocoanut to the pecan and peanut, but this fact is not fully appreciated. I appeal to the agricultural and horticultural press to make these facts more widely known. Let us keep telling our readers of the wonderful resources of the United States as a fruit growing country. In what other part of the world can you find trainloads of the most beautiful apples ever grown starting out daily from various parts of this great country, and trainloads of oranges, also trainloads of grapes and peaches? There is no part of the world where such quantities, such ligh grade, and such beautiful fruit is produced.

Fifteen Years' Experience in Southern California

By DR. F. FRANCESCHI

INTRODUCTIONS from CENTRAL AMERICA. Although the first introductions of foreign plants were made by the Franciscan Monks from Mexico, it does not appear that the Mexican Flora was represented to much extent among them. The only Mexican trees which can be reasonably traced to the first period of the Missions, are probably the "zapote blanco," CASIMIROA EDULIS, a wild, very small fruited variety, almost seedless, and the "capolin" PRUNUS CAPULI. Very likely, the "pepper tree" SCHINUS MOLIS, and the "floripondia" or "angel's trumpet" DATURA SUAVEOLENS, were also imported from Mexico at the time of the Padres, as must have been also the large fruited "tunas" of various colors, OPUNTIA TUNA, still to be found in the vicinity of the old Missions.

After 1850 commercial intercourse between California and Mexican and other Central American ports became more intense; also a steadily increasing number of American prospectors and miners started to "penetrate" the peninsula of California, Sonora, and all Northern Mexico. To such period must belong the introduction of "ahuacates," PERSEA GRATISSIMA, "cherimoyas," ANONA CHERIMOLIA, "pineapples," ANANAS SATIVA. Also "poinsettias," EUPHORBIA PULCHERRIMA, which have become such a brilliant feature of our coast cities; the powerful scented "galan de noche," CESTRUM NOCTURNUM; the beautiful and fragrant FUCHSIA ARBORESCENS; different species of SALVIA, AGAVE, etc. It was however in consequence of the opening of railway lines, now covering a great part of Mexico and in progress of extension; also of enormously increased American interests all over Mexico, both in mining and agricualural pursuits, that the introduction of plants was made easier. To a very high degree it was promoted by the persevering work of the Smithsonian Institution and of the Department of Agriculture of the U. S. in investigating the flora of various parts of Mexico. Thousands of plants were collected, many of them undescribed before; some seeds were obtained, and they have been acquired to our gardens. But, no matter how numerous the introductions of these late years might have been, the whole of Mexico with the rest of Central America, remains to this date an inexhaustible mine of plant treasures, in the same way that their mineral wealth appears inexhaustible. Not very numerous were in the years past the introductions from Cuba, Porto Rico and other islands of the West Indies, geographically and botanically considered as making part of Central America, but, after the liberation of Cuba and the annexation of Porto Rico, facilities have increased considerably. In the last named island the diligent work of the Department of Agriculture has already given results and brought to notice a number of plants worth introducing.

A bontanical Station had also been established in Cuba, and it has done good work, unfortunately interrupted by recent disturbances.

There are not less than 30 different species of Palms from Central America now growing at Santa Barbara, of which number we have introduced two species of ERYTHEA, two of BRAHEA, several of CHAMAEDOREA, all from Mexico, the very rare COLPOTHRINAX WRIGHTII and GAUSSIA PRINCEPS from Cuba, and the newly discovered OREODOXA BORINQUENA from Porto Rico. After many years failure (seeds from Europe never germinating) we succeeded at last in raising the majestic "Montezuma" or "Chapultepec Cypress," TAXODIUM MUCRONATUM, and we have also introduced CUPRESSUS EXCELSA and PINUS NELSONI from Guatemala, together with different species of PINUS from Mexico. It was also after many years' efforts that we succeeded in introducing the legendary and very rare "MACPALXOCHITLQUAHUITL" of the Aztecs, "arvol de la manita" of the modern Mexicans, CHEIROSTEMON PLATANOIDES CEDRELIA ODORATA from Cuba and C. DUGESII from Mexico, ENTEROLOBIUM CYCLOCARPUM, "orellera" of the Cubans, and several species of Central American BAUHINIA are also growing on our grounds.

The "bread nut" of Jamaica, BROSIMUM ALICASTRUM grows well and blooms, but did not yet set fruit. BYRSONIMA CRASSIFOLIA "nanche" very popular in Mexico, "zapote negro" DIOSPYROS EBENASTER; FICUS PALMERI, bearing white figs; RANDIA THURBERI, "papache" of Sonora; CRYTOCARPA PROCERA, one of the "ciruelas" of the Mexicans, are all very promising fruit bearing trees introduced by us, and we had also the good luck of raising quite recently the delicious LUCUMA SALICIFOLIA, "zapote borracho" which although noticed and described by Humboldt a century ago, has only of late years found its way to Mexican

Experimental.

RARE FRUITS THRIVE HERE.

Delicious Persimmon Variety Found in China.

Anona, Like Ice Cream, Guavas of Many Flavors.

Balmy California Climate Favors Them All.

The introduction of new varieties from the Orient and the development of hardy species that yield a shipping fruit that is free from astringent qualities promises to make the growing of persimmons on a commercial scale one of the profitable industries of Southern California. That the persimmon does well throughout the southern part of California is abundantly demonstrated by the presence of flourishing trees in widely scattered localities. The common varieties possessed such indifferent shipping qualifications that no general attempt was made to plant a tree except now and then in the family fruit garden. The difficulty is that the fruit is too astringent unless thoroughly ripened, and when ripe is too soft to withstand shipment any considerable distance.

During recent years, however, the larger size and brighter color of the Japanese persimmons have, to a considerable extent, attracted the attention of fruit growers away from the hardier, although less conspicuous, native species. Although the Japanese persimmons was recorded in America as early as 1828, it was not until about 1875 that it began to gain a permanent foothold. Many of the imported varieties, while being abundantly productive and yielding a fruit of such conspicuous size and brilliant color as to render them attractive in the market, still retain their characteristic astringent flavor.

During recent years indefinite reports from travelers and missionaries in China related to the discovery of hardier, large-fruited sorts grown in the interior of China. These were stated to be superior in many respects to the Japanese varieties. The fruit is from three to five inches in diameter, possesses a bright orange color, weighs more than a pound, is seedless and is not astringent. It stands shipping well. The trees are thrifty growers, frequently reaching a height of more than thirty feet. They are heavy producers. The fruit may be eaten with a spoon and is said to be delicious, even when quite hard. Scions of this variety were obtained from west of Peking, China, and those that are being experimented with in the United States are said to be giving a good account of themselves.

Such fruit as does not go to market in a fresh state will no doubt be available in a dried form, as successful [illegible] experiments made along this line.

MULTI-FLAVORED GUAVAS.

With more than a hundred different kinds of guavas not yet tested in Southern California an immense field is still open to the experimenter in the introduction of useful plants. In flavor they resemble the strawberry, banana, pineapple, raspberry and lemon. They range in color from red through the browns and yellow, and in habit demand a range from frostless to those semi-thermal belts which are visited occasionally by light frosts.

One variety or another of the guava is destined to become of commercial importance in the Southwest. The frult may be preserved for later use or eaten fresh, as the pulp is of delicious flavor. The sterling qualities of both bush and fruit commend the guava for general planting. The shrub is of easiest culture, is quite hardy and thrives along the coast or inland and requires but little water.

The anona reticulata, vulgularly known as the "custard apple," is commended for planting in all situations where the lemon and orange do well. It will, however, stand light frost. The anona was first introduced to California some forty years ago, and has steadily grown in favor, but is not as yet produced on a truly commercial scale. The natural order of anona numbers more than 500 species, which are found in all warm countries. The familiar North American pawpaw and the Mexican papalia are familiar members of the great family. The anona cherimolia is one of the most-widely-known species. It has been in cultivation in Mexico for centuries and was familiar even before the conquest of Cortez. In portions of Mexico ripe fruit is to be found during every month of the year, but the principal harvest is from September to December. The cherimolia tree begins ordinarily to bear when about three years old. When ripe the pulp is of the consistency of ice cream. The taste is difficult of description, but generally relished.

PALATABLE AND SEEDLESS.

The horizon widens when one advances from guavas and anonas to eugenias, which are botanically allied to the former, though unlike them. There are not less than 1500 species of eugenias and nearly all of them yield palatable fruit. The rose apple and surinam cherry are varieties of the eugenia, to be found in Southern California gardens and so far as records go, the first must have been introduced into the State almost forty years ago from one of the islands of the Pacific. Being almost seedless, the fruit is desirable for use in making jam or jelly.

In certain quarters, considerable attention is being paid to the production of the white sapota of Mexico, which is about the size of a small orange and thrives well in the thermal belts of California. It contains three or four large seeds, embedded in a white pulp of pleasant taste. The flavor is not unlike that of the peach.

Much attention is directed to the aquacate, or avocado, since it has been demonstrated that this fine tropical fruit is adapted in its culture to many parts of Southern California. It is perhaps the most nutritious and wholesome of all fruits. Culture of the avacado is feasible in localities where the oragne and lemon find congenial condition of climate and soil. The market for the salad fruit is a wide one.

Bamboos in California

By DR. F. FRANCESCHI

Fifty years ago there was not one bamboo in California. The Franciscan Fathers had omitted to carry any from Mexico, and, up to 1849, communications were so difficult, either by sea or by land, as to prevent absolutely every introduction of plants otherwise than from seed, a mode of propagation almost denied to bamboos, which, as it is known, produce seed only at very long and uncertain intervals.

When the trade of San Francisco began to expand towards the Orient, bamboos began to be imported, mainly from Japan, and after the opening of the first transcontinental railroad some must have been brought also from nurseries of the eastern states and of England.

It was slow work, anyhow. The writer remembers well that fifteen years ago, that is, in 1893, in the city of Los Angeles there was only one small sized grove of the now so very popular "fishpole bamboo," Phyllostachys Viridi-Glaucescens, on Figueroa street, and another much smaller clump of Bambusa Vulgaris on Alvarado street. A couple of large clumps of the not much prized Arundinaria Japonica were quite prominent in the old Silent place, on Adams street. At Santa Barbara, which has always been from the very beginning the most active "focus" of horticultural introductins, the above-named bamboos were more plentifully represented, and a great wonder spoken of by everybody was the large feathery clump of Arundinaria Falcata at Ellwood, the "Mrs. Cooper's bamboo," as it has been popularly known for years, and which, by a strange coincidence, did die just a short time before we had to deplore the irreparable loss of its enthusiastic and amiable introducer, the late Mrs. Sarah P. Cooper.

Up north, that is principally round the bay of San Francisco, some of the hardiest kinds from China, Japan and northern India, had also gained a certain foothold; several good specimens were to be seen in the university grounds at Berkeley; several also in Golden Gate Park, and in other public and private grounds. However, it is only these last ten years that bamboos have been planted to any considerable extent, and the general public has learned to appreciate their unsurpassed merit on the horticultural and decorative standpoint.

All bamboos now grown in California are of Asiatic extraction, excepting the Louisiana and Florida "cane," Arundinaria Macrosperma, and possibly also Bambusa Vulgaris, which, like the cocoanut palm, claims as its birth place the tropical zones of both the old and the new world. In eastern Asia bamboos are very widely distributed, a large number of species having been found from the tropical zone up to northern China, and the most northern islands of Japan.

There are no bamboos native of Europe nor of Australia. The continent of Africa has only a few species, very imperfectly known, and none as yet introduced into gardens. In America, that is from Mexico southward to Chile, quite a number of species are to be found, many of them being climbers, and some attaining very large size. Unfortunately, they are very little known, and none as yet have been introduced in gardens.

A most important distinction is necessary to make, from the horticultural standpoint, between bamboos that always grow in a clump—which will of course increase in diameter with age, but will always remain more or less compact—and "running" bamboos, which spread in every direction their underground "stolons" or stems, and send out new shoots, often at a wonderful distance from the mother plant. Evidently this second section is not much adapted for planting on lawns, or on grounds of limited extent.

The species belonging to the Bambusa proper, and to Dendrocalamus, do not run; it is true that B. Fastuosa and B. Quadrangularis do run considerably, but they were clasified among Bambusa for lack of better knowledge, and some day, when their flowers and seeds will have been studied, they are very likely to be found not to belong to the bambusa proper.

The species belonging to the genus Phyllostachys, almost exclusively Chinese or Japanese, all run more or less.

Among the species belonging to the genus Arundinaria, those introduced from the Himalaya mountains grow in clumps and never run, while those introduced from China and Japan are great "runners."

In the alphabetical list of introduced kinds which follows, those growing in clumps are marked with C; the running ones with R. I will endeavor to make it as concise as possible, but still sufficient to enable amateurs and gardeners to recognize the plants they may possess already, or to pick out such kinds as are most suitable to their needs:

C. Arundinaria Falcata, Northwestern Himalaya: 10-20 ft. The fine, feathery bamboo for a long time known also as Bambusa Gracilis and as "Mrs. Cooper's bamboo" at Stnta Barbara. Canes not over ½ inch thick, in the young stage covered with a bluish-white coating, yellowish when old; at first standing erect, then very gracefully drooping under the weight of its dense whorls of plumy leaves, which are quite narrow and usually 4 to 6

Canning Mangoes

Industry Developed by an Enthusiastic Hindu.

By Consul General WILLIAM H. MICHAEL,
Calcutta,
In Daily Consular & Trade Reports.

A FEW years ago a young Hindu named A. B. Sircar conceived the idea of canning mangoes in India. After giving the matter considerable thought he went to the United States to learn the art of canning peaches and other fruits grown in California, and also the trade of tinner, or at least enough of the trade to be able to manufacture tin cans and to solder the cans in the best manner when filled with fruit.

He spent several years in different canneries in California and also obtained degrees in chemistry and bacteriology. He returned to Calcutta and secured sufficient financial backing to establish a plant at Muzaffarpur, which is about 350 miles from Calcutta, on the East Indian Railway. About $28,330 has been expended on the plant and all the machinery was purchased in the United States. Although just starting in the business, 20,000 cans of mangoes and pineapples were shipped to Europe in 1910, mostly to London. In 1911 shipments aggregated 18,000 cans of mangoes and 12,000 cans of lichis to Europe. At the branch here a case of 24 2½-pound cans sells for 42 rupees (about $14), and it cost 10 rupees (about $3.30) freight to land a case in London.

The company's retail prices in Calcutta are as follows: No. 3 size (2½ pounds)—Langra standard quality, 1 roupee 4 annas ($0.41); Langra extra, 1 rupee 8 annas ($0.49); Langra special, 1 rupee 12 annas ($0.57); Bombay standard, 1 rupee 8 annas ($0.49); Bombay extra, 1 rupee 12 annas $0.57). The company also sells lichis put up in 1½-pound tins at about 33 cents per can.

The process of canning the mango is precisely the same as that employed in canning freestone peaches in California. The mangoes are carefully pared and the stones taken out. Overripe, bruised, or otherwise unfit fruits are rejected. The mangoes thus stripped of their peel and stones are put in cans, which are then weighed and filled with sirup. Then the cap is soldered onto the opening of the can with a capping steel, leaving a vent hole in the middle of the can for driving out the air inside. Steam from a boiler is passed into water in a large wooden vat and the cans are placed in the boiling water in crates suspended from a crane. This is called exhausting. After the air has been driven out the vent hole is soldered up and the cans are put in boiling water. This operation is called processing. After a certain time the cans are taken out and placed in the cooling vat. Some of the cans are put in an incubator and the fruit examined with a microscope to see whether it is free from bacteria.

Last year the canning plant employed more than 80 persons per day. The common laborers receive 5 to 8 annas (10 to 16 cents) a day, and those who peel the fruits are paid by the hundred. It is said that the employees show wonderful adaptability to the work, and at the end of the season were able to do three times as much work as at the beginning. Even persons belonging to high-caste families took an interest, and some of them became employees in the cannery. It is believed that plenty of intelligent labor can be obtained.

Bamboos in California

By DR. F. FRANCESCHI

(Continued.)

R. Arundinaria Macrosperma: Louisiana and other southeastern states. The only North American bamboo; mostly suitable for swampy and submerged locations, where it may attain twenty feet and over. Will stand considerable frost. Introduced to California by the S. C. A. A. some ten years ago.

R. Arundinaria Marmorea: Northern Japan, the same as A. Kokantsik of Japanese botanists. Quite interesting and distinct for its thickly set, wiry canes, which are solid and perfectly cylindrical; they will never attain more than 1-3 inch diameter and five feet in height. New growth comes out in the fall, being all wrapped in deep purple sheaths, beautifully marbled with gray. When quite tender these are much prized by the Japanese as "winter greens." To be sure, one of the hardiest kinds.

R. Arundinaria Simoni: China and Japan. Runs quite widely and at greater depth than most other kinds, thus standing better drought and cold. Canes may attain twenty feet under favorable conditions; leaves are narrow and generally striped with white. This species has been known to bloom quite often and ripens seeds larger than an ordinary grain of wheat. It does not die down entirely after blooming, as most other kinds do.

R. Arundinaria Veitchi: Japan; dwarf, seldom attaining three feet; canes quite thin; leaves up to 4 inches long and 1½ inches broad, of a pleasant green color, mostly suitable for covering ground under trees. Very hardy.

C. Bambusa Arundinacea, India: the very handsome of Bengal, making impenetrable jungles. Some of the lower branchlets are transformed into hard, recurved thorns. Canes may attain 70 feet in height and over 4 inches diameter, and when coming out they have a much-marked zig-zag outline; light green at first, they will turn to a deep golden color with age. Introduced by the S. C. A. A. in 1894. It has proved to be quite hardy on our coast, while, in order to attain its full development, it appears to need more heat than our summers will afford.

R. Bambusa Pastuosa, Japan. Introduced to California some twenty-five years ago, that is much before it was known in Europe, but never re-introduced since, as far as I was able to ascertain. Very ornamental and of a very peculiar appearance, its underground stolons running mostly in one direction, unlike most of the Phyllostachys. Canes grow straight upright, up to 20 feet, and not much over one inch diameter and tapering very slightly. They are perfectly cylindrical, with no grooves at all, and they have quite a large cavity. They will take in seasoning a rich brown color, and are eminently suitable for light furniture work. They are thickly covered with branchlets of uniform size from top to bottom, which impress like a columnar outline to each stem, the foliage being tufted and of dark green color.

R. Bambusa Quadrangularis, China and Japan. First introduced to Europe about 1880, but in California several years later, and never become much known, as it would deserve for the unique appearance of its canes, which are actually not cylindrical but "four cornered," and so markedly so that people believed at first their being the

A NEW AND VALUABLE MANGO

Professor H. P. Rolfs, of Miami, has several trees of the Cambodiana mango fruiting this season. This is one of the finest mangos yet imported. The trees are heavy fruiters, the fruit of good size and very attractive, with an entire absence of fiber and of delicious flavor. This fruit brought 25 cents each in the home market. It is evident that the Cambodiana will become one of the most popular fruits grown. The demand for budded trees of this and other varieties is much greater than the supply, the nurserymen are not keeping pace with the accumulating orders.

Introductions from Africa. It is safe to state that only one African plant was introduced by the old Padres in the Missions of California, namely the common Date Palm, Phoenix Dactylifera, of which a few escaped destruction and are still living at San Diego and San Buenaventura. When the flow of new plants started in California, African introductions were almost exclusively limited to the Cape of Good Hope and to the Canary Islands, the interior flora of the large "black continent" being very little known at that time. But, the last 25 years have brought a great change, and African plants, in increasing numbers, are steadily coming to enrich our gardens every year.

We have now growing at Santa Barbara about one dozen and a half of African Palms, the majority however belonging to the adjacent islands; a few species of Conifers, among them Pinus Canariensis, the king of Pines in Southern California, and Juniperus Procera, of our own introduction, a giant among Junipers, and recently found on mount Kilimandjaro and other mountains of Central Africa. Years ago we introduced also the "Mlanje cedar" WIDDRINGTONIA WYTHEI, but it was not a success up to now.

Other African trees worthy of special mention are Calodendron Capense, a rather fast grower but a shy bloomer with us, Dombeya Natalensis, literally covered with snowy white, cherry-like blossoms in November, and Dombeya Spectabilis from Central Africa, almost everblooming and in two varieties, one light pink and one pure white, both introduced by us. Erythrina Caffra and other "coral trees," Greya Sutherlandi, Harpephyllum Caffrum, "kaffir plum," promising to make a first rate shade tree, the celebrated "silver tree," Leucadendron Argenteum, from Table mountain, feeling so much at home at Santa Barbara that it naturally reproduces itself; Pistacia Atlantica from Algeria; also Celtis Kraussiana from Natal, Ficus Sycomorus from Egypt, Myrica Faya and Persea Indica from Teneriffe, Trema Bracteolata from central Africa, Dodonaea Viscosa, Dodonaea Thunbergi and Dodonaea Madagascariensis, all of them capital trees for dry lands; Copaifera Baumanni and Copaifera Coleosperma from Angola, the "Baobab" Adansonia Digitata and last of

desia, named by myself Tecoma Reginae Sabae from its having been found on the ruins of what is considered to have been the capital of Queen Sheba's kingdom of Ophir. It is a more vigorous grower than Tecoma Ricasoliana (or Mackenni); foliage richer and flowers larger, gloxinia like in appearance, vivid crimson and fragrant; blooms continuously from the end of September until May.

Introductions from North America

It was obvious that Americans who migrated to California from the eastern states must have desired to bring over plants familiar to them in their old homes. But not many of them did prosper, and more markedly so in Southern California. The main reason of such failures I believe to lay

to need an absolute period of rest, during which to mature the tissues for future growth, and no such rest can they get in Southern California. Still, there are exceptions, and, occasionally one can admire at Santa Barbara very fine specimens of Ulmus Americana, Juglans Nigra, Hicoria Pecan, etc., always growing however in rich deep soil, not devoid of moisture. The evergreen Magnolia Grandiflora from the South Eastern States succeeds admirably in California, and even in shallow, rocky soil, and it has become almost everblooming here. Texas, Florida and others of the "Gulf States" have contributed a certain number of trees and shrubs; a very desirable one, Prunus Caroliniana, since long highly prized in Southern

LOS ANGELES WOMAN NOW IS 'DATE QUEEN' OF COACHELLA

Dr. Rebecca Lee Dorsey Gives Up Practice to Become Valley Rancher

This is the story of a Los Angeles woman who applied keen business judgment to the horticultural prospects of the Coachella Valley and became the Date Queen of that district.

The woman is Dr. Rebecca Lee Dorsey of the Pacific Electric building, who, after twenty years of practice as a physician and surgeon, last week gave up her practice to devote her entire time to the growing of dates and alligator pears in the Coachella Valley.

When a carload of date shoots from Algiers arrived in Los Angeles last week headed for Indio, the center of the Coachella Valley, the date experts of the Southwest knew that Dr. Dorsey had made good her promise that she would send a special commissioner to Africa to secure the proper kind of dates for growing in Southern California.

The arrival of the thousand shoots from Algiers marks the beginning of the development of the date industry in Southern California, which experts say can be made the greatest field in the world.

The story of Dr. Dorsey's nerve and enterprise in securing the great quantity of shoots of the famed deglelnoor dates is a most interesting one.

For several years the government stations in the valley had been experimenting with varieties of dates. They at last reported that the rare deglelnoor of Algiers was the ideal date palm for the valley. Deglelnoor means "date of light," so named because the fruit is so transparent that the seeds can be easily seen.

The home of the deglelnoor is in Algiers. One grower of the valley took a trip to Africa to secure the proper shoots. He made a fortune on the sale of the land after the dates went in. It was absolutely proven that the Coachella Valley, at the very gates of Los Angeles, could be productive of as fine a date crop as could be found in the world.

It was about that time that Dr. Dorsey and Mr. Bray of Los Angeles bought property in the valley. Their lands comprise 1000 acres at Indio, in the heart of the valley, and are known as the Bray-Dorsey ranch.

Dr. Dorsey found that many of the date planters had inferior qualities planted because they did not want to attempt securing the finer quality.

The date in the Coachella valley takes five years to produce, and during the interim the land is planted in cotton, onions, alfalfa or any other crop. When the date starts to bear it keeps on producing for an indefinite period, running into scores of years, and its crops are enormous.

Dr. Dorsey bought land at $125 an acre. It was raw land, uncleared of brush. She planted onions on a portion of it. The onions netted $200 an acre during the season. This convinced her of the quality of the land. When other planters feared to take the long step of securing Algerian dates, Dr. Dorsey decided to go it alone. She learned that Paul Poponoe of Altadena was in Southern France studying the pineapple guava, which he hopes to introduce into Southern California soon. He agreed to go to Mskra, Algiers, in search of the date shoots. His quest was so successful that he has secured a concession from the French government to ship the shoots out of the country to Southern California in great quantities next year. The trip was made on camel back, and Poponoe soon had the thousand shoots properly stitched in canvas sacks, aboard camels and headed for the coast. They arrived in Los Angeles last week, were given their quarantine bath at Indio, and Dr. Dorsey forthwith became the date queen of the Coachella valley.

Securing the shoots from Algiers gives Dr. Dorsey a two-year start. Ordinarily the seed is planted, and, after two years, when the sex of the plants is determined, the orchard must be replanted. The third year the orchard is worth anywhere up to $5000 an acre.

By securing the shoots direct from the parent trees, Dr. Dorsey has eliminated the replanting process.

Her ground, for which she paid $125 an acre a few months ago, became worth $1500 an acre with the planting of the Algerian dates, which cover twenty acres, leaving the remainder for the cultivation of cotton, onions, peaches, almonds and alligator pears.

By careful experimenting this remarkable Los Angeles woman has learned that the rare alligator pear of the tropics is absolutely at home in the Coachella Valley. The alligator pear brings about 50 cents apiece on the present market, and Dr. Dorsey has discovered that this tree, which produces several hundred pounds of fruit a season, is in its natural element in the Coachella valley.

She is planting twenty acres on her ranch, combining two of the most unique crops in the history of the Southwest.

THE JUJUBE.

Mr. G. P. Rixford, of the plant introduction division of the department of agriculture, reports that the jujube, Zizyphus rhamnacaae, introduced from Northern China by the Service and planted at the Plant Introduction Gardens at Chico, has grown remarkably and is producing some fine fruit. It was sent to this country by Mr. Frank N. Myer, of the department, and began fruiting the second year. This year it has fruited so extensively that some of the crystallized fruit has been put in packages and will be served at the banquet of the Geological Society at its next meeting in Washington. Chief Fairchild, of the division of seed and plant introduction, has hopes that this plant will prove remarkably profitable in this country. The tree is a small shrub, though it sometimes attains a height of 30 feet.

with methods more accurately developed as we are beginning to employ them to-day, and with a greater impetus given to the work through the increased importance of practical agriculture, through the greater returns now according therefrom, and through the readiness with which the modern scientific farmer inclines toward the adoption of new methods in soil management which are based on reason and careful investigation."

F. W. Popenoe's paper on "The Ahuacate" was read by his brother, Paul B. Popenoe. This elicited an interesting discussion, during which it developed that many had faith in this fruit for its great nutritive values. As one speaker expressed it:

"Oranges are a mere confection, while the ahuacate is real food."

Mr. Popenoe said:

"The Ahuacate," by F. W. Poponoe of Altadena.

THE ahuacate, or, as it is commonly but incorrectly called, avocado or alligator pear, promises to become a fruit of first importance in California. Its value lies not in its use as a dessert fruit, but as a staple food product which can do much to solve the problem of high cost of living. Everywhere in the tropics this fruit is looked upon as a food of equal value with beans or rice. It has an oil content of 12 to 18 per cent.

It has been thoroughly proved that the ahuacate will succeed in Southern California, and experiments now being conducted seem likely to prove also that it will also succeed in the San Joaquin and Sacramento valleys. The last winter has shown that many of the old trees in Southern California are hardier than oranges.

The ahuacates grown in California can be divided into two types, the Mexican and the Guatemalan. The Guatemalan is the most desirable from a commercial point of view, as it has a thick, woody skin which enables the fruit to be shipped to distant markets. Many varieties of the Guatemalan type are now being propagated by the Southern California nurserymen, and planting is already being done in small acreages. The next year will see at least two hundred acres of budded trees set out.

Propagation is effected by means of shield budding, much the same as practiced with citrus fruits. Although somewhat more difficult to bud than the citrus fruits, many of the nurserymen are now successfully budding the ahuacate and trees are being produced in fairly large quantities. They can best be set out in early spring, about the last part of March. During the first few years the tree requires an abundance of water, and manure will encourage its growth.

Dr. F. Franceschi followed on "New Fruits." He said:

result of some patient artificial "trick" of the Japanese. It needs, however, strong established clumps before the canes show "square." Canes, under favorable conditions, will attain thirty feet and one inch diameter, the nodes being much marked, and four cornered like the canes. Branchlets are short and tufted somewhat like B. Fastuosa, but not quite as heavy. It will soon spread in every direction, the new growth appearing mostly in the fall. Neither of B. Quadrangularis nor of B. Fastuosa were flowers ever seen; when they will be, it is not unlikely that they will be found to belong to different genera than Bambusa proper.

C. Bambusa Thouarsi, Madagascar. By some botanists considered to be only a local form of the widely spread B. Vulgaris; but, if not scientifically, at least horticulturally sufficiently distinct. Will attain fifty to sixty feet in height, and four to five inches diameter. This, like the following, were introduced quite recently from the Botanical Gardens of Calcutta by the U. S. Department of Agriculture.

C. Bambusa Tulda, Central and Eastern Bengal, Assam and Burma. A very distinct species, quite remarkable for its grey green culms, which may attain seventy feet and four to five inches diameter, as well as for its rich, broad foliage, bright green above and more glaucous beneath than any other known kind; only recently introduced and distributed by the U. S. Department of Agriculture.

C. Bambusa Verticillata. Native country unknown. Since forty or more years it has gone under this name in Europe, and it also appears to have been one of the first bamboos introduced in California. Flowers were never observed, and its identity still remains doubtful. It is, however, well worth growing for its graceful habit in symmetrical shape, its canes beautifully colored with pink when young, and with orange red when older; foliage is fine and graceful, growing in tufts on the nodes, and partially striped with white.

C. Bambusa Vulgaris, native or naturalized in all tropical countries. Its stems are of bright green color, and will attain seventy feet, and over four inches diameter, growing at first straight up, but by degrees very gracefully bending under the weight of its very thick foliage, looking in fact like immense ostrich plumes. Will stand but slight frost, and will give best results with plenty of heat and moisture.

C. Bambusa Vulgaris Variegata. A striking variety of the preceding, originated, it is said, in Southern China, quite similar in habit and size, but having its canes of the richest golden color; they are, moreover, pencilled with green, and always in a different way on each internode. First offered in the U. S. by the S. C. A. A., some nine years ago.

C. Bambusa No. 1. Said to have been imported to California from Japan some twenty-five years ago, which, however, appears doubtful, as it was never included in introductions from that country in after years, nor was it ever known in Europe, as far as I was able to ascertain. Canes will grow up to fifty feet and over, and about three inches diameter. In the young stage they are often covered with a waxy white bloom, but their most distinct characteristic is that the sheaths are striped white and green, unlike any other bamboo that I know of. Fine clumps of this undetermined species are to be seen in Eastlake Park and elsewhere about Los Angeles; also at Santa Barbara. It appears very hardy and it is certainly one of the best bamboos to grow in Southern California.

C. R. Bambusa No. 2. Another undetermined and very remarkable species, which I have seen only in the grounds of Mr. William S. Tevis near Bakersfield. Unique indeed for this peculiarity, namely, that, while it grows generally in rather open clumps, it will occasionally throw out suckers at quite a considerable distance. Stems are deep green, the lower internodes slightly bent or "flexuous," and they are sparingly and irregularly thinly striped with white. Its foliage is quite graceful and light, often striped with white when young, and from each node a branchlet springs out much longer than the others. Of this I have not seen canes much over thirty feet, nor over two inches diameter, but it may possibly attain larger size.

C. Cephalostachyum Pergracile, Burma. A remarkably elegant species, first raised from seed by the S. C. A. A. in 1907. Will attain forty feet and two to three inches diameter; leaves up to fourteen inches long.

C. Dendrocalamus Hamiltoni, Northeastern Himalaya. Grows up to eighty feet, its stems attaining seven inches diameter, generally bare at the base, much branched above, and densely clothed with foliage. Although introduced to this country not less than fifteen years ago, it has always remained rare, but it promises to become one of the most ornamental tall growing bamboos in Southern California.

C. Dendrocalamus Latiflorus, Formosa, Cochin China and Burma. Since at least fifteen years imported every year, in a small way, by Japanese nurserymen, under the name of "taisanchiku" the (Formosa bamboo), and in California known as the "Japanese giant bamboo," which was rather confusing, it evidently being not a native of Japan. It was only in 1901 that the writer happened to get hold of some imported plants which, for some unaccountable reason, had come to bloom, and died in due time, and was able to identify them as Dendrocalamus Latiflorus, which opinion was corroborated by the authorities at Kew Gardens. It

A BIG AVOCADO ORCHARD.

Messrs. Collins and Horner are clearing land on the peninsula opposite or a little north of Miami, for the purpose of planting one of the largest, if not the largest, avocado orchards in the world. The land is being cleared by means of a large steam plow, which turns out the palmetto roots with ease, the latter being gathered into piles and burned. Last week Messrs. Collins and Horner planted 1,000 Trapp avocadoes. The stock was purchased from Mr. George Cellon, of this city. Messrs. Collins and Horner expected to have planted 100 acres in pineapples this season, but owing to unavoidable delays they will not be able to plant more than 20 or 25 acres. It is said that the lands on the peninsula belonging to these gentlemen are especially adapted to the growing of avocadoes and pineapples. There is no rock in the land and the soil is from two to four feet deep, made up largely of decomposed vegetable matter.

TROPICAL and semi-tropical fruit bearing trees, shrubs and plants grown at Santa Barbara, California, in the year 1912. A complete list compiled for and dedicated to the forty-first convention of California Fruit Growers by Dr. F. Franceschi.

N. B.—Plants marked (*) have ripened fruit at Santa Barbara. For special notices see at the end of the list.

*Aberia Caffra, South Africa, "kai-apple."

Achras Sapota, Mexico, West Indies, etc., "Zapote ch'co;" "sapodilla."

*Aleurites Moluccana, Moluccas, Philippines, etc., "candle nut," "kukui."

Ananas Sativa, West Indies, etc., "pineapple."

Anda Gomesii, Southern Brazil.

*Anona Cherimolia, Mexico, etc., "Cherimoya" (1).

Anona Cherimolia, Mammilaris, imp. variety, Mexico.

Anona Cherimolia, Pyriformis, Imp., variety, Chile.

Anona Glabra, Mexico, West Indies, etc., "pond apple."

*Anona Macrocarpa, South America.

Anona Muricata, Mexico, West Indies, etc., "custard apple."

Anona Palustris, West Indies, etc., "corcho," "cork wood."

Anona Purpurea, Costa Rica, etc., "soncoya."

*Anona Reniformis, South America.

Anona Squamosa, Mexico, West Indies, "sugar apple."

*Anona Suavissima, Mexico?

Antidesma Bunius, Java, etc.

Artocarpus Integrifolia, Malaya, "Jack fruit."

Averrhoa Acida, Madagascar, etc.

Bassia Latifolia, India, "Mawha tree."

Benthamia Fragifera, Himalaya, etc., "Strawberry tree."

Britoa Acida, tropical Brazil.

Byrsonima Crassifolia, Mexico, "nanche."

Capparis Mitchelli, Western Australia.

*Capparis Spinosa, Mediterranean basin, "caper."

*Capsicum Baccatum, Texas Mexico, etc., "bird pepper," "chiltapin."

*Capsicum Frutescens, West Indies, etc., "cayenne pepper."

*Carica Cundinamarcensis, Rep. of Colombia.

*Carica Papaya, Mexico, "melon zapote," "papaw."

*Carica Quercifolia, Paraguay, etc., "mamona."

Carica Spinosa, Panama, Rep. of Colombia.

Carissa Carandas, India, etc.

*Carissa Edulis, India, etc.

Carissa Edulis Macrocarpa, Eastern Africa.

*Carissa Grandiflora, Natal, etc., "Natal plum."

Carissa Grandiflora Macrocarpa, improved variety.

*Casimiroa Edulis, northern Mexico, "zapote blanco." (2).

*Casimiroa Edulis, var. Parroquia, imp. variety.

Catha Edulis, Arabia, Africa, "Khat."

Bamboos in California

By DR. F. FRANCESCHI

[Concluded]

R. PHYLLOSTACHYS AUREA, China and Japan, 8 to 15 feet. Very likely the first of this section introduced here, as it is found in some of our oldest gardens, where in many cases it has proved wonderfully resisting to drought. Easily recognized by its internodes being very short towards the base and its branchlets inserted at a rather acute angle. Its

China to make arrows. Since many years plants under this name were introduced to this country, but those which have been tried in the grounds of the S. C. A. A. did always prove to

be something else; the true species, however, is at present under cultivation in Europe, and we expect to get hold of it before long.

R. PHYLLOSTACHYS CASTILLONIS, China and Japan, said to attain 30 feet under favorable conditions, but generally much smaller. Very pretty and ornamental for its stems being irregularly striped golden yellow and green, and its foliage partially var-

years ago, and believed at first to be the result of some artificial trick like the many for which Japanese gardeners are famous, it is now generally admitted to be quite a natural product,

R. PHYLLOSTACHYS MITIS, China and Japan, said to attain over 60 feet in favorable conditions. Although introduced in Europe about 50 years ago, and in this country not less than 20 or 25 years, for some unaccountable reason it has never become as popular as it would certainly deserve, both for its hardiness and for its large size, as well as for the "edibility" of its young shoots said to be far superior to any other kind. It appears, moreover, that some confusion exists about this very desirable kind. Those imported at first to Europe from China are certainly distinct from the plants more recently received from Japan, both in Europe and in California. These have much smaller leaves, and appear to be a different plant altogether, but I have never been able to see any well developed clumps of it, and I should feel particularly grateful to anybody possessing this kind for specimens or photographs of same.

R. PHYLLOSTACHYS NIGRA, China and Japan, may attain 20 to 25 feet in favorable conditions, but will remain much smaller if planted in poor soil and not afforded much water. Its glossy, black jet stems and very graceful foliage make it one of the most desirable, and it is also one of the hardiest bamboos, being known to have stood without injury as low as zero Fahr.

R. PHYLLOSTACHYS NIGRA PUNCTATA, China and Japan. Very similar to the preceding, of which after all it may be simply a variety, but by some authorities asserted to be hardier and to grow taller. Its culms, instead of being jet black, are of a dull yellowish brown color, thickly spotted with brownish black.

R. PHYLLOSTACHYS PUBERULA, in Europe more known as PH. HENONIS, Japan, up to 15 feet. In vigor and in brightness of foliage similar to PH. AUREA, but much preferable to it for its branchlets not being stiff at all, but very gracefully drooping and thickly covered with finer leaves.

R. PHYLLOSTACHYS QUILIOI, China and Japan, 70 feet and perhaps more. The very remarkable and very hardy bamboo at first brought to Europe from Japan by the French Admiral Du Quilio in 1866 and which for years was grown in southern France also under the name of BAMBUSA MAZELI. It is comparatively little known in California, although it must have been introduced

lieve that a description and a little history of the grove will be of interest to all plant lovers in California. Mr. Tevis who is a great lover of plants and of bamboos in particular, has had the courtesy of putting at my disposal all his records concerning this grove, which I am going to summarize. The little plant (in a six-inch pot) was bought in 1898 at San Francisco, under the name of "Japan giant bamboo," and now, ten years after, that is in July, 1908, it covers an area of about half an acre. There are at present 691 stems standing, of which not less than 100 are over 4 inches in diameter, and more than 250 over 3½ inches, and it must be borne in mind that several hundred canes have been cut from the grove during these ten years. The tallest cane now measures 70 feet in height and the biggest 5½ inches in diameter. Are these going to be the ultimate dimensions? The future only can tell. The progressive increase of each year was as follows: Largest cane developed in 1899, 2¾ inches diameter; in 1900, 3¼; in 1902, 3⅝; in 1905, 4¼; in 1906, 4½; in 1907, 5 inches. Although no special record has been kept, it is safe to assume that also the development in height and the number of canes produced each year must have followed a parallel ratio of increase. No doubt, there were exceptionally favorable conditions on the spot: the deep, alluvial loam of the Kern river valley is far famed for its fertility, and the inexhaustible volume of water which constantly runs through the irrigating ditches must have contributed not a little to such wonderful development. The range of temperature, as registered in the course of several years, just outside the grove extends from 12 degrees to 105½ degrees Fahrenheit, but such extremes are sure to be considerably modified by the permanent shade afforded by the bamboo itself, and by the volume of water not less permanently running through the grove. Concerning the rapidity of growth of the culms or canes numerous observations have been made: the greatest growth observed being on April 29th, 1908, namely, of 5½ inches in exactly three hours, from 8:50 to 11:50 a.m. From the above statements it surely appears that PH. QUILIOI is the most desirable kind to grow where space covered is no objection, and that it will be perfectly hardy al over California.

R. PHYLLOSTACHYS

"New Fruits," by Dr. F. Franceschi of Santa Barbara.

We are told that in the Garden of Eden there was growing an unlimited variety of delicious fruits. What sort of fruits they were we do not know, nor do we know for how long our progenitors were contented with them. We do know, however, that after a while they became tired and hunted for something different and something new.

We must believe, indeed, that this craving for new fruits was born congenital with the human race, if we look back to the more or less dim records of the earliest civilizations, starting from the Assyrians, the Phoenicians and the Egyptians, and coming down through the centuries to the comparatively recent and more familiar periods of Greece and of Rome.

In fact, constant and unmistakable evidence is found that in their struggle for expansion of power over land or over sea every one of those peoples was eager to annex to its own cultures the fruits of the lands they had conquered.

In this, as in other ways, Rome was in the lead, in the same manner that its dominion extended to much greater vastness than that of any of the older civilizations. Let us remember that the original strains of almost all deciduous fruits now growing in our orchards were at first brought to Rome by the victorious Consuls and Emperors, thence to be distributed to the remotest corners of the Roman empire.

Fifteen hundred years ago the Romans were well acquainted with citrons, a complete treatise on their culture having reached us written by Palladius, who had grown them in Sardinia and at Naples.

But for introduction of oranges and lemons on the shores of the Mediterranean the credit belongs to the Arabs. And, strange to say, those fruits gained stronger foothold in Spain and in Sicily, the countries from which the Moslems were soon to be driven out.

Spread of Fruits.

After the discovery of the continent of America, with the gradually increasing knowledge of the surface of the earth, and with commercial facilities never dreamed of before, a permanent intercourse came to be established, through which every country has endeavored to grow the fruits of other countries endowed with similar climate, with the wonderful results now under our very eyes. Thus, we see now brought upon the same market apples from Tasmania, from the Cape, from Canada, from Oregon; plums from Bulgaria, from France and from California; bananas from Central America and from the Canary Islands; dates from Morocco and from the Persian gulf; pineapples from the Azores and from the Hawaiian Islands, and so on, without end.

It is indeed a stupendous race that every country is running at present in raising and offering to the markets of the world all sorts of fruits, and it is no small satisfaction to state before a convention of California fruit growers that the progress of our State in this line has no rivals.

When we stop to think that hardly one hundred years ago the only fruits grown on this Coast were the native acorns, the islay ad the manzanita, and then take a mental survey of the thousands and thousands of acres which are now planted with fruit trees from so many different parts of the world, there is certainly much reason to feel [illegible] California fruit grower. [illegible] California had the first start with deciduous fruit trees brought over by the mission fathers, mostly seedlings and of poor quality. No wonder that [illegible] disappeared. It was [illegible] much more than fifty years ago that transportation became easy enough, at first by sea, much later by rail, and then no country in old Europe or out- [illegible]

of different kinds of fruits. This gathering together of varieties from different lands afforded also excellent opportunities for breeding, scientifically or empirically, new varieties of exceptional merit, many of which found their way also to other countries.

Need Pomological Society.

Concerning the varieties originated in California, I cannot refrain from remarking that it is much to be deplored that a system of registration is still lacking, and I will strongly recommend the creation of a California Pomological Society, with the special purpose of investigating and testing and of publishing accurate descriptions of every new variety of merit raised in California. This work, to be efficient, must be done on the spot and by local men. I know that there exists an American Pomological Society, and I do not certainly mean to depreciate its work, but the recollection of the way it tackled once the matter of tropical and semi-tropical fruits in California is enough to make one shiver even after so many years.

During this last quarter of a century a practical, continuous work has been carried on in California, both of elimination of inferior varieties and of abandonment of unsuitable localities, together with a remarkable extension of the land devoted to fruit culture, in these last few years great improvements having been made also in the vital matter of marketing our fruit produce and of proteciton from frost.

It was also during the last few years that steadily increasing attention was brought upon several fruits which up to now had been grown only in a small way, for private use and pleasure, but which offer good prospects of becoming no insignificant contributors to the local as well as to the outside markets.

Ahuocate in First Place.

Among these the ahuacate holds the first place. The paper read before this convention by F. W. Popenoe leaves nothing to be added. Only I cannot refrain from stating how wonderfully characteristic of California enterprise is the fact that of this tree, hardly considered as a curiosity up to three years ago, many hundred thousands have been planted to this date in various parts of California. Also, I cannot lose this opportunity for raising my voice again and entreat all fruit growers, all nurserymen and all citizens of California to uphold our classical, melodious name of ahuacate, which came straight to us from the ancestors of Montezuma, and to leave the blunderous, nonsensical name of alligator pear and avocado to the other side of the continent, if they do not know better.

The cherimoya, which was introduced to California at the same time as the ahuacate (by the late Judge Ord, in 1871, at Santa Barbara), did gain more popularity, mainly in these last twenty years, when quite a number were planted also at Hollywood, at Orange and elsewhere. This is such a delicious fruit that the demand for the local market is sure to increase indefinitely. But in order to conquer an outside market it will be necessary to evolve a special strain, with tough and hard skin, that will not bruise in travel, and also to find appropriate methods of culture to insure more prolific setting of fruits and more uniformity of size.

While the Casimiroa, or "zapote blanco," was by a long stretch the senior of all Mexican fruits introduced in California (about the year 1810, at Santa Barbara), it is only of late years that people came to appreciate it. [illegible] Santa Barbara and in other places. Varieties are beginning to be studied and selectionized, and there is no [illegible] local markets. As for shipping it, the trouble is that this fruit is even more soft than the cherimoya, but it does not look impossible that tough-skinned varieties

The Loquat

Front cover cut shows fruits of one of the new varieties of this excellent fruit. Orchardists are beginning to appreciate the commercial value of it, since Mr. C. P. Taft of Orange, Cal., gave us several varieties of superior excellence, both in size and quality, to the little fruits of the seedling trees which are grown everywhere on this coast, chiefly because it is an umbrageous evergreen. It is a difficult subject to propagate either by budding or grafting, therefore, varieties propagated true to type will be expensive, nevertheless as a money maker one such tree is worth than a half dozen seedlings, indeed many of these are worthless so far as the fruit is concerned. We believe that if well ripened wood were used for cuttings and placed under glass—with bottom heat of 80 or 85 degrees and a uniform heat and humidity be maintained that they would root. The fruit appears on our markets about March 1st, generally, though this season not until about the middle of the month, retailing at 15 to 20 cents per pound. The January freeze ruined the crop, except in a few localities, therefore it will not be as plentiful as in years past.

THERE are few people in the United States today and even in Florida who possess even the slightest knowledge of the many possibilities which South Florida has to offer, or even dream of the many rare and strange tropical fruits, nuts, trees and plants which can be grown in this tropical section. All of us know that the markets are always hungering for new fruits, products and novelties, and to obtain these they are willing to pay the fancy prices. To find the desired products and the climate in which they may be grown to the best advantage requires one to look into South Florida. It is here that an energetic and creative man who comes to this country will have an opportunity to increase his wealth by trying out and cultivating these many new products which can be raised in this section on account of the prevailing climate which is conceded to be unequalled.

Let us rest from our labors for a few moments and together pay a visit to the subtropical garden at Miami, Florida, in order to see what it contains and what are some of these possibilities one hears so much about.

We come to the gate and on entering we pass through a beautiful avenue of wild date palms (the Phoenix Caransis), then turning to the right we pass a group of inter-budded citrus trees. The heads of the garden are experimenting with these trees, trying to produce new and high grades of fruit.

Next, we come to the ramie, the Japanese fibre plant from which pongee silk is made. It is interesting to learn that machinery is now being perfected to separate the fibres and when this is completed the United States will be able to compete with Japan in this silk industry.

Passing these plants we see the carrissa from the Orient. This peculiar forked thorn bush, covered with white blossoms and red fruit, arrests our attention, for it was from one of these bushes that the "crown of thorns" was made. The fruit is very delicate, having a flavor similar to a spoonful of freshly crushed berries mixed together. To the left of this bush stands a healthy specimen of the "ginger" plant, from Jamaica, and on the right a most interesting tree from the Orient, known in this country as the "soap berry tree." By rubbing the berries between the hands one obtains a good lather which, when water is applied, acts as soap and is so used by the people who live where this tree thrives. Close to this tree is the white sapota, a delicate fruit from the Bahamas, and beyond this several bushes of the Surinam cherry. This tropical cherry is quite different from its Northern brothers, but yet very pleasing to taste. It is now occasionally seen for sale in the markets, though the supply is very small. After viewing a splendid stand of the most lately discovered African sorghum, young ebony, eucalyptus and heavily laden gooseberry trees standing some thirty feet in height, and many interesting shrubs, we cross to another section of the garden.

This part we find devoted to the five fiberless varieties of the mango and avocado, the budded Mexican, African and Indian varieties. As the importance and great value of these fruits have been previously dealt with at some length, we pass on to the Panama orange, a small kid glove citrus fruit having a flavor which somewhat resembles that of the lime. This fruit makes an excellent preserve and marmalade. This tree bears continuously, and is a rarity in that blossoms, ripe fruit and green fruit can be found on the tree any time during the year.

The bromo plant close by attracts our attention as it is this Philippine fibre plant from which stout ropes are made. The sisal hemp fibre plant, which is near by the bromo, has a good commercial value for rope-making as well.

After hastily glancing at the cashew, a fruit of the Bahamas, the sapodilla, another tropical fruit of some note, the cassia fistula and other decorative trees and plants, we come to the nursery.

In this nursery we find Messrs. Simmons and Ward, who are in charge of the gardens, experimenting with an immense variety of almost unheard-of plants. We are much interested in watching them bud the mango and avocado, a most difficult operation, and in seeing the other plants in their early stages. We are shown the tallow plant of China, a tree whose berries are enveloped in a coating of tallow. This tallow is used commercially by the Chinese for cooking purposes, candles, etc. Aside from this we see young fruits of all descriptions, as well as the Queensland nut from China, which, if it is proven successful in this section of the United States, it will have a fortune in store for many people. Also the vanilla bean from which the extract is made. These beans have a commercial value of from $15 to $25 a pound.

At another end of the nursery is seen the several varieties of the anona, the finest being the sugar apple and cheromoya. The latter is an excellent Chinese fruit which has a most delicate and enjoyable flavor and is eaten much in its mother country. It is believed that this fruit when budded on our native pond apple will thrive in any part of South Florida. Passing by several handsome bushes of Mexican coffee in full bloom, with a nod of farewell to Mr. Simmons who has kindly answered many questions, we leave the nursery and go to the south end of the garden, each person wondering whether it is possible that there can be anything more of interest to be seen. Yes, there is more, and a pleasant surprise awaits us.

The loquats or Japanese plums, of which all of the party had a sample, and after carefully eating all of it and then being tempted even to eat the stone, each turns to his neighbor with such a remark as, "Well, did you ever know that anything like this grew?" The answer is invariably, "No. It sure takes my eye."

In a good humor we see the grove of seedless guavas, a well known Florida fruit,

on plants, the pigeon pea from India, a splendid fowl food, and many other interesting and unusual plants. Then going a little further on, we are struck by the many varieties of tropical forage crops—the sorghum, cow pea, velvet bean, a patch of clover, another of alfalfa, the carob or St. John's bread fruit. There is much of this last mentioned crop raised in Asia for stock, while Italy ships many tons into England for the same purpose each year.

Philippines' Best Fruit

Philippine mangoes, to the mind of many Americans and foreigners the sweetest fruit grown anywhere, would alone make many millionaires in this country if the fruit could be successfully shipped, or, better still, grown here, as the Hawaiian papaya is now being made to grow in the Philippines. Spaniards spent thousands of dollars trying to get samples of the Philippine mango to their late queen, but without avail. There is absolutely nothing to equal this fruit in the Western hemisphere. Mangoes in New York should easily retail at from $1 to $1.25 a dozen with the demand never fully supplied. One tree of enormous size is said to have produce 5000 mangoes in one season. The fruit in shape and general appearance resembles a huge pear flattened to a thickness of about one and a half inches. The skin is green and the meat pumpkin-colored. The flavor can be compared to no fruit in this country; to appreciate its deliciousness one must eat a mango off the ice.—The Bookkeeper.

Grafting Oranges.

How may I graft over a seedling orange and what is the best time of the year?—Subscriber, San Jose.

Grafting is not followed with citrus trees, budding being preferred. If the tree is old with the younger branches so high as to leave the top too much up in the air, it is best to cut off in early spring, say February or March, some of the larger limbs, leaving part of top, when these limbs will send out a number of strong young shoots. The following fall these shoots may be budded and the buds will remain dormant until spring. In case the bark is not too old and thick and will still lift, budding may be done directly if care is used in securing as old budding wood as possible. This should be in March or April when the sap is flowing, as will be manifested by strong young growth.

California Garden

This monthly publication is another of those benefactions we meet with along the journey of life. The December issue is of more than ordinary interest to us. Plant Lore, which appears elsewhere in this issue, is taken from it. It also contains an article from the pen of F. W. Popenoe that is worth the price of the publication for a whole year, and this leads us to quote the editor in his suggestion for new subscriptions: "Why not send a subscription to California Garden as a Christmas present? It will remind the recipient of your good wishes every month of the year. It costs less than

Guavas Gaining Ground.

Feijoa Sellowiana is, comparatively, a very recent introduction, the first plants having been imported by myself at Santa Barbara in 1901. The difficulty in procuring good seed from abroad, and of other ways of propagation, kept it back for a while, but since the few plants introduced began to bear, and since a practical way of rooting cuttings was found, several thousand plants were already set out all over California, many of which are likely to come into bearing this year. This will allow the public to get acquainted with this new fruit, which combines in the highest degree, the qualities of hardiness, drought resistance, abundance of bearing and aptness to shipping. It appears also remarkably inclined to variation, so that larger and improved varieties are sure to come to the front in a short time.

Guavas were first introduced to California about fifty years ago, the so-called "purple strawberry guava" having been planted more extensively than any other, and principally in Southern California. The yellow strawberry guavas, which I introduced, are gaining ground, but not as fast as they would deserve, being much preferable to the older introduction.

To enumerate and to comment, even briefly, on all tropical and semi-tropical fruits which have been introduced of late years in California, would certainly carry me beyond the limits of your benevolent attention. Great as their number may appear, it is sure to increase tenfold in the near future. California has indeed all the elements to become the testing pomological ground of all the world.

What Can Be Expected.

Let us give a rapid glance to what new acquisitions can we reasonably expect to obtain and from what countries.

From Europe, of course, no new species are to be expected, but without doubt many improved varieties, mostly in deciduous fruits, some of which are likely to prove adapted to our climate.

From Northern Asia a large number of valuable varieties of deciduous fruits are now being introduced in a thoroughly systematic way by the United States Department of Agriculture, the greater part of which will have, however, more special interest for the colder portions of the country.

From Southern Asia, which gave us already the multiform series of citrus fruits, we are just on the way of obtaining the litchi or Chinese nut. This has come in bloom at Santa Barbara just in these days, as if in honor of the first convention of fruit growers which is held here, and for the first time on the continent of the United States. And we expect to obtain from Northern India some comparatively hardy varieties of mangoes, on which the special attention of the United States Department of Agriculture was brought these late years. We may expect also the introduction of the finest varieties of dates from the Persian gulf, it remaining to be seen in what localities these will attain perfect maturity. From what experience I have gathered, I do not think we can entertain much hope of succeeding with the celebrated but much too tropical durian, mangosteen and lanssat, from the Malayan peninsula.

The poorness of Australia in the line of native fruits is generally known, so much so that it was offered as an explanation, or an excuse, for the cannibalism of its aboriginous inhabitants. Australia has given us already the Queensland nut, which is likely to acquire commercial importance with us, and the Moreton Bay chestnut, much [illegible] first-class ornamental tree. The degree of [illegible] of all other so-called fruit trees from Australia is indeed so low that we cannot place much hope in them.

Many From Africa.

The continent of Africa, the great bulk of which is being opened in our own times, is likely to contribute many additions to our pomological flora, and principally from the southern part, as far as Transvaal and Rhodesia, and from the central plateau, while from the sweltering tropical coasts, both east and west, there is nothing to expect for us.

North America is sure to contribute, being in its own home, to the increase of our pomological wealth with improved varieties of different kinds of fruits as a natural result of the enthusiasm and capability of the California fruit growers.

But our greatest expectations, I believe, are to be placed on both Central and South America. These two immense countries, which are literally at our door, were only partially explored during the last four centuries, and still retain, hidden and unknown, an incalculable wealth of vegetable life, and particularly of fruit-bearing plants. When one stops to think that only of eugenia and allied genera more than 600 different species were described, ranging from Mexico down to Chile, and 200 of guavas, of which, however, only an infinitesimal fraction was introduced, and that only God knows how many more remain still undescribed, and that the same rule will apply to all other orders of plants, outside of the myrtaceao, one cannot but feel the profoundest wonder at the immensity of the field looming before us both in South and Central America.

There is, indeed, an intense fascination in the work of introducing and experimenting upon new fruits, even if tangible, commercial results are not to be obtained at once and I am glad to state that the number of such workers is steadily increasing in California.

Every fruit that is tried and succeeds increases the wealth of the country. Let us go ahead and never forget that the opportunities of to-day may coin millions to-morrow.

Santa Barbara, Cal.

Dr. Franceschi is making preparations to leave this country, to enter the service of the Italian government in its effort to rehabilitate Tripoli. This is an unfortunate circumstance for this Coast. To the Doctor's untiring energy and ceaseless activities is this State indebted for a multitude of ornamental and economic plants. I think that I am safe in saying that to him is due the credit of directing the attention of gardeners, both amateur and professional, to the great possibilities of the State, more than to any other half dozen men and women within its borders who might be named. We shall miss him, and no mistake, but whoever sits beneath a pergola covered with a luxuriant growth of the evergreen Grape vine, Vitis Capensis, and eats of its pleasant sub-acid fruit, will remember the Doctor with gratitude, or whoever tastes the delicious fruit of Feijoa Sellowiana, or looks upon a bush of this evergreen shrub and knows that it was he who introduced it to California, will be thankful that he cast his lot with us for a quarter century, and left his benificent works to follow him. P. D. B.

Plant Notes from Hollywood

Erythrina Caffra, var Humei

This is one of the finest flowering trees ever introduced here and as it behaves in this locality is an excellent substitute for the world renowned Poinciana regia of the tropics. It makes a tree ten or fifteen feet high and if properly suckered while young makes a fine head. It usually loses most of its leaves by midwinter and about February begins to produce its spikes of pea-shaped, brilliant orange scarlet flowers; continuing in bloom through March and April. I have a group of thrse trees in one corner of my garden. For some reason, perhaps owing to the drouth and unusual heat the beginning of last winter, they began flowering in December and continued to be a most gorgeous sight until May. It is most likely to flower freely when grown in a warm, well drained soil and after attaining good size should not be watered after the first or middle of August. It is hardy here, and in other localities having a similar climate. I have a neighbor who has learned to take photographs by the new color process. At the time [illegible] in full bloom and the ground beneath them was covered with the falling flowers. [illegible] ing picture, useful either as a transparency or a lantern slide.

Mr. J. C. Harvey, a former resident [illegible] siastic and best posted amateur horticulturist who ever lived here. To him we are indebted for the introduction of this tree. Some time in the early '90s he obtained seeds from South Africa and afterward three young trees were planted in the Botanical Garden in Elysian Park, where they flourished and came into bloom. Two of these trees are of strong growth but produce only a few flower spikes. The third is of dwarfer and more compact habit and flowers very abundantly. From this my trees were propagated.

Mr. Wm. Watson now curator of Kew Gardens, visited South Africa many years ago. In his account of his journey published in The Gardeners' Chronicle he writes of seeing Erythrina Caffra there and states that there were two forms of it. One of strong growth, the other more dwarf and very free flowering. From this I conclude that the one in my garden is the true E. Humei. Propagation is by cuttings of wood not less than two years old taken in winter while dormant.

Erythrina speciosa

This [illegible] flowering species [illegible] of about six feet. Its flowers are [illegible] brilliant crimson scarlet and far more showy than the old E. crista-galli. My plants are now in full bloom with spikes two feet long. After these are done flowering I will cut them back and a new crop will appear.

Subtropical Laboratory. Miami Florida

To Exhibitors.

I WOULD like to give a brief outline on the growing of SWEET PEAS, as adopted by the leading exhibitors, and I believe after a few seasons this method will become general.

Trench the ground all over, at least three feet deep, adding plenty of good manure and bone-meal. This is preferable to taking out a trench, as the drainage is better, which is important. Sow seeds in pots about the middle of October or first week in February, and place in a cold frame, planting them out about the end of March. Set out plants in double rows about two feet apart, and from plant to plant in each row not less than eight inches, and tie each plant to a twig. From centre to centre of double rows allow seven feet. When the plant begins to send out side shoots, select the strongest of these from one to three according to the variety. For such varieties as King Edward Spencer, Arthur Unwin, etc., allow from two to three shoots, and for the less vigorous sorts one or two. Each of these shoots must be trained up a rod or bamboo cane or large mesh wire netting, eight to ten feet high.

As soon as these selected growths begin to send out side shoots, pinch the laterals out just in the same manner as one would treat a Tomato plant. The main stems, as they grow, should be tied about every six inches. Give a good dressing of Superphosphate in April, and liquid manure when plants are blooming; but this must be left more or less to the discretion of the grower, as there is no hard and fast rule. This method of growing entails a lot of work, but to be successful in keen competition I advise my customers to give it a good trial.

Pasadena Flower Show
April 19[illegible]

Roswell, N. M., June 15, 1911.

My Dear Mr. Barnhart: I have your Pacific Garden for June. Thanks. I am glad I put those questions about the Avocado on the list of queries of your Gardeners' Association last winter, for they have brought out your interesting comment. You do not as yet see quite as much in the thought I suggested as my own dreams embrace, for your conclusions are a bit discouraging. May I discuss the matter a little with you? We cannot help wondering, as we look ahead for a hundred years, how people will live—what they will eat—when there are four hundred millions to be fed in the United States, out of the land that now supports one hundred millions. With this great density of population, will there be room for producing much animal food in that time? Will it not become a necessity of existence to utilize all of the land in a way that will yield the greatest tonnage of human food?

An acre of land can produce, let us say, one quarter of a ton of beef, or other animal food, per year. It can produce one ton, or possibly two tons of food in wheat, or corn, or rice. It can produce five, or ten, or possibly twenty tons of an incomplete food ration in the form of apples, or grapes, or bananas. And there may be from one to two tons or more of very rich food in the form of nuts—notably pecans—from one acre of land. But with avacados there would seem to be a possible yield of food of very high nutritive value equal in tonnage to apples with their low nutritive value.

This avacado business is new. It has to be worked out. But is there not great potential value indicated in the few facts we have? If men may produce many tons of food of best value from an acre of land in trees that can only yield a fraction of a ton in the form of animal food, is it not pretty certain that they are going to plant the trees? The crowding of men together in dense population, will compel this. We see it working now. Meat foods are constantly going higher and they will. In a very few generations they will be mostly eliminated.

In primitive conditions men turned to animals for food. It was a state of savagery. We are outgrowing it. Very soon there will be no room for animals that are grown to be eaten. It is compulsory. It is nature's way. We must get our food in greatest quantities from a minimum area of land. And we must have food containing the same elements that animals have been giving us. Among these substitutes does not the avacado offer itself as one of large possible importance? As to its durability as a food. The fact that it comes from Mexico, and from the Pacific Islands, into the markets of Los Angeles and of Pasadena, and is kept there for many days in excellent condition, seems to indicate that it can be sent to wide markets from wherever grown.

This whole matter is in its early infancy. It must all be worked out. The best varieties must be found.

There seems to be a long range of ripening season. What kinds to grow that will fill half the year will be found out. How to propagate the best kinds so that these only need be grown; and so that they can be grown in large orchards. The present cost of trees may seem high. But if one avacado tree can be grown on four rods of ground to yield about as much food for men each year as an ox that it will take a whole acre of land for four years to produce, then even five dollars for that tree may not be too much.

The avacado industry is very young. And so is the idea that it can become an important factor in feeding the generations of men in centuries beyond us. But it is in good hands. Such men as Coolidge and Popenoe, and the other horticultural scientists and prophets of Pasadena—will not let this beautiful tree of such great potentialities perish for lack of culture.

Very truly yours,

PARKER EARLE.

THE MANGO.

The mango is rapidly becoming one of the most appreciated tropical fruits grown and each year new specimens are being fruited that bid fair to eclipse the finer varieties. The Mulgoba is probably the most popular budded variety of this fruit, yet the Mulgoba has its drawbacks, as it is considered a shy bearer. The quality of the fruit cannot or has not been surpassed. The Cecil, a newer seedling, is becoming very popular. It is a free bearer, the trees generally are loaded with fruit. Many prefer the flavor of the Cecil above the Mulgoba. The fruit of both the Mulgoba and Cecil are beautiful to the eye and make a very attractive show in the market. The Perrine is another seedling that is rising in popular favor. Like the Mulgoba and Cecil it is free from fiber and has a most delicious flavor. It is a free bearer and as a rule has no off years. There are many gives the fruit more character than other budded varieties.

It also has a very decided spicy flavor, which added to the slight acidity makes the fruit most delicious. The entire absence of fiber is greatly in favor of the fruit for the market. Mr. Jones will bud from this tree largely and plant in a more favored place. The indications are that Burma, through Mr. Jones and his missionary friend, has added one of the most valuable mangoes to the already large collection grown in this southern country. The original or bush mango, grown here and in the South American countries, is known as the turpentine mango, as the larger part of them have a peculiar flavor resembling the taste of turpentine and the nut or kernel is covered with a thick layer of fiber which extends throughout the fruit. Many who are accustomed to the "turpentine" mango prefer it to the more choice or budded varieties. Individually we are extremely fond of the "turpentine" varieties. We have never tasted a "poor mango" and they are all good and to us are far superior to the finest peach for table use; but the day of the old turpentine mango is passing and the budded fruits without fiber are taking their place.

The time will come, when the mango has been sufficiently introduced throughout the north, east and west, when not enough can be grown to supply the demand. The mango is unlike the peach. The peach is grown in almost every State in the Union, while there is but a narrow strip of land on the south portion of the East Coast of Florida where the mango can be grown successfully. The mango is a purely tropical fruit, the tree is very tender so far as cold is concerned, while grown in its native heath the tree is very hardy and not susceptible to disease. In some portions of Florida where frosts fall almost every winter, people have [illegible] trees [illegible] commercial standpoint. In southeast Florida the mango grows more thrifty than in Cuba and, the native or budded kinds, fruit is much superior. There is something evidently in the soil and climatic conditions which are better suited to the development of both fruit and tree than in

A Defense of the Spencer Type of Sweet Peas

Editor Florists' Exchange:

I was very much interested in the paper read by Rev. Mr. Hutchins before the National Sweet Pea Society at its recent meeting; in fact, I was astonished at the tone of it. I had supposed that all questions as to California Sweet Pea seed had been settled years ago in its favor, and this, coupled with the fact that Mr. Hutchins had just recently arrived from the Pacific Coast put me all at sea; but, a re-reading of the article showed me that the crux of the whole situation lay in the fact that California Sweet Pea seed does not grow the ideal flower in the Atlantic Coast region.

The thing that surprises me most is that Mr. Hutchins expects any Sweet Pea seed to grow a first-class flower along the Atlantic Coast. He has tried it for some thirty or thirty-five years without success, as have other growers who have not succeeded any better than he. I have long since come to the conclusion that no Sweet Pea seed will give its best results along the slope of the Atlantic Coast. I cannot tell why. Is it the seed or the soil?

There was a time, some twelve years ago, when I, as well as many other amateurs, considered the California Sweet Pea seed at fault; and a number, among whom were Hutchins, Higgins and myself, expressed ourselves in the columns of your paper, but I am now convinced that the California Sweet Pea seed growers are producing the finest Sweet Pea seed ever grown, and seed that produce the finest flowers, but they must be grown in a location and climate where the utmost success is possible, and this is, apparently, not on the Atlantic Coast.

I have just returned from my annual trip as judge of the flower carnivals in central-western New York, where I judged Sweet Peas (grown entirely from California stock), the like of which I fear Mr. Hutchins has never seen, unless he has seen them in that section.

Mr. Hutchins' expressed hope in his paper—in fact his doubt—that we may some day see a two-inch Sweet Pea, made me smile when I held a Florists' Exchange containing his paper in one hand, and a vase of fifteen sprays of King Edward VII Spencer in the other, and called the attention of my friend, Edgar A. Higgins, to them. They were all two-inch specimens.

Around and about me on the tables were hundreds of specimens of the Spencer type of Sweet Peas, all grown from California seed, two inches or more in diameter easily, and of the finest color and substance.

I do not know how Mr. Burpee grows his seed, as I am not familiar with his methods on the Pacific Coast; but I can testify to the fact that all of the Spencer Sweet Peas grown from his seed which I examined and judged at the carnivals, during the present season, averaged two inches or more in diameter. At Angelica, N. Y., where I found the most of the large sized Sweet Peas, I awarded a first prize to a vase containing one hundred sprays of Sweet Peas, all of which were two inches or more in diameter, grown from Burpee's California seed; and it was hardly possible to find in this carnival a Sweet Pea of the Spencer type less than that size.

When the grandiflora type of Sweet Peas was in vogue, the extra large ones were not preferred, as they lacked substance, and the petals were droopy and thin; but it was not the case with the Sweet Peas grown from Burpee's, Rohnert's and Morse's California stock during the past season in central-western New York. The substance of the petals was so good that they had a stiff, leathery feel, and stood bold and upright. This was especially true of King Edward VII, Othello Spencer, Ramona Spencer, and Florence Morse Spencer, all of which showed more substance than I had ever seen in a Sweet Pea petal.

These super-excellent Sweet Peas were not grown by experts, but merely by house-wives, in the back yards of their homes in Angelica, N. Y., who did not realize they were showing anything out of the ordinary.

As I had in contemplation the writing of this article in answer to Mr. Hutchins' paper, I called the attention of many people to the size and quality of the Sweet Peas shown at this carnival, as well as those at Livonia, Shortsburg and Perry, in order that if any questions as to their size or quality were raised I would have sufficient evidence to substantiate my statement.

The largest single specimens found at Angelica were two King Edward Spencers, the top two flowers of which measured two inches easily, and the lower ones two and one-fourth inches easily.

I found the conditions the same at Livonia, as far as the Spencer types were concerned, but there was not as large a proportion of the Spencer type shown there as at Angelica. All of the seed planted at Livonia came from California, and I found at Livonia hundreds of two-inch Sweet Peas, and one single specimen, the petals of the two top flowers of which were slightly over two inches in diameter, and the lower one two and three-eighths inches, easily. This Sweet Pea was measured by dozens of persons who can testify to the fact, and the substance was so fine that after the flower had stood three days in water it was apparently as fresh, and stood as stiff and bold, as if it were made of brown leather. It was an Othello Spencer, grown from seed procured from Burpee, who has his seed grown in California.

In the gardens of Charles Larrowe of Cohocton, N. Y., Edgar A. Higgins of Avoca, N. Y., and Henry Greffrath of South Lima, N. Y., all of whom are extensive growers, I had the best evidence as to the vitality and general excellence of California grown Sweet Peas, and these gentlemen I know will testify to their worth.

I hope Mr. Hutchins will, next season, make a tour of the flower carnivals in central-western New York, and see what ordinary home-loving amateurs do with Sweet Peas grown from California seed put out by Burpee, Dreer, and others.

I suggest that the next meeting of the American Sweet Pea Society be held in either Elmira, Rochester, or Ithaca, N. Y., in order that these amateurs in central-western New York can compete, and show the professional growers of the Atlantic slope what the California seed will do if it has the proper soil and temperature.

I wish I could speak as highly of the purity of the California seed as separated into varieties. The large growers are evidently paying attention to the rouging of their crops, as I found but few rogues in the seed grown for Burpee, Morse and Rohnert, but some of the smaller growers are not paying any attention whatever to this. The seed of one grower was especially bad.

In the garden of Henry Greffrath of South Lima, N. Y., who planted one pound of Countess Spencer, I counted not seven stalks of true Countess, the remainder being almost everything in the grandiflora type. This is not only a great disappointment to the grower, but it is outright robbery, and if the stock of this grower does not improve by next season, I will feel impelled to warn my friends among the flower carnivals to insist that their seedsman procure his stock from some other grower.

SAMUEL ARMSTRONG HAMILTON.

Huntingdon Pa.

MULGOBA MANGOES IN NEW YORK.

E. A. WADDELL, who returned Saturday night from New York City, states that while in New York, he passed the fruit store of Hicks, on 28th street and Broadway, and there saw a beautiful display of Mulgoba mangoes.

Surprised and wondering what place was going to outdo Miami in the production of this fruit, Mr. Waddell went into the store and discovered that the mangoes in the show window were from Miami.

In conversation with Mr. Hicks, Mr. Waddell states that he is ready to take all he can get of that particular fruit, and has sent samples of those he received from Miami to all of his customers, doctors, lawyers, clergymen, and the wealthiest people of the city.

The Hicks fruit store has the reputation of being the best fruit store in the United States, catering to the wealthiest class, who alone are financially able to consume the higher grade fruits from the Hicks store.

Beside the mangoes, there were the avocado pears in the window, from Miami, and Mr. Hicks told Mr. Waddell that he received 50 and 75 cents a piece for them and the same for the mangoes. When leaving, Mr. Hicks told Mr. Waddell to have all the mulgobas in this section sent to him, that he would take them all.—*Miami Metropolis.*

DATE PALM AS BUSINESS.

Occupies the Front Seat at the State Fruit Growers' Convention at Santa Barbara.

Paul B. Popenoe, date expert for the West India Gardens of Altadena, has been visiting the valley this week with Theodore U. Barber, secretary-treasurer of the West India Gardens; C. K. Valentine, capitalist of Altadena; and E. B. Plank, a Los Angeles broker. The party is inspecting date lands with a view to embarking in the business on an extensive scale during the coming winter.

Mr. Popenoe made a trip to the Sahara desert this spring and brought in 1,000 Deglet Noor offshoots, of which 600 went to Dr. Rebecca Lee Dorsey and R. R. Bray; 330 to D. H. Gillan; and 70 to Moyer & Gilbert. He is expecting to visit Baghdad during the coming winter for a very large shipment of the choice varieties there, part of which will be for the West India Gardens, and the rest for various other growers in the valley.

Dates were one of the chief topics of intepest at the recent state fruit growers' convention in Santa Barbara, according to Mr. Popenoe, who delivered an address upon the subject there. Dr. Walter T. Swingle of the Bureau of Plant Industry was present, and expressed his opinion that the date industry was destined to become one of transcending importance, and that California would undoubtedly produce in time new varieties that would rank with the best in the world.

Bruce Drummond, in charge of the government work in the Coachella Valley, was unable to be present, but Dr. Swingle's assistant, Prof. S. C. Mason, who is now doing special research work at Indio, answered questions from the audience and spoke in optomistic terms of the future of the industry. Prof. Mason's line of research, if successful will be of immense value to the industry, since he hopes to find ways to make palms produce offshoots more abundantly and to make these offshoots take root while still very young.

Horticultural Commissioners Wilsey of Imperial county were present, and declared without reservation that the Marlatt scale was under control, as the result of recent experiments with the Braucco spray. While it is still too early to say that it can be absolutely exterminated, both men believe it can, and this means that there is no hindrance in the way of further importation of offshoots, provided these are submitted to proper treatment and inspection. This will be cheering news to all interested in the industry, since all the immediate progress of it depends on imported offshoots.

There is no doubt but that the Persian Gulf offers a rich field for invasion by California agents, since its dates are the most famous in the world, and the North African varieties have in the past been given the preference only becausethey were more accessible. Several Baghdad varieties which have already fruited in America have shown great excellence, and many more will fruit for the first time this year, when a good idea can be had of their possibilities here. It is probable that there are several varieties obtainable in quantities which are fully as good as, if not better than, the Deglet Noor.

It is these varieties which the West India Gardens intends to introduce to Coachella Valley this winter on a larger scale than has ever before been attempted. Paul B. Popenoe, with his brother F. W. Popenoe, a well-known botanist and specialist on subtropical fruits, will leave Altadena August 1st for the Persian gulf, in order to have plenty of time to study the date industry there in a searching and scientific manner. They will not return before next May.

The Spencer Type of Sweet Peas

The advent of the Spencer type of Sweet Pea has undoubtedly added thousands of worshippers to the shrine of this popular annual, although previous to the introduction of "Countess Spencer," the new and improved forms which were annually given to us by the late Henry Eckford had been the means of bringing this dainty and fragrant flower to the front rank of all annuals.

The Spencer type is, however, such an advance in size, and the frilled or wavy form so much more attractive, that it has to a considerable extent ousted the grandiflora type from popular favor, and for exhibition purposes there is no comparison in the merits of the two forms. In addition to the size and form of the flower must be added the new colors and combinations of colors which have come with the Spencers. For instance, just to mention a few, there are no varieties among the grandifloras that are in color quite like Helen Lewis, John Ingman, Mrs. Routzahn, Evelyn Hemus, Constance Oliver, Audrey Crier, Florence Morse Spencer or Miriam Beaver.

Countess Spencer was first exhibited in London in 1901 and, to put it very mildly, it created a perfect sensation among all Sweet Pea enthusiasts who were fortunate enough to be at the exhibition, and its introduction was eagerly awaited.

The Countess was said to be a sport from Prima Donna, and was generally spoken of as such in the various English gardening papers for several years after its first appearance. As is generally known, when any plant sports it often does so in several places simultaneously. Countess Spencer was first exhibited by Silas Cole, head gardener to Earl Spencer at Althorp Park, Northampton, England. About the same time W. J. Unwin of Histon, Cambridge, England, observed a sport in his batch of Prima Donna, and this he named Gladys Unwin, while it also appeared at Henry Eckford's at Wem, Shropshire.

The reports of the various growers are as follows:

Countess Spencer as raised by Silas Cole. Raised by Crossing Prima Donna with a seedling in 1899. The seedling itself was the result of a cross between Triumph and Lovely, and was unfixed.

Eckford's Countess Spencer appeared among Prima Donna without artificial crossing and as it was identical with Mr. Cole's variety he sold his stock as Countess Spencer.

Gladys Unwin appeared in a row of Prima Donna without artificial crossing, but this variety, although of practically the same coloring as Countess Spencer, is rather smaller in size of flower and not of such fine form. It had, however, one great advantage over Countess Spencer in that it was fixed and true to type, and it is said that Henry Eckford's stock was also true.

The following explanation has been given for the unfixity of the Althorp stock. The seed was disposed of by Mr. Cole to a seedsman, and a few pods from another cross—Countess Spencer and Salopian—were mixed in with it by accident, the whole being sent to California to be grown; and we are told that this was the reason of the admixture of colors which we got when Countess Spencer was put on the market in 1904.

The finest of the first year's sports (if we can call them such) seen in Countess Spencer were Helen Lewis, John Ingman, Mrs. C. Mander and Mrs. Charles Foster, but as these all appeared in duplicate—that is, practically the same colors were present in both waved and grandiflora types—only those who have rogued and saved Sweet Pea novelties can appreciate the difficulties that were presented to the growers for a few years afterwards, but careful growers have now got these varieties practically fixed and true.

What is generally acknowledged to be the finest of the Spencer type, Audrey Crier, so far no grower has been able to fix. The introducing of this novelty has given to the public the crosses in obtaining it, but it is a fact that it appeared with many growers as a sport which came in several of the Spencer varieties or selections.

The same might be said of Elsie Herbert, Evelyn Hemus, etc. The white and primrose types were seen in Mrs. Charles Foster, The King, in John Ingman, and as ok, yet other growers, so we are told, secured these, or similar varieties, by crossing.

This simple and easy method of obtaining new varieties—that is, by sports—has led to an unlimited multiplication of names for the same variety, and this is especially the case in England, where, previous to the introduction of Countess Spencer, practically the only introducer of new varieties was Henry Eckford. Now there are Sweet Pea specialists by the score. However, the Sweet Pea Society there has taken the question of nomenclature in hand and is gradually creating order out of chaos, and, doubtless, our new American Society will do likewise.

The trouble is, nowadays, that enthusiasts won't wait for the fixing, the cry being for novelties, this being especially so in England where so many growers are exhibitors, and can we blame the seedsman for pandering to their cry?

I firmly believe, however, that all Spencers can be fixed, but not without time and patience.

In the Fall of 1908 a well-known English seedsman asserted through the medium of the press that no grower could produce ten varieties of the Spencer type that would come true, and offered to pay ten guineas (roughly $52) to the gardening charities and pay all expenses of the trials to anyone who could prove otherwise. A grower accepted the challenge, with the proviso that the challenger would agree to 90 per cent. of purity. This was agreed to and the following ten varieties were sent to the Superintendent of the National Sweet Pea Society's trial grounds at Reading: Blush Spencer, Countess Spencer, Evelyn Hemus, Malcolm's Waved Cream, Marjorie Willis, Mrs. Henry Bell, Mrs. Wm. King, Paradise Ivory, Princess Victoria and White Spencer. The results certainly bear out my contention that the Spencers can be fixed, for in the trials of the aforenamed varieties there was only one rogue each in three of them.

Roguing Sweet Peas looks a very simple matter in theory, but it is quite a different proposition when you come down to the practical end of it, unless it be done on quite a limited scale and even then to be done well only those who thoroughly understand the varieties can accomplish good work.

In the older type roguing was comparatively a simple operation, but with the Spencers all this is changed, and the work, especially should the weather be very bright with hot, scorching suns to scald the flowers, is made extremely difficult, as only those who have attempted to rogue large patches of such varieties as John Ingman and Helen Lewis, even when planted in single rows, can appreciate.

However, when we consider that Countess Spencer was put in commerce six years ago and we have now practically straight stocks of at least two dozen varieties, among which might be mentioned Countess Spencer, Helen Lewis, John Ingman (with which we must bracket George Herbert, as it is only another name for it), Mrs. Charles Foster, Mrs. Charles Mander (a later name for which is Menie Christie), Florence Morse Spencer, White Spencer, Primrose Spencer, King Edward Spencer, Othello Spencer, Senator Spencer, Aurora Spencer, Marie Corelli or Prince of Wales Spencer, Romona Spencer, Elsie Herbert or Dainty Spencer, Apple Blossom Spencer, Constance Oliver, Mrs. Hugh Dickson, Mrs. Routzahn, etc.; and as this result has been accomplished in six years, counting from the date of the introduction of the type, surely it is great work and instead of decrying Spencers as some are inclined to do on account of novelties not always running true when first offered, we ought to congratulate ourselves on what has been done in such a comparatively short period.

Another peculiarity inherent in the Spencer Sweet Peas is shy seeding, it being now a well known fact that in comparison with the grandiflora type the Spencers only give us on an average 50 per cent. The theorist again steps in here and tries to explain the matter, pointing out that the large, wavy wings and standard retain moisture and as the flower fades falls down and encloses the keel and so causes damping and pod dropping. Another explanation is the abnormal length of the pistil and large open keel, the stigmatic point of the pistil being often beyond the reach of the anthers when the pollen is ripe, thus naturally causing barrenness. The first theory may hold good in England, but in sunny America we can hardly advance that as a reason. There may, however, be something in the open keel and enlarged pistil theory, for on comparing the various types you will find the feltilizing functions of the flower in closer conjunction in the grandiflora types than we do in the Spencers.

Unfixity of stock was only occasionally heard of previous to the advent of the "Fickle Countess," but now all this is changed and the question naturally arises, "What is wrong?" and many theories to account for it are advanced, of which, to my mind, the most likely one is that of the enlarged pistil, which is so often met with in the Spencer type; but even this answer to the problem seems open to question, as fertilization is effected while the flower is yet in the bud, or unopened stage, and ere the pistil can possibly be exposed, or only occasionally, as the overgrown pistil which we sometimes see protruding from the flower is generally seen after fertilization has been effected and the flower fully expanded, though now and again it may be seen in the bud stage. But even in such cases, where is the foreign pollen coming from to cause cross fertilization? Some growers have asserted that the honey bee has been seen gathering pollen from the open keeled Spencer type, but, as they cannot reach the pollen until the flower has become ex-

If we have to put aside all idea of an outside agency influencing the unfixity of the Spencers, we naturally ask "Wherein lies the trouble?" Going back to the days of the late Henry Eckford, we are told that many of his introductions took from six to nine years to fix ere he considered the stock in a fit state to offer to the public.

All this is, however, merely theory and, with time, doubtless the Spencers may become quite as fruitful as the older type. For example, when the new hybrid Primula Kewensis was first put on the market no grower was able to procure seed from it; but now this is completely changed, and the same may be said of that grand hardy perennial, Delphinium Belladonna, as until within the past few years it was never known to ripen seed. If the characteristics of these two plants have altered, may we not in course of time expect to see the Spencer Sweet Peas doing likewise and rewarding us with plentiful harvests.

Mr. Wright, chairman of the floral committee of the English Sweet Pea Society, very happily launches into verse on the seeding question:

"When the Sweet Pea reached Albion's shore
  Its standard was modest and plain,
Nor waving nor frilling it bore,
  And it suffered no harm from the rain.
Today, in its Spencerized pride,
  It sniffs at that plain standard weed,
Its furbelows spread far and wide,
  But there's a very poor harvest of seed!"

G. W. Kerr.

Fordhook Farms, Doylestown, Pa., August 10, 1910.

Growing the Avocado

By P. D. BARNHART

THIS semi-tropic fruit, known to botanists as *Persea gratissima*, of the order Lauracea, was introduced into Southern California, about twenty-five years ago, from Mexico, and is destined to be one of that state's most valuable economic trees. That it may be grown successfully anywhere along the coast from Santa Barbara on the north to San Diego on the south has been proven to the satisfaction of every pomologist resident of the territory named. How far inland that is—how near the mountains which separate the desert, with its warm atmosphere, from the coastal regions—has not yet been definitely determined.

The trees that have fruited up to this time are seedlings, and show some wonderful variations in character. There are trees of large size which do not bloom; others, again, bloom profusely, yet never set a fruit,—even though they grow near by trees which bear abundantly; still others begin to bear when but two years of age. Diverse as they are in this one particular, they are equally interesting because of difference in the fruits. These vary in size from that of an ordinary hen's egg to two pounds in weight. They also differ in quality as well as in size.

The meat of the best types is smooth, and cuts like butter which is neither hard nor soft. It contains from twelve per cent to eighteen per cent of fat which is easily digested, and readily assimilated. In this one particular it belongs to the class of oil-producing fruits, the most conspicuous example of which is the olive.

One tree which came under my observation bore fruits without seeds. They were about the size, shape and color of Damson plums, very firm in flesh, and of good quality.

There are two types of fruit as it grows in California. One has smooth skin which in color and texture resembles that of the eggplant, and which I think is exclusively Mexican. The other has a rough, glandular coat which separates readily from the meat, and the impression on the minds of fruit-growers in this state is that it is a native of South America. So far as the quality is concerned, the Mexican is the better. But the

The tree is an evergreen and attains to a large size. In appearance it is very like *Magnolia grandiflora* of the southern states. The time of ripening varies in the different varieties of both types, and, except the lemon, it is the only fruit grown here which may be had fresh from the tree every month of the year.

This subject, like all other vegetation, except the Eucalyptus, grown in California, has its insect enemies and fungous diseases to a greater or less extent. Pernicious scale pests prey upon the leaves and bark, the destructive thrips work on the blossoms, and anthracnose destroys the foliage of some trees, some seasons.

There is no necessity of having valuable ground lie idle while the trees are coming into bearing. Alfalfa can be profitably grown for the feed, and, what is of more importance to the orchardist, the productivity of the orchard, when it does begin to fruit, will be increased. The subsoil will be filled with humus and nitrogen by the deeply-rooting alfalfa, providing an amount of fertility, not otherwise obtainable, no matter how much money might be invested in the attempt.

The state quarantine against all nursery stock grown in the Gulf States and Mexico, for fear of introducing the "White Fly" from the one place, and the "Orange Maggot" from the other, to the detriment of our citrus industry, makes it imperative for planters to procure local-grown stock, and there is no necessity for sending abroad for wood for propagation. Prolific seedling trees, which bear fruit of good quality, ripening at different seasons of the year, may be found by the nurseryman who is in love with his work.

BABOO ENGLISH.

A VERY ORIGINAL PROGRAMME FOR A CIRCUS.

Under the heading "A Very Original Programme," the Bombay "Truth" prints the following quaint specimen of Baboo English:—

THE GREAT INDIAN CIRCUS.

Under patronage of Royal Duke of Connaught, K.C.B., etc. (N.B.—This circus is the very better, therefore he comes to see that).

The performance preparation will be commence at 8 p.m.

PART I.

1.—Some horses will make a very good tricks!
2.—The clown will come and talk with the horses. Therefore audience will laugh himself very much!
3.—The lady will walk on horse's back and horse is jumping very much also!
4.—The clown will make a joking words and lady will become too angry. Therefore klown will run himself away!
5.—This is the very good gimnastiks!
6.—One man will walk on wire—tight. He is doing very nicely, because he is professor of that? ? ? ? ?

REFRESHMENTS 10 MTS.

PART II.

1.—One man will make so tricks of trapeze, audience will fraid himself very much.
2.—Dogs will jump and roll in the mud.
3.—One lady will make himself so bend, then everybody he will think, that is the rubber lady.
4.—That is the very good trick also.
5.—One boy will fall a ball from top side, then he can catch that ball, before that ball can fall.
6.—This is the better jumping trick.

REFRESHMENTS 10 MTS.

PART III.

Then will come very good dramatic.

NOTICE.

No sticks will be allowed in the spectator and he shall not smoke also.

COLD EFFECTS ON TROPICALS.

Santa Barbara perhaps has a greater collection of tropical plants than any other section of California. Its climate has encouraged extensive planting and its inhabitants have been of the class which could afford such planting. Wishing to know the effect of the January cold on these plants we have asked Dr. F. Franceschi of the Montarioso Nurseries for his estimate of frost effects. Dr. Franceschi writes:

At Santa Barbara.

Both November and December were more than usually fine and mild at Santa Barbara; very few mornings of white frost on lower ground; hardly any wind, but also hardly any rain, the year having closed with a little over one-half inch of precipitation, which having fallen at three different times, could not have any appreciable effect on vegetation.

January 3rd and the night after had been unusually warm, and also the forenoon of the 4th. About noon an icy breeze began to blow from the northwest, steadily increasing in iciness, so that on Sunday morning there was ice formed, not only down town, but even up here at Montarioso (800 feet above sea level). The piercing wind and the low temperature continued with slight variation until about noon on Monday the 6th, when the wind having ceased, the sun predominated again, and made us feel more comfortable. A few days after we had the first good rain of the season, and everything started to grow.

During the cold snap the lowest temperature that was registered by the official observer at Oak Park (about 100 feet above sea level) was 26 degrees Fahrenheit, being the lowest, to my knowledge, since the year 1871. The nearest approach during this period of forty-two years was in 1883, when 28 degrees Fahrenheit was registered. In the lower part of town, near the ocean, as well as on low ground west and east of town, it is not unlikely that lower temperatures may have occurred, while up town, near the Mission, (325 feet elevation) and in the upper part of Montecito, it must have been less cold.

From such unprecedented weather, lasting for about 48 hours, most lamentable effects were reasonably to be expected, but they did not realize. Beginning from the lemon orchards in the neighborhood of town (and where no smudging was resorted to) the careful researches made by our horticultural commissioner have determined 10 to 15 per cent of damaged fruits, while no appreciable damage was suffered by any of the trees. It is well to remark that there are in town and in Montecito lemon trees not less than 55 or 60 years old, none of which show evidence of having ever been damaged by frost. The "zapote blanco," Casimiroa edulis, of De la Guerra street, the veteran pioneer, now fully 100 years old, was also never injured.

In the lower part of town, as on the Potter grounds, and at the annex of the Montarioso Nursery, only a few feet above sea level, some damages are certainly noticeable, but mostly confined to soft-wooded plants like bananas, cannas, wigandias, poinsettias, etc. All about town, as well as in Montecito, there is not to be seen a [illegible] Cocos plumosa. Where the wind blew harder, Seaforthias and Kentias were partially affected, with no permanent injury however.

At Montarioso I had two small coffee plants, two species of Lucuma, one Carissa carandas, with their leaves roasted, but the wood undamaged; they stood only a few inches above ground. At the same time Carica papaya, the most tropical and tender "melon zapote" continued to bloom during the freeze, as did one "Ahuacate" (Persea Gratissima); four species of Clerodendron from tropical Africa were uninjured; none of the other specimens of tropical fruits were touched, comprising the very tender "sapodilla" (Achras Sapota) growing on the back of the hill, a perfectly northern exposure. At Mrs. Hale's place, just below the Mission, a tamarind tree only two feet high did not even lose its leaves. At the Gillespie place in Montecito, where so many unrivaled specimens are gathered, hardly any damage is noticeable. In fact, I honestly believe that between Santa Barbara and Montecito the number of plants killed outright must be exceedingly small.

How could this happen with an ascertained fall of the thermometer to 26 degrees, and with the immense number of tender and tropical plants that have been set out here in much larger number than everywhere else in California?

This is more than I can tell. It is evident that a certain degree of temperature of the atmosphere is not the only factor which may bring death to one particular plant. There certainly must be other factors, like the degree of humidity of the atmosphere, of the ground, and of the plant itself. Temperature of the ground surrounding the roots, and perhaps, some magnetic conditions, and who knows what else? It is a matter of which we know very little, and it is certanily worthy of scientific investigation.

* * *

As to cold effects in another section further removed we have from Mr. W. T. McConnell, editor of the Progressive Farmer at Phoenix, the following:

In Arizona.

The frost during the cold wave that spread over the southwest was no respector of localities. The damage in the Salt River Valley was confined to the citrus fruits. The oranges and grape fruit, especially the Navel oranges, were very largely marketed. Consequently the immediate loss was slight. Except a few orchards that grow Valencias those that were provided with modern frost protection escaped with minimum damage.

The greatest loss was in the nursery stock. It is believed that older trees in bearing are not injured. It may, however, reduce the yield another year. The loss of nursery stock will no doubt reduce the acreage that would have been planted this spring on account of inability to obtain the stock. The friends of the citrus industry are not discouraged, on the contrary, they are enthusiastic as to the possibilities of the future of the industry. Practically all the nursery stock that can be obtained will be set out.

The orchards in the lower levels suffered the most, yet even those in the so-called frostless belt adjacent to the mountains did not escape. To sum up, the loss was very largely confined to the citrus nurseries that were not protected.

TESTING OF THE AVOCADO.

By Dr. F. Franceschi.

I cannot add much to the information you are gathering in regard to the comparative hardiness of the different strains of alligatores. At Santa Barbara none of them have been hurt by the frost of January, not even the budded ones which had been set out during these last few months, mostly Taft, Dickinson, and Meserve, I believe.

At Montarioso one three-year-old seedling of the "White" variety (which I introduced under the name "Santa Barbara Early"), had started to bloom at the end of December, and not one single flower was hurt by the frost. It is covered with blossoms now and I expect it will set some fruit.

It will certainly be most interesting to ascertain whether some trees already bearing are hardier than others, independent of location where grown. Most of them, if not all, must be of Mexican origin, but the precise location is very doubtful. I was only able to trace the "Chappelow" to seeds forwarded to the department of agriculture from somewhere in Northern Mexico by my excellent friend, Prof. F. Foex, now of Guadalajara, Mexico. Did the Chappelow prove hardier than others?

* * *

W. R. Wood of Roeding & Wood Nursery Company.

We have several different varieties of budded avocados and a number of seedlings growing in our La Habra nursery, and we find quite a difference in the hardiness of these with relation to the frost. Although it did not get as cold with us as it did in most localities, yet it froze several of our budded varieties and some of our seedlings. We had one lot of seedlings from seed received from Porto Rico, and I think without exception that every one of these seedlings froze to the ground, while the Mexican varieties growing in the same block were only slightly damaged. This would therefore indicate that the Mexican varieties are to be preferred in Southern California for budding purposes on account of their hardiness.

We have a number of budded varieties sent us by the department of agriculture for experimental purposes, most of which evidently came from Florida or Porto Rico, and all of these were more or less affected by the frost.

The most of our stock budded for commercial purposes was budded from the Harmon tree at Sherman, and these were the only budded trees we had that did not show any damage whatever from the frost. We also had three different varieties of budded trees in our lath house in Los Angeles, and the Harmon was not injured in the least while the other two varieties were practically killed.

From what we have seen of the avocado, we are inclined to think that it is somewhat similar to citrus trees in relation to frost, as we find that the small trees grown in the nursery are much more susceptible to the cold than the larger ones, and we do not think that trees, especially of the Mexican variety, will be hurt any more susceptible to cold after they had been planted in the orchard several years than oranges and lemons, which have proved to be quite hardy. Such as the one just passed, it would probably be very difficult to get an avocado orchard started.

* * * *

Newton B. Pierce.

The thin-skinned type, such as Ganter, etc., ripens mostly in the autumn months and is apt to come in competition to some extent with the larger thick-skinned fruits from Mexico which are imported in considerable quantity principally from December to April. Being smaller and having a thin, paper-like skin, it can hardly be the best for shipping, but it has the advantage of maturing in from five to eight months from the bloom and is mostly out of the way before winter fairly sets in and the trees resist cold better anyway.

* * * *

UNKNOWN PHILIPPINE FRUITS.

A Manila Horticulturist Makes Some Unexpected Discoveries in a Trip Through the Jungles.

[Pacific Commercial Advertiser:] The Philippine Bureau of Agriculture has given out for publication the following report on the result of the recent trip to Mindanao of P. J. Wester of the Division of Horticulture.

P. J. Wester, horticulturist of the Bureau of Agriculture, arrived from the South after five weeks' trip with the Secretary of the Interior's party. Wester left July 26 on the Basilan, joining Mr. Worcester at the Cuyo Islands, and accompanying the party throughout the entire trip, although he did not cross the Island from Davao to the headwaters of the Agusan. Mr. Wester is exceedingly well pleased with the plant material found on this trip, and his assistants are now busy propagating same at the Singalong experiment station and at the Manila office. Some of the more valuable seeds will be very closely watched at the bureau's office, while other more hardy plants will be immediately transferred to Singalong. Mr. Wester brought back a quantity of the baluno fruit, a cousin of the mango. He also had an opportunity to sample the famous Durian, and has a quantity of sprouted seeds on hand now. Another new fruit discovered by Wester on the trip was the marang, a large fruit somewhat like the breadfruit.

Wester was particularly well-impressed with the Bukidnon country and was struck with the luxuriant vegetation of the deep gorges, or, as they would be called in Mexico, barrancas, which are sunken valleys, from fifty to seventy-five meters below the level of the plateau. Here he found coffee apparently free from the blight which so seriously attacks this crop in other sections of the archipelago; also cacao in fairly good condition. At present, however, the means of transportation are considerably limited and communication between one part of Bukidnon and another is difficult.

It is safe to say, however that good roads would open up one of the richest agricultural districts of the Philippines.

A number of new kinds of citrus fruits, several bananas, two sorts of wild vanilla, two promising grasses and the sago palm were brought back by Wester.

Regarding the condition of the inhabitants and their towns in the Bukidnon, Wester states that great credit is due to those who are responsible for the welfare of that district. The village streets and the roads connecting the villages are unusually well kept, and there appears to be no sign of distress nor even shortage of crops in that region. In the Buiddnon and in Butnan, however, Wester noted swarms of locusts, and these insects had done considerable damage to cocoanuts in parts of Misamis.

Almost Seedless Mango

Cuba Mag. Feb 1913

Not Fibreless, From Hawaii.

THE following account of an almost seedless mango that has been given the name Oahu is contained in the Annual Report of the Hawaii Agricultural Experiment Station for 1911.

A seedling tree about six or seven years of age bore fruit this year, and its characteristics have given justification for naming it Oahu. It is probably a cross between the Hawaiian sweet mango and the Crescent. Although the husk is present, the seed presents an undeveloped condition with often just the seed coat present. About 75 per cent. of this year's crop has had no seed.

The Oahu is valuable as a large, fine-appearing fruit of good quality. Its nearly seedless condition makes a thin husk with a large proportion of flesh. No mango weevil *(Cryptorhynchus mangiferae)* has been found within these mangoes, and it will be interesting to note what may be a fruit which contains no seed upon which its larva may feed. The Oahu is also worthy of propagation as a basis for breeding toward complete seedlessness.

In form it is oblong, heavily shouldered at the cavity end and tapering toward the apical end; size large, averaging in weight from 10 to 15 oz.; cavity shallow, flaring, irregular; stem slender; apex variable, ranging from a point to a depression; surface moderately smooth and undulating; colour pale-yellow with a reddish blush on the exposed side; dots numerous, small, yellow, depressed; bloom bluish-white, moderately abundant; skin moderately thick, tough, very tenacious; flesh thick, bright-yellow, juicy, with an abundance of fibre; seed dried up or represented by just the seed coat; flavour rich, moderately sweet, quality good." Season June to August at Honolulu, Hawaii.

This tree is of the average height and

Japan Persimmons and St. John's Bread Beans

One of the mysteries of horticulture is the agility displayed by plant enthusiasts chasing after novelties when put upon the market by designing seedsmen and nurserymen, who know that a "sucker" is born every minute, and that none ever die, and all are ready to bite at every bait if it be presented in a glowing description by some ready writer. The "wonder berry" was one of the novelties that was to supply everybody, everywhere, with delicious fruits ninety days after the seed was planted, and it is said that 350,000 suckers took the bait. Fruits, flowers, vegetables, some of which are worthless old varieties, sent out under new names, are exploited annually by unscrupulous seedsmen, to the discredit of the trade and the disappointment of planters, all for the sake of gain; while old and tested varieties are passed by which, if planted and cultivated as carefully as the novelties, would add beauty to the landscape and dollars to the bank accounts of pomologists and horticulturists. Two of these subjects are named at the head of this article. The proper name of the first one is Diospyros Kaki. As an ornamental deciduous tree there is none grown on this coast more beautiful. The fruits are of various sizes and shapes, from the size of a guinea egg to some of a half-pound weight. They also vary in color from orange to bright red, and are equally at home in the warm interior valleys of the state, where the temperature sometimes drops to sixteen degrees below freezing during the winter season, also in the coastal part of the state; yet not one person in ten resident in the state has ever tasted the delicious fruit. At this writing the retail price of the fruit in our markets is ten to fifteen cents per pound. The trees are prolific bearers, and, so far as we have observed, free from insect pests and fungus diseases. One year old trees may be bought for $25.00 per hundred, yet in all our travels over this state we have met with but three small orchards. When ripe, the fruit is so soft that it is eaten with a spoon, and if dried is equal to cured figs. Now is the time to plant the trees. Orchardists who think of planting citrus fruits in locations of doubtful adaptability to lemons and limes had better plant Diospyros Kaki.

The name of the second subject is Ceratonia Siliqua. It, too, has been given a thorough trial in this Southland and it has proven its adaptability to our soil and climate. At this time the beans retail in our markets at 20 cents per pound, 20 beans to the pound, and the marvelous thing about the transaction is that the beans are brought here from Syria and the island of Crete. Tons of them are imported annually, the bulk of which are made into meal and fed to horses of the high-grade class. This procedure is a discredit to the intelligence and the business acumen of agriculturists of this coast. There are two facts relative to this subject that must be taken into consideration by planters. First, it blooms during the winter, therefore will not fruit where frosts are severe enough to damage the blossoms. Nevertheless there is enough territory between Santa Barbara and San Diego suitable to its cultivation, which, if planted to good varieties, would in a few years obviate the necessity of our importing any of the beans, and keep our money at home. Second, it is a dicecious flowering tree —that is, one tree bears pistillate, another staminate flowers; therefore one bears beans, the other is barren, but in this case pollination does not seem necessary to fruitfulness. Such, at least, has been our observations. The trees are as drouth resistant as a pepper tree, but to do well, some water and cultivation and food would be necessary to the greatest productiveness and profit. Another fact in regard to this tree must be kept in mind by prospective planters. There is as much difference in varieties as there is in the seedlings of any other fruit tree, therefore it must be propagated true to type by budding, or grafting, or cuttings. Moreover, unless so propagated, one has no assurance of getting a pistillate flowering tree.

Neither of the subjects under discussion is a novelty in the sense that the word is used, yet both are practically unknown to the majority of the residents of this state. Indeed, there are nurserymen on this coast who never heard of Ceratonia Siliqua, who, when the name is mentioned in their presence, confess their ignorance to their shame and confusion.

Plant Introduction.

TO Dr. P. Franceschi of Santa Barbara is due the credit for having introduced lippia into California, and from the small beginning made a dozen years ago there are now thousands of acres planted with this heat and cold-resisting lawn carpet. It was in 1898 that he sent to the director of the Botanic Garden in Rome for a specimen of lippia repens, and in response to this request he received by mail a small tin box containing less than twelve ounces of lippia plants. The specimen sent from Rome was planted in his experimental gardens and the many acres of it now flourishing throughout California and Arizona tell the story of the success of the venture.

The experience of a dozen years has demonstrated that lippia will thrive in any soil, no matter how poor; that it rapidly covers the ground and smothers all weeds in a short time; and that it requires only one-tenth as much water as a lawn of any other kind. It will withstand severe heat and many degrees of cold, can easily be established on sloping grounds, saves the trouble of mowing, and will never become a pest, as it is not difficult to eradicate, having no underground runners.

Dr. Franceschi tells an interesting story dealing with the introduction of lippia from Corsica to Florence, where it was first experimented with in one of the public gardens. In 1869, when the centennial of the first Napoleon was being celebrated with great festivities in his native Ajaccio, the superintendent of parks of the Florentine city, Signor Pucci, to whom the floral decorations had been entrusted, was most favorably impressed with lippia, as used in the public gardens of Ajaccio. Upon his return to Florence he took some of the plants with him and tried it in the city's gardens. So well did it succeed there that it quickly spread throughout Italy, and particularly along the Riviera, where the climatic conditions are not unlike those of Southern California.

"What We Can Grow in Southern California" makes an interesting story, as told by Dr. Franceschi, who has made a life study of trees, plants and flowers and enjoys the distinction of having introduced perhaps more shrubs and trees in California than any living man. He appreciates the immense fascination there is in raising and watching the growth of any new or strange plant, and says the interest is intensified by awaiting the appearing of the blossom and the development and ripening of the fruit. He realizes, too, that there is another feeling of satisfaction in contributing by his personal experience toward the welfare of his neighbors and to the increase of the productiveness of Southern California. It is his idea that every resident of Southern California, whether the possessor of a thousand acres or of only a city lot, who plants a few trees will be repaid tenfold for the care, while the value of the property, whether small or expensive, will be considerably increased. The field of experimentation is wide, as almost every variety of tropic and semi-tropic fruit and fruit-bearing plant from any part of the world can be grown in this section. Many of them cannot be expected to bear plentifully or to perfectly ripen their fruits, but there are others which experience has demonstrated will succeed here.

One of the fruits from Mexico with which he has been experimenting with for a number of years is the anona, of which there are not less than 500 species, belonging to different genera. They are found in all warm countries, the North American pawpaw being the only one reaching far into the north. One variety of anona, the cherimoya, was first introduced to California more than forty years ago and has steadily grown in favor until it is now found on the market in several cities. It is not yet produced on a commercial scale and the knowledge of these delicious fruits and of their requirements is limited.

There remain more than 100 varieties of guavas yet to be tested in California, and his deduction is that the horticultural horizon widens when it is considered that more than 150 species of eugenias are enumerated. Botanically they are allied to guavas, but are unlike them. For the most part they are native to Central and South America, and all of them bear more or less palatable fruit. The first specimens were brought to this State perhaps a third of a century ago.

Dr. Franchesci looks upon the Feijoa sellowiana as among the coming fruits of California. It is a shrub closely related to the guava, but quite distinct from all of them in its foliage, flowers and fruits. It will stand more cold than the guava. It was introduced from Uruguay into France in 1890, and the next season found Dr. Franceschi experimenting with it at Santa Barbara. The fruit is described as being the shape of a plum, with tough skin which insures safe shipment for long distances. The pulp is white and juicy, sweet, with a little acidity and in flavor and perfume having an indescribable blend of raspberry, pineapple and banana. The shrub is well provided with wiry branches and leathery foliage to withstand the strongest and most parching winds. It is not particular as to soil and will thrive under ordinary care with a minimum of moisture.—[Irvine, Santa Monica.

* * *

Mealy Bug Invasion.

THE December number of the Pomona College Journal of Entomology is a splendid example of what can be done by men and money in a particular line of horticultural inquiry. In that issue E. O. Essig, horticultural commissioner of Ventura county, has an article entitled "The Citrus Mealy Bug" which is most interesting and material to one of the gravest menaces to citrus culture. It is accompanied by a map showing the centers of infection at this time and giving a list of all the localities known to be harboring the mealy bugs in their orchards. This entomological journal is supplied at $1 a year by addressing C. T. Baker, editor, Claremont.

Mr. Essig has found in his special investigation of the mealy-bug pest that sprays, to be effective, must have penetrative as well as killing powers in order to reach through the cottony filaments of the egg masses and destroy the eggs. He has done much to establish the best admixtures for this purpose, which experience is set forth in the late numbers of the Claremont publication. While his experiments mark the greatest advancement in this work we have seen it will require several seasons of application to work out an entirely successful remedy. The nature of the insect makes it more difficult to exterminate than perhaps any other orchard pest of this class, for the bug both protected and free to fall and crawl to safety even while the spray remedy is being applied. The use of cyanides meets the same objection. It is more expensive and not as effective as the spray, and in pulling the lent the insect is liable to fall to the ground and escape into the soil.

With the increase of the mealy bug and the difficulties involved in its destruction comes renewed interest in the establishment of the insect's natural enemies. A new and promising ladybird has been brought in and is now multiplying rapidly in the State insectary, and is being established in a dozen orchard-breeding cages in four counties of the State. The latest of these was supplied this week at Glendora, where an infestation has become securely established. The others are located at Santa Paula, Fresno and San Diego. In another year some definite progress should be made in determining whether this new ladybird will be of value in the open field. It is exceedingly prolific in the insectary, and wipes out the mealy bug there as rapidly as the white scale was destroyed by the Vedalia twenty years ago. The peril of this comparatively new foe of citrus culture should engage undivided attention through quarantine laws, spraying and the use of its insect enemies. Among the most positive means of control is care in the transportation of packing boxes, ladders and picking

Another very useful book, though older in date of issue, yet of great scientific value, is A Textbook of Tropical Agriculture, by H. A. Alford Nicholls, M. D., F. L. S., C. M., Z. S., corresponding member of the New York Academy of Sciences, etc., London. The Macmillan Company, publishers, 1897. It is a very practical book and has been translated into French and Spanish.

Culture of the Citrus in California, research by B. M. Lelong, assisted by experienced horticulturists, revised by the California State Board of Horticulture, A. J. Johnston, superintendent state printing office, Sacramento, 1902. There are numerous illustrations and it is a very useful book for citrus fruit growers.

Readers who know French (1) will find the Bibliotheque Practique du Colon, H. Dunod and E. Pinet, editors, 49 Quai des Grands Augustins, Paris, of real service. They have published and continue to publish a series of books necessary to the tropical planter, on Le Cocotier, Le Bananier, Annanas, etc., etc. I possess only the book called Plantes et Parfums, by Paul Hubert, published in 1909. It is a complete treatise on the perfume plants, ways to utilize them, etc.

A complete list of French books on tropical horticulture, written recently would fill many pages; certainly there are books and good ones, on all subjects.

Messrs. O. Doin et Fils, Editors, Place de l'Odeon, Paris, publish a series of books on tropical agriculture, the name of which is Bibliotheque de Botanique Apliquee. I have the volume called Les Plantes a Tubercules Alimentaires des Climats Temperes et des Pays Chauds, par Henri Jumelle, Professeur a la faculte de sciences de Marseilles. It is a book of importance to Cubans for all plants the roots of which are foods are considered in this excellent tome; there are many illustrations. The series comprises volumes on every subject.

One of the best books for those who wish to study tropical fruit trees is the book: Traite Pratique de Cultures Tropicales, par J. Dybowski,, Inspecteur General de l'Agriculture Coloniale, Directeur du Jardin Colonial, Professeur a l' Institute National Agronomique, etc., Augustin Challmel, editor, 17 Rue Jacob, Paris, 1902. It is a quarto of nearly 600 pages. The Bibliotheque Augustin Challamel comprises many books on Tropical Agriculture, for that is its speciality. Those interested should ask for catalogues here and of the other Bibliotheques mentioned.

The best periodical publication on tropical agriculture in France is the Journal d'Agriculture Tropicale, founded by J. Vilbouchevi, offices, 164 Jeanne d'Arc prolongee, Paris, now in its thirteenth year.

For books on agriculture in Spanish, readers should ask a catalogue of the Libreria Española, Vda. de C. Bouret, 23 Rue Visconti, Paris. That firm publishes La Biblioteca de Agricultura. One of its principal books is Agricultura y Agronomia Tropical y Manual de Cultivos, por Sencial. Others are Las Plantas Forrageras, por Romulo Escobar; La Selva y el Prado, por Diaz de Leon.

Budding of the Mango

Told by One Who Has Had Much Experience

By P. J. WEBSTER, in Miami Metropolis

SHIELD-BUDDING of the mango has been successfully done in Florida for at least six years by experimenters in the propagation of this fruit. The writer first experimented with this method with some success in 1904. The percentage of successful buds was, however, so low that he did not then feel justified in calling this method to the attention of the public and the experimental work was temporarily suspended. However, experimentation has been continued by a few men interested in the problem, in some instances meeting with remarkable success. The success achieved by Mr. Orange Pound, Cocoanut Grove, Fla., deserves special mention, not only for the difficulties that he has successfully surmounted, but for the public spirited way in which he has placed his data at the disposal of the writer for publication for the information of the other mango-growers. It is not too much to say that Mr. Pound's discovery marks an epoch in the mango industry, not only in Florida, but in other parts of the world. Mr. Pound recently obtained, with this method, over 85 per cent of healthy trees among a lot of 200 plants budded, a most gratifying result.

"Success depends on the prime condition of the stock plant and that the sap is flowing freely; the buds should be selected from well matured wood that is still green and smooth, of the first, second and third flushes from the terminal bud, and cut rather large, three to five centimeters long (one and a quarter to nearly two inches.) The lower, thick part of the leaf stem at the leaf should not be trimmed off, but allowed to remain on the bud until it is shed voluntarily. If the leaf-stem or petiole, as it is also called, is cut too near the bud, fungi frequently gain entrance through the wound and destroy the bud. It is possible that the leaves can to advantage be trimmed off the budwood while it still remains on the tree and the budwood be used after the petioles have dropped and the leaf scars are well healed. It appears to be equally satisfactory to push the buds up or downward. To facilitate the insertion of the bud, it is well to trim off the edge of the horizontal cut. In tying the bud, allow the remnant of the petiole to stick out between the strands of the tape and protect and bud from the sun and rain with a square piece of wax cloth held in place by one of the strands of the tape above the bud. It is essential that the buds should be inserted at a point in the stock where the bark is of about the same age as the budwood, i. e., green and smooth, and the work done when the plant is in flush. When the union has been affected, which will be in the course of two to three weeks, the stock should be pruned off about 15 cm., 6 inches, above the bud. The buds are sometimes very dilatory about starting and in order to force them out the plants should, after the buds have taken, frequently be gone over and all adventive buds rubbed off.

"In top-working old seedling trees the same principle obtains. Part of the main branches are then pruned off to 3 to 6 cm. from the trunk and the resulting sprouts are budded and treated in the manner already described. As the buds increase in size the native top is gradually removed; care should be taken, however, not to prune the tree too severely at one time, as it is then apt to become permanently injured and die from such treatment.

"In, to some extent, employing another method called by the originator 'slice-budding' matured budwood sufficiently old as to have turned brownish or grayish, is also used in top-making seedling trees planted at stake. The back of the part of the stock where the bud is inserted, or more correctly placed, should exhibit the same character. For all practical purposes this is identical with the chip budding method employed in the propagation of pecans. The work is performed by cutting a slice or chip of bark and wood from the stock in the same manner as if the removed part was to be used as a bud; a shield bud just large enough to make a snug fit is now cut from the budstock and placed on the cut and tied in the usual way. In using either of the methods of budding described above, the stock should at the time of budding be girdled 15 to 20 cm. 6 to 9 inches above the bud.

"Mr. J. E. Higgins, horticulturist of the Hawaii Agricultural Experiment Station, Honolulu, Hawaii, in Bulletin 20 of that station describes a method of shield-budding the mango that has recently been tried with success there. An unusually large bud, 75 to 90 mm. 3 to 3½ inches long, is recommended, and that the buds be inserted on well matured stock where the bark is rough and brownish, using budwood of the same character."

SEEDLING AVOCADOS.

Wishing information as to the action of seedling avocados in the Hawaiian Islands, where that fruit has been a favorite for many years, Mr. Ernest Braunton wrote Mr. J. E. Higgins, of the Hawaiian Experiment Station at Honolulu, and from him has the following:

"It is difficult to state what percentage of our seedling avocado trees turn out to be of clear commercial value. If you mean by this, what proportion turn out to be superior to those which we already have and which would, therefore, be worth while for further propagation, the percentage would be quite low. I have no accurate records from our station plantings, since these are now just beginning to come into bearing. The percentage of good trees is entirely too small to warrant anyone starting a seedling orchard as a commercial proposition.

"When grown from seeds the resultant trees do not bear fruit resembling that of the parent as closely as do seedling orchards of citrus resemble their parents. There is a very wide variation. Seeds from purple fruit may come green, and vice versa; those from a round or pear shaped fruit may be elongated. There is quite as wide a variation in bearing habits.

"We have succeeded in growing some plants from cuttings, but we do not regard this as a practical means for the propagation of the avocado. In budding we get from 80 to 90 per cent of successful buds on strong seedling, nursery or orchard trees when about one and a half or two years old. A well grown tree might be budded when it is a year old. In top working orchard trees the percentage may fall to as low as 50 per cent, but we expect between 60 and 75.

"We bud in nearly every month in the year if the trees are in such condition that the bark will slip. The months which we prefer are from January to July, and the earlier in this period the better. Our trees begin to put forth new growth about December or the first of January.

"I am glad to learn of your observations on avocado in California and to find that it does not appear to be too tropical in character for your climate. If it proves to be adapted to any large areas in California, it will certainly become an important industry."—J. E. Higgins.

Plainly it is a mistake to plant seedlings excepting with the expectation of working over.

The Harvey "White Sapote."

WE ARE very pleased to give place to the following description of a most excellent tropical fruit tree of high ornamental value, planted years ago by one of the most enthusiastic, energetic and scientific amateur horticulturists the present writer has ever enjoyed an acquaintance with. Mr. Harvey has for several years been living in the midst of the tropical beauties of plant life in the State of Vera Cruz, Mexico. It is a pleasure to learn, through our correspondent, that his name permanently attaches to one of his many excellent introductions.

Strikingly outlined against the gray of the mountains and only a short distance from the foot of the Mt. Wilson trail in Sierra Madre, stands a tree the peer of its species in California. The casual observer would see nothing of interest in it, save perhaps its rare beauty; by others it is passed unnoticed, but botanists and tropical fruit enthusiasts come to see it from all parts of the Southland, and cannot say enough in praise of its virtues.

It was planted in its present location over twenty years ago by J. C. Harvey of Los Angeles, and has come to be known as the Harvey White Sapote, and will in all probability always be known by that name. No doubt it had care and water in its infancy, but as the land changed hands from time to time it was sadly neglected, yet thrived on the moisture it absorbed during the winter's rains.

No one seems to know just how long it has been bearing, but judging by other sapote trees that have borne in their sixth or seventh year, it has probably been bearing for fifteen years.

The present owner was not aware of the value of the tree, neither did the sellers attach any particular value to it, but it has since proven a source of considerable income. The fruit brings easily from 30 to 50 cents apiece. As the sapote is a Mexican fruit, it is very popular with the Mexican people in this country.

Last year the tree bore over a thousand fruit, varying in size and time of ripening: the first ripening the latter part of August and lasting until Christmas. It varies in size from that of a plum to a good-sized quince, and in shape resembles very much the latter, its color being green with a dull yellow cheek. It is perhaps the most delicious fruit on the market, and cannot be compared with any other fruit, its flavor being essentially its own. People who have eaten it describe it as melting and peach-like in flavor. The skin is thin and the pulp very soft when ripe. It can be picked when hard and shipped in that condition as it ripens off the tree as well as on, and is quite as delicious. The size of the tree and the shape of the leaves are similar to the English walnut; the sapote, however, is rather weeping in habit. Those who were fortunate enough to obtain seeds are successfully growing trees, some of which will be [illegible]

P. H. Popenoe of Altadena, who has written a treatise on the sapote in general, says [illegible] colored variety, with the proportion of the seed considerably less than in most varieties."

Favorable soil and climate with the promise of splendid returns, also the fact that the planting of acreage to this fruit is being considered, would indicate that the growing of the sapote on a large scale in Southern California is more than a possibility."

* * *

Avocados Resista[illegible]

Notwithstanding great injury to many small avocado trees by the January cold weather, we believe the tree has been given a place in California's productive industries which it would not otherwise have had. We have not heard of any bearing tree very seriously injured. Of course, some of them show that it has been cold and have lost some leaves. Many nursery trees were killed. Those which have shown the greatest resistance have been referred to in communications of different growers and nurserymen. In giving those accounts the Cultivator made an exasperating error in taking from the article of Mr. C. P. Taft of Orange, the last paragraph and placing it under the name of Professor Newton B. Pierce. Professor Pierce had replied to our request for information: "The hardiest avocado is that found at the highest altitudes of Mexico. I mean Persea gratissima." Through some hook or crook this was laid aside and the last paragraph of Mr. Taft's article substituted, as noted. To do Mr. Taft justice we give the paragraph below which should have been on his original article.

"The thin-skinned type, such as Ganter, etc., ripens mostly in the autumn months and is apt to come in competition to some extent with the larger thick-skinned fruits from Mexico which are im[illegible] princip[illegible] Being [illegible] paper best vant[illegible] eigh[illegible] mo[illegible] fait[illegible] better [illegible] fro[illegible] of the Ganter:

"The Ganter stood [illegible] as I will show to all wi[illegible] The Harmon was supposed [illegible] hardiest as regards the cold, but [illegible] the Ganter showed its superiority."

Horticultural Commissioner Roy K. Bishop of Orange County gives the following general comment:

"The avocado in this county is largely in the nursery and so observations must be made of small trees. It was found that in the nursery some seedlings were badly damaged while others adjacent were not materially injured. This was also the case with orange trees in the nursery, and is probably due to the greater resistance of individual trees.

"It may be interesting to know that the avocado has shown itself to be equally hardy to the orange. Of the older trees in the county, of which there are but few, none were injured by frost. Of the few varieties in the nursery rows consisting of yearling buds the "Taft" shows the least injury.

BEAUTIFUL BUENOS AIRES.

REPORT ON ITS CONDITIONS BY OUR CONSUL GENERAL.

IN a recent report from Consul-General R. M. Barteman, Buenos Aires, Argentina, he pays a very high tribute to "An American City Beautiful." He goes much farther, and tells of many of the same class to be found in South American republics. But of the city in which he resides his praises are of the highest and it would appear from the details of the work as though the city really is one of which the residents may justly feel proud. Mr. Barteman writes:

"Senor Carlos Thays, director of the public parks of Buenos Aires, has published a highly illustrated monograph on the Buenos Aires Botanic Garden. The author has modestly set forth in this monograph the fruits of some of his nine years' ceaseless activities to render Buenos Aires a city beautiful. He has planted over 142,000 trees; he has placed the pine of Neuquen (Araucaria imbricata) by the side of the palms from Misiones Territory (Cocos australis); he has caused over eighty well-distributed parks to be opened throughout the great city; his masterpiece is the great Plaza del Congreso, which will provide a breathing space in the heart of South America's greatest metropolis for all time to come, together with the creation and development of the Botanic Garden and park system, part of which was used for the Centenary Exposition. Municipal decoration is one of the many things that the United States has yet to learn from the twenty sister American republics. There is no city among them from which more can be learned, not merely in municipal decoration alone, but in the sense of private interest subordinated to the public welfare, as is shown in the fact that the commercial element never demands here that squares shall be cut up to build more skyscrapers on, than from the largest Latin-American city, Buenos Aires."

The climate in this southern city, so far as temperature is concerned, is very similar to ours; the relative humidity is, however, much greater during all parts of the year. The trees mentioned are well known in Southern California; the Araucaria, though, does not thrive in our dry climate, and the largest we have are but a few feet high. It is the only one of six species we grow that does not grow luxuriantly, though the only other South American species (A. Brasiliensis) burns during our summer months and the leaves drop off the lower limbs. In San Francisco, where the air is always damp, both these South Americans grow splendidly. The palm used so extensively (Cocos plumosa) is the grandest tree we grow and may each year be seen in greater numbers. A number have just been planted in our Central Park, but they are much more common to Santa Barbara and San Diego, though we are planting small ones by the thousands. In years to come this palm will be a marked feature of our city decorations and cannot fail to be admired above every other plant we grow.

* * *

California Pineapples.

PINEAPPLES will certainly grow out of doors in many places, but the writer has never tasted a homegrown that could be called "good to eat." Several years ago we grew a hundred each of Red Spanish, Porto Rico, and Sugar Loaf. The former seemed to be the hardiest and stand more neglect and rougher treatment and this sort would, perhaps, be the best to grow here, where their value is chiefly as an ornament. The general impression that pineapples like a poor soil is erroneous. They will grow in it but do much better in a rich, well-drained, warm soil.

* * *

The Avocado.

A FEW inquiries are received every month concerning the alligator pear, especially asking where the improved or valuable varieties can be obtained. This fruit is becoming too well known to require description, and while it has been known to civilized people for over 200 years, its popularity has not been great until the last few decades. It has a multiplicity of names—avocado, avocado pear, avocate, avocat, aguacate, alligator pear and midshipman's butter. Most of these names are the corruption of the Aztec name of the fruit, ahuacatl. In California the name "alligator pear" is giving way to "avocado," as that is preferable because of its origin and also because many strains of the fruit are not pear-shaped at all.

The avocado will not come true from the seed, and much attention is therefore to be given to grafting and budding. On this account it will prove a popular nursery plant. Through this means of propagation the different types, colors and qualities may be maintained. The violet varieties are nearly round; the large, green, round types with inside yellowish; the large yellow, which resembles a ripe pear and another kind very long and green in color—these are the variations most popular. They are becoming modified by selection and we may have large variations as the propagator manipulates the stock.

The avocados do not come true to seed, and hence reliable orchards cannot be established from seed. Budding is preferable to grafting and crown working is preferable to top grafting. Late ripening varieties sell for highest prices and the oblong types are the best sellers. Those wishing trees should consult the advertisements in their agricultural papers, as several nurserymen are now making a specialty of this great fruit.

AVOCADO FACTS AND FANCIES.

By Ralph D. Cornell.

The avocado, incorrectly called alligator pear, has suffered from much exaggeration and misrepresentation, as do many new industries in their infant stages. A few exceptional cases are being cited as a fair test of what the tree will do on a commercial scale, without taking into account the fact that the fruit is now rare and commands a price far beyond that which will be established when it is grown commercially, and not considering the fact that bud wood which now commands a high price will soon be worthless because of its great abundance. Citrus buds are of no value to the orchardist now, although the buds from the first Washington Navel tree commanded a high price. So will be the case now.

The land dealer who thinks to attract buyers to his land by stating that the avocado can be there grown, expounds its virtues. One such advertisment reads: "Imagine 50 trees of the avocado producing an income of $3,500 each per year at seven years from planting! Our land is growing them." It further states: "A seven-year-old tree at Whittier, California, has produced $2200 worth of avocados since last September, and the crop is not yet half removed. At a conservative estimate, this tree will yield $3500 this year. How would you like to grow avocados on our land?" This same tree has been cited as a typical example by some who have had young trees to sell. It is not typical. There is deceit in the implication, though not perhaps in actual statement of facts. In the first place, this tree is one of a group of seven seedlings, all planted at the same time, and the only one that has borne profitably or is being quoted. A large proportion of the receipts from this tree have been from bud wood, and probably never again in California will the receipts from this or any other tree approach in any way the magnitude they have reached in this first year of fruiting. Again, these fruits have brought $5.00 a dozen, which is more by far than could be expected from avocado fruits grown in quantities on a commercial basis. The writer knows of individual instances where people are planting from six to 20 trees with the expectation of realizing an annual income per tree, as stated above. The implication of such advertising is false, and more harm is done to the industry and to the firms so advertising than can possibly be offset by the immediate profit.

Another fact that is harmful to the industry at large is the promiscuous selling, by a few nurserymen, of seedling trees or those budded to inferior varieties, without being careful to explain to the buyer that seedling trees are very apt to fruit poorly or not at all, and that the mere fact of a tree being budded does not insure it being a first-class fruiting tree. The budded tree comes true to the parent stock from which the bud was taken and reproduces fruit accordingly. If this parent tree bore small, inferior fruits, so will the young tree. While some trees can thus be sold at a good price, the injury to future sales and to the confidence of the public is too great to warrant this present gain.

Now let it be known that despite all exaggeration and misrepresentation, the avocado is a splendid fruit from the standpoint of both the grower and the consumer and can stand sufficiently firm upon its own merits. Trees have been growing in California for the past 25 years, and there are now about 100 fruiting trees in the state. Locally grown fruits have been known for a number of years, but it is only in the past five years that any attention has been given to the commercial possibilities of this fruit. One hundred acres have already been planted to young stock, and efforts have been made to obtain trees for at least 500 acres for this spring planting. Acreage has either been planted or is contemplated at Vista, Fallbrook, Whittier, Sierra Madre and Glendora, and other places.

The avocado will grow anywhere the orange will.

During our very recent cold spell in which so much citrus stock was damaged, the avocado has suffered less than citrus trees in the same vicinity, and has proven hardier in many cases. Up to the age of three years, the avocado tree will stand less cold than the citrus tree of equal age, due to the unusually rapid and luxuriant growth that is made; but after the tree has reached sufficient maturity to form hardened wood, it will withstand any ordinary California winter, and more cold than an orange.

Another characteristic in favor of the avocado is that winter ripening fruits are uninjured by freezing. The cold may be sufficient to kill the foliage and drop the fruit, but if it is practically matured, the freezing will not injure its qualities for table use. The superabundance of vegetable oil in ripened fruits, undoubtedly is a large factor in determining this condition. Had a grower been raising winter ripening avocados instead of oranges, he might have marketed his crop after the recent severe freeze, and thus avoided the total loss that has befallen so many in this established industry.

At present, there are probably not more than seven or eight recognized commercial varieties that can be obtained in sufficient quantities to warrant their consideration. These are the Taft, Dickey, Meserve, Dickenson, Lyon, Harmon and Chappelow, listed approximately as to their individual merits. Aside from these, at least thirty budded varieties have been introduced into the state, but are not to be had in sufficient quantities to place them upon a commercial basis. The demand for budded trees far exceeds the supply and the near future will show a much more rapid development of the industry than has been seen in its remarkable growth of the past three years.

As to the productiveness of an orchard, a good, thrifty tree when budded, should produce annually about 500 fruits, for which the grower could conservatively expect to receive ten cents each. With 50 trees planted to the acre, this would afford a gross income of $2500 per acre annually, instead of $3500 per tree ($175,000 per acre, per year) as is being stated by some few. It stands to reason that the avocado will ever be more profitable than the orange, since its fruits test as high as 18 per cent fat according to government reports, and are of decided food value in addition to their superior delicacy, and since the tree is hardier than the orange. As the most conservative estimate places the avocado on a plane of desirability above that of all other local fruits, it seems too bad that implied exaggeration and misrepresentation should be used for the immediate gain of the individual and the ultimate harm, not only of the individual in question, but of the future industry. Why not let well enough alone?

THE AVOCADO CROP.

WHILE the crop of avocados in the southern portion of Dade county was not as large as in previous years the amount of fruit grown was more than in years past, owing to the fact that hundreds of young trees came into bearing. The growers have received more money this year from their avocadoes than any other year in the history of the business.

In several orchards the budded trees bore good crops of fruit, and the prices received for them were phenomenal—indicating that the avocado is highly esteemed as a fruit in the Northern cities.

With the better varieties selling in New York at from 50 to 75 cents each, and the demand increasing each year, there can be no speculation as to the future of this profitable and luscious fruit.

W. E. March, of this city, as has been noted in the columns of THE HOMESEEKER, received net returns of $27.00 per crate; and others, who are fortunate enough to have the choice budded varieties, received equally as good prices.

The ordinary avocado seedling found a ready market, ranging from 75 cents to $1.50 per dozen. Even at these prices there is no fruit grown that brings the grower as much money to the acre, as the trees, when given a half a chance for life, are liberal bearers.

There has been and is an increasing demand for the known or budded varieties, and the seedling fruit has been carefully inspected by propagators, the best selected and budded, grafted or inarched, and a few energetic planters now have trees in bearing.

George B. Cellon, of Miami, has been greatly interested in growing the finer strains of tropical fruits, has spent lots of money in procuring the best, and now has the only purely tropical nursery in the world. John B. Beach, of West Palm Beach, has also taken a great interest in introducing the budded varieties of this fruit.

The Pollock, which originated at Miami, has been considered one of the best strains of the avocado, and has been budded extensively. The fruit is large and is known as medium early. The Trapp, another variety, was originated at Cocoanut Grove. This is a late fruit of a smaller variety, but on account of its lateness it is a most valuable acquisition.

One of the newest avocados is the Blackman. The tree which bears the fruit was grown from Philippian seed and is very unlike the parent fruit.

In shape it is slightly oblong; in size large, with the stone or kernel firmly embedded in the pulp. The color of fruit on the same tree varies. Some are dark red, others of a greenish hue, with stripes of red, varying from dark to the brightest and most beautiful shades. It is what would be termed a medium late fruit. The pulp is soft and melting, being of the consistency of a rich full-cream cheese, and in color is a delicate yellow, with no black or dark lines running through it.

Last year a sample of this fruit was sent to the Agricultural Department and tested by experts, who claimed it to be the best avocado they ever tasted, and named it after the originator.

The tree did not hold a heavy crop of fruit this season—having perhaps two dozen. These have been distributed among those who have made a study of the avocado, and the universal opinion of all has been "that it is the best yet."

We gave one fruit to Mr. and Mrs. W. E. March, who are interested in growing avocadoes (in fact, Mr. March was the first to plant out largely of the budded varieties), requesting them to test it and give us their opinion as to the quality of the fruit. In return we received the following letters from Mr. and Mrs. March:

MIAMI, October 31, 1907.

E. V. Blackman, Miami, Fla.

DEAR MR. BLACKMAN—I am very much indebted to you for the magnificent specimen of the Blackman avocado.

I have never sampled an avocado that was its superior in richness of meat and delicate nutty flavor.

As yet there are only a few named varieties of this most profitable fruit and the Blackman need not fear competition.

Yours truly, W. E. MARCH.

Mrs. March's letter reads as follows:

GREEN TREE INN, MIAMI, October 31, 1907.

E. V. Blackman, Miami, Fla.

MY DEAR MR. BLACKMAN—We have just eaten the beautiful, large Blackman avocado you so kindly sent us.

It was perfectly delicious; I think in flavor and quality the finest of any I ever tasted, and wish we might have them to serve our winter guests, as they certainly would please the most fastidious.

Yours very truly, MINNIE E. MARCH.

There have been several other seedlings discovered which will make a most valuable acquisition to the avocado products of this southern country. The avocado is the coming fruit of this section, and will prove far more profitable than oranges, grapefruit or other citrus fruits.

THE AVOCADO CROP.

On the whole the avocado crop is a good one and prices for good specimens of seedling fruit are bringing the growers good prices. A few budded avocadoes have been brought in, but they were not mature, yet they sold at 25 cents each. Good specimens of the seedlings are sold readily at $1.20 per dozen. Later when the Pollock, Trapp and other budded varieties are fully matured, they will bring from $4.00 to $6.00 per dozen.

A CHOICE NEW MANGO.

The friends of John B. Beach were again called together at his house Monday to sample another choice variety of mango. This time it was a Fernandez grown by Mr. Beach. This fruit while not large in size is one of the choicest of the mango family. It weighs on an average 6 to 7 ounces and has a beautiful purple bloom like a concord grape. This bloom also covers the extremities of the branches, making the tree very handsome. The fruit has scarcely any fiber at all, the seed is small and flat, the flesh of a firmness similar to the Mulgoba. In flavor the Fernandez is delicious, and reminds one of the sub-acid delicate flavor of the Williams' Favorite apple grown in the North. Mr. Beach is accumulating a large variety of mangoes and is doing splendid work in the development of the popularity of this magnificent fruit.—*Tropical Sun, W. P. B.*

THE POMELO IN CALIFORNIA AND THE PHILIPPINES.

Written for the California Cultivator by Prof. C. F. Baker, University of the Philippines.

The matter of the pomelo, it appears to me, is one of the most important from the pomological point of view in subtropical horticulture. Everywhere in the tropics and subtropics there are numberless forms of this most valuable fruit, in my opinion far more valuable in its better forms than the orange. Named varieties are few in the United States, and mostly more or less inferior in value and not well known even among planters—indeed, often hopelessly mixed in their groves. Thus, any one of several very distinct nearly seedless forms, is quite likely to be called "Marsh Seedless." Some of the best passing under this name in Florida are really superb fruits, thin-skinned, with melting pulp reeking in juice; few seeds, and when well cured, sweet and with only enough bitterness to give an appetizing tang. Were I planting pomelos in the states I should spare no expense or pains to personally select buds from such stock, and only such stock.

Speaking in terms of really fine pomelos, most of those now appearing in state markets could scarcely be called fit for the table. They are thick skinned, full of seed, and exceedingly sour and bitter. Yet in any eastern city one of these fruits—poor as it is—can only be had by paying a fairly shocking price. Suppose the market could be supplied with an abundance of really fine pomelos. I believe they would eventually become more eagerly sought and more widely used than the orange, for the best pomelo is a finer fruit than the best orange; this too, without the effort to push the market and keep it bolstered up, that the orange requires.

Southern California can produce as fine pomelos as any part of the world, but only on the best soils and with abundant fertilization and irrigation. This is not being done now because no consistent effort in this direction has ever been made—no gathering together of all the known varieties from every source and trying them out thoroughly under all the varied conditions of the South. I have for years advocated strongly the immense importance of such work for Southern California, not only in the matter of pomelos, but with many other things. Every year it is deferred means another year of possible development and advancement lost. Private planters cannot undertake it. The state or the federal government, or private endowed pomological gardens, should certainly do this at once—the wonder is why they have not done it long ago.

The native pomelo in the Philippines which I find to be common here is one of the poorest fruits of this class I have ever seen in any subtropical region—thick-skinned, abundantly seeded, and extraordinarily dry, tasteless and coarse. I believe, however, that it will make a good stock for these regions. I had not been here long when Mr. Cuzner of the college of agriculture called my attention to a pomelo he had received from Hongkong, apparently originally from the region about Canton. It is a large fruit and one of the most uniquely valuable pomelos I have ever seen or heard of, even after many years of experience with pomelos in many countries. The skin is not very thick and may readily be stripped from the fruit, although not loose as in a tangerine or mandarin. The sections are large and few seeded, the pulp sacs very large, juicy and tender. The fruit is very slightly necked at the stem end, where it is also slightly furrowed. Most remarkable of all, the skin of the sections can easily be stripped off as is the outer skin, thus rendering it the ne plus ultra of pomelos for table use. Its flavor is exquisite, very sweet, slightly aromatic, and with the bitterness confined to the dissepiments.

This remarkable pomelo, which I am naming the "Cuzner Pomelo," we are planting in seed only, and I have sent several seed to Southern California, to Mr. Popenoe and to Mr. Cornell. This is, of course, to a large extent a futile operation, though it is still a very interesting one. We hope to get buds. Every branch of our work is replete with just such hopes—perennial hopes. But here is the vital point! Why in the world has not Southern California long since ransacked Southern China, Indo-China, Burma, Siam, India, the Malay states and islands, and Ceylon, where citrus fruits have been raised for countless centuries and where continual seed planting with a certain natural selection has now prepared the way for a possible scientific selection that will out-Burbank any operation of the sort ever undertaken by even Burbank—to bring together in her most favored localities for exhaustive trials all these most valuable varieties, now unknown to pomology, but many of which promise most certainly to add to and enhance in great degree her most possible and practicable assets. Similar things have been done for the alfalfa, the wheat and oats, and other industries with marvellous results, and California even, has repeatedly covered these same countries in quest for beneficial insect parasites.

Now it seems to me before the year of the exposition when she is supposed to prove her extraordinary enterprise in all things, is the time for Southern California to get busy, and take this work up on a comprehensive and adequate scale and push it forward energetically. She cannot afford to waste a day in getting at these great opportunities. I am remarking the same thing of the Philippines—here within easy striking distance of some of the greatest horticultural opportunities in the whole world, and yet I cannot get a good orange or pomelo on my home market, unless it be brought from China, near by; tea unless from Formosa, coffee unless from Java or Sumatra, cacao unless from Ceylon or the Malay states,—no home production that we have supplies even the home markets in these things, and yet it is perfectly fair to say that the Philippines in one part or another, could raise as good and as abundantly of these as could any other country of similar size. But we must start out forthwith and go after them—nothing whatever will take the place in effectiveness or certainty of results of expert personal work in the field. So that my earnest advice is to send the best obtainable men on this mission, and not next year, but now!

In a recent letter from Mr. Jeffrey, the State Commissioner of Horticulture to the Department of Biology of Pomona College, he says:

"The loyalty of your department is not questioned, and it is becoming appreciated all over the South in the assistance being given to the fruit and kindred interests. In fact Pomona College is recognized as a center from which emanates a most practical influence in horticulture. I could give numberless examples in which steadying influences originating in your department have been felt. You have done much to rescue the office of county horticultural commissioner from politics and other baneful perils; you have done much to enlighten the fruit growers upon the benefits of pest patrolling; your department has enlivened its surroundings with a corps of horticulturists, whose achievements in a cooperative way are known to all; it has given its support to every forward movement whether originating with you or with some one else."

PROPAGATING THE AVOCADO.

THE avocado is one of our most recent fruits and, while still largely unknown in the North, the demand for this fruit is increasing steadily as the people become accustomed to its peculiar qualities which for culinary purposes place it in the vegetable department. Until the last five or six years it was thought that the avocado came true to seed, and attempts to propagate good varieties asexually were wanting or had failed. Great credit is due Prof. P. H. Rolfs, now of Lake City, and Mr. George B. Cellon, of Miami, Fla., who did the pioneer work in budding the avocado.

As in the early days of the orange industry the budding of citrus fruits was thought to be very difficult, so the budding of the avocado was at first considered a complicated operation, but the difficulties are rapidly being cleared away as experience is accumulated, and in our experiments at the Subtropical Laboratory, I have frequently succeeded in getting an average of 75 per cent. of buds to develop into trees. The general impression is that the avocado is difficult to transplant, and, budded trees being expensive, parties buying trees prefer to purchase them established in boxes or pots. To meet this demand, the seed is placed in the pot and allowed to develop until it is ready to bud the next spring; or the seed is planted in a nursery in rows three and one-half to four and one-half feet apart, six to eight inches apart in the row, where the trees grow until they are budded and ready for the market when they are taken out of the nursery and planted in pots or boxes where they remain until they are well established, which will take from four to six weeks. Boxes 5x5x12, or 6x6x12 are more suitable than pots, being less liable to breakage in transit; also because plants grown in pots are not so well braced against the winds after being set out.

The method of budding is the same as that employed in the budding of citrus fruits. Many complaints have come to my notice that the buds do not take or that they do not start readily. This is due, not to an inherent difficulty in the avocado to be budded but rather to the inexperience of the performer, either in budding or, more frequently, in the selection of bud-wood. Only large, well-developed buds should be inserted, and rather larger than citrus buds—certainly not less than three-fourths of an inch, in length and, preferably one inch, as small buds are frequently grown over where the stock is in vigorous condition as it should be. In our experiments at the Subtropical Laboratory, I have found that tender wood is preferable to older wood, and have used even the soft and tender tops, inserted as sprig buds, with perfect success. Where old and hardened wood is employed, the buds frequently drop, making a "blind bud." For wrapping the buds, waxcloth is preferable to string, as it affords the bud better protection from injury and water. The buds should be inserted during the spring and early summer and not later than August 1. Two weeks from the date of budding the buds have taken and the trees ready to lop. The trees should now be gone over every two weeks, the wild sprouts rubbed off, and when the buds have made a growth of eight to twelve inches, the stock may be trimmed back to the bud. It frequently occurs at this period that a fungus, Colletotrichum sp., enters the wound and kills the bud. A satisfactory remedy for this evil has not been found. The loss of buds may be diminished by covering the cut with grafting wax to prevent the entrance of the fungus.

The discovery of the feasibility of budding the avocado being very recent only a few varieties have been distributed. Of these the best known are Trapp, a round fruit holding its fruit until Christmas, and commanding a fancy price because of its lateness. The Pollock, a pear-shaped fruit, is known mainly for its size, fruit having been recorded as weighing four pounds, and fine flavor.

Any one in possession of large, unproductive avocados can easily convert them into paying trees by cutting them down about three or four feet above ground and budding the sprouts which soon make a start. For home use, any fruit of good quality will answer the purpose. In budding for a commercial orchard, it should be kept in mind that the very early and late varieties command the highest prices. Other desirable points are:

1. Prolificness.
2. Skin smooth, thick and leathery.
3. A fruit of good keeping qualities.
4. The seeds filling the cavity, as a loose seed pounds the walls in transit, causing early decay.
5. Small seed.

The best material for grafting or budding tape is cheap cotton cloth which will tear easily. Rip up the cloth in strips of desired widths, say six or seven inches, and roll these tightly on stout iron wire as long as the width of the cotton strips. Several strips may be rolled on until the roll is one inch in diameter; tie a string around the roll at each end to prevent unrolling while being boiled in the wax. A good wax is made by boiling together two pounds beeswax, two pounds rosin and one-half pound good lard; when in boiling state put in the rolls of cloth and let them remain for fifteen minutes when they are taken out and cooled off before being stored away. The iron wire is more desirable than sticks of wood, as the weight of the wire keeps the roll below the surface of the boiling mass. Another advantage in using the wire is that if the wooden sticks are not quite dry the water as it is converted to steam will cause the contents to boil over.

Parties possessing avocadoes that they consider of special merit are cordially invited to communicate with the Subtropical Laboratory, Miami, Fla., with a view of testing their qualities and propagating such as are deemed worthy of dissemination.—*P. J. Webster, of the Subtropical Laboratory, Miami, in the Florida Agriculturist.*

Sheep are selling in the West for the highest price known for fifteen years. Word comes from Linn county, Oregon, that sheepmen are receiving as high as $6 and $7 a head, and spring lambs a few weeks old bring $2.50 each. Those who purchased bands of sheep a few years ago are reaping small fortunes. Mr. L. M. Powell, of Albany, Ore., recently sold 6,000 sheep in Montana at $5 a head and is holding 30,000 head for better prices. Northern and Western Florida is the sheep grower's paradise. Green pasturage the year round, with no severe winters to contend with.

ATTRACTIVE SPAIN.

NO "DECADENCE" BUT MUCH CHARM.

By SIDNEY LOW.

MADRID.

Though many Americans begin their European journey at Gibraltar, and though the great agencies make excellent arrangements for tourists in the Peninsula, Spain still lies a little outside the main stream of Continental holiday travel.

Many Englishmen who know their way well about the Rhine, and the Alps, and the Riviera, and in Norway, and Sicily, and Egypt, and Algeria, have never crossed the Pyrenées. Apart from artists, and writers of art books, and other professional seekers after the picturesque, I do not find that many of my acquaintances have been to Spain. To some of them a trip to that country presents itself in the light of an adventure which may be attended by various discomforts, such as do not afflict the traveller in more familiar lands. They envisage Spain as a backward, poverty-stricken country, still imperfectly civilised, swarming with priests, beggars, and fleas. One pessimist says he is afraid you will have to rough it a good deal; another doubts whether it is quite the place to take a lady to; a third suggests that you had better carry a revolver; all with one accord commend you to equip yourself with the valuable preparations of Messrs. Keating.

OUT-OF-DATE DELUSIONS.

Most of these warnings and exhortations are out of date. The traveller in Spain who wanders far off the beaten track will no doubt have to put up with poor accommodation at very inferior country inns. But the same thing may happen to him in Germany, or Austria, or Italy, or for that matter England. There are plenty of villages not far from London where, if they happen to lie off the main motor routes, you will find no better harbourage than a public-house as bad as those "miserable taverns," the Spanish *posadas* and *ventas*, against which the discriminating Baedeker utters a warning to the tourist. No Spanish inn could be much worse than the squalid beershop in which I once endured a night's martyrdom when held up by stress of weather under the edge of the Sussex Downs.

In the larger towns of the Peninsula the hotels are good enough to satisfy all reasonable requirements. In a few places like Madrid, Algeciras, and Ronda you will be lodged and boarded as well as if you were at the Ritz or the Astoria. Elsewhere the standard is not quite so exalted nor are the charges, but the traveller will find establishments equal to all but those of the very highest class in France, Switzerland, and Italy, with civil attendants, well furnished rooms, baths, lifts, electric lighting and, as a rule, an excellent cuisine, none the worse for its slight admixture of piquantly flavoured Spanish omelettes and cunning concoctions of rice, olives, artichokes, and eggs, with good wine, red or white, at reasonable prices. He will have no hardships to endure, and he may keep his tin of Keating's in his portmanteau. The Spaniards are a cleanly people in their housekeeping as well as their persons.

HANDSOME AND GAY TOWNS.

Before you have been many days in Spain you grow sceptical as to the legend both of Spanish dirt and Spanish decadence. You see bright towns with handsome houses, fine modern boulevards and plazas gay with trees and flowers, an excellent service of handy little tramway-cars, electric lights blazing everywhere, busy shops, cafés, music-halls, prosperous-looking men and women, well-dressed and well set-up soldiers and civil guards, smart young officers in brilliant uniforms, ladies in becoming black gowns with smooth, dark tresses, healthy, bright-eyed children who might have stepped from the canvases of Murillo, sturdy, upstanding peasants.

I saw many wineshops, but not one drunken person; I scarcely noticed a woman, even of the poorest classes, with frowsy clothes and untidy hair, and none arrayed in the appalling cheap finery of our own East End. I have been told the Spaniards dislike strangers; but I never met with an uncivil word or applied for information to anyone without receiving a polite reply. Evil things are said of the Spanish railways in the guide books. Slow they are, I admit; but otherwise they seem to me admirably managed, and never did I find a Spanish train arriving five minutes behind its scheduled time.

There are the beggars, of course, an inheritance, like much else from the ages when Spain was Oriental. But those who know the real East will not be greatly outraged by the comparatively mild and harmless mendicants of Spain. Personally, I rather liked them. They are mostly children or young girls, often quite well-dressed, usually polite and not without a keen sense of humour. It is worth scattering a few halfpence to draw some of these cheeky imps of boys into voluble chaff or to elicit smiles from the roguish little gitana maidens.

A DELIGHTFUL CLIMATE.

And the visitor to Southern Spain will find many delightful things. He will come upon many lovely gardens, ablaze with irises and camellias and roses and flowering magnolias and oleanders, and green with the waving plumes of palm trees and the broad spears of the cactus; he will see the snow peaks of the Sierras gleaming white above the verdant groves and fertile champaign of Andalusia: he will taste, as he cannot elsewhere, the glory and the charm of that brilliant culture which the Arabs brought to Spain, and the meaning of the most romantic chapter in European history will become clear to him; he can learn, in the galleries of the Prado at Madrid and in the cathedrals of Toledo and Burgos and Seville, how the Gothic energy developed the Moorish vivacity to the stern majesty of the greater Spanish art; and if he goes at the right time he may bask in the sunshine of a delightful climate while Northern Europe is still shivering in its wintry spring.

Best of all, he will be in an atmosphere that will give even the jaded tourist a sense of novelty and strangeness. For though you may buy the latest English novel in the shops and hear the newest rag-time tune at the music-halls, you will not fail to note that Spain is still a land apart, the land of Ferdinand and Isabella, of Don Quixote, of the Inquisition, of Velasquez, of Goya. You are so near London that some bold airman might, and soon will, traverse the distance in a matter of thirteen hours or so. But when you lean out of your window at Granada to hear the nightingale singing beside the walls and towers of the Albambra, when you see the peasant in sash and cloak and broad-leafed hat driving his string of donkeys from the hills, when you listen to the cry of the water-seller in the street, when you gaze at the multitude rocking with delirious excitement round the bull-ring as the matador plants the death thrust, or gloating at the cabaret over those fiercely suggestive and sensuous, yet strangely measured and controlled Spanish dances, when you hear the guitar tinkling in the moonlight while the long-drawn chant of some old song of love or war floats upon the still and scented air—when all these and many other *cosas de España* come before your perceptions, you feel that you really are rather a long way from home. The modernising process is going on fast, and in due course no doubt Spain will conform to the general dead level of European and American monotony. In the meanwhile it is still characteristic and still charming, and there is no better region for a spring or autumn holiday to freshen the mind as well as the body, and to impart new experiences and ideas.

THE ALLIGATOR PEAR.

A comparative newcomer to the northern fruit markets, but one which has already made good, is the avocado or alligator pear, a salad fruit of the tropics. Southern California is already raising some, though not in quantity sufficient yet for exportation. Florida begins sending north in July, the shipments lasting until January, while the West India alligator pears are in market from July to October. Although still too expensive for most people's daily use, we all like to know about them so as not to be "fazed" if we meet them at some festal board, private or public.

The food value of the avocado, known also as alligator pear, aguacate and midshipman's butter, is high, containing according to government statistics over 20 per cent of fat and that in the most digestible and easily assimilated form. It is not ready to use until the meat cuts easily with a teaspoon, yielding to a slight pressure, and the flesh is of a mellow, creamy consistency. It must not, however, be allowed to get over ripe, as it grows rancid.

While to most cultivated palates the simplest dressing for the avocado pear is considered best, others prefer it in combination with higher seasonings and other vegetables or fruits. An ideal way of serving it is to send to the table cut in two or sliced, to be dressed with salt, pepper and lemon or limejuice. Vinegar is too strong for this fruit.

Alligator Pear a la Mexicaine.

The Mexican method of serving it is to bring it whole to the table where it is cut in halves and the pulp rubbed smooth with a spoon. It is then mixed with lemon or lime juice, and a little olive oil with salt and pepper added. It is served with thin bread and butter.

Aguacate Salad.

Cut the ripe avocado pears in halves, take out the stones and scrape the pulp from the skin. Add three tomatoes, first removing the skin and hard pieces around the stem end, and half a green pepper pod cut in fine shreds. Crush and pound the whole to a smooth mixture, then drain off the liquid. To the pulp add a teaspoonful or more of onion juice, a generous teaspoonful of salt, and about a tablespoonful of lemon juice or vinegar.—Ex.

Tropical Fruits on the Florida Keys

By J. P. WESTER, Subtropical Laboratory, Miami, Fla.

This gives a correct account of the great future possibilities of fruit culture on the Keys, which will be brought about by quick transportation and more improved methods of cultivation.

THE development of the culture of tropical fruits in Florida dates from 1860, when Benj. Baker, of Key West, brought a small quantity of pineapple slips from Havana to Plantation Key. The experiments turned out successfully and the large profits realized from the sale of the fruit in Key West soon induced others to engage in the novel enterprise, and plantations, large and small, were gradually established on all the principal keys.

Twenty years later, Captain Richards set out the first "patch" at Eden, which henceforth has remained the center of pineapple culture. The systemized cultivation of "pines," as the pineapples are popularly called, has developed mainly in St. Lucie county.

Remoteness from the Northern markets, lack of transportation facilities, the rocky formation of the land and absence of intercommunication with the progressive growers in other parts of the State, all have tended to retard the further development of the industry on the keys, in a latitude situated more favorably for the production of tropical fruits than any other part of the United States within reach of fast transportation.

The ever-present coralline rock and the scarcity of soil renders clearing and grubbing the land both impracticable and impossible and all that is accomplished preparatory to planting is cutting down and burning the native vegetation.

The first crop is Pineapple, Ananas sativa. The slips and suckers are prepared and set out wherever there is a crevice in the rock, the base covered with a little soil, and are left to care for themselves. The Red Spanish variety is planted almost exclusively, very few fancy pines being set out. The only attention the pinery receives between the time of planting of the slips and harvesting the fruit, is an occasional pulling of the largest weeds. No fertilizers are applied.

After eighteen months the first crop is ready for the market. Before the railroad extended to Miami, the crop was moved via Key West, but now a large portion is handled by the Florida East Coast Railroad, the fruit being brought to Miami by schooners.

In four to eight years all available plant food is exhausted from the scanty soil, and the fields "run out." To produce a yearly crop of fruit the planter clears a new field every few years and sets out slips. With many growers pines are the only crop, and the exhausted field is then abandoned. Others plant out limes, avocados, sapodillas and other trees, between the pineapples at the time the slips are set out. With this method, the fruit trees begin to yield their first crop when the pines die off.

Outside of pineapples the only fruit grown extensively for the market is the "Key lime." Botanically the "Key lime" is identical with the common lime cultivated on the mainland, Citrus medica, var. acida, but the soil and probably other conditions have modified the fruit, so that the average size is smaller, and the skin more smooth than that grown on the peninsula. Bright and juicy, it is in active demand. Planted as cited above the trees yield their first crop five years from the time of planting. All trees are seedlings and as such bear fruit remarkably uniform in size and quality. A fixed variety does not, as the name suggests, exist. Neither the lime nor any other fruit trees receive any further attention than a cutting down of the largest weeds with a machete whenever the occasion calls for it, nor do the trees receive any fertilizer. Of late years a few growers have budded grapefruit, various varieties of oranges and tangerines on the lime. Occasional budded trees have fruited, but it is yet too early to form an opinion as to the success of the enterprise.

The Avocado, Persea gratissima, does well on the various keys, and the trees attain considerable size. All seedlings, the production of individual trees is extremely variable—also the size, form and quality of this popular salad fruit, now too well known to need further mention. A limited quantity of the fruit is marketed. Its precocity on the Keys has been noted by the writer in one locality where trees were loaded with fruit thirty-two months from planting of the seed. It has been demonstrated at the Sub-tropical Laboratory that budding the avocado is accomplished with almost the same degree of success as in budding of the citrus fruits when the work is performed at the proper season, and with the right kind of material. By careful selection, several varieties of excellent quality have been found, which extend the avocado season from June to December. Of little value now, the trees growing on the Keys could easily be made highly remunerative by taking advantage of this knowledge by budding to the best varieties.

Seeds of the Mango, Mangifera indica, have been planted repeatedly, but this tree is apparently not adapted to such a dearth of soil and an abundance of rocks as exists on the Keys. It presents a stunted, dwarfish appearance, is early attacked by fungus enemies and dies without yielding a large crop. If the former difficulty can be overcome by blasting, and the holes filled with good soil, it is probable that the luscious Indian varieties imported by the United State Department of Agriculture could be grown at a great profit, as the fungus enemies of the mango are easily and cheaply controlled by judicious applications of Bordeaux mixture.

A marked contrast to the mango is the sapodilla, Achras sapota, which is seemingly at home on the coral reefs. It is not uncommon to encounter trees twenty-five feet tall with a diameter of eight or more inches, one foot above ground.

At all times highly ornamental with dense dark evergreen foliage, occasional trees becoming exceedingly so, where the fruit at the approach of maturity is tinted on the cheek with brown and burnished gold. The main crop is gathered in the spring and early summer, but odd fruits mature during all seasons.

The average size of the fruit is that of a small apple, although trees are growing carrying fruits twice as large. The variation in form, color and flavor of the flesh is considerable. From flat and depressed, round and orbicular, fruits are found oblong to almost pear-shaped. The color of the flesh varies from a pale sea-green to yellow and brown shades. The fruits from some trees are watery and tasteless, from others rich and sirupy; the prevalence of seeds is equally variable. The color of the skin is russet in various shades. A few trees bearing exceedingly attractive partly "gilded" sapodillas grow on Upper Meta-

FRUIT AND FRUIT TREES.

COLD STORAGE OF FRUIT AND VEGETABLES.*

I.

The storage of fruit is a matter of some commercial importance, and a thorough knowledge of the best conditions for keeping ripe or unripe fruit of different kinds will be of great value in relation to the conveyance of fruit to a distance, and for other purposes. The methods at present in use, including refrigeration, have made it possible to carry many kinds of fruit for long sea voyages. The partial spoiling of a cargo of fruit is, however, a not uncommon occurrence, and attention is therefore called to the possibility of effecting improvements in method. The finding of such improvements will be greatly helped by a good knowledge of the physiological processes going on in fruits at different stages of ripening and at different temperatures, and it appears that much still remains to be learnt on this subject.

A paper recently published† records a number of experiments on the respiration of fruits, made with the object of gaining fresh data, which might be useful in connexion with fruit storage. The paper also contains a summary of literature dealing with different matters relating to the process of respiration.

In the experiments described in this paper, the respiration of different fruits when kept in air, in nitrogen, and in hydrogen was measured, and the keeping power of fruits in these gases and in carbonic acid gas was also tested.

An experiment with ripe cherries was carried on for about sixty hours at 30°C., and gave the following result. The average hourly production of carbonic acid reckoned in milligrammes (mg.) per hundred grammes (grm.) of cherries was 14·2 in air, 12·0 in nitrogen, and 11·3 in hydrogen. In this case the fruit was kept in a continuous current of the respective gases. Another experiment was differently arranged, the gases being left undisturbed, except for half an hour twice a day, when they were drawn through the vessels containing the fruit as in the first experiment. Here the amounts of carbonic acid given off are represented by the figures 12·2 in air, 9·9 in nitrogen, and 10·9 in hydrogen. It is seen that in these two experiments the production of carbonic acid in an atmosphere of nitrogen or hydrogen, i.e., in the absence of oxygen, is not far behind that in air, or in other words anaerobic respiration is not much less than aerobic.

Experiments were made with two varieties of ripe grapes and gave the result that respiration was as active in nitrogen and hydrogen as in air, more so in fact in some cases. One of the experiments carried on for 114 hours at 30°C. gave 5·2 mg. of carbonic acid per 100 grammes of fruit per hour in air, 6·2 in nitrogen, and 7·3 in hydrogen. The other experiment (thirty-four hours at 37°C.) gave 9·9 in air, 9·5 in nitrogen, and 10·2 in hydrogen.

The above experiments show that in ripe fruits at 30°C. anaerobic respiration may be as rapid as aerobic, or not much less so.

An experiment was also made with unripe fruit, and this showed a different behaviour. Green peaches, about half grown, gave off 13·4 mg. of carbonic acid per 100 grm. of fruit per hour in air, 6·4 in nitrogen, and 6·1 in hydrogen. Here the anaerobic is only about half the aerobic respiration. The difference between this ratio and those in the previous experiments may be attributed to the presence of growing tissues in the unripe fruit.

Germinating wheat was chosen as another example of actively growing tissue, and gave a similar result to the green peaches in one case namely, 12·8 mg. in air, 6·0 in nitrogen, and 6·5 in hydrogen. In a second experiment there was a much greater difference between the amount of carbonic acid produced in the presence and absence of oxygen, the values being 33·5 mg. in air, 7·8 in nitrogen, and 6·4 in hydrogen.

It appears then from the different experiments that ripe fruit differs from unripe fruit in its respiratory processes, respiration in the former being to a great extent independent of an external supply of oxygen, while in the latter about half the respiration is stopped in the absence of oxygen. This is regarded as indicating that respiration in ripe fruit is probably maintained for the most part by enzymes which work independently of oxygen, while in unripe fruit the respiration is partly of the same nature, but is as much due to processes dependent on the presence of oxygen. The latter processes may be enzymatic, but it is probable that the direct metabolism of the protoplasm plays a considerable part in them.

A calculation has been made in order to give an idea of the volume of carbonic acid given off in these experiments. The amount produced per hour by 100 grammes of ripe grapes at 30° C. was 5·2 mg. This would measure about 2·9 cubic centimetres, and the grapes at this rate would give off a volume of carbonic acid equal to their own bulk in about 32·6 hours, while the cherries in the first experiment would produce a corresponding amount in 11·8 hours.

Other experiments were made on the keeping quality of fruits in air and in other gases. In one case apples of one variety were placed in jars of air, nitrogen and hydrogen, and left for thirteen days. In each jar some apples were fairly ripe, and others somewhat green. At the end of the experiment the apples in air were in very good condition, while those in nitrogen and hydrogen had lost their red colour, and had turned brown, both their appearance and flavour being much as in half-baked apples. This effect in nitrogen and hydrogen was shown not to be due to micro-organisms, but to the anaerobic respiration of the fruit. This shows the necessity of aeration when apples are kept for a considerable time at the temperature of the experiment, which was 21° to 23° C.

Another experiment was made with peaches, and it was found that they became brownish and acquired a bad flavour in the absence of oxygen, and that the softening of hard, unripe specimens was greatly decreased in carbonic acid, and to a considerable extent in nitrogen and hydrogen, as compared with air.

In two experiments referred to above it was found that ripe cherries respired much more rapidly than ripe grapes in the ratio of 14·2 to 5·2. In view of the better keeping properties of grapes as compared with cherries, it is suggested that the rate of evolution of carbonic acid may be more or less proportional to the rate of spoiling of ripe fruit, and this may also be proportional to the enzyme content of the fruit, since the processes concerned are probably chiefly due to the action of enzymes. Hence, if the factors controlling the production of enzymes were sufficiently understood, additional means might perhaps be found for improving the keeping quality of fruit.

*The footnotes in the original (see *Kew Bulletin of Miscellaneous Information*, No. 1, 1914) have been omitted.—Ed.

†See Bulletin 330, Cornell University Agricultural Experiment Station.

New Variety of Mango

This has been an exceptional season for mangoes. The trees of the common variety have borne bountifully, and the people of the East Coast section have had a generous supply, but mangoes of the choice varieties and cultivated sorts have not been as plentiful as could be wished, but this year there have fruited for the first time some remarkably fine choice varieties, and in one instance a Mulgoba seedling, the only one ever heard of in the country to come true to seed and the first one to have fruited, has borne a fair crop. This tree is the property of Wallace R. Moses, of West Palm Beach. It is five years old and grown from a mango seed. The fruit is of the same general appearance as a Mulgoba, and ranges from thirteen to seventeen ounces in weight, the same size as the Mulgoba. It is almost entirely free from fiber, and is of a delightful flavor and texture, being in fact a remarkably fine fruit, and ranks well with the parent Mulgoba. Mr. John B. Beach, the nurseryman, of West Palm Beach, who has had a wide experience in the propagation of the choice sorts of mangoes, considers this seedling of special value, and to him is due the naming of it "The Moses Seedling," and to Mr. Moses is due the distinction of being the first person to propagate the Mulgoba seedling that distinctly represents the parent tree.

Some years ago, during the lifetime of the late Rev. Eldridge Gale, among other specimens, he received from the department of Washington a choice imported mango called the Perlouis, which he with great difficulty kept alive and finally obtained an inarched plant which has developed very slowly, and this year his son, George Gale, for the first time, secured a fruit from the tree at Mangonia, and it has proven to be one of the very choicest of these fruits. It is not large, weighing but about seven or eight ounces, but it has a very distinct and delicate flavor, is almost absolutely free from fiber and the meat is soft and custardy and can be eaten with a teaspoon. In this tree Mr. Gale has a prize, as it is one of the most delicate, highly flavored and aromatic of the family of mangoes, and is a valuable addition of the varieties being grown in Florida.

Another sort of fruit this year is the Rajpuri mango, a plant sent to Mr. John B. Beach from the department at Washington. This is a fruit averaging from eleven to twelve ounces, and while it is practically free from fiber and of a delicate texture and flavor, its remarkable characteristic is its perfume, which is entirely different from any mango yet grown in this section. This perfume, fascinating and delicate as it is, is hard to describe, and this mango, like many others that are being propagated here, is bound to become of great value, as it promises to be a prolific bearer and a great favorite.

The Soondershaw, the largest of the known varieties of mangoes, is another fruit at the nursery of Mr. John B. Beach, where the enormous mangoes hanging on the trees are an interesting sight. This is a late variety and will not ripen for three or four weeks yet.

Another new variety of mango propagated by John B. Beach has ripened this year and has produced a splendid fruit. It is known as the Amini mango. The fruit weighs about eight ounces, the flesh of a light yellow color, very tender, and of a delightful acid flavor. The flesh has scarcely any fiber and like others grown by Mr. Beach, this will be a splendid variety added to those already being propagated.

The propagation of the mango has been a long and discouraging process, but the propagation of these fruits is now well understood by the nurserymen, and they are supplying large quantities of the trees to the public that are being set out and it will not be many years before there will be a good supply of this most valuable of tropical fruits and West Palm Beach, the home of the original Mulgoba mango, grown by the late Rev. Eldridge Gale from the plant sent to him that was imported from India by the department at Washington, will be known as the center of the mango industry and the home for the propagation of practically all of the choice varieties.

ALLIGATOR PEARS PLENTIFUL.

The Pasadena mesa has been found particularly adapted to the raising of that rare combination flavored fruit known as alligator pears or avocado. Avocado is a foreign name and does not signify much to the average American but alligator pear carries with it a watery mouth for just a bite of the best fruit grown in Southern California. During the past few years many of these trees have been set out and are doing nicely. Many of the older trees are now in good bearing.

H. E. Huntington has a large number of alligator pear trees on his magnificent estate. Albert Calkins of Altadena also has several trees which are well filled with fruit this fall. The tree most familiar to the public is the one in Library Park.

NEWS NOTES.

A VIRGIN FIELD HERE FOR THE MANGO.

The late Eldridge Gale, of West Palm Beach, in writing of the mango, said:

"Shall we plant choice mango orchards here at home? More than thirty years ago, a much valued friend found in his surrounding conditions demanding, as he thought, that in place of raising trees for others to plant, he might better plant trees for himself. But he had no land suited to the purpose. He leased first one quarter section on terms mutually satisfactory and started in to what then seemed a big undertaking. Conservative old nurserymen looked askance. He made the farm crops pay for the orchard planting. The work went on. In a little time he was able to buy land for his orchard planting. For several years he has been known all over the northwestern States as the 'Apple King' of America.

"This fact would be of little interest if it was not suggestive of parallel conditions, at our very door, vastly more important. For long ages perplexing questions have hung about the whole matter of mango propagation. The always short supply of choice mangoes even in India testifies to this. The 125 years' experience in Jamaica mango culture give us no better testimony. These questions, so perplexing, have been one by one so far eliminated that we now know that these sand ridges and scrub lands immediately about our homes can be planted to the best of mangoes by a simple and almost costless method. It will be hard to find wider or grander fields for any man or woman interested in horticultural pursuits than open just here at our own doors and yet how few of us see it. We are looking somewhere else. We are ready to 'hark back' to past ages and past conditions rather than grasp the things that are ready here at our hands. It is not always easy to break away from old notions. It takes courage. It is easier to run on in the old ruts.

"Now what are the conditions that urge us to mango culture here at home? First of all, our soil is better suited to mango culture than to anything else. Second, by adopting a new and economical method of mango culture we can make the pine crop pay for growing the mango orchard. We know that hundreds of acres all up and down this coast are being planted to pineapples. This work of pine planting is only fairly begun. Now these pine fields as they are set in pine slips could be planted to seedling mango trees in orchard form with a very slight addition to the cost of the planter. With almost no addition to the cost the mango trees could be cultivated with the pines. As the mango when left to itself invariably sends its roots deep the two crops will scarcely interfere with each other.

"You have then almost without cost a seedling mango orchard. Such a plantation would have secured, by its thoroughly established roots, the best possible protection against that well dreaded pest of all the tropics, the wind storm. Only those who have suffered from these storms will realize the importance of this matter."

NUTRITION.

THE PROPER DIET IN THE TROPICS.

The *Experiment Station Record*, Vol. XXX, No. 3, publishes the following conclusions arrived at by Dr. A. C. Eustis, on the subject of human nutrition in the Tropics. The paper appears in full in the *American Journal of Tropical Diseases* (1913) No. 4:—

The author holds that there is greater danger from an excessive use of meat in tropical than in temperate regions, because 'ptomaines', which may be produced from undigested meat by the action of putrifactive bacteria in the colon, and which under ordinary conditions would be 'rendered inert by the liver cells', would not, in his opinion, be so taken care of where there is little severe exercise, as is the case with most residents in warm regions.

He believes further, that in such regions 'there is little need of internal combustion to maintain the body temperature.'

Similar arguments are given against the use of alcohol.

In the author's opinion, not more than 40 gm. of protein per day should be eaten in the Tropics. He believes that the energy value of the daily diet should be from 2,000 to 2,500 calories, depending upon the muscular work done, fats being taken in moderation and the energy supplied largely from carbohydrates; that vegetable proteids are preferable to animal proteids; and that the diet should contain an abundance of fruits and vegetables.

The desirability of limiting the amount of meat in the diet is illustrated by a case cited, in which symptoms of toxemia in a patient were overcome by reducing the meat consumption, and which the author considers typical of many which he states have come under his observation.

A SUCCESSFUL METHOD OF TRANSPORTING CANE CUTTINGS.

Although the method of shipping cane cuttings in damp charcoal has been known for many years, there has always been considerable risk involved on account of the time occupied by the transportation to distant countries. With a view to overcoming this difficulty, this Department last year decided to try the experiment of shipping cane cuttings in damp charcoal (1 lb. charcoal, 4 oz. water) to India by parcel post, thereby lessening the time of transportation. On account of the maximum weight which is allowed in sending by parcel post, being 11 lb., it was found necessary to have special tins constructed, and to reduce to a minimum the size of the cane cuttings. The light tins employed measured 18 inches × 4 inches × 4 inches, and cuttings were selected having the nodes moderately close together, thereby getting a good number of buds per cutting with a minimum bulk of cane.

The time taken during the transportation was only six weeks. On its arrival in India, the case of cuttings was opened immediately, and the following observations on the condition of the cuttings were recorded: Many of the buds had already sprouted, the sprouts varying from ½-inch to 2 to 3 inches in length. In a few cases rootlets had developed 1 to 2 inches long. These looked in perfect condition and were unbroken and undamaged. The canes themselves were perfectly healthy in appearance, not in the least dried or shrivelled up, quite hard and bright in colour.

The cuttings were planted out at once and in a later communication from the Agricultural Chemist, it was stated that the cuttings had all germinated and were doing well.

THE AVOCADO TO BE MARKETED SYSTEMATICALLY

One of the most valuable fruits grown in the tropical portions of Palm Beach and Dade counties is the Avocado, a fruit that has recently come into prominence in the Northern markets and one that in the near future will be the most profitable fruit known in the United States.

The East Florida Avocado Association, which was recently formed, has chosen Messrs. E. R. Brackett and Company as their exclusive agents for the handling and distributing the fruit in the Northern markets. Messrs. Brackett and Company have inaugurated a system of advertising which is already bearing fruit. It is evident that the association has in organizing chosen the right method of getting this fruit properly handled and advertised. While the Avocado has been going to the northern markets for the past several years, there has been no uniformity of package and the express company made no special rate, but charged almost prohibitive rates for transportation, and there was no organized effort on the part of the growers for the disposition of their products. By the organization of the East Florida Avocado Association these troubles have been overcome. The association has adopted a standard crate identical with the tomato crate, the matter of rates has been settled with the express company and a rate of $1.40 per crate (which is 600 lbs.) has been made and the entire output of the members of the association will be handled by Messrs. Brackett as distributers, which will secure the best possible distribution of the fruit in all the Northern markets. Besides this the association will have their fruit packed in the best possible manner, each fruit being placed in a paper sack, with the name of the association and grower with his address, and on each sack there will be several receipts for preparing the fruit for the table.

The Avocado business is just in its infancy and eventually will become one of the largest and most profitable industries in this Southern section. There is but a limited area where the Avocado can be successfully grown in Florida, as it is a purely tropical fruit; hence there will be absolutely no competition. The growers have made a right start and with unity of purpose and a close adherence to the rules of the association, the Avocado industry will become the most profitable fruit industry in the United States. A bearing Avocado orchard will be of greater value than a national bank.

The editor of THE HOMESEEKER received the following note from a gentleman at Hudson, N. Y.:

"MR. BLACKMAN, MIAMI, FLA.

"Mr. Parry's claims as to high prices received for Avocados would seem to be substantiated by evidence in a recent highly interesting trial in New York, wherein a bill is offered in evidence in which occurs an item charging $1.10 for a single portion of Avocado salad. J. Y. P."

If any of our readers wish to prove to their satisfaction that Avocados do bring high prices, let them step into any of the high-class restaurants in New York City and he will have a demonstration that he will not forget, if dollars and cents count. This brings to our mind a certain Florida cracker who was in New York, visiting his sweetheart. While he with his sweetheart and her mother were "doing" Broadway, this cracker spied some very handsome specimens of Avocados. Turning to his prospective mother-in-law, he asked, "Did you ever taste of an Avocado pear?" She replied, "No." He hurried into the store and asked the clerk for two fine specimens of the fruit. The clerk most obligingly showed him the stock and he selected two large, fine specimens, saying to the clerk, "How much." The clerk replied, "Two dollars and a half, only." By that time the cold chills were creeping up the cracker's spinal column. Thinking that the clerk had made a mistake, he said in his blandest tones, "How much did you say?" "Only two dollars and a half," was his reply. The cracker was convinced that Avocados bring high prices in New York. If you are a doubting Thomas, just step into some of those high toned restaurants and call for Avocado and you will be convinced that Avocados do cost something in New York.

A SEEDLESS AVOCADO.

R. L. Mills, an expert fruit grower, who has charge of Gen. S. C. Lawrance's large estate and citrus grove near Miami, has at last succeeded in producing a seedless avocado. Although the fruit is small, Mr. Mills is confident that he will succeed in producing avocadoes of the usual size without seed.

In examining several specimens of the fruit which were almost without a seed, just the least bit of a seed could be found in the fruit, and it is expected that this will disappear as the tree increases in age. The fruit is small, but if the seed can be made to disappear it will be only a small job to increase the size of the fruit. Mr. Mills is confident that he will in a few years have made a complete success in this line and will be able to put a real new variety of avocado on the market. If he succeeds in producing a seedless avocado of good quality and fair size, his name will go down to posterity, coupled with that of the famous Burbank of California.

News Note: Col. T. Roosevelt, the eminent naturalist, is now engaged in an extensive plant-collecting tour of South America, collecting rare specimens for the Department of Agriculture.

The Paw-Paw, a Neglected Luxury, Undoubtedly Has a Great Future

(By R. L. GOODWIN)

(The prevailing idea generally of those who know the paw-paw at all is associated with the small inferior fruit that grows in many sections of the United States, but the paw-paw of the tropics (carica papaya) is a delicious melon fruit that grows on trees, and is one of the great fruit luxuries, a fruit with a delightful, fascinating flavor that once eaten is always remembered, and one that creates a desire for more. The fruit is not only tropical, but grows in the semi-tropics and trees grown from seeds secured from Cuba, Nassau, Jamaica, or any of the tropical countries where it is found, when grown in Florida produce fruit of exceptional quality, and it is quite evident that the climate and soil of Florida give everything that is desired for perfectly maturing the paw-paw, and as people are becoming acquainted with the choicest varieties of this fruit, they are being planted in the private gardens of all those people who are able to secure the seeds.—Ed.)

The paw-paw of the tropics is a melon that grows on trees. The fruit is attached to the trunk of the trees at the junction of the trunk and the stem of the leaf. It is one of the most valuable fruits of Florida, and one of the most neglected. It is propagated from seed and bears ripened fruit in less than 18 months from planting. It is a food, a medicine and a cosmetic. The tree is a beautiful tree and an ornament to any yard. In my yard stands two trees, a male and a female. The male tree does not bear fruit, but blossoms and fertilizes the bloom of the female tree.

From one tree I have gathered about fifty fruit, and there are still about 200 fruit to yet ripen. The fruit ripens one at a time and lasts all the year round. The fruit is considered delicious by those who like it. Strangers have to usually cultivate a liking for it. Children are always fond of it. The flavor of the fruit is something like a cross between a cantaloupe and a pumpkin. Some say it tastes like cooked pumpkin with butter on it. The only thing it really tastes like is paw-paw. The sickish, sweet flavor is made palatable by the addition of salt and pepper, or lime or lemon juice. The fruit may be cooked with some kind of acid fruit and make a nice sauce for dessert.

A paw-paw pie just simply beats anything in the pie line on earth. Everybody likes paw-paw pie.

Recipe for paw-paw pie by a pie expert: Select a medium sized paw-paw cut it in half and remove seeds, with a spoon dig out the soft pulp and put through a sieve to make it smooth; beat three eggs, add a cup of milk, put in ginger, cinnamon and cloves to flavor. Place the contents in the crust, put in oven and bake till set; in other words, make the same as a pumpkin pie only you don't have to cook the paw-paw in advance as you do the pumpkin.

The green fruit is cooked in tropical countries, being peeled, sliced, soaked in several waters then dropped into boiling water and boiled, then served as a vegetable.

The fruit eaten raw is a cure for indigestion and is sometimes called vegetable pepsin. It is said to make tough meat tender and is used for that purpose in the tropics by placing meat between slices of the fruit and cooking the fruit with the meat.

It is said that in Cuba a paw-paw is used first to make tender a piece of freshly killed meat, then served as dessert, the skins being preserved by the ladies until after dinner, when they retire for the afternoon siesta, when they are rubbed on their faces to acts as face bleach, which may account for the smooth, satiny complexion of the Cuban beauties.

If this fact is true, and St. Lucie county will advertise the fact it will result in a wonderful boost for a product that grows and bears with no effort and will bring riches untold into the county. For old sores there is nothing better to apply than the fruit, for ulcers and all skin diseases. Pimples vanish like magic when the skin or flesh of the fruit is applied. The fruit is laxative when eaten, and a syrup made from the fruit acts as an expectorant, tonic and sedative.

The seeds are of a peculiar aromatic flavor, resembling nasturtium seed in taste, or the piquancy of water cress, and suggestive of mustard. They are of great medicinal value, being anthelmintic, emmenagogue and carminative. Good for worms, a medicine to cure female troubles and to cure wind colic. A tea made of the seeds acts as a febrifuge to counteract fevers. The fruit allays nervousness, tones up the system and cures a cough.

Plant some in every yard in the city, and on every farm in the county—have the good wife make a paw-paw pie and you sure will boost paw-paws forevermore.

A FINE VARIETY OF MANGO.

"Prof. J. R. Pomeroy, of Stuart, has the thanks of *The Tribune* for a crate of fine mangoes. In the crate was half dozen of a special grafted variety with which the professor has been experimenting, and while we have not tried the famous Mulgoba, we can pronounce this new variety an excellent fruit, and if the Mulgoba can go it one better it certainly is a winner. Mr. Pomeroy states that several who have tried his new variety prefer it to the Mulgoba. It is larger than the ordinary mango, and is almost fiberless—at least in eating one gets none of the fiber. What little there is clings to the pit."—*St. Lucie Tribune.*

We have written Professor Pomeroy for a full description of his new budded mango and hope to give it to our readers in our next issue. We believe that the mango and the avocado are the two coming fruits, and owing to the small area where they can be successfully grown, the demand will be greater than the supply.—Ed.

MANGO MENTIONS.

George Gale, of West Palm Beach, has shipped seven crates of Mulgoba mangoes that have netted him 25 cents for each mango and each crate contained 18 mangoes, so it can be seen that a profit can be made from this splendid fruit. Mr. Gale has not been able to fill all his orders this year. He weighed one mango this week that tipped the scale at 20½ ounces and several others each weighed 19 ounces.

On Monday forenoon a small party assembled in the directors' room of the Dade County State Bank at West Palm Beach to test a Mulgoba mango grown by John B. Beach on his original tree that he propagated from the original Gale mango tree some eighteen years ago. The fruit tested was fully up to standard in size, and its delicate flavor was praised by all present. There was no fiber, the flesh cleaving readily from the seed. There is no wonder that this mango is a general favorite and it is sure destined to become a leader in the

Keep Out the Mango Weevil

IN an article regarding the mango weevil, C. L. Marlatt, assistant chief of the government bureau of entomology, states that shipments of mango seeds now coming into this country from foreign lands are largely infested.

Prof. P. H. Rolfs, director of the agricultural experiment station at Gainesville, Fla., also states that it is about the time of year when fruit growers are importing seed of the mango from various foreign countries, and recommends that growers be acquainted with the fact that it is dangerous to the industry to have these seeds brought into this country promiscuously. Prof. Rolfs believes that the weevil has not yet appeared in Florida, and for that reason urges growers to be careful.

The article by Mr. Marlatt follows:

"The most serious insect pest of the mango in oriental countries is the mango weevil (Cryptorhynchus mangifera Fab.) This weevil is classified with the boll weevil and the chestnut weevil, which, aside from its well-known destructive work on the mangoes is sufficient indication of its undesirability. It is probably of Indian or at least of oriental origin, and has already obtained foothold in most of the important mango growing countries, being carried readily with seed for planting. It now inhabits all of the mango regions bordering on the Indian ocean and adjacent islands, and throughout the East Indies, including the Philippines and other groups of South Pacific islands. It has gained foothold similarly in South Africa and Madagascar and numerous other points. Fortunately this country is so far free from this pest, and if it can be kept out the mango industry which it is hoped to develop in Florida and perhaps in the other warmer parts of this country can be given a very great advantage over other mango producing regions of the world.

"As already indicated, this mango pest belongs to the weevil family. The egg is deposited in the fleshy part of the fruit, where it hatches, and the young grub burrows at once through the seed itself and develops there into the mature beetle. The green mango soon heals up over the egg site, and there is very little if any exterior indication of infestation. The weevil or beetle developed in the seed is about a quarter of an inch long and dark brown in color. It remains in the seed for some time, and may thus be easily distributed with seed for planting or with the ripened fruit.

"Protected as it is by the tough seed coats and, in fact, buried in the seed itself, it is not possible to destroy it by fumigation with any certainty. The only means of determining infestation is by opening the seed pod and removing the papery covering of the seed itself, when, normally, the gnawing and excrement and discoloration due to the work of the larvae and the weevil which develops from it can be noted. Therefore, it is manifestly a very dangerous thing to import into this country in regions where mangoes are grown any foreign grown mango seeds or fruits. Where there is no mango fruit, the danger, of course, is perhaps negligible, as no other food plant is known for the mango weevil. Still if large numbers of these weevils should be introduced and liberated, they are long lived and might easily be carried on railway trains to regions where they might make lodgment. It is, therefore, desirable, should planters wish to import seeds for planting, that they make special arrangements to have them inspected on arrival by competent authorities who are familiar with this dangerous pest.

"It has already been stated that this mango weevil is the principal enemy of the mango, practically wherever this fruit is grown. In the Hawaiian Islands Mr. Van Dine, formerly entomologist of the Hawaii experiment station, reports that the first year of his examination he found 60 per cent of the mangoes infested; the following year 80 to 90 per cent, as many as four larvae being found in a single seed. While the mango weevil destroys primarily the seed of this fruit, it is also believed by growers that it hastens the maturity of infested fruit and causes a greater percentage of them to fall.

"Inasmuch as this insect passes its entire development within the seed, it is beyond the reach of insecticides and fumigation, and the only remedy is to collect and destroy all of the fallen or supposedly infested mangoes.

"It is most urgently important now, however, for Florida to keep this weevil out. Mango seeds are now probably being imported into Florida by various growers, and the danger of such importation should be thoroughly understood, and whatever authority the State may have to prevent or control such importations should be put in operation."

THE AVOCADO

The avocado season is approaching and quantities of this fruit will be sent to the Northern markets from this portion of Florida. The fruit being comparatively new in the markets and the great mass of people not being familiar with it and the manner in which it is used, we requested a connoisseur in preparing the avocado to give the readers of THE HOMESEEKER some hints along this line.

This is what he says:

Editor of The Homeseeker:

DEAR SIR—During a residence of several years in this locality I have had opportunity to become familiar with the various tropical fruits. Many of these, such as the orange, grapefruit, etc, are quite well known, but I have thought perhaps your readers might be interested in some facts in regard to the aquacato, avocado or alligator pear, one of the most useful and delicious of them all. A few years ago this fruit was practically unknown outside of its indigenous territory.

Now, however, with the building of the railroad and the large influx of tourists each season, it has become more widely known, and, in the Northern markets the demand greatly exceeds the supply, notwithstanding the fact that many new groves have been planted and are coming into bearing. The avocado is a beautiful tree whether planted in a grove or as a single specimen on a lawn.

The different varieties of trees extend the bearing season from early summer until quite late in the succeeding winter. The fruit is large with one large seed and a tough skin which gives it value as a shipper. The edible portion is yellow with a narrow green border which gives a dainty and appetizing appearance when cut in dice in a salad for which it is very generally used. Salads are made from a variety of recipes, according to individual taste, the one most commonly used being just the cut-up pear with salt and pepper and moistened with vinegar. Many persons like the addition of a thinly sliced or chopped onion and any preferred dressing may be used, the simple salt, pepper and vinegar dressing, however, best preserving the delicate nutty flavor of the fruit.

An attractive salad is made of a combination of avocado, grapefruit and banana with sugar, and a favorite one is made of avocado, lime juice and sugar. The fruit is substantial food and is often used as a breakfast dish.

One gentleman living near Miami told me that during the entire pear season he had for breakfast a cup of coffee, a slice of bread and half a pear which he ate with pepper and salt as he would a canteloupe. He said that he kept well and at work and was sorry when the pears were gone and he had to return to meat and eggs.

The avocado also makes a very good pickle and some persons fill the seed cavity with forcemeat and bake them in their skins, but by the majority the natural uncooked fruit is most esteemed.

If this does not find its way into the waste basket instead of into the columns of THE HOMESEEKER, I may send other communications regarding some of the other

THE MANGO

Promises to be One of the Chief Products of Lower Florida.

By PROF. P. H. ROLFS.

AMONG the tropical fruits that are being introduced into Florida no one is more certain to make a definite impression upon the market than the new mangos. The fruit produced by the mulgoba exhibits such a character that it will push its way into the market were it to compete with peaches; but fortunately it ripens just ahead of that crop, and so we will not be thrown into actual competition with this luscious fruit. The mulgoba budwood can now be had in almost any quantity that any one desires in Florida. There is still some difficulty experienced in propagating and setting out the trees. From my experience in this matter I am inclined to believe that we shall have to adopt methods for the propagation and setting out of these trees that are radically different from those practiced in setting out citrus trees. As citrus growers we are apt to make this our standard, and anything that does not conform to the methods of procedure that we have adopted for growing citrus trees is considered to be extra difficult, or else not worthy of our attention. We are also apt to draw a long breath when the nurseryman confronts us with a price for these trees that is probably ten times as high as that of citrus trees. Here again we allow our standard to interfere with our business methods. We should remember that mulgoba trees are really rarities.

PROPAGATING.

Budding of mangos is not only possible but may be done profitably. The mango nursery, however, must be radically different from that of the citrus nursery. For general purposes I think the method advised by Mr. B. Beach, and which he has published repeatedly in the agricultural papers, and also in addresses to the Horticultural Society, are probably familiar to every one here, so I will not take them up again at this point.

AREAS ADAPTED TO MANGOS.

If we will examine the map of Florida we will see that all of that area on the East Coast south from Mangonia and on the West Coast south from Caloosahatchee River, is adapted to mango growing. In addition to this general area there are isolated areas to the north of this in which mangos can be grown with a fair degree of assurance that crops will be obtained. Several years ago a considerable number of mango trees were fruited in the vicinity of St. Petersburg. In this region there are trees sufficiently large to produce a considerable quantity of fruit. Various places on the Manatee River are also quite certain to produce paying quantities of mangos. I will not attempt to enumerate further the isolated localities where mangos may be grown. To a large extent this will have to be determined by actual experiments. In a general way we may say, however, that wherever citrus fruits may hang on the tree all the winter and never become frosted it will be possible to grow the mango. This definition for a region in which mangos can be grown should not be taken too strictly as we know that under certain peculiar conditions a few citrus fruits pass the winter in orchards where the greater bulk of the fruit is frosted.

We are hopefully looking forward this year to the fruiting of Alphonse mangos. This variety is said to be very much better than the mulgoba. To us who have eaten the mulgoba, however, this sounds like sweetening honey or perfuming the rose.

MANGO RACES.—The mango, so far as I have examined the locally, seem to group themselves into the following races: 1st. The Number Eleven; 2nd. The Pineapple; 3rd. The Manila; 4th. The Apricot-apple; 5th. The Bombay.

1st. The Number Eleven group, which is composed of seedlings running to well-marked varieties, is early ripening, flat fruit, and long tapering fruit, weak fibre, but profuse; color, pinkish or reddish. Tree tall upright growing. The leaves medium smooth and veining not prominent. Stigmatic even. Skin medium and not tough.

2nd. The Pineapple group is yearly growing. Leaving medium smooth and veining not prominent. Stigmatic area ripening. The fruit medium size, tapering to obtuse point at stigmatic area; fibres medium profuse; color light orange with strawberry cheeks; skin medium and rather strong.

3rd. The Manila, which is said to be the same as the Philippine of Cuba; ripens early; flat fruit; tapering; long; fibres very weak and scanty. Color, lemon or a little darker. It ripens about the same time as the pineapple, and many hybrids, and all intergradations were seen, but the two types are very distinct. Skin very thin but tough.

4th. The Apple-apricot group contains a number of named varieties. The tree is of a low, spreading growth. Leaves rather short. Fruit ripens late. Very full at sides. Very short. Stigmatic area well up on ventral side. Color uniform yellow; between orange and lemon. Fibres very coarse and strong, though scattered. Skin thick and tough.

5th. Bombay, including mulgoba. Late ripening; fruit short for its diameter; sides very full; stigmatic surface well up on ventral surface; frequently grooved along lower portion of ventral surface; fibers scant and very weak; confined mostly to ventral and dorsal sides; skin very thick; not leathery; ground color, green turning to yellow with rosy cheek. The tree is a vigorous grower and is between upright and spreading, and the leaves are rather small and rigid with the veins prominent.

AVOCADOS.—For a money crop in the sub-tropical region of Florida, this has a very promising outlook. During the last five years a very great amount of work has been done in systematizing the varieties and in working up the methods of propagation. In connection with this work, I may be allowed to say that among the avocados as among the citrus varieties, we strike some that are particularly difficult to bud, and others that take very readily. Buds of the Chapellow avocado live with the greatest ease. The Trapp avocado does so somewhat less readily; the Pollock buds fairly easily, and the Baldwin requires considerable attention to work well. The family avocado is one which begins to ripen in July, and continues to ripen its fruit until late in October and November. It should not be planted for commercial purposes, but is one well-adapted to having at the home place.

TRANSPLANTING.—Lately a great deal has been said about the difficulty of transplanting avocados. Just why this should occur, I do not know. I know that a certain disease occurs upon the young trees, which is especially apt to strike in at the point where the stock is cut off. This difficulty can be avoided to a considerable extent by waxing over the stock at this point when it is cut off, or by painting it over. Then the shock of transplanting is apt to prove somewhat severe and the tree apt to die back to the bud. In my own field there seems to have been no difficulty in planting avo-

Mango Culture in Porto Rico

By J. F. Bergen.

Taking advantage of your kind invitation to give my views on the fancy mango question through your columns, for the benefit of our horticultural friends, I will endeavor to do so as far as my knowledge extends in that particular line.

The propagation and raising of the East India, Ceylon or fancy mango, to an extent which might be called commercial, is as far as I can find out a very recent industry in the United States, a few being raised by planters in Southern Florida. I have every reason to believe that mango raising will be one of the leading, if not the leading industry in our tropical and semi-tropical climates. They are particularly adapted to the conditions of soil and climate in Porto Rico and grow remarkably fast, much more so than any I have seen in Florida. During my limited residence in Porto Rico it has been practically demonstrated in our nursery at Bayamon what can be done by proper cultivation and care, and a cordial invitation is extended to any of our horticultural friends interested in mango culture to call and see for themselves.

Five of the rare varieties have fruited in the United States, but I have eaten the Mulgoba and Sundusha varieties in Florida and they are certainly delicious—the word does not really describe the flavor. Their freedom from fiber and the absence of the unpleasant turpentine flavor so often found in the native mango, together with a firm, smooth flesh that can readily be sliced with a knife, are recommendations which place them far in advance of the common varieties. Of the flavor, I can only say it is "indescribable."

Last September Mr. Marsh, of Miami, Fla., received $27 net per crate (orange box size) for Mulgoba mangoes. Mr. J. B. Beach, who is engaged in propagating fancy mangoes in West Palm Beach and Indian River, writes me that mangoes on the original Mulgoba mango tree, owned by the Rev. Mr. Gale, were sold on the tree to New York fruit dealers at 25 cents each. I quote from the *Tropical Sun*, of West Palm Beach:

"Mr. Geo. Gale, of Mangonia, two miles from West Palm Beach, shipped two crates of Mulgoba mangoes to New York on Wednesday. There were eighteen in each crate, some of which weighed seventeen ounces each. Mr. Gale received $4.00 per dozen for the mangoes here."

And the following from the *Miami Metropolis*:

"Three dollars a dozen for Mulgoba mangoes! It sounds fabulous, but they are worth it, and that is what the few growers in Dade county are being offered for them, with no possibility of supplying a fractional part of the demand. * * * Many of the orders are accompanied by checks to cover the shipment f. o. b."

In our nursery we have some varieties said to be much more choice than the Mulgoba and embracing several new varieties received through the courtesy of the Department of Agriculture and two shipments received direct from Ceylon. People who have traveled and resided in all parts of India say that the latter varieties were the most delicious they had ever eaten.

Mangoes are shipped from Bombay to London, a trip of twenty days, in cold storage and arrive in very good condition, bringing very remunerative prices. Now that some of our steamship lines are introducing cold storage to a limited extent, they can be sent from here to the United States safely.

I have seen fruit from young Mulgoba trees in Florida at the age of three years and there is no reason why they should not do equally well if not better in Porto Rico. Quite recently we had blossoms on seven trees which were transplanted sixteen months ago from six-inch flower pots. They range in height from six to seven and a half feet and five to six feet wide at the top. This speaks well for the Porto Rico climate.

The Department of Agriculture is now considering ways and means of introducing them generally in Porto Rico after fruiting and classifying them. This will, of course, take some time, but when it becomes known that they head the list in the fruit line as money makers, they will receive much attention. With the able and highly trained corps of specialists we now have at the Mayaguez Experimental Station, we may feel assured of rapid strides in horticultural work in Porto Rico. No obstacles should be placed in their way, as they will assuredly be of much service to us in many ways.—*From the Porto Rico Horticultural News.*

A NEW VARIETY OF MANGO.

UNITED STATES DEPT. OF AGRICULTURE,
BUREAU OF PLANT INDUSTRY.
WASHINGTON, D. C., July 11, 1908.

Messrs. Hickson Brothers, Miami, Fla.

DEAR SIRS—Yours of the 27th ult. and the four specimens of the Cecil mango were duly received. We held them until they were fully ripe and then had a model and painting made of one of the best specimens for placing on file in our office. This mango I consider among the very *best*, a very choice variety. Just now we are getting in a number of varieties from Southern Florida, some from the Reasoner Brothers and some from the Miami Experiment Station, but so far I have not found any of them quite as good as the Cecil.

Please accept my hearty thanks for your kindness in sending the specimens. If at any time I can reciprocate your favor I shall be glad to hear from you.

Yours very truly,

G. B. BRACKETT,
Pomologist.

The above letter speaks for itself. Messrs. Hickson Brothers, of Miami, Fla., are the originators of this variety and are propagating it on a large scale. Last year the Cecil met with so much favor that Messrs. Hickson Brothers sold all of their inarched plants and did not have enough to supply the demand. Many who have tested the Cecil say that it is superior to the Mulgoba. Almost every year new varieties are being tested, but many of them have no merit over the old-fashioned fruit that is grown on every plantation. There are a few varieties of the mango that are a marked advance over the wild or bush fruit, among them being the Cecil, Mulgoba, Bennett, etc. The mango will become a close competitor to the peach, the mango having one great advantage over the peach, as that fruit is grown to a greater or less extent in almost every State in the Union, while the mango is confined to the tropical portion of Florida, making the area where it can be successfully grown very small. From West Palm Beach south to the end of the mainland and on the Florida Keys the mango is grown and yields even a better class of fruit than trees in their native country.

The Mulgoba Mango, Queen of Fruits

By WILLARD L. BRAGG

Destined to be One of the Big Florida Money Makers—Cultivation Rapidly Increasing.

The only portion of the United States where tropical fruits can be grown is in the southeastern part of the peninsula of Florida. Here is a truly sub-tropical climate where the tropical sunshine of the equator can be enjoyed without actually passing the Tropic of Cancer. This is due to the vast body of warm water of the Gulf stream flowing northward along this favored coast, 60 miles wide and hundreds of fathoms deep. It warms the blizzards of winter and tempers the heat of the sun in summer. The temperature of the water is 76 degrees, and when a heated term scorches the Mississippi valley, the cool trade winds coming in over the Gulf stream and the coast keeps the air well down in the low eighties, while during the winter northers it warms up the air and takes out the frost.

The soil of this section is sandy, but is particularly adapted to the growth of the pineapple, the mango, the avocado pear and citrus fruits. Where the muck deposits are found all sorts of vegetables are at home in the winter, thanks to the climate. From January to May the farmer is shipping string beans, tomatoes, eggplant, peppers, potatoes and other crops, together with oranges, grapefruit and limes. Following this the pineapple season begins, and when that is over comes the season for mangoes and guavas, followed by the avocado pear, and these last are just as valuable and standard a fruit as the pineapple, banana or the orange. But the mango (the queen of all fruits) has never as yet been placed on the markets of this country, although England has been enjoying them for some years shipped via Suez canal from India. The reason for this is not that this country cannot grow the mango, but from the difficulty of propagating true from this choice fruit.

Inarched Mulgoba Mango Two and One-Half Years Old. Spread of Tree 12 Feet. Trunk Three Inches Diameter. Note Size of Old Stump of Common Mango and Small Stock of the inarched Mulgoba that was Planted at Side of Old Tree and Inarched into a Sprout from the Old Tree Stump.

Mangoes grown from seed are nearly worthless, being of inferior flavor and full of fibre, with generally a turpentine flavor. These trees are grown plentifully all through the West Indies and are an article of food for both man and beast, but they are not of a quality that would command much respect in the Northern markets. There are trees of the common variety near West Palm Beach that are three feet in diameter, and in Cuba and Porto Rico are trees four feet through and sixty feet tall whose yield is enormous, and they stand all sorts of vicissitudes and are entirely proof to the insects that affect the orange. They are sometimes hurt by an unusually severe winter, but the size of our oldest trees proves that they are at home in this section. The original home of the tree is India, and there for hundreds of years the fine varieties have been propagated by inarching. It was the mango tree that saved so many lives during the great famine in India some years ago, as by its tremendously long tap root it was able to reach water and keep green when everything else was dried and shrivelled by the sun and barren of fruit.

Many years ago the common mango was introduced into Dade and Monroe counties by people migrating from the East India Islands to this tropical section. Around every old home there are more or less mango trees planted out like the forest trees, which have borne large crops of fruit year after year with almost none or, at best, very little attention, which demonstrates beyond question the adaptability of the mango to this climate. In the original plantings there were as many varieties as there were trees, and many of them were designated as "the old turpentine" mango. In size, color and shape they differ greatly, some being round, others flat and others oblong. In color they vary from a dead black green to a handsome bright yellow, with checks of red and pink. Nearly all of the "native" varieties are filled with a strong fibre which is attached to the seed, but this objectionable quality is eliminated in the standard sorts, the principal varieties of which being the Mulgoba, the Soondershaw, the Gore Alphonse, the No. 11, the Philippean, and other imported from India by the Department at Washington, and the fruit of these choice propagations is several times larger than the common variety, is of exquisite flavor, has no fibre, and can be eaten with a spoon. It is not uncommon for a Mulgoba mango to weigh from eight to fourteen ounces. One of the first of the Government importations over twenty years ago was a Mulgoba which

AVOCADO PEAR AND MANGO TREES BEST IN THE STATE.

The grove of George A. Gale, situated one and a half miles north of this city, contains some of the best fruit trees to be found in Dade county, or for that matter in the whole United States, when it comes to the particular variety.

Here at "Mangonia," on Mr. Gale's place, is growing the original Mulgoba mango tree, grown by his father, the Rev. Elbridge Gale, from a pot plant imported by the Department at Washington a number of years ago. The tree has a spread of some thirty feet, and with its waxy green leaves, its thrifty new growth of pale green, and the large, pink cheeked, delicious looking mangoes peeping out of the dense mass of foliage here and there, the tree is a picture beyond compare.

In another part of the grounds there is a row of seedling mangoes that are forty feet high and with a spread of an equal amount. These trees have trunks two and a half to three feet in diameter, and are loaded with fruit, not the Mulgoba, but a splendid quality of the natural fruit, so called, and which meets with a ready sale in the local markets.

The pride of the place to Mr. Gale is his magnificent avocado pear trees, one of which a few years ago bore a crop of eleven hundred pears and brought them to maturity. This tree is a heavy bearer every year. There are a large number of these trees and they produce a handsome income each year. Last season Mr. Gale sent some of his pears to Denver, that sold from 75 cents to $1.00 each.

Mr. Gale has a large grove of young trees, Mulgoba, Soondershaw, and others of the superior sorts of the mango, and many avocado pears, so that in a few years he will have a fruit plantation that will not only be a delight to the eye of an horticulturist, but an income producer of no small proportions.

Other men in this city have small groves of avocado pears and some mangoes, as well as grapefruit and oranges, and a visit to the properties of Mr. Gale, George Potter, Capt. G. C. Matthams, Fred S. Dewey, E. W. Burkholder, T. J. Grier, and many others, will convince the most skeptical of the adaptability of our rich soils for the cultivation of fruit, a business that can never be overdone, and one that will insure a steady income after the trees come to bearing. In the planting of trees it is surely a case where "time is money," and the man who plants fruit trees today is sure to reap the reward of wisdom.—*Tropical Sun.*

THE AVOCADO A MONEY MAKER

Dr. Wetzel of Cocoanut Grove, who has a fine orchard of Trapp avocados, has just closed out his crop at $8 per dozen f. o. b. Miami. Dr. Wetzel has had a good local demand for his fruit in this city, for which he received from 75 cents to $1 each.

Dr. Wetzel will clear and plant another five acres during the summer months.

One of the greatest difficulties the would-be planter meets is the scarcity of good budded trees, but this condition is being gradually overcome by the nurserymen. The Trapp avocado is probably the most profitable fruit grown in this southern section, or in the world.

The avocado tree is a hardy tree in tropical portions of the country, but will not thrive in parts of the State where frosts are liable to fall. In Palm Beach and Dade counties there are avocado trees that are thirty or more years old and hold good crops of fruit each year. This is absolute proof of the tropical conditions which prevail in the southern portion of the East Coast of Florida.

PLANTING AHUACATE SEEDS.

By Dr. F. Franceschi, Santa Barbara.

Plant them as soon as received. They will retain their vitality only for a short time.

Redwood sawdust mixed with one-fourth clean sand will make the best rooting material. If this is not available, sifted leaf mold with sand will do, or any other material which will be porous and will allow free expansion of the roots. Manure should be avoided; it may cause decay of the young roots.

Boxes about six inches deep should be used; if too deep, more difficulty will be found in transplanting.

In whatever season the seeds are planted, it should be done under some shelter: either under glass, under cloth, or in the house; in order to insure an even temperature and a more uniform degree of moisture.

Seeds should be planted one inch apart, with their pointed end standing a little above the ground. Boxes must be kept moist, but they must have good drainage.

Within three to five weeks germination will take place, the roots plunging downwards from the base of the seed, while the two sections of same will be split open by the fast growing plantlet. Sometimes two or more sprouts will emerge from one seed; only the strongest should be left, except when found that each one has developed an independent system of roots.

When the seedlings will have developed four to six leaves, it will be the right time to transplant them, before the roots grow too long and too much crowded in the boxes. This can be done either in pots, boxes or cans, always employing good garden soil.

Three to four months after having been potted, the seedlings should have grown strong enough for transplanting in the open ground, where they are sure to grow well under ordinary care. When about one year old they will be ready for budding or grafting.

: : Mango Culture in Florida : :

For the past few years there has been much written regarding the cultivation of the mango, and the industry has made a rapid increase, yet the increase in production has not kept up with the increase in the demand for the finer varieties, and it will be many years before the demand can be supplied. Each year the mango has become more popular with the wealthy classes throughout the North. There was a time when the demand for this fruit was confined to the Latin races, or those who had been brought up in the countries where they are grown. In Cuba, Hawaii, and many other of the tropical islands, the mango is one of the chief reliances for food during its fruiting season.

The original settlers in the Biscayne Bay country came from Nassau, where the mango is grown extensively. On coming to this new country the seed of this fruit was brought with them and planted, and it was found that the trees grew much more rapidly than in Nassau, and come into bearing earlier. Around all of these old places groves of old trees are found, and almost yearly they bear heavy crops. The greater portion of these old trees are those that are known as the "turpentine mango," all having been grown from the seed. There is a great difference in the quality of the seedling mango—some would be classed as fair, others better, and others best, but we have never tasted a mango that would be termed "worthless."

Many years, or rather, several years ago, the United States Department of Agriculture, through its agent, recognized that the mango was destined to become as popular with the masses as the peach, and commenced importing the better varieties, such as the No. 11, Mulgoba, and other choice varieties, and as soon as possible began distributing the trees in this southern portion of the State.

The late Elbridge Gale, of Palm Beach, was among the first to secure a Mulgoba tree from the department. This tree is alive and bearing annual crops of the luscious fruit. So far as the No. 11 is concerned, we do not know of a single original tree in Dade county. Thousands of the seed from the No. 11 have been planted, and in some instances trees have been known to fruit a mango resembling the original tree.

The greatest objection to a large number of the seedling mangoes is that there is a strong fiber which is attached to the seed, running completely through the flesh of the fruit. Many of these seedlings in richness and flavor are equal to any of the finer varieties.

The beautiful residence of T. A. Snider at Hobe Sound, built of Coquina rock.

The new varieties which are being introduced have no fiber, and we are told that the Department of Agriculture has introduced a seedless variety, and if this fruit proves to be of good flavor it will undoubtedly become extremely popular.

NEW VARIETIES.

Almost every year young seedling trees are coming into bearing, and among them are some most excellent fruits, with an entire absence of fiber. A few days since Mr. M. S. Burbank, of Orange Glade, placed a number of fine specimens of the mango on our table, requesting us to test them, which we did, to our entire satisfaction. The fruit is probably from a No. 11 seed, as it resembles that variety very much in shape, flavor, color, and texture, yet with an entire absence of fiber. We were simply delighted with the fruit, and, to make sure that we were not over-estimating its quality, we called in several people, and their verdict was the same as our own, that it was "one of the best yet." It is an unusual occurrence for a fruit tree to bear the first year a really good specimen, but this was a variation from the general rule. This mango should be propagated and named the "Burbank," after the originator.

A Mr. Seybold, who lives south of Miami, has one seedling mango that is worthy of classification and propagation. For years to come many seedling trees will bear fruit worthy of propagation, and those who have young mango trees should give them the best of care and attention, with the hope of bringing out a fruit of superior quality.

For a commercial orchard, no one should think of planting seedlings, as the fruit on this class of trees are unlike in quality, appearance, flavor and value. Our advice is plant the best known varieties.

A FEW OF THE KNOWN OR BUDDED VARIETIES.

So far, the Mulgoba stands at the head of the list as a market fruit. It is said by those who are growing this variety, that the tree is inclined to be a shy bearer; but this difficulty may be overcome later. At this writing, a few Mulgobas are being shipped to fancy fruit dealers in the North, and there are more orders already booked at $3.00 per dozen than can be filled.

The Fernandez, Gen. Gordon, and Bennett, are imported varieties, and all are splendid fruits, and will bring fancy prices in the markets. The Perrine originated at Cutler, in Dade county, and is classed among the best of the Mango family.

The Sundersha is another imported variety. The fruit is very large, with but little fiber. This mango was imported by the United States Agricultural Department. At the experimental station, in this city, they have one Sandersha, which fruited last year, and is holding considerable fruit this season. There seems to be quite a difference in opinion in regard to its merits. Some pronounce it one of the best varieties yet fruited, while others class it as inferior to some other varieties. It has one or two meritorious characteristics. The tree is a good bearer and the fruit is large. We tested the fruit last season, and our opinion is that it is equal to the Mulgoba, but tastes differ.

THE AVOCADO OR "ALLIGATOR PEAR"

[The following article by Messrs. Hickson Bros., of Miami, Fla., who are extensive growers of the avocado, is worthy of reading by every one and especially by those who are interested in fruit culture. The article in part, is from letters from the Department of Agriculture, written at the request of Hickson Bros., and part from an article appearing in the *Miami Metropolis*.]

The avocado or more commonly known as the "alligator pear" is an old fruit that is recently being brought to the front as a new fruit and from its many fine qualities is fast forging its way to the front in the Northern and Western markets, while at home it has become, during the season, a part of the daily diet of by far the majority of our people; some have to acquire a taste for it but when once acquired the desire for it is so great that we will have it no matter what the cost, and become an "alligator pear" enthusiast.

The food value of most fruits lies in the sugar and organic acids contained in them. The avocado, however, is usually free from sugar and contains no acid; on the other hand, it is very rich in oils, containing from eight to nearly twenty per cent; the only other fruit which can be compared with it in this respect is the olive. In the olive, however, owing to the methods used in pickling, this oiliness is concealed and the vinegar often leads one to think that olives are an acid containing fruit, whereas, like the avocado, it naturally contains no acid. The oil contained in the avocado is as easily digestible to most people as the purest olive oil and is extremely nourishing.

The avocado ought to be (and this is borne out by the reports of many who know), a very good fat-producing food, especially in the cases of people who are physically run down by the ravages of disease.

Wherever the fruit is known it is classed along with salad fruits; it is not a juicy fruit and in its natural state resembles cheese. Navigators, many years ago, called it "midshipman's butter."

The earliest account we have of the avocado is by Hughes, in the West Indies in 1672. He describes a hard-skinned variety, but so far as we know this type does not exist today. Hughes say of the avocado: "I think it to be one of the most rare and most pleasant of fruits; it nourisheth and strengtheneth the body, corroborating the vital spirits and procuring lust exceedingly; the pulp being taken out and macerated in some convenient thing and eaten with a little vinegar and pepper or several other ways is very delicious meat."

It would appear from the description of the fruit given by this eminent authority so long ago, that the avocado is the affinity of the grapefruit, designated by the botanists as the "forbidden fruit," because of its elements to corroborate the vital spirits.

Following are a few methods of using the avocado, the first, a Cuban method:

The fruit is halved before sending to the table and cut across with a sharp knife into little grooves into which the dressing will run and thus penetrate the flesh; then salt, red pepper, and possibly a little cinnamon is dusted over it. Next, two tablespoonfuls of prepared mustard, a tablespoonful of vinegar and two of oil are poured into the halves, a piece of ice placed thereon and the fruit set on the ice that it may be first thoroughly chilled before serving.

A Mexican method is to serve the fruit uncut, to be halved at the table. The pulp is then rubbed smooth as butter with a spoon, and lime or lemon juice added, with oil (one tablespoonful of acid to three of oil) and a dash of pepper and salt. By some, the addition of a little sugar is preferred. This is eaten with thin slices of bread.

The avocado may be combined with water cress, a little chopped onion, radishes, cucumbers, lettuce, beets in varying combinations, but always with the French dressing of oil, vinegar, salt and red pepper. The fruit may also be simply sliced, with vinegar, salt and pepper dusted over it. A delicious salad is made by simply cutting the pear into cubes about one-half an inch in size, and pouring over it mayonnaise or any other good salad dressing. For a breakfast fruit, it is halved and eaten with a spoon from the skin with no condiment, or, if preferred, with salt, vinegar or lemon juice. Care should be taken that the fruit is ripe but not overripe.

The increase in the consumption of the fruit in Miami alone is sufficient to encourage growers of the avocado to extend their orchards as fast as possible; indication also points to a fast and increasing trade throughout the Northern and Western cities; the demand for the avocado promises to be more rapid than did the first introduction of the grapefruit. This is one of the coming fruits and he is wise who looks to the future.

I have a few orange trees infested with scale. How may I fumigate, as I am not located where I can obtain services of professionals?—Subscriber, Pasadena.

The only requirement is a perfectly tight tent or other enclosure that will hold the gas for an hour or more. Then secure a good quality of cyanide of potassium and sulphuric acid. Use in proportions of one ounce of cyanide, one ounce of sulphuric acid and three ounces of water. The acid and water should be placed in a vessel under the tent after it is arranged so as to be practically gas tight, then at the last moment drop in the cyanide. Use in the proportion of one ounce of cyanide to each 100 cubic feet of space. The work is to be done at night, or at least when the sun is not shining. It done in the early part of the evening and allowed to remain over night no harm is done. This strength is sufficient for black scale. For purple scale or mealy bug a 25 per cent. stronger dose may be used.

MEXICAN FRUITS.

Consul A. J. Lespinasse of Frontera, reports that the mangoes in Tabasco are said to be the finest in Mexico. The several varieties are grown in limited quantities, as they are not cultivated for the export trade.

The Manila variety, introduced there, is fleshy, of a golden color, and delicate flavor. Among the domestic varieties several kinds are highly esteemed by connoisseurs, owing to the peculiar blend of delectable flavors they impart when eaten. If sliced and put up in heavy syrup, as suggested by a New York firm, they would no doubt be greatly appreciated in the United States.

The mango season begins about the middle of June and ends about the latter part of July, but small quantities of late mangoes are obtainable up to the latter part of August. Three Manila mangoes measured and weighed in this consulate gave the following results: (1) 14 ounces, 4¾ inches long, circumference 9¼ inches; (2) 11½ ounces, 4⅝ inches long, circumference 9 inches; (3) 10½ ounces, 4⅛ inches long, circumference 8⅞ inches. After deducting about one ounce for the seed or kernel and about one ounce for the rind, and accepting eleven ounces as a fair average for the large size, there would remain nine ounces of clear pulp for canning purposes. The regular run of selected mangoes, both Manila and domestic, would be about eight ounces for the former and six ounces for the latter, and at beginning and middle of the season can be bought for $1.50 gold per 100 at wholesale for Manila and $1 per 100 for the domestic.

Mango culture in an amateur way has commanded some attention from a few specialists and plant lovers in Southern California, and in the thermal regions has proven successful in a limited way. There are a few trees in and about Santa Barbara, the Cahuenga Valley and other similarly

THE AVOCADO

The avocado is comparatively a new product of Florida so far as the average American citizen knows, although it is not a new product in the world by any means, having been grown in Cuba and the West Indies for a number of years. The avocado is really a vegetable growing on a tree, having the shape and appearance of a giant pear, from which appearance it has evidently acquired the incorrect name of "avocado pear" or "alligator pear," a name which to the uninitiated invariably creates the wrong impression, an impression that in some cases is damaging upon the first introduction of the fruit to the individual.

When we speak of a pear the mind instantly imagines a juicy fruit similar to a Bartlett or some other kind of pear. We immediately decide in our minds that it is a large, juicy fruit similar in every way to a Bartlett pear and with some delightful quality of flavor or flesh to which we are as yet strangers. Now this impression is entirely incorrect, because the avocado is not at all like an ordinary pear, other than in shape. It is a heavy meated fruit, surrounding a very large center seed and does not taste like a pear and is not juicy. Just what it is like or what it tastes like would be hard to describe, and it is only through the experience of eating that one can get an idea of its delightful qualities.

Ten or twelve years ago peddlers in New York and other large cities sold the first grapefruit that appeared on the market for "big oranges," and the following day the housewives were out looking for the peddlers with broomsticks and hatchets, all because of a misrepresentation. But today, however, the grapefruit has taken its proper place as one of the leaders of the citrus fruit family and is an indispensible adjunct to millions of breakfast tables. A similar misrepresentation is built up in the mind of the uninitiated when the avocado is sold to him as a pear, but, contrary to the experience of the first eaters of the grapefruit, the eaters of the avocado will not look for the man who sold it to them with a hatchet, but with money to buy more.

The avocado is one of the best, if not the best, of all tropical fruits. It is very easily digested, is most wholesome and nourishing. According to government statistics it contains over ten per cent. of fat and in a form uninjurious to the most delicate digestion, and people who are unable to partake of fat from animal sources will be able to eat the avocado without injury. It is an upbuilder of the system, with as to nerves as well as muscles, and is a splendid regulator for an unruly digestion and it requires but little coaxing of the palate for one to become extremely fond of it.

The avocado is served for eating in many ways. It can be eaten and is eaten by a great many people with relish just as it comes from the tree, and it is the best when eaten as a salad and can be prepared or served with any and all kinds of condiments, according to one's taste. It has an affinity for and welcomes olive oil, lime or lemon juice, or may be eaten with pepper, salt and vinegar.

A favorite way of handling the fruit is to cut it in half longitudinally, remove the seed and serve within the outer skin, and eaten in the manner best liked, with any of the above mentioned condiments. It has been said that the avocado makes the basis of more salads than any other known fruits, salads the finest that ever tickled the palate of an epicure, and it has the great merit that it can not be spoiled.

The late Charles B. Jefferson deemed the avocado the best of all fruits, and in his grove at Hobe Sound and in the grounds about his winter home at Palm Beach he has a great many trees. He once said, when asked in regard to eating the avocado: "It is friendly alike to olive oil, lemon or lime juice and a little mustard or pepper sauce will bring out its most delicate flavor, but the best way to enjoy an avocado and the way that I prefer is to secure a fine specimen just ripe enough to yield gently to a pressure of the thumb, sit on the kitchen steps, split the fruit in halves, lay aside the big round seed, tenderly scrape out the inside lining with a silver spoon. Squeeze a little lime juice in the globular cavity, just a sprinkle of salt, gouge out gently a heaping teaspoonful of the meat, place in the mouth and let it dissolve under pressure of the tongue against the teeth, swallow the resulting paste unctuously, when you will close your eyes with thankfulness. Then when the delicious impression upon the sensory nerves begins to fade away repeat the operation and so on until nothing is left but the thick skin of the avocado."

One-half of a good-sized avocado is enough at a time and may be taken before, after or with meals. The taste is good, the effect is good, the only necessary precaution being not to eat too large a quantity.

This fruit shou'd be carefully investigated by all physicians on account of it nourishing and digestible qualities, and from the fact that to those who are acquainted with the fruit it is known to be one of the best remedies for constipation they have ever known, and on this ground alone it will fully recommend itself to the American people.

STRANGE FRUITS FROM THE TROPICS.

The Malayan countries form the Garden of Eden for queer and little known fruits. Their very names sound as though Lewis Carroll had invented them as provender for his Jabberwock. How many Americans have ever heard of, let alone tasted, the bilimbing, the langsat, the luing, the mandaroli or the rambs, which last grows in bunches and reminds you of a very large and very sweet grape, although it is not a grape at all?

Then there is the pintawan, as large as a big pear and with its flesh encased in a thick India rubberish overcoat, the flesh itself firm and pleasantly acid. Also the tarippe, than which the breadfruit tree has no finer variety. Then, too, the Borneo fig, which Dr. Beccari describes as "bearing great bunches of fine red fruit," the only fig that is not sweet, but relies on an enchanting tartness to win its way to favor.

In Borneo, too, is grown the guango, which six or eight seeds, "embedded in a sweet pulp," something like a pomegranate. It is a fruit that according to the doctor, "all human beings like and some think exquisite."

King of all the Malayan fruits is the durien, or duryan, the pulp of which has an ineffable flavor, while the smell of its rind is intolerable to civilized nostrils. White men in countries where this fruit grows form durien clubs, so that they can feast on it and confine the smell to one roof.

Queer fruits with queer names that sound like jokes are not confined to the Malay archipelago. Something over sixty years ago the explorer Chapman wrote that in the territory beyond the great Kalihari desert he had found the bododo and he characterized it as "almost too luscious for a white palate." Livingstone told of the maneko of Matabeleland and described it as "full of glutinous, woody fiber and about the size of a walnut." "Really excellent eating," he wound up. He also praised the marula of Zululand, which is like a large stone and hardly any pulp, but with a sweet liquid instead. "simply delicious."—New York Sun.

Some Suggestions from Algeria

By PAUL B. POPENOE

(Continued from August number)

Yuccas are popular in Algeria, the Jardin d' Hamma having an alley of them which is as fine as anything I have ever seen. Most of those grown are of the Y. elephantipes group, although the horticultural names are so confused that it is not always possible to identify a given specimen. Those most in favor are Y. draconis, Y. aloifolia and its horticultural variety variegata, Y. treculeana, Y. filifera and Y. guatamalensis. It has been proposed to secure by selection a desirable fruit from Y. aloifolia, whose fruit has an excellent consistency and flavor, save for its bitterness. This could doubtless be eliminated and it would be good to eat raw as well as preserved although the black pulp is unattractive, resembling axle grease or the flesh of the Mexican persimmon, Diospiros ebenaster.

Dr. Trabut assures me that the flowers of Y. elephantipes have a marked but delicate asparagus flavor, and that they are superior to real asparagus for such purposes as making omelets. He often makes culinary use of them in this way; it is worth trying by anyone who has a yucca of this type and likes asparagus omelets.

Furcraea bedinghausii, a beautiful and vigorous plant, is widely cultivated under the horticultural name of Yucca Parmentieri.

The Eucalyptus has created a great deal of interest in Algeria as a timber tree, just as it has in California and some extensive plantings have been made. So far no species has been found which will stand the climate of the Sahara desert, where timber is most needed, but it does well on the coast and in the mountain valleys. E. globulus is most frequently planted, but admitted by all who know to be inferior. Dr. Trabut recommends E. maculata as the best for timber, while the hybrid E. Trabuti is also widely planted. The deforested regions of Algeria are mostly subject to severe cold in the winter and a temperature of 12 to 15 above zero has killed many E. globulus. The hardiest species for these elevated situations have found to be E. coccifera, E. gunnii, E. pauciflora and E. Risdoni. Even these conditions as was hoped, and the Algerians, like the Californians, have learned that it is no use to expect to make a fortune growing eucalyptus on ground that is worthless, in an arid situation. As to the sanitary effect which the planting of eucalyptus was expected to have, it has proved very disputable, and in some cases conditions have been made worse by the growth of the dense groves of trees.

In the matter of ornamental plants, Algeria has less to teach us than the south of France, of which I spoke in a recent article in the Pacific Garden; for the colonists are busy, practical men who have taken more interest in fruits, and trees of commercial value, than in subjects adapted solely for decoration. When they have progressed, however, they have progressed in what I hold to be the right line—namely, the attempt to create an exotic and tropical appearance, rather than to reproduce the vegetation of temperate regions.

Nothing is more useful for this purpose than climbers, and the Algerians show that they realize it by the number of climbers they have naturalized. Many of them are known here, but not as many of them are common as should be.

The Bougainvillea flourishes just as it does with us, and is more varied, although the species and varieties are horticulturally confused. B. laterita, with brick-red flowers, is considered rather delicate and also has the disadvantage of being a little difficult to propagate. The pale rose of B. glabra and the darker rose of B. spectabilis go well together, while the violet red of B. warcewizii (a horticultural name) contrasts well, and this variety is considered by the Algerians to be particularly vigorous. But the species considered most desirable, for the beauty of its foliage and the abundance and permanence of its flowers is B. glabra sanderiana.

The North American Dasylirions are popular, since they fear neither the summer drought nor the winter frosts. D. longifolium, D. gracile and D. glaucophyllum are the only species I heard of. To return to climbers, let me give a list of those most commonly used in Algeria:

Ampelopsis volnieriana requires some shade.

Argyrea argentea, one of the most vigorous growers known; its red flowers appear in the autumn.

Aristolochia elegans and sipho; Bignonia venusta; the Bougainvilleas I have already mentioned and also B. cypheri, B. Fortunei, and the new variety Maud Chettleburg; Phaseolus caracalla; Lonicera; many varieties of Clematis; Cobea scandens; Dolichos lignosus and others; Ephedra altissima; Ficus repens; Hoya carnosa, of which several handsome varieties are distinguished.

Polygonum baldschuanicum, which sometimes attains a height of 12 feet in two months, and is highly prized for its flowers as well as its rapid growth.

Hardenbergia, Jasminums, Hederas, Lonicera brachypoda, Lotus peliorhyncus, Mandevillea suaveolens, Medeola asperagoides and virginiana, Passiflora edulis, Philodendron, Phaedranthus, Rhyncospermum, Solandra, Solanum Wendlandi (all the Solanums are much more used than in the United States); Stauntonia latifolia with its perfumed flowers and comestible fruit, is much esteemed.

Stephanotis floribunda, Tecoma radicans and several varieties of Volubilis, complete the list, from which I have omitted a few of the most common cosmopolitans.

The coastal plain of Algeria is narrow and many of the finest homes are quite near the sea. This has led to the gradual selection of plants especially adapted to such exposed locations, just as it has in Southern France. The seashore of Southern California is not now as highly prized for fine residences as it will be in the future, but the movement that way has started, and it may be of interest to know what the Algerians consider the best things for such properties.

First I should enumerate the Ageratum of Mexica, a few species of Aloes (particularly ciliaria and saponaria); the dwarf geranium and Petunia. In the line of climbers come Argyrea argentea, Ephedra altissima.

In shrubs I noticed Atriplex nummularia, monumentalis, Duranta, Myoporum, Pittosporum and several Tecomas, particularly capensis.

Araucaria leads the list of trees, for beauty, followed by Phytolacca dioica, Tamarix hispida estivalis, and the indigenous Tamarix africana. These trees will stand all the exposure that can be given.

Gardening in Algeria has not reached such a widespread state of excellence as in Southern France, or even in Southern California. The Algerians are willing to learn, however, and although they are handicapped by a poor soil, they are coming to the front as an artistic subtropical horticulture.

THE MANGOES OF FLORIDA

Description of the Different Varieties Grown in Florida

By JOHN B. REACH

Of the various East Indian mangoes which have come into bearing on the East Coast, the Mulgoba has about ten years the advantage over the others. It is the only survivor of the first importation of trees made by the Government and it is the only East Indian mango in America which has found any recognition in the New York market. The ruling standard market price has been fixed at 25 cents, f. o. b. Florida wholesale, and the supply has as yet never equalled the demand. They are sold by the retail dealers from 50 cents to $1.00 each. It is with one exception the largest of our mangoes that have so far fruited, and very handsome in appearance, with a most delicious aroma and an excellent record for shipping and keeping qualities. Color lemon yellow with a carmine cheek where the fruit is not shaded by leaves, so that one side may get the sunlight. (Mangoes that grow inside the tree where no sunlight penetrates will not develop any red cheeks.)

The second of the mangoes to bear was one of the Alphonse type, which was one of a later importation by the department. The fruit was selected by some gardener or fruit dealer in Bombay as being the best that came into the market there, and was termed Douglas Benett Alphonse, after the introducer, which has been shortened to Bennett by many growers. Its fruit is smaller than Mulgoba, running from eight to twelve ounces, while the former runs from twelve to sixteen. In flavor and aroma as well as other qualities it is equal to Mulgoba, differing enough to make some prefer one, some another according to individual taste. So far as it has been tested it appears to be more prolific than the former, and we presume as good a shipper, though it has not had the same test of time to determine. This is the only one of the famous Alphonse type that has fruited with us as yet, but we are eagerly looking forward to the Goa Alphonse which should soon produce fruit.

There were four Hindu students from Calcutta, who were graduated from an Indian university, and were taking post graduate courses at Cornell, who made a trip down this way two summers ago. They had letters of introduction from Washington to people at the various places they were booked to stop off, and among others one to myself. When I took them into my mango corner, they observed the characteristic long foliage of the Alphonse and naming it, spoke of it as the finest of all the mangoes. And when questioned further on the subject assured me that the Goa was the finest of all the Alphonses.

Fernandez is a small fruit, with a bright red cheek, and small seed. It is the only one of the imported sorts so far that has a distinct sub-acid flavor. Some specimens are so absolutely free from fibre that by making an incision around the centre of the fruit, the bottom half of the pulp with the skin can be slipped off from the seed, just like a freestone peach. It has a very distinctive foliage, and is further distinguished from all others by a whitish bloom which covers the new bark so long as it remains green, disappearing only when the latter turns brown with age. This can be rubbed off, however, though it is more persistent than the bloom found on some kinds of grape, which it very much resembles in appearance.

Totafari is another of the Washington importations which has proven a good fruit. It is about the size of Bennett, but has not the same aroma or flavor, still it is a very desirable and valuable acquisition. Weight eight to ten ounces. Rather long and pointed at blossom end. Much like Sundersha on smaller scale. Cambodiana, also from Washington, is much like the above, but not so pointed and both are free bearers.

Amini, also from same source, has produced fruit as free from adhesion as Fernandez this year, and of excellent flavor. The shape is more nearly what is most desired for a market fruit, *i. e.*, it approached more nearly to the spherical than any of the above mentioned. It is very thick and very short, with no noticeable point at blossom end.

Rajah Purri, sent out from Washington at the same time, has produced a heavy crop this year, while all the other bearing mangoes, including the old native seedlings, have been very shy, and made less than one-third of a crop. It weighs from seven to fourteen ounces, seventy-five per cent of all the fruit weighing ten to eleven ounces, and is more near to the globular in shape than any other of our mangoes. It has a fine aroma and flavor, which are distinct and peculiar to itself, preferred by many to Mulgoba or Alphonse. Yellow with delicate pink cheek where exposed to the sun. As nearly spherical in shape as a mango ever is.

There is a grove of about 100 trees grown from seed of Philippine mango west of Miami, which are bearing, and among them is one tree which is free from fibre like the East Indian sorts, and almost seedless. Most of the seeds are merely shells with no germ inside of them. The grove was planted by Mr. Samuel Belcher, and is now the property of Hickson Bros. They have named this seedling "Cecil."

Perrine is the name given to a seedling found on the Perrine Grant, which is very prolific, and free from fibre, which however lacks the aroma and flavor of the East Indian sorts. It is, however, well worth cultivation.

We are eagerly looking forward to the fruiting of other new sorts, among them Goa Alphonse and Gola, and trust they will materialize next summer. As it is now we have a fine collection of fibreless and high flavored mangoes, but all except the Sundersha ripen at about the same time. This latter produces an enormous fruit, averaging from twenty to thirty ounces, and last summer I weighed one which tipped the beam at forty-four ounces. It has been bearing for three years, beginning the third year from the graft, and setting all the fruit that the size of the tree would permit it to sustain. It is long and curved, somewhat after the manner of an S, with a double curve and pointed at both ends, being widest and thickest in the middle. The seed is comparatively small for the size of the fruit, and it matures five to six weeks after the last mango of other sorts is gone. The flesh is firm, and of excellent flavor, and free enough from fibre to be eaten with a spoon. Altogether it is a tree that every person should have in his back yard for home use, coming as it does so long after the season for others is past and gone.

Carissas

Several members of this family of plants have been in cultivation for years in this Southland, chiefly because it is an evergreen, and for its pure white fragrant flowers. If a fruit or two set and matured the gardener was happy and thoroughly satisfied, never even dreaming that in its native habitat it is one of the most highly esteemed fruits grown. All the plants grown in California are seedlings and, like seedlings of most fruit bearing trees and shrubs they have varied in character. Some are sterile, others bear fruits, and a few, a very few are prolific. We have met with but one of the latter sort about Los Angeles and a number of them at San Diego, from whence have come the fine displays of fruit that have been made at the several flower shos in recent years. It is a native of Africa from Zanzibar to the Cape and has proved its adaptability to the climatic of this coast, therefore it is time for nurserymen to wake up and propagate it by layering, or from cuttings and give fruit growers, plants that are true to type, prolific bearers of the largest fruits. It is easily propogated by the methods named, and planters should not protest if they are charged a dollar for a pedigree plant of the same size of a seedling that may be had for ten cents. It is a low growing subject, densely umbrageous, the foliage leathery in texture, dark green, and has theappearance of being varnished. The fruit is about the size of a damson plum, red in color, and contains a few very small seeds. It is delicious and, a remarkable feature of it is, that the juice is the color of milk. Whether the one we grow is the specie known to botanists as, Arduina or grandiflora, is not yet positively known. The name does not matter so much as to get a plant that will bear an abundance of its delicious fruits. It belongs to the tribe or natural order; Apocynaceae. If the San Diego brethren will bestir themselves and get up a stock of paints propagated from the most prolific plants growing there they will be public benefactors and in so doing will also add to their bank accounts. Incidentally the Pacific Garden will say right here that the majority of nursery men on this coast are content to plod along in the same old path that they have been traveling for years.

The citrus fruits, the decidious fruits, and grapes, is about as far as they seem to get. There are single trees of the Avocado in this Southland that have been more profitable to their owners than the average acre of citrus fruits. Japan Persimmons is another fruit that has been more profitable than citrus fruits, yet it is doubtful question whether a hundred of the last named trees could be found in the state that have been propagated here. Another fruit that sells for twice the price of oranges here and in the East is wholly unknown to the majority of our nurserymen, and that is the fine varieties of the Pomegranate. The measely little things that find their way to our markets are seedlings grown in back yards without any attention, yet sell for 15 cents per doz. Seedling Fiejoas are also very uncertain bearers, some indeed seem to be barren, yet there is not a tree to be had that has been propagated true to type in all this state. It is about time that nurserymen on this coast were getting their eyes open to the great possibilities of the state as a fruit producer in healthful and profitable varieties yet unknown to the majority of them.

WHY THE TRAPP AVOCADO

Mr. W. E. March, of Miami, was among the first, if not the first, to recognize that the Trapp avocado, owing to the lateness of its maturing, would become a most valuable fruit for commercial purposes. He backed his judgment by planting a commercial orchard on his place south of Cocoanut Grove. Time has proven the foresight and wisdom of Mr. March. While waiting and caring for his budded trees he has not labored and waited in vain. Last year his young trees brought him some fruit, which he sold at fabulous prices. This year his trees bore more heavily and now he is reaping the reward of his labors and expenditure of money. Recently Mr. March submitted an account of sales for his trial shipments and asked THE HOMESEEKER editor to look them over.

The first account of sales was from Van-Dyke & Lindsey, of New York, which read as follows:

2 crates Avocados	$22.67
Express	$4.78
Commission	$2.27—$ 7.05
Net proceeds	$15.62

No. 2.

Hicks & Son, New York.

2 crates Avocados	$24.00

This was net, without freight or commission.

No. 3.

J. Gott & Brother, New Orleans.

2 crates Avocados	$25.00
Freight and Commission	5.30
Net proceeds	$19.70

These sales mean a little less than $10.00 per crate f. o. b Miami.

It is reported that Mr. S. B. Bliss, who owns the largest Trapp avocado grove in the world, has already shipped 150 crates, for which he has received $12.60 per crate net.

Mr. March also informed us that he had received from two houses in Havana an order for all the avocados he could spare at $1.80 per dozen, f. o. b Miami.

Messrs. Hicks & Son, in a note below their account of sales, said "Bill out all later shipments at $4.80 per dozen, f. o. b. Miami."

The Trapp avocado is the latest variety known and is called a winter fruit. This fruit was originated by a Mr. Trapp, Sr., who settled at Cocoanut Grove many years ago. This fruit was discovered by a horticulturist of Miami, who commenced propagating it by budding and during the past few years has produced thousands of strong sturdy trees. The planting of the budded varieties has necessarily been slow, on account of the difficulty in producing them.

The avocado was practically an unknown fruit in the Northern markets until the completion of the Florida East Coast Railway to Miami, where the avocado grows to perfection, even producing a fruit much better in quality than the avocados produced in Cuba and other tropical islands.

The avocado was soon recognized in the Northern markets as a most valuable fruit and each year the demand became greater. Believing that something better than the ordinary seedlings should and could be produced, a systematic search among the thousands of old seedling trees for the best from which to commence propagating a known variety was made. Among those found were the Trapp, Pollock, and other varieties; but on account of the late ripening of the Trapp it is considered the most valuable, as it reaches the market in a better season.

Each year the demand for the avocado increases and each year the growers are receiving prices that astonish the most optimistic.

There is no danger of this particular branch of horticulture being overdone, as there is but comparatively a small portion of the State where the avocado can be safely grown. Dade county has a monopoly in growing avocados and mangos.

One word regarding the cultivation of these excellent fruits. Both the avocado and mango tree are extremely hardy, and thrive on any well-drained land. The rocky lands seem peculiarly adapted to their rapid and healthful development.

Guanajay Mountains — Vegetation in Western Cuba — Pinar del Rio

SOME GOOD SWEET PEAS.

WITH ALL the really exquisite varieties of Sweet Peas that are now offered by the seedsmen, it seems a shame that not more of them are grown in place of the inferior mixtures that are seen in almost every yard. Many of the Spencer varieties are now practically fixed, and although they do not come in as great a range of colors as the grandiflora varieties, by combining the best sorts of the two classes one can have a display of bloom that will be the wonder and admiration of all who see it. Helen Lewis is an orange-pink Spencer variety that can hardly be excelled, either in form or coloring, and it is now obtainable from all of our best seedsmen. St. George is a dazzling orange-scarlet, with slightly waved standard, and does not burn as badly as most varieties with orange in the standard. For a pink, the original Countess Spencer can hardly be excelled. It has the ideal Spencer form coupled with the most delightful shade of pink it is possible to imagine. Nora Unwin is a very beautiful white variety, and while it is not so decidedly waved as are the true Spencers, it has the advantage of coming entirely true from seed. Frank Dolby is a fine clear lavender, of the slightly waved Unwin type. John Ingman is an immense flower, rose carmine in color, of the Spencer type, and comes practically true from seed. Apple Blossom Spencer, White Spencer, Primrose Spencer, Florence Morse Spencer, and Asta Ohn Spencer are all equally fine and deserve a place in every collection.

There are still some of the old grandiflora varieties, however, that have not been duplicated in the Spencers, and while not having the wavy standards, are nevertheless very beautiful and deserving of a place in every collection. Henry Eckford is a marvelous color, flaming orange, but the flowers burn in the sun. To secure the finest color the flowers should be picked in the bud-state and allowed to open in the house. Dorothy Eckford is a fine white, almost as good as Nora Unwin. Mrs. Collier is a fine large primrose. Queen Alexandra is an intense scarlet self of the finest form, and has not been equalled in color by any of the Spencer type. It is one of the finest of all scarlets. Lady Grisell Hamilton is a lovely clear lavender. Black Knight is about the best dark variety, being very dark claret, shaded with purple.

It is no more trouble to grow a fine selection of named varieties of Sweet Peas than it is to grow the most inferior mixture, and the pleasure and satisfaction derived from them is out of all proportion to the labor expended. To secure the best results, however, the plants should be given more room than is ordinarily allowed; eight to twelve inches apart is close enough. If allowed plenty of room the flowers will be larger and the stems longer.

F. W. Forenoe.

Altadena, California, Aug. 21, 1910.

SWEET PEA.

To the Editor of The Over-seas Daily Mail.—Sir: In your issue of November 26 a correspondent at Hawaii asked if any reader knew of a place beating the rainfall of 18 ft. 9 1-2 inches at Oaaa, Hawaii?

It is true the record of sober fact that at Cherrapoonjee, Assam, the annual average rainfall is 600 inches, or 50 ft., and I believe that somewhere in the seventies they had an awful year there with a fall of 800 inches. I do not myself know Cherrapoonjee (a hill station in the Assam Himalayas), but any Assam man would vouch for my figures. I served from 1901-4 in Darjeeling, another Himalayan hill station, where our average rainfall was often over 140 inches in the year—a very wet place, where it is commonly said that the "rains" begin on April 1 and end on March 31!—Yours faithfully,

Herbt. A. Heard, J. P.

Pakur, Bengal, India.

CARL VON LINNÆUS.

PLANTS have been studied and classified more or less from the earliest times, but there was really no scientific botany, properly so called, until the 16th century of the Christian era. The first European to publish a book on the subject, was Brunfels, a physician of Berne, Switzerland, who was the author of a *History of Plants*. Following him came other students of botany, who advanced the science, but we come to no scientific classification of plants until Carl von Linnæus published his celebrated system about the middle of the 18th century. Carl von Linné, or, as he is commonly called, Linnæus, was born on the 23d of May, 1707, in the village of Rooshoolt, Sweden, where his father was a Lutheran clergyman. He first studied at the University of Lund, afterwards at Upsal, then spent some time in Holland and England, and finally became professor of botany at the University of Upsal, where he died on the 8th of January, 1778, in his 71st year.

CARL VON LINNÆUS, "THE FATHER OF BOTANY."

The system which Linnæus introduced is founded on the sexes of plants, a subject overlooked by the botanists before his time. It was strongly supported by many botanists, although opposed by a few, and adopted in nearly all the schools of Europe. One of his biographers says of this system: "It is called an artificial method, because it takes into account only a few marked characters in plants, and does not propose to unite them by natural affinities. It is an index to a department of the book of nature, and as such is useful to the student. It is only a stepping-stone to the natural system." For many years it was the only system used by many teachers of botany, but it was gradually superceded by the natural method, taught by Jussieu in France, and by Robert Brown in England. The scientific study of any subject is never effected by any one man, but he may be the great pioneer. It is an evolution, not a revolution. Great as were the changes made by Linnæus in the study of botany, he knew that his system was not complete or perfect, and that other investigators after him would add to what he had so well begun. Although his system, as such, is no longer taught, yet our botanical system of today owes much of its completeness to it: and for that the name of Carl von Linnæus is honored in all the universities of Europe and America.

Lancaster Co., Pa. Wm. D. Henkel.

Health in the Tropics

AS regards food in the tropics the best way to deal with this point is to repeat my own personal experience. The rules of my household were that boiled water only should be drunk, and that no salads of any kind should be used except with the greatest precautions, and that no cold meats whatsoever should come to the table; everything, in fact, should come to the table straight from the fire. Anything that comes straight from the fire, if digestible in the ordinary way, can not cause bacillary mischief; so that, granting that any food is suitable for digestion, if it is brought to the table straight from the fire, there can be no fear of contracting cholera or dysentery.

As a result of following this rule, neither I nor my family have had any dysentery or intestinal trouble; and it is my opinion that intestinal affections are mainly due to articles of food and drink, and that the risk of infection from dust is slight. In regard to alcohol my advice is to let a boy be a total abstainer until he has reached thirty years of age, when he can use his own discretion. [He will probably continue to be a total abstainer after that age.—Ed.] My own conviction is that alcohol is absolutely unnecessary, and if taken at all it should be as a luxury and not as a necessity.

Concerning fruit, it is my experience that fruit which possesses a rind that can be removed may be eaten with impunity by a healthy man in the tropics at any time of the year. Fruits that it is impossible to peel, or that are incapable of being thoroughly cleansed, may be contaminated and thus rendered harmful. An example of this is seen in the grape, which can not be peeled like an orange or banana, or pared like an apple or pear.

Soda-water in the tropics is dangerous, and it is better to learn to do without it. If it must be drunk, then care should be taken that the source from which it is derived is above suspicion. But in hot countries one is liable to drink too much soda-water.

Another point: A filter should not be used. If the use of a filter is insisted upon, then the water should be boiled afterwards.—*Sir Richard Havelock Charles, K. C. V. O., M. D., in Practitioner, London.*

SOME NEW FOODS.

THANKS to the United States agricultural explorers,—who are searching the world over for new foods that are palatable and economical,—vegetables and fruits with unfamiliar names are finding their way to American tables, and foods heretofore imported are now being grown in this country.

A recent triumph is for the benefit of the lovers of salad who find the cucumber indigestible. A new salad plant, *udo* (Fig. 1), has come from Japan. Its value as a salad was discovered by an American girl, who used for the purpose the thick blanched shoots two feet long. Shaving these into long, thin strips, and serving them with mayonnaise dressing, she produced a salad attractive both in flavor and appearance. *Udo* shoots suitable for the table have been produced in many places. We may look for it on the market within a few years.

FIG. 1

Interest in the *avocado* (Fig. 2) as a salad fruit is increasing yearly, and the market demand in Eastern cities during the late autumn and winter is so great that Southern growers are materially enlarging their plantings. It is a slender, bottle-necked fruit that grows on a tree, and its dull purple skin, when broken, reveals a pale yellowish green flesh that is rich in flavor and very fragrant. Cut into cubes, it is frequently used in mixed salads, and when added to lobster, or any shell-fish salad, it imparts a very agreeable flavor. Served with mayonnaise on lettuce, it is delicious.

Two recent additions to the menus of our hotels, which are due to the activity of our agricultural explorers, are the *chayote* (Fig. 3) and the costly bur artichoke. The chayote, a large, green, pear-shaped vegetable, the color of a cucumber, is borne on a vine which can be trained, like a grape-vine, over a trellis. A single vine will often bear large crops, as many as five hundred chayotes, some of them weighing a pound. The chayote is perennial, the fruit keeps excellently, the roots are edible, and the young stalks are as tender as asparagus. It may be prepared in twenty different ways.

The bur artichoke is a foreign food now grown through the South, below Virginia. It looks like a big green flower, and after it has been boiled its scalelike leaves are pulled off one at a time and eaten with mayonnaise dressing. It is believed that before long the best bur artichokes in the world will be on sale in our markets for a few cents each.

FIG. 3 FIG. 2

The Department of Agriculture not only imports new things, but it also invents them. An invention of recent years is the tangelo, the result of crossing the tangerine and the pomelo, or grapefruit. It is between these two parent fruits in size, with the tangerine's loose skin and ease of separation into segments, with an acid flavor like the grapefruit, although sweeter. This astonishing invention will give us a grapefruit that can be eaten with the ease of the tangerine.

FIG. 4

The *leitchee*, or Chinese nut (Fig. 4), now grown in California, is an interesting addition to the menu. It has what looks like a raisin inside in the dried form which most of us know, but in its fresh state it is far more delicious, for then the brown, leathery skin surrounds a round, juicy plum with a refreshing subacid flavor.

A new variety of watermelon comes to us from Roumania. It is small, round, green in color, with a thin skin, and is about the size of the ordinary grapefruit—just large enough for one person. It has a very good flavor, and is likely to become popular.

Bush berries, plums and peaches from northern China; a delicious persimmon, also from China, large as an apple, and without any puckering effect; a strawberry-tree, bearing round, wine-red fruit with a pleasant taste when eaten either fresh, stewed or preserved, and some promising blackberries and currants from Koren all make it look as if the next few years would see great changes in our menus.

ALLIGATOR PEAR AND SOME OF ITS USES.

C. F. FRANCESCHI, JR.

The Alligator Pear is not as yet very well known in California or anywhere else in the United States, the main reason for this is the very small number of fruits of the Alligator Pear on the market for which a very high price is asked. This inconvenience will be eliminated when the Southern California growers will have their Alligator Pear trees in bearing. The price of the fruit on the market would still be high for some people but it would be within the reach of many, and when the different uses are better known and appreciated it will become a very important factor in everybody's bill of fare.

There are many uses for the Alligator Pear, and it would take a more competent man than myself to be able to name all of them or anywhere near it. The following will give an idea of the importance of this fruit: First. To use the pulp of the Alligator Pear as we do butter on bread, it is the healthiest and best way of eating it and as one gets accustomed to it he or she will use it rather than butter for the rest of his or her life. Second. Peel the Alligator Pear, then melt in hot water or in a pan and use for cooking as you would lard, butter, etc., it gives a very appetizing taste to the food and is very much healthier than any other kind of fat. Third. Peel and slice the Alligator Pear, then add some sliced tomatoes and a few peppers, season to taste and cook in a pan; don't overcook it. This is a dish that a white man relishes; it is simply great. Fourth. This is the most common way in use in California. Open Alligator Pear in half, remove stone, season to taste with pepper and salt; add a drop of vinegar and eat with spoon; to be served as salad.

There is no fear of an overcrowded market, for an oil can be extracted from the Alligator Pear which could compete with the best kinds of edible oils.

ment. The range of temperature, as registered in the course of several years, just outside the grove extends from 12 degrees to 105½ degrees Fahrenheit, but such extremes are sure to be considerably modified by the permanent shade afforded by the bamboo itself, and by the volume of water not less permanently running through the grove. Concerning the rapidity of growth of the culms or canes numerous observations have been made: the greatest growth observed being on April 29th, 1908, namely, of 5½ inches in exactly three hours, from 8:50 to 11:50 a.m. From the above statements it surely appears that PH. QUILIOI is the most desirable kind to grow where space covered is no objection, and that it will be perfectly hardy all over California.

R. PHYLLOSTACHYS RUSCIFOLIA, Japan, next to a giant quite a dwarf, reaching hardly three feet, and very peculiar for its leaves being ovate in shape and different from any other bamboo. Grows very thickly together, while running a good deal, and is very valuable for covering the ground under the shade of trees.

R. PHYLLOSTACHYS SULPHUREA, Japan, 10 to 15 feet, somewhat similar to PH. AUREA, but its stems are not so stiff and are of a clear sulphur yellow color when mature. Stands drought better than most other kinds. I have seen it in bloom in Montecito some ten years ago, and again this year at Mr. Tevis' place near Bakersfield, but I do not know if it has ever ripened perfect seed.

R. PHYLLOSTACHYS VIRIDI-GLAUCESCENS, China and Japan, up to 60 feet in favorable conditions, the "fish-pole bamboo," as it is called in California, where it has become more popular than any other during these last fifteen years. And deservedly so, there being hardly any other plant so much "all around useful" in gardens as this. Stands well alike cold and heat, runs and increases extra rapidly, suitable for covering ravines or embankments, for tall hedges or screens, and also for clumps (if kept within bounds), and giving a perennial supply of decorative material all the year round.

During these last few years, several bamboos were introduced from the Philippine Islands to Santa Barbara, Los Angeles and elsewhere in southern California, but nothing much can be said about them as yet.

Should any of the readers of the Pacific Garden or other amateurs in California happen to have under cultivation any other kind of bamboo which they cannot recognize among those enumerated above, the writer will greatly appreciate specimens, photographs and descriptions kindly forwarded to him, and will make his best efforts to have them properly identified.

Santa Barbara, Cal.
Summer, 1908.

(From the Pacific Garden)

[From The American Journal of Science, Vol. XXXI, March, 1911.]

PROF. BAKER IN THE PHILIPPINES

By E. O. Essig.

The resigning of Prof. C. F. Baker from Pomona College and his going to the Philippine Islands means so much to California that this recognition of his great work is thoroughly warranted.

No man of recent years has had such an influence in shaping the studies of insects and plants as has Prof. C. F. Baker. No man has given more to the practical work of insect control in Southern California than he has through the well fitted corps of trained men along this line.

In all the field of biological study there is no one who can excel him, for he is equally well versed in the study of plants, insects and general agriculture and horticulture. His work, though specific along certain lines, has been broad and far reaching. He began as an ardent student of insects and plants, taught for a number of years, and then went into the practical side of the work for the U. S. Government in Cuba and for the Brazilian Government at Para. To many he is known as a great botanist, to others as a highly specialized entomologist, while those of us who know him well recognize both, and in addition also an agriculturist and horticulturist. In Cuba he made a thorough study of tobacco and is an authority on that subject, while his work in tropical and subtropical countries has made him thoroughly familiar with the pomology of those climes.

His published work has been more along the line of entomology than any of the subjects mentioned above. Besides the contributions to the entomological press of the world, he has edited two entomological papers: "Invertabrata Pacific," which was published several years ago while he was at Stanford University, and the present Pomona College Journal of Entomology.

But his interest in pomology and gardening, especially landscape, has been vital during his stay at Pomona College. One of his first steps was to organize a class in plant propagation with the ultimate aim of establishing an arboretum on the college campus. Later he gave special work in subtropical pomology, and in order to make his work known founded the Pomona College Journal of Botany and Subtropical Horticulture, which has met with great favor in the Southland. His paper on the pomelo delivered at the State Fruit Growers Convention held at San Bernardino is an example of the thoroughness of his work in this subject.

The wide interests of the man are further exemplified by his gifts of the largest botanical collection on the Coast and one of the largest insect collections to Pomona College. He has also made important insect donations to the U. S. National Museum and to the present State Commission of Horticulture. In all, his donations number over 50,000 specimens and are worth many thousand dollars.

But his largest service has been rendered to the many students who have worked under him and who are now carrying the spark of his untiring and efficient enthusiasm into the practical work of the agricultural world. Every student who has taken special work under him at Pomona is either doing practical work in entomology, botany and general horticulture or has obtained a scholarship or fellowship in another institution for more advanced work along these lines. In California today there are a score of these students in the work of the U. S. Department of Agriculture, in the state and county horticultural work, as specialists in the employ of large orchard corporations and as workers in both universities.

As a result of his past achievements Prof. Baker has been given complete charge of the biological work of the University of the Philippine Islands with a large salary. He leaves California in August to take up his new work across the Pacific. The service he has rendered, especially to Southern California, is so pronounced that his going means a great and serious loss for all time. But, regretting all this, we cannot but feel that there is opened to him a great and new field of endeavor—a field of harvest where the results such as he will produce are much needed—and as he leaves let us extend to him our sincere appreciations for his labors among us and wish him Godspeed in the new work. Surely the Philippine University is to be congratulated in securing the services of a man so ably scientific and technical and yet so intensely practical.

"Tropical Life" Friend.—No. 62.

Professor Charles Fuller Baker.

Our first correspondence with Professor Baker was in connection with tobacco culture in Cuba, after he issued a very useful pamphlet on the subject, a copy of which was sent us, and to which we often turn for reference.

Whilst attached to the Department of Botany in Cuba, "Our Friend" was much interested in the Propagation and Acclimatization Garden, where much useful work was accomplished, especially in connection with investigations concerning various matters, such as cover crops and green manures for the Tropics, tropical forage crops, comparisons of various rubber-yielding plants, tobacco-breeding, management of tobacco-seed beds, cultivation of fibre plants, &c., &c. At the same time the department introduced, and began the acclimatization and distribution throughout the Island of several thousand kinds of economic plants from all parts of the tropical and sub-tropical world.

Our next letter was sent on from Cuba to Pará, where "Our Friend" had transferred his services, he having accepted the Curatorship of the Botanic Gardens and Herbarium at Belem. Whilst in Pará, Professor Baker, in consultation with the leading members of the Syndicato Agricola, arranged the plans for the foundation of a large propagation and acclimatization garden for the State of Pará. These plans were afterwards approved by the Legislature and the money voted. Meanwhile the directorship of these gardens has been offered to "Our Friend," who has arranged for Mr. Walter Fischer (who did good work at the Bureau of Seed and Plant Introduction of the United States Department of Agriculture) to go there as Superintendent.

Born at Lansing, Michigan, March 22nd, 1872, "Our Friend," Professor Baker, took up his first course of agricultural studies at Michigan Agricultural College. During 1891-92 he was acting as assistant at the college, and from 1892-97 acted in the same capacity at Colorado Agricultural College, and then passed on to the Alabama Polytechnic Institute and Experiment Station (where Professor Lloyd, the Guayule expert, is now engaged), and remained there until 1899. Four years later (in 1903) he took his M.A. at Stanford University, and during the twelve or eighteen months following was at Pomona College as assistant professor. It was from there that "Our Friend" went to Cuba to take up the post of Chief of Department of Botany at the Central Agronomical Station at Santiago de las Vegas. From 1907 to 1908 he was, as already stated, Curator of the beautiful Botanic Gardens and Herbarium attached to the Museu Goeldi in Pará, Brazil, leaving there for a full professorship in Pomona College in 1909, where he is still engaged.

During these various periods, Professor Baker acted as Zoologist and Associate Botanist of the Alabama Biological Survey; was in charge of the Colorado Forestry and Zoological Exhibit at the Colombian Exposition in 1893. He acted as botanist to the H. H. Smith (*not* the Editor of Tropical Life) Exploring Expedition in the Santa Marta Mountains, Colombia, 1898-99, and also conducted field explorations in Southern Illinois, Wisconsin, Colorado, New Mexico, Nevada, California, Nicaragua, Cuba, and through Brazil. His knowledge of tropical and sub-tropical America is therefore fairly exhaustive. Naturally his pen has not been idle, but we have not at hand a list of his notes on the various expeditions that he undertook, but, as editor of the *Pomona Journal of Entomology* and publisher of the *Invertebrata Pacifica*, "Our Friend" has given some useful information to the world. If we are not mistaken, Professor Baker is now engaged on the publication (co-operatively) of sets of the "Economic Plants of the World."

Alligator Pear, Avocado, Ahuacate?

When in 1530 Cortez landed in Mexico the Ahuacate was a popular fruit among the natives, and had been known to them under that name many centuries. And it was so much prized by the conquering Spaniards that it was soon introduced in Santo Domingo, Cuba and the other islands which still retain the name of West Indies. In the British Colonies the name of Ahuacate became corrupted into alligator pear, and in the French islands into Poire d'Avocat and Avocatier. In our own times this French corruption gave birth to the name of avocado, which has no meaning, and no historical base. Why, in the name of common sense, must not the name of Ahuacate be retained? It is the aboriginal name, and it is no more difficult to pronounce than Avocado.

In South America, where the tree is not as common and not so popular as in Mexico, it bears the name of Palta, said to be originated from a locality in Peru, where it was first brought into notice. A more hardy form, with rather small fruits, is known in Chile under the name of Paltita, that is "small palta."

Quite recently somebody has fancied to change the old respected and expressive name of Persea Gratissima of Linnaeus into Persea Americana, evidently a misnomer, there being several other species of the genus Persea which are native of the American continent. One cannot protest strongly enough against this modern craziness of creating new names for old things.—[Dr. F. Franceschi, in Cultivator.

The Gardner

This member of society always has been considered an essential part of it. His services are in demand in proportion to his ability to grow the finest specimens of the vegetable kingdom whether they be of the ornamental or economic class. It does not follow, that to be successful, a great amount of technical knowledge relative to plants is necessary; but it is very essential that he has a love for plants, and manifests that love by carefully looking after every detail necessary to plant development. With this inherent love of plants it is but a short step to the acquirement of a fund of information on the subject, which is sure to redound to his credit and of public appreciation.

The gardener is **born** with an inherent love for plants, and without this inheritance, no one may hope to attain to that degree of perfection in the art, which characterizes the man or woman thus endowed. Nevertheless by close application to study, and close observation of the habits and character of plants, the gardener if **careful**, is sure to be more successful than the one who is proficient in the art, yet **careless.**

Books and periodicals devoted to the subject are numerous and while the majority of them are written by men and women of large experience, few, very few of these publications contain information of value to the Pacific Coast gardener, yet there are certain principles underlying the profession which are of universal application, and the gardener should be able to analyze the principles and deduce methods applicable to his necessities, no matter where his location may be, nor his surroundings and environments.

There is one phase of the profession—and we contend that it is as much of a profession as law, theology, or medicine—toward which there has always seemed to us to be an unjustifiable, and unwarranted attitude on the part of some who employ this class of help, namely, to place no higher estimate on the intelectual ability of a skilled gardener than upon that of the fellow who tamps ties with no higher aspirations in the scale of intellectual development.

The gardener, as a rule, is lacking in ability to properly care for money, and so invest it as to bring him a competence in old age. The result is the majority of them are poor men, and because of their poverty, are not in favor with many rich, considered from an intellectual standpoint. This fact is emphasized, and made clearly apparent when the gardener is supposed to be a good milker, a first-class coachman, an expert window washer, and a husky rug and carpet beater. It is not intended in this article to disparage honest, honorable toil, but the thoughtful mind will certainly agree to the proposition that gardening requires a higher order of intellect, and mental capacity than any of the other occupations named. Many a rich man in his desire after fine scenic effects would have saved much money, and a great deal of disappointment had he listened to the council of The Gardener.

Garden

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DENA, CALIFORNIA

The Avocado

By FRED W. POPENOE

The avocado (Persia gratissima) is a native of tropical America, from Mexico to Peru and Brazil. It was cultivated and highly esteemed by the Indians when this continent was discovered by Columbus. Since the time of Columbus, the avocado has spread from its home in America entirely around the world, within the tropics. Not until recently, however, has it been cultivated to any extent within the United States. Being strictly a tropical fruit, its culture in this country is limited to the so-called frostless areas in Florida and Southern California. While as yet not grown on a commercial scale here, the number of trees being set out every year is increasing rapidly, and it is probable that within the next few years small plantations of them will be set out for commercial purposes in the warmest portions of this part of the state.

There is a rapidly growing demand for the fruit in all the large cities and such high prices are realized, that the avocado should be one of, if not the most profitable fruits to grow for market.

In this country, the avocado is often, and in fact, generally, called the "alligator pear." This designation is not only misleading, but incorrect, as the avocado in no way, except in form, resembles the common pear. The term "alligator" is probably a corruption of "avocado" and is incorrect. "Alligator pear" is much easier to remember than "avocado" and this probably accounts for the use of that name in this country. It is to be hoped that the use of the misnomen will be done away with before the fruit comes into extended use, as its general use would lead to much confusion. "Ahucate," the Spanish name of the avocado, is used to some extent in the United States, especially in those states which border on Mexico.

Apart from being a very valuable fruit, the avocado is of great value as an ornamental tree, and as such is worthy a place in every garden. The tree grows to an ultimate height of 40 or 50 feet, and is generally spreading in habit. The branches are so densely clothed with leaves that the sun's rays rarely penetrate the foliage. Its glossy green leaves, symmetrical shape, and dense foliage, combine to make it the equal of many ornamental trees grown in Southern California gardens.

Avocados are usually divided into two classes or types, the Mexican and the South American. The principal difference between the two is in the character of the fruit, but they can also be distinguished by the taste of the leaves. The leaves of the Mexican type have a distinct flavor of sasafras or anise, which the leaves of the South American type do not possess. In mature trees, the foliage is generally broader and smoother in the South American, but the foliage of each is so variable that it is hard to distinguish between them by foliage alone. Unless in fruit the only sure way to distinguish between them is by the taste of the leaves. The size of the leaves of both types varies greatly. On the average the leaf of the Mexican type is shorter and not so broad as that of the South American.

The leaves of both types are acuminate at the apex, varying from acute to truncate at the base, and the margins are always smooth. The upper surface of the leaf is glossy green, with the veins depressed, and the lower surface is glaucous, with the veins raised. In the young trees the bark is green, tinged with red or brown, and sometimes there are numerous brown dots on it. As the tree grows older, the bark becomes a grayish brown, and remains that color. The bark is smooth on the young wood, but as the wood becomes older the bark becomes somewhat rough.

The flowers, which are inconspicuous and about three-eighths of an inch in diameter, are perfect and are borne in axillary racemes near the ends of the branches. The corolla is wanting and the calyx is 6-parted. The lobes of the calyx are all of equal length and greenish white in color. The stamens are 9, and the ovary one-celled. The flowers are produced in early spring and usually remain on the tree for several weeks. If a heavy frost occurs at the time of blooming it is liable to ruin the crop for that year, by freezing the blossoms. The Mexican type is less liable to injury by frost than the South American and it is only occasionally that a crop is ruined in Southern California.

In their natural state no two avocado trees produce fruits exactly alike. The avocado does not come true from seed, and this fact has resulted in there being about as many different kinds of avocados as there are trees. The fruits vary in form from globular to long and slender, in diameter from 1 to 6 inches, and in weight from 2 ounces to 3 pounds. In color they range from green through various shades of brown and dull red to purplish black.

All avocados can be classified as belonging to one of two forms, the South American or the Mexican. The former is large, and is usually globular or pear-shaped. The outer covering of the fruit is thick, tough and granular. The seed is large, often an inch and a half or

Judging Sweet Peas

By Walter P. Wright, F.R.H.S., Chairman of the N. S. P. S. Floral Committee

A judge of Sweet Peas has a different, and in my opinion a more difficult task, as compared with a judge of Roses, Chrysanthemums, Dahlias, Carnations, or indeed any other popular florists' flower.

In the first place, it is customary to set up Sweet Peas in vases, each variety being represented by a number of stems. In the case of the other flowers named it is usual to show one flower only of each variety. It is true that sprays of garden varieties are sometimes shown, but they are in minor classes, and as a rule the number of specimens is so small, and the arrangement such that all the flowers can be seen at a glance.

There is certainly no parallel among other leading florists' flowers to the Sweet Pea, with its twenty or so stems per vase, and its three or four flowers on each stem. For this reason, we who specialize what from the exhibition point of view is a new flower cannot turn for guidance to the rules or principles of other florists; we have to work out our own salvation.

There is another reason why the judging of Sweet Peas is different from that of other flowers. In practically all the principal colors we have two types; the plain or grandiflora, and the waved or Spencer. Many of the varieties are identical in color; they only differ in form.

Given twenty-four varieties of Roses or Chrysanthemums, a judge has twenty-four specimens to examine in order to make sure that there are no duplicates. Given twenty-four varieties of Sweet Peas he has, in the ordinary way, 480 specimens to inspect. Any one of the twenty sprays in any one of the twenty-four vases may be a plain where it should be a waved, and if there is one the exhibit is liable to disqualification.

The difficulty of giving correct awards is increased by the absence of guiding principles as to (1) length of stem, (2) allowance of haulm or otherwise, (3) disposition of the flowers on the stem, (4) size, (5) freshness. Judges follow a go-as-you-please course, and are swayed by individual tastes and preferences. One attaches paramount importance to length of stem and size of bloom, another to freshness. Others never trouble to see whether there are plain and waved flowers in the same vase. One of our friends told me that on disqualifying a competitor for mixing plain and waved flowers the latter smiled sweetly, and, quite unabashed, remarked that as he had "tried it on" successfully with several judges previously, he thought he might as well take his chance again.

The greater the difficulty in judging Sweet Peas, and the greater the confusion as to principles, the more necessary it is that the problem should be faced, and I think that the time has come for the National Sweet Pea Society to take action, with the object of establishing an authoritative code. In order to further this, I propose to set out the principal points, and give opinions thereon, with a view to inciting discussion. * * *

(1) HAULM.—In my opinion, one of the first rules laid down should be that stems are really to be flower stems, and not haulm. The inclusion of haulm attached to the stems should disqualify.

(2) NUMBER OF STEMS.—In exhibiting a given number of Roses, Chrysanthemums, or Carnations, it is usual to use perforated boards, so that it is a simple matter to get in the right number of blooms and no more. It is wholly different with Sweet Peas. The use of movable vases on tables or stages makes the task of counting more onerous, and if to this is added the obligation of counting say twenty sprays into each vase the task is a serious addition to that of choosing stems and arranging vases. For this reason I believe in stating twenty sprays as an approximate number, with the warning that crowded vases will be passed over. Few, if any, judges pretend to count the contents of vases. In judging a show it is my custom to state at the outset that I do not intend to count, as this would waste valuable time that ought to be given to judging alone. Time devoted to counting is time taken from judging. As things are, if a mistake is discovered it is generally at the instance of another competitor, and inasmuch as it is almost impossible to count the contents of a vase without handling the stems, the way is open for substitution, subtraction, or addition. For these reasons I am opposed to a fixed number being stated. Nor do I think that a rigid rule is necessary in order to prevent awards being influenced by quantity rather than quality. A judge who has a good code to work upon, and a mind of his own, is not likely to be influenced by mere numbers.

(3) WIRING.—The use of wire to mount the stems should disqualify.

(4) MIXED TYPES.—Judges should be warned to look out for cases of plain and waved flowers being mixed in a vase of one variety, and to disqualify when found.

(5) LENGTH OF STEM.—Inasmuch as stems are sometimes staged 2 feet long, with the flowers straggling along them, and … stems should carry three or four, the flowers should face one way, and should be near enough together to form a homogeneous set. Long stems, with large flowers widely separated, should be discountenanced. This is not a case for disqualification, but for showing, by the choice of neater, more refined specimens for the prizes, that coarse examples are not appreciated. At present judges differ widely in this particular, and many, who at heart disapprove of coarseness, are afraid to ignore the giants because of the criticisms of the crowd. The public, however, would soon become educated up to an appreciation of genuine quality.

(7) FRESHNESS.—Great stress should be laid on staging young, fresh flowers. Judges should be instructed that old flowers, however large, ought to be passed. If some vases are young, and some old, points should be deducted from the latter.

(8) SPOTTED FLOWERS.—Speaking broadly, clean flowers are desirable, but I think that young flowers which are merely spotted by a shower should be penalized less severely than blooms that are curling and discoloring from age.

(9) BLENDING OF COLORS.—Judges might be taught with advantage that as the artistic arrangement of colors is desirable, a stand in which the colors are well blended might, other things being equal, carry the award over one in which the colors were not well arranged. Color blending should not, however, carry inferior flowers to victory.

(10) DOUBLE STANDARDS.—I think that double standards should be regarded as defective on the ground that they mar the symmetry and harmony of the flower.

PROCEDURE FOR JUDGES.—I think that the following might be suggested as good procedure for judging Sweet Peas:—

(*a*) When starting, count the exhibits in each class with the secretary's assistant, to make sure none is omitted.

(*b*) Count the number of vases.

(*c*) See that the exact number of varieties specified in the schedule are present in each exhibit.

(*d*) Make a preliminary survey, and rule out those stands that are palpably defective, in order to be able to concentrate attention on the eligibles.

(*e*) Look through the vases in the selected stands for mixed types.

(*f*) Make the awards on freshness, number of flowers per stem, size of flowers, disposition, and blending of colors. Compare vases of the same varieties side by side.

(*g*) Take a final look over, to make sure that there is no oversight.

(*h*) Mark 1st, 2nd, or 3rd on the back of the exhibitor's card.

(*i*) Be blandly unconscious of the subsequent decisions of the defeated competitors and "the Man from the Street," but give courteous attention and explanation to any inquiry made through the executive.

(*j*) Invest your fees in new varieties for the following year.

As a concise summary, I would suggest the following scale of points:—

QUALITIES.	POINTS.
Freshness and good color	6
Number of flowers per stem (three to four)	4
Length of stem (approximately 18 inches)	4
Arrangement of flowers on stem	4
Size of bloom (approximate width of standard 1⅝ in.)	4
Color blending	2
Total	24

The Technique of Crossing and Hybridizing

Abstracted from an address by C. S. Crandall, Associate Professor of Pomology, University of Illinois, delivered before the Illinois State Horticultural Society.

Crossing and hybridizing between plants as they grow wild is common; in fact, the maintenance of many species is dependent upon crossing with neighboring plants of the same species. This is sufficiently manifest in the marvelous structural adaptations that effectually prevent self pollination and greatly favor the introduction of foreign pollen.

From the great number of structural or functional adaptations of floral parts, favoring or making necessary cross-fertilization, it is a fair inference that there is some advantage to the plants in this plan. That there is an advantage and that new vigor is imparted by legitimate crossing has been abundantly proved, first by Darwin and later by others who followed after Darwin.

The means employed in Nature to prevent self-fertilization and insure cross-fertilization, as first enumerated by Darwin and now recognized by all students of cross-fertilization, are: First, the separation of the sexes. Here the stamens are borne in one set of flowers and the pistils in another, and there are two general arrangements —the monœcious, in which both kinds of flowers are borne on the same plant, and the dioecious, in which the staminate flowers are borne on one plant and the pistillate on another. The monœcious group may be illustrated by such plants as the Oak, Beech, Birch, Hickory, and all plants belonging to the order Cucurbitaceæ—the Melons and Squashes. The dioecious group is illustrated by the Willow, Poplar, Hemp, Hop, and Moonseed. Where the essential organs are thus separated, the work of crossing artificially is somewhat simplified; all that is necessary is to cover both kinds of blossoms before they are matured, and at maturity collect the pollen from the staminate flowers, taking all necessary precautions to prevent mixture of undersized pollen, and then apply this pollen to the stigmas of the pistillate flowers.

One other division of plants should be noted here, and that is in reference to the agencies in natural cross-fertilization. There are two principal groups, the anemophilious group, the plants of which are fertilized entirely by the wind, and the entomophilious group, in which insects are the active agents in the transfer of pollen. Nearly all of the dioecious plants and many of the monœcious group belong to the anemophilious class. These plants that depend upon the wind for fertilization can be readily distinguished by the fact that the flowers are inconspicuous. They have no high colored parts to attract insects, they secrete no nectar, and the pollen which they produce is very light and powdery and readily blown about by winds. Plants of the entomophilious group have conspicuous flowers that seem especially designed for attracting insects; most of them secrete nectar and many of them are odoriferous; in all of these plants the pollen is more or less sticky, the grains adhering to each other, is not easily disturbed by the wind and readily attaches itself to visiting insects which carry it with them to other flowers visited. Wind-fertilized flowers are best illustrated by the Grasses, the Pines, and the Spruces.

The second means of securing cross-fertilization is the maturity of stamens and pistils at different times. This is a common arrangement in plants having hermaphrodite flowers, and the same arrangement is noted in some monœcious groups. In many plants having hermaphrodite flowers the pollen matures and is shed from the anthers before the pistils are in condition to receive pollen. This arrangement effectively prevents the fertilization of the flower by its own pollen. In certain other plants the pistils mature first and the anthers remain undeveloped until fertilization has taken place. Those plants in which the stamens mature first are called proterandrous, and may be illustrated by the Fireweed (Epilobium), the Corn plant, the Carnation, and the flowers of most plants of the order Compositæ. The plants maturing the pistils first are proterogynous and may be illustrated by the common Plantain, by Scrophularia nodosa, and by quite a number of plants belonging to the order Rosaceæ. The proterandrous arrangement is rather more common than is the proterogynous. In some cases the maturity of stamens and pistils is synchronous, occurring at the same time. This is often the case with the flowers of Apples and Pears, and with those of some other plants.

A third means of securing cross-fertilization is dimorphism, or the existence of two forms in plants of the same species, for example, in certain species of Primula some plants have the stamens attached at such point that the anthers appear in the throat of the corolla, and in these flowers the style is short, with the stigma well below the throat of the corolla. In other plants the stamens are attached to the tube at about the middle, so that the anthers occupy about the same position that the stigmas do in the short-styled plants, and in these plants the style is elongated, bringing the stigma into or about the throat of the corolla.

Mr. Darwin conducted an elaborate series of experiments showing that the arrangement is evidently designed for securing cross-fertilization. The plants with long stamens crossed as indicated give seedlings of good and normal vigor, while the seedlings grown from crosses in which the pollen from long stamens was applied to stigmas on short styles, and vice versa, the seedlings were of very low vitality.

A fourth arrangement for securing cross-fertilization in Nature is found in the prepotency of foreign pollen; that is to say that, with very many plants, if the plant's own pollen is applied to the stigmas, and some hours later pollen from a distinct plant of another variety of the same species be applied, the pollen last applied will be the effective agent in fertilization. This has been demonstrated to be true in a considerable number of cases, and probably is true in many cases where the fact has not been demonstrated experimentally.

Still another important means of securing cross-fertilization, and preventing self-fertilization, is seen in special contrivances or special positions of parts that prevent the pollen of any particular flower from reaching the stigmas of that flower, for example, in Epilobium the stigma is four lobed. In the early stage of the flower the lobes of the stigma are compressed together, entirely covering the stigmatic surface, and in addition the style is curled downward so that the stigmatic end is entirely out of reach of the stamens, which in this stage of the flower stand prominently out in front. When the pollen has been shed the filaments wither and the anthers droop, then the style becomes straight, assuming the position formerly occupied by the stamens, the four lobes of the stigma unfold and curl back and are then in position to receive pollen. An insect visiting a young flower will become covered with pollen from the anthers, then on visiting an older flower which is in the second stage, that portion of his body which received the pollen will come in contact with the receptive stigmas. A second example is found in the Mountain Laurel, Kalmia latifolia. In flowers of this plant the anthers of the ten stamens are held in pockets in the corolla and the filaments are bent downward so that considerable tension is placed upon them. An insect visiting the flower comes in contact with these tense filaments, and they are released, allowing the anthers to spring forward and shower the contents upon the insect. If these flowers are not visited by insects the anthers remain in the pockets, the flowers wither and no fertilization takes place.

Another very interesting mechanical contrivance is found in Salvia pratensis. The corolla of this flower is bilabiate, the anthers, two in number, are supported on short filaments which are inserted on the corolla tube. The two cells of each anther are widely separated by a long connective; the lower cell produces no pollen, but is expanded or somewhat broadened so that it nearly closes the entrance to the nectary; the other, or upper cell is included within the hood-like upper lip of the corolla, and the connective is so pivoted to the filament that when the lower cell of the anther is pressed upon the pollen bearing cell is depressed directly upon the back of the visiting insect. On the withdrawal of the insect the anthers spring back to the original position. This performance takes place in the young flowers, and during this period the stigma is enclosed within the upper lip of the corolla; a little later the style elongates, the stigmatic lobes separate and are brought down to occupy just the position that the anthers assumed when depressed, so that portion of the insect's back which received the pollen from a young flower would come in direct contact with the stigmas in the older flowers.

Other examples of mechanical arrangements are found in Viola tricolor, and in very many species of Orchids; in fact, many of the most wonderful floral structures that appear to be designed especially for securing cross-fertilization are found among the Orchids.

In the order Compositæ the most common arrangement of floral parts seems to be especially designed for favoring cross-fertilization. The anthers form a tube about the style and shed the pollen inside; at about the time the pollen is shed, the end of the style, which in many plants is provided with numerous hairs that constitute a sort of brush, elongates, pushing the pollen before it out of the stamen tube. Insects visiting the flower at this stage will brush this pollen away, the anther filaments then contract to some extent and the style still further elongates. Then and then only, the two lobes of the stigma separate, curl back and expose the surface receptive to pollen.

The examples mentioned are sufficient to show how common the arrangements for cross-fertilization are, and the fact that there are so many different arrangements is warrant for the conclusion that the plants derive benefit from cross-fertilization. That a benefit to the plant results from crossing has been shown by many definite experiments in which comparison has been made between self-fertilized and cross-fertilized plants in the same species. In nearly all cases it is shown that the crossed plant is more vigorous and in every way stronger than is the self-fertilized plant.

In practical work in crossing and hybridizing there are a number of points which the operator must consider carefully. When operating upon hermaphrodites, emasculation must be practiced on those flowers which are to be used as the pistillate parents, and the first question that arises is: When should emasculation be done? Of course, it must be done before the anthers burst and shed their pollen, but just how long before the anthers is ripe is it best to emasculate? There is no rule that applies to all cases. The time will vary with different plants, and depends upon the rate of development of the flowers, upon the size of the buds, and upon the relation as to position of the stamens and pistils.

If one is to operate upon a large number of flowers in the open, where conditions of temperature and moisture are not under control, it will be necessary to begin with quite young buds. The objection to working with young buds is that the parts are very much smaller; in the undeveloped buds the stamens are in closer contact with the pistils and it requires very careful manipulation to remove them without injury to the other parts. Naturally, the work is most easily accomplished the nearer the time is to the maturity of the stamens. Not only is the work easier to do, but the danger of injury to pistils is very much less, so that, whenever possible, it is best to work with flowers that are nearly mature. In some cases, as, for example, in the Sweet Pea, the ripening of the anthers occurs at a rather early stage—two, three and possibly sometimes four days before the opening of the flowers. In this case it is necessary to open the buds when quite young, and considerable care is required in the operation.

In plants having numerous stamens, as, for example, the Strawberry or Raspberry, the stamens may be several days in reaching maturity, they do not all mature at once. Beginning with the outside they open in order, a few at a time, toward the center. The opening of the outer anthers will often occur sometime before the petals expand and the flower opens, so that in this case it is necessary to operate on quite immature buds. An additional precaution with flowers of this character must be taken to insure removal of all of the stamens. Those that are very small are easily overlooked, and it is hardly necessary to say it is essential that every one be removed.

In some cases removal of stamens is best accomplished by cutting the calyx tube below the insertion of the stamens; this is rather delicate work, but can be accomplished by using care. On this point we would say then: Always emasculate before the first stamens open, and as near the time of opening as possible, and be very sure that all stamens are removed. In operating upon such flowers as are borne by the Apple and the Pear it is common practice to cut the calyx as spoken of above; considerable care should be exercised that the cut be not too low, because it has been found that cutting too low is likely to result in deformity of the fruit, and there is also danger of injury to the style and the prevention of fertilization by such injury.

Regarding the tools to be used in this work, there is some diversity of opinion among those engaged in crossing as to which tools are best. Some prefer tweezers, and here there is difference of opinion as between straight points and curved points. In my own experience I have found the curved points preferable for most work, although for some plants straight-pointed tweezers would be chosen. Some prefer to use scissors, especially for those flowers where the calyx tube is severed. The use of scissors requires a steady hand and a good eye, and, I may add, scissors of right construction, for some scissors are very much better than others. In general those scissors having short and sharp-pointed blades are much to be preferred to scissors with long blades. Another tool that is commonly used in emasculating is the scalpel. This tool should have a rather short and narrow blade, not too bluntly rounded at the apex. If this tool is kept very sharp and is operated by a steady hand it does the work admirably. In operating on Sweet Peas or other leguminous flowers, I believe the sharp-pointed, curved tweezers are much to be preferred to any other tool for the removal of the anthers. With these flowers the filaments are simply broken off just below the anthers.

A further point to be considered in the work of emasculation is the degree of mutilation of the floral envelope. Several comparisons between complete removal of calyx and corolla, and removal of only such portions as are necessary to allow access to the anthers, seems to indicate that the less of the degree of mutilation the higher the percentage of success. This may not be equally true of all flowers, but in general I have come to regard it as the best policy to mutilate as little as is possible, only enough to allow convenient performance of the work.

Now a word as to the pollen. Pollen to be used in making crosses must be provided for beforehand. If it is to be used fresh, the flowers should be protected from insects with just as much care as is given to the protection of those whose pistils are to be used. It is sometimes convenient to remove anthers from flowers and apply the pollen directly, by rubbing the anthers over the stigmas; or in some cases the whole flower may be taken, as, for example, in crossing Squashes the staminate flower deprived of a portion of the floral

keep the pollen a varying length of time before using. It is possible to do this by taking precautions against the loss of vitality. If pollen is removed and immediately dried by exposure in dry air, it can then be placed in bibulous paper, or in waxed paper and kept for several days, or in some cases for months without appreciable loss of vitality. The main essential appears to be protection from moisture; if the grains are allowed to reabsorb from a moist atmosphere they very quickly lose vitality.

In our work with Sweet Peas, we have used pollen which has been kept in glass dishes for a little more than a week. Numerous trials with pollen of greater age have proved failures. Burbidge records the successful use of Rhododendron pollen that had been kept "from six weeks to two months and upwards" in an ordinary paper box; and equally successful use of pollen of Clematis Jackmanii which had been kept for eleven months. There are other recorded examples of pollen successfully used after being stored for a number of months. Where possible I believe it best to use the pollen quite fresh, that is, within twenty-four or forty-eight hours from the time of its removal from the flowers.

Choice of particular blossoms to use in crossing is a matter of considerable importance; for example, in the Apple the clusters average five flowers. If taken at the right stage of development it is possible, of course, to emasculate and pollinate all the flowers in a cluster, but it is not thought desirable to have more than one fruit in a cluster. Our practice then is to emasculate the two strongest blossoms, removing all of the others. Where clusters are in close proximity, some whole clusters are removed, in order to admit of proper covering of the one cluster used. This same idea to maintaining some distance between the flowers used is followed with other plants. We have learned from experience that it is not a good plan to use flowers that are crowded close together. Of course, any flower that has opened sufficiently to allow access of insects should be discarded.

When it comes to applying the pollen, the state of development of the stigma is fully as important as the condition of the pollen. Where working a large number of flowers there is often a tendency to apply pollen to immature stigmas. Experience has taught us that it is a waste of effort. Stigmas should be mature and in a receptive condition before the pollen is applied. In our work with Sweet Peas, it has been definitely determined that a large percentage of our failures is due to the pollination of immature stigmas. When using the pollen that has been stored a number of days, the question of how to apply it most easily and conveniently is worthy of attention. The camel's hair brush is frequently recommended, but in our practice we have found that this tool is open to serious objection, and we no longer use it. While pollen is most successfully kept in paper pockets, we have found it most convenient, where working with a large number of plants, to use Petri dishes. With Sweet Peas, it is unually possible to bend the peduncle and immerse the stigma in the pollen contained in the dish. Where this cannot be conveniently done, the pollen is transferred on the handle of the tweezers. This we have found is quite a satisfactory method of transfer.

After extensive tests of paper sacks in comparison with cloth sacks, we have decided that a paper sack is preferable to anything else. These sacks should be selected with some care, choosing a paper that, while possessing toughness, is not too thick and heavy. Where working on Apple or other fruit trees in the orchard, the sack is attached by tying. On Sweet Pea plants, owing to the slender peduncles, the sacks are pinned on. It is necessary not only to fold and pin the sack tightly about the peduncle, but the upper portion must be carefully pinned to the supporting wire or string; this is necessary to prevent whipping about by winds. It is our custom to fully expand the satchel-like bottom of the sack, and rarely do we have any trouble from contact between the sack and the flowers. In crossing fruits in the orchard, as soon as fertilization has taken place and the fruit begins to develop the paper sack is removed and a sack made of mosquito netting substituted. This sack is of sufficient size to allow full development of the fruit; it serves to distinguish the fruit, and prevents loss by dropping under the action of Autumn winds.

In labeling flowers that have been pollinated we have found the Dennison string tags entirely satisfactory. Various sizes may be used, but the smaller sizes are preferable for outside work because they are less likely to be torn from the strings by heavy winds. For outside work we place upon the label only the number that designates the particular cross in the record; this is put on with a paint made of [illegible]. Nothing has been found to equal this paint in point of durability; recently I removed some of these tags that had been hanging on Apple trees since the third day of May, [illegible], a period of one year and nine months, and the figures were perfectly legible. Where operating on plants under glass, the numbers are put on with lead pencil; usually the date is added, and sometimes the

The essential points to be considered when undertaking work in crossing may be summarized as follows:

1—Accurate knowledge of the floral structures of the plants to be operated upon; the relation of the parts as to position and relative time of maturity.

2—Provision in advance for all necessary tools and appliances, including forms for recording details of the operations.

3—Protection of flowers, both male and female, in such manner and at such time that no contamination by foreign pollen can occur.

4—Emasculation, at the proper time, of the flowers of hermaphrodite mother plants.

5—Collection of pollen from plants chosen to serve as male parents, and proper arrangements for storing so that vitality may be retained until used.

6—Application of pollen to stigmas when they are receptive, in such manner as will minimize the danger of introduction of undesired pollen.

7—Protection of the pollinated flowers until fertilization is assured.

8—The use of legible and durable labels.

9—Removal of the crossed fruits at proper maturity. With Sweet Peas removal of mature pods must be carefully timed because if neglected pods will burst on the vines with consequent loss of Peas.

10—Maintenance of adequate records of all operations. Care in the performance of operations is essential. Every detail should be under absolute control to the end that the chances of error be minimized and that no taint attach to the scientific accuracy of the results.

THE PASADENA STAR: MONDAY, MAY 29, 1911.

DONALD FOX TO DRAW STUDENTS FOR CLAREMONT

DONALD FOX
Who Is Arousing Interesting in Pomona College.

Following his freshman year at Pomona college, Donald Fox of 993 North Madison avenue is now touring the county and arousing interest in the institution. He is the son of Rev. D. F. Fox, pastor of the First Congregational church.

Fox went to La Canada today, where he told the attractions of the Congregational institution to some of the aspirants for higher learning there.

During his attendance at Pasadena high school, Fox made a record as a debater, which he has continued at Pomona. Although only a freshman, he was alternate of the last intercollegiate team there. He expects to take up the sophomore year in the fall.

TO PREPARE AVOCADOS.

TELLURIDE (Colorado) April 24.—[Editor Western Empire:] Having lived for several years in tropical countries, I have learned several ways of preparing the alligator-pear, or as it is called, avocado, aguacate, and palta.

I enclose a brief article, which you may find useful. Very truly yours, Mrs. W. H. Staver.

Those in search of a delicious novelty for the table will find it in the slightly known fruit-vegetable variously called the avocado, the alligator-pear, palta or aguacate. It is a pear-shaped, green, yellow, or purplish, or purplish-black fruit (at least it grows on a tree like a fruit) having a leathery skin, one large seed, and a thick, fleshy, oily, green or yellow pulp. Having lived for many years in the tropics, and learned various ways of preparing this delicious fruit, it occurred to me to submit the following dishes.

(1) To my mind, it is best when most simply prepared. Cut it around the seed from end to end and separate the halves. Take the seed out carefully so as not to break the pulp. Scrape the cavity lightly with a spoon to remove any threads found there. Sprinkle thickly with salt and pepper, add a bit of lemon juice if you like, and eat with a spoon from the shell, with an accompaniment of bread or crackers.

(2) Or after removing the seed as above, cut several times lengthwise and crosswise of the flesh with a knife, not cutting the skin, scoop out with a spoon onto lettuce leaves, when it will separate into dice, add any dressing desired, though mayonnaise will make it almost too rich, and serve as a salad course.

(3) Another delicious dish is made thus: Boil a chicken tender, separate meat from bones and cut into small pieces. Scoop the pulp from some alligator-pears, put through the fruit-press, season highly with salt and pepper, add a bit of vinegar or lemon juice and olive oil, and serve the prepared pulp as a dressing on the chicken. Chopped celery may be added and it may be served on lettuce leaves, making the best of salads.

(4) Still another favorite dish is made as follows: On a platter or other flat dish place a layer of lettuce leaves or shredded lettuce, then a layer of cold boiled potatoes thinly sliced; next a layer of Spanish onions very thinly sliced; (If you c nnot get Spanish onions, slice ordinary cooking onions thin, pour boiling water over them and drain, repeating this three times; then chill thoroughly in ice water. You can scarcely distinguish them from Bermuda or Spanish onions) continue by adding any vegetables ordinarily used in a combination salad. Then place on top the alligator-pear dressing prepared as directed in number three. This is an especial favorite with men.

It used to be difficult to get the alligator-pears, but they are now usually to be obtained in all large cities. The West gets them from Hawaii and Mexico, the South from Mexico, and the East from the West Indies. They are rather expensive, varying in price from 15 cents to 50 cents, but as one goes a long way, they are not prohibitive as an occasional change and luxury, even for people in moderate circumstances.

The Jujube Tree

One of the most ancient of cultivated fruits, highly esteemed in the Orient, but little known in America, is the jujube or Chinese date plum produced by several species of small trees of the genus Zizyphus, natives of eastern Asia and Palestine, south to India and even Ceylon. Of these Zizyphus sativa or vulgaris stands first in importance, as it is by far the hardiest, being naturalized in southern Europe and growing well, though not

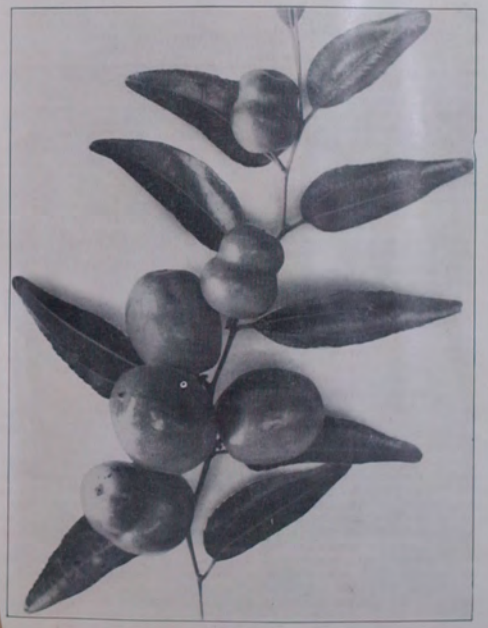

Fig. 516

iting freely, in this country as far th as Philadelphia. On the Paci- Coast it is hardy at ordinary ele- ons up to the Oregon line, and ably can be fruited in any local- ot subject to sharp Winter frosts. sparingly planted in the Gulf and California, but deserves eration as a commercial crop conditions favor its full devel- nt. The drupe-like fruits are borne in the greatest profusion on short deciduous, leafy branches over the whole tree, and range in size according to variety from small cherries up to that of good-sized plums. The whitish flowers are not conspicuous but are freely produced on the new growth throughout the early summer months, the fruits ripening near the close of the year and turning various shades of brown as maturity advances. Trees are generally of graceful, upright growth, the aspect in late Fall strangely simulating that of a young eastern locust of Pseudacacia covered with chocolate plums in place of seed pods—a resemblance further enhanced by the numerous sharp spines found on most jujubes and the apparently pinnate character of the foliage. The fruits are scarcely edible until they shrivel, which usually occurs in dry climates before dropping. The flavor is then to be compared with rather sweet and tender dried apples or rather with that of certain edible hawthorn fruits, but there is great difference among varieties as regards sweetness, acidity and mucilaginous character of the flesh. Each fruit contains a single relatively large pit or stone-like seed, but in some of the prized Chinese sorts this is reduced to small proportions, and is even said to be lacking in certain choice varities, not yet introduced to cultivation in this country.

The jujube fruit is scarcely known in commerce save in Oriental countries, where it is extensively used in the preparation of sweetmeats and confections in great diversity of forms, but what is termed jujube paste in Europe and America is said to be principally compounded of sugar, gelatine and gum arabic, with fruity flavorings. By suitable preparation the fruits can be made to yield a large proportion of well-flavored fruit pulp, suitable for high-class confections, conforming to the most stringent requirements of pure food legislation, and would doubtless be in large demand were the home supply assured. Though of little utility for domestic use, jujubes have great possibilities as manufactured products. The Chinese "dates," largely imported by the Celestial residents of our cities, are crystallized jujubes, and are often little inferior in size or quality to the best products of the true date palm, while in hardiness, general ease of culture and early productiveness, the jujube tree is greatly superior. It is not unusual for little plants to show blooms while still in the seed leaf. Trees commonly bear when four or five years old, and produce abundantly after the sixth year. Fig. 517, this page, shows a five-year seedling, 12 feet high, in Northern California, bearing a very fair crop; Fig. 516 represents in nearly natural size a fruiting twig from this tree. The curious constriction in the middle of several of the fruits is evidently characteristic of this variety, as it was apparent all over the tree.

Jujubes are freely propagated by means of buds, grafts and cuttings of green or even hard wood. Like other long cultivated fruits, seedlings do not with certainty perpetuate the variety and propagation for orchard use should be made by some of the above methods from known worthy sorts. The agricultural explorers of the National Department of Agriculture are searching for the best jujubes grown in northern China and in due time really desirable varieties are likely to become available for extended trial.

Zizyphus Jujoba is less known in this country than Z. sativa, though a great favorite in the warmer portions of the Orient. The fruits are well-flavored, though often somewhat acid, and the tree is quite ornamental,

GRAPEFRUIT IN SOUTHERN CALIFORNIA.

By C. F. Baker, Pomona College, Claremont, Cal.

When Americans began settling in considerable numbers in Cuba, their attention was early turned to the possibilities of citrus culture there. The island abounded in half wild seedling orange trees, many of which, however, bore very superior fruits. Scale insects of many varieties occurred there, but were held in check by fungous parasites and ladybirds, and though also other more serious pests, such as a pernicious root borer, exist there, still the settlers began the active planting of citrus fruits. They ordered stock in large quantities from Florida. Usually the orders were for certain definite varieties, which were soon exhausted in the Florida nurseries. The nurserymen then filled out the orders with anything that they happened to have in the nursery rows. The result may be imagined. In a single ten-acre grove may frequently be encountered trees of Pineapple, Parson Brown, Valencia, Navel, Joppa, Jaffa, St. Michael and several others. Exactly the same condition resulted among the grapefruits. Florida has always been famous for her grapefruit, and varieties have multiplied there. Cuba can produce just as good. But the difficulties in harvesting and marketing these orchard mixtures were colossal. Solid block planting is a necessity for the economical handling of most fruits. Apart from other difficulties, the growers did not know enough about them to correctly distinguish the various varieties which their trees turned out to be, and their fruit had to be marketed simply as "grapefruit," whether Marsh Seedless, Duncan, Pernambuco, Hall Excelsior, Walters, Royal, Triumph or McKinley, or a mixture of all of these.

It became my solemn and perilous duty while in Cuba to undertake the identification of these varied mixtures of oranges and grapefruit, and I carried this work on for several years with many very interesting results. I return to California, "where everything is done right," and I find here, too, a most remarkable job lot of grapefruit scattered through the groves. Moreover, I find many growers who do not know the varieties they possess. Others more confident, will name them, but if I carry the same fruit to others, equally confident, I am quite likely to get other names for it.

Now, it is my humble opinion that California is capable of producing just as fine grapefruit as either Florida or Cuba. Eventually, I believe that this state will yield a finer product, since we have here a more all-alive community, and more vigorous, radical and up-to-date methods. We are now awaking to the fact that we have never yet taken the first step towards broad, thorough, systematic effort in applying modern methods of plant breeding to our citrus fruits. A little haphazard and unsystematic selection here and there, tells the whole story to date. We are now at the opening of a new era, and I expect to live to see the day when we will have a Navel orange or a Marsh grapefruit better in every respect than the average of today, and in addition possessing but four or five sections. What breakfast fruits they will make, and how rapidly they will replace the sorts we are getting along with today! There may be bud sorts even now existing in some California orchard that will yield such fruits. I have already seen individual fruits that were definite promises of such possibilities. We can beat the world along these lines if we will get at the work actively enough.

The existing named varieties of grapefruit were each named from some single parent type, and that particular type carries the name always. However, every fruit grower knows of the wide individual variation that occurs within the limits of any variety, and also the wide variation from the type in some character, that may be produced by varied surrounding conditions. If the variation be not too wide, we still recognize the variety. And how? Simply by approximating it to the original type which it most nearly resembles. A great trouble has always faced us in the fact that neither our orange or grapefruit varieties have received the more systematic and careful comparative treatment that has, for instance, been given the avocados, by our Mr. F. W. Popenoe. With the works of Hume, DeLong, or even of Risso or Bonavia, in hand, one must simply flounder about among many closely related varieties, with about as even chances of being wrong as of being right in his conclusions. Some few varieties are marked by very conspicuous characters which are almost always unmistakable, such as the orange-likeness of Aurantium, the sweet flesh of the Royal, or the pink flesh of the Tresca. But for the most part decisions have to be based upon judicious examinations of the character of the surface and the thickness of the skin, the shape—especially form of base and apex—the number of sections and seeds, shape of seeds, character of pith, and so on, and also occasionally the character of growth and foliage. Taking the fullest descriptions of the varieties that have been given and carefully comparing them, we find many pairs of varieties that can scarcely be separated so far as the current descriptions go, by any characters that are of good diagnostic value. In Hume's work, for instance, compare the descriptions of Hall and Josselyn, Walters and Excelsior, May and McKinley, and Hall and Triumph. Nothing will take the place of being thoroughly acquainted with these things in the field. Have we any permanently established breeding gardens where one may see enough typical examples of all these varieties of authentic origin, and brought to characteristic and perfect development? Can we secure any firm foundation for breeding work or exact knowledge, by absolutely ignoring pedigrees? Hundreds of our growers would go far to visit such plantings. Certainly in the case of the grapefruit, such a fundamental knowledge must precede any really serious work in selecting or breeding. Indeed, I believe that such planting should exist in every distinct type of region that we have, the common property of the orange growers themselves, and governed by them, and such plantings would be of immense service and rich in information, apart from all other considerations. Our growers are now only definitely organized for the business side of citrus work. I believe that there are just as cogent reasons for organization to promote research, investigation and production. The condition of the grapefruit in Southern California today is only one of many evidences of our needs in this direction.

Pasadena Flower Show, April 1911.

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Pasadena Flower Show, April 1911

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Smiley Hall, Claremont.

Mulgoba Mango a Valuable Tree

John B. Beach Gives Technical Description of This Great Fruit

WHEN the American Pomological Society, recently in session at Tampa, heard a paper by John B. Beach, of West Palm Beach, on "Mango Culture in Florida," members learned many interesting things regarding the history of this fruit. After giving a history of the mango, as known and grown in foreign countries, Mr. Beach referred to its advent into Florida, saying:

"The mango will grow and thrive in almost any soil, producing crops of fruit on the poorest white sand ridges, if properly fertilized, where not a thing but pineapples would grow. It will also succeed on land so low that all other fruit trees will be killed out by too much water in time of freshets. In fact it will grow on land so low as to be unfit for anything else but cocoanuts, provided the soil is never poisoned by salt water. They are often found in the West Indies growing on the edges of mangrove swamps. It stands wind well owing to its leathery foliage and tough, resinous wood, so as to make it a most desirable windbreak for delicate trees. The fruit matures in June, July and August, and can be gathered several weeks before mellow, and shipped while still hard, like a pear.

"There are as many different kinds as there are seedlings, though only a few hundred of the best are propagated and known by name, as is the case with apples and peaches in America. In like manner each variety is prized for some particular quality or characteristic. They vary from the Round Amini, 4 to 6 ounces in weight, to the Sundersha and Langra Benarsi 2 to 3 pounds, and in shape from almost round to long crooked and flattened.

"Mulgoba is a good typical average specimen of the East Indian mango to take as a sample for description, and as it has a wider distribution in Florida than all other varieties put together, I will take it. I will say here that in Bombay it is very highly esteemed, often bringing $1.50 per dozen in the local market, and is there only considered as second to some of the Alphonso type in flavor. The latter are all distinguished by particularly long foliage, while the Mulgoba looks more like the general type of mango seedlings, so far as foliage and habit of growth are concerned.

"In Florida the established price for the fruit is 25 cents each, f. o. b. This price was established by Mr. Gale, who for some years produced all the Mulgobas in the country, and up to the present time, good specimens have always brought that figure. In the fancy fruit stands in large cities they retail from 50 cents to $1.00 apiece.

"Following is the technical description on file at the Pomological Bureau at Washington: 'General color yellow, rich apricot yellow, texture medium tender, juicy. Size large, flavor mild, sweet, very rich, quality very good.' In common everyday parlance it is an elongated and flattened fruit weighing from 14 to 20 ounces, yellow with red cheek when mellow, with a thick leathery skin, the latter possessing a flavor of turpentine, owing to the fact that the sap of the trees contains a turpentine. The pulp is a rich apricot yellow. In flavor it is richer by far than the choicest peach, which it somewhat resembles. It may be compared to a mingling of peach and pineapple, together with a spiciness all its own.

"The aroma of the fruit is very abundant, and the perfume most subtle and enticing. A plate of them will perfume a whole room.

"There is a slight down on one side of that flat seed, but it does not extend into the pulp of the fruit, even as much as is the case with a clingstone peach.

"A special mango fork is used in eating them. This comprises one long central tine, which is thrust into the seed at the stem end, and two short tines on each side of this to engage the end of the seed, and prevent the fruit from slipping about on the central tine. It can thus be held in one hand without soiling the fingers with the juice, while the skin is removed with the other hand and the pulp scooped from the seed with a spoon.

"The common seedlings are most of them far inferior in flavor and aroma, while many have a crude, pumpkin-like taste and often are much tainted with turpentine. All are more or less injured by the fibre which is attached to the seed, often filling the entire fruit with a mass of tow-like threads which with the turpentine flavor have given rise to the common description of the ordinary mango as 'turpentine and tow.'

"It is needless to say that all the varieties which are considered worthy of propagation are like Mulgoba, free from fibre. The mango is a most prolific producer of fruit and many of the oldest and longest propagated sorts will blossom and bear fruit at two years old; in fact, I have matured excellent fruit on specimens growing in 6x6x12-inch single boxes."

No. 1447 G R. B. Gardens 2

From The Director, Royal Botanic Gardens, Peradeniya, Ceylon.

To F.W.Popenoe Esq.
Altadena, California,
U. S. A.

10th July 1911

SIR,

I have to acknowledge with thanks the receipt this day of the Contribution to this Department mentioned overleaf.

I am, Sir,
Your obedient Servant,

H. F. Macmillan

Curator, R.B.G for *Director.*

The Avocado.

THE AVOCADO, or aguacate, grows in nearly all parts of Mexico and occurs in many different varieties all the way from the size and the appearance of a small plum or prune to a large fruit fruit some six inches in diameter. The meat varies in quantity and quality from poor and insipid to rich and delicious. Yet in spite of the immense range of varieties very little attempt has ever been made to improve them or even select the best. It has been taken for granted apparently that no other variety would flourish in any locality except those that have been there for years. In recent articles on the "Avocado in Southern California" by F. W. Popenoe the possibilities of improvement from budding and selection are strongly brought out. It is a fact well known to horticulturists the world over that a large proportion of the seedling trees either never bear any fruit at all or else bear a worthless product, and almost none possess the fertility and fruiting capacity which budded stock does if rightly handled. With proper experimentation under thoroughly scientific control the avocado could be made a source of tremendous profit and benefit. The fruit is so universally a part of the people's diet and at the same time so delicious and nutritious that no expense should be spared to produce the best trees possible by selecting and budding the best varieties. Wealth and great benefit to the nation can be derived from its production not only for home consumption, which would necessarily be great, but also for export. With present methods of railroad shipment it would scarcely be possible to export the large, soft, thin-skinned varieties grown in Chiapas and Vera Cruz States, but beyond all question there is a ready possibility of shipping some of the harder and thicker-skinned varieties such as, for instance, those produced in San Luis Potosi, Coahuila, and in the vicinity of Torreon. These varieties even in their present state are very delicious and with improvement in stock and with best methods employed in handling, packing and shipping surely will find a ready market anywhere in the United States, even after Florida and Southern California become heavy producers, as they will. Rightly managed, the avocado industry can and surely will become a source of great wealth to the country, and the time when this shall come merely depends on the readiness of the people to adopt the best that science has to offer. What better investment could be made than a large and scientifically managed avocado plantation, with only the best and most approved stock planted therein, to produce fruit that would easily take preference over the inferior seedling fruit now offered in the market, and some of which could be shipped with great profit into the United States?—[Pomona Journal Economic Botany.

OFFERINGS OF THE TROPICS

FRUITS OF THE WEST INDIES.
The juices of these fruits are used to flavor the refreshing drink always offered to callers under the name of "refresco."

THE resplendent bounty of the tropics is abundantly seen in the large varieties of fruits of the West Indies, which are even more evident and grateful than its varied flora. Like many tender flowers, numbers of fruits are too frail for transportation and so are little known abroad. There is the "anon," a custard apple, selected by the natives of Cuba as their favorite fruit, and although the aromatic delicious pineapple is grown side by side with the medlar pear, or "zapote," the latter is chosen in preference. This little untranslatable "caimito," the "mamey" and quite a family of melons, such as the "papaya," are all used as table delicacies, uncooked and also preserved, but quite generally as popular soft drinks which are well named refreshing—for to fail to offer a "refresco" to a caller in tropical regions is to lack in etiquette.

Limes, lemons, the homely tamarind or some satisfying flavor is ever at hand, while even watermelon is more esteemed crushed and its pulp served with sugar and water mixed with mango or a dash of orange and jingling ice, according to the locality and availability of that sometimes rare commodity.

More About Papaya.

I READ with interest the statements in regard to the papaya in your paper of September 14. I was interested because during a residence of three and a half years in the tropics the papaya was one of my favorite fruits and I have eaten it in various forms.

Papaya salad is one of the most delicious salads I have ever tasted. It is used in a green state for this and is chopped fine together with the other ingredients of the salad.

The ripe fruit may be eaten with a spoon like a muskmelon is eaten. I think it is not generally liked the first time it is tasted, but after one has acquired a liking for it one can eat it every day as long as the season lasts. It contains a ferment which makes it very digestible.

The papaya has virtues enough without overstating them, as they were overstated in the article referred to. That the ferment when uncooked may have a certain amount of digestive action upon raw lean meat is probably true, but the amount is not noticeable. I have squeezed out the milk from the green papaya upon raw carabao meat and left this together with the fruit in contact with the meat for twelve hours, yet after that amount of time I have failed to detect the least softening action upon the meat due to the papaya.

I have eaten green papaya cooked with meat very often. It is the general belief that cooking papaya with meat softens the meat. This is untrue. The softening claimed is credited to the ferment in the fruit. Now I am told by doctors and chemists that ferments are destroyed by heat. Therefore the ferment would be destroyed before it could cause any softening effects.

In the tropics the papaya is capable of withstanding most adverse conditions. While it responds to care and a fertile soil it is often found bearing its load of fruit hugging the trunk on the most barren and rocky soil.

There is a male papaya plant and a female papaya plant, the fruit being borne by the female plant. One cannot tell which is the male plant or which the female plant till the first blossoms appear, which is when the plant is from six months to a year old. Now the most remarkable thing about the papaya relates to this matter of sex and seems incredible. If the male papaya plant is cut off smoothly at the surface of the ground as soon as the blossoms show the sex of the plant the shock seems entirely to alter its nature, and as soon as the shoot from the stump reaches bearing age, as it quickly does, most of the flowers will be female and produce fruit. I did not believe this until I actually saw the experiment tried, although the commonly accepted belief among certain Filipino peoples.—[F. H. B., University Farm School.

* * *

Travelers' Tales

William Falconer on Some Gardens Abroad

I have just returned from a little visit to England, Scotland and France. Everywhere there unusual great heat and prolonged drouth prevailed, parching the lands and shortening agricultural crops. But it was as a horticulturist that my eyes were open and especially so as to decorative gardening.

Lovely as those countries are, and with gardens centuries old, giving them the advantages of broad, mature landscapes and splendid umbrageous trees in their pleasure grounds, in our newer, contracted way, in the case of maintenance and good keeping, the advantage is with America.

I was disappointed with the plantings, in the great Parisian gardens.

In England, the finest flower garden I saw was at Hampton Court Palace near London, and the most interesting garden anywhere was the Royal Botanical Gardens at Kew. The Scotch people dote on the Princes Street gardens. Being in the center of the city and that, too, in the best part thereof, they are more conspicuous than any other garden in any other metropolis. Certainly, they are well filled, gay and well kept, still I saw nothing in them to rave over. The botanical gardens at Edinburgh are very interesting, especially the outdoor rock gardens. But a more open, prominent and inviting entrance to them wouldn't hurt them in a popular sense. At the Glasgow Botanical Gardens are the finest and healthiest Tree Ferns I ever saw under artificial conditions. Why, the specimens of Dicksonia antartica there were more luxuriant and had a wider spread of fronds than any Cyatheas. All were planted out in an immensely wide conservatory; night temperature in Winter, 45°.

The Grampian Mountains, sterile and naked, were a sheet of deep rose-purple bell Heather, oh, so beautiful and dry, gravely knolls and banks were cushions of crimson purple Thyme. Blue Bells (Campanula rotundifolia) abounded along the lanes and roadsides, railroad embrankments and in fertile sports. The Ling, or Grey Heather, was opening everywhere. Speaking of Heather reminds me that bunches of Heather in bloom were abundant in Covent Garden Market, London, and also in the markets of Paris.

Yellow Calceolarias (aurea floribunda), blue Lobelias, tuberous Begonias, dwarf Nasturtiums, Canterbury Bells, bedding Violas, monthly Roses and hardy Fuchsias (F. Riccartoni) were the glory of the gardens of the Moray Firth region; in fact, these prevailed all over Britain. Indeed, at Wiseman's Nurseries at Forres, in the North of Scotland over 1000 distinct varieties of Roses are grown, including nearly everything that is new and desirable, and every kind is carefully and distinctly named. In fact, I don't think either E. G. Hill, William C. Barry or Antoine Wintzer knows Roses more widely, intimately or lovingly than does this grand old Scottish nurseryman. And what a wealth of blooms he had! And bordering the garden paths and flower beds in northern Scotland, Campanula pumila, and, more frequently, its white form, was one of the commonest plants used, and so full of little bells as almost to hide the foliage. Sweet Peas were finer in Scotland than either in England or France; the moister climate and cooler nights might have had something to do with this. At Sanquhar, than where I never saw them finer, the gardener told me of the vast quantity of cow manure he used for his Peas.

In the gardens of the hill or mountain regions of Scotland that hardy perennial vine, Tropæolum speciosum, was a solid sheet of scarlet flame, but in the lowland country or in England it wasn't nearly as good. I never saw a happy plant of it in America.

Of recent years the Victoria regia at Kew has been troubled with a rot-spot in its leaves that is giving them much concern. This same disease has been apparent in the Victorias at Schenley Park, Pittsburgh, for the last three or four years, while in the Allegheny conservatories, a few miles distant, not a vestige of it appeared until this year, and now it is quite bad. Several experimental remedies have been applied but without evident success. Speaking with Mr. Burke, the superintendent, and John Jones, the foreman, the other day, I advised, that after the Lily season was over, the houses be completely emptied of all plants and beds and the tanks cleaned out, the houses to be then thoroughly and repeatedly fumigated with sulphur, the tanks rewashed with cement, and all pipes and woodwork cleaned and repainted. With such heroic treatment, of course, all plants that are planted out in the side borders would have to be sacrificed. And even this is only experimental.

Kew was a joy throughout. Not only does it contain the greatest collection of species of living plants, native and exotic, hardy and tender, extant, but its arboretum and pleasure grounds are a fine example of landscape art, and everywhere it is scrupulously clean and well kept; even the private propagating houses and grounds and nurseries are as clean and well regulated as the parts of the garden open to the public. And these gardens are exceedingly popular. It was a bank holiday in London, the day when I was at Kew, and thousands upon thousands of visitors were in the gardens, and all so happy and so well behaved.

The style of flower gardening over there has changed a good deal from what it was in my time, forty years ago. Then ribbon borders and mass and pattern beds were much in evidence, and the herbaceous borders were more spotted with individual plants than panicled in clumps as they now are. Nowadays, the prevailing taste seems to be for large panels of one variety in the borders, and in the beds, high plants stuck into carpets of lesser ones. The best example of this sort of gardening in this country that I now can recall is at the Public Garden in Boston. Some carpet bedding is yet attempted and it is well done, too, but nowhere did I see anything to compare with that at Schenley Park here in Pittsburgh. The grotesque and ridiculous in designs there, as well as here, have disappeared and pretty little scroll or pattern plans are given instead. In the Princes Street Gardens, Edinburgh, were some well executed "coronation" designs. The excellent and lasting behavior of the dwarf Lobelias in these beds give them a great advantage over us, but their crimson panels of thickly grown little seedlings of Dill's Crimson Beets seem very far fetched when compared with our Alternanthera panels and lines. But Alternanthera doesn't like cold nights, hence their disadvantage. In other gardens, though, the crimson form of Oxalis corniculata made neat little panels.

Bold foliage effects, usually known as subtropical gardening, outside of some of the London parks, doesn't seem to be as popular as in long ago years; mass beds of blossoms seem to be more desired.

I didn't see a Cactus garden anywhere. In this the gardeners of Europe miss a splendid attraction. Wish they could see the beauty and attractiveness of the Summer Catcus garden outside Horticultural Hall, Philadelphia. It is even better than any I saw in California. Nor were Croton gardens or beds in evidence. Of course, only in the south of England and in France, could these occur to advantage. In this, too, Philadelphia could give them a lesson.

In the way of Water Lily gardening, my good friend, James Gurney of St. Louis reigns supreme, but here again we have the advantage of heat and sunshine, and friend Gurney's Lilies are all tender. But the Chicago parks can show us fine results in hardy Water Lily gardening. I had to go to Kew, though, to see my own namesake, Nymphæa William Falconer, in happiest mood. It was with evident pride, Mr. Blair, the assistant curator, led me to the Lily pond in the arboretum,and there pointed to a big patch of vigorous, healthy Lilies, thickly studded with lovely garnet blossoms. With a merry twinkle in his eye, he asked, "Do you know that?"

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Altadena, California
E.U.A.

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FANCY FRUITS

By SIDNEY HOCKRIDGE.

Attention is being drawn to the possibilities of the culture of varieties of fruit locally which have hitherto been regarded as needing a tropical climate, and the conditions of the tropics. Among these are avocados, mangoes, the sapotes, and also the star apples, another form of the sapotes.

It may be said in this regard that the experiments so far undertaken point to the entire feasibility of the profitable production of at least the avocados and sapotes, and possibly also the mango. Of these the avocado at the present time promises the best, and is now a commercial production of California and Florida. In groves the present season those fortunate enough to possess good types of the avocado trees in bearing are selling the fruits for twenty-five cents each on the trees to northern dealers. It may be noted too that avocados are highly nutritious, containing much greater value in food that the finest olives or even meat, so that there is no more likelihood of overproduction than is the case with potatoes, and is much less of a probability than with either apples or oranges, both of which appeal rather to elegance and luxury than to diet value.

The avocados with which we are most familiar are of the poorest types of seedlings, such as are known as alligator pears, a Florida name for them, and no more compare with the good types than does the fruit of sour orange with our finest navels. The proposed type of commercial avocado is a very ancient fruit and was common among the Aztec nations when the invaders came to their country. It is native of the tropical belts principally; but one form is found in the United States and another in the Canary Islands. That a tree affects the tropical regions and is introduced from there is not an infallible guide that it is not adapted to other sections, or at least may become adaptable, since the higher altitudes in the tropics correspond to a more northerly, or a more southerly latitude; and this is exactly the case with avocados, the finer fruiting forms being met with at considerable elevations in tropical Mexico and Eucador, both being regions with little of the humidity common to the coasts and having indeed some of the rigors of winter, even a slight snowfall.

Of the other fruits proposed for California much the same may be said. The delicious mango at present cultivated only in the tropics, may without the slightest doubt by methods of adaptation, be cultivated in Southern California. Of the cherimoya and the sapote there is little doubt if suitable locations are selected they can be planted with as little risk as we take in planting the orange.

A matter of importance with the fruits mentioned is they all recover quickly from frost damage, and suffer no permanent injury as the orange does. A degree of cold which freezes fruit on the orange tree will usually so, also rupture the cell structure that the effects are visible for years in the larger outgrowths, causing a spindling growth which prevents fruiting but come back grandly in a single season to full vigor.

The writer thinks less of the mango as a fruit for California. It may be, however, that some of the ranches which are situated on the rims of the valleys can look for considerable success in the cultivation of mangoes. It is certain that practically frost-free territory must be chosen for the experiment. Low lying land which is air-clogged during cold spells is out of the question. The mango enjoys a warm, buoyant atmosphere which must be nearly if not absolutely frost-free.

One of the things which causes failure in the cultivation of many forms of vegetation which are introduced from a warm climate to a colder one is a poorly ventilated soil. The effect is that the soil does not, quickly enough, approximate the air temperature. A porous soil which is also rich should for that reason be selected for trees which are known to be susceptible to sharp variations of temperature. The effect upon trees of poorly ventilated soils is to cause them to exhibit what we observe to the orange as gum disease, which is due entirely to congestion of the energies at the point nearest the ground. It is probable enough that valuable fruit groves composed of the rarer sorts from the tropics will warrant the cost of a special preparation of the soil to meet this difficulty where necessary, for given the other requirements of climate and location, the cost of making a complete change of the soil in view of large and sure profits which will come, would not be great comparatively.

Splendid Possibilities.

AVOCADO HAS FINE FUTURE.

Alligator Pear Promises to Become a Staple.

Trees Flourish in Southern California.

Fifty Thousand Plants in Altadena Nursery.

The wonderful variety of the horticultural products which it is possible to raise in Southern California on a commercial basis is attested by the growing popularity among planters of that valuable tropical fruit, the avocado, or "alligator pear." This queer, rich product has been asserted by experts in food values to be "the most valuable fruit grown;" and it is further said that with a sufficient supply of avocado tres in bearing the world could do away wtih meat entirely—in fact that with widespread planting of these trees their enormous productiveness in food values would make the raising of animals for food purposes too wasteful to be considered.

The avocado seems to be nature's concentrated "field ration"—the concentration of all the necessary ingredients for human nourishment in a single fruit. While this astounding product may not be grown in the colder regions of the world, the amount which it is possible to produce on a single acre in the favored sections, such as Southern California, would make it possible to send a sufficient output through the nation at large to place it within reach of all classes.

As a result of the study of the avocado, in which the United States Department of Agriculture has co-operated with local horticulturists, Altadena is now possessed of the largest avocado nursery in the world, from which are being distributed the trees that are to be the basis of the most picturesque ranch industry yet inaugurated in this land of variety. Fifty thousand avocado plants, all the way from little potted seedlings to the budded and well set trees in the field, ready for the planter, are to be seen within the confines of this beautifully situated experiment station at the base of the mountain back of Pasadena. From here shipments of as many as 5000 trees at a time are being made, one of the large orange growers of Redlands having recently planted that number on ground previously intended for the expansion of his orange orchard. Such plantings as these seem to indicate that the practical ranchmen of this region are prone to believe that the avocado is bound to become a formidable rival of the orange in profit to the grower, which is just what the enthusiasts claim for this product. They go even further, and assert that it will become the most valuable crop of Southern California.

A ROMANTIC FRUIT.

Be this as it may, it has been proven that the avocado (Mexican [illegible]) can be successfully grown for profit in portions of the orange belt, and it is said that it can be depended on to produce in any section where the by those who have small home ranches and delight in surrounding their homes with rare products.

Avocado growing on a small scale is not new in Southern California. There are several enormous trees in this section, twenty-five and thirty years old, which have long bern large crops. But these are only seedling trees, and the success of the present avocado movement is based on the proposition that all stock must be budded, like the orange, to produce in true tropical perfection. But these scrub trees, even, have made a wonderful showing. For instance, on the Miller place at Hollywood there is a tree which bears annually as many as 2000 fruits that are sold at from 25 cents to 50 cents each. The common price of an "alligator pear" in tae market, both here in Los Angeles and in eastern cities, is 50 cents—when you can get one! Mr. Chappelow of Monrovia has another old seedling, grown from seed sent out years ago by the Department of Agriculture, which nearly equals the record of the Hollywood tree in productiveness. The famous Ord tree at Santa Barbara is another pioneer. Plantations of budded trees in Southern California which are becoming well known are those of Joseph Sexton at Goleta; C. P. Taft, at Orange; F. S. Thatcher, Nordhoff; W. G. Davison, La Habra, William E. Spinks, Monrovia.

The Mexican is the variety which seems best adapted to this region, but the wide range of varieties which are being experimented with here, and with success in most instances, may be gathered from the following list of localities from which derived Florida, the Bahamas, Guatemala, Cuba, Canary Islands, South America, Hawaii.

ALMOST PERENNIAL.

The Mexican avocado is peculiar in that it is found growing all the way from the hot lowlands of the tropics to the cool plateau, where there is often experienced lower temperatures than are ever felt in the orange belt of California. The trees at the different altitudes produce at different seasons of the year, so that in taking buds from these varying localities it is expected that the crop of the California tree can be made to extend over most of the year. The large nursery at Altadena, before referred to, keeps an expert constantly traveling in Mexico and Central America locating choice native trees and securing buds from them, which are successfully shipped over the intervening deserts and mountains and grafted onto the California seedling stock.

The reason that the marvelously nourishing avocado is so little known to the people of the United States is that nowhere in the tropics is it grown on a large scale, the product which drifts into our markets coming from small groups of trees around native huts, where they flourish without care and afford easy meals to the indolent owners. With the systematic growing of the trees in the more energetic northern regions it is expected that the taste for the avocado will be rapidly cultivated among the American people. It is pointed out that a quarter of a century ago the banana, which is now imported into the United States in enormous quantities, was practically unknown to the masses. Systematic development of the market by large concerns has developed a taste for this product, which reaches truly appalling figures. As a food, the avocado is asserted to be greatly superior to the banana. It is said that on account of the irrigation and cultivation required to develop flavor and shipping qualities, the avocado never will be grown in competitive quantities [illegible] more than the orange.

The avocado contains from 5 to 20 per cent. of pure oil, beside other ingredients of extreme food value, and one good-sized fruit is a meal for an

The avocado orchard is planted and irrigated much as the orange grove, but the tree is not susceptible to the insect pests that annoy citrus trees. The seedling is ready for budding at between one and two years of age, and begins to bear three years later. The Mexican variety produces a roundish, green-skinned fruit, differing considerably in appearance from the oval, purplish Hawaiian variety, which hitherto has been most seen in the local market. The Hawaiian fruit has been lately excluded from California by the authorities, on account of the prevalence of the Mediterranean fly in the islands.

Experiments of great interest in other kinds of tropical fruits are being carried on in the Altadena nurseries, with the co-operation of the United States Department of Agriculture, of which this is one of its regular co-operative stations. The department has eighty prosperous little mango trees here, and among other rare products may be seen rows and rows of the fruiting passion vine, papaya, melon zapote, Queensland nut (which retails in London at $1.50 per pound,) the pineapple guava (feijoa sellowiana) from Brazil and Uruguay, the huge Guiana guava, the rose apple, which has the perfume of a rose, and the famous Mexican cherimoya, or custard apple, a truly "heavenly" fruit.

Specimens of the cherimoya, in full bearing, may be seen in the home grounds of F. O. Popenoe, adjacent to the nurseries in Altadena, and fine fruit is produced on the Miller place in Hollywood. In fact, all these delicate tropical fruits with which the department is experimenting here are expected, by the successful results of the chance private effects, which have been made here and there, to develop into commercial success, and the work is not done to satisfy the curious or produce hot-house oddities for the fancier.

Los Angeles Sunday Times.

The Avocado, or "Alligator Pear,"

Which is becoming popular in Southern California and is pronounced the most valuable fruit grown in the world. Below is shown a part of a fifty-thousand-plant avocado nursery in Altadena.

NOVEMBER 5, 1911

"When a specific name is taken from the name of a man, it is formed in the following way:

(a) When the name ends in a vowel, the letter i is added (thus **Glaziovi** from Glaziou; **Bureaui** from Bureau), except when the name ends in a, when e is added (thus **Balansae** from Balansa).

(b) When the name ends in a consonant, the letters ii are added (thus **Magnusii** from Magnus; **Ramondii** from Ramond), except when the word ends in er when i is added (as, **Kerneri**, from Kerner)."

The basis of these recommendations is, of course, the Latin rules for the formation of genitives. The Latin form of a name is not the same as the ordinary English form—for example, Veitch would be Veitchius in Latin. Of this form the us is the termination which, according to rule, becomes i in the genitive, giving us the form **Veitchii**. We therefore write **Ampelopsis Veitchii**, as given in Nicholson. Some people arbitrarily simplify this by dropping the final i, as in Bailey's Cyclopedia, but neither the scientist nor the Latin scholar will officially sanction such simplification. However, the rule is not rigidly adhered to. We find, for example, in Bailey's Cyclopedia, under "Explanations," this statement:

"The original spelling (as written by the author of the name) of the masculine genitive ending is usually retained, whether i or ii, but the syllable is usually pronounced as if the i were single. Whether one i or two is used in the making of a masculine genitive, is largely a matter of euphony and personal preference."

It will be observed that a noun ending in a vowel (except a) takes a single i in the genitive. It is also to be noted that names of persons may sometimes take the adjectival form if the author of the botanical name so desires. We find this in **Aspidium Veitchianum, Geranium Robertianum**, etc. Very truly yours,

H. M. HALL.

Budding Avocados. • • •

A FANCIER of tropical fruits wishes to know when to bud avocados; if it may be done now. F. E. Higgins, Hawaiian horticulturist, says one may bud any time the bark will slip. So says F. W. Popenoe, a local authority, but he recommends November as the best month. The writer knows of one successful grower who has many November buds growing but was putting in some only last week. The budding stocks should be a half-inch in diameter but by reason of the active demand for budded trees many bud them when but a quarter-inch at the base.

LOS ANGELES EXAMINER
SUNDAY, MARCH 10, 1912

South Fruit Industry Enriched

Huge Alligator Pears Grown Here

Miss Maude Stofle, Holding Basket of Alligator Pears.

Thousands of Trees Planted to Bear Product to Surpass Imported Variety

Southern California has been enriched by the addition of the so-called "alligator" pear to her wealth of fruit products, and thousands of trees are being planted in the West India Gardens, near Altadena, where it has been demonstrated that alligator pears may be grown to surpass both in size and quality the finest ever imported from Mexico or Hawaii.

The importance of this new achievement, it was stated yesterday, lies in the fact that Southern California has heretofore been forced to import these pears. A prominent produce dealer said yesterday that Southern California will in a few years become a great market of this valuable product.

Only a few days ago twelve of the largest alligator pears ever seen in Los Angeles were received by a local produce firm from Hollywood. One of these weighed [illegible] pounds and [illegible] ounces. The average pear weighs from twelve to fourteen ounces.

At the West India Gardens 10,000 of these trees have been planted and more are being imported and are being seeded in the rich soil of Southern California.

The utmost care is taken in the growing

[Reprinted from TORREYA, Vol. 9, No. 11, November, 1909.]

TERATOLOGICAL FORMS OF CITRUS FRUITS*

BY S. B. PARISH

Malformations as remarkable as are some of those which have been described and figured in the pomes, notably the pear, do not appear to have been noticed in the hesperidiums. But while these curious forms are of merely scientific interest, and are without economic importance, among oranges and lemons those most commercially valued are, teratologically considered, mere monstrosities.

The best lemons are varieties which habitually abort the ovules, and, therefore, bear seedless fruits, which are, for that very reason, preferred to those which are perfect and seed-bearing. There are also other, and objectional deformities to which the lemon is subject. The simplest of these is a roughening and thickening of parts of the rind, causing elevated longitudinal ribs, or sections, of greater or less breadth.

Occasionally the carpels themselves are more or less atrophied. This results in such forms as *d* and *e* in the accompanying figure, in which the vestiges of the carpels are contained in the bulb-like extremities of the fruit. In *f* and *g* are shown forms of still further degeneracy, in which the carpels have entirely disappeared, only the pericarp remaining, which is further deformed by fission.

Syncarpy, one of the commonest teratological conditions in fruits, is often exhibited by lemons. In specimens which have come under my observation it was confined to the coherence of only two individuals, but it is probable that a larger number may sometimes be involved. In some cases the coalesence is so complete that the proper outline of the fruit is little affected; more commonly the union is incomplete. Usually one member is not fully developed, as *a* and *c*, or both may be only imperfectly developed, as shown in *b*. Syncarpy also occurs in the orange, but more rarely than in the lemon.

The most esteemed varieties of the orange are also those which abort the ovules, and produce seedless fruit. This is the case with the navel, the choicest orange grown in California, which exhibits, in addition, a more pronounced teratolog cal modifica-

*Illustrated with the aid of the Catherine McManes Fund.

SOME POINTS ON FIELD-GROWN ROSES.

By John Gill, West Berkeley.

Read at the Convention of California Nurserymen, Los Angeles, Nov. 23, 1911.

The cultivation of field grown roses in California has assumed very large proportions within the past few years. This refers not only to plants grown on their own roots, but to budded stock as well, and it is only within a comparatively short time that the latter sort has become so popular that many hundreds of acres are devoted to it. Many roses are of very satisfactory growth when raised on their own roots. By this statement it is meant that they root easily, grow strongly and transplant readily. These are ideal conditions when they exist and are the only things to be considered if we would make a success handling stock after this method. Unfortunately, a majority of our best sorts only fill one or two of these essentials, and unless all points correspond the effort with that particular variety can not be deemed a good risk.

Some roses root readily, but the quality of the roots is not such that they are to be recommended for transplanting purposes. This is a serious point and one that has caused great annoyance, and it might be well to qualify here and state that this is controlled largely by the quality of soil, the plan of irrigation pursued, and the amount of cultivation given. Each contention listed here has a direct bearing on all the others, and even under the best possible conditions many kinds will not make sufficient growth of either top or root to make salable plants in a reasonable time. Many pages might be written on any of the phases mentioned here, and as one thought leads to another we will now turn our attention to budded stock.

Planting Stocks.

First of all, let us consider the proper time for planting wild stocks. This is so dependent on climatic conditions for ripening, heeling in when necessary, and lining out, that every location is a law unto itself, and local conditions can not be handled in a general way. Presuming then that the stock is made into cuttings of usual length and caliber of well ripened wood and free from borers or other pests, we will next note the soil. Roses as we all know prefer stiff, heavy loam, with good drainage. An excess of sand means that an excess of water must be used, followed always by an excess of young growth which is not prone to ripen, and an excess of dead roses after transplanting. This is the reason why so many growers have not been successful in the warm, dry parts of California where good stock cannot be grown without lots of water, always followed by the train of disasters just mentioned.

Cultivation.

Cultivation first, last and all the time during the spring and summer is the key to successful rose growing in this state and by no other method has any grower achieved anything except pecuniary loss. When the cuttings, climate and soil are right, we may next devote our attention to the planting. Always place the stocks deeply in the ground and see that the soil is packed around them firmly. Commence cultivating thoroughly as

Choice of Stocks.

As to the choice of stocks there is quite a diversity of opinion in what should be used for the various sorts to be worked on them. Many varieties absolutely refuse to make a union with certain wild roses. Others make a half-hearted connection, and wait patiently for a good wind-storm when they may sever their irksome bonds. Some are very discriminating in one locality and not in another. Others work well on several sorts, and some apparently will not grow on anything. So on down the line, a constant study with the end always in view of finding out what is best for your particular purpose. It will be seen from this that to make a success in this division of rose growing many particulars must be kept constantly in mind, and eternal vigilance your watchword.

Budding.

After the stocks are planted and growing strongly the budding season comes around. This is another important season. The cutting of buds must be done with great care and precision and woe to the grower who relaxes his vigilance at this time. Careless help has driven many a nurseryman to distraction when he deserved a better fate. The selection of varieties and the quantity of each to be worked is another perplexing problem. The fickle public changes its wants often and without notice. The sort that is popular this season can't be given away next year, and vice versa. We are supposed to know all of this ahead of time and act accordingly. There are quite a number of so-called standard varieties for which there is always call in limited or fair quantity, but with the bulk of the different kinds it is sometimes a gamble.

About budding itself there is little to argue on, but about the mistakes made after the bud has been inserted a book might be written. Presuming that the scions are properly cut and handled and the choice of tying material right, we must pay attention to the man who ties the strings. Too many wrap too loose. Wrapping or carelessness in making a knot ruins many thousands of good material yearly. Then the growing of the stocks must not be allowed to stop. Too much stress cannot be laid on this point, whether the young stocks are to be encouraged by artificial means to shoot out quickly or not. Then the effect of a possible cold snap or a heavy wind storm taken into consideration and the young wood pruned accordingly. These two latter conditions cannot be entirely forestalled, and he is indeed lucky who does not lose a goodly portion of his crop occasionally by some of these happenings. But barring accidents and under usual conditions the buds are ready for inspection in a few weeks after budding. If all points are right there should be no failure greater than one per cent, and this has been our record for many years. Occasionally we get poor scions of some new variety from a distance and the loss is much heavier.

General Hints.

In topping the stocks the rose grower has another good chance to distinguish himself. Whether to do it early or wait until later is often an enigma, and if one was always sure of the weather, much extra work could be avoided and less danger from wind and rain. Heavily irrigated roses show little inclination to become dormant, and when dug in the fall and covered with young foliage, are in anything but satisfactory condition for transplanting. On the other hand when there has been no irrigation and the stock allowed to dry off naturally, there is no difficulty in digging, no danger of heating during transit, no drying back when replanted, and no kick from the purchaser.

Another point should be mentioned here. Non-irrigated roses can be dug with perfect safety as early as October and from that time on there is no difficulty in handling them until the first of April. This gives the grower a splendid chance to dispose of his stock at such times as best please his customers in the many parts of the country. Digging when possible should always be done with a treedigger, as the public have become quite as particular in the matter of roots as they always have been with tops.

One might ramble on indefinitely about the varieties of roses, both new and old, and the peculiar conditions favorable to certain kinds and classes, but it is not the intention to go into details along these phases, and in concluding will remind you that the demand for properly grown, fieldgrown roses was never greater than it is at the present moment in California and although quite a few growers have "gone broke," to use a common expression in our state, it was because invariably they had overlooked or did not consider the importance of one or more of the points we have endeavored to impress on you.

American Pomological Society.

ORGANIZED 1848.

SESSION MEMBERSHIP $2.00.

LIFE MEMBERSHIP $20.00.

This is to Certify, that Mr. F. O. Popenoe having paid a membership fee of TWO DOLLARS, the receipt of which is hereby acknowledged, is a member of THE AMERICAN POMOLOGICAL SOCIETY for the period ending with the opening of the session of 1912, and is entitled to one copy of the Proceedings and to all the privileges extended to its members.

Ithaca, Nov. 24, 1911

John Craig
TREASURER.

Christmas 1911

AGAIN we come to the season of Friendly Feeling, to the time of remembrance of Great Gifts, to the rebirth of Christ and his sublime unselfishness in the hearts of men. As the close of another year of our lives approaches, I am wondering what the year has brought to my friends and acquaintances that they themselves consider of preeminent importance.

To me, this year has yielded accumulated riches in great friendships and wonderful acquaintances, that alone would suffice, in spite of the trials, disappointments, and burdens of Life, to keep my head erect, and my eyes to the Front. For these friendships and acquaintanceships are among men of great hearts and great ideals, men not afraid of criticism, men fearless in the face of apparently overwhelming obstacles and opposition, men unshrinkingly true to their own great ideals, fighting hard themselves and cheering others on to do the same—the kind of men who will pass through great troubles and sickening disappointments with Smiles and Good Cheer.

Among the many of this sort of whom I am thinking now, are, just for example:

Brother Leon, of the Colegio de la Salle, Havana—a Christian gentleman of the highest type, a priest, a great teacher, and a devoted botanist. A man big enough to sink even his own name in the business of unselfish endeavor.

Dr. E. B. Copeland, of the University of the Philippines, a university man of broad attainments, who has accomplished great things for the educational interests of the Philippines, and in addition to all his other endeavors has accomplished great results at a scientific investigator.

Dr. Huber, diretor of the Museu Goeldi, **Mr. Simao da Costa and Dr. Ferreira Teixeira,** publicists, of Para—great men, of great outlook, with hearts and interests fixed on the highest development of that coming Empire—the Amazon Valley. They are fighting their way through fairly paralyzing conditions, with extraordinary constancy to the great ends in view.

Program and Details

SUBJECT TO CHANGES

FIRST FALL MEET

OF THE

CALIFORNIA ASSOCIATION OF NURSERYMEN

AFILIATED WITH

THE PACIFIC COAST ASSOCIATION

TO BE HELD IN THE

Chamber of Commerce

LOS ANGELES

Thurs. and Friday, Nov. 23-24, 1911

Automobile Drive and Picnic Nov. 25

LOS ANGELES:
THE KRUCKEBERG PRESS
1911

the dooryards throughout the South as the apple-tree is to-day. These are all fields of discovery, and already pioneer workers are entering them.

What secrets lie hidden in the soil! It is almost as much a *terra incognita* to-day as it was in the times of the Egyptians. The roots of plants and their life in the soil are hidden

furnaces.

The days of early Indian wars and the massacres of whole villages are gone, but the pioneers are still here; pioneers who have left the beaten track and are blazing new trails into the wilderness, often sacrificing their comfort, risking sometimes their lives and endangering the lives of their families while doing it.

STRAWBERRY ACRES

In Ten Chapters. Chapter Three

By Grace S. Richmond

DRAWN BY FLORENCE E. STORER

THE SILVER NOTES . . . DROPPED DAINTILY AT FIR[ST FROM] THE SINGER'S LIPS.

"I FEEL," said Sally Lane, impressively, "that the way to receive them properly is to have afternoon tea on the lawn. What is the use of having a lawn—even if it's still rather hummocky—and four magnificent ancestral oaks, if we don't sometimes have afternoon tea on it, under them?"

She stood in the doorway of the front room in the west wing, where Mrs. Burnside and Josephine were sitting, the one busy with some small piece of sewing, the other writing letters at a desk.

"Are they coming over before we call on them?" Josephine asked. "Coming to-day? Why, they arrived only last night."

"I saw Mr. Ferry this morning," Sally explained, "and he said he didn't want to wait for us to call. He wanted to bring the girls and his mother over this afternoon. He said they were crazy to come."

"Sally! He didn't say they were *crazy* to come."

"He didn't use that particular word, perhaps; men never do, of course. But he said eager, or anxious, or something like that—it means the same thing. Evidently they've been told all about us. What would you give, Jo Burnside, to know how we have been described?"

"We probably haven't been described at all. Men never describe people. They just say, 'She's all right, you'll like her,' or something equally vague."

"It would give me a chance to wear my lilac muslin," mused Sally, quite irrelevantly, but Josephine caught her meaning. "Afternoon tea on the lawn? Then do let's have it. Anything to see you in that lilac muslin!"

"Then we'll trail over the lawn to meet them,—only the lilac muslin doesn't trail,—and we'll hold out our hands at a medium sort of angle, so that we'll be prepared to reciprocate whatever sort of high-low shake fresh from abroad they give us. Since Dorothy Chase came back last fall she gives a side-to-side jerk that stops your breath short just where it happens to be at the moment. What do you suppose they'll be like, anyhow? Young ladies from two years' residence in Germany, or just plain, jolly girls?"

Josephine shook her head but her mother replied, in a quiet tone of conviction, "I doubt if the daughter and sister of that family will be anything but a simple-mannered girl, no matter how experienced she may be in foreign usages."

Sally nodded. "So I'm hoping. But 'Miss Carew,' with a voice, sounds more formidable. It's for Miss Carew I'm going to have after-[noon tea and wear the lilac muslin; she will be in] black clothes," said Josephine to her mother. "It will be good for her to wear the lilac muslin, for now she's made it she can't bring herself to put it on, though she knows how we all want to see her in colors again. Speaking of colors, Jarvis said this morning that in the south meadow the grass was blue with wild violets. I'll go and pick a big bunch for Sally's tea-table."

"It's rather early for tea on the lawn," suggested Mrs. Burnside, "though I couldn't bear to damp Sally's ardor by saying so."

"Oh, it's very warm, and the lawn seems quite dry. I don't blame Sally for wanting to show off the ancestral oaks. It's really like June."

But alas for plans which count upon the most June-like May weather! No guests were served with afternoon tea that day except under a roof more substantial than the low-bending boughs of the great oaks. On the lawn Sally, lilac-clad, was laying her fine linen cloth, setting out her thin teacups of the gilt-banded china, and arranging Josephine's blue meadow violets in a curious old engraved glass bowl of Grandmother Reid's. A small gust of wind, lifting the edges of the heavy damask cloth and nearly capsizing the

Date Culture in California

By Dr. J. Eliot Coit. Pomologist, California Experiment Station

For the last two years small quantities of California grown dates have appeared on the market and on account of their very fine quality and the neat and cleanly appearance of the package, they have commanded prices greatly in advance of imported dates. The question as to whether the high-priced Deglet Noor date can be produced commercially in California may now be answered in the affirmative. As a result of the stimulation of interest in dates and date culture, a large number of people are today seeking information in regard to various phases of the business. Until the last year or two dates have been grown only in an experimental way, but the success of some of these small test orchards presages a large expansion in the near future.

Where Dates May Be Grown.

While date trees can be grown as ornamentals wherever the orange is grown, they will not properly mature fruit in any except the hottest and driest portions of the state. Perhaps a small quantity of very early soft dates may be matured in the hottest parts of the San Joaquin and Sacramento Valleys. The best quality dates, however, are limited to the southeastern corner of the state where the thermometer may be expected to range above 100 degrees almost daily for five months of the year and where the moisture content of the air is very low during the season of the date harvest. While it requires a very large total number of heat units to properly ripen dates, the trees are fairly resistant to frost. Date palms may be expected to endure on frosty nights a temperature of 20 degrees for a short time without serious injury. Another very important requirement is dry air at harvest time, for should a rainy spell occur just as the dates are ripening they are very apt to ferment and decay on the trees.

The date palm is not a typical desert plant, however, for while its head must be in the burning sky its roots must be well supplied with water. It cannot survive on a desert without water and considerable quantities of water are required to make the date a profitable tree. It is estimated that water equivalent to one miner's inch continuous flow for each five acres would maintain a bearing date orchard. All of the requisite conditions may be found in many places throughout the Imperial, Coachella and Colorado Valleys and the country around Palo Verde and Blythe, Riverside County. At other places in the state, such as the vicinity of Riverside, Redlands, Fresno and Oroville, early dates might be grown in a small way for home consumption and even placed on local markets to be sold in the fresh uncured condition. The Coachella, Imperial and Colorado Valleys are, however, the regions where date culture is destined to assume commercial proportions.

As to type of soil the date palm is not very particular. A very stiff adobe is not desirable, neither is a light sand which is low in plant food. Any kind of loam soil which is easy to work is suitable. One of the most striking characteristics of the date palm is its great resistance to alkali. It will grow and flourish on soils far too salty to produce alfalfa, grapes or a number of field crops. It is therefore especially suitable for the reclamation of white alkali lands which may be bought very cheaply. On very strong alkali it is difficult to raise seedlings, and offshoots may require some fresh soil well mulched with straw in which to take root. Once started, however, the tree will thrive under such conditions.

Kinds of Dates.

The date palm like most deciduous fruit will not reproduce itself true to variety from seed. Seedlings vary greatly in character of foliage, precocity, fruitfulness, color, shape, size, season of fruit, and other characteristics. The only possible way to propagate varieties is by transplanting the offshoots or suckers taken from the base of the young trees. Standard African varieties such as Deglet Noor and Fard are simply extra good chance seedlings which were discovered, named, described and propagated in Africa many years ago. The U. S. Department of Agriculture has been collecting varieties of Old World palms for ten years, and upwards of 200 varieties of offshoots have been planted in the co-operative test garden at Tempe, Arizona. This large list of varieties may be classified according as the fruit is soft, medium or hard. The dates ordinarily sold in bulk by California grocers are the Halawi variety produced in Mesopotamia. The small dark-colored dates sold by grocers are the Fard grown in the Semail Valley near the Persian Gulf. Practically none of the dry or Arabian bread dates have been placed on American markets and they are therefore unknown to the American consumer. They are perfectly dry and may be handled like peanuts. They are filled with sugar and have a rich, nutty flavor. Offshoots of a number of different kinds of dry dates were imported and are now fruiting abundantly in California. These probably will sell at a smaller price than the soft dates, but on the other hand the loss from fermentation is practically nothing and the expense of harvesting

The varieties may also be classified according to whether the sugar they contain is cane sugar or grape sugar. Cane sugar dates are much sweeter and not nearly so sticky; neither do they cloy the palate as do the grape sugar dates. The Halawi is a good example of the sticky grape sugar type, while the Deglet Noor belongs to the cane sugar class. The grape sugar dates greatly outnumber the more desirable cane sugar varieties.

Of the two hundred or more varieties under test, a large number have have shown themselves to be but poorly suited to American conditions. Some have not fruited as yet, but perhaps twenty-five varieties will prove quite successful. After making a personal study of the fruit at the Tempe test farm for two years I consider the following among the most desirable for California planting. Soft dates: Deglet Noor, Itima, Beni Kebala, Tadala and Maktum. Dry dates: Thuree, M'Kentichi Degla and other varieties will come to the front, Horra. A very fine quality soft date suitable for local use but doubtful for shipping and a shy bearer is the Rhars. As the tests continue no doubt

Planting Offshoots in Orchard Form.

As a rule only young palms bear offshoots, the growth of trees over eight or ten years old being limited to the one terminal bud. Most young palms will produce from five to fifteen offshoots which are cut away from the mother palm and transplanted as fast as they reach the proper size, which is from five to fifteen pounds with the leaves trimmed off. April and May are the best months to transplant. The offshoot should be set to the depth of its greatest diameter, with the central bud somewhat above the irrigating water level. A shallow basin around the plant filled with straw facilitates irrigation and prevents the rise of alkali until the roots have taken hold of the soil. It is very important that the soil be kept constantly wet by frequent irrigations. The palms should be set not less than 30x30 feet and 30x26 feet is preferable, at which distance forty offshoots would be required for an acre. The subsequent culture is very simple. Frequent irrigations with an occasional cultivation to keep the weeds down and the surface of the ground loose is sufficient.

The Sex of the Date Palm.

The date palm belongs to that class of trees which bear male and female blossoms on separate plants. Somewhat more than 50 per cent of the seedlings will turn out to be male palms. In a state of nature this proportion of males will so fill the air with pollen that artificial pollination

lings, however, it economizes space to limit the proportion of males to females to about one to twenty or thirty and resort to artificial pollination. The process of pollination consists in cutting the large bunches of male bloom and dividing them into small strands. One or two strands when tied over the female bloom is sufficient to pollinate an entire bunch. This work may be performed very rapidly and cheaply provided a sufficient number of male palms which bloom at the right time are near at hand. The date ovary is three-celled, but one fruited by abortion. If the blossoms are not pollinated, there will be produced a large bunch of small seedless, worthless dates borne in clusters of threes. These seldom ripen and usually simply hang on till the winter cold and rain brings about their decay. It is not uncommon for city newspaper reporters to mistake these unpollinated dates for some new thing of value and indulge in scarehead articles about the wonderful possibilities of the newly discovered seedless date. A male seedling which is found to produce a very large quantity of good pollen is valuable and should be propagated by offshoots, these to replace the more inferior males. For very late blooming female varieties it is practicable to preserve the dried pollen powder in bottles and dust it on the late blooms with brushes.

Age of Fruiting and Production.

Varieties differ in time of fruiting, some not beginning to bear till six or seven years from the planting of the offshoot. The Deglet Noor is notably precocious. It usually bears two or three small bunches the third year and by the seventh year is producing six or seven bunches of from ten to thirty pounds each. Occasionally twelve or fourteen bunches are produced, but this is likely to be followed by a light crop the succeeding year.

Date trees live to a very great age. They should continue to bear profitable crops for one hundred years.

Processing and Curing the Fruit.

In the date growing countries of the Old World it often happens that a large proportion of the crop is lost by fermentation. This is caused by a wet spell of weather occurring during harvest time. This element of uncertainty was a serious drawback in California also, for the fall rainstorms on the American desert are known to be extremely erratic. Realizing this the Arizona Experiment Station has endeavored by long continued research to gain some understanding of the [illegible] edge, to devise a method of artificially [illegible] weather and putting the industry on a more secure footing. It is a great pelasure to note in Arizona Bulletin

Noor dates have been successfully ripened by controlling the temperature and moisture in incubators. This method with certain modifications has been used in California this year in ripening Deglet Noors. Dates thus treated of very fine quality and attractive appearance were sent to Los Angeles market and sold at one dollar a pound. Perhaps the novelty of this new California product partly accounts for such a high price. By ripening dates artificially, the opportunity is provided to thoroughly wash and cleanse the fruit and protect it absolutely from the flies which are a great nuisance wherever dates are handled in the open. It is said that imported dates are picked and packed by the Arabs in a horribly unsanitary and filthy manner, and on account of being pressed into a sticky mass it is next to impossible for the consumer to cleanse them.

Packing for Market.

One of the most attractive features of high quality dates is the fact that they are not mashed together but lie separate in the box with skins unbroken. In this way they may be handled and eaten without soiling the fingers. The stickiness of the ordinary imported dates is one of their chief drawbacks. After incubation the dates are sorted into three grades, the first grade being the finest quality, the seconds being of good quality but slightly off color or somewhat blistered with broken skin. The third quality or waste is composed of all dates for any reason unfit for packing. These can be made into excellent vinegar.

Fancy one-pound boxes, preferably of tin with paper lining and tastefully gotten up outer wrapping add a great deal to the attractiveness of the product.

Scarcity of Offshoots of Good Varieties.

Owing to the expense involved in importing offshoots from Africa the U. S. Department of Agriculture only brought in a few palms of each variety. Offshoots from these multiply at such a slow rate that it will require a number of years before a sufficient stock is secured to plant out a large acreage. The two varieties imported in largest numbers are the Deglet Noor and Rhars. As fast as offshoots are available they are distributed by the government, one or two to a party in all parts of the date region. Of course the waiting list of applicants is already quite extended.

Unfortunately when these palms were introduced two kinds of date scale insect pests were introduced with them; the Parlatoria scale and the Mariatt scale. An effort was made to disinfect these pests on entry, but [illegible] became established in California. They occur only on date palms and it [illegible] found [illegible] not an effective remedy. The Arizona Station has developed a method of fighting the scale with the gasoline

fruit for several years. It became necessary to scorch the trees in the oldest Deglet Noor orchard in Imperial Valley this year.

The presence of these scale pests makes the distribution of offshoots still more difficult, for county horticultural inspectors prohibit the bringing of infested offshoots into scale-free territory, and of course they are perfectly right in so doing. It is very difficult for private parties to secure any large quantity of offshoots true to name in Africa and any such shipment must run the risk of being held up by the local scale inspectors and if found infested ordered out of the state.

Growers Resort to Seedlings.

On account of these various difficulties in the way of securing adequate quantities of offshoots for planting out large acreages, growers have, for the present at least, resorted to the growing of seedlings.

In raising seedling palms about 50 per cent will turn out to be males and of the females a part, perhaps a third should be good marketable dates, a third indifferent, and perhaps a third will be worthless. To provide for this the seed are planted eighteen inches apart in rows four feet apart and allowed to grow two years. By this time any which may have shown themselves by a small bit of bloom to be males are destroyed and the rest planted in orchard form seven and one-half feet apart in rows thirty feet apart. This will allow for the cutting out of most of the remaining males as soon as their sex becomes known, and by some shifting of adjacent females a permanent orchard with the trees thirty feet apart each way will be secured. At some later date a few of the most undesirable trees may be cut out and replaced with offshoots taken from the very best trees. If desired, intercalary crops, such as vegetables, blackberries, or grapes may be grown between the tree rows for the first few years. This, of course, would be impossible in case the dates were planted on alkali land.

The question which seems to be bothering the growers at the present time is in regard to what particular kind of seed they should plant in order to secure the greatest percentage of good, marketable dates. At this stage of development this is a very difficult question to answer with any degree of certainty. Deglet Noor seeds from dates grown in Arizona or California are the most popular; partly because the pollen used in their production is known to be from males [illegible] partly because this variety is known to come into bearing very early. Fard seedlings also have produced some very fine seedlings. The writer has studied the fruit from a large number of seedling dates and it is his opinion

sorted Halawi or "Golden Gate" date which is commonly sold by grocers. Too many of the seedlings, although very good to eat from the tree, are watery and sticky and do not show enough body to hold their shape and appear attractive when packed. The great majority of the seeds being planted are American grown Deglet Noors and Fards.

How to Judge New Seedlings.

When judging new seedlings the following points should be considered:

Precocity—It is, of course, highly desirable that palms give some indication of what they are at an early age.

Season—Early ripening varieties are preferable; flavor and sugar content; amount of fiber in flesh; color; packing and keeping qualities; size of stone; thickness and quality of flesh; toughness of skin. Date skin should be tough enough to stand handling, but not so thick and leathery as to be objectionable in the mouth. Amount and regularity of yield; manner of ripening—It is very desirable to have all the dates on a bunch ripen at approximately the same time. This enables the whole bunch to be cut at once and obviates the necessity of going over the tree several times to pick the individual ripe dates. It is also important that the date in ripening should soften from the apical end toward the stem. Those varieties, such as Rhars, which soften around the stem first, shatter off on the ground at the slightest touch and thus cause much loss and extra labor.

BEST MEXICAN PLANT EXHIBIT IN WORLD HERE

Five Years and Trips to Regions Before Unknown to White Men Required to Gather 27 Carloads

What is declared to be the most remarkable collection of Mexican palms and plants in the world is being assembled at the home of E. L. Doheny, wealthy oil operator, in Chester place. Their collection represents years of arduous effort in Mexican jungles, miles from transportation lines. It is being classified by Dr. F. Francheschi of Santa Barbara, an eminent Italian bontanist and scientist. Twenty-seven carloads of rare plants have been received and more are coming.

Edward Howard, senior member of the nursery firm of Howard & Smith, 349 South Olive street, has worked five years in Mexico, below the tropic of cancer, gathering rare specimens. He has traveled thousands of miles, visiting regions and villages where white men, to the recollection of natives, had never been before.

Tender Varieties

All are tropical growths and very few are able to withstand even the semi-tropical climate of southern California and are restricted to greenhouses. The Doheny Mexican collection is far in advance of that of all other greenhouses in the country as a whole. It consists of about 4000 specimens, ranging in weight, when shipped in cases, from fifty pounds to three tons.

Its fame has spread to Europe, some of the plants being so rare that specimens of them were sent to Germany and Italy for botanical classification. There are 225 species of palms alone. Twenty-seven carloads have arrived and five more will be brought as soon as the weather permits.

Dr. Francheschi, said toh have a wider acquaintance with plants than any other man in the country, has come here to make a classification of some of the plants and palms, but Howard did his work so well that even Francheschi is baffled by some of them. The collection is worth a fortune. For the tariff it is necessary to get special rulings from the customs appraisers.

Five Years to Get Plants

"The collection consists of all kinds of ornamental tropical plants," said Howard. "I put in five years gathering them, eight months in the vicinity of Guatemala alone. Very few will stand the climate outside a greenhouse here. Some were shipped by water from Salina Cruz and some I brought in overland. There will be thirty-two carloads in all. Only one of the rare palms was lost, but that was because I did not take time to properly establish it. I have established another of the same species, however, and will have no difficulty getting it here in safety.

"This was a fan palm with leaf-spreads of ten and twelve feet. I have its duplicate growing down there in a box now, so I do not think there is any danger of losing it. The collection was made from within a few feet of the railroad tracks to sixty miles inland. We hauled them with canoes and ox-carts and dragged them afoot through the mountains. The orchids we found, however, were not as good as those of South America and are not considered valuable. The rest of Mr. Doheny's collection is the greatest in the world."

123 BISKRA. — Jardins Landon. — LL

...nished the PACIFIC RURAL PRESS by the United States Department of Agriculture, Weather Bureau, at San Francisco, for the week ending at 5 P. M., Dec. 12, 1911:

Stations.	Rainfall Data.			Temperature Data.	
	Past Week.	Seasonal to Date.	Normal to Date.	Maximum.	Minimum.
Eureka	.26	4.71	12.43	52	38
Red Bluff	.42	2.02	7.18	66	34
Sacramento	.32	.67	4.80	66	38
San Francisco	.47	1.79	5.34	70	46
San Jose	.26	1.82	4.02	66	32
Fresno	.34	.65	2.52	60	32
Independence	00	.80	2.44	62	16
San Luis Obispo	1.58	3.45	4.24	70	36
Los Angeles	.76	2.25	3.03	72	44
San Diego	.32	.85	1.80	72	48

The Week.

There is not much doing yet in soil-turning, as moisture is rather shy over large areas of the State, except where dry work is being done in preparation for irrigation, planting, etc. Naturally, there is much activity in valley subdivisions, where newcomers are beginning their home making and the warm, bright days are helping them along with these delightful and engrossing undertakings, and the result will be greater comfort for beginners when the heavy storms come along. The orchards and vineyards of older owners are also getting into good shape under the notably fine conditions for outdoor work: pruning, early spraying for fungi which attack the new wood, cleaning of corrals and spreading the richness therefrom—all these and similar seasonable things are being done swiftly and economically because the ground is firm and the skies bright. Citrus fruits and olives in early-maturing districts are being advantaged by the heat and by the better work which pickers can do in the clear than in the rains and mud. Still, in the time of such activities there is plenty of time for politics and these joys are keener in the sunshine of the fence corners than in the stifling heat of the stove of the country store with its aureole of cracker-boxes. It strikes us also that views of the political situation may even be clearer and more wholesome in the sunshine than in winter quarters to which subsidiary statesmen are forced to resort in stormy weather. And surely there is a depth of obscurity in this political situation which requires the clearest light to penetrate to an understanding. We are evidently undergoing a revolution in our public affairs, possibly as far-reaching as the contention in China, but which, fortunately, will be carried out with a free flow of breath instead of blood and is surer to reach its desired end because the human animal has a greater content of wind than of blood—if for no other reason. Therefore we exhort our readers, if any of them have idle days, to consort with their fellows in patriotic political converse and thus do their part in saving the country from manifest perils. We exhort them also to participate for the joy of it. Last month in Ohio we heard a speaker deploring the [illegible] in light, rich soil, with abundance of water for irrigating, quite large bunches

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Pasadena.

ALTADENA MAN'S STRANGE QUEST.

Goes to Sahara Desert for Date Palms.

Crown City Campaign for Water Is Opened.

New Directors for Pasadena Hospital Association.

[Office of The Times, No. 35 S. Fair Oaks Ave.]

PASADENA, Feb. 3.—It has fallen to the lot of a resident of Altadena to make one of the first trips into the Sahara Desert in quest of date palms for transportation to California. Paul B. Popenoe, a well-known newspaper man in the local field, has set out on a journey to some of the remote oases. He has been commissioned by a horticulturist at Indio to procure 600 shoots of the best variety obtainable for cultivation in the Coachella Valley, where the raising of dates for commercial purposes has got well beyond the experimental stage.

A letter received here yesterday brought the information that he planned to leave Algeria, from whence he wrote, immediately for the town of Biskra. This is the terminus of the railroad in the direction he is to take, so that he is probably now out on the desert with his caravan actually collecting trees. He expects to return home about May 1.

To gather these shoots and transport them to the railroad is a task which requires much patience and fortitude. The ownership of the Sahara groves is divided among so many Arabs that to obtain the quantity and quality of trees he has been authorized to purchase will necessitate his traveling about to a number of oases, making a trip of several hundred miles on camel back, and packing the shoots by caravan as they are procured.

Several of these importations already have been made by the United States government, and last spring a private shipment was made to California from the Sahara Desert. But the trade is still comparatively new and journeys after the merchandise are much in the nature of explorations.

Popenoe left Pasadena last June for an extensive tour of the European continent. Since then he has traveled in eleven different countries. He was in Italy when he received the commission to procure the date palms and fortunately at about the same time he met Dr. Walter T. Swingle, of the United States Department of Agriculture, and Dr. L. Trabut, a director of botanical research in the service of the French government. They were able to give him much valuable information relative to the manner of procuring and shipping the shoots; so that, by profiting by their advice, Popenoe expects to return with one of the finest lot of trees that has yet been brought across the Atlantic.

The Anonaceous Fruit Trees of Mexico.

BY DR. FRANCESCHI.

Bulletin No. 9, of the Estacion Central Agricola (Central Agricultural Station) of Mexico contains a Report by Prof. F. Foex on "Algunas Anonaceas frutales de Mexico" (some fruit bearing Anonaceae of Mexico), which is certainly not less interesting to the people of Southern California than to our neighbors across the Mexican border.

Cherimoyas were first introduced to California some forty years ago; they have steadily grown in favor and are now found on the market in several of our cities, but are not produced as yet on a truly commercial scale; in fact our knowledge of these delicious fruits and of their requirements is very limited. A condensed review of the important and exhaustive Report of Prof. Foex is sure to call more attention towards the possibilities of Anona culture in Southern California.

The natural order Anonaceae numbers at least 500 species, belonging to different genera, which are found in all warm countries, both of the old and of the new world, our own North American "papaw" (Asimina Triloba) being the only exception, reaching as it does as far north as Canada.

Twenty three species of Anonaceae are known in Mexico at present, belonging to eight different genera.

Uvaria Hahniana, found in Southern Mexico, not much known and not in cultivation. This genus, more plentiful in Eastern Asia, bears fruits in bunches like grapes, generally of brigat red color.

Asimina Triloba, ranging from Canada southwards to the State of Jalisco in Mexico; there called "Ahonillo" and in the U. S. "Papaw." This as Prof. Foex points out, is a most important species. Extra good varieties are occasionally found wild and some were obtained by judicious selection. Moreover it offers a wide field for crossing with the more tender Anonas, and is sure to prove a frost resistant stock to bud or graft on to.

Rollina Mucosa from Southern Mexico, and the only Mexican species of this genus which belongs chiefly to Tropical South America, bears almost globular fruits full of a very sweet pulp. There are already on trial at Montarioso two more species of Rollinia from Paraguay and one from near Para, Brazil.

Anona Cherimolia, Mexico and Central America, the most widely known, and certainly one of the hardiest species, quite familiar to many people in Southern California. According to Prof. Foex it is found in all parts of Mexico, from the "Tierras frias" to the "Tierras calientes" and, having been in cultivation in that country for centuries before the conquest of Cortez, it is not surprising that a number of varieties and forms were originated, of more or less value, hardiness and size. It is worth remarking here that some recent researches made by Prof. G. Alcocer, of the National Museum of Mexico, and quoted by Prof. Foex in his review, have proved beyond doubt that the popular belief which credited the Cherimoya to Peru is erroneous. Father B. Cobo, travelling from Lima to Mexico in the year 1629, found this fruit in Guatemala City, and was so pleased with it that he despatched directly a good quantity of seeds to his friends in Peru, and when he returned there three years after was delighted to find that quite a number had been raised, and that the Cherimoyas sold in the market "from 8 to 12 reales" each. It was more than 100 years later when the first seeds of Cherimoyas found their way to Spain and to Italy, and, having been received from Peru, they were naturally thought to be native of that country. Statistics gathered by the Mexican Government some years ago show that in those States which possess considerable variation in altitude, like Oaxaca, Vera Cruz and Michoacan, Cherimoyas are ripening all the year round, in the States of Chiapas and Jalisco for about nine months: in the remaining parts of the Republic, principally from September to December.

2. Anona squamosa. "Texaltzapotl," "Saramuyo," "Anona Blanca" of the Mexicans, called "Pomme Canelle" and "Attier" in the French, "Sugar Apple," "Sweet Sop" and "Custard Apple" in the British West Indies.

A smaller sized tree than A. Cherimolia; bark of trunk and branches ash grey; leaves deciduous, oblong shaped, very strongly scented; fruits generally smaller than the preceding, having the shape of a pine cone, covered with convex, depressed protuberances, of yellowish green color; the pulp quite creamy, delicious, containing a large number of small, flattened, blackish seeds. Will stand more heat, but less frost than the A. Cherimolia, and appears to be more prolific, as under favorable conditions a regular crop can be expected from trees four years old from seed.

Mostly found and cultivated in the Southern part of Mexico; introduced and tried at Santa Barbara and other points of Southern California, but with only indifferent success, there being no fruiting specimens as far as my knowledge goes. Prof. Fox suggests that by proper selection the amount of seeds in its fruits might be considerably reduced.

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THE PROPAGATION OF THE AVOCADO.

By P. J. WESTER, *Horticulturist.*

(From the Philippine Agricultural Review)

The fact that the avocado (*Persea gratissima*) will thrive and fruit in the Philippines is now being established beyond doubt, as trees introduced in 1903 by the Bureau of Agriculture are this year bearing their second crop. A short exposition of the experience gained in the propagation of this fruit by the writer during seven years' study of tropical fruits in south Florida may, therefore, be of timely interest. The method described has been used repeatedly on a large scale by the writer, as well as by others, with uniformly good results.

The seed of the avocado is very susceptible to injury from fungi and loses its viability very rapidly by being exposed to the air, and it should, on that account, be planted as early as possible after it is taken from the fruit. Where delay is unavoidable, the seeds should be covered by moderately moist soil. Seeds treated in this way can, however, be left for a short time only, as germination, in most cases, starts very early, much more so than in the seed of the mango.

There are two methods of propagating the young plants: (*a*) To grow and bud the stock in pots or boxes, and (*b*) to plant the seed in the nursery, bud the stock there, and afterwards take up the budded plants, transplant them to boxes or pots, and grow them in a plant shed until they are large enough to set out in the field. The direct transfer of plants from the nursery to the field has never been done on an extensive scale, as far as the writer is aware. In Florida, where on account of the sandy character of the soil this does not adhere well to the roots, the avocado transplants with more difficulty than citrus trees, but it is quite probable that in loamy and clayey soil where the plant can be taken up with a ball of earth around the roots, it could be moved without serious trouble.

FRUIT MEN IN CONVENTION IN SANTA BARBARA

Many Papers on Various Subjects, Practical and Scientific Are Presented.

THE AHUACATE, AVACADO OR ALLIGATOR PEAR.

By F. W. Popenoe, of Altadena, Cal.

RIGHT in the beginning I want to say that it is greatly to be regretted that this fruit has become established in California under a misleading and meaningless name. I refer to the term "alligator pear," which certainly has no excuse for existence, and invariably gives those who are unfamiliar with the fruit a wrong impression of it. The name "avocado," however, can be said to be scarcely less objectionable. The correct name is "ahuacate," and I call upon the veteran botanist whose paper is next on the program, Dr. Fanchesi, to raise his voice in support of this statement.

can produce five, or ten, or possibly 20 tons of an incomplete food ration in the form of apples, or grapes, or bananas. And there may be from one to two tons of very rich food in the form of nuts—notably pecans—from an acre of ground. But with ahuacate there would seem to be a possible yield of food of very high nutritive value in tonnage equal to apples with their low nutritive value.

"This ahuacate business is new. It has to be worked out. But is there not great potential value in the few facts we have? If men can produce many

CLUSTER OF GUATEMALAN AHUACATES.

the San Joaquin valley as one from an elevation of 6000 feet in Mexico, where the winters are quite cold and the summers hot and dry. There are several ahuacate regions in Mexico whose climatic conditions almost parallel those of some parts of the San Joaquin valley.

In regard to the coastal regions from Santa Barbara to San Diego there is not a vestige of doubt remaining. The ahuacate has been too thoroughly tested in this region to leave any room for doubt as to its adaptability, and with this to rely upon, planting is going on with confidence.

Although the general public is not yet familiar with this fruit, it is evident that Southern Californians have been very much alive to its possibilities during the past two years by the fact that fully one hundred thousand seedlings have been grown at various points south of the Tehachapi. Many of these are being budded this season. The difficulties of propagation, which were considerable during the first few years, have now been practically overcome, and the production of budded trees can go on at a fairly rapid rate. Already several small acreages of budded trees have been set out, and the coming year will see a total planting of two hundred acres, at a conservative estimate. Innumerable trees will go into small home gardens and back yards, for the value and interest of an ahuacate in the door yard are appealing to everyone.

The subject of varieties and types is probably the most important which must be considered in connection with the development of the industry and the extension of the region in which the fruit can be successfully grown. Little is known of the different types which are grown in other countries, since this subject has received almost no systematic attention. It is possible broadly to divide the seedlings which have fruited in California into two classes, based on characteristics of growth, foliage and fruit. By far the largest number have come from Northern Mexico, especially from Monterey and other parts of the State of Nuevo Leon. The type from this region is a small, pyriform or oval fruit, purple in color and thin skinned, coming into bearing at three or four years from the planting of the seed, and ordinarily very productive. It is so dis-

notice in that country. The same type appears to occur in Southern Mexico, however, and many examples of it which are growing in this State have come from there. The principal characteristic which distinguishes it from the Mexican is the woody skin of the fruit, which is sometimes a quarter of an inch thick and could properly be called a shell. The foliage lacks the anise-like odor possessed by the Mexican type. The fruits are normally larger than those of the Mexican type and seedlings do not usually come into bearing until seven or eight years old.

Seven years ago G. N. Collins of the Bureau of Plant Industry called attention to this type and asserted that it was the most promising type from a commercial point of view. At that time it was not generally known that it was growing in California, but experience with it in this State more than bears out Mr. Collin's assertion. The thick woody skin permits the fruit to be shipped to distant markets without undue care in packing and with loss in transit reduced to a minimum. It possesses advantage over the type grown in Florida in that the seed is always tight in the cavity, and cannot roll around and bruise the flesh.

The type grown in Florida, sometimes known as the West Indian-South American, has also been planted in California, but too recently to permit definite statements in regard to its adaptability to be made. It has proved to be more tender than the Mexican or Guatemalan types, either of which will stand several degrees of frost, but in favored localities it suffered no injury during the cold weather of the past winter. The oldest trees in this State should come into bearing within the next year or two.

Many seedlings from Hawaiian fruits have been grown in California, but coming from a warm and humid region they have not been very successful, and only one or two of them are known to have produced fruit.

The varieties now propagated and offered by the trade are mainly of local origin. The difficulty and expense connected with obtaining budwood from foreign countries has prevented any large quantity of trees being propagated from them, but a good start has been made in obtaining the choicest varieties Mexico has to offer, and budded trees which are now established here will soon supply enough budwood to permit their extensive dissemination. Of the local varieties, several are first-class in every paticular and would almost seem to fulfill the commercial requirements as we understand them at the present

ZAMBOA
(Citrus sp)
Maison Carre, Algiers
Jan 17, 1912

MANDARINE
CLEMENTINE
Maison Carre, Algiers, Jan 17, 1912

Agricultural Explorers F

By Worth C. Harder.

WORKING FOR THE FARMER.

WITHIN the last few weeks three experts from Uncle Sam's Agricultural Department at Washington have returned from exploring expeditions through Europe, Asia and Africa, with important secrets for the American farmer and fruit grower.

These men are part of the small force that is constantly scouring remote corners of the earth for new agricultural treasures. They are the last men in from the expeditions that are bringing to the farms and orchards of the United States new fruits, grasses and vegetables that will ultimately be worth millions of dollars in the annual agricultural production of the country.

The three who have recenty returned are Frank N. Meyer, the government's official "agricultural explorer"; Walter T. Swingle, who has been pursuing date-palm investigations in the heart of the Sahara Desert; and Prof. Charles V. Piper, who has made an investigation of forage plants and fruits in the Straits Settlements, Southern China and India.

New varieties and new methods have been brought to Washington by the explorers, and will undergo rigid test and trial in the gardens and laboratories of the department. Ultimately it is expected that great improvements in fruits; new species of vegetables; new forage grasses for the Southwest; new alfalfas for the north, and new methods of pushing the interesting experiments in date raising in Arizona, California, and Texas, will result from the work of the returned travelers.

Beaten tracks were deserted, rough mountain and desert trails were followed for hundreds of miles, and hardships were undergone in many lands, in the pursuit of new agricultural treasures. The trip Mr. Meyer has just completed is one of the most important in the history of exploration under the department.

In the highlands of Chinese Turkestan, far from the regular routes of trade, he found wild apricots that showed remarkable hardiness. They will be experimented with in this country in the hope of developing American varieties that will bear the extremes of temperature in the northern Mississippi Valley, and aid in extending northward the range of apricot culture.

He found olive trees in the Caucasus that had withstood thirteen degrees below zero, without suffering injury. Such hardiness in olives was unknown to the United States agricultural authorities; and like the hardy apricot, the tree may prove the base for experiments to greatly improve the olive orchards now being developed in California.

The foreign exploration work is one of the most interesting and valuable features in the development of the Agricultural Department at Washington. It is under the general charge of Dr. Beverly T. Galloway, chief of the Bureau of Plant Industry, who made a trip through Asiatic countries in 1910 in the interest of the exploration service.

The work has been developed, however, directly under the hand of David Fairchild, "agricultural explorer in charge," as he is officially known. The office of foreign plant and seed introduction has been the agency for bringing into the United States scores of new farm, garden and orchard products of immense value to the nation.

Mr. Fairchild made several exploration trips through Europe, Asia and Africa, and has been in constant touch for over a dozen years with agricultural research stations and departments in all parts of the world. Missionaries in Asia and Africa; American consuls in these lands and in South America and the South Sea Islands; and foreign plant breeders and agricultural officers are sending thousands of new things to Wash-

One of the important immigrants from China is a big sweet persimmon, free from all puckering qualities, which may be picked and eaten while hard, and may be kept in good condition for months. The "Tamopan," as it is known, is declared by Mr. Meyer to be the choicest persimmon product of China. Whole valleys there are given over exclusively to persimmon production. Mr. Fairchild believes persimmon growing will ultimately become one of the great fruit industries of the United States.

Explorer Meyer is a Dutch gardener, and a man trained in research work, and in plant culture. He joined the Agricultural Department's exploration force in 1905, and spent a year or two immediately after that in studying the fruit and nut orchards of China.

His last trip began in 1909. He went to St. Petersburg, under a commission to study the crown gall disease of apples, in the large orchards and breeders' collections of Europe; and to later take up the important tour through Russian and Chinese Turkestan, which has resulted in the finding of many valuable plants and fruits.

Mr. Meyer worked southward into the Caucasus, where he made a search for specimens. Among his most important finds there was the hardy olive, which had withstood a temperature of 13 below zero, and which he recognized as possessing great possibilities as a breeding stock for American olive growers.

In the Caucasus he secured many seeds and plants of promising alfalfa. He then pushed into Russian Turkestan and went to Chardjui, where some of the most important "sand-binding" experiments in the world have been in progress.

Railroads that were impassab'e because of the drifting sand have been fully protected by the development of the plants having the binding qualities necessary to hold the sand in place.

Similar problems are encountered in many parts of the American Southwest; and Mr. Meyer secured seeds of all of the Turkestan plants and bushes that had been found useful in the experiments. These are now under test by the United States government, and will be given a thorough trial in sandy regions of this country.

Permission was secured by Mr. Meyer to cross the border into Chinese Turkestan, and he left the railroad at Andijan and made up a caravan and pushed through the mountains to Kashgar. From this point much important exploration work was done. In the oases of Khotan and Yarkand to the southeast, he secured cuttings of grapes, apples and pears that thrive in those regions. He found watermelons and muskmelons that keep all winter; and many new varieties of fruits.

From Kashgar Mr. Meyer sent back nearly a half-ton of seeds and plants. The problem of packing was a big one. American five-gallon kerosene cans, thoroughly scrubbed with soap and ashes and then packed with native felt, were used for the specimens, which were securely sealed up. The consignment was nearly six months in reaching Washington, but most of the specimens were in good condition.

Mr. Meyer then worked up along the foothills of the Tian Shan range to Asku, where he deserted his two-wheeled cart and put his outfit on pack horses to cross the mountains. He crossed at Mussart Pass, one of the most dangerous passes in China, where a glacier must be crossed at an elevation of [illegible] feet, and wound up at Kuldja in the Ili Valley.

In the hazardous and wearing trip through the Tian Shan range the American explorer found many treasures to reward his labors. Wild apricots and apples, native berries and other things were added to his collection, and later sent to the United States. He finally worked northward to Chugutchak on the border of Mongolia, and ultimately west and north to Barnaoul and Biisk in Siberia. From the latter place he took a river steamer to connect with the Trans-Siberian Railroad.

Mr. Meyer continued in Siberia the search for hardy alfalfa varieties, in which the government has been engaged for several years. Many alfalfas are now being experimented with in the effort to extend the range of this valuable crop northward to the Canadian boundary.

This is an outline of the work of one of Uncle Sam's explorers. Of quite a different character was the work done during the last few months in the heart of the Sahara desert by Walter T. Swingle, who has been working for twelve years to establish in the Alkali regions of the Southwest the profitable industry of date-growing.

Mr. Swingle is not an agricultural explorer; he is in fact the head of one of the important divisions of the agricultural department, that of plant-life history; but his work in Africa in connection with the introduction of date-growing in this country has been of an interesting and at times hazardous character.

Mr. Swingle's connection with the efforts to establish date growing in the United States began in 1899, and since then the experiments have developed so satisfactorily in Arizona and California that there were nearly 2000 bearing date palms in the Southwest this year.

"The time has arrived to teach American growers how to handle, pack and market their dates," said Mr. Swingle. "My visit to the Sahara regions this year was with the particular object of studying the handling and packing methods of the French, German and Arabian merchants who control the date output of that country; and to ascertain what features of their methods were adaptable to the conditions in the United States."

This was Mr. Swingle's third trip into the desert regions. He has traveled by caravan as much as a hundred miles from railway connections, in the search for new varieties of dates to be tried in this country. The first date palm he imported came in a tub; and date-palm importation seemed doomed because no cheap and effective way was known to bring over young offshoots for American cultivation.

On his second trip, in 1900, Mr. Swingle found that fifty young trees could be packed into a box, with their roots in moss, and brought safely to the United States for the cost of one specimen rooted and growing in a tub. That discovery marked the real beginning of date-culture developments in the Southwest. The government now has five experimental orchards, at Indio and Mecca in California, Tempe and Yuma in Arizona, and Laredo in Texas.

Because it will grow in alkali soil, and thrives in extreme heat, the date will be a valuable fruit resource for the irrigated lands of the Southwest. Further than this, Mr. Swingle believes it will ultimately be a highly profitable fruit crop for more valuable lands, because of the rapid growth and heavy yield of the palms.

Over 200 varieties have been imported and set out in the government's orchards through the efforts of Mr. Swingle, Mr. Fairchild, and Thomas H. Kearney, head of the office of alkali and drought-resistant crop investigations, who made a trip into the Sahara Desert in 1904 and 1905. The date cannot be budded nor grafted; and the choice varieties are only reproduced by offshoots. For this reason it has been necessary to find out the varieties adapted to the conditions of each locality; and this problem is being solved in the government gardens.

The date must be pollinated by hand, another thing that makes its culture peculiar and necessitates great care. Growers have fixed an arbitary proportion of one male to 100 female trees, as the former do not bear fruit. The flowers of the male tree are broken off and tied among the clusters of flowers in the female tree, so that wind pollination may take place. The palm

There is one spot in the desert to which Mr. Swingle could not obtain access. Before his return to the United States the Agricultural Department at Washington gave out a statement that he had found at Alcazar, in Morroco, a remarkable seedling date, an offshoot of which would be worth $1000 in California.

This date has not been secured for American growers, however, and probably will not be for some time. It is the especial product of the oasis of Tafilet, which is the home of the Sultan of Morocco. The tree has spread throughout the oasis, and the sale of the famous dates has become a great business there; but the royal family guards against the transplanting of any offshoots from the tree. The dates are shipped to Spain and England, where they command top prices.

The Deglet Noor variety has shown the greatest promise in the United States. It was brought in by Mr. Swingle, and its fruit sells at from 40 to 60 cents a pound. At present the United States gets but few first-class dates from abroad. Most of those in the market are the second-class and third-class product of the Persian Gulf region. Mr. Swingle believes the consumption of dates in this country will develop wonderfully when fresh, clean fruit is placed upon the market from American orchards.

The explorations of Prof. Piper in Southern China have been another feature of the year's foreign work of the Agricultural Department. Prof. Piper was sent to the Philippines to make a thorough study of conditions with a view to introducing there new grasses and forage plants.

His return trip from Manila was an exploring expedition for the office of foreign seed and plant introduction, and he covered in his tour portions of Malaya, Java, Southern China, India and Ceylon.

"I regard Southern China as the most important part of the world to study for the benefit that may be secured for our southern States," said Prof. Piper. "The Chinese have taken fruits of the temperate region and pushed them gradually southward. By a study of their methods and results we may greatly aid fruit growing in the southern part of the United States."

He expects great results from foreign grasses and forage plants, many specimens of which he brought back to the United States. Japan clover, Bermuda grass and other foreign plants have already demonstrated their wide usefulness in this country. Prof. Piper believes many other important grasses from India and the valley of the Ganges will become aggressive in the United States, supplanting native grasses, and increasing the value of grazing and hay lands.

Frank N. Meyer

Walter T. Swingle.

Prof. C. V. Piper.

African date palm in governments orchard in Arizona.

Mr Meyer's 'caravan' in the Chinese Highlands.

The Papaya

The Source of Papain, Called Vegetable Pepsin

By K. DAHLBERG,
Finca El Mamey, Nueva Gerona, Isle of Pines.

[This paper won first prize in the contest opened by The Homemakers' Department of this magazine last November, and closed on January 15th.—Ed.]

THE papaya grows on an herbaceous tree seldom reaching the height of twenty feet, with a single straight stem and beautiful palmate seven to nine-lobed leaves on very long hollow stalks. The plant rarely branches unless broken off. It is probably native to South America, but is now found all over the tropics both cultivated and wild. Commonly it is referred to the order of Passiflorea, of which the passion flower is the type, but some botanists make a separate order of the genus Carica and call it Papayaceae. The botanical name is Carica Papaya, given by Simoeus, and it is also known as "melon tree" and pawpaw, which latter name it shares with another entirely different fruit, the product of Asimina Triloba, a small tree of the middle, southern and western United States belonging to the order Anonaceae, of which the sour sop and the custard apple are types. This has given rise to endless confusion among people who are not botanists, and if the fruit is to be introduced on the northern markets the name pawpaw must be absolutely taboo. In Cuba it is commonly called *fruta de bomba*.

The plant is very decorative and tropical in appearance. The very name papaya sounds tropical, at least it did to me when I first met with it in books of travel, and already when a boy I had my mind made up that if I ever should get to the tropics I would certainly have some papaya trees! A few years later when I saw a specimen of the plant at Kew Garden, London, England, the world's most renowned botanical garden, I was confirmed in my love for the papaya, though their specimen was a very poor one compared with those I have my eyes on at the present moment. And when finally I got to the tropics and ate my first *fruta de bomba* on the Isle of Pines I knew that my scent for good things had not led me astray that time. The fruit is one of the very finest products of the tropics and the plant is extremely prolific, when treated right.

That papaya, bought for ten cents from a *Pinero*, became the parent of over five hundred seedlings. I planted the seed in a mixture of coarse sand and black muck (I had no compost heap then), with some fertilizer added, in drills six inches apart, about one inch between the seeds, covered it about one-half inch, soaked the bed good, shaded it with fertilizer bags, and in less than a week practically every seed germinated. I put out about a hundred of the young plants around the pineapple patch and in other convenient places, and gave the rest to friends. That was in November, two years ago, and since then I have grown papayas constantly. Some of the things I have learned about them are the following:

The papaya does well on a great variety of soils, provided they are fairly porous and perfectly drained. It is the most sensitive plant I know, to too much water. Any land that becomes miry after heavy rains is unsuitable no matter how steep the grade. On this account practically all the savannah land and nearly all the pine land on the Isle of Pines must be bedded up if one wishes to grow this crop. And even then in weather like that of October last year the whole crop will be a loss on such land even without the wind we had. As soon as the plant has had too much water is shows it immediately by the drooping, wilting and final dropping off of the leaves. These are the distress signals which show that the fibrous roots are dead. If more rain is in sight the only way to save the plants is to pull them up on top of the ground, covering the thick fleshy roots with some coarse trash to prevent

A Visit to the Cocal

A Famous Old Grove of Trinidad, B. W. I.

By H. C. HENRICKSEN.
Port of Spain, Trinidad.

TO JUDGE from the numerous articles and reports on cocoanuts during the last couple of years the subject would seem to be of more than usual interest at the present time. Those who are seriously engaged in cocoanut cultivation are especially interested because they usually have a number of problems, and very little written data to refer to that will help them in their wirk. Many ask why has there been no more scientific work in connection with the cultivation of cocoanuts, and the answer is undoubtedly that there has been no demand for it. As long as the nut was left to grow whereever it happened to drop, or if planted, was left without any care, and as long as the copra was handled in the careless manner which may yet be observed in many places, the planter was simply not ready to take advantage of scientific investigation. These conditions have evidently changed or are changing, because the demands for information are becoming insistant.

This change from the extreme primitive to more up-to-date methods may be observed in many places in the West Indies, but probably nowhere does it show more plainly than at The Cocal in Trinidad. While there are other cocoanut groves in Trinidad it seems natural to speak of this one as *the* Cocal, because it is so well known here. It is located on the West Coast of the Island, extending over thirteen miles in length along the ocean beach. This would indicate a tremendous area, but the property is really not much more than thirteen hundred acres. It is a narrow strip of land, bounded on one side by the ocean, and on the other by a large almost impenetrable swamp. After the British occupation of the island more than one hundred years ago The Cocal became the property of the Port-of-Spain Burough Council, and it was probably more or less

SHEEP GRAZING IN COCOANUT GROVE CLOSE TO DRAINAGE DITCH

TROPICAL FRUITS

FOR

CALIFORNIA

FEIJOA SELLOWIANA

THE PINEAPPPLE GUAVA

FEIJOA—NATURAL SIZE

IN growth and character the Feijoa (pronounced, according to the Century Dictionary, Fay-zho-a, accenting the middle syllable) much resembles the common guavas. It is, in fact, closely related to the guavas, all being members of the natural order Myrtaceae, or myrtle family. The plant grows to an ultimate height of eight or ten feet, making a very ornamental shrub, with brilliant and attractive flowers, silvery white in color, with a tuft of crimson stamens tipped with golden anthers. The foliage is of a pleasing

A FINE SYMMETRICAL AVOCADO TREE AT PUEBLITO, MEXICO.
A single fruit of this tree will make a meal for a man.

THE CUAGUALLIATE OR BONETE TREE.
This is a coarse Mexican fruit eaten only by Indians who fry it in slices.

NEW FRUITS TO LOWER COST OF LIVING

By

CHARLTON LAWRENCE EDHOLM

THE scientific replenishing of the nation's larder by such methods as intensive cultivation, expert management of agricultural lands, reclamation of waste areas and the introduction of new foods to take the place of those which are becoming too ...h priced for the av... man's pocket will help to solve ...estion of the in... cost of living. ...ong the less foods which may be profitably cultivated in this country are some of the sub-tropical fruits which form an important item in the bill-of-fare of our neighbors to the south, and plans have been made, and carried out to a considerable extent, to popularize these products within our borders.

IF YOU WANT THE TASTE OF PINEAPPLE, RASPBERRY, AND BANANA ALL AT ONCE, TRY THIS.
The pineapple guava, about two-thirds its natural size.

Of greatest importance among these fruits is the avocado, commonly known as the alligator pear, which is seen once in a while on the fruit stands with

THE AVOCADO

The famous Montezuma Avocado Tree, in Mexico. Said to be 200 years old. Measures 4 feet across at the base, and yields an annual crop of 3000 delicious fruits weighing one pound each.

BEHAVIOR OF ALIEN PLANTS AT SANTA BARBARA

Dr. F. FRANCESCHI

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CONTENTS.

THE FRUIT INDUSTRY IN JAPAN.

[From Consul General Thomas Sammons, Yokohama.]

Varieties of Fruit—Market System.

The principal fruits marketed in Japan are persimmons, mikan (mandarins or Japanese oranges), pears, apples, peaches, grapes, strawberries, apricots, watermelons, melons, figs, loquats, walnuts, chestnuts, bananas, and pineapples. Except bananas and pineapples, all of these fruits are grown in Japan.

Buyers or local agents of large commission houses in various market centers collect and purchase fruits in the growing districts. The fruit is crated or boxed by them and sent to the commission houses, which offer them at a regularly established fruit exchange market, where daily quotations are practically determined. Only the greengrocers or regular fruit dealers have the privilege of buying in wholesale quantities at the exchange.

It is customary in Japan for grocers to send out their clerks to their regular customers to note their orders in the morning and make deliveries in the afternoon. Housewives seldom go shopping for vegetables or fruits.

Packing—Retail Prices.

Hard persimmons are put up in barrels; soft ones are crated. Native oranges are invariably put up in small boxes measuring about 13 by 10 by 10 inches, and containing 70 to 160 or 170 oranges, according to size. Pears are carefully wrapped in paper and boxed. Peaches are crated. Apples are put up in boxes, usually being packed in sawdust. The size of apple boxes is practically similar to the cases containing two 5-gallon petroleum cans. Often the petroleum cases from America are turned into apple cases.

The average retail prices in Yokohama are:

Persimmons, fresh and large, 1.5 to 3 cents each; medium, 1 to 1.25 cents each; small, 2 to 6 cents per dozen.

Mikan, best grade, 45 cents per box; medium grade, 27½ cents per box.

Oranges, imported from America, 72 cents to $1.50 per dozen; Japanese navel oranges, 24 cents to 75 cents per dozen. The so-called Japanese navel oranges are grown in small quantities in Japan from original cuttings imported from abroad. This fruit does not grow well in Japan.

Pears, one-half cent to 5 cents each; stored pears in winter are sold at 5 to 15 cents each.

The Banana

Its Value, Varieties, and its Requirements.

By R. S. CUNLIFFE, B. Sc. (Edin.), F. R. A. S. E., etc.

THE BANANA is in many respects one of the most wonderful of nature's productions. Regarding its early history little is known, but it seems to have originated in south eastern Asia, possibly in the Malay Peninsula, from whence it has spread all over the tropical and sub-tropical world. Botanically it is a member of the natural order *Scitaminaceae*, sub-order *Musaceae*. Among its relatives are such plants as Cannas, *Ravenala madagascariensis* or Traveller's Palm, and *Strelitsia reginae* or Bird of Paradise Flower, the last two bearing a very striking resemblance to *Musa*. The plant is a perennial herb, having an underground stem, from which it sends up long, vertical, sheathing, leaf-stalks, overlapping one another, and forming the so-called stem, from the top of which expand the large herbaceous leaves, so well known to dwellers in the tropics; they measure sometimes 10 feet long and 2 feet wide. The flowers are bourn on huge pendulous spikes, provided with large boat-shaped, often colored bracts, in the axils of which the flowers are produced. The lower ones are usually female or hermaphrodite, while those at the apex are male. These flowers consist of a perianth of six divisions, partly united, enclosing five perfect and one imperfect stamens. The

BANANAS ON THE WHARVES, JAMAICA

ovary is inferior and three celled, and ripens into a long fruit, filled with a spongy pulp, in which the numerous seeds are embedded. The accumulation of starch and sugar in this pulp renders the fruit of great dietetic importance in the tropics. In fact the fruit of the banana and plantain forms a large part of the food of multitudes of people. It is to the inhabitants of the torrid zone, what bread and potatoes are to those of the temperate zone. The following figures represent the average composition of the pulp of the ripe fruit:

Nitrogenous Matter	4.820%
Sugar, peptins etc.	19.657%
Fats	.632%
Cellulose	.200%
Ash	.791%
Water	73.900%

From this it will be seen to contain more carbohydrates, and in the case of nitrogenous matter, about double the amount contained by potatoes.

Where the climate is suitable the fruit may be dried, and a nutritious flour made from the dried fruit. For this purpose the fruit must be well developed, but not on the turn. It is sliced and dried in the sun by spreading it in trays, or artificial means may be used. The quicker it is handled the better, and the freer it is from "stain." In one trial 87 bunches of fruit weighing 4,555 lbs. gave 452 lbs. of flour, or 10% of its weight. The composition of the flour varies with variety, maturity of fruit, etc., but will average about as follows:

Water	12.33%
Starch	71.60%
Sugars and gums	6.82%
Nitrogenous matter	2.01%
Cellulose	5.99%
Fat	.50%
Salts	.64%

It is valuable food for invalids and children, and useful in cookery, but as an industry it has not made much progress, probably due in some degree to the ready sale for the ripe fruit, and to the fact that the public has not been educated to its use. Other products of the plant are preserved ripe fruit, alcohol, vinegar, and wine. The fruit bud of some varieties is cooked and eaten, also the fresh white leaves inside the stem, and the flowers, fruit, and corn are said to possess medicinal qualities. The leaves have been used as fodder, and have a composition comparable to that of meadow hay. They are also used for thatching. The sap is a source of dyeing material. Many attempts have been made to extract the fiber contained in the "stem" and leaves, but with the exception of the variety *Musa textilis*, known as Manila hemp, it is of inferior quality, and the tissues of the plant are said to contain only about 2%, which necessitates the handling of a very large bulk of material for a comparatively small amount of fiber. The ashes are used in India for dyeing and tanning purposes, making curries, and as a substitute for salt. The banana is one of the most prolific of all food plants. Humbolt has calculated that 33 lbs. of wheat, and 98 lbs. of potatoes require for their growth the same amount of ground, as will produce 4,000 lbs. of bananas.

There are a very large number of varieties of the genus *Musa*, a circumstance which testifies to the long period during which the plant has been cultivated. This is the more remarkable, in that perfect seeds are rare, and the plant affords us a striking example of bud variation, but in spite of the many varieties met with in different parts of the world, under different conditions of soil and climate, they are considered by many botanists to spring from the one species, *M. sapientum*. This includes such varieties as "Jamaica" or "Martinique," which has many names. It is the chief banana of the American trade, and is an excellent shipper, with fine appearance, fair flavour, and fruits well placed on the bunch for handling.

M. Cavendishii, Chinese or Dwarf, is usually spoken of as belonging to one type, but it varies considerably under differences of environment. The plant is of low growth, fruit of good flavour, bunches of good size, good shippers, but will not stand as rough usage as the Jamaica. This variety is grown largely in the Canary Islands and shipped to the English markets.

M. sapientum, var. rubra, Red Spanish, is a large plant, with trunk, petiole and midrif colored red, bunches large, fruit large, and changing through various shades of red while maturing, very attractive and sells as a fancy fruit; flavour good.

The varieties best known in Cuba are *Manzano, Enano, Morado colorado, Mo-*

The Pineapple, Mango and Avocado

Interesting Address by John B. Beach Before the Horticultural Society

JOHN B. BEACH, of West Palm Beach, read a valuable paper upon "Tropical Fruits" before the recent meeting of the horticulturists at Miami, and, as Mr. Beach is recognized in Florida as a high authority, THE HOMESEEKER prints below in full:

"I will only discuss the three tropical fruits which have attained commercial importance with us, the pineapple, mango and avocado. To attempt to describe the host of others which supply our home table and find their way into nearby markets, would greatly exceed the limits of this article. I will mention, however, that the department is making exhaustive researches into the Anona family and in time we are likely to have the best of this fruit in the world at our command.

This is the family to which belong the famous Cherimoya of Peru and the custard apple grown in Europe in hot houses. The world-renowned Mangosteen, whose fame we have heard from childhood, and which has never yet been fruited successfully outside the Malay Peninsula and adjacent islands has been taken hold of at Washington. New methods of propagation discovered and the prospects are that some day we may fruit it in Florida.

The pineapple industry has gone through a severe strain in the past few years. A vast increase in acreage in Porto Rico and Cuba glutted the market. As a result in 1909 prices were not remunerative, and in 1910-11 were far below the cost of production. Growers were forced out of the business, fields abandaned, and new planting abandoned. Last summer the reduction in output had re established former economic conditions to a large extent. In Florida a severe drought reduced the size of the fruit so much that prices were still rather low; as near as I can gather from different sources, the average prices were about $1.50 per crate. The good sized fruit was in active demand and sold as high as before the glut occurred. The growers who still hung on thus encouraged fertilized freely. With abundant rains the crop this season promises to be a good one and prices as remunerative as of old. One grower has sold his entire crop for $1.75 f. o. b. and he thinks this price will prove not below the average. Many fields have been pronounced "run out," the land either "exhausted" or the plants reduced in vitality.

"Those who believe the former to be the trouble have tried hauling in leaf mould or burying old plants for humus, or merely allowing the land to lie fallow. To the latter I can give a word of encouragement. The other day I passed a field at Eden which 20 years ago was cultivated in pines by the late Capt. Richards and is now covered with a thrifty young patch just coming into bearing. Those who believe that the plants have become exhausted, last summer imported slips from Cuba and Porto Rico to infuse new blood, the results of which plan time only can tell. My theory is that too much mineral fertilizer has been used in many

The Old Fashioned Cane Grinder.

cases which has bad effect upon the vigor of plants, and a more liberal use of tobacco and cotton seed meal would go a long way towards correcting the trouble where it hao not gone too far.

"The avocado crop in Dade county is reported to be a failure this season while in Palm Beach county it seems little below the average. One pioneer grower in Dade county, says this is the first season in 12 consecutive years that the Trapp budded trees have failed to make him a good crop. This year three-fourths of the fruit have dropped in his section. All seem to attribute this to the damp, rainy weather during the blooming time, and since then a consequent attack of fungus similar to that which blights the young mango. The trouble is being investigated very exhaustively by the department and some feel assured that should next season be wet the trouble can be absolutely controlled.

The Trapp stands at the head of the list of varieties for commercial planting its lateness bringing it into the market after the bulk of the others are gone. Its excellent quality, round shape, solidity and keeping qualities give it preference over other varieties which mature fully as late. And the test of 12 years on the budded trees and 15 or 20 on the parent, constitute a pedigree of great weight in such an infant industry. A good early variety is now much desired, and I will mention two that are competing for this place. One belongs to H. H. Harrison and he has named it Estelle. He says that there are several trees grown from a certain lot of seed planted in 1899 by James T. Truitt, and that all the trees from this lot of seed seem identical in character. He described the fruit as "medium size, short neck, yellow-green, solid and meaty, close-fitting seed and nutty in flavor, can be picked from the 1st to the 15th of July." Dwight Allen, of West Palm Beach, has a seedling which he calls William, which answers almost precisely to the foregoing description, except that the color is dark

green with scarlet cheeks. I am not sure that the seed is absolutely tight-fitting, but think so. This is an important matter when it comes to long shipments.

One of the serious features of the avocado industry is that growers in gathering and packing the fruit handle them as roughly as they would tomatoes or citrus fruits. As a matter of fact to get your avocados in market in the best possible condition, they should be handled as carefully as a setting of eggs from a prize strain of chickens. They should be gathered when they are cool, or, if they are gathered when the sun has been shining on them, they should be quickly put in the shade and not be packed for several hours—giving them opportunity to lose their heat.

"Very early fruit has proven not as profitable as fruit medium late. Most of our large fruit is of early variety, and we obtained from $1 to $3 per dozen, f. o. b. For our late fruit we obtained from $1 to $6; some seasons as high as $12 per dozen. The mid-season fruit which are mostly made up of seedlings has not been profitable the past season. Fancy trade desires the uniformity in quality of the fruit, and with the seedlings it is not possible to test every tree when you are handling any quantity of fruit.

"Mangoes have suffered more in this section from blighted fruit than avocadoes this year. In Palm Beach county the crop seems to be about 25 per cent. The trees bloomed freely, many of them several times. I am quite confident from experiments I have made that faithful use of Bordeaux will save much of the mango crop in a rainy spring, but you must begin with the first bloom. Exposure of the fruit to sun and air as much as possible is of value, whether done by pruning, propping up, clipping away the foliage from about the fruit, and it serves a double purpose.

"Where the sun shines on one side of the fruit a bright red cheek develops, which is never found on fruit grown on the inside of the tree in total shade. The tremendous demand for fancy mangoes will warrant almost any outlay for labor to insure a good crop. Good Mulgobas have never failed to find a ready market at $3 per dozen f. o. b. and the demand has never been supplied at that, while some growers sold for $4 last

Reclaiming Prairie Land.

summer, and I heard of one party who got $400 for the crop from three trees. As to varieties the Mulgoba still stands at the head although many new sorts have been fruited and some show great merit. The test of time alone can prove their relative value. The Sundersha still holds the record for reliability, heavy yield and large size, and is the standard variety for the household. My tree is loaded with the seventh crop and has enough quarter-grown fruit to break down ten trees of the size if all came to maturity. Unless they drop very freely soon I will have to go to work as I did last year with a clipper and thin out. It has never failed to produce all the fruit the tree could support and began to bear at two years from the graft. It is specially adapted for cooking and preserving, and can be cut for that purpose when the fruit is but two-thirds grown.

"I have Itamaraca, D'Or and Goa Alphonso in fruit this year but the latter tree is under a shed closely crowded by adjacent trees and it did not get the Bordeaux in time to head off the fungus, and only three half-grown fruit are now left on it. The others are pretty well exposed to the sunlight and I think will mature some fruit.

"The mango will thrive on land too poor and sandy and coarse for any citrus tree and also in places too low and wet. The avocado will not stand as wet locations as the mango nor succeed in quite as barren a spot, but wherever you can grow a grapefruit tree an avocado will thrive. Under the above conditions and with the high prices obtained for the fruit, it seems to me as if South Florida would do well to plant more tropical groves, in which the relative freedom from cold gives them a great advantage and leave citrus growing to the upper part of the peninsula.

A Shady Drive In Florida.

DATE PALM AS BUSINESS.

Occupies the Front Seat at the State Fruit Growers' Convention at Santa Barbara.

Paul B. Popenoe, date expert for the West India Gardens of Altadena, has been visiting the valley this week with Theodore U. Barber, secretary-treasurer of the West India Gardens; C. K. Valentine, capitalist of Altadena; and E. B. Plank, a Los Angeles broker. The party is inspecting date lands with a view to embarking in the business on an extensive scale during the coming winter.

Mr. Popenoe made a trip to the Sahara desert this spring and brought in 1,000 Deglet Noor offshoots, of which 600 went to Dr. Rebecca Lee Dorsey and R. R. Bray; 330 to D. H. Gillan; and 70 to Moyer & Gilbert. He is expecting to visit Baghdad during the coming winter for a very large shipment of the choice varieties there, part of which will be for the West India Gardens, and the rest for various other growers in the valley.

Dates were one of the chief topics of intepest at the recent state fruit growers' convention in Santa Barbara, according to Mr. Popenoe, who delivered an address upon the subject there. Dr. Walter T. Swingle of the Bureau of Plant Industry was present, and expressed his opinion that the date industry was destined to become one of transcending importance, and that California would undoubtedly produce in time new varieties that would rank with the best in the world.

Bruce Drummond, in charge of the government work in the Coachella Valley, was unable to be present, but Dr. Swingle's assistant, Prof. S. C. Mason, who is now doing special research work at Indio, answered questions from the audience and spoke in optomistic terms of the future of the industry. Prof. Mason's line of research, if successful, will be of immense value to the industry, since he hopes to find ways to make palms produce offshoots more abundantly, and to make these offshoots take root while still young.

Wilsey of Imperial county were present, and declared without reservation that the Marlatt scale was under control, as the result of recent experiments with the Braucco spray. While it is still too early to say that it can be absolutely exterminated, both men believe it can, and this means that there is no hindrance in the way of further importation of offshoots, provided these are submitted to proper treatment and inspection. This will be cheering news to all interested in the industry, since all the immediate progress of it depends on imported offshoots.

There is no doubt but that the Persian Gulf offers a rich field for invasion by California agents, since its dates are the most famous in the world, and the North African varieties have in the past been given the preference only because they were more accessible. Several Baghdad varieties which have already fruited in America have shown great excellence, and many more will fruit for the first time this year, when a good idea can be had of their possibilities here. It is probable that there are several varieties obtainable in quantities which are fully as good as, if not better than, the Deglet Noor.

It is these varieties which the West India Gardens intends to introduce to Coachella Valley this winter on a larger scale than has ever before been attempted. Paul B. Popenoe, with his brother, F. W. Popenoe, a well-known botanist and specialist on subtropical fruits, will leave Altadena August 1st for the Persian gulf, in order to have plenty of time to study the date industry there in a searching and scientific manner. They will not return before next May.

Send this paper to some friend back home. It will do the friend good. It will do you good. It will do the valley good, and it will do the paper good.

COMMERCIAL ASPECT OF THE SAPINDUS TREE.

[From Consul Dean B. Mason, Algiers, Algeria.]

The tree designated by Dr. L. Trabut, director of the Algerian Government Botanical Bureau, as the *Sapindus utilis* (soap-nut tree), was first planted in Algeria at the Government nursery at Algiers in 1845. In 1859 cuttings were offered for sale under the name of *Sapindus indicus*, and all the soap-nut trees grown in Algeria have been derived directly or indirectly from the Sapindus tree planted in 1845, which was probably of Asiatic origin, as the Sapindus grows wild in different parts of Asia, and its nuts have been used instead of soap in China and Japan for centuries. The *Sapindus utilis* of Algeria resembles more closely the *Sapindus mukorossi* grown in China and Japan than any other variety of Sapindus, but the nuts of the *Sapindus utilis* contain a much higher proportion of saponin. According to the analysis of the Paris chemist, M. Mercier, the shells of the nut contain 37.76 per cent saponin, whereas the shells of the Sapindus of the Orient contain only 14.59 per cent. The Sapindus nuts from India, although far inferior in quality, are sold in Europe, as they are considerably cheaper than nuts grown in Algeria. Labor is so cheap in India that it is profitable to gather the nuts from wild trees. The *Sapindus utilis* of Algeria is a much more valuable tree than any other variety, and it is unlikely that the cultivation of any other variety in the United States would be as profitable.

The Government of Algeria encouraged the cultivation of the Sapindus for a number of years. In a pamphlet published in 1895, and republished in 1898, Dr. Trabut states that the cultivation of no other tree is more worthy of consideration by Algerian colonists who possess good land and are willing to wait some years for a remunerative crop. The results obtained in Algeria have been discussed at length with Dr. Trabut, who attributes the considerable decrease in the prices paid for Sapindus nuts during the last eight years to increased production and lack of enterprise in introducing and pushing their sale in Europe. He believes that the prices paid for Panama wood will continue to rise as the forests are being depleted and the tree is not cultivated and that saponin obtained from the Sapindus of Algeria should prove a satisfactory substitute.

Original Expectations of an Agriculturist.

Monsieur M. J. Bertrand, president of Société des Agriculteurs d'Algérie, the only Algerian agriculturist who has grown the Sapindus on a large scale, in a pamphlet published in 1907, strongly recommended its cultivation. He stated that the nuts of the Sapindus contain more than twice as much saponin as Panama wood and should find a remunerative and well-assured market. While he did not believe that prices varying from $160 to $200 per metric ton (2,204.6 pounds) would be again attained and that to secure a regular market it might be necessary to sell at $100 per metric ton, he declared that even at this price Sapindus culture would be very profitable, and that he had obtained a return of $320 to $340 and a net revenue of $200 per hectare (2.47 acres) within 10 years after planting Sapindus cuttings.

It was stated in the pamphlet that three particularly fine trees planted eight years previous, which were carefully watered, produced

RE-ACTION TO STIMULUS.

PLANT SENSIBILITY AND ITS REVELATION.

For many years it has been an open question whether there is any fundamental unity in the response of plants and animals to external stimuli. In the case of certain plants it has been known for many years that these are able to respond in a marked degree to various forms of treatment but as to whether it is rhythmatic and whether in degree it holds good for all plants had not been definitely established until Professor J. C. Bose investigated the subject a few years ago.

In *Nature* for July 23, 1914, there appears an article entitled Plant Autographs and their Revelation, in which the ingenious apparatus used by Professor Bose for obtaining an answer to the various questions regarding rhythmatic sensibility, and the results which had been obtained in the investigation are fully described and illustrated.

By the invention of different types of recorders it has been possible to make the plant itself write an answering script to a testing stimulus. First attempts to obtain these answers were made with a comparatively simple recorder and in principle the method is as follows. In the case of the Mimosa plant, which has been the principal subject of investigation, an electric current is passed through the plant by the tendrils, the leaf being attached by thread to one arm of a lever to which is fixed a writing index that traces on smoked glass the responsive fall and recovery of the leaf induced by the electric shock. In attaining the actual record of this movement in plants many serious difficulties are encountered, the principal one being that the movements which may be induced will not always overcome the friction of the apparatus. This difficulty was overcome by making an intermittent instead of a continuous recorder. The possibility of this lay in rendering the writer tremulous, this being accomplished by an invention depending on the phenomenon of resonance. Expressed in the simplest terms, the index writer and a reed are tuned to the same pitch. In accordance with the well-known law of acoustics if a note is sounded on the reed, the index will vibrate in sympathy and in consequence will deliver on the recording plate of glass a succession of taps many hundred times a second. By means of this it is not only possible to get rid of the error due to friction, but make the record itself measure time as short as may be desired. The extraordinary delicacy of the instrument may be understood when by its means it may be possible to record a time interval as short as the thousandth part of the duration of a single beat of the heart.

The first subject which received investigation was the so-called 'sleep of plants.' In order to find out whether Mimosa, a plant which exhibits sleep movements, shows diurnal variations of sensibility, a specimen was made to answer to uniform questioning shocks repeated every hour of the day or night. The amplitude of the answering twitch gave a measure of the wakefulness of the plant during twenty-four hours. The results obtained were quite unexpected and are described by Professor Bose in the following words: 'The plant is found to keep up very late and fall asleep only at the early hours of the morning. It makes up for its late hours by gradually waking up by noon. It then remains in a condition of uniform sensibility all the afternoon. This period of uniformity is chosen for investigations on the effect of changed external conditions on excitability.'

As regards the effect of air, food and drugs, it has been demonstrated by means of plant autographs that the plant may be suffocated if the air contains a large percentage of carbonic acid gas and the autograph published in the article under review clearly shows what Professor Bose calls the 'gasp of relief' when fresh air is introduced. Only in the presence of sunlight is this effect modified by photosynthesis. In contrast to the effect of carbonic acid, ozone renders the plant highly excitable. Sulphuretted hydrogen, even in small quantities, is very fatal, and alcohol gives rise to 'a ludicrous unsteadiness of gait.'

Interesting though these results undoubtedly are, it is even more instructive to know that it has been established that they are common to all plants. Moreover the autographs obtained show that there is a latent period between the application of the stimulus and the first sign of response which is a characteristic phenomenon in regard to the response to stimuli in men and animals.

The determination of the speed of impulse in plants has received attention, and it has been shown that the true time for the excitation to travel through a distance of 30 millimetres in a plant is 1·5 seconds, the velocity being 20 millimetres per second. The velocity of nervous impulse in the plant is slower than those of higher, but quicker than those of lower animals. The speed of the impulse is, however, subject to variation under different conditions. One significant result that came out was that, while a plant carefully protected under glass from outside blows looks sleek and flourishing, yet as a complete and perfect organism it proved to be a failure. Its conducting power was found to be paralyzed. But by the continued application of stimuli its nervous impulses became very much quickened after a time.

It is a very interesting fact that temperature has been found to affect the rate of nervous transmission. In the case of the plant it seems that the velocity is doubled by a rise of temperature through 9°C. When a portion of the conducting petiole if subjected to cold, the speed of conduction is retarded. Excessive cold temporarily abolishes the conducting power. It is a suggestive fact that the normal conditions of a plant can be restored by subjecting the sterilized portion of the plant to a measure of moderate doses of electric shock.

As well as the various phenomena already described as having been shown to exist, Professor Bose claims that by means of an oscilating recorder or 'pulse record', he can show the existence of spontaneous pulsation in plants similar to that exemplified in animals by the beating of the heart. For instance the leaves of a plant *D. gyrans* have been shown to grow in a state of perpetual vibration. As a continuation of this discovery remarkable parallelisms were found to exist in regard to the effect of anesthetics, all of which tend to show that there is a strong relationship between the sensitiveness of plants and that of animals.

Lastly the methods of investigation on which the results outlined above are based have been used successfully to measure with great accuracy the rate of the growth in the plant. Although by calculation it can be computed that it would take an average plant 200 years to cover the short distance of a mile, the extreme slowness of the development is a serious drawback to an accurate scientific determination. Professor Bose, however, claims that difficulties have been overcome by his invention of a crescograph which records the absolute rate of growth in a time so short as a single beat of the pendulum. The actual rate of growth and its variation under the action of nutrients, various electrical and other forms of stimuli are thus recorded in the course of a few minutes. The great importance of this method of investigation in agriculture is sufficiently obvious.

DATE GROWING

IN

CALIFORNIA AND ARIZONA

Grown in Arizona

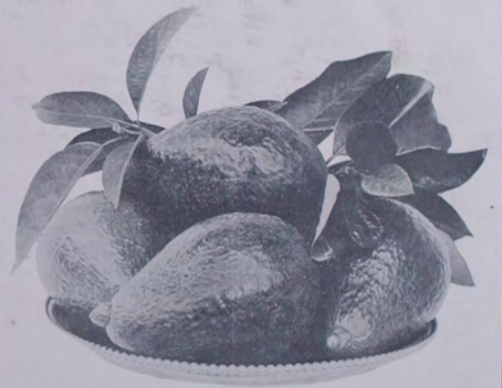
DATE palms have been fruiting in California and Arizona for a quarter of a century. More than 200 of the world's best varieties have been imported by the U. S. Department of Agriculture and most of them are now fruiting. Several hundred acres have been planted by individuals, of which about 60 acres are already bearing. Every test ends in the same proof: that the industry is one of the best adapted to the Coachella valley, Imperial valley, Colorado river country and some parts of Arizona. In these regions the date thrives as well as in Asia or Africa and is far more profitable.

Given good treatment, the palm commences to bear at an early age in the United States, and should begin to yield returns in the fifth year, increasing for 10 years and continuing for a century or more. From the age of six or seven years, good palms will bear 100 pounds

TROPICAL FRUITS

FOR

CALIFORNIA



The Taft Avocado

WEST INDIA GARDENS

F. O. POPENOE, *President and Manager*
T. U. BARBER, *Secretary and Treasurer*

IMPORTERS AND GROWERS OF

SUBTROPICAL PLANTS AND TREES

MARENGO AVE. AND CALAVERAS ST.

ALTADENA, CALIFORNIA

April 1, 1911

Telephone Fair Oaks 1577, Pasadena Exchange

Mr. P. Popenoe with [illegible] the author

Extrait de la *Petite Revue Agricole et Horticole*

Fruitiers exotiques sur la Côte-d'Azur

par le Docteur A. Robertson Proschowsky, Nice

Monsieur le Directeur de la Petite Revue vous m'avez demandé d'écrire quelques articles pour votre Revue, et, en même temps, vous m'avez envoyé quelques numéros traitant des sujets, qui m'interessent, pour que je me rende compte de ce qui a déjà été publié.

J'ai parcouru ces numéros et je me suis arrêté à un article signé J. B. D. et paru le 23 Janvier 1910, non pas que je me sois occupé d'une manière très spéciale de l'introduction et de la culture de fruitiers exotiques, mais parcequ'il me paraît que l'auteur, qui m'est connu comme un jeune horticulteur intelligent, aurait pu envisager son sujet d'étude d'une façon différente, et je crois plus en rapport avec son importance.

—x—

Pendant l'automne 1911, un jeune américain, publiciste horticole et frère d'un jeune horticulteur des plus actifs de Californie du Sud, qui possède un grand établissement à Altadena, a voyagé sur la Côte d'Azur et ailleurs aux bords de la Méditerranée. Il est venu chez moi comme chez tant d'autres et nous avons longuement causé des sujets d'intérêt commun, surtout parce que, ayant habité assez longtemps la Californie du Sud je connais bien son climat, ses jardins et ses possibilités. Il m'a mis en rapport avec son frère, l'horticulteur, qui est en même temps un botaniste instruit et très amateur des plantes, mais comme on vit difficilement bien rien qu'en botaniste, et pas du tout rien qu'en amateur de plantes, il a, en vrai américain, résolument choisi une carrière en quelque rapport avec ses goûts et il a choisi comme spécialité l'introduction et la culture des fruitiers exotiques. Le nom de ce jeune horticulteur est F. W. Popenoe et son adresse *West India Gardens, Altadena, Californie du Sud, Etats Unis*. Comme le nom de l'établissement (Jardins des Antilles) l'indique, c'est les fruitiers des climats chauds, comme, par exemple des Antilles, qu il cherche à introduire en Californie du Sud, autant que faire se peut, car, comme ici les fruitiers des pays tempérés y sont depuis longtemps, introduits, et même, comme tout le monde sait, cultivés avec un succès remarquable, non seulement à cause des conditions favorables du sol et climat, mais autant peut-être à cause des qualités d'intelligence et d'activité de la population.

M. F. W. Popenoe a bien voulu m'envoyer ses publications sur les sujets suivants : *Feijoa Sellowiana*, The Cherimolia (*Anona Cherimolia*, The Avocad (*Persea gratissima*), The white Sapote (*Casimiroa edulis*), The Mango (*Mangifera indica*) et d'autres ; et c'est un plaisir de lire ces brochures si sobres et pratiques, et où l'auteur se tient toujours aux faits bien constatés. Il est, à juste raison, convaincu, qu'il y a un grand avenir en Californie du Sud et ailleurs pour nombre de fruits des pays chauds, car ces fruits, il faut se le rappeler, sont presque tous comparativement peu travaillés par l'homme. On arrivera à créer des races meilleures comme qualités et plus résistantes au froid ou autres influences climatériques. Du reste, le Département d'Agriculture des Etats-Unis, le plus important qui existe, a depuis, quelques années, employé plusieurs de ses experts aux recherches, études et travaux pratiques de ce genre.

A part l'établissement horticole de F. W. Popenoe, à Altadena, il existe en Californie du Sud, depuis quelques années, un autre établissement très important s'occupant non seulement des fruitiers exotiques, mais aussi de plantes ornementales, économiques etc.et qui est situé dans une des localités les plus abritées de la Californie du Sud c'est le *Southern California Acclimatizing Association Santa Barbara, S. California*, et dont l'actif et zélé secrétaire est le Dr. F. Franceschi savant botaniste et praticien. Un très grand nombre de fruitiers des pays chauds sont cultivés dans cet établissement, et beaucoup y ont fructifié déjà.

La raison pour laquelle j'ai tant parlé de la Californie du Sud est double ; d'abord, c'est que le climat de ce pays est presque identique à notre climat, et, ensuite, que le fait, que les Américains, gens pratiques entre tous, s'occupent tant des fruitiers des pays chauds, prouve, qu'il ne s'agit pas uniquement de curiosités d'amateurs, mais de cultures pou-

The Avocado: It's Good to Eat

It Has a Great Future and Value as a Fruit. It is Worth Extensive Planting in Tested Sections and Experimental Planting in Many Parts of the State. It has Proven Highly Profitable to Many.

The most promising industry in Southern California is the growing of the avocado, sometimes called alligator pear. Just now it is in its infancy, but a few years will suffice to make the most skeptical sit up at least and take notice. I am no prophet, nor the son of a prophet, but I believe that in the small space of three years the avocado industry will cause more stir than the growing of any other fruit, nut or vegetable. Just as soon as one or two little alligator pear orchards begin to bear and bring in fabulous returns everybody will be ready to dig up their orchards and plant the latest thing that offers such wonderful returns. It is characteristic of the Californian to do this. I see some remarkable alligator trees interspersed over this southland from Santa Barbara to the Mexican line and all of them very vigorous and a sufficient number bearing to prove this point.

Some of these trees are very profitable and bring returns to the owners almost beyond belief. I find the avocado will stand the cost as well as the orange tree. The fruit sells at outrageous prices, from fifty cents to one dollar each. This seems terribly high, and yet the people who buy them would rather have one alligator pear than a bushel of apples or a whole box of oranges. Some few people have to cultivate a taste for the fruit as they did for the olive, though nearly every one considers it delicious at first, but do not at present cultivate the avocado habit unless you have plenty of money, for it grows on a fellow and in this respect is worse than the morphine, whiskey or tobacco habit.

Can you tell me what a banana or pineapple tastes like? No, neither can I describe the alligator pear, but I know it is the most enticing and delicious fruit known. I often think it was an alligator pear that Eve tempted Adam with and think they forgot the botanical name and called it apple for short. I know she used the most tempting fruit and that must have been an alligator pear. The ways and modes of preparing the fruit to be eaten you have heard reiterated in most every journal, and I will not attempt to tell all, only a few of the most popular ones. Eat it right out of the shell when the fruit is as soft to the touch as a Bartlett pear when thoroughly ripe; season with salt, pepper or vinegar to taste.

Make it into different salads, and so well adapted to this is it that it is often termed the salad fruit. Everybody likes it spread on bread, and the time is coming when avocados will take the place of butter where nothing else can, and I say that anything that takes the place of butter and is even more agreeable and palatable than butter can never be a drug on the market, especially when there is so limited a scope of country where it can be successfully raised.

I see in this fruit a boon to dyspeptics or persons with stomach trouble, as they can take this nourishing vegetable oil into their systems where animal fat could not be assimilated or digested. It is the most valuable fruit, or vegetable fruit known. One of our choice varieties tested over twenty per cent vegetable oil (by far the highest test known for the avocado).

I must explain a very serious mistake or belief through ignorance that is prevalent. Most of the public are of the opinion that alligator pear trees do not bear until very old and then not very abundantly. There is ground for this belief, but it applies to seedlings only. Remember this if nothing else! Budded or grafted trees will bear the same kind and the same quantity as the parent tree from which the buds are taken, and furthermore, they will begin to bear one year from the time the bud is inserted. I have now in the nursery small trees only ten months from budding, already a mass of bloom. Last season I had to pull the blossoms off nursery trees to keep them from fruiting, as I wanted growth on the trees instead of fruit. I inserted one Lyon bud in a four year old, non-bearing tree and after it had made one season's growth, about two feet, it blossomed and set fruit, and now there are on it eleven fine pears over half grown worth one dollar each. There are a great many avocado trees in Southern California, but few that are very choice. Probably there are not over a dozen that are worth propagating from. I have made it a specialty to find the very best things in the country and then plant and propagate heavily from them.

I realized the possibilities of the Gardena dewberry a few years ago, and there have been thousands of dollars made out of these wonderful plants. Later on I discovered the Chase walnut tree and the minute I saw it I could see the possibilities in it, and it has proven to be the finest walnut proposition on the coast. As proof of this statement I sell out every year far in advance of the planting season, when I can not sell the other varieties until the Chase are all sold. Every year I plant more heavily, and yet the demand exceeds the supply. In August I had sold about 20,000 grafted trees of this variety and not a single one of any other sort. The demand is so great that I am now selling the very smallest trees that I generally keep over for two-year-olds to be sold the following spring.

The most valuable tree in the world today is the Ganter avocado. I planted it here in Whittier on my place in the spring of 1905; I also planted about a dozen more at the same time, but this one is the only one worthy of mention. This wonderful Ganter tree is now 38 feet in height and has a spread of 30 feet. The fruit of this Ganter tree is of very good merchantable size. It will size up sooner and longer with the pocketbooks of the laboring class than will the larger fruits. Avocados from one to one and a half pounds will sell the best like the average size lemon and orange. This Ganter fruit has extra fine flavor, is rich, oily and nutty, with average sized seed and no noticeable fiber. It is a good shipper, fruit having been shipped to New York and Pennsylvania with gratifying results. We have budded trees from the Mexican variety that will bear fruit which will weigh over two pounds, but we do not recommend this for commercial planting, for we know that the trees will bring more money that produce the same quantity by having it divided up in four times as many shells.

This Ganter tree is by far the most valuable of any of the avocado trees here in Southern California. The proof of the pudding, etc., so the proof is the returns in dollars and cents. It is valuable for its wonderful growth of bearing wood and its enormous crops of valuable fruit.

I do not brag about the number of varieties I carry but I do pride myself that I am placing in the hands of the public something that I can conscientiously recommend as a paying investment. I have done it successfully with berries and walnuts and I am sure that there is a greater future for the Ganter Avocado than either of these, for the simple reason that the avocado is a food, while nuts, oranges, etc., are mostly luxuries.

Of course, the more secluded and warmer the place in which they can be planted, the greater the returns will be. I have figured up the returns from only one acre of Ganter avocados on a very reasonable estimate, and yet the result seems almost beyond comprehension. Figuring the trees 24 feet apart, 76 trees to the acre will allow for the cutting out of every other one after a few years of bearing, and from what the parent tree has borne, this season the entire crop was contracted by Mr. Woodworth for five dollars per dozen and over two hundred dozen fruit have already been picked and sold with a few yet on the tree.

Think of this! Over one thousand dollars for one crop of fruit from one tree and that less than eight years of age! Last year it did not bear so heavily, the exact number of fruits I do not remember, but think it was in the neighborhood of 1500; and the year previous it bore a few less than twelve hundred.

I want to keep in the bounds of reason, so I place the price per fruit at ten cents each and yet I expect never to live to see the time when it will sell for less than this.

Age of tree	Number of Fruit	Value at 10c each
2 years	few fruit	
3 years	100	$ 760
4 years	300	2,280
5 years	500	3,800
7 years	1000	7,600
Total amount for five crops		$13,760

Sounds rather large, but I am backing up my belief by planting 50 acres of valuable ground here in the Whittier foothills to this fruit.

This tree fruits from the middle of September until the middle of January and thus avoids most of the winter winds that will shake off some of the fruit, although the fruit that is blown off any time after October will mature and ripen nicely if placed in a shady place. The green fruit though will cling on like "grim death to a sick nigger."

If you do not have a suitable and somewhat protected section in which to plant avocados of any variety, I would advise you not to plant them and expect great returns, but if one-fourth of the fruit blows off and one-fourth freezes then you still will make more money than on most any other crop.

I have nursery trees ten feet high only 16 months from budding. Wm. H. Stephens at 1239 West Fifteth Street, is interested with me in the avocado nursery and is going to plant a large orchard in the foothills of Montebello. We expect to have only a few thousand of these trees for sale.

We will be glad to show any one interested in this industry the original tree, young bearing orchard trees, and the nursery, if they will but write or phone when to expect them.

Come any day in the week, but do not come on Sunday, as we do not talk or transact business on that day. —A. R. Rideout, President Magnolia Nursery Co., Whittier, California. —Adv.

THE

Gardeners' Chronicle

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CONTENTS.

ILLUSTRATIONS.

BRAZIL'S BOTANIC GARDEN.

ALTHOUGH the Botanical Garden at Rio de Janeiro has been in existence for over a century, it is not so well known in Europe as its merits deserve, and even among the comparatively small number of people whose travels have led them to the fascinating capital of Brazil it is only the single feature of the great central avenue of Palms which has attained celebrity.

Yet the Garden at Rio de Janeiro may justly claim to rank alongside its better-known counterparts at Peradeniya, in Ceylon, and at Buitenzorg, in Java, as one of the best botanic gardens in the Tropics. At the beginning of last year the Government of Brazil appointed Dr. J. C. Willis, who for sixteen years had been Director of the gardens at Peradeniya, to be Director of the Rio Garden, in succession to the Prefect of Rio, the previous Director. Dr. Willis is animated with the desire of spreading the fame of his new charge among all those interested in botany and horticulture, in order that the resources of the garden and laboratories may be put to the fullest use for the advancement of knowledge. In accordance with his invitation, very kindly extended through Prof. Seward, of Cambridge, the present writer spent a most delightful winter in the enjoyment of the lovely surroundings that the Garden and its neighbourhood afford.

Rio de Janeiro (which means "January River") was named by its discoverers under the false impression that the enormous bay, or rather inlet of the ocean, upon which Rio stands was the estuary of a river, and in accordance with this name the Garden is often yet entitled the "Hortus Fluminensis," or the "River Garden."

The bay itself is of great extent, running some forty miles inland, and terminated by the range of the Organ Mountains, the native home of many lovely species. Round the mouth of the bay rise a multitude of precipitous granite peaks, bare above, forest-clad below, and at the foot of these mountains, spreading itself for many a mile over hill and dale, lies the city itself, occupying what is perhaps the most beautiful, and certainly the most extraordinary, site of any metropolis in the world.

Although Rio is nearly 23° S. lat., and is consequently only a short distance inside the tropic line, it enjoys a perfectly tropical climate. This is partly owing to its sheltered position, but is chiefly due to the warm equatorial current which sweeps the coast and carries the zone of tropical vegetation far south of the actual geographical tropic. There are only two seasons in South Brazil—the dry season, which is also the cold season, and the wet season, which is hot. The climate is never really dry, but from March to September rain is decidedly less frequent, the sky is clear and the temperature lower; while in October the rain begins to increase in amount by periodical downpours, after each of which the sun comes out a little higher and a little hotter. January and February are the height of summer.

It is remarkable, however, that in tropical South America the sun, even when vertical in a cloudless sky, has nothing of that scorching power which is so inimical to plant life in Eastern lands. The atmosphere during the hot season verges continually upon saturation, and the moisture acts as a screen to the heat, without greatly diminishing the light of the sun's rays. Consequently the precautions against sunstroke which are so necessary in the East are here unneeded, and even an exposure of an hour in the sun with one's head bare hardly produces more than a slight headache. The climate is, in general, as incalculable as that of an English summer. Whatever season of the year it may be, when the wind blows off-sea clouds and rain follow—not torrential downpours either, but gentle English rain.

These moderate conditions of climate reflect themselves in the aspects of the vegetation, as well as in the habits of the population. The feature of Rio city and of the Garden which would most likely first strike the attention of an English horticulturist is the quality and extent of the lovely lawns which are to be seen everywhere. From a distance they appear smooth as the finest velvet, and of a purity which is hardly ever equalled in temperate climes, because these lawns are not sown—grass-seed will not grow at all—but actually hand-planted, each root of grass being dibbled in separately with infinite patience. It is not Poa which is used in their composition however, but Stenotaphrum, and the resulting lawns, although so beautiful, are much too soft and turfy to be of any use for games. To anyone who has ever realised the difficulty of cultivating grass outside the temperate zones, these lawns speak eloquently of mild sun and perennial moisture.

The Botanic Garden lies upon the fringe of the city, on a space of flat ground—a somewhat scarce commodity—lying at the mouth of a valley, and surrounded upon three sides by mountains, the highest of which, Corcovado, is a sharp peak about the same height as Snowdon. In front of the Garden is a lagoon, and beyond that the open ocean. All over the hills behind stretches the virgin forest, very little interfered with, in spite of its proximity to the city.

The Garden is divided into two portions by a road; the first and much the smaller portion, lies between the road and the lagoon, and remains in a wild condition. The soil is swampy and unsuited for cultivation, therefore the jungle is left standing, and the ground is covered with Bamboos, Sensitive Plant (Mimosa pudica), and other moisture-loving herbs and trees, which do not reach any considerable height.

The other portion of the Garden, which is much the larger of the two, is practically bisected by the main Palm avenue.

There is not much open ground, and the wonderful collection of Palms gives quite a woodland aspect to the views, an aspect which is increased by the alleys of Mango trees. These last are large and handsome, and impress the visitor with a strong sense of the prevailing magnitude of the trees. A full-grown English Elm looks insignificant if measured in imagination against one of the giants of the jungle.

The last Director but one, Dr. Barbosa Rodrigues, was a great authority on the Palmae, and the collection of specimens, comprising nearly 400 species, which he got together in the Garden is undoubtedly the finest in existence. From the spectacular point of view they are a great adornment; indeed, such another combination of grand natural surroundings and cultivated beauty as the Gardens of Rio provide could hardly be found anywhere else in the world.

The chief object of general interest in the Garden is, as has been before mentioned, the great Palm Avenue, a splendid coloenade, half a mile in length and composed of individuals of Oreodoxa oleracea, which are over 150 feet in height. The original Palm, from which those forming the avenue are descended, was introduced by one of the Emperors and is still in the Garden. No photograph or picture does justice to this wonderful spectacle. It is size and colouring which lend grace and dignity to the bare poles of the Palm stems, and redeem the avenue from the imputation of the ugliness with which critics sometimes charge it. This avenue runs from the main entrance right across the Gardens and terminates in a little temple, dedicated to "Dea Palmaris." From the main entrance two similar but smaller avenues diverge, so that the effect of the three combined meets the visitor immediately upon his entrance. Grouped together at one end of the Garden and approached by a special gate, stand the offices, including the library and the herbarium, the Director's new house, the laboratories, and the Director's old house, a building dating from the seventeenth century and now divided up among several families of workpeople.

It is intended that the herbarium shall soon be accommodated in a more worthy manner in a building of its own. The laboratories, including those for vegetable physiology, agricultural chemistry and bacteriology, are under competent direction, and are furnished with an equipment of apparatus, material and funds which render possible the accomplishment of the very best work. Under Dr. Willis' direction the quarterly *Contributions du Jardin Botanique de Rio* has been recommenced, therefore much more may be expected from these laboratories in the future than the past has produced.

From the hill behind there descend two little cascades, the water of which is led everywhere throughout the Garden in rippling channels which cool the air even in the height of summer. Mosquitos are rather rife, but are fortunately

there is not that specific and easily acquired information that is derived from a study of the Agricultural Departments, surveys, maps and pamphlets. Their information embraces a wider range of crops, indeed all crops of any considerable importance. Copies suited to each locality where the work has been completed should be in the hands of every cultivator of the soil. In no age or country has so thorough and comprehensive investigations been undertaken, and so successfully prosecuted.

The work of the surveys and soil treatment done in other localities in the west together with experimentation show that much injury to crops and the soil results from excessive irrigation. It is a fact that is useful to California where irrigation is extensive.

Gardening in Southern California.

BY EX-GOV. LIONEL A. SHELDON.

Garden planning in connection with dwellings should be directed towards comfort for the inmates, and enjoyment; just in the same way that one goes about supplying a room with furnishings; if we can gain equal seclusion for the garden, so much the better.

Everything about the garden should be upon a natural plan. Avoid always those artificial effects which are much too common everywhere. Amateurs should study the habits of vegetation when planning a garden, and dispense with draughtsmanship. Success in gardening depends upon the well-being of the plants; costly bordering, elaborate stonework, and all other extraneous accessories seldom fit well in the garden scheme, and soon become tiresome. The monumental features of formal, or the European types of gardens, are ready makeshifts to enable those who lack perception of art to create more or less impressive effects; flowers are never happy in such environment.

In arranging the garden, the plan should be adopted to have the best effect towards the windows or porches. It is rather common to reverse this so that the most pleasing perspective is presented to the passer-by. This is rather neighborly, but by no means the best disposition from any viewpoint. Many of our towns contain whole streets set out upon this plan; the houses themselves appear as so many architectural samples, and the effect seen altogether is not more interesting than rows of cemetery plots. The plan is crude, in very poor taste, and destroys utterly the opportunity for individuality.

The garden should not fall under the eye as a whole; it must be a place which offers a variety of views. To accomplish this it is generally necessary in the case of new places to provide slight breaks, or divisions, in the form of lattice work; as the place gets older the trees and shrubs (if in the first place they are set with this idea in view) grow up, and the lattice will no longer be necessary. Permanent divisions are only required when some portion or feature must be concealed.

The great majority of dwellings occupy quite small areas of ground—many not more than one-fifth of an acre, and the place is a large one which contains five acres. Manifestly it is not possible to create a garden by any set of measures or rule of thumb; yet this very thing is quite frequently attempted, with the result that the small place is more often than not overcrowded. It is quite possible, however, by a study of the laws of proportion, to increase the apparent area, and this without any violation of the ethics involved. In planning upon the small area some effects are beyond us; that, for instance, which is so entrancing at the two ends of day—the long, sweeping shadows; since these are produced by tall objects upon extensive open spaces.

A garden must contain, more than anything else, abundant green; stretches of sward backed with trees and shrubs in varying mass at the edges, is in every case the best disposition, and provides for that merging of the foreground with the sky picture which is so desirable.

The plan in general does not admit of overloading with color—that is to say, masses of color; the flower plants should be disposed so that they sparkle by contrast with lesser tones.

A Spring garden should be lavish; tiny beds of this or that will not satisfy. Above all do not cut out beds in the lawn; it is best to arrange your flowers in colonies, in natural-looking sites. Neither square, circular or any other formal pattern for the beds should be thought of. This rule is of particular importance in all phases of garden arrangement; it is especially to be observed with the spring flowers.

We have not so far evolved here in California any distinct type or style of garden; that is to say, we continue to use and depend upon those "well-tamed" and time-honored varieties of plants which are such favorites in older-settled parts of the world. Thus: we know that the Pansy, Mignonette, Ten-Week Stock and Poppies will not fail us for spring, and neither will Eschscholtzia, the pretty scarlet flax (Linum), Snapdragons, Malcomia, Saponaria, Candy-tuft (Iberis), and hosts of others. It is the same with bulbous flowers; if we would have brilliant effects, the Tulip, Hyacinthe, Anemone, Ranunculus, Daffodils, Jonquill, Calla Lily (Arum), and Ixia are very much to be depended upon, all of which are of easy culture and yield gratifying results.

Nowhere in the world probably does gardening return so generously in pleasure and profit as in California. Let no one think because his possessions in land or building lots are rough, uneven, or maybe on edge, that no course of improvement is possible or would be profitable.

Hamlet Omitted.

"See here," exclaimed the theatrical manager, "have you the nerve to call this play a rural drama?"

"That is what I claim for it," replied the author modestly, as all authors reply.

"And you pride yourself on being a realist?" snorted the manager.

"I do," replied the other, again modestly.

"What's your evidence of realism in this play?" demanded the manager.

"Well," explained the author, "I've introduced the old oaken bucket, with the quartette of farmhands; the scenario calls for real cows and chickens, a load of real hay, drawn by real oxen, is introduced; the heroine is discovered churning real butter in the—"

"Piffle! Piffle!" cried the manager. "What I want to know is where's the mortgage? Who ever heard of a farm-house without a mortgage that the wayward son comes home and pays off in the last act to frustrate the evil designs of the villain?"

Burbank's Place in California Horticulture.

BY GEORGE C. ROEDING.

So much has been written about Burbank by men far abler than I am to discuss him intelligently, that I feel some constraint in taking up this subject.

I knew him, when, as a boy, I started in the nursery business and had occasion to meet him in days gone by in the discussion of our nursery interests. In later years I have come in closer contact with him, as a distributor of some of his fruits, and have had a better opportunity to form a fair and unbiased opinion as to what he has accomplished.

Luther Burbank.

Before proceeding further, I want to say a few words to his detractors, who in the last few years have become exceedingly numerous and seem to take a keen delight in decrying and branding every new fruit and flower he has ever introduced as worthless. It is an old story, however, a man after years of persistent effort, rises to a point where he has earned his reward, and then what happens? Petty jealousies arise, and because everything he has originated has not proven the unbounded success it should, remarks are made intimating that he has never introduced anything of merit. I will discuss some of his meritorious introductions later, meanwhile I wish to say a few words about him personally.

Much ado has been made about the barrier which he apparently surrounds himself with at home, and to the public an impression is conveyed that he is a very difficult man to approach and understand. This small man physically, but not in mind, has an extraordinary ambition, the fulfillment of which can only be satisfied by some new introduction. This is no sooner accomplished than he seems bent in bringing out some other new and unthought of hybrid and at the proper time offering it to the public for approval. Is it strange, then, that a man so deeply engrossed in his work should resent the time taken up by visitors, who in many cases merely have a curiosity to see him and ask useless questions? What right has the public to presume that this man is their property? Probably the one reason, more than any other, is his prominence. My observation of prominent men has led me to believe, that the greater their attainments, the simpler and more approachable they are, particularly if they consider your visit to them is made with some definite purpose in view. Burbank is no exception to the rule, his childlike simplicity, his diffidence and his sympathetic nature are so forcibly impressed on you in your conversation with him, that it is difficult to form a proper realization of his wonderful work with nature. He makes no pretensions of being a scientific man, nevertheless the recognition and pedestal upon which he has been placed, by men whose scientific attainments can not be questioned, should be sufficient evidence, that the word fakir and Burbank are anomalies which should never be used in the same breath.

True, Burbank has made mistakes, but for that matter who does not make them? The mistakes he has made have been the means of spurring him on to renewed effort and failure with him is unknown.

Few men with his disposition, unless they possessed an ambition beyond that of a more than ordinary man, would have had the nerve to continue in their efforts to add more and more to the horticultural wealth of the world.

Another criticism, which to say the least is very unreasonable, is the one in reference to his grounds. It is quite evident that some of his visitors expect to find beautifully laid out grounds with his many introductions artistically arranged to make a pleasing effect. Visit any botonical garden where experiments are constantly being carried on, and is your eye greeted with nicely laid out grounds! I say no, then why should anything different be expected from Burbank?

He is not striving for effect, but on the contrary is planting seedlings of berries by the thousands. Then again you will find row after row of Gladiolus; then beds of Amaryllis followed by rows of Shasta Daisies of various forms; and mixed among this there will be a row of cherries, plums, apples and walnuts, all of which are under his observing eye for the purpose of selecting from the innumerable mass, that which has merit.

Spend the day with Burbank as I have had the pleasure of doing, examining the endless variety of fruits, many of which will prove of value but have not been offered for sale, because not up to Burbank's expectations. Then again, inhale the fragrance, admire the size and coloring of his numerous flower novelties, and you will go away with a feeling of admiration at the results which Burbank has attained. It is relatively an easy matter to concentrate ones mind on a few varieties of fruits and flowers with a view of improving them, but to keep in touch with such a great variety of plants, requires a mind, a keen eye and powers of concentration, with which but few men are gifted.

It would require too much time in a paper like this, dealing only in generalities, to take up in detail the standards in fruits and flowers which are recognized as having commercial value, and I will therefore only mention a part of those the intrinsic value of which has never been questioned.

Will the value of the Burbank Potato ever be forgotten? The Burbank, Climax, Chalco, Wickson, Bartlett and Plum and in more recent years the Santa Rosa, Formosa, Gaviota, are all important factors in the fruit world. The valuable winter vegetable brought to perfection by him, the Crimson Winter Rhubarb; the finest and most delicious of all Quinces, Pineapples; the Phenominal and Himalaya berries, all have their uses and are now standards.

In flowers, the Shasta Daisy, jumped into prominence more quickly than any other plant which has ever been introduced, and has been sought after throughout the civilized world.

Among the many later introductions, all of which have merit, but have not been on the market for a sufficient length of time to be fully tested out, are the following: The Spineless cactus, a number of new Cherries; the Santa Rosa, Royal and Paradox walnuts; a blackberry in which the thorns are entirely absent; the gladiolus, amaryllis and red Eschscholtzia and many others which I do not readily recall to mind now.

In conclusion, allow me to say that if Burbank had never introduced a single new plant to gladden the hearts of mankind, he would nevertheless be a benefactor, for he has created a spirit and an incentive in others similarly inclined, in all parts of the globe, to advance the horticultural interests much beyond the ordinary.

His indomitable will, determination to succeed, no matter how insurmountable the obstacles apparently were, should, now that he has fully demonstrated his abilities, be the cause of his receiving the encouragement and endorsement of the public so that in the years still alloted to him he may continue in his great work, and when he finally does lay aside his burdens, he may look back with a feeling of pride in having accomplished much that shall be of lasting benefit to the human race.

Burbank's Introductions in the Market Place.

BY HENRY W. KRUCKEBERG.

A correspondent from the wilds of Pasadena writes to The Rural Californian wanting to know what Burbank has really accomplished of commercial value. Since this inquiry comes from one in the trade, and further, since Burbank's so-called critics are chiefly representative of his class, possibly a little enlightenment will bring about a better understanding of the situation.

To enumerate but a few of the successes the following list in brief is here submitted:

The Burbank potato was introduced in 1875. In 1908 it is estimated that 14,000,000 bushels were produced in the Rocky Mountain and Pacific States; for the present season a like amount has undoubtedly been grown. It is also largely produced in the northern Mississippi States and in New England. The annual value must run into the millions. Some people consider this introduction as a decided commercial success; what the Pasadena Gardeners Association think of it has not yet been recorded in the book of fame.

Some fifteen years ago Burbank introduced the Tokapuna Russett apple from Australia, which we learn is proving of commercial value in the Northwest.

In 1893 the "Van Demon" quince was introduced and has been acknowledged to be a valuable fruit.

The two plums "Gold" and "America" were introduced the same year and are now a feature of commercial horticultural literature from Maine to California.

This same year saw the announcement of the "Giant" prune, now a recognized favorite for canning and shipping in the fresh state.

In 1894 the "Wickson" plum was introduced. With the exception of the "Burbank" plum, introduced from Japan several years earlier, no plum is so extensively grown for shipping; and it has always given good satisfaction, sometimes bringing as high as $9.00 per box in the East at auction.

In 1902 the cherry "Early Burbank" was sold to a syndicate of horticulturists at Vacaville; in 1908 it sold at auction in the Eastern States in competition with all other cherries, at $15.00 per ten pound box for the early ones and $7.50 per ten pound box by carload lots; this year in Philadelphia it sold for $31.00 per ten pound box, the highest price, without doubt, ever paid for cherries in any market in the world. Is this to be considered a commercial success?

In 1906-'07 the "Santa Rosa" plum and the "Rutland" plumcot were introduced; the former is a fine fruit, while the latter is indeed interesting from a plant breeders point of view, and may yet develop to commercial importance in sections where the climate is too severe for the apricot,—it being a cross between the apricot and the plum.

In 1907-'08 the "Formosa" plum was brought forward—the largest, finest colored, and best eating plum of the Burbank group; the "Vesuvious" was also introduced, its chief value being ornamental on account of its immense and richly colored foliage; the "Gaviota" plum is another of this year's introductions, being a cross between the "Americana" and "Japan."

The Crimson Winter Rhubarb all will acknowledge was introduced from Australia by Burbank and brought from the production of stalks about the size of a lead pencil to the enormous stalks which were produced by his "Giant" Crimson Winter rhubarb —the result of about fourteen years' work on this plant. Being shipped in carloads to the eastern market, it may also be said to be a commercial success.

The "Himalaya" blackberry is becoming popular. This is an introduction of Burbank's sent out some eight years ago. The "Phenomenal" berry is another acknowledged by all to be of superior quality.

The Shasta Daisy now encircles the earth. No white flower has ever been produced which is so valuable for the common people by making it possible for everyone, rich and poor, to have white flowers in abundance all through the summer.

The work which Burbank did on the Gladiolus a number of years ago was appreciated by horticulturists. Blanc of Philadelphia purchased one half of the stock and H. H. Groff of Ontario, Canada, the remainder. By consulting Bailey's Cyclopedia of Horticulture, you will notice that Burbank is given credit for improvements which has placed the American Gladiolus in advance of the European varieties.

The Burbank Canna, introduced in 1898, is still offered for sale by many of the seedsmen and florists, not only in America but also in Europe. The Canna "Tarrytown" (1897), took the gold medal as the best blooming Canna at the Pan-American Exposition. No Canna will surpass it in blooming qualities.

The "Crimson Eschscholtzia," which was produced from our common yellow wild poppy, is acknowledged to be a great improvement; and although lately introduced is receiving high praise wherever grown.

The "Royal" and "Paradox" Walnuts are certainly improvements on the old varieties, both as to rapid growth and quality of timber.

But why go on? Is it not true that many nurserymen who damn Burbank's introductions by word of mouth, list them in their catalogues? Is it not a fact that the mere name of "Burbank" adds a selling value to the goods? Then why the question as to the commercial value of his introduction? Is it possible for a nature fakir to so gull an intelligent public? No. It is not that Burbank is a failure that galls: it is because he has all of his critics skinned to a finish when it comes to producing the goods that have a commercial value and have withstood the test of the market place. That is all.

The Himalaya Berry.

BY J. K. SEXTON.

Among more recent introductions the berry known as the Himalaya is attracting more than passing attention. Often it is spoken of as the "Himalayan Blackberry," though strictly speaking it hardly comes under that classification. It is native to the north slope of the Himalaya mountains, where it is a favorite among the natives for making wines and cordials, and has only of recent years attracted the attention of berry growers in

Himalaya Berry. Two years' old. Fair crop.

this and other countries. It produces good sized clusters of large berries which ripen and grow pretty much over the summer season. The flavor is good, being sweet and rich; the fruit jellies easily, and eaten either fresh or cooked, is a prime favorite. The severity of the climate in its native habitat enables it to withstand a considerable degree of heat and cold. My experience with the plant has [illegible] and I [illegible] valuable acquisition to our berry plants. Going more fully into details, I quote from N. S. Trowbridge, who has had considerable experience with it which largely tallies with results attained on my grounds in Pasadena:

"No proper comparison can be made between this berry and the Mammoth or other blackberries, as their mode of growth is different and their treatment should therefore be different. The Himalaya is a perennial, not an annual, like most berries of this character. The bearing wood will continue to bear for several years and must be cut out at intervals and new stalks grown to bear afterwards. The new sprouts do not come up from the ground like other blackberries, but start from

Three years. Full bearing.

the one root, being branches just as much as the branches from a tree, and the roots will not throw up sprouts unless they are cut or broken by cultivation, etc. The fruit is also borne in a different manner from other vines. The bearing stalk, which is one or more years old, throws out the fruit laterals, which grow from 16 inches to 3 or 4 feet long and bear immensely. Because of this long growth, the sprouts or stalks must be trained high, or the fruit would all lie on the ground. The vine is a wonderful grower and immense bearer and the roots should be set in rows 8 feet apart and 4 feet apart in the rows. This is supposing that the ground is good and well fertilized and cultivated and conditions right for this berry. I have found that much the best and easiest way to train them is to string two wires not less than 3½ feet and 5½ feet above the ground, with sufficient posts to properly support the vines, and allow about four stalks to grow from each root, training one on each wire half way to the next vine. This will give a continuous mass of berries the whole distance and is about as much bearing wood as the roots should support. Leave the laterals on the stalks say 6 to 12 inches long and you will simply marvel at the amount of the fruit. Cut off all other sprouts and low laterals, so that no vine will [illegible] when bearing.

"It is better to allow one or two new sprouts to grow each year, and these may then be used instead of [illegible] or, of such as may die from any cause. The new growth needs frequent pruning or pinching back, for if one does not do so, no one could get through between the rows.

KEY TO GENUS WASHINGTONIA, AFTER PARISH.

Petiole acuminately prolonged in the blade.

Blade abundantly filiferous

Margins of the petiole unarmed near the blade

1. W. filifera.

Margins of the petiole armed throughout

1a. W. filifera robusta

Margins armed only near the base

1b. W. filifera microsperma.

Blade destitute of filaments or nearly so

2. W. gracilis

Petiole obtuse at junction with the blade

3. W. sonorae.

Photographs of A. Robertson Proschowsky removed

This Patent Book K.

IN FILLING this Scrap Book NEVER gum in papers, etc., close to binding. Leave at LEAST ONE-HALF INCH from back of leaf.

To get a better result after gumming the paper or picture on the leaves, STAND the book up on END, the leaves spread apart so that the air can flow through and dry. This will prevent MOULD, and the leaves will be less liable to wrinkle.

PAT. No. 471,276.