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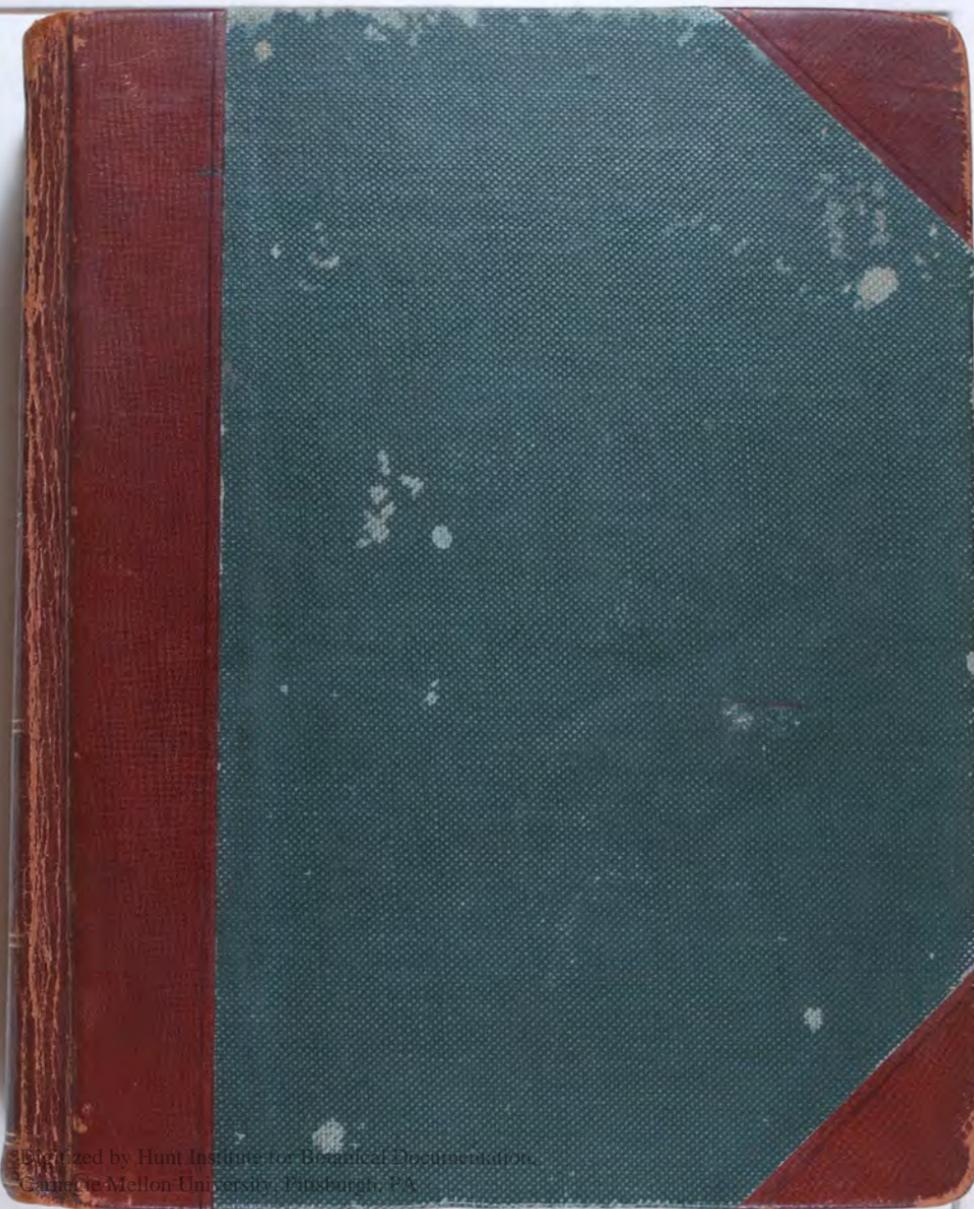
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The Hunt Institute for Botanical Documentation, a research division of Carnegie Mellon University, specializes in the history of botany and all aspects of plant science and serves the international scientific community through research and documentation. 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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*Ex Libris*



Wilson   
de Popenoe



Carib Ymaguakakut (Lehmwort) Hond.

Esmeraldas

quijúe

Ecuador I. p. 37

Choco

seo

Colombia I. 83

Cuna (San Blas)

awé

Bluffels, Nicaragua  
I. 139

Guaymi - Doragonan

gria (Muvie); bu(?) (Muvie); doge (Muvie)

uop (Chunab); kar (Chagener) I. 159

Bubre, Cebeco, Estrella, etc

I. 247

Chinipe' kamo-ue

I. 326

Quetoso setek

I. 394

Rama bulup

Nicaragua I. 426

Muchito sibia, Sans serin,

blun serin

I. 516

Xicague tait. (Corymbia) yow

559

Mitogalpa <sup>ANANAS</sup> cial <sup>II</sup>. 600

BOSTON, MASSACHUSETTS  
GENERAL OFFICE, ONE FEDERAL STREET

II. 615  
617, 621

Cacopen sid  
sid

Lenea gial, sid  
II 677

Chalange shia  
II 695

Xunca halle, hayi  
fay, jay, jay, jay  
II 717  
II 786  
788

Mise cyto, aylo  
II 771

Tapachutea - Nup - Japer  
Moyeta cofori  
II 781

Margue nimo, nemo,  
II 848

Mazateca llam  
II 906

Subteora auto  
II 949

Pepil drigt  
II 1032  
1048 1064

Mexico (Pochutlan) August II 1075

e

1



*Dahlia coccinea* has the ray-florets oblong, and rounded at the tips, and the scales acute; the leaves are bipinnate, with the lower pinnae pinnate, and the rachis and petiole are not winged in the type.

*Dahlia popenovii* has the ray-florets lanceolate-acute, the scales obtuse; the leaves are trifoliate or rarely simple, and the rachis is winged.

Guatemalan deciderata, of Mr. Bisset:

Chayotes

*Prunus salicifolia* - seeds and cions.

*Carica papaya* seed

*Crotalaria stipulosa*, seed and cions.

*Passiflora ligularis*, seed

*Dahlia* spp. seeds and roots

*Chamaecrista* spp.

*Annona diversifolia* seed and cions

*Rubus* spp. seed and plants

*Lycopersicon* seed.

Geo Darrow wants

*Rubus* - all species

*Fragaria* - all species

Wm. H. Eyster, Cornell University  
all types of *Zea mays*

Wm. S. Mayon says that remarkably good oranges are grown at Navarro, Costa Rica, 5 miles South of Cartago.

Dr. Rose wants data on

*Calicodendron scabridum* 'zapote de perro' between Loja and Portovelo, Ecuador  
It is a source of chicle.

Prof. Peper wants seeds of all grasses, with one head for identification.

Herb. barbareum	no. 867
Plant & Seed	" 229
Photographs	1770

M. T. Dwyer  
Aparicio 61, Bogota, Colombia

Quillota Chile, Philippi's avocado

Advise the Minister of Ecuador in Washington  
re time of my visit to his country, so he  
can inform his government.

Advise Chilean Ambassador here of  
the approximate time of my arrival in  
Chile.

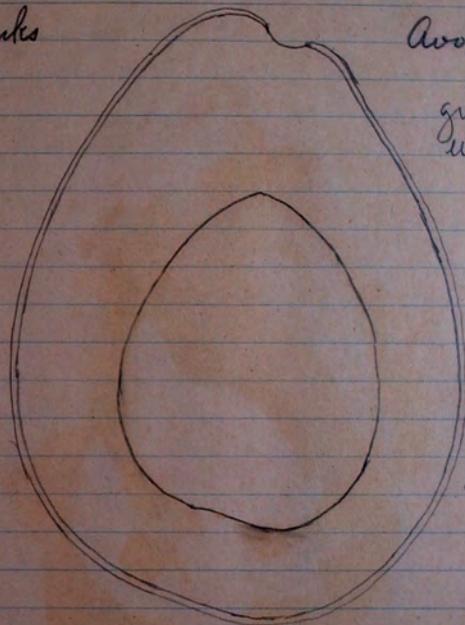
Called on Venezuelan minister

Called on Peruvian chargé d'affaires,  
Mr Gibson, whose father lives in  
Arequipa.

Called on Colombian minister

Spinks

Avocado

grown by  
W. A. Spinks

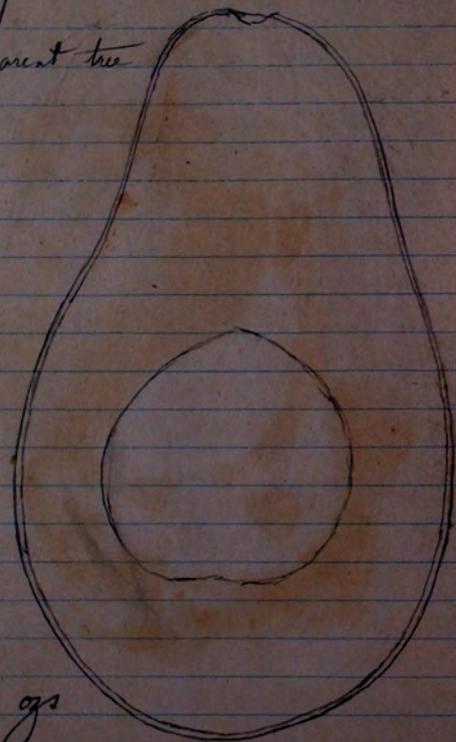
Color, shining purplish black, with minute brownish dots

Flesh yellow, green near skin, with fiber traces. Flavor rich, free from wateriness, quality excellent.

Seed often slightly loose in the cavity, with outer coat adhering to cavity wall in places.

Sharpless  
from parent tree

Avocado



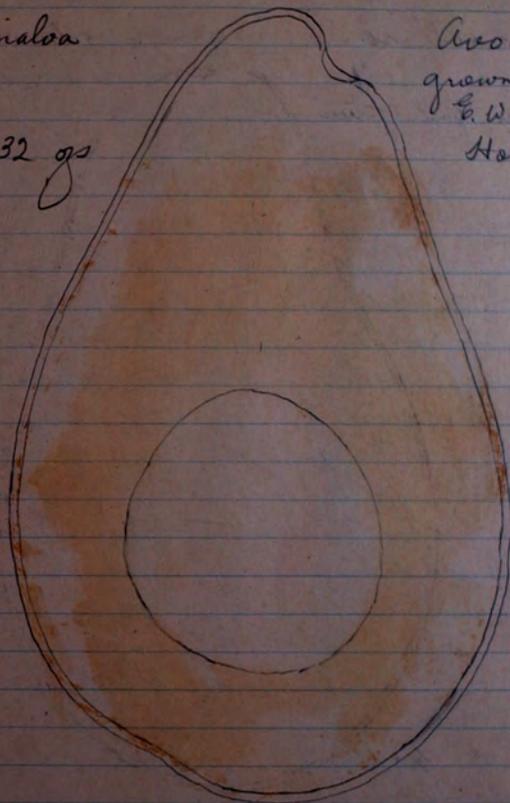
Wt 21 gms

Color, purple-black, with large russet dots.  
Flesh cream-color, with fiber discoloration.  
Flavor rich, pleasant, not watery.

Sinaloa

wt 32 gms

Avocado  
grown by  
E. W. Dickey,  
Hollywood



Color green, with yellowish dots.  
Flesh cream-yellow, almost clean.  
Flavor rich, quality excellent.  
Seed light in cavity

Jacob Miller of Hollywood tells me that the parent Miller avocado was brought from Guatemala as a young plant by Mrs. Miller's uncle. Mr. Miller says that the time was 27 years ago, which would make it 1895, but the accounts of Clarence Harvey and others indicate that it was more probably in the '80s; Mr. Miller is now 90 years old, and his memory is perhaps not accurate.

Mr. Miller says a man in Los Angeles named John <sup>W.</sup> Snelak (spelling?) was active in the early days in obtaining avocados and other plants for trial here.

Joseph Walker of Hollywood believes the history of the Walker, Royal and Challenge trees to be as follows. They are now 22 years old; they were grown from seeds brought from Guatemala by a friend of Mr. Sumner, the latter who property at that time.

### Blake's key to the Avocados.

- A. Perianth densely griseous-pubescent on both sides; staminoes pubescent.
- B. Ovary pubescent; staminal glands stipitate.
- C. Pedicels 1 to 6 mm long; staminoes with triangular head, much broader than its stipe.
- D. Branchlets glabrous to pubescent; leaves glabrous to pubescent beneath; filaments 2 to 3 times as long as the anthers; head of staminoe much shorter than the stipe.
- E. Leaves not anise-scented; perianth deciduous.
1. P. americana.
- EE. Leaves anise (or sassafras) scented; perianth usually persistent.
- 1a. P. americana  
drymifolia.

DD. Branchlets pubescent-willose;  
leaves floccose-tomentose beneath,  
filaments only one-third longer than  
the anthers; head of stamens  
about equalling or exceeding the style  
3. P. floccosa

CC. Pedicels 8 to 15 mm long; style of  
stamens twice to three so long  
and essentially as broad as the  
oblique head; branchlets densely  
ferruginous-tomentose  
3. P. schiedana

BB. Ovary glabrous, staminal glands sessile  
4. P. cinerascens

AA. Perianth sparsely pilosulous outside,  
essentially glabrous within; pistil and  
stamens glabrous  
5. P. leiogyne

Thursday Guatemala City Dec 11 1919  
Packed and shipped by freight 9 cases  
of material, including the following:

229a. Chayota edulis. 15 fruits large  
round green, from Sta Maria mostly  
small. A few slightly prickly

230a Chayota edulis. 40 fruits small  
green prickly, (small, round)

231a. Chayota edulis. 21 fruits white  
prickly, small to medium size.

And 3003 avocado seeds, as follows:

Case # 1	375 seeds
2	400
3	375
4	375
5	370
6	375
7	333
8	400

Later packed for shipment by mail

via the Legation pouch the following:

232 a. *Crataegus stipulosa* from  
Antigua ~~Marzavilla~~

233 a. *Sarcobatus regularis* Guatemala  
Guatemala City market

234 a. *Rubus tinctorum* (?)  
Morazan for Guatemala City market

235 a. *Spondias mombin* Jacote  
de Corona for Antigua

Monday Tactic, Alta Verapaz Dec. 22, 1919

Cajal

I have visited the tree which stands on the property of Pedro Rivera, and obtained some wood and budwood which I shall send to Washington, though I do not entertain great hopes of their arriving in good condition. Not only are they very dirty (fungus-covered) at this time of the year, but in addition the tree is just coming into bloom, and there are buds of flowers on the end of every branchlet.

This tree produces the best *Cajal* I have seen, and the variety is worthy of careful trial in the U.S. There are no fruits left on the tree at this time.

Rubus

I have today collected fruits of three species of *Rubus* which seem to be worthy of trial in the U.S. Two of them can be classed as blackberries, while one appears intermediate between the loganberry and the red raspberry. The three are as follows:

1. *Rubus tuckermanni*, probably (I sent a *Lythrum* specimen from Chejel two years ago, and I believe it was identified as this species). Abundant in the Verapaz when I have seen it at elevations of 3000 to 5000 ft. It is robust and very vigorous species, one of the most productive. Very few others are found which occur here. It is well distinguished from other species by its stout, densely clothed with soft red spines, sometimes reaching to feet in height. It is somewhat in character with a little pruning it should form a shrubby bush. The leaves have commonly three, sometimes five oblong-ovate, shortly acuminate leaflets 2 to 4 inches long, velvety to the touch, finely serrate, disc green above and glaucous beneath; the petioles (1/2 to 1 1/2 inches long) as well as the petiole (3 to 4 inches long) is furnished with many soft reddish spines and a few stiff, sharp ones.

The fruits are produced in terminal panicles 4 to 8 inches long, sometimes loose, sometimes quite compact and often carry

ing 50 to 75 berries. The latter are about half an inch long, oblong to oblong-oval or ovate in outline, composed of numerous drupelets smaller than those of the cultivated blackberry. The color of the ripe fruit is nearly black, when immature it is brown-colored. The flavor is sweet, resembling in general that of the blueberry. The juice is abundant, and the seeds are small and not hard; sometimes they are so soft as not to be at all troublesome in the mouth.

For its vigorous habit of growth, its productivity, the pleasant flavor of the fruit and its freedom from hard seeds this species deserves a trial in the Southern United States, where it will probably be found to succeed.

2. *Rubus* sp., certainly very close to the *R. tuckermanni* which occurs near Guatemala City. A robust blackberry found in the vicinity of Tactic, where it frequents roadsides and open places. It forms a compact bush 10 to 15

petiole height. It is not so productive as *R. triflorus* but resembles the northern blackberries in bearing habit, as well as in character of fruit.

The canes are stout and rather sparse covered with coarse purple hairs, as well as being armed with numerous strong, sharp, recurved thorns. The leaves are 5-foliate, occasionally 3-foliate, with the leaflets oblong to oblong-elliptic, acute to slightly acuminate,  $2\frac{1}{2}$  to  $3\frac{1}{2}$  inches long slightly inclining to the top, pale green above, lighter beneath, petioles  $\frac{1}{4}$  to  $1$  inch long and petioles  $2$  to  $4$  inches long with numerous short purple hairs and scattering thorns.

The flesh-pink flowers,  $\frac{3}{4}$  inch broad, are produced in small racemes in the leaf-axils of young branchlets, and in terminal panicles  $3$  to  $6$  inches long. The fruits, which are produced in loose clusters, closely resemble good northern blackberries in appearance and taste. They are often  $1$  inch in length, sometimes larger, and the seeds are not unduly large nor hard. In fact

this berry compares very favorably with a good blackberry of the north.

The species should be tested in the southern United States, and it deserves to be placed in the hands of plant breeders interested in the genus *Rubus*.

- 3 *Rubus* sp. A slender, semi-trailing species, making little wood. It is easily distinguished from the two preceding by its greenish white stems. It is relatively rare in this region. The leaves are trifoliate, with the leaflets lanceolate to elliptic in outline long-acuminate,  $\frac{1}{2}$  to  $3$  inches long (the central one commonly larger than the two others) serrate, glabrous, light green above, whitish glaucous beneath; petioles almost none on the lateral leaflets, up to  $\frac{1}{4}$  inch long on central one, petioles  $1$  to  $2$  inches long, sometimes reddish, with scattered thorns.

The white flowers,  $\frac{3}{4}$  inch broad are produced in small (commonly terminal) panicles not over  $3$  inches long. They are followed by leaf-wind-colored fruits

examines the size and shape of large  
and small berries, and sometimes oblong like  
dogberries, with a flavor suggesting  
that of the latter.

Saturday Coban, Alta Verapaz Dec 27, 1949

Packed and despatched to Washington  
the following material:

P-236. *Chamaedorea* sp. quantity  
of pacaya palms, entirely filling one  
packing case

237. *Dahlia masoni*, single white  
variety, from near Coban

238. *Dahlia masoni*, double white  
variety, from Tactic

239. *Dahlia masoni*, double lilac  
variety, from Tactic

240. *Persea schudeana* Verapaz  
cogs, Tactic

241. *Persea schudeana* Hemfstead  
cogs, near Coban.

242 a. *Rubus trichomallus?*  
Tactic

243 a. Rubus of large blackberry,  
small eye. Tactic

244 a. Rubus of Loganberry  
Tactic garden

245 a. *Zea mays* Coban

Tuesday Chamá, Alta Verapaz - Dec 30 1919

Elevation 900 feet.

The bush (Spanish orthography poá)  
is found here and the fruit is now  
commencing to ripen.

In size and habit of growth this  
species, *Annona scleroderma*, resembles  
*A. reticulata*. In foliage, however, it  
is quite distinct. The leaves are  
oblong to oblong-lanceolate in outline,  
6 to 9 inches long, 2 1/4 to 3 inches broad,  
sharply acuminate, coriaceous in texture,  
deep green, almost glossy, above, and  
pale beneath.

The fruits, which are borne on stout  
stalks about one inch long, are broadly  
heart-shaped to round, and up to 4 inches  
in diameter. The surface, which is dull  
gray-green in color, differs in character  
from that of most other *Annonas*: it  
is divided by prominent ridges into  
irregularly pentagonal areas. The skin or  
outer covering is nearly 1/4 inch thick,  
coarsely granular and woody in texture.

except close to the surface. It forms a stiff brittle shell which effectively protects the flesh, and which makes it possible to handle the fruit roughly without diminishing in any way.

The most white flesh, in lovely looking segments and containing a mass of remarkably pleasant flavor. It may be compared to the flavor of the more soft *A. squamea* with the addition of a dash of lemon. Many times one is told it is sweet or overripe, but as the fruit has sufficient acidity (more than the *Cherimoya*) to give it spiritfulness, and it never drops the pedicel.

The trees which I have seen here are more productive than the average *Cherimoya*. The species can be compared to *A. squamea* in productiveness. Abortive fruits, such as many of those borne by most *Cherimoya* trees, are rarely produced. There is considerable variation in the size of the fruit (average about 3" in diameter) but

very few are malformed.

The species undoubtedly belongs to the tropical lowlands, hence it is likely that it will succeed in the United States only in southern Florida. It should prove a valuable addition to the list of Annonas which can be grown in tropical countries. Its only visible defect consists in the large number of seeds contained in each fruit. It will probably thrive in a moist region, and on heavy soils.

Saturday Tuxtla, Alta Verapaz Jan 10, 1911

*Passiflora*  
This plant is abundant in the last  
Cuba region, growing freely in pasture  
and open places, and is less common among  
mountains. It is most frequently seen as a  
vine 2 to 6 feet high, but it some-  
times covers the habit of a small  
tree with a slender trunk, and attains  
to 15 feet in height. It always has  
very green, and densely branched.

The fruit known as Kikchi or Chamak  
and in Cuba as Chamak, is produced  
in great abundance by occasional trees  
but usually sparingly. It is globose in  
form, commonly about 1 inch thick but  
occasionally  $\frac{1}{2}$  inch. It is yellowish green  
when ripe, occasionally greenish yellow.  
The outer area of flesh is thin. The seed  
cavity deep, and filled with soft juicy  
pulp in which the numerous seeds are  
imbedded. The color of the flesh is green  
ish or yellowish white. The pulp around  
the seeds is translucent pale orange yellow.  
The flavor is acid, free from the insipid  
ness which characterizes *P. guajava*. The

aroma is pleasant, but not pronounced.  
The numerous seeds are about the size of  
those of *P. guajava*, and are very trouble-  
some in the mouth.

The fruit is scarcely eaten at all in  
the region, because of its highly acid  
flavor. It would probably make good  
jelly; but in general, the species does  
not improve one as one which merits  
horticultural attention.

Monday Tucuman, Alta Verapaz Jan 12/49

Prepared for shipment the following:

246. Gramineae. Cuttings of s'choy from Chama. These have already been in storage two weeks, and are throwing out roots from the joints. See herbarium no. —

247. Geranium schimperianum. Verapaz and from property of Pedro Rivera, Tactic. Leaves and buds wood cut on Jan. 10.

248a. Cleome brucei-smithii? Ob. may. From Tactic. One lot in biscuit tin, and slightly moistened with oil. One lot in paper bag, also with oil. One lot wrapped in waxed paper in glass. See herbarium —

249a. Annona scleroderma. Poae (from Chama). One bag of seed.

250a. Rubus sp. Uruk-Tokán. From Santa Cruz Verapaz. See herbarium specimens —

251a. Rubus sp. Tokán. Seed of good blackberry from spot near old coy's tree, Tactic. See herbarium specimens no. —

252a. Crotalaria sp. From Finca Sanac, near Coban. See herbarium specimens no. 916

253a. Rubus trichomallus (?) Tokán. From Tactic. See herbarium specimen no. —

254a. Salvia sp. From near Perulha's, Baja Verapaz. Red-flowered. Herbarium specimen no. 928.

255a. Rubus sp. Tokán. From near Santa Cruz Verapaz. No herbarium specimen obtained. A good blackberry.

256a. Gramineae. Grass 3 ft high, from roadside near Chama. Believed to be good forage. No herbarium specimen.

257a. Gramineae. Grass 3 ft high, from roadside near Chama. Believed to be good forage. No specimen.

258a. *Panicum* sp. Hotg kov. From  
Chama.

259a. Gramineae. Foxtail grass from Samae  
near Coban. Herb. no. 911.

260a. Gramineae. From Samae, near  
Coban. Herb. no. 910.

261a. Gramineae. From Samae, near Coban.  
Herb. no. 899.

262a. Gramineae. From Samae, near  
Coban. Herb. no. 906.

263a. Gramineae. From Samae, near  
Coban. Herb. no. 913.

264a. *Cymbopetalum penduliflorum*  
Orchids of mud, from Coban. On lat-  
phagnon and wafes paper; one in cloth bag.

265a. *Juglans* sp. Nuez, from Tactic.  
About 50 seeds.

266. *Ananas sativus*. From Sacca-  
mini, near Turcurui. Elevation 3200 ft.  
Very sweet, thick pineapple, very juicy, white  
flesh. "Sugar leaf" pine.

Sunday Finca Mucca, Alta Verapaz, Guatemala  
 Added to foregoing shipment the following numbers

267a. Herb. Finca Mucca, Alta Verapaz.  
 See Herbarium no. 935. Blue-bordered herb

268a. *Phytolacca floribunda*. Chupat.  
 Finca Mucca, Alta Verapaz

269a. Herb. *Bursera*-like shrub from  
 Paradi. Herb. No. 923.

270a. *Browdia*? Fern Finca Mucca, Alta  
 Verapaz. Herb. no. 917.

271a. *Chamaedorea* sp. *pacayito*, Finca  
 Los Alpes

272a. *Zinnia* *missp.* from Coban

Monday Finca Mucca, Alta Verapaz Jan. 19, 1920

Following numbers listed, to be carried to  
 Guatemala and there prepared for shipment:

273a. Gramineae. Good pasture grass  
 from Finca Los Alpes, ht. about 1500'. said  
 to be nourishing, not too watery.

274a. Gramineae. Pasture grass from  
 Finca Mucca. Probably not very good. Ht.  
 9 ft.

275a. Gramineae. Tall pasture grass  
 from Finca Los Alpes. Coarse leaves  
 and large heads of seeds.

276a. Gramineae. Tall grass from Finca  
 Mucca. Sticky seeds.

277a. Gramineae. Tall grass (4 ft.) from  
 Finca Mucca. Large leaves and seed some-  
 what like kaffir corn.

278a. *Cassipoua* sp. Finca Mucca.  
 (See Johnson herb 59). Vigorous climber, with

round fruits  $\frac{1}{2}$ -2" diam, lemon yellow in color with translucent whitish flesh, subacid and of fairly pleasant flavor. Seeds alone like an apple core. Hot country species.

287a. Apocynaceae. Climber, 30 ft high, from Colombia. Flowers funnel form, 2" diam, creamy white with strawberry-red throat.

288a. From Colombia. Herbaceous perennial, 1 ft high, with spikes of red flowers.

289a. *Clusia* sp. See Johnson herb. 65. Annual, with red flowers.

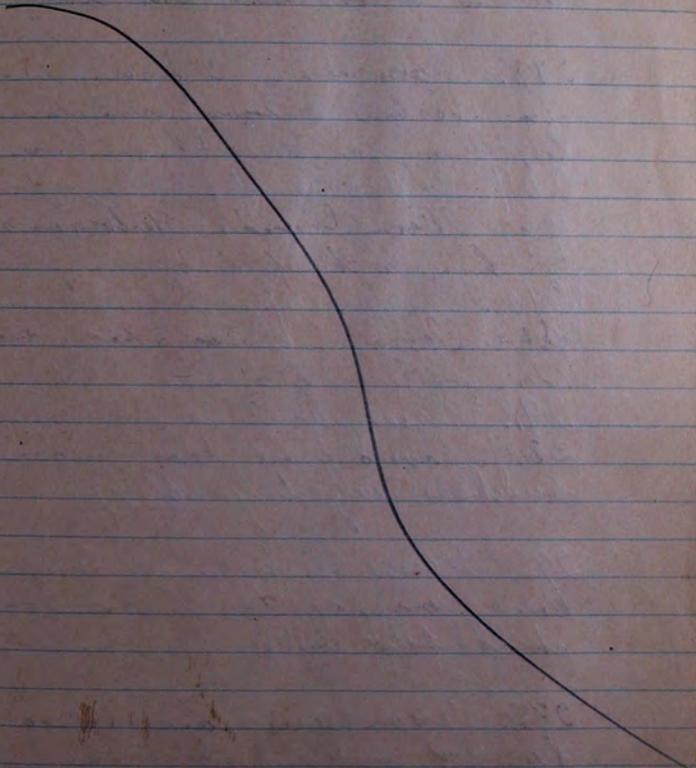
292a. *Alpinia* sp. Tuber, from Cambodia.

293a. *Amaranthus* sp. from Mexico.

294a. *Indigofera*? ? From Los Alpes. See Herb. no. 939.

295a. Solanaceae. Climbing plant from Finca Mosca. See herb. 936.

286a. Gramineae. Forage grass from near El Progreso. In Herbarium no. 942.



Monday Antigua, Guatemala Feb. 16  
 Prepared for shipment to Washington.

287. Rubus sp. Raspberry from the  
 Volcan de Agua. Plants. Herb 946

288. Salvia? Red flowered shrub  
 from Volcan de Agua. Cuttings. Herb 947

289. Crataegus sp. Cutting of marginella  
 from Volcan de Agua. Herb. 949

290. Begonia sp. Pink flowered  
 Begonia from Volcan de Agua. Cuttings

291. Persea americana. Avocado no  
 38, Oblong fruit, La Chacara. 25  
 budsticks, very dirty (black)

292. Persea americana, Avocado no. 3  
 Round green, from La Chacaras. 30 bud  
 sticks, dirty and in poor condition

293. Persea americana, Avocado no  
 40, Oval, small seed, from Finca at La  
 Chacara. 35 budsticks, in fair condition,  
 not as dirty as lot B. (see number)

294. Persea americana, Avocado no. 37,  
 from La Polvora. 20 budsticks, condition  
 fair.

Tuesday Antigua, Guatemala Feb. 17

Put up the following material collected on trip to slopes of Volcan de Agua:

295 b. Soil from around chayote roots, Santa Maria de Jesus. For Dr. Cobb

296 a. *Ceanothus* sp. Ka-kiish from Volcan de Agua. See Herb. no. 945

297 a. Gramineae. Common grass from the slopes of the Volcan de Agua, 7000-8000 ft. Grows about 3 ft high, with fine leaves

298 a. *Crotalaria* sp. Much, from Santa Maria de Jesus. See Herb. no. 950.

299 a. Gramineae. Grass 3 ft high from slopes of Volcan de Agua. For foliage and seed.

300 a. *Crotalaria* sp. Shrubby species 5 ft high, road to Santa Maria. See Herb. no. 944

301 a. Indet. Red berried thorny shrub from road to Santa Maria de Jesus. See Herb. no. 943

302 a. Indet. Tairy. Tree from slopes of Volcan de Agua. See Herb. no. 948

303. *Dakha popenovii*, from near Santa Maria de Jesus. See herb nos.

304 a. Salvia? Blue flowered herb from road to Santa Maria de Jesus. See herb. no. 951.

305 a. Gramineae. Ka-kiish, from San Antonio Agua Caliente. This is the favorite native fringe grass. It makes slender wing stems up to 6 ft high, with tender narrow leaves, and a sp-tail seed head. Grows on dry bank. Try in southwest.

Avocado The parent tree of this variety is in the  
No. 37 finca La Polvora, Antigua.

Stock  
plant  
No. 1.

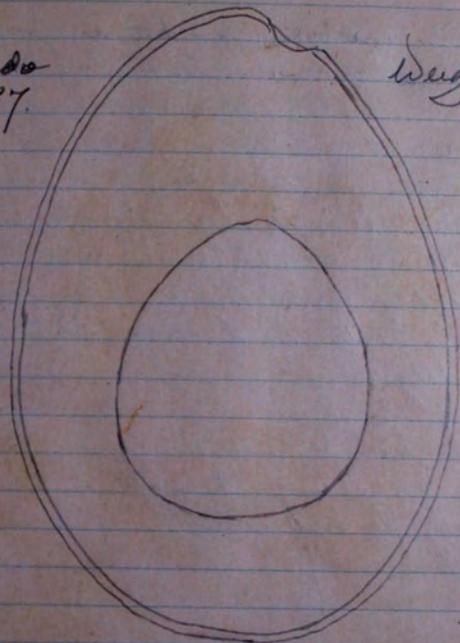


Avocado # 37

Weight 20 oz.

Avocado  
# 37.

Weight 18 oz.

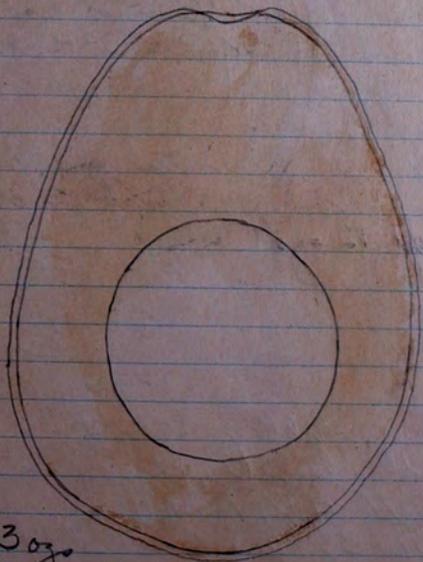


Form obovoid to slender pyriform; weight of the best specimens 18 to 20 oz., many not exceeding 15 oz.; length 5 to 8 ins., greatest breadth  $3\frac{1}{2}$  ins.; base tapering, the stem inserted slightly to one side without depression; apex rounded; surface lightly pebbled, more green to rich green in color, with num-

crass greenish yellow dots, very small, skin  
1.5 to 2 mm thick, very hard, brittle; flesh  
cream yellow, very pale green near the  
skin, almost free from fibers, discolor-  
ation, and of rich bland flavor, free  
from bitterness; quality appears to be  
superior; seeds broadly obconic, weighing  
slightly more than 200 mg, tight in the  
cavity with both seed coats adhering  
closely.

The tree produced this year 450 fruits in  
spring season, it may be classed as  
early to midseason.

This variety is growing in the rear  
portion of the finca La Polvora in  
Antigua, close to the back fence. It  
has not been selected for propagation  
by budding, but solely as a stock  
plant:



Weight 130 mg



Weight 12 oz

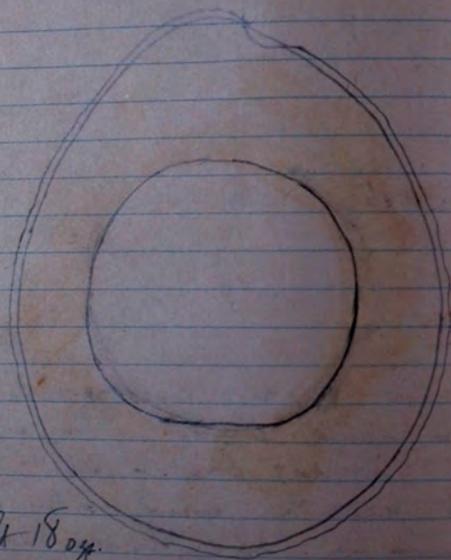
Form oblong-obovoid to obovoid; weight of the largest specimens 12 to 14 oz; length  $4\frac{1}{4}$  to  $4\frac{1}{2}$  in; greatest breadth  $3\frac{1}{4}$  to  $3\frac{1}{2}$  in; base slightly flattened to tapering, with the stem inserted to one side or nearly squarely; apex round or flattened slightly on one side; surface

face distinctly pebbled, moss green to deep green in color, with few large greenish yellow dots; skin 1.5 to 2.5 mm thick, hard and brittle; flesh cream yellow, very pale green close to the skin, fiber markings noticeable; flavor strong, the texture a trifle watery; quality fair; seed nearly spherical in outline, 2 obovoid in shape, tight in the seed cavity with seed coats adhering closely to the cotyledons.

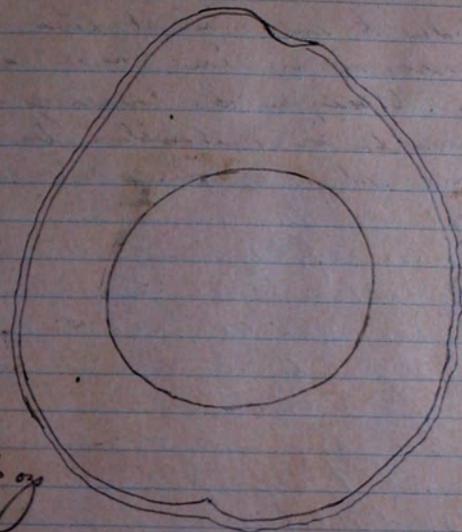
The parent tree bore this year about 800 fruits. The ripening season is early to midseason.

Stock  
plant  
No. 3

The parent tree of this variety is growing in the place La Polera in Antigua. The variety has not been selected for propagation by budding, but only as a scioning stock.



Weight 18 oz.



Weight 16 oz.

Form broad pyriform to nearly round; weight of the largest specimens 16 to 18 oz.; length  $4\frac{1}{4}$  to  $4\frac{1}{2}$  ins; greatest breadth  $2\frac{1}{2}$  to 4 ins; base pointed to nearly rounded, the stem inserted obliquely without depression; apex slightly flattened; surface decidedly rough, deep purplish maroon in color, almost glossy, dots not conspicuous; skin 1 to 2 mm thick

somewhat more flexible than in the average variety of this region, but coarsely granular in texture; flesh cream yellow to yellow near the seed, whitish green close to the skin, almost free from fiber discolorations, dry in texture, and of rich pleasant flavor; quality good; seeds round to oblate, basal weight light on the seed cavity with both seed coats closely surrounding the cotyledons.

This is a midseason variety. The parent tree produced this year about 1700 fruits.

Friday Antigua, Guatemala Feb. 20 1920

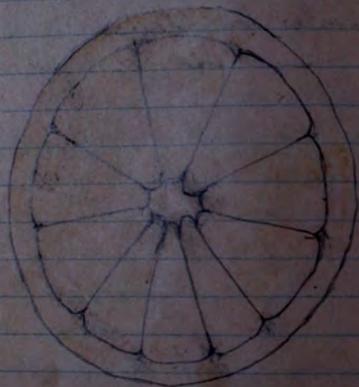
306. *Citrus sinensis*. Semi-seedless sweet orange from tree in garden of Cirilo Pray, Antigua.

Above budwood cut and packed for shipment today. In cutting it, the principle of Shamel was applied, i.e. to take as budwood the fruiting spur on which choice oranges only are found.

This orange is worthy of a trial in the United States, although it is quite likely that it will not prove to be better in any way than Valencia. But on the chance that it may show some characteristic not found in the latter or in other varieties grown in the States, it is being introduced for trial.

Some of the fruits produced by this tree are altogether seedless. The remainder contain very few seeds.

rarely so many as five (at the time  
 in specimens a few vestigial ones)  
 The tree is prolific in fruiting, and  
 the fruit of unusually good quality.



Above is a specimen without seeds  
 Form round, sometimes slightly elongated; dia-  
 meter 3-3 1/4 in.; surface pitted, deep orange color;  
 skin 5 mm thick; flesh rich orange color, very  
 juicy, with rich flavor, (plenty of sugar and  
 acid), and very little rind. Seeds none to  
 5 or thereabouts. Season in Antigua January  
 to May or June.

307a. *Medicago sativa*. Alfalfa seed  
 grown at Antigua, presented by Sr.  
 Pedro G. Cofiño.

This is a variety which has been grown  
 in Antigua for many years; - perhaps  
 introduced in the time of the Spaniards.  
 Don Pedro has planted German alfalfa here  
 and finds that it does not grow nearly  
 so well as the native (or acclimatized)  
 stock. He thinks, therefore, that the latter  
 may prove to be a useful strain in  
 other regions where the climate is similar  
 to that of Antigua.

Alfalfa is grown here without irri-  
 gation, and flourishes even during  
 the driest part of the year. It must  
 be remembered, however, that the water  
 table is here only 6 to 15 feet below  
 the surface of the land. There is no  
 rainfall here from October to May;  
 the annual precipitation is commonly  
 30 to 40 inches.

Alfalfa is cut here, according to Don  
 Pedro, every 40 days throughout the year.

308a. *Dahlia masonii*.

About 3 pints of seeds, from plants growing in abundance full and along roadside. Antigua.

This species should be distributed thru the subtropical regions, especially the Riviera, Algeria, Northern India, Southern Jap., Hawaii and southern Brazil.

Saturday Antigua, Guatemala Feb. 21, 1920

From the finca La Cascajal, in the outskirts of Antigua.

The parent tree is about 35 feet high, of good erect form, branched 12 feet from the ground, with an oval, open crown. The bearing habit appears to be good; this year the tree produced about 400 fruits, well distributed throughout the tree. There is no evident tendency for the fruit to be borne in clusters.

The fruits on the parent tree are variable in size. The largest weigh about 24 gms, and the smallest not over 8 gms. The average is about one pound. The shape is fairly uniform. The relative size of the seed varies somewhat, as is usual in accessions varieties. The major-domo of the finca recommends this as a very good fruit. 300 were picked for seed, but had not ripened well; many of them being immature.



Form broadly obovoid to nearly oval, sometimes tending to become broad pyriform; weight 20 g., length  $4\frac{1}{2}$  cm., breadth 4 cm., base rounded. The stem inserted almost squarely; apex flattened or slightly depressed; surface smooth, dull green in color, with numerous greenish-yellow and russet dots;

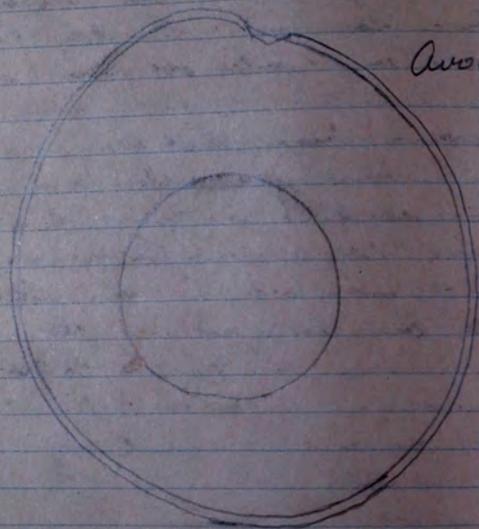
skin about 1.5 mm thick separating from the flesh readily, woody and brittle in texture; flesh creamy yellow in color, pale green close to the skin, with slight fiber markings, smooth in texture and of rich nutty flavor; quality very good; seed obovoid, relatively small for size, weighing about 2 g., tight in the cavity with both seed coats adhering closely.

This impresses me as a promising variety, but I have not had it under observation for a sufficiently long time to recommend it with confidence.

The ripening season cannot be definitely determined; I believe it will be midseason to late, i.e. March to June.

Avocado Parent tree growing in the finca La  
No. 39 Chacuras.

Sketch  
fruit  
No. 5



Avocado #3

Weight of this specimen 21 ozs.  
This is one of the largest fruits  
produced by the tree this year. The  
average size is considerably smaller.

Form obliqui-spherical; weight 8 to  
22 ozs, average 12 to 14 ozs; length  
3 to 4 1/4 in. Greatest breadth 2 1/2 in.;  
base rounded to bluntly pointed.  
The stem inserted obliquely, apex oblique-  
ly flattened; surface pebbled throughout  
around base; dull green in color,  
with numerous yellow-green dots,  
skin about 2 mm thick, hard & brittle;  
flesh cream color to cream-yellow,  
tinged green near the skin, practically  
free from discoloration, flavor only  
moderately rich, quality?; seed round  
to oblate, relatively small, weight about  
1 1/2 ozs; light in the cavity with both  
seed coats adhering closely.

Some of the fruits on the parent  
tree are now dropping others are  
immature. Season probably early to  
mid-crown.

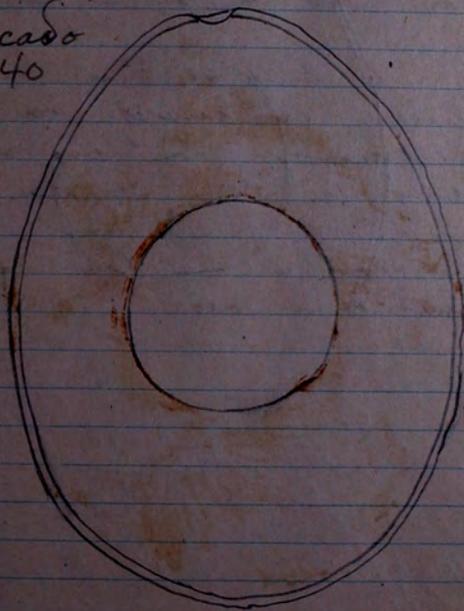
The parent tree is about 35 feet  
high, branched 18 feet from the ground,  
with an umbrelliform crown, rounded in  
outline. The fruits are often

borne in clusters. So far as I can judge, the variety seems likely to be very productive. The tree has probably 40 to 500 fruits in it this year; 300 were picked for seed.

The only doubt for fruit about this variety is its quality, which I am afraid may not be very good. The variety has been selected for trial because it is productive, and the fruit is of good size and forms with a relatively small seed.

40. From the finca La Chacra. The parent tree stands in the ruinas or corner of the capital, about  $\frac{3}{4}$  mile from the haven.

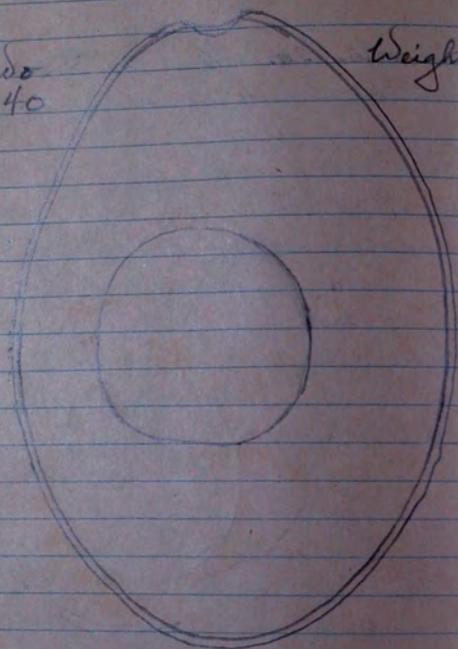
Avocado  
No 40



Fruit immature, not weighed.  
Probably fully grown

Avocado  
no. 40

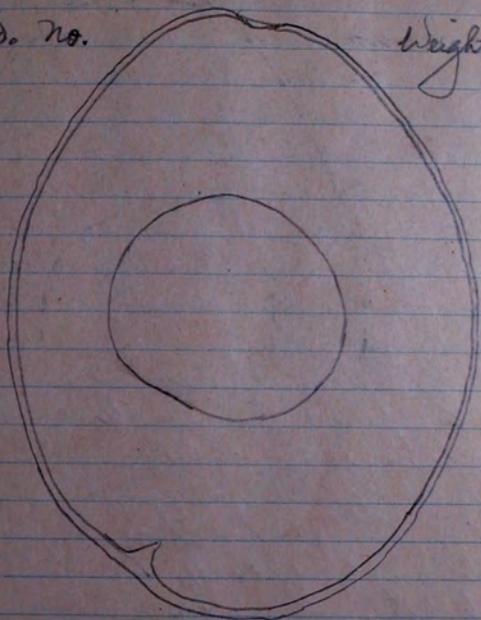
Weight 24 g



A fine specimen of the variety

Avocado no.  
40

Weight 21 g



Form oval to elliptic, sometimes oblique, weight 16 to 24 g, length  $4\frac{1}{2}$  to  $5\frac{1}{2}$  ins, breadth  $3\frac{1}{2}$  to 4 ins; base broadly pointed, the stem inserted slightly to one side; apex broadly pointed somewhat flattened on the ventral side; surface undulating

to finely pitted, more greenish color,  
with numerous yellowish green dots,  
skin 1.5 to 3 mm thick, waxy, brittle,  
flesh cream yellow in color, pale green  
close to the skin; free from all fiber  
discoloration, and said to be of very  
rich, pleasant flavor; quality probably  
excellent; seed relatively very small, tight  
in the cavity, well set seed case  
isolating itself.

The parent tree is about 25 feet high,  
spreading in habit, with a dense crown  
formed by the foliage in the outside. The  
crop too young is not heavy, but the  
bearing habits of the tree are said to  
be good. The megostoma recommends the  
of other forest avocados in the fruit,  
and to me it looks unusually promising  
because of the large size of the  
fruit coupled with small size of seed,  
and the probable excellent quality of  
the flesh.

From a tree belonging to an Indian,  
in Santa Catarina, near San Antonio  
de la Aguas Calientes.



The parent tree is about 20 feet high,  
evidently not very old, and is bearing this year  
a heavy crop - more than 500 fruits.

Form broadly obovoid to nearly round, obliquely  
flattened at the apex; weight about 10  
oz., length  $3\frac{1}{2}$  ins., breadth  $3\frac{1}{4}$  ins. Surface  
finely pitted, deep green in color, with  
numerous yellow-green dots, skin 1 mm thick near

stems becoming 2 mm at apex, rather fleshy  
flesh even yellow, green near skin, with  
slight fiber. Its colorations, flavor rich  
characteristic seeds very large, roundish  
oblate, light in color cavity with lock  
and coats adhering closely.

While the flesh is of good quality,  
the large seeds would dehydrate this  
variety for seed propagation. 250 fruits  
were purchased for seed.

Miss W. Cameron Townsend's recipes for  
Guisquiles:

### Baked Guisquiles (6 medium sized ones)

Boil the guisquiles until quite soft,  
then cut them in halves and carefully  
scoop the flesh out of each half, leaving  
the skin intact.

Put the flesh through a sieve or colander,  
and add to it the yolks of 4 eggs, a  
small amount of melted butter, sugar to  
taste, a pinch of salt, some raisins  
and some bread crumbs, stir all together  
and refill the skins, and then sprinkle  
bread crumbs on top. Place in the oven  
and bake for a few minutes.

(Editorial note: This would probably be  
called guisquil relleno in Spanish.)

### Guisquil de papa

Boil the guisquil thoroughly, then  
peel it. Saute with butter, salt and pepper,  
and serve.

This applies also to other varieties.

Guisquil de papa, migado

Boil the guisquiles thoroughly, then  
peel them.

Heat a skillet thoroughly, and put  
into it some butter or lard, and a  
little salt and pepper.

Put in the guisquiles, let them brown  
a bit, then add some bread crumbs  
and stir the guisquiles a bit. Remove  
from fire and serve.

Piña de Palín

This pineapple, of which I have obtained  
a few plants for trial in connection  
with the Hawaiian experiments, is not  
a fruit of excellent quality, but like  
Red Spanish (which it resembles somewhat  
in other characteristics also) it is a  
good shipper.

The plant is distinguishable by its  
broad leaves, rather coarsely serrate. The  
"pine" is oblong to oblong-oval in  
form, commonly about 6 inches long,  
the crown large, with broad recumbent  
leaves. In color the pine is deep  
brownish yellow, and the carpels are  
marked by deeply incised lines. The eyes  
stand out prominently, making the  
surface of the fruit decidedly rough.  
The flesh is crisp, deep yellow in color,  
with plenty of acid and flavor, but  
enough sugar so that it can be eaten  
without sweetening. Juice abundant.  
I believe it has more flavor than  
Red Spanish.

Wednesday Guatemala City Feb 26 1928  
Packed the following for shipment

(309. *Persea americana*. Avocado No.  
36. Chabil. From San Lorenzo del Caba.

310. *Persea americana* Avocado No. 41  
From finca El Pintado

311 b. Soil from around Chayote roots  
San Lorenzo del Caba.

312 a. *Persea americana* Avocado Stock  
plant No. 1 from San Antonio A.C.  
247 seeds in Case No. 1

313 a. *Persea americana* Avocado Stock  
Plant No. 5 from Antigua  
214 seeds in Case No. 2

314 a. *Persea americana*. Avocado  
Stock plant No. 4, from Antigua  
280 seeds in Case No. 3.

315 a. *Persea americana* Avocado Stock  
Plant No. 3, from La Palovina, Antigua  
300 seeds in Case No. 4.

325 seeds in Case No. 5

185 seeds in Case No. 6.

316 a. *Persea americana* Avocado Stock  
Plant No. 1, from La Palovina, Antigua.  
300 seeds in Case No. 7.

85 seeds in Case No. 8

317 a. *Persea americana* Avocado  
Stock Plant No. 2, from La Palovina,  
Antigua. 250 seeds in Case No. 8

350 seeds in Case No. 9

311 seeds in Case No. 10

318. *Ananas sativus*. Piña de  
Palovina. 10 plants in Case No. 11

319. *Ananas sativus* *Piña de*  
*Abasco* 6 plants. *Casa No 11*

320 a. Indet. from *Termino Carreras*,  
*"Cala giate"*

321 a. Indet. "*Mescal*" from *F. Carreras*

322 a. Indet. "*Asipin*?" from *F. Carreras*

323 a. Indet. "*Sasa blanca*" from *F. Carreras*

324 a. Indet. "*Gabonillo*" from *F. Carreras*  
*Sobremesa*

325 a. Indet. "*Carlie Santa*" from *F. Carreras*

326 a. Indet. "*Pala del Amor*" from *F. Carreras*

327 a. Indet. "*Sulica*?" from *F. Carreras*

328 a. Indet. from *F. Carreras* "*Fruta de*

329 a. Indet. "*Achistilla*" from *F. Carreras*

330 a. Indet. from *F. Carreras* "*Tapas de*

331 a. Indet. "*Colacion*" from *F. Carreras*

332 a. Indet. "*Paraiso*" from *F. Carreras*

333 a. Indet. "*Papalotillo*" from *F. Carreras*

334 a. Indet. from *F. Carreras* "*Jurica*"

335 a. Indet. "*bailador*" from *F. Carreras*

336 a. *Guaiacum* sp. "*Guayacan*" from *F. Carreras*

337 a. Indet. "*Flor amarilla*" from *F. Carreras*  
*Tecoma stans*

338 a. *Erythronium* sp. "*Plo*" from *F. Carreras*

339 a. Indet. "*Quina*" from *F. Carreras*

340 a. Indet. from *F. Carreras* "*Adelfa*"

341 a. Indet. from *F. Carreras* "*Flor de peinetita*"

342 a. Indet. "*Pimentillo*" from  
*F. Carreras*

343a. Dried from F. Carrera. "Verbenic"

344a. Leafy "Hot country corn",  
from Barranguille.

Examination of experimental shipment of  
budwood from Dr. Galloway. See his  
letter of January 19, 1920.

No. 1. Feels decidedly moist on opening.  
Sip citrus budsticks. Perfect condition.

No. 7. Distinctly moist on opening.  
Sip avocado budsticks. Perfect condition.  
A few buds may have pushed a trifle.

No. 2. Moist. Some mold on newspaper  
around mass. Sip citrus budsticks, all  
in perfect condition. Calluses on basal ends.  
Package had been somewhat crushed on the  
sides but no harm done it.

No. 4. Newspaper under was covering  
covered with mold. Sip citrus budsticks  
in perfect condition, well callused. Newspaper  
badly "gone to pieces".

No. 5. Sip citrus budsticks. Rather hard to  
remove from tube. Budwood in good condition.

No. 9. Three avocado budsticks, in fine condition all cultured at base.

No. 11. Moss felt dry on opening slip avocado budsticks.

1 dead.

1 black at upper end, & slightly shrivelled.

1 black at both ends, shrivelled.

1 Almost dead, green only at center.

1 All green, but shrivelled.

1 Greenly shrivelled, appearing dry.

No. 6. Feels quite moist on unwrapping paper paper. Slip avocado budsticks all in good condition. Newspapers rather moldy.

No. 3. Could not be opened.

No. 8. Could not get moss out of Tab. Budwood in file as could be seen was in good condition.

No. 9. *Handwritten notes*

No. 11. *Handwritten notes*

*Handwritten notes*

No. 6. *Handwritten notes*

No. 3. *Handwritten notes*

No. 8. *Handwritten notes*

**I N V O I C E**

of shipment dispatched Guatemala City, February 27, 1920, to Washington D.C., via Puerto Barrios and New Orleans (in care of John Ward, New Orleans).

Case No.	Contents
1	249 seeds 312 a. Avocado Stock Plant No. 6.
2	214 seeds 313a. Avocado Stock Plant No. 5
3	280 seeds 314 a. Avocado Stock Plant No. 4.
4	300 seeds 315 a. Avocado Stock Plant No. 3
5	325 seeds 315 a. Avocado Stock Plant No. 3
6	185 seeds 315 a. Avocado Stock Plant No. 3
7	350 seeds 316 a. Avocado Stock Plant No. 1
8	85 seeds 316 a. Avocado Stock Plant No. 1
	250 seeds 317 a. Avocado Stock plant No. 2
9	350 seeds 317 a. Avocado Stock Plant No. 2
10	311 seeds 317 a. Avocado Stock Plant No. 2
11	<i>Annona sativus</i> 318 and 319, two varieties of pineapple. Plants.
12	1 sack of Antigua coffee, 75 lbs.
13	Box of miscellaneous seeds
14	Box blankets and hampiles, to be shipped by express collect to F.O.Popence, Pasadena, California.
15	Box containing miscellaneous seeds, and Dr. Galloway's experimental shipment of avocado and citrus budwood.--
16	Box containing two 25 lb. bags of coffee, to be shipped by express collect to F.O.Popence, Pasadena, California.
17	Box containing herbarium specimens, a few baskets for office use, "wood-flowers", and a pair of fiber saddle bags for office use.
18	Box of 255 avocado seeds for stocks
19	Box of 275 avocado seeds for stocks
20	Box of 300 avocado seeds for stocks

*Handwritten notes*

No. 9. The  
condition is

No. 11. The  
avocado  
1 dead  
1 black  
1 black  
1 black  
1 black  
1 black  
1 black

No. 6. For  
analysis paper  
in good condition

No. 3. Coc

No. 8. Coc  
Budwood  
good condition

2.

21  
22  
23  
24  
25

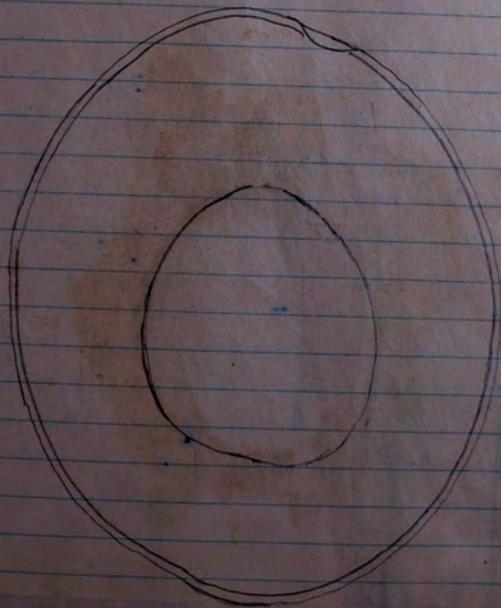
Box of 200 avocado seeds for stocks  
Box of 300 avocado seeds for stocks  
Box of 300 avocado seeds for stocks  
Box of 300 avocado seeds for stocks

Box containing three tin cans of soil, for analysis.  
See letter of advice, under date of February 27, 1920.

Saturday Guatemala City Feb. 28, 1920

Avocado No. 41 is from the finca "El Pintado", which belongs to Pedro J. Cofino, and is situated on the main road between Antigua and Ciudad Vieja.

The parent tree is about 35 feet high somewhat spreading in habit, with the trunk nearly 2 ft thick at the base.



P. G. COPIÑO  
ANTIGUA  
GUATEMALA, C. A.

Antigua, February 22, 1920.-

Mr. Wilson Popocate, City.-

Dear Sir:-

I am sending to you the three samples of soil from my plantation which you kindly offered to send to Washington for analysis at your Government's laboratories.- I thank you once more for your kindness and hope you will allow me to serve you or be of any help to your investigations at any time.-

These samples were taken by means of borings with an auger; No. 1 represents the average of six borings through the first foot of soil; No. 2 is the average of the same borings through the second foot; and No. 3 is the average of the borings through the third foot or sub-soil.-

As you have observed at my plantation, growth is rank and luxuriant on the coffee bushes but the yield of berries is below the average for other plantations on drier soil having better natural drainage although these gravelly soils are generally poorer in plant-food. I have experimented with other plants than coffee, like sorghum, maize, and sugar corn, but always the growth is very luxuriant and abundant although the soil is very poor. Sugar cane grows quite abundantly on the same soil, the water being rich in sugar.

These samples have been made some experiments with artificial fertilizers bought from San Francisco and said to contain 8% Potash, 8% Phosphoric Acid and 5% Nitrogen; 10% Potash, 8% Phosphoric Acid and 5% Nitrogen; 14% Potash, 8% Phosphoric Acid and 5% Nitrogen; 12% Potash, 5% Phosphoric Acid and 5% Nitrogen.- These fertilizers were applied in small amounts of 1 lb. stirred around each tree during October 1919, but so far the condition of the trees has not been improved.- Lime has proved beneficial for the plants and has greatly improved the mechanical condition of the soil.- I am now going to try applications of Acid Phosphate containing 17% Water soluble Phosphoric Acid at the rate of 300 to 500 lbs. per acre.-

I will be very much obliged to you for any advice you may be able to give me after knowing the results of analysis.- I am interested on information as to the best fertilizers to be used on this land for growing coffee and sugar cane, our staple crops.-

I await with interest you valued news and hope you will have encouraging results from the introduction of Avocados from my plantation; if you need any more buds or seeds at any time, just let me know and I shall be very pleased to help you anyway.-

Believe me yours very truly,

P. G. Copiño

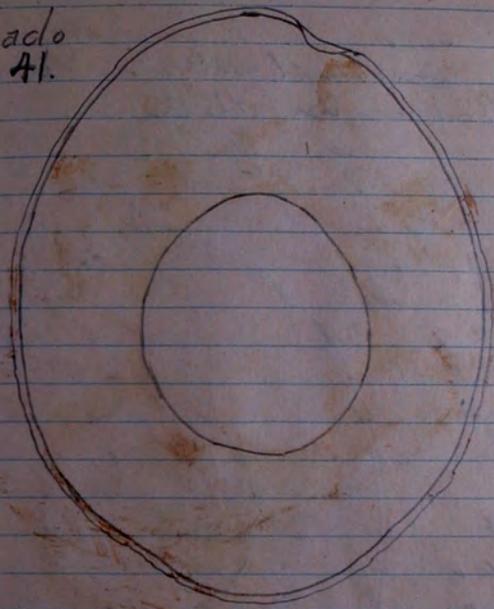
Feb. 28, 1920

finca  
Popocate  
The map  
Finca Vieja  
part high  
of the  
same

Forms oval sometimes obliquely so. <sup>or</sup>  
 22 ozs; length  $4\frac{3}{4}$  ins, breadth  $4\frac{1}{2}$  ins  
 base rounded, the stem inserted more or  
 less obliquely without depression; apex  
 rounded to obliquely flattened; surface  
 undulating to pitted, purpleish maroon  
 in color with large dots of a reddish  
 shade; skin 1 to 2 mm thick, waxy, and  
 brittle; flesh cream yellow, changing to  
 whitish green very close to the skin, the  
 firm flesh merging and of such flavor  
 though a little stringy in texture  
 (perhaps because specimens were picked  
 prematurely); quality very good; seed  
 relatively small, ovoid - borne in form  
 kept in its cavity with bit seen  
 adhering closely.

Season of ripening March and April  
 tree flowers February and March  
 Productiveness appears to be fairly good  
 though there is not much of a crop  
 this year.

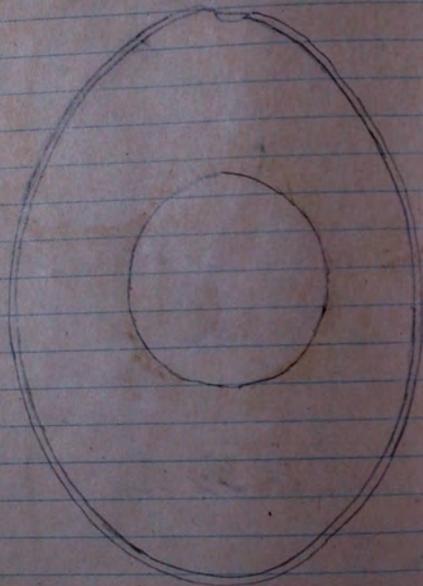
Avocado  
 No. 41.



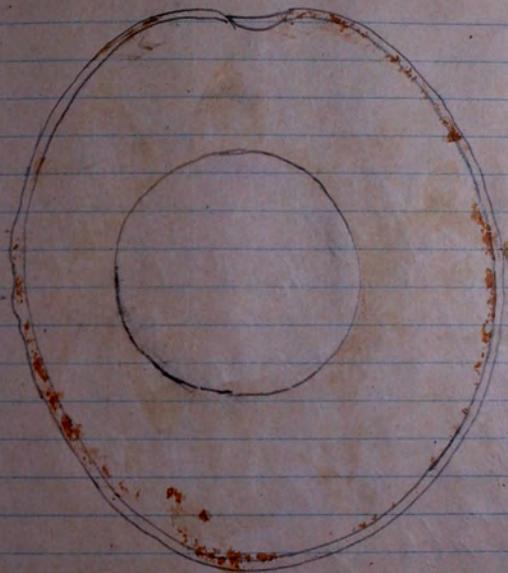
This looks like a promising variety.  
 Good size, good form, attractive  
 appearance, small seed, good quality  
 of flesh.

Specimen brought from the place  
Chocoma, in Antigua.

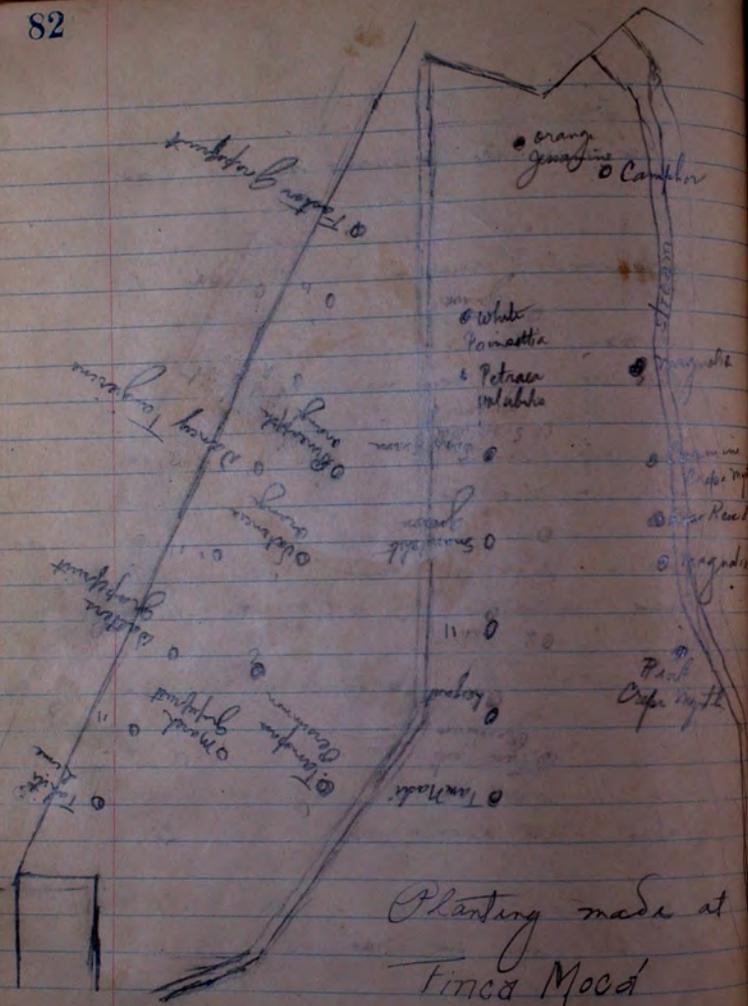
Avocado  
No. 40



Avocado No 40



Weight 22 gms.



Tuesday El Barranquillo

Mar. 16 1920

Obtained following seeds from F. Carreira:

Cola de gato. Small tree, with yellow flower. Blooms in March

Chunuro. Climber, with large purple flower. Fl. January.

Barreto. Small tree, 20ft. Small purple fl. in April.

Palo de la Cruz <sup>Plumera</sup> Medium sized tree, with funnel-shaped white fl. in May.

Guacamaya. Caesalpinia pulcherrima.

Bejuco blanca. Climber, with large white flowers in December.

Vainillo. Medium sized tree with bright yellow fl. in March.

Granadilla Medium sized tree, with  
small white fls in abundance, produced  
in December.

Cruciferae Guaiacum sp. Flowers  
here in March

Plumajilla Tree about 25 ft. producing  
many white fls in January.

Viborana Small tree, with small red  
flowers, in March.

Cacho de chibo Medium sized tree  
with white fls (small) in January.

Cuero de zapo Petraca volubilis.

Flores de Pasqua Small tree, with small  
white fls in December.

Manzanito Medium sized tree, with  
small white fls in January.

Suguinay. Small tree 10 ft. with small  
white fls about March 1st.

Notes on plants of which seed was supplied previously by F. Carrera.

Palo Griete Tree up to 40 ft, with small white fls, abundantly, in January.

Mescal. Medium sized tree, with purple ~~flowers~~ flowers in August.

Arripin Medium sized tree, producing many small yellow flowers in February.

Sosa Blanca Tree 10 ft high, with small white fls in August.

Costas Santa Herb, 4 ft, yellow fls in March.

Palo del Amor. Shrub 5 ft, producing many small purplish flowers in May.

Subin Tree 20 ft high, producing small yellow fls in January.

Truta de para Medium sized tree, producing purplish flowers in January.

Achiotillo Small tree or large shrub, producing white rather large flowers in July.

Tapaschiute Tree 20 ft high, producing large white fls in August.

Colación Climber, producing pink flowers in September. Antagonon?

Paraiso Tree 25 ft, small white fls in January. Melia

Papalotillo Tree 20 ft, small white fls in Enero.

Jurón Climber, producing white fls, small, in August.

Bajla dor Tree 25 ft, producing small white fls in January.

Guayacan Tree 15 ft. producing pale blue fls in March.

Quina Tree 15 ft high, producing large white fls in January

Adelta Climbing plant with purplish or bluish flowers in November.

Parneta Climber, flowering in March

Pimentillo Tree 15 ft high, producing small yellow fls in December.

Verbenilla Tree 20 ft., producing yellow fls in December.

Duracho Small tree, with yellow fragrant flower in Feb.

Arranged with Fernando Carrera to deliver the following to H. W. Goforth, Consulate Americano, Guatemala, for forwarding to Washington:

345a. *Phyllocarpus septentrionalis*  
Flor de tico 10 lbs

346a. *Cochlospermum vitifolium* Tecomacocha  
1 lb.

~~347a. *Salvia purpurea* metalsomitas  
1 lb.~~

347a. Choreque, purple-fl'd climber. 1 lb.

348a. Brazil, yellow-fl'd tree. 1 lb.

349a. Cruzita, white-fl'd small tree 1 lb.

350a. Larcomas (gallito) shrub 1 lb.

Paid \$10000 in advance, leaving \$250 to be paid on delivery.

Thursday Guatemala City March 18, 1920  
Herbarium specimens from Barranguito  
to aid in determining species of which  
have been obtained thru Fernando Carreras.

✓ Guayacano	952	Guaiacum sp.
✓ Clippia	953	
✓ Cusco de yapa	954	Petraea exaltata?
✓ Ybarra cutis	955	Tecoma stans?
✓ Plumbago	956	
✓ Derris	957	
✓ Florib. perota	958	
✓ Napitilla	959	
✓ Aniquinay	960	
✓ Tapasco cutis	961	
✓ Piscal	962	
✓ Brazil	963	
✓ Chobogue	964	
✓ Bailpor	965	
✓ Adilla	966	
✓ Gochotilla	967	
✓ Caraiso	968	Melia?
✓ Colp de pato	969	
✓ Chumichos	970	
✓ Carlos Santo	971	
✓ Barreto	972	
✓ Pruzita	973	
✓ Consona	974	

Friday Guatemala City March 19, 1920

The more I think it over, the more am I convinced that a book should be written on gardening in the American Tropics. There is, at the present time, no book available to planters and residents in this part of the world, which gives simple directions for the planting and care of the home garden and orchard, nor which describes the best plants for them. The works published in the Orient are not readily available to people in tropical America, nor do they exactly meet the requirements. The best of them Macmillan's Handbook treats of a multitude of species not known here, and covers a broader field than would, I think, be desirable.

I would suggest a book on the following lines, intended for the guidance of people with practically no experience in gardening nor knowledge of plants. An elementary work is the thing needed here:

Gardening in Tropical America

might be a good title; or it ought to put in

The Rural Manual Series and called  
 A Manual of Gardening for Tropical America  
 or it could be termed  
 Tropical Gardening, and so on.

The following arrangement seems to me at  
 present to be of the general type required:

I. General Principles of gardening in the tropics  
 Pointed in which it differs from gardening in the  
 temperate zone (most of the reasons are  
 due to the habits & needs of the Americans who have come  
 to the tropics), particularly in regard to  
 landscape gardening. I believe the purpose  
 and methods of tropical landscaping is, or should  
 be, quite different from that in the North.  
 I recall Seward's failure when he tried to apply  
 northern principles at Buena Vista, near  
 Miami. Laying out of Acaryards and home  
 grounds.

II. Soils and Sites. In this chapter there  
 should be an elementary treatment of the

principal types of soil encountered in the  
 tropics, and the possibilities of each. Especial  
 emphasis should be laid upon the matter of  
 drainage.

III. Propagation and Planting. Seeding, cutting,  
 budding & grafting. General remarks about cutting  
 out plants and trees. Preparation of the  
 ground in advance, shade and watering to  
 be given after planting. Cutting back before  
 planting.

IV. Cultural Methods. Tillage and mulching  
 of the soil. Necessity of applying water in  
 dry season. Pruning, general principles to  
 follow. Methods of irrigation.

V Lawns. How to Make and Maintain Them.  
Grasses most suitable for this purpose. How  
to plant and care for the lawn.

VI The Rose Garden. Soils suitable for  
rose growing. Varieties of roses which succeed  
in the tropics. How to care for them -  
planting, fertilizing, watering, pruning.

VII Herbaceous Plants

Descriptions, with figures when possible  
of the best ornamental species. How to use  
them, and cultural notes on each one.

VIII Ornamental Shrubs

Descriptions and figures of the best  
ones, with cultural notes and proper places  
to use them. Hedge plants.

IX Ornamental Trees

Flowering and otherwise. Tropical and  
in Shrubs.

X Palms

Descriptions of the best species. How  
to use them. Cultural notes.

XI Ferns and Ferneries

Best ferns. Fern borders. Ferneries.

XII The Fruit Garden

Proper site for an orchard. Distances to  
plant. Preparation of ground. Planting. Des-  
criptions of the best fruits, with cultural  
notes on each one.

XIII Pests. Principal (1) Insect Pests, and  
how to combat them, and (2) Fungous Pests.  
Formulas for sprays, etc. How to fight the  
leaf cutting ants.

Tuesday Quirigua, Guatemala April 6, 1928

Dr. Edward B. Ross says that the following items are all that are needed in the medical kit of the traveler:

Iodine 4 grams to 1 oz alcohol will give a 3% solution, which is about right for ordinary use. Small bottle of the tincture has set in case.

Colomel

Alcohol Two or three ounces sufficient

Magnesium sulphate

Bichloride of Mercury  $7\frac{1}{2}$  grs to 1 pt H<sub>2</sub>O

Aspirin 20 grams to be taken at a dose unless desired effect is obtained with less

Baric Acid in powder form

Dhoby Itch Ointment (local name) Ammonium mercury, salicylic acid, sulfur: Good general purpose ointment.

Cotton Gouze, sterile, for bandaging wounds.

Compound Cathartic pills, with colomel. Not really necessary with colomel and magnesium sulphate already in the kit, but convenient.

Quinine

*Plumiera rubra*. Closely resembles *P. tricolor* in habit and character. Leaves like those of the latter. Flowers of the same size and texture, but deep cerise red or salmon yellow at the throat. Fragrance about like that of *P. tricolor*.  
This is a good thing, with flowers of very pleasing color.

*Petraea volubilis*. This is one of the finest blue-flowered plants grown in the tropics. In habit it is a slender stem climber, reaching an ultimate height of 20 or 25 feet, and spreading out to cover a surface ten feet or more in diameter. In eastern Guatemala, where it is a common native plant, it scrambles over shrubs and small trees. When planted in the garden it should be given support in the shape of a horizontal frame seven or eight feet above the ground; after reaching this it will spread out and form a fairly

compact crown. It may also be trained against a building, but the long growth will require, <sup>at first</sup> to be tied to a lattice-work or frame of some sort, since they are not furnished with tendrils by which to cling. Later they can be allowed to hang naturally, as the flowers will develop more gracefully.

The foliage is light green or grayish green in color, with the leaves oval or broadly elliptic, three to four inches long, and lance to the stem. The star-shaped flowers, about an inch and a half broad, are borne on graceful racemes up to ten inches long. The color they vary from deep lavender to light mauve-blue. The general effect of the pendant racemes, which are produced very abundantly during the dry season and in limited numbers at other times of the year, is extremely beautiful, and suggests the *Wisteria*.

*Petraea volubilis* should be much more widely planted than is the case at present. Its culture is not difficult, nor is rich soil necessary. The plant is rather intolerant of cold, but can be grown where two or

three degrees of frost are occasionally experienced. The simplest way to propagate it is by means of layering.

Very successful at Quirigua, also at Wajtilanga and Retalhuleu.

*Jasminum sambac*, var. *Maid of Orleans*.

A shrub of slender habit, reaching about one foot in height, an ultimate height of about 10 feet.

The obovate, pointed, thin but rather stiff leaves, 2 to 4 inches long, are opposite up the long slender stems. The white flowers about 1/2 inch broad, are terminal, solitary or in clusters of three (normally the latter) and semi-double in character, with a fragrance suggesting that of the honeysuckle and the Hyacinth.

The plant produces a few flowers throughout a large part of the year but never covers itself with bloom. It should not, therefore, be planted in a situation where an ornamental plant of striking appearance

is required. The cut flowers are excellent for house decoration.

The best situation for it is a moist, half-shady spot where the soil is reasonably deep and rich. The production of flowers can be encouraged somewhat by removing the tips of the long growths. The latter will then throw out short flowering shoots from the uppermost leaf axils. The plant is not frost resistant, and can only be grown where temperatures below freezing are rarely experienced. It does best in a warm atmosphere. Propagation is effected by means of cutting of the half-woody stems. They should be 4 or 5 inches long (3 or 4 nodes) and inserted in sand under a slat-house or in light shade. They are slow to form roots.

Docs were at Quirigua.

Thursday Guatemala City April 23 1909

Prepared for shipment the following.

- 345a *Phyllocarpus septentrionalis*, flowers  
in mass, from Barranquillo. 14 lbs
- 346a *Cochlospermum vitifolium*, from  
Barranquillo. 1 lb
- 347a *Chorizanthe*, from Barranquillo, 1 lb
- 348a *Brazil*, from Barranquillo 1 lb.
- 349a *Cruzito*, from Barranquillo
- 350a *Caracomo* from Barranquillo 1 lb.
- 351a *Corallillo*, from Barranquillo, 1 lb  
Climber, red flowered, now much withered
- 352a *Sapindus* sp. *jaboncillo* from  
Barranquillo 1 lb
- 353a Insect *Jocote mico*, from  
Barranquillo. 1 lb

- 354a *Plumeria* sp. *Palo de la Cruz*  
from Barranquillo. 1 lb
- 355a *Plumajillo*, from Barranquillo
- 356a *Durruche*, from Barranquillo
- 357a *Barrito* from Barranquillo
- 358a *Suginary* from Barranquillo
- 359a *Flor de pascoa*, from Barranquillo
- 360a *Bejuco blanco*, from Barranquillo
- 361a *Cola de fete*, from Barranquillo
- 362a *Vainilla*, from Barranquillo
- 363a *Cheneno*, from Barranquillo
- 364a *Guaiacum guatemalensis*, *Guaiacum*  
from Barranquillo  $\frac{1}{2}$  lb
- 365a *Petreaa volubilis* *Cuerro de zapo*  
Barranquillo

- 366a. Cacho de chibo, from Barranquilla
- 367a. Viborana from Barranquilla
- 368a. Campana from Barranquilla
- 369a. Granadillo, from Barranquilla
- 370a. Manzanita, from Barranquilla
- 371a. *Persea* sp. from finca Mocer.
- 372a. Jacate blanco, from Guiriqué.
373. *Ananas sativus*. Montaña from affl. from Guiriqué. 6 plants
- 374a. *Attalea* sp. 1 box of cones or cones with from Guiriqué.

### Propiedades del Aguacate

Tan agradable al paladar y tan grato como manjar succulento en la comida, ya sea al natural o en diversas preparaciones, tiene aplicaciones así en la industria como en la medicina, que conviene conocer. Sirve en efecto:

I.—La infusión bien caliente del cogollo del árbol, es sudorífico poderoso que preserva contra los resfriamientos.

II.—La semilla, de naturaleza cáustica, modifica y cauteriza cualquiera úlcera, sea o no de carácter canceroso. Se aplica la pasta molida desatada en miel rosada.

III.—La semilla fresca y molida, disuelve los panadizos y seca y pulverizada después de tostarla, es remedio especial para ciertas enfermedades del estómago.

IV.—Con el sumo de la semilla fresca se marca la ropa de una manera indeleble.

V.—La carnosidad de la fruta contiene un aceite inmejorable para evitar la caída del pelo; y el jabón hecho con él es excelente para suavizar el cutis, siendo además el mejor emoliente para la gota.

Todas estas virtudes del aguacate han sido comprobadas con repetidos experimentos.

# EL NORTE

Semanario de los intereses generales de esta Zona

Director y Redactor  
EMILIO ROSALES PRINCE

AÑO IX

COBAN, 20 DE DICIEMBRE DE 1919.

NUM. 469.

Serie de 4 Números \$10  
AVISOS PRECIOS MODICOS

## Rainfall on "Moas" in inches

	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920
Jan.	1.72	2.97	1.77	2.97	3.81	.97	3.01	.97	.17	2.80
Feb.	1.70	.86	5.95	.86	.50	1.73	3.	1.28	3.05	—
March	2.14	1.93	1.93	2.20	10.47	8.01	6.54	5.02	9.82	—
April	1.60	1.55	13.59	8.99	12.85	11.61	7.95	9.59	10.46	—
May	50.73	10.34	24.70	19.73	21.50	21.91	31.25	11.51	15.65	—
June	38.42	22.23	35.72	16.85	33.53	33.15	32.27	22.74	26.36	—
July	11.92	12.03	16.09	8.71	30.28	39.87	24.96	14.43	13.54	—
August	14.79	14.95	22.52	7.29	35.91	40.46	30.58	9.16	16.43	—
Sept.	25.51	27.34	35.05	21.80	36.10	31.84	27.56	23.96	37.80	—
Oct.	26.52	31.96	20.82	30.74	26.96	23.22	25.70	21.59	25.17	—
Nov.	7.65	5.30	5.17	10.69	6.27	5.55	4.92	3.85	7.70	—
Dec.	.92	2.16	2.74	2.77	1.65	.65	4.06	1.02	2.99	—
Total	188.26	183.42	181.27	183.60	217.09	227.97	201.80	125.12	169.14	—



Guatemala, C. A.

## Rainfall on "Palмира" in inches

	1915	1916	1917	1918	1919	1920
Jan.	—	—	.10	.32	.35	—
Feb.	—	—	.48	.05	.63	—
March	1.90	—	.03	.41	—	—
April	.31	.92	.27	1.83	—	—
May	11.06	11.82	8.81	6.87	4.67	—
June	14.83	16.60	12.35	12.50	12.75	—
July	11.56	15.58	6.49	6.33	12.95	—
August	11.36	13.62	8.50	5.49	9.95	—
Sept.	13.94	13.97	8.24	16.92	—	—
Oct.	7.27	10.13	18.16	14.59	8.89	—
Nov.	3.96	3.14	.73	.53	.45	—
Dec.	.62	.20	—	—	1.17	—
Total	76.81	88.98	64.16	65.90	51.81	—

Finca Palmira  
 Pueblo Nuevos Viñas  
 Depto. de Santos Rosas  
 Rep. of Guatemala  
 C. A.



Vol. II

Central and South American Explorations.

Wilson Popenoe

U. S. Department of Agriculture,

Washington D. C.,

U. S. A.

Monday San José Costa Rica May 17 1920

Perseas in the Herbario del Museo Nacional  
de Costa Rica:

Persea pittieri Mez. No. 1156

nombre vulgar Santa María (?)

Valle de Rancho Redondo. 1500 meters

Collected by H. Pittier, April 1889. Determined by  
Mez. One sheet only, foliage and flowers.  
Probably the type.

Persea pallida Mez and Pittier

Valle de Coto

Collected by H. Pittier, February 1897.  
Determined by Mez.

Persea caerulea Mez

Buenos Aires (Other sheets from  
Baruca and Rio Cruceles)

Collected by Ad. Toumey, February 1892.  
Determined by Mez.

Persea gratissima

One sheet only, from near San José.

Friday El Coyolán, Costa Rica May 31

I came down on the train this morning from San José, and have had a long talk with Carlos Wercklé.

He says that he knows an agnacate de agua, apparently not *Persea americana*, which occurs as a wild tree in the forest between La Palma and San Jeronimo, not far from San José. This may be the agnacate de agua mentioned by Pittier. Wercklé says the fruit is round with flesh gritty or tartare.

In the hacienda of Mr. Carter at Naranjo he has seen a peculiar and distinct wild agnacate tree. This tree stands among orange trees, on the East bank of the Rio Naranjo, at the foot of a hill, a few hundred yards from the river.

At San Cristóbal, about 7 hrs ride from San José, toward the south is a remarkably good white zapote - *Casimiroa*. It is in the hacienda Moras y Haberl; and is one of a row, the 10<sup>th</sup> tree from the fence near the house. Wercklé says the fruit is oblate in form, with a thick, gray skin, and small seeds.

At the same hacienda Moras y Haberl is the best 'yá Wercklé' has ever seen. The tree stands in front of the house.

He says that there is a wild Carica here, which he believes to be *C. peltata*. The fruit is the size of a lemon, fragrant, with a thin skin, and a thick shagreened, smooth the seeds. This sounds like the species I collected at Jacralpa, in Soconusco, Chiapas, Mexico.

At Orozima, on the property of José Manuel Chavez, on the road to San Mateo, are two interesting avocado trees; one bears two crops a year, the other three.

Wercklé does not believe *Persea frugida* has ever been described botanically. Luber, a Dutchman who many years ago had a remarkable nursery of tropical plants, catalogued the 'yá' under this name. *Persea peltata* is probably the correct name.

*Guilandina utilis* is the pejiwaye

*Pogononia* sp. "pococa" fr like *P. ligularis*,  
 violet black, hard shell, some skin up. Lost  
 swaters of left  $1\frac{1}{2}$  weeks after picking. Does  
 not shrivel

*Cucurbita costarica* - in Miramar, in Paines,  
 bean like large Lima, but red spotted with  
 black.

*Caña fistula*, Punta Arenas *Cassia kerrii*  
 near R.R. station Fine flowering tree

*Cherimoya* in Punta Arenas *Annona* sp. fr. etc.  
 fine & better than true cherimoya.

*Sapotillo de dor* *Couperia kunthii* ("de  
 sopo" eye) Punta Arenas.

*Misero-sapotillo* = *Lucuma* of *Riviera* type  
 Pta Arenas

*Cyphomandra* called *ucoca*, near Mecenas  
 also called "huevos de Indio."

*Averrhoa bilimbi* "mimbro" Pta Arenas.

*Fruta de pava*, *Myrtaceae*, frt about 1" long,  
 shining black, flesh dark purple, juice  
 colorless, single stone, elongated. As any  
 berries, young frts yellow, then red, then black.  
 Tree large. Flavors agreeable, not sour,  
 variable in quality. Sometimes astringent.

*Coccolobis* sp. Small tree, handsome,  
 much branched, evergreen, frts the size of  
 the mirabelle fruit, blue-black, flesh  
 violet black, juice same color. Flavor acid,  
 somewhat astringent. Seed large, angular (?)

*Peyote* can be found on his side from  
 Silver Spring, on Limon line. Frt boiled  
 in salt water, skin firm & thin, so peels off.  
 flesh mealy, solid, orange colored, better than  
 chestnuts. Palm buds heavily, beginning at  
 5 yrs of age. Plant them 4 meters apart, yield  
 \$10<sup>00</sup> per year per tree. See for 5 centams per  
 fruit in San José. Zelandón has a seedless  
 variety.

*Maranta* sp. Laureri.

Sunbirds. Wercklé says the best way to fight them is to stop the small holes in the dry season, and put around each of the large holes 1 teaspoonful of London purple. They carry this into the nest on their feet, and later die from its effects: the eggs in the nest may hatch, however, and a second brood must be required to clean out the colony.

Wercklé thinks the few *Rubus* which I saw at Rancho Redondo is *R. glaucus*. He says he sent seeds to Burbank of California some years ago, and that the plants failed to grow there in that climate.

Saturday Orotina, Costa Rica May 22 1920

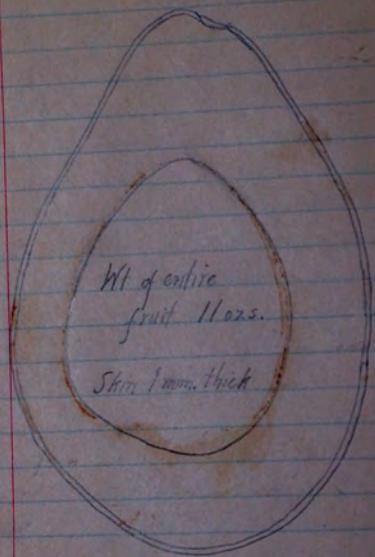
Elevation 750-800 ft, approx.

I came here from El Cezar this morning, to examine the avocados. This is one of the principal avocado growing centers of Costa Rica, and the ripening season appears now to be at its height.

So far as I have seen, everything here is of the West Indian race. Many of the fruits are very small, like those of Orizaba, Mexico, and nearly all have proportionately large seeds.

The West Indian race evidently appeared here considerably earlier than it does in Florida. At the same time, I am satisfied that a good many of the fruits marketed here had been picked prematurely. I got 400 seeds in San José last week for Orotina fruits, and many of them have shrivelled, showing that they come from immature fruits.

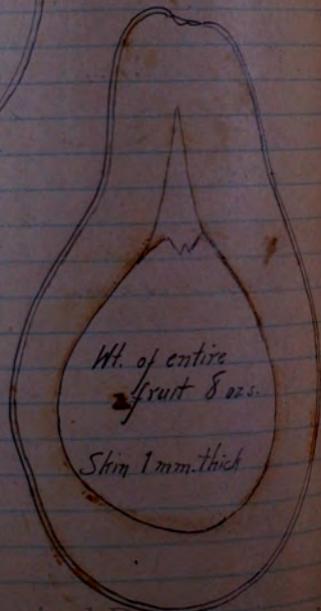
Over leaf are shown four avocados, samples of the best on sale here today. I have seen fruits here larger than these, but the majority are smaller. Pyramiform is by far the commonest shape.



Wt. of entire  
fruit 11 ozs.

Skin 1 mm. thick

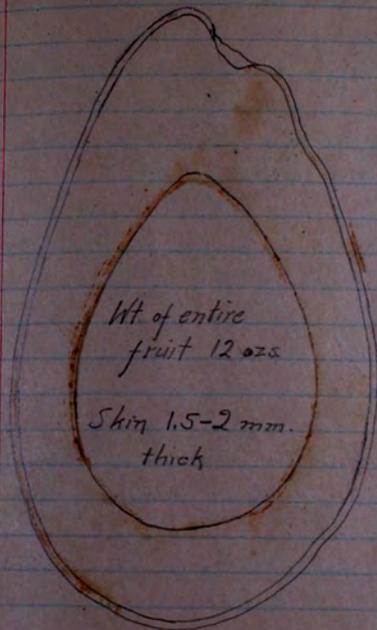
Color light green



Wt. of entire  
fruit 8 ozs.

Skin 1 mm. thick

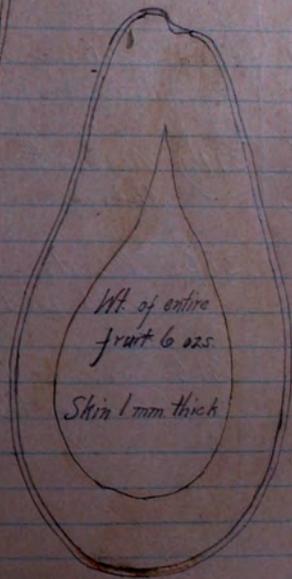
Color yellowish green



Wt. of entire  
fruit 12 ozs.

Skin 1.5-2 mm.  
thick

Color moss green



Wt. of entire  
fruit 6 ozs.

Skin 1 mm. thick

Color deep maroon

Thursday San José de Costa Rica May 27 1930

Prepared following for shipment by parcel post:

375. *Insect Myrmecinae*. Fruta de pájaro, from C. Wreckle. El Coyolán.

376. *Coccidulus* sp. From C. Wreckle. El Coyolán.

377. *Maranta* sp. "Laurin" from C. Wreckle. El Coyolán.

378a. *Rubus glaucus*? Mora, from Rancho Bidonda near San José.

379a. *Nectandra panamensis*? From near Rancho Bidonda. 33 seeds.

380a. *Chayote edulis*, from San José. 2 seeds white fruits, slightly opening.

381b. Insect pests on avocado leaves, from Muñoz residence, San José.

382. *Persea americana* Avocado. No. 42. 14 substitutes. From Muñoz, San José.

383. *Persea americana*. Avocado. No. 43. 17 substitutes. From Córdoba, San José.

384a. *Persea americana*. 450 avocados seeds. West Indian race, in 3 packets.

Monday San José de Costa Rica May 30 1922

Prepared for shipment the following:

385. Indet. 15 Cuttings of pink-fl'd shrub from La Palma. See Herb.

386. *Passiflora americana* A. DC. No. 44, from benefices of Chale and Asamuan, San V. Elota 15 bundles all young wood.

387. *Passiflora* sp. 11 bundles of young cut de Ramo from La Palma.

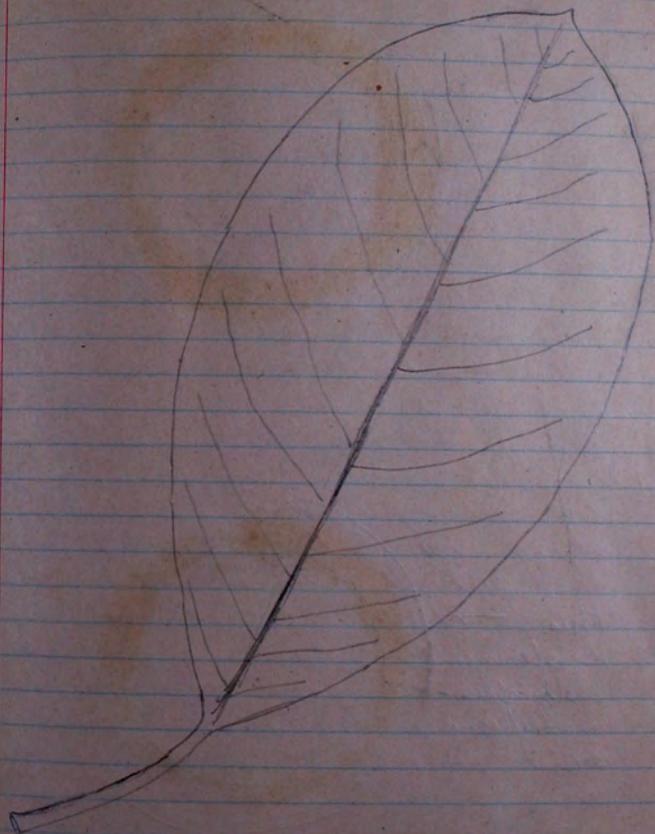
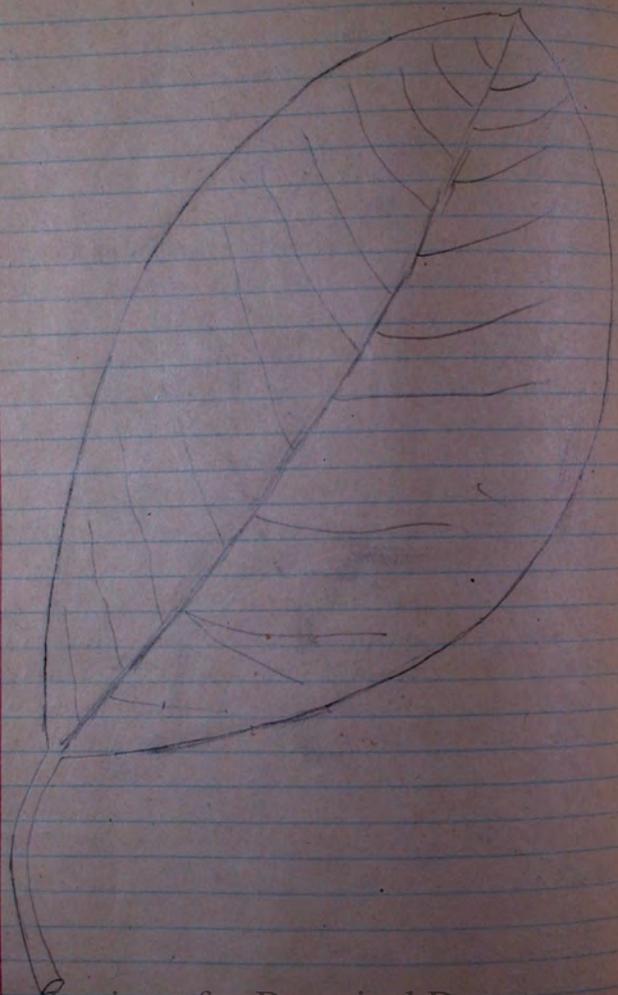
All the above forwarded by parcel post in one box with Museum labels.

August 20th No. 502

Yesterday Oton Jimenez and myself went on horseback to the region of San Jeronimo and La Palma on the low slopes of Fraqui some 40-15 miles from here. I wanted to hunt the *Agave cate de avis* which Pittier mentions in his book, and which Warckel had told me about.

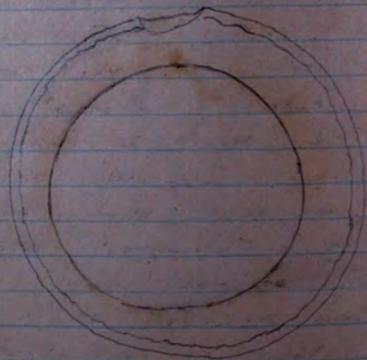
A native of the region of La Palma said that he knew where there was a tree, and would take us to it. He led us for an hour across hilly pastures and along small brooks, bringing us at last beside two trees which had the appearance of avocados, and which stood on a hillside about 100 yards from a small brook. We found a few (3) avocados on the ground beneath one tree, and there were a few more on the tree, but it was raining hard and I did not go up to get them. The fruits for next year's crop had already formed, and were  $\frac{1}{2}$  full, which is somewhat precociously the tree had bloomed in March and April.

Following are outlines of leaves and fruits:





This is →  
the specimen  
photographed  
in longitudinal  
section.



The foliage is of a light green color, the leaves almost coriaceous in texture and glaucous below. The upper surface is glabrous; the lower, including the lateral veins but not the midrib, sparsely pubescent.

The fruits, so far as seen, are borne singly on slender, fruit-stalks about 4 inches long. The form is somewhat oblate, the greatest diameter about 3 inches. The stem is inserted without depression, nearly centrally, and the apex is not noticeably flattened. There is a faint crease down one side of the fruit, from the stem nearly to the apex. The surface is moss green in color, and distinctly pebbled in texture. The dots are very few to numerous, small, yellowish. The skin is 1 to 3 mm thick, very coarsely granular in texture, and so hard as to be woody. The flesh is dull whitish or pale brown near the seed, sometimes yellowish and always tinged with green close to the shell. There are no fibers in it, but "stom cells" like those of some of the pears, and of the same

Character on the hard granular bases of the  
inner part of the skin or shell. The flavor  
is strong, suggesting onion, with an  
avocado flesh, faintly noticeable. I do  
not think the percentage of oil contained  
in the flesh is so very great for  
it is only marginally oily in texture. The  
seeds are very large, oblate, hard and  
the seed coats being to it closely.

The character of the tree and fruit  
are such as to suggest the possibility  
that we have in this species the  
prototype of what we term the Guatemala  
and of avocados. The only fruit which  
does not agree in the possession of a  
strong onion-like flavor by the fruit of  
this wild species, and a faint onion odor  
in the leaves and bark. We know  
however that these odors are rather  
things easily lost and not valuable  
as specific characters. The fruiting  
habit of the tree suggests the Guatemala  
one as also the hard granular shell  
and the form and general character  
of the fruit. I shall investigate  
the matter further.

Monday San José de Costa Rica June 7 1920

Prepared for shipment by parcel post  
the following:

388b. Soil sample for Dr. Cobb. From  
around Chayote roots, Juan Vinas.

389b. Soil sample for Dr. Cobb. From  
around Chayote roots, Juan Vinas.

389a. *Nectandra panamensis*? 96 additional  
seeds of this number, from same tree as  
those sent May 27. Packed in charcoal  
and sphagnum.

390a. *Rubys* sp. A blackberry, purchased  
in the market of San José.

391a. *Guiljelma utilis*. Pezomachus palm  
from Juan Vinas. 226 seeds in two  
biggest tins, 110 in each. Packed in  
charcoal and sphagnum.

570-571

570-571

570-571

570-571

Yesterday, Atón Jimenez and myself went to Don Rodríguez ranch above Rancho Records, in search of wild avocados. Rodríguez ranch is about three quarters of an hour from Rancho Records, by horse. The elevation of the ranch house is 7500 ft. but we found in the property others above 8000 ft. There is a beautiful spot, and a few acres are the scrubby scrub of the zone. We engaged two laborers at the ranch to help us search for aguacate de anís and other species. They did not know anything about it, but they thought there were trees at Las Agujas, about 4 hours distant, by foot, locally some men thought he knew of them trees close by, and we went to see them. They were at an elevation of 8000 ft. and were not the species we were hunting for, but had the appearance of being a species of *Persea*, rather close to the aguacate. They were large trees, but were neither flowers nor fruits on them. Don José Meléndez stated that he had seen wild aguacate in abundance on this ranch, but I do not believe they were of the aguacate de anís species.

Wednesday San José de Costa Rica June 9, 1920

Prepared the following material for shipment.

392. *Persea* sp. "Aguacate de Anís" wild avocado from La Palma. Additional budwood as follows:  
 1 pkg 8 young budsticks (tips) nearly clean  
 1 pkg 12 old crown budsticks, all very dirty with sooty mold etc
- 393b. Scale insects from aguacate de anís La Palma.
- 394b. Three cakes of aguacate soap from charcoal from the Botica Francesa
- 392b. *Persea* sp. Aguacate de anís, from La Palma. Two fruits packed in a bract cut tin
395. *Persea americana*. Avocado #42, from yard of Margarita Muñoz. 15 bud sticks, mostly young wood, a few old ones.

Paquete Postal No. 521

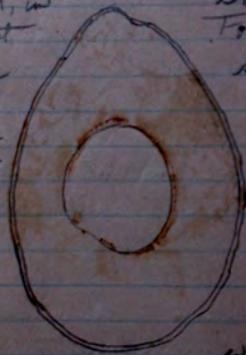
Following are all the facts I have been able to obtain regarding Avocado No. 42.

Avocado No. 42.

Avocado  
No. 42

In residence of Margarita Muzquiz,  
4<sup>a</sup> Avenida Este + 15<sup>a</sup> Calle  
Tree 30 ft high, trunk straight, 15 cm  
thick at base, branched 1 ft from ground. Form  
slender. Heavy branch. The plants sometimes  
in clusters of 2 or 3. Season of ripening  
September to November, sometimes as late as  
December. The variety is later in season than  
the majority of trees in region.

Fruit, in  
present  
stage  
of  
develop-  
ment



Stem slender, 4 to 6 inches long.  
Form of fruit obovoid, surface  
slightly rough, said to be  
green at maturity.  
It is said to be of  
very good quality.

This avocado is highly  
recommended by several  
people who are familiar  
with it. The tree is not in  
good condition - badly attacked by mealy bug.

Dr. Burrows of Tanahu Loguet, ex-Director del  
Museo Nacional, San Juan.

Don Anastasio says most of the avocados here  
in San Juan flower from December to February  
away, and ripen their fruits from August  
to October.

Good avocado trees in Alayuela on the side of  
Zuniga  
Barbas,  
intersection on street to Cemetery.  
Dr. Cortez

Thursday San José de Costa Rica June 19

Oton Jimenez and I this morning visited don José Zedeno, to see his peji-baye.

Peji-baye

Don José has four or five palms, which he says are ten years old. They commence to bear, he says, at six years, and yield up to six volumes of fruit per year. He thinks some palms are males, yielding no fruit at all.

He has just cut a fine racine from one of his palms, and we sampled and photographed the fruits. They are larger than those I obtained at Juan Ybarra, and entirely seedless, as a rule.

Don José says he finds five or six fruits with seeds in each racine.

The fruits will keep for some days after cutting if not boiled. Don José thinks they would finally dry up without spoiling. They are boiled for 13 hrs in water, after to prepare them for eating, and are then peeled and eaten out of hand. Don José says that Wendell has described the fruit, and in this state it will keep indefinitely when soaked in water. It becomes nearly as good as when fresh.

Don José says this is a variety of

peji-baye at San Carlos (about 2 days ride from here) which has thornless stems. He thinks it would be important to obtain and propagate it.

The only way to propagate this variety will be by means of suckers, as in the date of palm. The peji-baye does not appear to produce as many suckers as the latter, and its vegetative propagation will therefore be slower.

These fruits appear to be of two kinds, one normal in shape and size, and the other slender and small, big date chis

Friday San José de Costa Rica June 16 1904  
 Prepared for shipment the following:

396 b. *Guaiacum utahii* 5 specimens  
 fruits fresh from garden of J. N. Rose  
 José Celestino

397 a. Dicot. Vine with seeds of *Abrus*  
*pyctoricus* from San Pablo Tarrazá  
 Herb. No. 1002

398 a. *Geacium* sp. Weevil-infested  
 cotton seeds, from park at Alajuela.  
 Brown cotton

399 a. *Persea*? from near Fraltes,  
 Costa Rica. See Herb. No. 1003

400. *Persea americana*, Avocado No. 43  
 from Padre Junco, Alajuela. 11 trees

401 a. *Rubus* sp. Blackberry from Fraltes.  
 See Herb. No. 1000

402. *Persea americana*, Avocado No 43  
 from Pantaleón Córdoba, San José  
 13 bundles

399 a. *Persea* sp. Avocado de Anís,  
 from La Palma, 28 seeds.

403. Cactaceae, for J. N. Rose. From garden  
 of Dr. José Celestino

404. *Cordia tugonae*?, for J. N. Rose, from  
 San Pablo Tarrazá

405. *Rhipsalis*, for J. N. Rose, from Rosario  
 de Desamparados

406. *Epiphyllum* sp. for J. N. Rose, from  
 San José de Talabá. *Pitahaya*  
*cinchonra*

Bunch  
 Post No. 542 544  
 Parwick

Note from Dr. Farquhar re (Columbian  
great blackberry:

"According to Chapman the time to be  
there to see the blackberry is (fruit)  
will be about April 15. The best  
place at a place about one hour  
from El Pinar toward Funguana  
known as El Rollo. The elevation is  
between 6000 and 8000 ft."

Letter of May 17 1930

Elevations on the line to Limón, as  
ascertained with the aneroid barometer:

San José de Costa Rica	3850 ft
Tres Rios	4400
Cartago	4750
Paraiso	4400
Santiago	3650
Juan Viejas	3300
Tucurrique	2850
Turrialba	2150
Peralta	1200
Squirres	950

Thursday San José de Costa Rica June 24 1900

Prepared for shipment:

407. *Amorpha mucicata*, Bennett var.  
from Zent. 19 buds etc.

408 b. Insect pest on *Psidium guajava*  
from Cartage.

409 b. *Diospyros* sp., from San  
José Zent.

410 b. Insects on orange trees, U. F. Co.  
grow, Navarra

411 a. *Guibulma utilis*, from Turinigo  
1094 seeds

Carack Post Nos. 552-553

For the last fifteen minutes I have been composing the following scorecard which, tho' faulty, will perhaps give you the ~~same~~ cue you want. I have listed the different qualities, not in the order of their importance; but more or less in the order of their apparentness:

1) Looks.....	10
2) Age.....	10
3) Education.....	10
4) Health.....	10
5) Family.....	10
6) Tastes.....	10
7) <del>Intelligence</del> Intellect.....	10
8) Disposition.....	10
9) Chromosomes.....	10
(10) Religion.....	10

Under (5) Family, is included dependent ~~relations~~ or objectionable relations; under (9) Chromosomes, we include hereditary taints; I have included (10) Religion, because it often gives one a fine cue to the girls education and habits of thought. I knew a girl that scored 10 on almost every count, but was a Christian Scientist, and Christian Scientists are strictly taboo with me. My precious St. Claire's score totals a round 100 without the least shuffling. In scoring 10 does not mean perfection; it merely indicates that the candidate comes up to your requirements in this regard. A total of less than 90 or a single score of less than 6 black-balls the candidate. Come on, let's make an article out of this and publish it under our names!

Saturday. San José de Costa Rica June 26 1924

Following are three roses, which do particularly well here, as judged by their behavior in the garden of H. W. Clausen.

Paul Neyron, Here called American Beauty. Grows well, and is a free bloomer. Particularly valued for fruiting because of its long stems. The color, to my notion, inclines to rust toward a magenta-pink.

Franz Karl Durschki. Here called White American Beauty. Said to be very hard to propagate by cuttings. Clausen uses layers. A grand grower as climber in the Tropics.

Maman Cochet. Both the pink and white forms are excellent. They make good growth and bloom very profusely. They should be in every garden.

Wednesday El Cedral, Costa Rica June 30 1924

Carlos Wercklé identifies the zapotillo I bought yesterday in Puntarenas as *Coccoloba kunthii*.

I have just been talking with him re peyibayes. He says it is best to allow two suckers to come up around each palm, thus making a clump of three; or even five stems, in all, may grow from one clump to advantage.

He has weighed the fruit from one clump here, and found there was 350 lbs. One stem alone produced 150 lbs. Wercklé thinks ground planted to peyibayes would produce more fruit than it would planted to banana.

The season of ripening is much longer than I had thought. He says ripe fruit can be obtained from one palm during as many as 8 months, beginning in August or September and extending thru the dry season. He says the Indians near Tucurriguo almost live on peyibayes for 8 months out of the year. The fruit grows to maturity very quickly; the palms here are now flowering or carrying young fruits.

He does not think the plants need to be set more than four meters apart in orchard form.

Suckers should be removed, he thinks, after they have attained a thickness at the base, of about 3 cms, and are 4 to 6 feet high. At this time they have formed roots and are easily removed from the parent and established independently. He does not think more than 8 or 10 suckers are produced by one plant, but it seems probable that by removing the early ones, others would be produced, and that perhaps 15 could be obtained from each palm.

The spines on the stem are orange in zone 4 to 5 inches wide near the ground, narrowing to about 1 inch wide higher up; and there is a deep red or orange trunk between the zone of spines.

Wardle says it is not hard to grow perbayes from seed, if care is taken to keep the ants away. He and Van der Laan one had several thousand plants from

the attacks of ants, who enter the seed thru one of the 3 eyes as soon as germination commences and eat the kernel or the young shoot. Seeds may be stratified in sphagnum and transplanted after germination. Work will take place in two months more or less. Seeds may be kept a year in good condition, possibly two years. They only need to be kept in the shade and kept dry.

Thursday San José de Costa Rica July 11<sup>th</sup>  
Prepared for shipment the following:

412. *Bunchosia*? *Cereya* from  
El Coyolán. About 100 plants  
See Herb. 1004.

413a. *Crotalaria*? From Puntarenas  
See Herb. 1021

414a. *Sapindaceae*. *Paraiso*, from  
El Coyolán.

415a. *Cordia* (Herb 1023). *municeo*  
from San José de Costa Rica

416a. *Castilla nicoyana*, from  
El Coyolán.

417a. *Rubus* sp. *Mora*, from woods  
between Cartago & Tierra Blanca.  
See Herb. no. 1006

418a. *Casbalum notatum* Genetzville  
Presented by Alfredo Quiroz San José

Poste No. 575  
Paguet.

419. *Wrecklea insignis*. 12 cuttings from  
a garden in Guadalupe. See Herb  
No. 1022. Propagate by air  
distribution from Ricardo Jiménez Méndez.

419a. *Wrecklea insignis*. Small quantity of  
seed from same plant as 419. Herb. 1022.

420. *Melastomaceae*. "San Miguel" from  
a garden in Guadalupe. About 30  
cuttings. See Herb. 1025

421b. Soil from around chayote roots in  
Guadalupe. For N. A. Cobb.

422. *Polakowskia tacaco*. 30 *tacacos*  
from the San José market.

*Ocyalus wagneri* is the *orpundula*

Tuesday San José de Costa Rica July 6, 1903

Prepared for shipment the following:

423a *Rubus* sp. Raspberry from  
slopes of Volcan Drazul 25-  
9000-10,000 ft. See Herb. 1016

424. *Guillematilis* Pezizay  
Seedless from Alfonso  
Alfaro Braca, San José. 2  
offshoots.

The following top Dahlia (Dahlia  
sp.) from Alfonso Braca:

425. Large double lilac-pink.  
Best of this set, the fls being very  
full. 4 cuttings

426. Small-flowered, half-double  
light lilac-pink. Flowers  
earlier in the season than the  
others. 10 cuttings

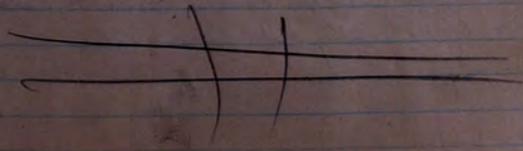
427. Small double-flowered lilac.  
Flowers later than the others  
3 cuttings

428. Single white. (green-leaved)  
all above have leaves + petioles  
tinged purple, + lots of different  
appearances, so that I think likely  
they are of a different species.  
5 cuttings

429. Double white (leaves like  
428) 3 cuttings

430 *Passiflora quadrangularis*  
from Alfonso Braca

431. *Guillematilis* utile. Seedless  
peizay, presented by don José  
Balestón. 9 offshoots, small.



Guavas  
 While Pittier, in his "Plantas Usadas," lists the guisaro of Costa Rica as *Psidium molle*. I believe there are two species here which go under this name.

The common guisaro of pastures and roadside is probably *Ps. araca*. It is very abundant in the mountains central. It is a small shrub, rarely more than 4 feet in height, often with several stems from the base. The leaves are quite stiff, and often brownish on the lower surface. The fruit is round, yellow, 1" thick, with a somewhat orange flavor. It is fully ripe at which time they are sufficiently sweet to be eaten out of hand. They have a distinct guava flavor.

What I take to be *Ps. molle* is relatively uncommon. I have seen it here and there in the mountainous regions, along the roadside or in dooryards. It is a larger plant than *Ps. araca*, forming a small tree much like that of *P. guajava*, but probably its maximum size is less. It is flowering just now, and I have seen no ripe fruit here. It blooms more profusely than most other guavas. Evidently it passes also as guisaro.

Photographs desired by Sten Jerning:

2051, 2045, 2043, 2042, 2041,  
 2040, 2038, 2037, 2035, 2032,  
 2031, 2030, 2026, 2024, 2023,  
 2020, 2019, 2018, 2016, 2014, 2012,  
 2011, 2009, 2006, 2004, 2003,  
 1999, 1995, 1993, 1992, 1990, 1989,  
 1988, 1987, 1986, 1985, 1984, 1982,  
 1980, 1951, 1947, 1924, 1920, 1917,  
 1916, 1915, 1912, 1909, 1908, 1907,  
 1903, 1900, 1899, 1898, 1896, P 2056  
 2062, 2063, 2064, 2065, 2066,  
 2067, 2075, 2076, 2077, 2078, 2079,  
 2080, 2081, 2082, 2083, 2084, 2085.

## Pejibaye notes of Oton Jiménez

## Historia

En Costa Rica el pejibaye fué objeto de cultivo por parte de los indios desde la mas remota antigüedad, principalmente los de Talamanca y los de toda la vertiente del Atlántico, ~~ANXXXXXXXXXXXX~~ según consta en los viejos escritos de los primeros conquistadores españoles. Las frutas cocidas se comían en tan grande escala que constituía casi la principal alimentación. El palmito o sea el cogollo tierno era tambien muy apreciado como alimento y con la médula del tronco, despues de haber sufrido una fermentación especial, preparaban una comida que contenía una gran cantidad de gusanos blancos. Algunos españoles que la probaron aseguran que era deliciosa.- Con la madera del tronco, que es tan dura como hueso, hacían las puntas para las flechas y los arcos. El Conquistador Sánchez de Badajoz fundó en la Costa de La Estrella (Costa Atlántica) en 1545 el puerto de Corotapa, habiendo realizado la conquista en perfecta paz y armonía con los indios, quienes lo apreciaban y respetaban mucho. Poco despues llegó Rodrigo de Contreras, quien había contratado en España la conquista de esta región; atacó a Sanchez de Badajoz, logrando vencerlo y hacerlo prisionero. Para castigar a los indios que habían apoyado y defendido a su enemigo, ordenó a sus soldados la total destrucción de cincuenta mil árboles de pejibaye. Este hecho ocasionó una enorme sublevación de los indios quienes lo consideraban como árbol sagrado y demuestra la importancia que para ellos tenía.- En todo tiempo las autoridades civiles y las asociaciones comunales han procurado fomentar y proteger el cultivo del pejibaye, dictando leyes especiales. Revisando documentos antiguos se encuentran muy amenas estas disposiciones.-

*Guiljelma utilis* Oerst. in *Vedensk. Meddel.*  
p. 46. 1858

*Bactris utilis* Benth and Hook. in *Genus*  
*Plantarum* iii, p. 942.

OTÓN JIMÉNEZ L.  
SAN JOSÉ, COSTA RICA

## Composición química y valor alimenticio.

Se ha análisis comparativo practicado por F. Sancho, Ph.Ch. sobre varios frutos tropicales, (1) ~~de las siguientes variedades~~ - *Fermeo los siguientes de*  
Valor nutritivo  
valores por libra

	Agua	Proteínas	Grasa	carbohidr.	Cenizas
Guspiñol	15,1	6,6	1,6	73,9	2,8
Pejibaye (2)	48,8	2,8	6,7	40,9	0,8
Banano	75,3	1,3	0,6	22,0	0,8
Mango	82,3	0,3	0,3	16,8	0,3
Piña	89,3	0,4	0,3	9,7	0,3

(1) F. Sancho, Ph.Ch. Anales del Hospital de San Juan de Dios, Costa Rica II - 2 : 99 - 1917.-

(2) Un análisis parcial practicado por uno de nosotros bajo la dirección del sabio profesor suizo Doctor Michaud, muestras de la pulpa cruda, dió el siguiente resultado : grasa 5,82 ; azúcar 4,00 ; almidón 26,90 Debe tenerse en cuenta que la composición de las frutas varía mucho según las calidades, localidades, etc.- El aroma sui generis de la fruta aumenta notablemente con la cocción. Es debido, probablemente, a un aceite volátil, que se fija en la grasa cuando esta ha sido extraída por medio del cloroformo, pero desaparece completamente al calentarse a 100 ° C. por algún tiempo.-

OTÓN JIMÉNEZ L.  
SAN JOSÉ, COSTA RICA

Mien claro se vé que la pulpa del guspiñol (Hymenaea Courbaril, Linn.) alcanza el coeficiente mas elevado, calculado en calorías por libra: pero quien conoce esta fruta sabe muy bien que nunca puede considerarse ni como alimento ni como fruta. El guspiñol es una mimosa de muy común en los trópicos: sus frutos son gruesas vainas de color chocolate, de consistencia pétrea, que encierran grandes semillas, duras como hueso, curiadas por una delgada espa de que pulpa pulverizante de color amarillento, de sabor y olor especial que recuerda los verberianatos. Por eso sólo son buscados por los niños y los animales silvestres. Estas cualidades son mas que suficientes para su uso medicinal y viene a ocupar su lugar el peibaye. Muy dignos de tomarse en cuenta son los altos porcentajes de grasa, carbonhidratos y proteínas, como tambien la poca cantidad de pulpa con relación a la semilla esto se agrega la gran cantidad de pulpa con relación a la semilla y cáscara y su delicado sabor y olor, puede afirmarse, sin temor a caer en la exageración, que este fruto ocupa uno de los primeros lugares entre los muchos de la exuberante flora tropical y por lo tanto no deben omitirse esfuerzos para contribuir a su propagación y cultivo, pues ademas de proporcionar una exquisita golosina se proporciona un alimento de primer orden, cuyo papel debe ser importante en los actuales tiempos de carestía de víveres.

Psidium of interest in the Herbario del Museo Nacional are the following:

*Psidium savanarum* J. Donnell-Smith.

No 4033. "Savane a Buenos Aires"  
Elev. 250 m. "Jeunes pousses". Legit.  
Ad. Toudy, 1891 Det. J. Donnell Smith.

A small branch with young leaves  
and a few flowers and buds.

*Psidium friedrichsthalianum* Benth. & Hook.

No. 11,977. Savanes, Guadeloupe, valle  
du Diguis. Elev. 150 m. Legit. H. Pittier,  
1898. Det? I am certain this sheet is  
incorrectly determined. It is not *Ps. friedrichsthalianum*, but a plant with fruits  
about 1/2 inch in diameter.

No. 11,731. Paturages au Capuy. Elev.  
1800 m. Legit. Ad. Toudy 1898. Det.  
H. Pittier  
Like 11,977: incorrectly determined.

No. 7806 " Paramos de l' Abeyonal  
Elev. 1900 m. Legit. Ad. Tondoy, IV. 1899  
Det. J. Donnell Smith.

All of these specimens appear to me to be of one and the same species, and I believe the determination is correct.

There are no specimens of *Ps. mollis* in the herbarium. There are several of *Ps. guineensis* but they have not been listed for they are of little interest.

Herbarium specimens collected in Costa Rica shipped to Washington in Paquete Postal #584, dated July 7, 1920.

Common names of wild avocados (probably degenerate form of cult. avocado):  
Aguacate de mico, aguacate de mono, aguacate del monte, aguacate cimarron, aguacate selvatico, and

[Reprinted from the JOURNAL OF THE WASHINGTON ACADEMY OF SCIENCES,  
Vol. 10, No. 1, January 4, 1919]

See it not 1920?

BOTANY.—A preliminary revision of the North American and West Indian avocados (*Persea* spp.). S. F. BLAKE, Bureau of Plant Industry.

For several years Wilson Popenoe, of the Office of Seed and Plant Introduction, has been engaged in the collection of the various forms of the avocado, or "alligator pear," which are found in Mexico and Central America. Many new and valuable forms have been introduced into the gardens maintained by the Office, whence they are being distributed among horticulturists, and a considerable amount of herbarium material has been accumulated. This material, which has recently been put into my hands for study, is sufficient, in connection with that already in the U. S. National Herbarium, to permit a fairly satisfactory preliminary treatment of the forms of the avocado which occur in Mexico, Central America, and the West Indies. Mr. Popenoe is about to extend the field of his investigations by a two years' trip in Central and South America, in which it is hoped material will be secured to settle the status of one or two South American forms, at present too poorly represented in our herbaria to be disposed of definitely. In the meantime it is desirable to put on record the information already obtained as to the relationship of the forms north of the Isthmus.

The latest systematic treatment of *Persea americana* and its relatives is that of Mez (1889),<sup>1</sup> in his monograph of the American Lauraceae. Mez recognizes, in the small group made up of the avocados, two species, *Persea gratissima* Gaertn. f. (*Laurus persea* L.) and *P. floccosa* Mez. Of *P. gratissima* two varieties are recognized in addition to the type, *P. gratissima schiedeana* (Nees) Meissn. and *P. g. drymifolia* (Schlecht. & Cham.) Mez. In a later publication Mez<sup>2</sup> has recognized the priority of the name *Persea americana* Mill. (1768) over *P. gratissima* Gaertn. f. (1807), the name by which the common avocado has generally been known in literature.

Mr. Popenoe,<sup>3</sup> as a result of his extensive field acquaintance

<sup>1</sup> Jahrb. Bot. Gart. Berlin 5: 145-148. 1889.

<sup>2</sup> Arb. Bot. Gard. Breslau 1: 113. 1892.

<sup>3</sup> In BAILEY, Stand. Cycl. Hort. 5: 2556. 1916.

## I. a)—El mamey

La familia de las gutíferas ofrece solamente pocas especies con frutos comestibles, pero entre éstas se encuentran unas de las mejores frutas del mundo, como la mangostana *Garcinia mangustana* L. de la India Oriental; el mamey *Mammia americana* L. y la Pacouriuva, *Platonia insignis*; estas dos últimas son naturales de la parte septentrional de Sur-América. A la misma familia pertenece también nuestro jorco, *Rheedia edulis*.

El mamey es un árbol giganteo y uno de los más hermosos entre todos los árboles frutales. El fruto es del tamaño de la cabeza de un niño, y contiene unas cuatro semillas grandes; la cáscara es amarga, pero se separa con la mayor facilidad de la carne; esta es traslúcida en tajadas delgadas, de un color de albaricoque y de un gusto delicioso; el olor también es exquisito.

Aunque la mangostana es generalmente reconocida como la mejor entre todas las frutas, no puede ser mucho superior al mamey.

Como todas las gutíferas, el mamey es caprichoso en cuanto al suelo que pide; necesita una tierra de aluvión fresca, muy profunda y próspera excepcionalmente bien en la vecindad de las corrientes de agua. En el Departamento de Bolívar, en Colombia, el árbol crece espontáneamente en la orilla de los riachuelos, en tierra de aluvión, rica y profunda.

En Costa Rica, este árbol es casi desconocido, aunque está cultivado al Norte y al Sur de nosotros; en Nicaragua es abundante. En Nicoya se encuentran unos pocos ejemplares ya grandes. En los últimos años se han sembrado unos pocos árboles en Orotina. En el Coyolar existen unos ejemplares que fueron plantados en un barro rojizo, duro, en un lugar donde la tierra se seca mucho en el verano; como es natural, no prosperan bien. Hay grandes extensiones de terreno de ambos lados del Río Grande, en su trayecto inferior, que son muy propios para el cultivo del mamey.

Cuando el árbol encuentra condiciones favorables, crece con una rapidez extraordinaria.

c. Wercklé

Boletín de Fomento, Costa Rica

Año III, num. 6, 1913

The Avocado in Costa Rica.

The explorations of the avocado growing regions of Costa Rica between May 10 and July 10, of this year, have convinced me that in so far as cultivated varieties are concerned, this country cannot supply horticulture with anything of great value. The quality of the fruits produced is, in general, decidedly inferior, due to their small size combined with the relatively large proportion of seed to fruit. It is possible that a few forms have been obtained which would be of value because of their ripening season, and they may be satisfactory in other respects as well, but the fact that I only sent to Washington specimens of four numbers, 42 to 45 inclusive, shows that not many promising forms were encountered.

Races

The great majority of cultivated avocados in Costa Rica, — practically all, — belong very evidently to the West Indian race. The only exceptions, so far as observed, were a few trees of the Guatemalan race growing in San José, and whose origin is directly traceable to Guatemala. There are several of these trees in the

garden of Don Jose Zuley, and seeds from them have been planted in a few other gardens.

The peculiar feature of the matter is this, while all the common pines have the characteristics of the West Indian race, some of them are found at much higher elevations than we are accustomed to find this race in countries to the north of Costa Rica. It is not uncommon to see trees at 6000 feet, and I find them as high as 7500 feet (Tierra Blanca, near Cartago); and even at the latter elevation the trees look like true West Indians in every way, so that I have been able to ascertain that any of them show the distinguishing characteristic that looks new to me to be the only dependable one for separating the two races, viz. the time required for the fruit to reach maturity. In the West Indian race the tree blossoms let us say, in March, and the fruit ripens commonly by the following September at the latest. It is never carried over to the following flowering season. In the Guatemalan, on the other hand, the fruit is carried over to the next flowering season, and often on in two months longer.

Thus it may be said the West Indian ripens within 8 months of the time of flowering, often in less than 8 months, while the Guatemalan takes 12 + 14.

In Guatemala I never found the West Indian race at elevations above 3000 ft. naturally, therefore, I was surprised to see it in Costa Rica at 7500 ft.

Nowhere in Costa Rica did I see the Mexican race. The *conocota de amio* of Petten, which I had thought would probably prove to be the Mexican race, is a wild species of *Persea* with fruits clearly resembling those of the Guatemalan race.

#### Cultural Conditions

Avocado trees in Costa Rica exist under about the same cultural conditions as in Guatemala. No regular plantings are found. Most of the trees are in *decurvados*, i.e. a limited number in small coffee plantations. No cultural attention whatever is given the trees, as a general rule.

The most important avocado-growing district in Costa Rica is the section along San Mateo and Britton, on the railroad from Puntarenas to the capital. During April, May and June the San Jose

market is supplied principally from this region.

There are also many trees in and about Alajuela, the fruit here ripening later than at San Mateo because of the higher elevation (San Mateo is about 800 ft., Alajuela about 3000 ft.). The avocados of Alajuela are better than those of many other regions.

About Cartago there are plenty of trees, but the fruit is small and large seeded. The same is true in general of the Atlantic coast regions on the Llanos Viejos. There were said formerly to be some fine large avocados on the Llanos Viejos, but they seem now to have disappeared.

I think in general the best fruits today are those of San Mateo and Alajuela. There are a very few good trees in San José.

Propagation is only by seed. Probably the only seeded or grafted trees in the country are those we sent last year to Minor C. Keith.

The insect pests which attack the tree appear to me to be rather less numerous or less serious than in Guatemala. The Psyllid which produces leaf galls are

so many trees in Guatemala as either absent or of little importance in Costa Rica. I found two scale insects and sent them home for identification. One, a soft scale or perhaps merely bug, was severe on the tree of Avocado No. 48, in the yard of Margarita Murray, San José. Dr. Clodomiro Picado Telez, one of the avocados. He thinks it is a Dipteron, and is attempting to breed out some adults. - Dr. José Galedin has had several trees nearly destroyed by some insect that bore in the trunk and limbs, but I was unable to obtain any specimens. The trees throughout the country are in general suffering from no insect attacks, in a sufficient degree to be noticeable.

#### Season and Marketing

There are said to be avocados on sale in the market of San José every day in the year as in Guatemala. This is made possible by two factors: 1, the varying elevations, from sea level to 7500 ft., at which the tree is grown, and 2, the picking of much fruit before it is mature. It may be said in fact, that most of the avocados sold

in San José and other markets are picked before they are fully mature.

On the coast, at elevations up to 1000 or 1500 ft, the principal season is from April to June. At Alajuela, 3000 ft, it is said to be July and August, and in San José, 3800 ft, it is said by Don Anastasio Alfaro to be August to October. At the higher levels I do not know just what the season may be.

There is a peculiarity of certain trees, notably in the Orotina-San Marcos region, in that they flower and fruit two times in the year. As soon as the main crop is off in June they blossom and set a crop to ripen about the last of the year. This seems to be a rare phenomenon, and I do not think at all that it is an inherent character, but that it is the result of certain climatic conditions. I believe the trees which flower in June are in general ones which bear little or no fruit in the April-June crop. And I do not believe, from what I have seen, that the trees can be depended upon to produce the late or second crop year after year.

It seems to me that there is less alternation of bearing in the West Indians of Costa Rica than in the Guatemalans of Guatemala. When I visited the Orotina region early in the season I found nearly all of the trees bearing fruit. In Guatemala one always finds many trees which are "missing a year" in their yield. This is an important point in favor of the West Indian race, I believe.

As aforementioned, most of the fruit is picked and sent to market before it is fully mature. The methods of picking and marketing are about like those of Guatemala.

#### Varieties

There is approximately the same range of varieties among the avocados of the West Indies as in Costa Rica as is found in other countries, with the exception of the very large forms, of which I have seen none. I think probably two pounds could be set as the maximum size attained in Costa Rica, and varieties one pound and more in weight are very common. I think the average size is about 6 oz, certainly not over 8.

The average varies somewhat in different districts. It is greater among several of the San Mateo region, for example, than among those found at Cartago or in the mountains south of Cartago.

The range of forms is wide, but round varieties seem exceedingly rare. The common forms are flat-cupped to obvoid, with pear-shaped being by the most predominant. Long and slender forms are occasionally seen. It is a significant fact that some wild forms found on trees growing in places where elsewhere under unfavorable circumstances, are nearly always pyriform. While some wild forms of the Guatemala race (see Bul 742) are usually round or oblate.

The skin is about the same in thickness as it is in West Indian varieties on Cuba and elsewhere, slighter than in the small-fruited varieties of Costa Rica, it is not as thick as in some of the large-fruited Cuban forms. The flesh is greenish yellow or pale green, sometimes fibrous. The flavor is very generally good

if the fruit has not been picked too early. The seed is nearly always tight in the cavity in the small fruited forms, when the forms are large being 10 mm and over, loose seeds become common. It looks as though loose seediness is a characteristic which appears in the West Indian and Mexican races when the size of the fruit is increased by cultivation.

## The Yás

This species, whose botanical standing has long been in doubt, proves to be nothing more nor less than the coyo of Guatemala and Chinini of Southern Mexico. Persea schiedeana.

The yás was listed in early publications including Collin's bulletin, under the name of Persea frigida Linden. This name probably is not valid, since it does not appear that the species was ever described. In later years it has come to pass that the yás has been doubtfully referred to as P. pittieri Nees. In his revision of the avocetes Blake included P. pittieri under P. schiedeana, as a synonym of that species, based upon a specimen examined in Washington I believe. He did not, however, state that this species was the yás or "Lady avocado" of Costa Rica.

When I arrived in Costa Rica early in May I found that the yás had already flowered and set young fruits, which did about the middle of May,  $\frac{3}{4}$  to  $1\frac{1}{2}$  in long. I am not able to ascertain with certainty the ripening season in

Costa Rica, but I believe it to be in October and November.

The yás is a fairly common tree, wild and semi-cultivated (in dooryards, like the avocado) about the Doland Drain, at 7000 (±) feet. I have seen it in the region of La Palma, La Esperanza, Rancho Redondo, and above Cartago. I am told also that it is abundant at Coblance, fruit coming from there to the market in San José. It is known also in the mountains south of San José.

Most of the yases known in Costa Rica are round or nearly round in form. In this respect they differ slightly from those of Guatemala, which are for the most part pyriform.

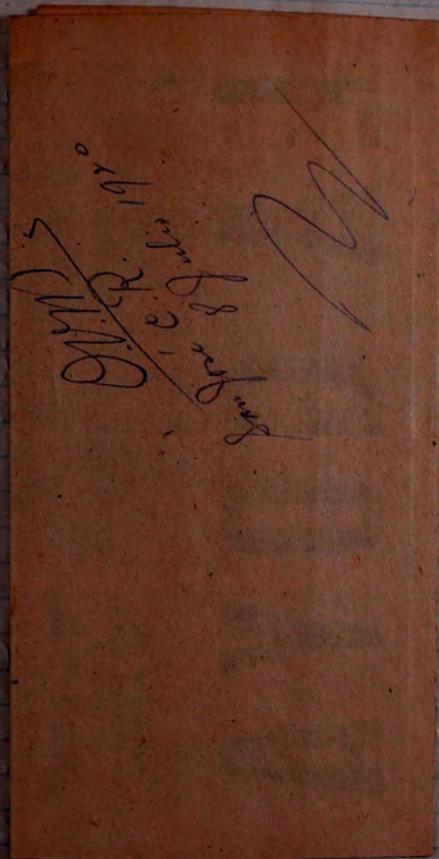
The fruit is held in esteem by Costa Ricans, as in Guatemala, it is preferred in flavor to that of the avocado, but the scanty flesh, usually containing fibers, is a serious defect. I do not believe there are any varieties in Costa Rica so good as those of the Terapay in Guatemala.

The other day Mr. L. H. Dewey, who has charge of the Fiber Investigations, asked me if you could get him certain information in Ecuador.

He is anxious to clear up the uncertainty concerning the fiber plant of plants which are found in the country behind Guayaquil, especially those known under the name "Barriguda". Is this name applied to species of Chorisia, or perhaps to Ceiba?

Our bamboo expert, Mr. R. N. Jones, sends his very best regards and says that if you should find any bamboos in flower he would appreciate herbarium specimens.

Recuerdo de la ultima noche en San José  
de Costa Rica.



Sunday Ancon, C. Z. July 18 1900

Persons called upon in Balboa and elsewhere on this side of the Isthmus:

Col. L. T. Hess, Supt. Ancon Hospital.  
Desires to get lawn grass seed of any species which might succeed here. Suggests *Stenotaphrum glabrum* and *Paspalum notatum*. He would also like fruit and ornamental trees and shrubs. He is anxious to see the Dept. of Agr send a man to the zone to introduce and test new plants, and would probably undertake to advance the project at Washington if it was put up to the Government.

Col. H. L. Fisher, Chief Health Officer of the Canal Zone.

Like Col. Hess, is interested in seeing the Dept send some one here to take up the introduction and testing of new plants. Would be able to supply land and labor at the Insane Asylum at Corozal. The land there is some of the best in the zone. Would be glad to receive plants for trial at Corozal.

Lt. Col. L. F. Garrard, Dept. Quartermasters U. S. Army. Is much interested in plants and in beautifying the various military reservations. Has a nursery at Corozal, with about 10,000 ornamental shrubs & 500 trees at present. Wants to get a man to supervise planting and care of grounds of the military posts. Also wants lawn grass seeds, ornamental trees, etc. Should have a large quantity of Philippine mango seeds from Cuba to plant in lieu of the inferior stock now being used.

Lt. Col. H. L. Steele, Commanding Post Defense of Balboa, Fort Amador and Capt Paul D. Bunker, Fort Amador need help in improving grounds of Fort Amador - about 50 acres available. Want to be listed to receive plants regularly (Post Commanding Officer, Fort Amador) and particularly want: good mangoes, including Philippine seedlings (Cecil, Cambodian); all tropical nuts; *Ficus religiosa*; ornamental trees of all kinds; good pineapples; citrus stock.

It seems to me that the planting of improved fruits and good ornamental plants here in the Canal zone falls definitely within the jurisdiction of Forestry and Plant Introduction, and that they should give the matter some attention. There should be closer cooperation between our Dept and the Army and Canal branches of the post. There is no reason why the last two branches should go ahead planting with less vigor on a large scale when we can and should obtain for them seed of the Philippine types and can find just the varieties or trees of the Indian varieties. There is a great opportunity here to establish choice mangoes when they will flourish there as well as good orange territory. We ought also to help secure for the zone good lawn grasses and good shade trees and ornamental shrubs.

Cal Hess, Supt. of the Ancon Hospital, told me that he had several mangosteen trees growing in the hospital grounds. When he showed them to me, however, I saw at once that they were not the true *Garcinia mangostana*, but most likely *G. hastulicarpa*. One of them is labeled, I think wrongly, *Garcinia morella*. The largest is about 15 ft high. I have seen small trees of the same species in the grounds of the Administration Building at Balboa and in the nursery at Corozal. This species does well here; can most the mangosteen be grafted on it?

There is quite a large variety of ornamental plants and trees in the grounds of the Administration Bldg, and also by around the house in Balboa Heights. Some of the things likely came from us, others from Rubner Brothers. There are such plants as *Lagerstroemia flor. regia*, *Spethosua canaliculata*, *Dillenia indica*, *Ficus religiosa*, *Pithecolobium* spp. and so on. Many of them have reached blooming age.

Lawn  
Grass

Bermuda grass is the principal species used here for lawns. A coarse-leaved grass is also seen in some of the lawns, but it is not a species well adapted for forming lawns. Other lawn grasses are needed, as Bermuda gets brown in the dry season unless well watered, and when it is of the very stems show objectionably.

Mango

At Port Limón, Costa Rica, I saw mangoes of one of the West Indian races - something like manga amarilla - and here in Panama I find several races or types which are not kind (or not common, anyway) in Mexico or Guatemala. I suppose these races have been brought here from the West Indies by the negroes.

There is one race quite common here which looks very much like the manga amarilla of Cuba. There is another large fruited, red-skinned race which looks much like the manga China of Cienfuegos, but I have not had an opportunity to examine it carefully, as I have seen none of the fruits in the market. The mango season is not yet at its height here probably it will be so in another 2 weeks, that is, early in August.

Avocado pests of the Canal zone (Frijoles)

Heilipus sp. now being described by Dietz, a serious pest. Seeds found on ground near house were 15% infested.

Tachnopsis longirostris, more slender than Lepidosaphes beckii.

Pulvinaria ficiformis, sometimes abundant

Targionia bifurca

Saissetia hemisphaerica

Ceroplastes sp. much like floridensis

Lepidopterous leaf-roller or leaf-binder

La Bibijagua y Medos de Comaterla  
 Bul. Agr. Exp.  
 Santiago de las Vegas, Cuba.

Mr. Zelik thinks the sulfur is the best  
 thing to combat the leaf-cutting ants  
 (Bibiaguas) and the best way to apply it  
 is with the blowing machine. No advantage  
 in using arsenic with it. Should do  
 the work about 2 months after the  
 beginning of the rainy season, to get the  
 - insects while they have few occupants.

*Diaspis pentagoni* is common  
 scale on papaya here, inflicting severely.

*Coccus viridis* soft gum scale, common  
 on Citrus.

*Selenaspis articulatus* West Indian  
 red scale, commonest of all scale insects  
 here.

*Chionaspis citri* snow scale,  
 abundant at Corozal.

*Solenopsis geminata* the stinging ant  
 which works on citrus trees, and probably  
 transports mal de gomo. Control the  
 tunnels with fish oil soap solution.  
 And where mal de gomo has obtained a  
 foothold, cut out infected area and paint  
 with Bordeaux paste.

*Trigona ruficornis* corvine, leaf-  
 cutting bee.

Tuesday Colon, Panama July 30 19

Today I visited the avocado orchard of the Panama Canal (Supply Department) situated at Trijales, on the railroad to Panama, about 20 miles from Colon.

This grove contains, I believe, several thousand trees, all seedlings, and all West Indians. Their age ranges from 2 to 6 years, according to a workman on the place, but I think some are older than 6 years. The land is red clay rolling hills, the highest point about 75 feet above the level of Gatun Lake which comes up to one edge of the grove.

Some of the trees died back at the end of the last dry season. Evidently the last drought (it was particularly severe this past season) was too much for them. The top limbs have died back in some instances 6 or 8 feet.

There is fruit in all stages of development in the grove today. I got flowers from 2 trees. There were very small fruits on several others, larger fruits on two and mature fruits on at least a dozen

trees. Many have not yet come in to production. The West Indian race seems to be very erratic here in regard to its fruiting season. While most of the trees mature their fruit in the early summer, May to July, there seems to be a second crop of blossoms on some trees (most probably ones which did not bear heavily in the main season) and fruits set which ripen probably in Oct. - Dec. I think this second bloom is probably due to the check to vegetative growth given by the long dry season. Trees which are not changing much fruit at that time receive the proper stimulus to make them flower in June or July.

The fruits examined, some 12 in all (from different trees) were all typical West Indians. All had large seeds loose in the cavity (with liquid in the cavity) in some instances. The form was in most cases pear-shaped, one variety was almost like Trapp in shape. The flesh appeared to be of good quality. The surface was green in the majority, or a brown-purple in a few cases.

I had an opportunity today to observe the variation in leaf form and size which occurs here. Most of the trees have the typical West Indian leaf - small, and elliptic-lanceolate in form. A few have longer and broader leaves a foot long in *Leptocarpus* cases and quite broad (see specimens). I can not yet, however, find two definite types can be distinguished, the small-leaved and the long leaves, since there are forms intermediate between the typical narrow-pointed, small-leaved variety and the apparently long and broad-leaved.

The long-leaved forms appear to be very open bearing. I only found fruit on one tree of the form. It differed in no way from the type of fruit produced by the small-leaved form.

The Pejibay Incident in the History of Costa Rica, taken from "History of the

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## HUMBERTO GARAVITO

DEL 12 AL 22 DE DICIEMBRE DE 1939.

ABIERTA DE 10 A 13 HORAS Y 15 A 19 HORAS.

GUATEMALA, C. A.

EXPOSICION DE PINTURAS

DE

ACADEMIA NACIONAL  
DE BELLAS ARTES  
9a. AVENIDA SUR, NUMERO 28



...of the wood and needle-like thorns rendered such a barrier impregnable to the Indians, the Captain ordered that the fort be encircled with trunks of the

I had an opportunity today to observe the variation in leaf form and size which occurs here. Most of the trees have the typical West Indian leaf - small, and elliptic-lanceolate in form. A few have larger and broader leaves a foot long in distal veins, and quite large broad (see specimens). I can not feel, however, the two definite types can be distinguished, the small-leaved and the large-leaved, since there are forms not intermediate between the typical narrow-pointed, small-leaved variety and the apparently large and broad-leaved.

The large-leaved forms appear in general to be very sparse bearing. I only found fruit on one tree of this form. It differed in no way from the shape of fruit produced by the small-leaved form.

The Pejibay Incident in the History of Costa Rica, taken from "History of the Discovery and Conquest of Costa Rica" by Ricardo Fernández Guardia, translated by Harry Weston van Dyke. (New York: Thomas Y. Crowell Co., 1913)

Hernán Sánchez, a native of Badajoz was a veteran of the Conquest of America, having arrived on the continent with Pedrarias Davila in 1514.

On Feb. 15, 1540 he left Nombre de Dios with 60 Spanish soldiers and some negro slaves. Toward the end of April he landed at the mouth of the Rivasla river, where he founded the city of Badajoz and part of San Marcos. Since the site was not healthy he removed about two months later to the valley of Cozaga, and built a fort on the hill of Corotapa (about 2 leagues from the valley and 12 from the sea). This fort he called Marbella.

"Because the great toughness of the wood and needle-like thorns rendered such a barrier impregnable to the Indians, the Captain ordered that the fort be encircled with trunks of the

pejibays, set closely together. Such a  
~~tree~~ <sup>tree</sup> was good even against  
 Christians according to the statement of  
 a witness". (p. 143)

The valley of Coaza contained at  
 this time great fields of maize and  
 cacao, and many aguacate maney  
 ("a sort of melon that grows in trees")  
 and pejibay trees.

Finally Hernan Sanchez gained the  
 friendship of the Indians, and the  
 conquest was proceeding peacefully,  
 when on November 15 1540 Rodrigo  
 de Contreras "arrived before the fort  
 of Marbella with 90 Spanish soldiers,  
 some negro slaves, and 400 Chichimec  
 Indians from Nicaragua" (p. 148). Contreras  
 laid siege to Marbella. "The garrison  
 was finally reduced to soup, provisions  
 were exhausted, and the supply of water  
 had completely failed. As a result, Hernan  
 Sanchez was forced to surrender on the  
 1st of December 1540" (p. 150).

The Indians of the region remained loyal  
 to Sanchez, however and did not turn  
 to Rodrigo de Contreras, because of his  
 severe and unjust treatment of them.  
 Consequently it was very difficult to go

from  
 "them, exhausted by hunger, the Chichi-  
 mecas cut down the pejibay trees in  
 order to eat the palmitos (pelt) and this  
 greatly displeased the natives who held  
 them in high appreciation, because  
 their fruit served them for food and  
 provided them with a refreshing beverage."  
 (p. 153). A foraging expedition was  
 sent by the Spaniards, and several  
 Spaniards killed.

The Chichimecas, becoming tired of  
 pejibay palmitos, killed, wanted,  
 and ate a small boy, son of one of  
 Coaza's chiefs. "At this last out-  
 rage, Coaza's people, who were  
 already enraged because of their having  
 cut down the pejibay trees and other  
 depredations they had committed, were now  
 terribly indignant. Resolving to make reprisals,  
 under cover of night they fell upon the  
 quarters of the Spaniards, killed 40 of  
 them, besides a negro slave, and alarmed  
 Contreras' entire camp" (p. 155). Convin-  
 ced that he could no longer maintain him-  
 self in Coatapa, Contreras removed to  
 Tariaca, where a part of his command was  
 already stationed.

The following vegetables are cultivated by the Chinese market gardeners at Trujillo, in the Canal Zone:

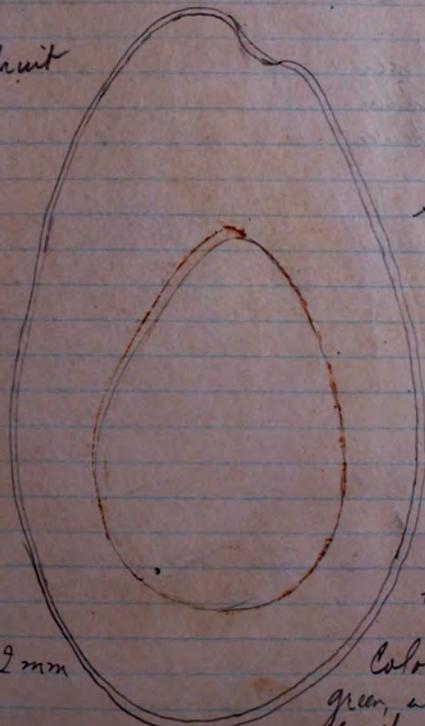
Egg plant  
Cucumber  
String-beans  
Pepper (bull-nose)  
Squash  
Lettuce (but had lettuce cannot be processed)  
Okra  
Onion  
Celery  
Parsley  
Mustard greens  
Mint

*Gaillardia uttilis* is known here in the Canal Zone as *Pijiba* or *Guajiba*. It seems to be wild here.

Sunday Santa Marta, Colombia August 1920

Following are outlines of avocados purchased today in the market, prices 3 to 5 cents each.

Avocado fruit



Seed tight  
in cavity

Weight 19 gms

Color light  
green, with numerous  
yellowish dots

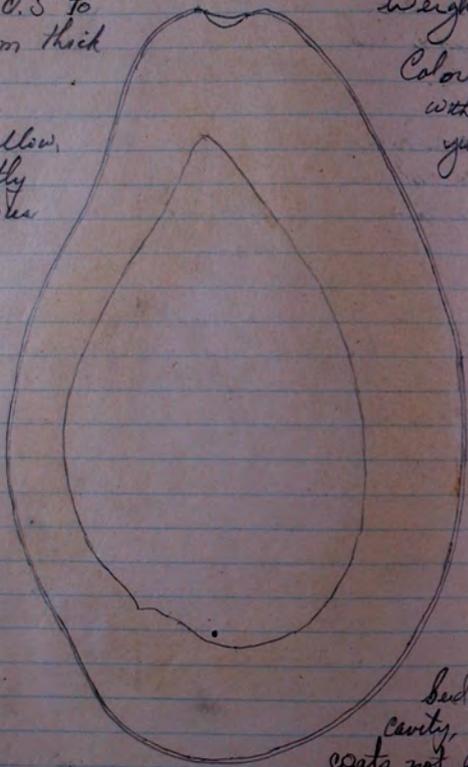
Skin 1 to 2 mm  
thick

Flesh light yellow; no fiber

Seed too large; otherwise a pretty good fruit

Skin 0.5 to  
1 mm thick

Flesh yellow,  
slightly  
fibrous



Weight 26 gms

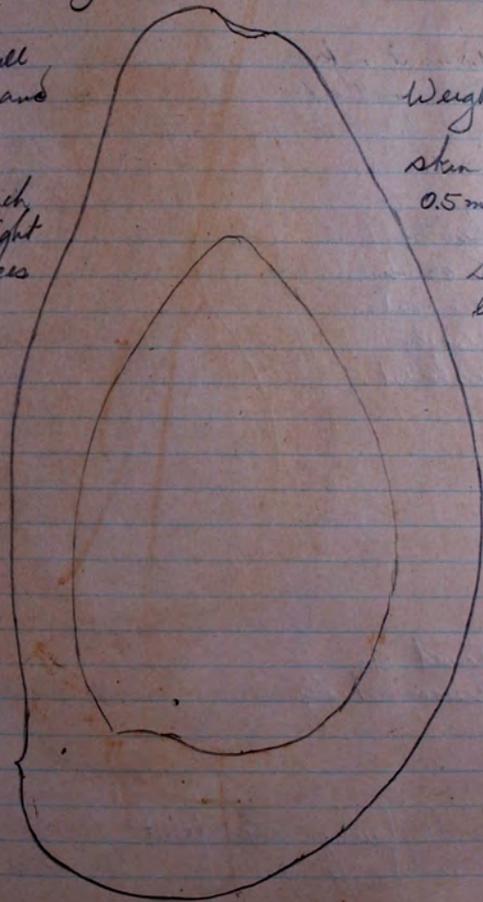
Color green  
with numerous  
yellowish  
spots

Seed tight in  
cavity, but seeds  
eggs not adhering  
closely

Seed too large; otherwise a fine fruit

Color dull  
purple and  
green

Flesh rich  
yellow; slight  
fibrousness



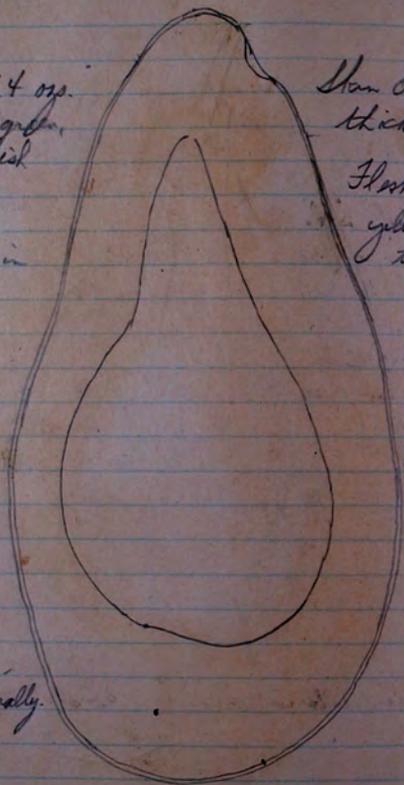
Weight 27 gms

Skin scarcely  
0.5 mm thick

Seed slightly  
loose in  
cavity; seeds  
separate

Weight 24 ops.  
Color dull green,  
with purplish  
mottlings

Seed tight in  
the cavity,  
seed coats  
closely  
adherent.



Fruit com-  
pressed laterally.

A fairly good fruit.

Skinn 0.5 to 1 mm  
thick

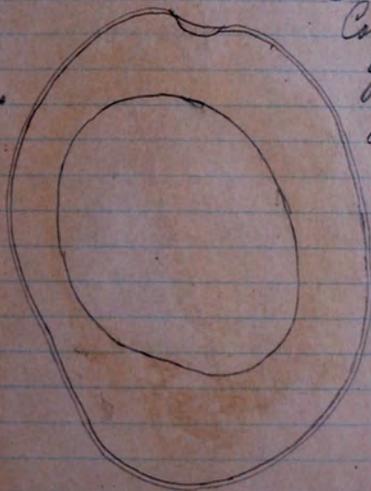
Flesh pale  
yellow, fibers  
tender

Weight 11 ops

Color light  
green, sweet  
yellowish dots

Flesh pale  
green, fibrous

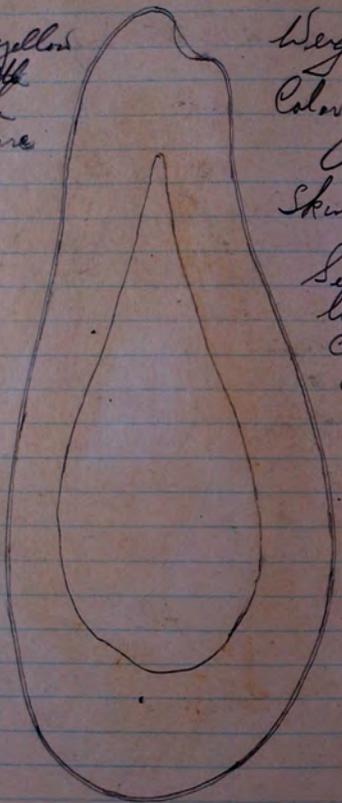
Skinn 0.5  
to 1 mm thick



Seed tight  
in cavity,  
with both  
coats adhering  
closely

An inferior variety: fibrous and large-seeded.

Flesh rich yellow  
with a little  
fiber in the  
neck, elsewhere  
clear



Weight 12 gms  
Color yellow green

Skin 0.5 mm thick

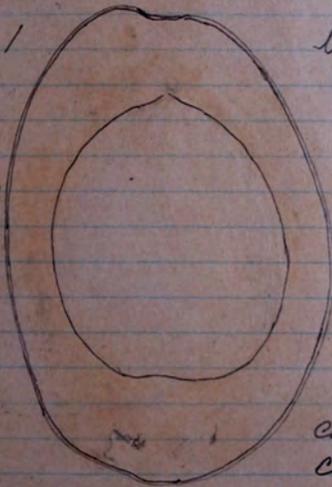
Seed slightly  
loose in the  
cavity, seed  
coats separate

A good fruit, apart that seed is rather large

A fruit of rather inferior quality

Skin 0.5 to 1  
mm thick

Flesh  
whitish cream  
color, with  
fiber markings

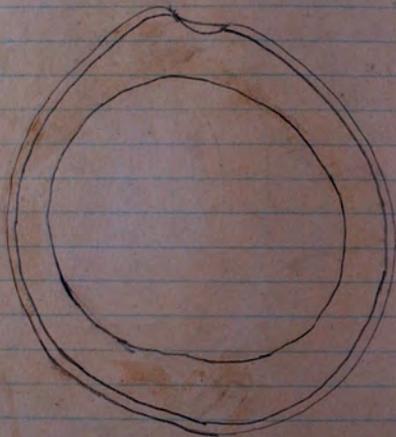


Weight 8 gms

Color light  
yellowish green,  
large yellowish  
dots

Seed tight  
in cavity  
with both seed  
coats adhering  
closely

A thick-skinned fruit, of good shape but having an unusually large seed.



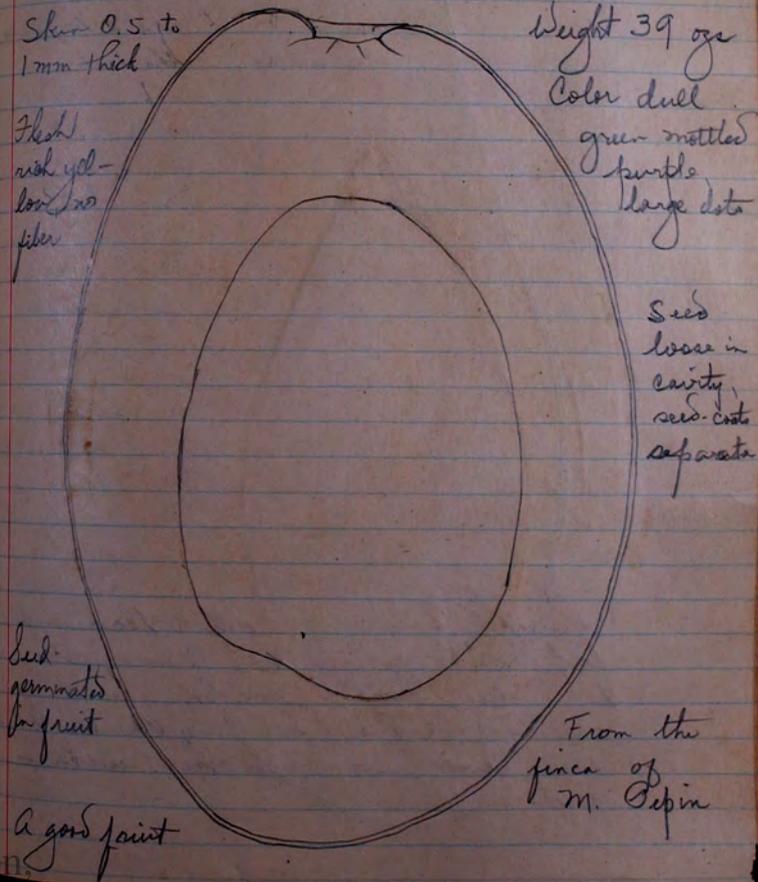
Weight 9 ozs. color yellow green, light with numerous large green dots; flesh pale green, with fibers (struts); skin 1.5 to 2 mm thick; seed tight in the cavity, with both seed-coats adhering closely.

Tuesday Rio Frio, Colombia Aug. 3 1930

Following are outlines of avocados obtained here:

Skin 0.5 to 1 mm thick

Flesh rich yellow, low in fiber



Weight 39 ozs

Color dull green mottled purple large dots

Seed loose in cavity, seed-coats separate

Seed perforated in fruit

From the finca of M. Sepin

A good fruit



Weight 20 ozs

Surface undulating  
light green mottled  
purple, numerous  
small dots.

Skin 0.5 mm thick

Flesh greenish yellow  
fiber traces  
neck.

Seed nearly  
tight in cavity,  
seed-coats  
easily separate

Cotyledons are  
toward upper end

Seed too large for  
the fruit to be well  
valued

A good fruit

Weight 21 ozs

Surface slightly  
wrinkled, yellow  
green in color

Skin 1.5 to 2  
mm thick

Flesh rich  
yellow, with  
fiber markings

Seed almost  
tight in the  
cavity, the two  
seed-coats sep-  
arate.

Cotyledons smooth.

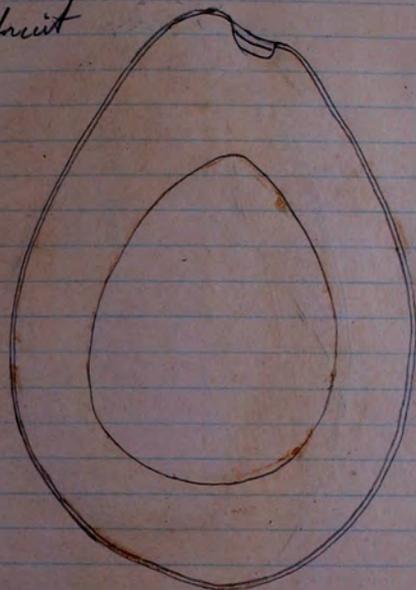
The seed had germinated in this fruit.



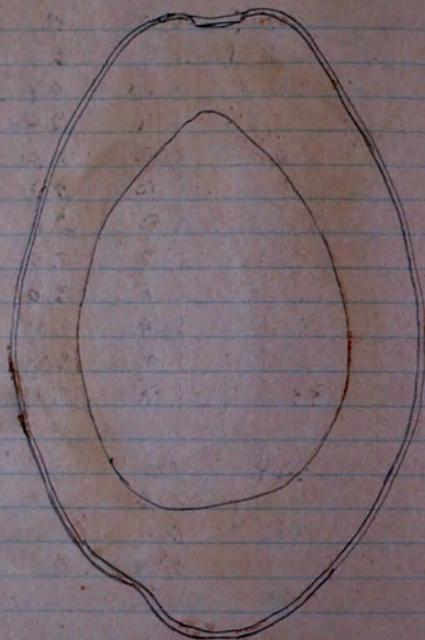
Seed too  
large

Weight 15 g; surface lightly pitted,  
deep maroon purple in color; skin 0.5  
to 1 mm thick; flesh greenish cream  
cream-color, with a few fiber markings;  
seed almost light of the cavity; the  
seed-coats separate.

A good fruit



Weight 12 g; surface smooth, dull  
green flushed purple, with numerous  
small dots; skin 0.5 to 1 mm thick.  
flesh red yellow, with fiber discolorations  
but no fibers. Seed quite loose in the  
cavity, one seed coat adhering to the  
cotyledons, the other forming a lining to  
the cavity.



Height 15 eggs, surface smooth, deep purple, almost glossy, in color; skin to 1.5 mm thick, flesh greenish cream color, no fiber, seed almost tight in the cavity, seed coats separate.  
Not a very good fruit.

Rainfall at Rio Frío (Inches)				U.F.C. records	
	1910	1911	1912	1913	1914
Jan	0.03	0.0	0.0	0.0	0.0
Feb	0.02	0.0	0.0	0.01	0.0
Mar	0.58	0.0	0.0	0.0	0.0
Apr	0.39	3.23	0.0	1.86	1.74
May	8.54	6.06	2.20	5.76	1.18
June	6.19	4.50	1.62	7.46	1.28
July	4.42	1.73	0.38	1.20	0.58
Aug	3.00	1.54	2.68	2.89	1.06
Sept	9.98	0.82	3.05	6.27	3.83
Oct	11.39	5.91	16.05	5.72	7.99
Nov	10.19	5.09	9.07	1.80	2.76
Dec	0.83	0.0	0.10	0.15	0.00
Total	55.56	28.88	35.15	33.12	20.42

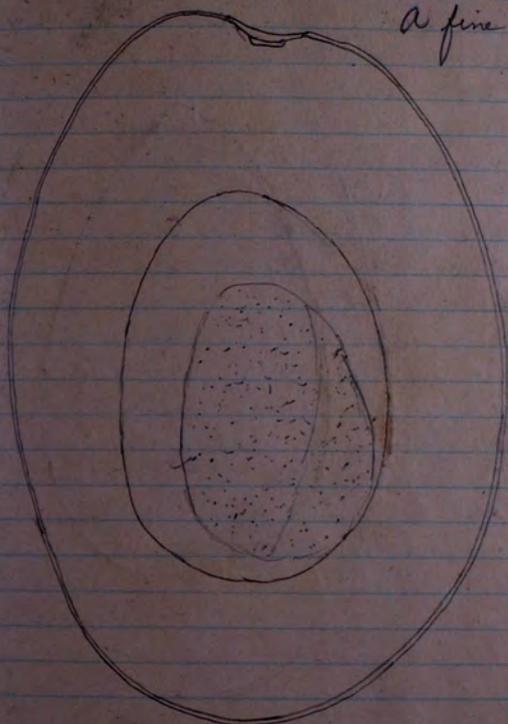
  

	1915	1916	1917	1918	1919
Jan	0.16	0.0	0.10	0.0	0.0
Feb	0.42	0.0	0.0	0.0	0.0
Mar	0.63	0.20	0.0	0.0	0.0
Apr	3.19	0.83	0.10	0.56	5.02
May	3.72	5.33	4.94	9.84	6.50
June	5.95	6.85	4.76	4.32	3.25
July	8.20	8.68	6.55	1.59	0.55
Aug	3.40	14.17	5.18	0.18	1.96
Sept	7.79	12.01	10.98	7.49	6.10
Oct	11.85	10.32	7.71	10.64	9.22
Nov	8.49	16.26	5.10	0.81	4.46
Dec	1.51	0.00	0.12	0.00	0.75
Total	55.31	74.65	45.54	28.43	37.79

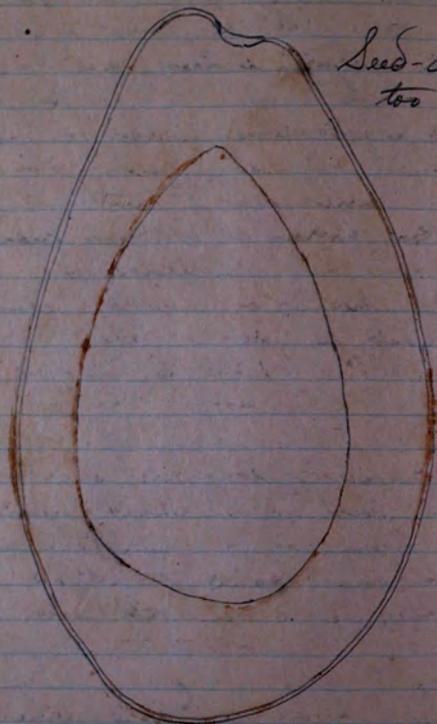
## Temperatures at Sevilla (U.F. Co. raco)

	max	min	max	min	max	min
Jan	99	70	97	64	94	69
Feb	93	67	97	58	95	72
Mar	94	67	96	62	94	75
Apr	94	71	96	69	95	73
May	93	73	97	73	97	74
Jun	94	70	99	72	95	73
July	92	69	97	71	95	72
Aug	92	69	98	74	95	72
Sept	97	72	100	71	94	72
Oct	94	70	98	71	93	72
Nov	93	69	95	71	90	70
Dec	95	69	97	69	91	67
	1913		1914		1915	

a fine fruit



Weight 26 gms. surface smooth, light yellow-green  
 in color, with many large yellowish dots; skin 0.5  
 to 1 mm. thick; flesh ~~is~~ cream-yellow, free  
 from fiber discolouration; seed small, loose in  
 the cavity, seed-coats separate, inner one in  
 fragments.



Seed-cavity  
too large

Weight 180 mg: surface slightly albed, bright  
green in color, glossy; skin 1 mm thick; flesh  
yellow, with some fiber discolorations; seed  
fatty loose in cavity, seed-coats separate; cotyledons  
with cuticle rough.

Jean Pepin, superintendent of the Rio  
Trio district, United Fruit Co, is a French-  
man who came to Colombia in 1892  
with a scientific expedition. He is a com-  
petent botanist, having been trained at  
the Jardin des Plantes in Paris, where  
he had charge of all the seeds which came  
in from foreign lands. He was an inti-  
mate friend of Edouard André. His  
address is Jean Pepin, c/o United  
Fruit Co, Santa Marta, Colombia.

Orawaak indians from the mountains  
near Rio Trio, when questioned regarding  
the name of the avocado in their  
language, said that it was called  
apacate as in Spanish.

Pinapples of two varieties are grown  
here; one seems to be of the Smooth  
Cayenne group and the other is much  
like Red Spanish, so far as I can judge  
from the specimen I have seen. Jean  
Pepin says the latter variety bears in about  
half the time required by the Smooth Cayenne.

Wednesday Rio Frio, Colombia Aug. 4  
 Elevation (from railroad level) about 6500

The avocados which are exported through Santa Marta are grown in the vicinity of Ciénaga and Rio Frio, the former 35 hours from Santa Marta, the latter 49, on the Ferrocarril Santa Marta.

This region is a coastal plain, formed of sediment washed down from the nearby mountains. The plain is perhaps 2 to 4 miles wide, level, and here lies at an elevation of 25 to 75 feet above sea level. The streams which have their origin in the mountains and flow down to the sea across this plain furnish water for irrigation. Bananas are now the principal crop, formerly much cacao was grown, and the production in the region of Ciénaga is still considerable.

Avocado trees were formerly grown as shade in the cacao plantations (and are still, in the Ciénaga district) along with sapotes (*Lucuma mammosa*), star-apples, mangoes, and a few other fruit trees. Thus it comes that the number of these trees is considerable in the Rio

Frio district most of the cacao has been taken out to make room for bananas, and with it have gone the avocados in many cases. A few of the avocados have been left.

While a closer approximation can not be made without examining the plantations more carefully than I have been able to do, I estimate the number of avocado trees in the Rio Frio district to be not over 1000, and in the Ciénaga district (mainly in the section called Córdoba) there are perhaps 2000 to 3000 trees. These are all large trees probably 25 to 50 years of age (I have seen very few which appeared to be of great age, - i.e. 100 yrs) and in form nearly all are stout or even slender, due probably to the fact that they are more or less crowded among other trees, and that they have been pruned up from the ground to have room for the cacao below. Trees grown in isolated situations, and around houses, sometimes are broader in form, but the majority of these, also, are erect to slender Broad, spreading trees are quite uncommon.

Along with the crops beneath them (bananas and cacao) the trees are irrigated every month or six weeks at the season when rainfall is scanty. The ground beneath them is usually clean and well-shaded. They receive no fertilizer nor any cultural attentions save from irrigation.

The fruit, even when intended for exportation, is knocked from the tree with a pole and allowed to fall to the ground, so one man expressed it to me "Some of them break open, and some don't". Occasionally the drupes are much as 40 or even 50 feet. The tallest trees here are about 60 feet high. I should say the average height is between 50 and 60 feet.

All of the trees in this region are of the West Indian race, and a finer lot of fruits I have never seen. That is, I have never seen a lot which would average so good as this. Indian varieties in Florida may in some instances be better than any grown here - I have not as yet seen or good a fruit as collected in this region - but on the average they are by and of good

quality. The great majority of them, however, are disqualified for cultivation in the States by the large size of the seed cavity. This is the only defect of many; others have, in addition, fiber markings or discolorations in the flesh to an undesirable degree.

I have not yet seen the trees in the mountains near Santa Marta; these are said to produce smaller fruits than those of this region, with a larger proportion of seed to flesh. Two or three of the fruits brought in the market of Santa Marta and outlined on preceding pages are probably of this kind.

W. J. Krome of Florida told me that the Santa Marta avocados reached New York in April and May, and he thought we might find here an early-ripening variety which would be of value for Florida. But it looks now to me as though the reason fruits can be marketed from this region in April and May lies in the climatic conditions, and not in the earliness of the varieties. Of course there may be some early varieties here too, but they cannot be located at this season of the year.

M. Jean Papin tells me that the trees ordinarily flower here in December. The fruit commences to mature in March and during March, April and May, and sometimes extending into June, ships are made to New York. I am strongly inclined to suspect that much of the fruit shipped in March and April is picked before it is at its best; but allowing for this, the ripening season is probably about 3 months earlier here than in Florida, due to the extreme warmth of the climate.

There are still a few fruits hanging on many of the trees, and these are found to be fully ripe and in prime condition at this time, August 3rd and 4th. In some of them the seed has germinated, as it sometimes does in a Trapp fruit along toward January or February.

A few trees in this region produce a second crop, though it is too amice to be of commercial importance. They flower in August after the main crop is off, and ripen perhaps 2 dozen fruits in December. M. Papin concurs with me in believing that this is more likely

a climatic effect than an inherent characteristic. It gives rise to the false idea here of trees which bear two crops a year or which bear all the year round. It seems likely that these trees which produce a light second crop are ones which have not produced to their full capacity in the main crop.

M. Papin says he has noted that the broad-leaved or large-leaved trees bear little or no fruit. This agrees with my own observation. He also says that the trees here bear regularly every year; some seasons the crop is large, some seasons small, but he does not think the trees of two moses a year entirely, as the Guatemalans or others do. He thinks the size of the crop is correlated with the amount of rainfall; in a wet season it is large, in a dry season, small. If there are no rains at the time the fruit is maturing it remains small; if the rains come it swells very quickly and almost doubles its size.

There is a belief here that the green-colored fruits carry better than the purple; it is said that the buyers in New York acquire only green ones. This is, probably,

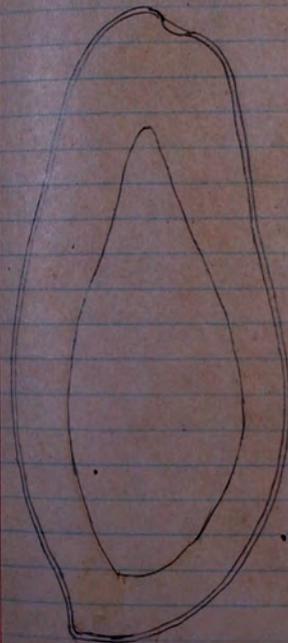
not because the green ship better but  
because the troops has prejudiced the  
market in favor of the green-colored fruit.

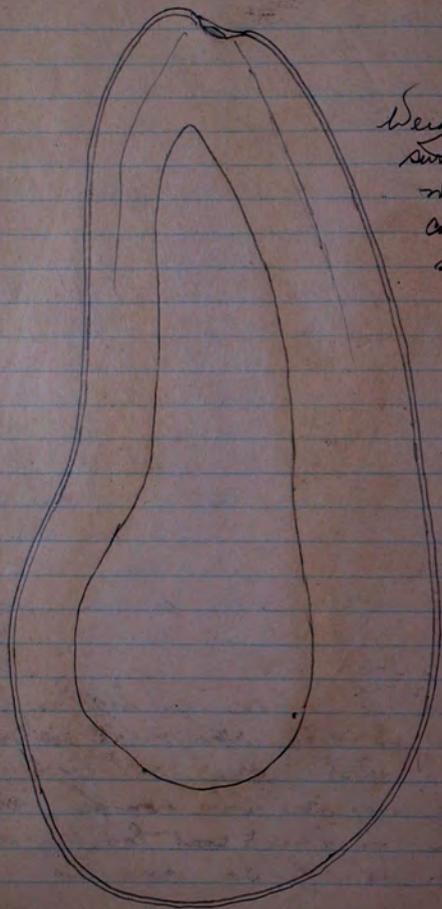
Thursday Rio Frio, Colombia Aug. 5 1920

The following avocados, obtained in the  
market here, were photographed as specimens  
of the sorts grown in this region:

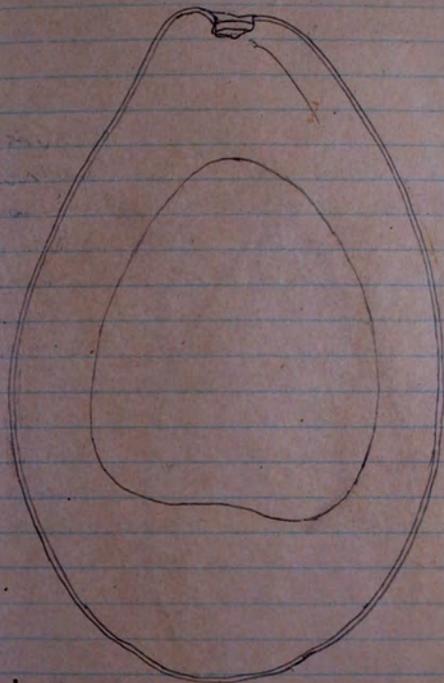
An inferior sort.

Weight 6 gms; surface  
smooth, light yellow-green  
in color; skin 1 mm  
thick; flesh light cream  
color with faint fiber  
markings; seed loose  
in the cavity, with  
the seed coats sep-  
arate, on surrounding  
cotyledone loosely, other  
lining cavity.

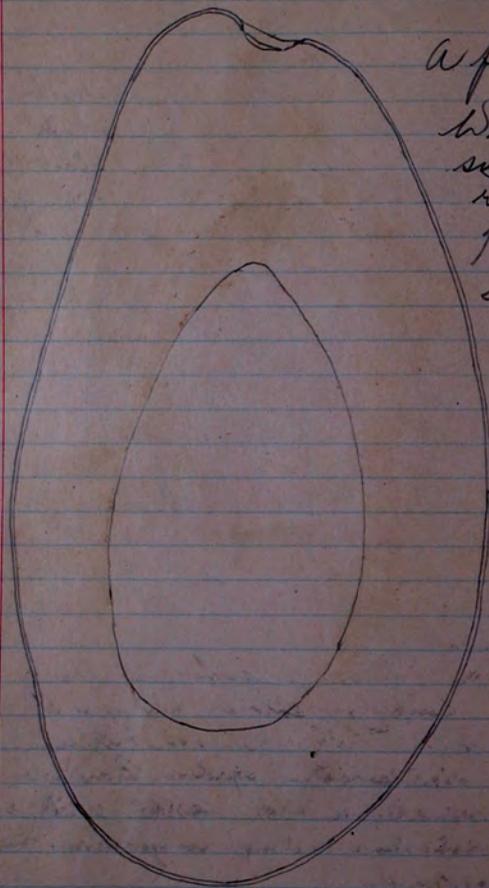




Weight 260 gms;  
 surface smooth,  
 moss-green in  
 color. But many  
 small yellowish  
 dots; skin 1 mm  
 thick; flesh  
 cream-yellow,  
 with well-marked  
 fiber strands,  
 seed lying in  
 the cavity, with  
 the seed coat  
 loosely coherent

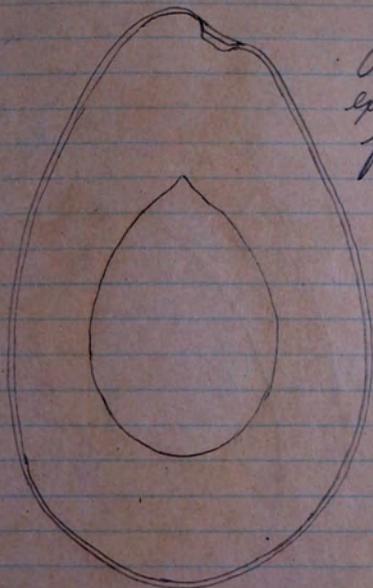


Weight 180 gms; surface lightly pitted,  
 dull green in color, with small yellowish dots;  
 skin 1 mm thick; flesh red yellow in  
 color, with very few fiber markings; seed loose  
 in cavity, one seed coat loosely surrounding  
 cotyledons, other lining cavity.



A fine fruit

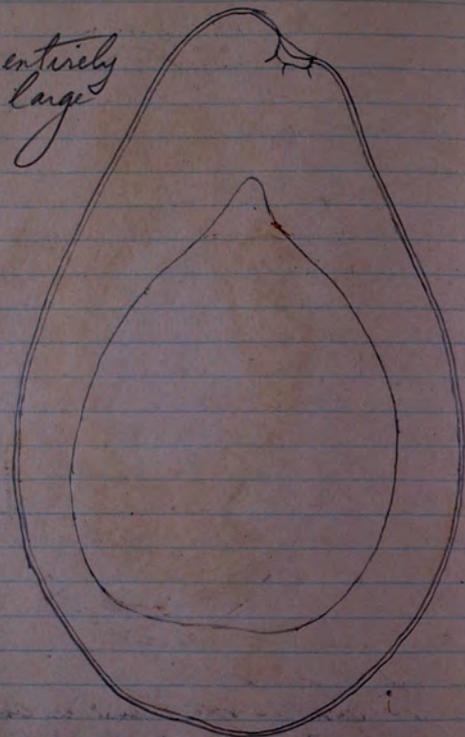
Weight 33 ops  
 surface faintly  
 ribbed, deep pur-  
 ple in color,  
 glossy, skin 1  
 mm thick,  
 flesh yellow,  
 perisperm  
 firm, distinct  
 location, seed  
 loose in  
 cavity, one  
 seed coat  
 surrounding  
 cotyledons, the  
 lining seed  
 cavity.



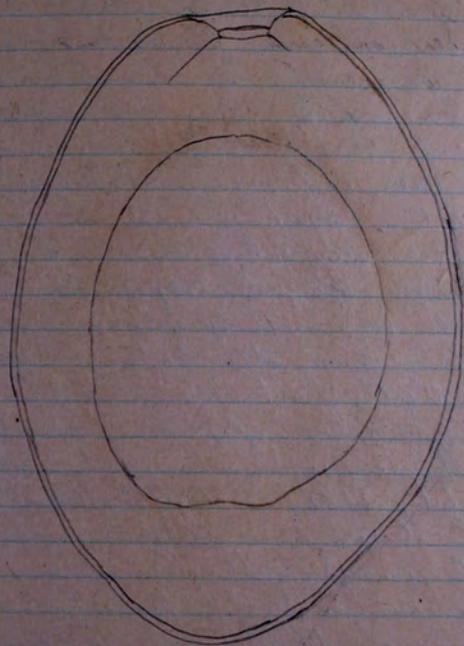
A fine fruit,  
 except for  
 fiber markings  
 in flesh

Weight 12 ops; surface pitted, dull  
 margin purple in color, very few dots; skin  
 1 to 2 mm thick; flesh yellow, with  
 rather objectionable fiber markings; seed  
 fitting snugly in its cavity, with one seed  
 coat closely surrounding cotyledons, the other  
 lining seed-cavity.

Seed entirely  
too large



Weight 95 mg; surface faintly pitted,  
light yellowish green in color with many yellow  
dots; skin not quite 1 mm thick; flesh light  
greenish yellow, with fiber markings; seed tight  
in cavity, seed coats more or less coherent



Weight 18 mg; surface smooth, light  
green mottled dull purple, numerous  
large pale green dots; skin 0.5 to 1.5 mm  
thick; flesh pale cream color few fiber  
markings; seed loose in cavity, one seed  
coat surrounding cotyledons, other lining the  
cavity.

Avocado No. 46, in good at Superintendent's  
Esperanza farm, United Fruit Co. Rio Frio

Avocado  
No. 46

Fernandez

This tree flowers in December. Fruit begins to ripen in April, being the first to mature of all the varieties hereabout. Main crop April, May & June. Some fruits remain until August. Sometimes flowers a second time in August to give 2 to 30 fruits in December. A good bearer, giving in the main crop, at least 500 fruits. An excellent fruit for eating.

The tree is about 50 feet high slender in habit, with a straight trunk 18° back at the base, and branching about 10 ft from the ground. The leaves are large, elliptical in outline. At present there are no buds or flowers on the tree.

The fruit is oblong-oval in form, and weighs about a pound and a half. The surface is light yellow-green, marked with numerous small yellowish dots. The skin is of firm texture, 0.5 to 1 mm thick, and the flesh buttery, fine grained, deep yellow in color (turns brown green near the skin), without any trace

of fiber or discoloration, and of rich, very pleasant flavor. The proportion of flesh to seed is much larger than is common. The flesh being about an inch thick on the sides of the fruit. The seed is small, and quite loose in the seed-cavity, which is also small. The seed-coats are separate, one loosely surrounding the cotyledons, the other lining the seed-cavity.

I believe I will name this the Fernandez avocado, in honor of Joaquin B. Fernandez, manager of the Santa Marta Division of the United Fruit Co.

432. *Persea americana* Avocado No 46, from Rio Frio, near Santa Marta. In 2 packages. Sent by mail, together in a cloth sack young and old budwood.

Saturday Santa Marta, Colombia Aug. 7, 1908

I went today to the mountains about ten miles from Santa Marta to see the "wild" avocados of which I had heard. They are found abundantly near the road to O. S. Fly's finca 'Cincinnati', at elevations between 2000 and 3000 feet (nearer the former than the latter).

While several people have told me that the avocado is indigenous in these mountains, it is very evident to me that the species is not indigenous but naturalized. In the first place, there appears to be no other species of *Persea* indigenous in this region, such as those which one sees in other parts of Costa Rica (in other words, this does not appear to be a region in which *Persea* occurs or are naturally distributed); secondly, the so-called "wild" trees are found along roadsides in a region which has been inhabited for a long time; and thirdly, the trees exhibit entirely too much variation in fruit characters for a wild species.

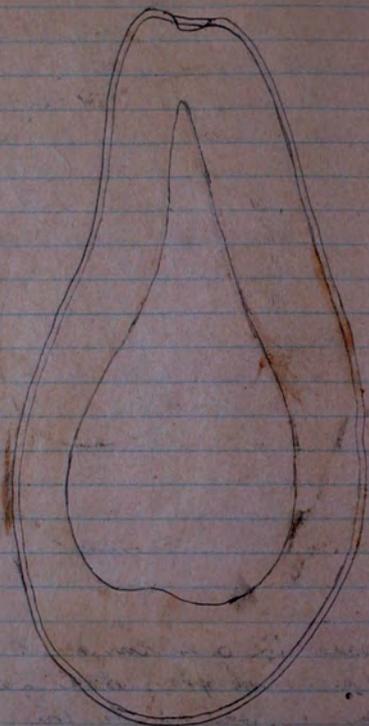
It is my opinion that the avocados were brought to this region at some remote

time (not necessarily very remote; 100 to 200 years would be ample to give it an opportunity to reach the state of spontaneity it now occupies) and finding natural conditions very favorable, it has rapidly become naturalized. The species *Eugenia jambos* forms small forests in the same general region, having become perfectly naturalized.

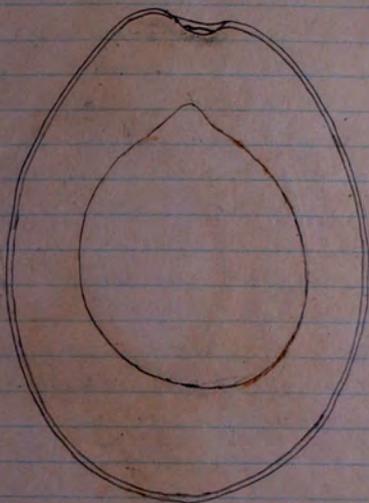
There are small forests of avocados in the mountain valleys, sometimes practically pure stands. The avocado trees are slender in habit and ordinarily 40 to 50 ft high, with straight slender trunks. Many of the trees bear profusely, though some I saw had a large crop, as I have sometimes seen on cultivated trees.

The season of ripening is June to August at 2000 - 2500 ft elevation. The fruits are now falling to the ground, where they are picked up by the natives to eat or to feed to their hogs. Many, however, are not picked up, but allowed to rot on the ground.

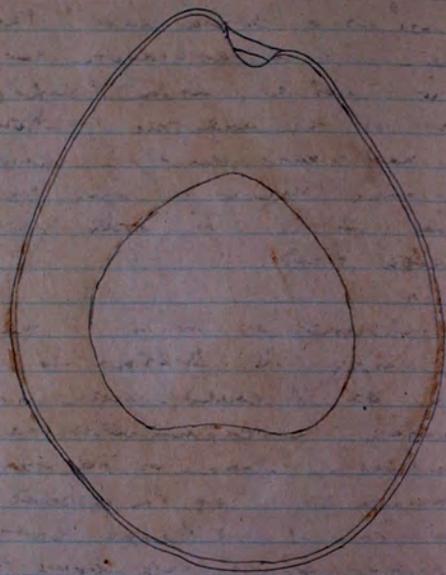
Following are three specimens I picked up:



Weight 14 gms; surface pale green, with few scattered yellowish dots; skin 1.5 thick, flesh cream color, tinged green near the skin, with few fiber discolorations; seed tight in the cavity, with both seed-coats surrounding it closely.



Weight 12 gms; surface smooth, light yellow green in color, with few dots; skin 1 mm thick; flesh pale greenish cream-color, with few fiber discolorations; seed tight in the cavity, with both seed-coats surrounding it fairly closely.



Weight 15 ozs; surface light green, with numerous yellowish dots; skin .5" thick; flesh cream color, free from fiber discolorations; seed tight in the cavity, seed coats loosely coherent.

It is a curious fact that all of these "wild" avocados are green in color. Not a single purple fruit was seen by me, and my native guide said he had never seen one either. The common color is a very light yellowish green, some of the fruits having a decided yellow cast.

The range of form is nearly as great as among the cultivated avocados, so far as I could judge. I saw no round fruits; the commonest shape seems to be pyriform or one of its variations. The average size of the fruits is probably between 6 and 10 ozs, but there are plenty which are above 10 ozs, see those on the preceding pages. It is interesting to note that the seeds in these "wild" fruits are relatively smaller, probably, than in the "cultivated" varieties of the Rio Frio region. The flesh was not yet yellow in any of the fruits I examined, but was commonly a pale cream color. Very few of the fruits showed any fiber markings, and in some was there as much fiber as I have found in some of the

"cultivated" fruits I have purchased here. The flavor is in many cases very nutty, which I think is due to a trace of the anise-like element found in the true wild avocado of Costa Rica; but there is not, I think, so much oil in the flesh as there is in many of the cultivated forms. The seed in all fruits I have found was tight in the cavity, that is, it did not rattle, but the two seed coats are not always closely coherent. Sometimes they separate very easily, the outer one adhering to the wall of the seed cavity.

In my mind, the most serious defect of these "wild" fruits is the pale, whitish color of the flesh, and its somewhat watery texture. I do not think the oil content is high enough in most of them to meet our needs.

Wednesday La Esperanza, Colombia Aug. 18 1928

After being nearly ten days on the way from Santa Marta through country that was little different from the lowlands of Mexico and Central America (though nevertheless interesting) I have reached this point, only a few hours by rail from Bogota, and in a region which seems to be, at last, to have new characteristics, a new atmosphere. I am, in short, decidedly interested, after a considerable time in more or less uninteresting country of about the same kind as I have been seeing for several years.

The elevation here is 4000 feet. I had been told that it was 7000. Passengers from the lowlands often stop here a day before proceeding to the cold mesa of Bogota. Some of my fellow-passengers from the Magdalena steamer (Ludley Smith, Ignacio Uribe, and the Chilean secretary) were stopping, so I dropped off with them. The Chilean has advice to put on woolen underwear here, not to bathe in cold water, and to cover his throat well when he goes on to Bogota. One would think he was

undertaking a false expedition for my part. San Giovanni, has the danger of going from the hot lowlands to Bogota is much more imaginary than real.

It is not cool enough here to account for you to Bogota, my way. This is coffee country, and rather warm coffee land at that. Probably a little warmer than Angola in Mexico. But it is interesting, the hills are brightened with many patches of glass rock (probably an Euphrasia) and there are many interesting fruits on sale at La Mesa, 45 minutes below here. I saw several a mixture of orange and passion fruit juice at dinner, and there were fine pineapples, mandarins, mangoes, grapes, the tomatoes, cucumbers, and several other fruits on sale.

After a long and somewhat tiring journey I feel that I am getting somewhere.

Next morning. Ah! but the air is fresh and cool. Here and there sounds of running water delightful.

Prof. Floyd Balliere of Nashville Agricultural and Normal Institute, Madison, Tenn. wants

*Canna liliiflora*, described from the Procs. of Veraguas, Panama, 1443 m. Flowering stems are terminated by almost sessile clusters of 4 to 6 pale yellow, fragrant flowers, tinted pink and purple. Grows in damp or swampy situations.

4332 *Canna* sp.

A common wild plant in the mountains south of Santa Marta, at elevations not greater than 9000 ft. Its stems reach to 10 feet in height, and are surmounted by clusters of small flowers, bright yellow spotted with orange-red. Of interest only to those engaged in gene breeding.

Please send some of this seed to John Dilling, Station for Experimental Evolution, Cold Spring Harbor, L. I.

Thursday Bogota, Colombia Aug 26 1928

Hermano Apolinario Maria, of the Instituto de la Salle, gives me the following list of food plants used by the Chibcha Indians in pre-Columbian times:

maiz comun	Zea mays
patatas	Solanum tuberosum
quinua	Chenopodium quinoa
parico	" aptencoides
Cebios	Tropaeolum tuberosum
tubias	Opalis tuberosa
Cuyva rosada	Ullucus buntii
Cuyva peruana	" tuberosum
Amacacha	Amacacha esculenta
yuca	Manihot sp.
Aji	Capsicum frutescens

Friday Bogota, Colombia Aug 27 1928

Packed the following for shipment to Washington via Diplomatic Pouch:

433a. Canna sp. See page 125

434a. Zea mays. Maicito. Small white short corn, ears 4 to 6 inches long, said to come from the hot country. Purchased in Bogota market.

435. Solanum tuberosum. 15 tubers of a smooth, somewhat flattened, red-skinned potato, Bogota market. Caicedo potato.

436. Solanum tuberosum. 25 tubers of the Tempranera potato, an early variety of round form, rather small size, and light brown skin.

The *Ferrea* collected by Pittier (No. 5915), to which I referred in my paper, was collected at La Pastora in the vicinity of Caracas. It was in good flower on February 28, and is said to bear ripe fruit from February to April. Its local name is *vacuquina* (Venezuela), and the single specimen which we have is remarkable for its short, dense, axillary panicles, only about an inch long. The leaves are indistinguishable from those of the West Indian *Leucaena*. The fruit is said to be yellow at maturity.

There is another *evocado*, collected by Pittier on March 19, 1916, at Curucuti, which looks precisely like *maricansis*, but which has the ovary glabrous except at the apex and the stipes of the staminal glands very short. This may be a mere form of *maricansis*, but it would be desirable to get more material if you visit this locality.

Letter from S. F. Blake,  
dated July 9 1930

Thursday La Esperanza Colombia Sept 2 1930

*Erythrina utilis* Tr.

Boliv. Called *Chachafruta* in Antioquia, *frijol ropas* in Santander.

A small, soft-wooded tree whose seeds are an important food in certain parts of Colombia, notably on the western slope of the Cordillera Oriental. It is sometimes planted for shade in coffee plantations, and it is often seen in dooryards and about the habitations of the natives. Andacina, in Guandacama, is said to be one of the most important centers of production. The tree is found in the part of Colombia mainly at elevations of 5500 to 6500 feet.

The tree is smaller than some of the other *Erythrinae*, rarely growing to a great height than 25 feet. Its leaves are trifoliate, with the leaflets greatly ovate, up to six inches in length. The flowers, which are produced in short spikes, are orange-scarlet in color.

The fruit is a plump pod up to

a further length, and one inch or more in thickness. It contains several brown seeds, of the form and character of the common bean, but much larger; ordinarily they are one to two inches in length.

When fully mature the pods are packed and the beans are prepared for eating by boiling or sautéing. The study shows a pigment which covers them, must be removed. The cuticle was seen to be thin and of very fine texture, and of a delicate flesh, faintly suggesting the common white bean. This is indicated by the Indians one of their best foods.

Saturday Bogota, Colombia Sept 4 1920  
Packed for shipment the following:

437a. *Erythrina utilis*, Bali, from La Esperanza. 150 seeds in 3 pkgs of 50 seeds each; chopped affognum and powdered charcoal. See herb. no. 1062  
1039

438a. *Rubus* sp. Blackberry from La Dorada above Esperanza. See herb. no. 1045

439a. *Rubus* sp. Blackberry, like the one from La Dorada (i.e. same species) but from a different plant.

440a. *Solanum*? Climber with fruits like a small tree-tomato, from between Esperanza and Zipacón. See herb. no. 1047

441a. *Datura* sp. Borrachera, from near Zipacón, 2 pods for W. E. Safford.

442. *Solanum tuberosum*. Papa criolla. 15 tubers, Bogota market. Round, red-skinned potato, with rather deep eyes.

443a. *Zea mays*. 1 lb. of yellow corn, Bogota market. Grains fat and sulfur-yellow, starchy.

444. *Tropaeolum tuberosum*. Cubid.  
Bagota market

445. *Fragaria* sp. 12 Strauberg plants,  
native species Herb 1106

Wednesday Bagota, Colombia Sept 8 1930

In walking between Nemason and Zipaguira Tracy I recorded the number of strides taken and time consumed for several kilometers. I was walking about as fast as I comfortably could along a level railroad track, most of the time on a hard path - occasionally on the ballast for short distances. I made five kilometers as follows:

1. 543 strides  
9 minutes to cover the kilometer
2. 546½ strides  
8½ minutes
3. Count of strides confused; record lost  
9 minutes.
4. 547½ strides  
8½ minutes
5. 568 strides  
9½ minutes

Rainfall at Bogotá José Alvarez  
 Lleras, "Contribución a la Meteorología  
 Colombiana", Proc. Second Pan Am. Sc. Congress

Year	Quantity		
1866	1.0208 mm	1891	1.0982
1867	0.8894	1892	1.1850
1868	1.1614	1893	1.1580
1869	0.9506	1894	1.1192
1870	1.3856	1895	0.7701
1871	1.3659	1896	1.2710
1872	0.9451	1897	1.1711
1873	0.8819	1898	1.0397
1874	1.2205	1899	0.4286
1875	1.1762	1900	1.0329
1876	1.1646	1901	0.9323
1877	0.9133	1902	0.7744
1878	1.1927	1903	0.9370
1879	1.6337	1904	0.9267
1880	1.2396	1905	0.9900
1881	1.1396	1906	0.8942
1882	0.6944	1907	1.1393
1883	0.8128	1908	1.0757
1884	0.9454	1909	0.9346
1885	1.3109	1910	1.4544
1886	1.1387	1911	0.8844
1887	1.0797	1912	0.9477
1888	0.9280	1913	1.0877
1889	1.1747	1914	0.8194
1890	1.3222		

Rainfall at Bogotá, per month in millimeters, from 1900 to 1914 inclusive

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1900	139.2	89.4	100.4	21.7	134.8	30.5	41.2	46.6	34.4	511.6	22.8	4.0
1901	18.4	79.4	57.9	46.9	78.4	16.0	56.4	107.2	41.4	194.0	22.5	57.8
1902	112.3	37.4	158.3	87.6	52.0	23.5	9.8	54.9	50.2	83.6	107.5	27.3
1903	30.3	40.0	81.6	101.8	72.5	107.2	12.2	103.8	42.5	64.0	149.4	105.6
1904	47.0	68.8	160.6	175.0	112.4	22.1	34.6	20.4	35.0	154.8	34.2	26.8
1905	63.7	15.0	48.2	112.2	96.8	48.5	23.4	15.0	96.0	127.2	198.6	145.4
1906	19.5	70.8	58.2	178.7	108.4	81.6	46.9	34.1	11.2	136.0	94.2	44.9
1907	29.3	113.7	206.9	193.3	90.1	61.2	68.0	32.9	73.8	105.3	90.8	68.2
1908	76.0	53.9	120.2	89.5	34.8	32.8	38.7	55.4	72.2	267.8	106.8	120.0
1909	39.8	116.2	9.0	113.8	138.4	70.8	87.6	58.5	47.2	110.9	68.4	54.0
1910	132.2	52.0	218.5	74.6	24.3	85.0	119.4	31.2	79.2	209.4	79.2	122.8
1911	47.3	130.1	91.6	179.3	106.1	50.4	35.1	18.5	6.0	46.2	87.8	36.4
1912	52.1	88.5	53.7	104.4	52.8	26.6	46.1	113.8	58.5	99.7	142.2	89.2
1913	19.9	34.0	79.2	244.4	100.0	42.7	17.2	18.4	180.4	127.0	137.4	84.0
1914	29.4	30.3	23.4	172.0	21.7	22.0	13.0	40.0	13.9	136.1	214.8	102.7

The elevation of Bogota is given on the latest map as 2640 meters. Hence

$$\begin{array}{r} 2640 \\ 3.28 \\ \hline 21120 \\ 5280 \\ 7920 \\ \hline 865420 \end{array}$$

the elevation in feet is 8659.20  
or roughly 8660 feet.

Observations at the Observatorio Astronomico Nacional Bogota, 1890.

Month	Relative Humidity		Temperature		Mean	Rainfall in millimeters
	Maximum	Minimum	Maximum	Minimum		
January	72	18.58°	8.78°	13.18°	178.9	
February	68	17.69	8.43	13.06	076.7	
March	64	17.59	8.67	13.13	068.0	
April	77	17.68	10.18	13.93	198.6	
May	77	17.75	10.18	13.96	131.8	
June	63	18.17	9.97	14.07	026.0	
July	67	17.38	8.90	13.14	045.7	
August	67	17.10	8.30	12.70	094.5	
September	62	16.91	8.89	12.90	035.7	
October	76	17.42	8.66	13.08	204.4	
November	77	17.36	9.44	13.40	216.3	
December	74	17.40	8.80	13.10	058.9	

Saturday Bogota, Colombia Sept. 11 1920

Packed for shipment the following, and dispatched via diplomatic pouch.

446a. *Rubus* sp. The Colombian berry, or giant blackberry. Quantity of seeds packed in powdered charcoal with a little pulverized sphagnum. One lot separate, dry, in cloth sock. Herb. no. 1108.

447. *Oxalis tuberosa*. Hibia. Tubers packed in chopped sphagnum and charcoal. From Bogota market.

448. *Ullucus* sp. Chugua. Tubers packed like those of Hibia, 447. From Bogota market.

449a. *Tacsonia* sp. *Cucurbita* common kind, from Bogota market. Seed packed in sphagnum dust + charcoal.

450a. *Capsicum* sp. Yellow peppers from Bogota market.

451a. *Physalis* sp. Uchuba, from Bogota market.

452a. *Passiflora* <sup>ligularis</sup> ~~sp.~~ Granadilla, from Bogota market. Herb. no. 1094.

453a. *Rubus* sp. Large blackberry from Bogota market.

Mon Fusagasuga, Colombia Sept 13 1948

Road from Sibati to Fusagasuga

Time

0hr. Leaving Sibati it begins almost immediately a gradual ascent to a pass through the mountains which rise from the mesa of Bogotá.

1hr. Reaches an elevation of approximately 9500 feet and maintains this elevation for an hour.

2hr. El Peñon, at the outer end of the pass from the mesa, with a huge drop ahead. All of the rocky from this point to

3 $\frac{1}{2}$ hr. The descent is steep and continues. At this point there is a covered bridge across a mountain stream, and from there, the descent begins, and the road winds around the shoulder of the mountain with a gradual and great descent to

5 $\frac{1}{2}$ hr. Fusagasuga, 5750 feet.

Outline for 'Useful Plants of the Andes':

Cereals and Vegetables

Fruits

Beverage Plants

Plants Used for Seasoning and Flavoring

Fiber Plants

Plants Used for Coloring and Dyeing

Wool and Hair Plants

Miscellaneous Useful Plants  
Gums, narcotics, etc.

Mon Bogotá, Colombia Sept 20

Packed and dispatched via the Departmental Post the following:

454. *Begonia* sp. "San Pedro"  
Hand some red flowered species from El  
Penon, near Fusagasugui. See herb. 1112

455a. Malvaceous shrub "malvaceo"  
from Nemocón. See herb. 1075

456a. *Canca candamarcensis* from  
Bogotá market. See herb 1075

457a. *Tacsonia* sp. "Curuba de  
Castilla", Bogotá market

458a. *Cyclanthera splendens*?  
"Befuna" from Bogotá market

459a. Dicot. "Lulu" from Bogotá market  
*Solanum sanctum* Jacq

460a. *Prunus salicifolia*? Cerezo,  
from Bogotá market. Herb. 1077

461a. *Tacsonia* <sup>mita</sup> ~~mita~~ Red-flowered  
Curuba, from Bogotá market. Probably 1054

*Desfontainia splendens*  
462a. Dicot. shrub, with holly like  
leaves and red and yellow fls. from  
El Penon, near Fusagasugui. See herb. 1113

Tuesday Bogota, Colombia Sept 22

Packed and left at Legation to go free  
in Diplomatic Pouch

463a. *Triticum spicatum* focho wheat  
from Bogota market

464a. *Hordeum sp.* Perlasa  
barley, from Bogota market

465. *Solanum tuberosum*. Flat,  
light brown potato, mostly smooth.  
A good variety. Bogota market.  
10 tubers

466. *Solanum tuberosum*. Round  
rather irregularly shaped potato,  
mottled dull maroon and whitish  
brown in color; eyes not very deep.  
Bogota market

Wed Guaduas, Cundinamarca, Colombia Sept 24 1920

Thompson and I reached here at about  
5:45 pm, after a short day on the road.  
The route from Honda to this point, with  
the "running time" made by us with our  
spoke bikes, is as follows:

One hour. Honda. Elevation 750 ft. From the  
railroad station the route passes thru  
the center of town, crossing a bridge  
over the rio Guadalupe, passes through the  
business part of town, over another bridge  
like the first, then on to the Magdalena,  
where it crosses on the Puente de Navarra,  
a Cantalever bridge.

It then follows the east bank of the  
Magdalena, but at 200-500 ft from the  
stream, for a mile or so, through  
hilly country with abundant trees, affording  
shade, much of the time. It then  
makes a steep ascent of two or three hun-  
dred feet, and follows over broken country,  
without any length ascents or descents, for  
some time (see below).

3/4 hr. Tocuy. Elevation 900 ft. Not a  
more important spot than many others; but  
when we passed the night Tavern, 550 yds

beyond it is a small spring, which furnishes the only potable water found along the road for several miles.

After leaving Tocu, the road continues for not more than a half a mile over rolling ground, and then commences a long, irksome steep ascent up the mountainside. The road is exposed to the sun most of the time and the climb is hard. Dry and with no good water along the road for considerable distance.

5 1/2 hrs. Las Cruces Elevation 2100 ft.  
A small tavern on the mountain side, where made an ascent to town.

8 hrs. Summit Elevation 4300 ft. The highest point reached between Honda and Guaduas. Then the long ascent ends. The road passes over a divide and commences an arduous and heavy descent to the valley in which lies Guaduas. The grade in some parts is probably as much as 20%. The steepest portions are nearly all paved on the section from the summit down

toward Tocu. There are many stretches which are not paved, and which are in very bad condition.

After descending to the valley, the road leads across level ground for about a mile, with cult. lands on both sides, water at intervals.

10 hrs. Guaduas. Elevation 3200 ft.  
Over up one of the main streets to the plaza.

The distance from Honda to Guaduas is calculated by the natives of the region at up to seven leagues. A horseman riding a good animal can make the journey (as he said) in six hours, but pack trains take up to a day and a half.



13h 45m. Second summit, 5900 ft. At the foot a few vines are spread out before me, to find the south and east. The distance the escarpment of the plateau (Bogotá mesa) with the distance piled up against it and closer to the valley in which lies Villota. This valley is deep and rather long, but has a level floor, it is broken by some small hills and irregularities, and shows only a few small level areas. Cult. with cane in some spots.

Now begins a long descent, then a dry and fascinating region. The road is steep and not well paved, in many places very poor footing. Dry scrub, and some cultivation. No good water.

15h 15m. San Mateo. 3300 ft. The descent here reaches the valley of a small clear stream (10 ft x 6 ins) and crosses it. Sugar mill (small) near by, and group of three or four houses, one used for a school. The water for the stream is not very good. Dry scrub for the most part. We reached here at 12 pm and had up for the rest of the day, and slept here.

Sun. Albán, Cmarca, Oct. 3, 1920.  
Colombia

We reached this point at 1 pm today. Continuing the record of our trip from Honda, we have:

15h 15m. San Mateo. We left the point yesterday morning at 8.45. The road follows the course of the small stream by which we had camped. After half an hour or thereabouts it leaves the stream, and follows among the hills, gradually making a descent toward Villota. The vegetation on the surrounding hills is sparse, and there is not a great deal of cultivation.

16h 30m. Villota, elevation about 2650 feet. This is perhaps the most important and business-like town on the road, though considerably smaller than Guaduas. A small rock-faced ditch (18 ins wide, 6 ins deep) conducts clear water down one of the fine-appe streets to the central square or plaza, an open space about 100 yards across, which a market was going on when we arrived. There was much fresh produce on sale, and many people present. Then we had seen in the market of Guaduas two days previously.

Villota is the principal stopping point for travelers from Tacatacama to Honda and vice versa; horsemen divide the trip into two jornadas and pass the night in Villota. The shops are better stocked than those of Guaduas, having a small quantity of imported goods and our party are several hotels (one in Molleaves, which looks rather attractive is about half a mile out of town on the road toward Albain).

Thompson stayed in the edge of town with the baron, while I went on to the plaza and got some things to eat. We stopped where the road crosses a stream (10 ft x 6 in) about  $\frac{1}{2}$  mi from the edge of town and the water has a taste of some mineral or minerals and is scarcely to be recommended; but we drank it.

After lunch, we took the road again and followed the course of the Rio Villota for about half an hour on fairly level ground. We then crossed the river (30 ft. water not very clear) on a wooden bridge in bad condition, and soon thereafter began to climb.

This long ascent toward Albain is

rather so steep as the ascent which we made coming from Honda to Guaduas. It is a fairly easy grade, the road paved most of the way, and elsewhere not bad up to the point when we camped last night. The mountains through which the road climbs are not covered with rich vegetation; there is much brush and scrub, but no good forest. Little water is to be had for a couple of hours after leaving the Rio Villota, but as one goes higher it becomes more abundant.

On the 20th at La Libertad (time approximate, we stopped for a shower to pass over and I did not make an observation of the exact time lost). This place is nothing more than one of the oxycorde taverns which are so common along this road. Elevation 4300 feet. We camped here for the night under a galera; good water, but the quantity is very small.

Leaving La Libertad this morning at 9:30 we continued to climb gradually but steadily to Albain.

2 1/2 hr 45m Chimbe, Elevation 5700 ft.  
This is nothing more than a settlement of  
four or five detached houses, where mail  
trains sometimes stop for the night. No  
decent accommodations. Half a mile or less  
beyond the settlement is a telegraph  
office beside the road.

About this point the vegetation changes  
somewhat in character. Evidently the  
region is moister than that of lower  
elevations along the same road. Grass  
and low lands now appear, and substan-  
tially built farm houses here and  
there along the road, and large trees  
scattered about. Water is found abun-  
dantly just now, but all in a sudden  
dried up - no streams of considerable

24 hr 0m Albán Elevation about 7000  
feet. A small place - perhaps 500  
people at the most, but evidently busy,  
having long freights which are brought  
from Facatativa in carts, and are  
then loaded into mules back to be carried  
to Honda (and freights from Honda to  
Facatativa as well). Hotel Recatativa  
only one in town - about 6 rooms.  
I saw what felt like over town & past

Mon. Facatativa,amarca Oct 4 1920  
Colombia

Today Thompson and I reached Facatativa,  
completing the trip from Honda, as originally  
planned. He now thinks that he will con-  
tinue to Bogotá on foot tomorrow, while  
I remain here two or three days to  
collect material in the vicinity.

Continuing our itinerary from Honda,  
we have:

24 hr 0m Albán. We left this town at  
eight this morning. There is an excellent  
cut road, quite suitable for automobiles,  
from Albán to Facatativa. The grade  
is very throughout.

About half an hour from Albán,  
perhaps somewhat less, I've left the  
cut road on our right, and took a  
cut off suitable for pack animals, which  
led off up hill toward the left. This cut-  
off is stony and not suitable for any sort  
of wheeled vehicles, but for pedestrians &  
mules it has the advantage of saving  
several kilometers.

The ascent from Albán is gradual but  
steady for about two hours, when the  
road passes over the divide at about

8900 feet and makes a brief descent to the plateau or meseta of Bogotá. It then follows across the plain for about an hour, with a few small hills of *Facatativa* visible in the distance. (At one additional long, tedious visit for photographs along the road) we observe

28th. On *Facatativa*. Elevation 8900 ft. Road passes up one of the main streets of town to the plaza. After passing over 3 patios and over the Gonzales at 4160 ft. for day.

Then, on our seventh day out is back and after leaving trails only 28 hours, with no accidents nor misfortunes to man or dog, we have covered the distance from Honda to Facatativa. How far it is, the Lord only knows. I estimate it at somewhere between 50 and 60 miles. It is a hard journey for the most part, with little level ground to travel over, and plenty of hard climbing. Except for the section between Honda and Guaduas however, it is not disagreeably tedious.

Fri Bogotá, Colombia Oct 8 1920

Packed for shipment to Washington, via diplomatic pouch, the following:

467a. *Fragaria chilensis*? Fruite chil., large strawberry, cultivated. Bogotá market.

468a. *Taccaea* <sup>*pinnatisepala*</sup> ~~sp.~~ *Julupas*. Bogotá. See herb no. 1078 from Memocor. Flowers more handsome than common *coruba*, but fruit not so good. *Pogonopsis rosea* Nut.

469b. Scale insects from indet tree near *Siliate*.

470a. *Cyclanthera splanthens* (?) Opisio, from Bogotá market. See 458a for description.

471. Cactus, flowering, cult. plant, from Hotel Gonzales, Facatativa. For Julpa

472. Cactus, tall, columnar plant cult. in laojera at Guaduas. For Julpa

473. Cactus, putabaya, from La Esperanza, for J. N. Rose

474. Cactus, flowering plant 8 ft high,  
cult. in garden of Hotel del Valle,  
Guadua. For J. Rose

475. Cactus, cult. pot plant, tall +  
slender stems, from Hotel Gonzales,  
Facatativa. For J. Rose

476 b. Scale insects, from indet tree  
near Facatativa.

<sup>mutabilis canopshapensis</sup>  
477 a. Lupinus sp. "Chocho", from  
Facatativa. See herb. no. 1150

<sup>Campanaria coriifolia HBK</sup>  
478 a. Insect. Myriacae. "Guayaba angelina",  
from Guadua. See herb. no. 1063 <sup>Campanaria</sup>

479 a. Eugenia? Araya, Bogota.  
See herb. No. 1138

480. Tropaeolum tuberosum. Cubio Bogota

481 a. Ericaceae? See herb. No. 1133. Shrub  
from mts near Facatativa; white berries

482 a. Duranta sp? From Facatativa,  
See herb. no. 1131.

483 a. Rubus sp. Mora de Piedra,  
from Facatativa. See herb. No. 1134

484 a. Indet. Blue berried half shrubby  
plant from Zipacim. See herb. No. 1141

485 a. Fragaria sp. "Fresa" from  
Bogota market. See herb. No. 1106

486 a. Tacsonia sp. Curula de Indio,  
from Facatativa.

CABLEGRAMA  
REPÚBLICA DE COLOMBIA  
TELÉGRAFOS NACIONALES



Plan

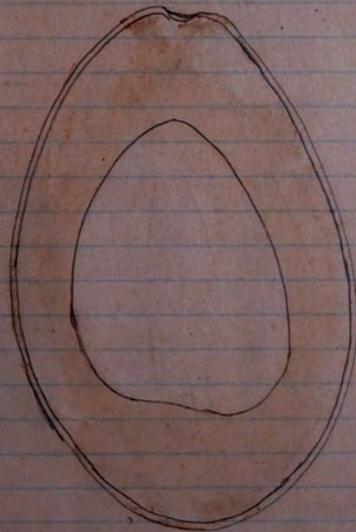
Número 105 C.  
Palabras 13 4573  
Valor \$ 340  
Hora de su introducción en la oficina de Buenaventura. 4/10  
Hora de su recibo 10/1

Washington 9 Boav. Octubre de 1920  
Peperence American Fogation  
Walker sanfermamb. & cited over  
blackberry and strawberry  
get the giants  
Lairchild

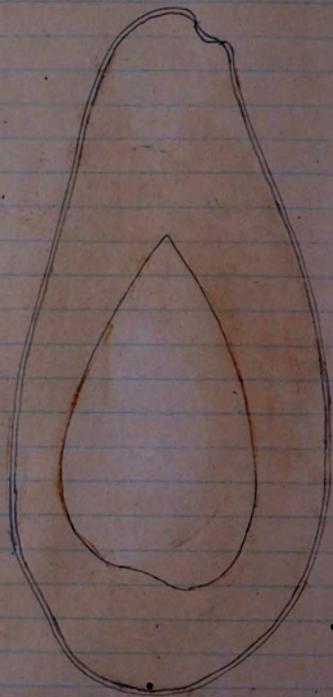


Monday Bogotá, Colombia Oct. 11, 1920

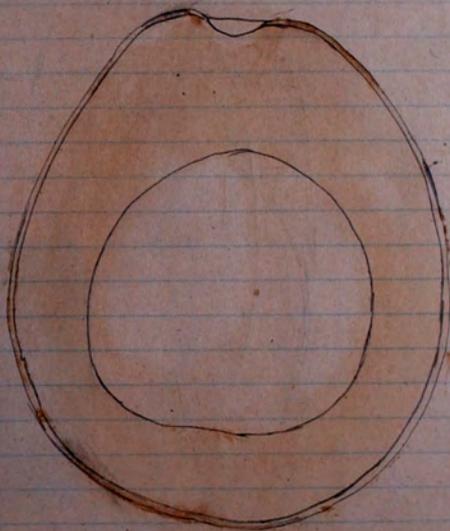
Avocado of the West Indian race, typical representatives of those now on sale in the Bogotá market:



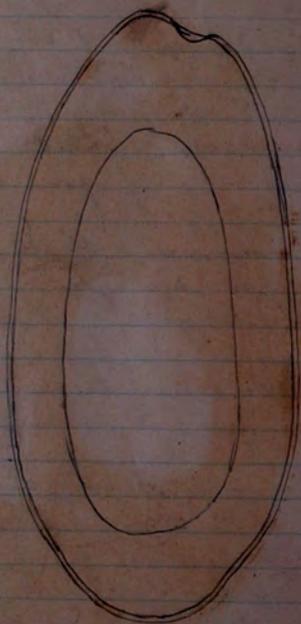
Green-skinned, flesh cream-color,  
seed tight in cavity



Green-skinned, flesh pale cream  
color, seed tight in cavity.



Green-skinned, flesh cream color, seed  
tight in cavity



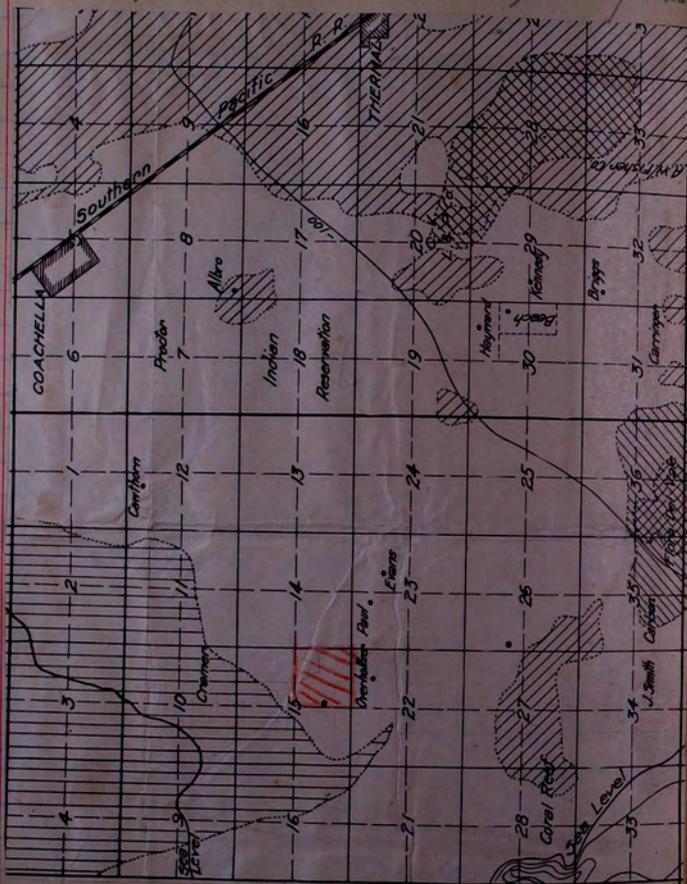
Green skinned, fleshy whitish green  
somewhat plump. Seed tight in cavity

Thursday Bogota, Colombia Oct. 14, 1920

Prepared the following for shipment:

- 487a. *Mutisia clematis*  
Compositae? Red flowering climber  
from Sibate. See herb. no. 1145
- 488a. *Befaria phyllitragolia*  
Ericaceae? Shrub with rose-pink  
tubular flowers 1" long. from Sibate. See herb. 1152
- 489a. *Vicia bogotensis*  
Leguminosae. Slender climber with  
deep blue pea-like flowers. From Sibate.  
See herb. 1153.
- 490a. *Vaccinium fogelundianum*  
Ericaceae. Shrub 5 ft high with  
small rose-pink fls. from Sibate. See herb. 1155
- 491a. *Eugenia* sp. Arayaca. Same as  
seed sent under 479a. See herb. 1138.
- 492a. *Berberis*? Shrub 6 ft high. Thorny,  
with yellow fls and blue-black berries. See  
herb. no. 1118(?). *Berberis rigidifolia*
- 493a. *Zea mays*. Flint corn, from Bogota  
market. 4 ears
- 494a. *Ficus* <sup>Slip up</sup> Small tree with red & black  
berries, fruiting with. from Sibate. See herb. 1151

## Location of land in Coachella Valley, California

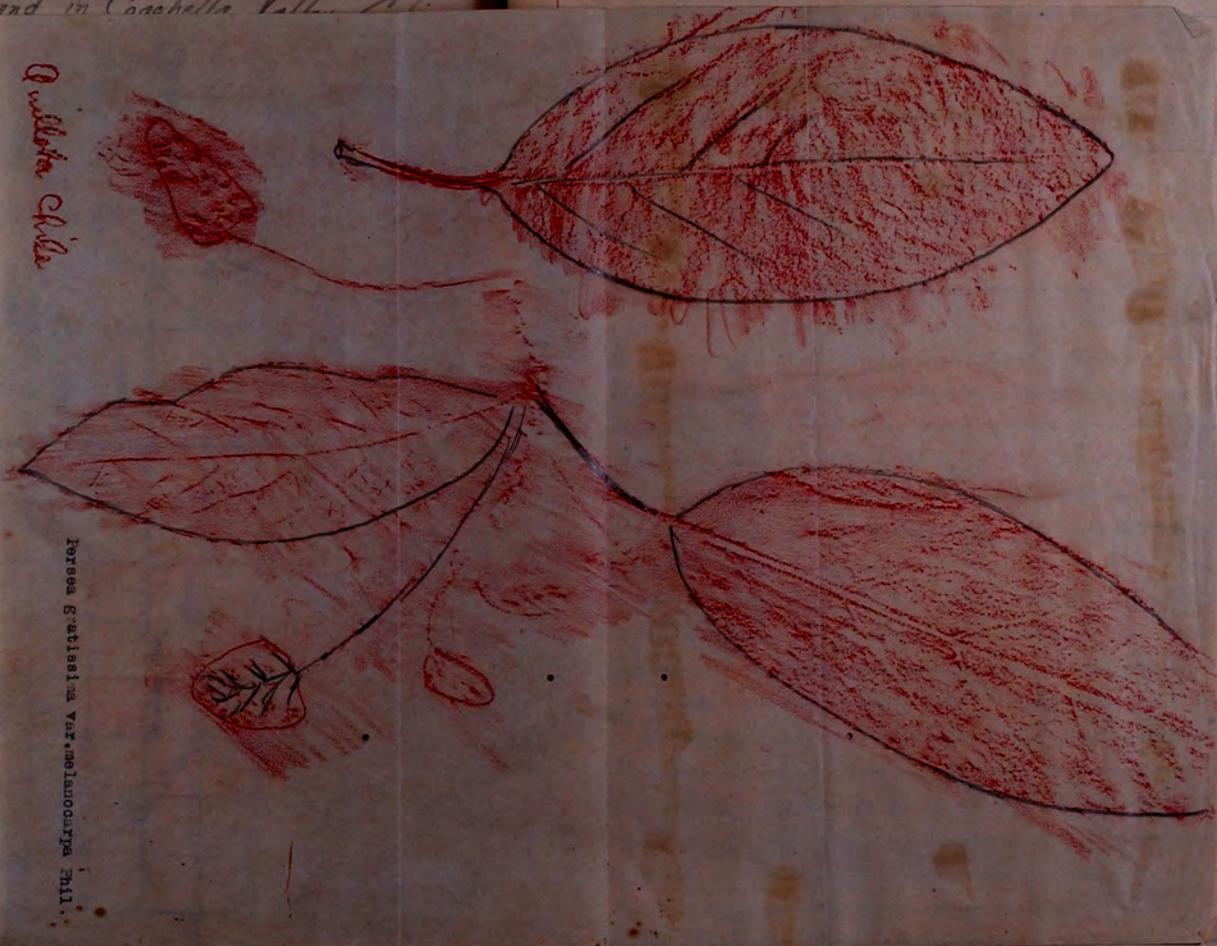


Location of land in Coachella Valley, Cal.



*Quercus chrysolepis*

*Quercus chrysolepis* var. *melanocarpa* Phil.



495. *Rubus* sp. Giant blackberry, from  
El Peñon, near Sibati, about 12 plants

496a. *Lupinus* sp. Chocho, from garden  
near Sibati, elev. 9300 ft. See herb. 1150

497a. *Brownea grandiceps*, from Guadua  
43 seeds, probably immature

498a. Indet. shrub with holly-like lvs.,  
from El Peñon, near Sibati! Same as  
462a.

499a. *Amygdalus persica*. Durazo or  
peach seeds from common white thicket  
grown in Cundinamarca, for stock tests.

500a. *Berberis* <sup>quinduenis.</sup> *Tachudo*, from El Peñon  
near Sibati. See herb. no. 1154. Seeds perhaps  
not mature, entire fruits faded in sphagnum  
dust and powdered charcoal, slightly moist.

I propose to prepare a report upon the  
great blackberry and deal up the following  
matter for it.

Introduction - Plant first called to our  
attention by Frank W. Chapman and Louis  
Agassiz Senter; later introduced through aid  
of F. L. Packwood; re-introduced in 1930 by  
myself, and investigated as fully as possible.

Distribution and Nomenclature

Where found in Colombia - Putumayo  
Name not known to me - Common  
name *mora*, sometimes *mora de Castilla*  
and erroneously *mora de piedra*.

Description of the Plant

The Fruit, its Character, season of ripening,  
and so forth

Economic importance of the fruit

Cultural requirements - probable based upon  
conditions of climate and soil in native  
home.

Monday Bogota, Colombia Oct 25 1920

501a. *Vallea stipularis*. "Rague" from Sibate. See herb no. 1149

*Tibouchina* sp.  
502. *Melastomaceae* "Lete Cueros" from El Penon, near Sibate. See herb no. 1185 Small plants, in sphagnum

*Lisianthus* sp.  
503. *Lisianthus* "Clavel del monte", pink-flowering about pen Sibate. See herb 1110

*quinduenis*  
504. *Berberis* "Lachuelo". Plants of age of which seed is sent under 500a. From El Penon, near Sibate. See herb no. 1154

*monteni*  
505. *Drimys granatensis* "Palo de ojo" from El Penon, near Sibate. See herb 1110

506. *Bassifloraceae*. *Curuba*, wild sp. from El Penon, near Sibate. 1 plant. See herb

507a *Pogonochloa rosea* "Gulupa" from Bogota

Mrs Fairchild quotes Mrs. Speranza as follows (letter from Mrs. F. of August 14 1920),

A thousand thanks for letting me know of this opportunity to try for some things from Peru! I would prefer for my little collection to have me or two good old pieces if possible rather than new weavings or embroideries, but that is only a suggestion. I shall be thankful for anything.

And Mrs Fairchild adds:

"It is the work she is interested in - so if you see something that is torn and faded and old but interesting work, she'd rather have it than something less interesting and old in better condition."

By the way, I have been greatly interested in the cinnamon of Ecuador which is known there as Canelo. If you can get any information regarding Canelo either in Colombia or Ecuador, please do so. The plant which I got in Ecuador appears to be an undescribed species; there may, however, be more than one species involved.

Yours very truly,

J. Rose

I am especially interested in the Melocactus, a round cactus with a peculiar spiny crown from which arise small flowers. This has been reported from Bogota but I suppose it must have been found at some-what lower elevations.

I am enclosing a description of a plant which I am especially anxious to see now. Just where in Colombia this is found I do not know, perhaps anywhere from Bogota to the coast. It will probably be a small round cactus not over two to four inches in diameter. If you should find this you will win a conspicuous place in my cactus book.

M. colombiana Nob.

M. caule cylindraceo simpliciter axillis lanatis, mamillis confertis subovato-conicis albidopunctatis, villis junioribus lanigeris senioribus brunneo-tomentosis, aculeis exterioribus 18 - 20 setaceis radiantibus albidis, centralibus 4 - 5 subaequalibus erecto-patentibus rigidis, aureis, ima base noduloso-incrassatis (Nob.)

Præter patriam diversam recedit hæc species à M. eriacantha caule graciliore, mamillis crassioribus, aculeis exterioribus validioribus, centralibusque 4 vel 5 glabris nec sub lente pubescentibus.

Above from letter of J. N. Rose,  
dated Washington Aug. 18, 1920

Sunday Bogota, Colombia Oct. 24 1920  
Description of the Great Blackberry.

The plant, which does not form a compact bush, but scattered shoots arising from underground stems, is half-climbing in habit. By proper training it could probably be made to form a bush, or at least the cane could be so trained as not to require any support.

The stems reach a maximum length of about 9 or 10 feet. Some of them stand more or less erect (somewhat arching as a rule) while others trail upon or are supported by the surrounding vegetation. Near the ground the stems are about half an inch thick, growing less in diameter toward the upper portion. They are light green in color, covered with short glandular reddish hairs, and abundantly armed with short, stiff, very slightly recurved thorns.

A pair of leaflike, clasping stipules, roughly orbicular in outline and about an inch in diameter, is found at the base of each of the leaves. The latter are normally trifoliate, and up to more than a foot in length; the petiole is up to 6 inches long, slightly grooved above, thorny and hairy like the canes; the petioles of the lateral

pair of leaflets an  $\frac{1}{4}$  to  $\frac{1}{2}$  inch long  
 that of the central leaflet 1 to 2 inch long.  
 The leaflets are commonly oblong-ovate  
 elliptic, or ovate in outline, <sup>puberulent</sup> 3 to 6 inch  
 long, cordate at the base and acute to  
 shortly acuminate at the apex, bright  
 green and very finely hairy above, pale and finely hairy on  
 below. The margin is dentate-serrate.

The flowers are produced in axillary  
 or terminal racemes of rarely more than 5.  
 Frequently a leaf-axil gives rise to but  
 one fruit, and clusters of 2 or 3 are rare  
 and usually terminal. The calyx is large,  
 the petals obovate, nearly  $\frac{1}{2}$  inch long and  
 pale rosy purple in color.

The fruits vary from slender oblong to  
 broad oblong, oval, or cordate in outline  
 and at maturity an 1 to  $2\frac{1}{4}$  inches in  
 length by  $\frac{3}{4}$  to  $1\frac{1}{2}$  inches in greatest breadth.  
 The color they are light crimson. They are  
 made up of a great many small, loosely  
 coherent drupelets, surrounding a large fleshy  
 torus which extends usually to the apex  
 of the aggregate fruit, and at maturity often  
 separates from the true fruits or drupelets.  
 Often the aggregate fruit is 4- or 5-angled  
 when viewed in transverse section. At  
 maturity it is rather firm in texture,

not so juicy as most of the cultivated  
 blackberries, and of a pleasant subacid  
 flavor perhaps suggesting that of the  
 loganberry more than that of the cultivated  
 blackberries.

The receptacle or torus can be eaten  
 along with the drupelets, but when it  
 comes away readily it is often removed  
 before the fruit is eaten. The seeds are  
 so large and hard as to be somewhat  
 objectionable when the fruit is eaten,  
 especially if the fruit has first been cooked.

This species seems to have the char-  
 acters attributed to *Rubus roseus* in  
 the key which Darrow sent me; this  
 may be the correct determination of it.  
 It also corresponds closely to *R. macro-*  
*carpus*, except that the latter has many  
 flowers, and I do not think this can be  
 said of the plant under consideration.

Map of the 'Valle del Cauca', covering region from Jamundí northward half way to Cartago, scale 1 to 400,000, by Gen. Vergara y Velasco, is recommended by Seatch.

The Wolf Map of Ecuador, published in 1892, is recommended as the best map of that country, giving topographic detail as far north as Quito.

"Nueva Geografía de Colombia" by Gen. Vergara y Velasco, is indispensable to the student of Colombian geography.

"Atlas Completo de geografía Colombiana" by Gen. Vergara y Velasco, is not complete but contains some valuable material.

Seatch recommends Cieza de Leon as the best early authority on this section. Was he not the one who mentioned the agave of Arma and Cali?

Seatch gives these elevations.

Cartago 2950

Ibaguá 4200

Quindío pass 11,350

Ibaguá to Cartago about 75 miles

Seatch recommends the Hacienda Cusing, elevation 9000 ft, near Ibaiza, in Ecuador, as an interesting place.

Note pond De Monsalve

En Cali, vase el quereque, plantas arbóreas especial de Cali. En el Jardín de Caicedo se encuentran

Harry Frank recommends the valley of Cajamarca, and the market of Huancayo, Peru.

I am glad to get the note from Reasoner in regard to Guilielma utilis. I haven't had the pleasure of eating the fruit, but they tell me that the specimens which you sent up were very palatable, at least, some of them, and, after what Mr. and Mrs. Hamilton Rice tell me, I think you are warranted in going ahead strong on this palm. I think I wrote you that Mr. Rice discovered two distinct kinds of what I took this same palm, growing in Colombia. Be sure to get to the bottom of this question, if you can. Send your article about the palm, and we will see if we cannot get it into print.

David Fairchild

2950  
8400  
11,350

*Nespronyx obtusifolia* Lindl.  
morus

*Thibaudia macrophylla* - shrub from forest  
in Bogota - *Coccinea*

*Stephanogasteria purpurea* - *tuna* *rosa*

*Vicia setifolia* - purple, from low, lignum, *Selata*

*Passiflora ligularis* Juss. *granadilla*

*Mutisia clematis* *zarzillo*

*Finca Cristo-Joseph*  
*Instituto de Rosales*  
Bogota (Colombia)  
Wants a collecting portfolio.

508 b. Specimen of Scale insect from the sp. of  
*Ficus plantae* in street tree in Bogota.

509 a. Rubus of Seed from few large pits  
of giant blackberry, from El Peñon. Dry,  
in cotton sack.

510 a. *Hyllococcus*? *Pitahaya blanca*, from the  
Bogota market. Seeds in dry charcoal  
*Tuberoschima* sp.

511 a. ~~*Chaetochytrium*~~ *Siete-cueros*. Seed  
from El Peñon. See 502 and herb. No 1185.  
Seed perhaps not mature; dry, in capsules.

Last photograph 2999

Last Bogota

The Avocado in Cundinamarca.

I have been disappointed in the avocados found in Cundinamarca. Not that I had grounds for expecting anything particularly good, but I thought at least to find them interesting. They prove to be about the most ordinary lot of West Indians imaginable, averaging larger in size than those of Costa Rica but in quality almost uniformly poor. I have not as yet seen a single really high-class one among them.

The principal zone of avocado culture in Cundinamarca - if there can be said to be such a zone - is probably the region between 4000 and 6000 feet or approximately the coffee zone. I saw scattered trees in the region around Cuchipaya, above Esperanza, perhaps more abundant by then in any other section.

The avocado is not cultivated on the mesa of Bogotá. I have seen a few small trees in gardens, and this is one tree, slender and perhaps 25 ft high, in the small back yard

across the street from the Parque de Independencia in Bogotá. I saw no flowers nor fruits on it and do not believe that it ever bears. I assume that the climate of Bogotá is too cool for the tree to fruit normally; though I do not believe it is sufficiently cool for the growth to be injured by frost.

I am told that the fruits are sold in the Bogotá markets all through the year. The name cura is perhaps more commonly applied to them than aguacate, but the vendors in the market are familiar with the latter name and it is often heard.

I have noticed one peculiar thing about the aguacates which I have seen on sale in Bogotá during September and October. Not one of them was purple. All were light green, or greenish cream-yellow. When overripe they turn brown. I have also noted that there are practically no round fruits sold, choiced to slender pear-form being the usual range. Lodge,

Slender fruits are rather common. The size varies from about 6 cms to 18 cms. I feel pretty sure that the largest I have seen would not go above 24 cms, and I have only seen a few which would pass 18 cms. The flesh is cream-colored or whitish, and very often fibrous. The seed is large and light or loose in the cavity.

The aguacate is not esteemed in Bogota as in some other places in tropical America. I can scarcely be termed an important article of diet here. Perhaps one reason for this is the relatively high price of the fruits, small ones cost 4 to 6 cents each, and 10-pounds cost 10 to 15 cents. Compared to many other foods, they are expensive. They are usually eaten in soup, or cut up and served as a salad. The guacamol does not seem to be known here, at least not by this name.

## Ferrocarril del Pacifico

Kilometros	Estación
0	Buenaventura
20	Córdoba
37	San José
55	Cisneros
82	Caldas
109	Comitas
129	La Cumbre
158	Yumbo
161	Isaac
174	Cali
199	Palmira

We are marketing the heaviest avocado crop ever produced in Florida and for the first time have had more fruit than the northern trade could absorb at profitable prices. This season's experience has given a rather black eye to the Trapp variety and has correspondingly boomed the Waldin. Trapp trees everywhere overloaded and this condition coupled with two or three weeks of very hot, dry weather during August has resulted in serious damage to the trees and heavy loss of fruit through dropping. Some of the Trapp trees at Medora Grove have been practically ruined and nearly all will suffer a serious set back. The Waldin trees put on a crop, heavier, if anything, than the Trapps, but when the fruit was a few weeks old, shed the surplus down to a fair load. This the Trapps always stubbornly refuse to do but try to carry the full burden until the tree is devitalized, when they usually drop the whole crop and suffer serious injury besides.

The Waldins are now carrying their fruit, without any drops to date and with the trees in fine condition. We had to begin shipping Trapps on September 1st in order to relieve the trees and have likewise lost many hundreds of crates by dropping.

The freeze of 1918 showed the Waldin to be much hardier than the Trapp. The hurricanes of September 9th, 1919, at which time we had a seventy mile wind at Homestead, proved the value of the short, thick stem of the Waldin as compared with the long, frail stem of the Trapp. And now we have very strong evidence of the superior fruit carrying qualities of the Waldin. Personally I am 'off' Trapps hereafter, but unfortunately I already have several thousand of them planted in Grove farm. Our nursery is being flooded with orders for Waldin far beyond our ability to produce the trees.

Letter from W.J. Home dated Sept. 27, 1920

Shipment prepared at Bogota Nov. 4, 1920,  
to go forward to F.O. Popenoe via Diplomatic  
Pouch. Two parcels containing:

1 Guatemalan overcoat

1 Bottle-green suit, somewhat worn.

1 Brown ruana

3 meters Gray woolen cloth for suit, made by  
la Magdalena, cost 24 pesos.

1 copy Maria, by Jorge Isaacs

1 copy Gramatica del Idioma Maya

1 copy Prestrepi, "Las Chibchas", in  
two volumes.

1 copy Gramatica Quechua.

Pejibaye

Little River, Fla.  
July 6, 1920.

SEP 18 1920

Dear Dr. Fairchild: -

In reply to yours of 1st about *Guleilma-Bactris* will say that I do not have the literature to straighten out the synonymy but that the two names are in use for the same plants. Those which I have bought as *Bactris* look externally exactly like *Guleilma* and the celebrated peach palm of South and Central America has been placed in both genera.

I have tried them in pots where they do fairly well, at least until they were put in the open ground. Have planted in pine land and hammock with equally discouraging results. Edward Brown had a specimen in rich hammock which for awhile did well and attained a height of ten or twelve feet. It suckered freely and I dug under it, made an incision and planted a pot in which a fine sucker was soon established. This I later cut off and put in a similar situation in my hammock and for a while it did well. But it soon began to look badly and finally after I rooted another sucker from it died. The last time I saw Brown's specimen it looked as tho it need parasitic.

I am under the impression that our soil disagrees with it. It ought to be tried down in the Homestead cuntry where, altho there is lots of limestone there is a good deal of clay and iron. Cultivated vegetation does better there than with us here and many things, such as roses, Cape Jessamines, and even the mammeesapots? do fairly well. Most of the growers down there I used to know have gone away but perhaps you have on your lists some one there who would try it. The peach palm must be a wonderful thing in its native country. The *Bactris* are all tender here.

I note that you have had sent up the black raspberry, *R. glaucus*, from Costa Rica. I hope that you are getting a great many different collections of this in Colombia and will be able to get it still further south and other different elevations throughout the Andes. I expect that you will be able to find a much greater variety in it than in the black raspberry of Eastern North America. Plants which are grown here have made no fruit this year. I am hoping that we will be able to get flowers and fruit for breeding work next year. The plants are remarkably vigorous. To me, this has seemed to be the most promising of all plants that you could get in the berry line in South America.

It may be, however, that you will be able to get some of the blackberries that will fruit freely. I have suspected that the large fruiting sorts will prove to be comparatively unproductive. Please note especially anything in the blackberry line which has young fruiting arms with great clusters of fruit. The reason why the Oregon Evergreen blackberry of Europe is of so much value in the Pacific Northwest is because it has upwards of 150 berries to each fruiting branch. The common red raspberry has only 5 to 10 berries to a fruiting arm, yet the hybrid which Dr. Van Fleet has produced using a Chinese species for one parent, has up to 100 berries to the fruiting arm and for this reason is tremendously productive.

Are you finding any of the Peach strawberries, *Fragaria Chilensis*? I am interested in securing large fruited selections of this as well as other kinds of strawberries from the Andes region. Many of the things which you will be able to get will be of value in breeding work, especially for the South Atlantic States. By the use of the black raspberry from the region in which you now are, I am sure that we can extend the raspberry sections very much farther south.

Geo. M. Darrow,  
dated Sept. 25, 1920.

I doubt the advisability of attempting to get nematode material through in ordinary soil sent in mailing tubes. The package is necessarily practically airtight and the soil becomes stale, with the result that the nematodes suffocate or die from some other cause. So that nematode material in general should be fired as soon as possible and brought right side up in phials in weak corrosive sublimate.

In order to get nematode material here in soil for the purpose of introducing monochas, the shipments should be made in cases large enough so that the soil will not grow stale. Whenever the roots of plants come through in favorable condition the nematodes in the shipment of the amount of soil that is attached to them are usually all right. At any rate I have secured large collections in this way with little evidence that any of them had died off. This, I think, is the best suggestion I can offer for the importation of live nemas. Plants brought personally as deck cargo ordinarily come through all right, but you might not like to undertake this.

We are greatly interested in the possibility of introducing beneficial nemas and will do everything possible to get out and rear anything you can get here alive. I wonder if you know that my daughter, Mrs. Arthur K. Adams, is at present living in San Jose? At the moment I do not remember the street, but it is such a small place that you should be able to find them easily. Mr. Adams is in the employ of the Costa Rica Oil Corporation, and you can get in touch with him at their office at San Jose, if you were interested to do so. Dorothy is also collecting nemas.

Very truly yours,

*M. P. Lusk*

Bogotá, September 22 1929

G. P. Van Eseltine, Esq.,  
Bureau of Plant Industry,  
Washington, D C

Dear Glenn:

Before starting down the Andes I must rid myself of every ounce of unnecessary baggage. I am therefore sending in to Washington certain articles which I am not going to need. Among these articles are some things which I do not like to have drifting about the Office for the next year, and I am going to ask you if you will be good enough to take the package which I am sending in this mail home with you, and keep it for me in a safe place until I return? It contains a field microscope, wrapped in a wollen quana better to protect it from injury in the mails; a thermos bottle; a spy glass, a silver necklace of native Guatemalan work, and a Guatemalan souvenir in the form of a fragment of a 5-inch shell which fell in my room in Guatemala City. In case you should leave Washington, before I return, please give the package to Mr. Bisset or some other member of the Office, with the request that he hold it for me in a safe place. And please keep the package away from moths, so far as possible.

I will greatly appreciate your good offices in this matter. I have a few rare books which I will also send to you within a few weeks, as I do not like to leave them on my shelves for a year.



With Oton Jiménez, San José de Costa Rica  
July 1920



Nearing Facotativa, on the trip from Honda  
Oct. 1920

Cosmos Club,  
1520 H. Street,  
Washington, D.C.

November 16, 1919

My dear Sir

It gives me pleasure to inform  
you of your election as a member of the  
Cosmos Club on the 17<sup>th</sup> day of November

At your earliest convenience be kind  
enough to enter your name and address  
in the Address Book at the Club; the Clerk  
will at the same time furnish you with a  
copy of the By-Laws.

I am, my dear sir

Very truly yours

Mr. Wilson Ropertz

J. L. Hazard  
Secretary



There seem to be a large number of *Persea*s described from western South America; if you wish data on any of them let me know.

Paul G. Russell

Key to *Rubus*. Superficial in many respects because materials not available to make better those marked thus are thought to be worth looking up.

*Rubus* of Central and South America.

*Chamaebatus*. Stems creeping, stipules free.

1. *R. R. rugosus* (8) Stem slender creeping; floral branches with 1 to 3 simple leaves and 1 or 2 white flowers called by natives "fratilla."

Woods mts. of Mexico. Fruit red, of no value, 1/3" long.

*Chamaerops*. Stems creeping, stipules adnate to petioles.

2. *R. R. radicans* (12) Stem creeping, branches short and from axils of leaves of preceding year; leaves ternate; flowers rose colored; fruit 1/3" long, yellow, sweet, aromatic, called "mine mine." Deep wood of Southern Chili.

*Orobatus*. Stipules broad and leafy, free or nearly so, stem trailing or climbing, rarely bushy.

A. Leaves simple.

3. *R. R. strictus* (28) Slender trailing stem 5' long. Chonta Cruz and Cutervo, Peru.

Ab. Broad almost oval stipules.

1. Stipules equal to or longer than petioles.

4. *R. R. loxensis* (29) Creeping rooting stem. Floral branches glandular hairy. Mts. near Loja, Paromo de Pasca, Estado Cundinamarca, 11,000' to 12,000' in Ecuador and Columbia.

II. Stipules much shorter than petioles of mature leaves.

- a. Flowers solitary or few.

5. *R. R. coriaceous* (30) Slender trailing stems, leaves like those of alder, flowers 2/3" broad, purple, 9,000' to 10,000' in Andes of Columbia, Ecuador, and Peru.

2. Leaves softly pilose, tomentose below.

2a. Flowers solitary.

6. *R. R. Rusbyi* (31) Canes ascending. Near Unduavi in Bolivia, 9,000' to 10,000' in Andes.

2b. Densely glandular, several flowered.

7. *R. R. lolakii* (32). Canes creeping; flowers large red. Cutervo in Peru.

2c. Without or with few glands.

8. *R. R. acanthophyllo* (33) Canes long creeping; leaves oblong, sometimes 3-lobed, flowers purple. 10,000' to 12,000' in Andes. In Columbia or Western Venezuela; near Monzon, Dept. Huancayo in Peru. Prov. Huamalis and near Chachapoyas Dept. Amazonas.

Flowers closely corymbose.

9. *R. R. betenicifolius* (34) Stem climbing to 9', flowers purple. Near Sandia in Bamboo thickets in Peru. In Bolivia.

Shipment from Guatemala which reached Washington June 8, 1914

194



195

How shall I know, unless I go  
To Cairo and Cathay,  
Whether or not this blessed spot  
Is blis't in every day?

Now, it may be, the flower for me  
Is this beneath my nose;  
How shall I tell, unless I smell  
The Carthaginian rose?

The fabric of my faithful love  
No powder shall dim nor ravel  
Whilst I stay here; - but oh, my dear  
If I should ever travel!



Wilson Popenoe

saluda a sus apreciables amistades,  
deseándoles Muy Felices Pascuas  
y un Próspero Año Nuevo.

Guatemala, 1° de Enero de 1920.



WILSON POPENOE

DESEA A SUS AMIGOS MUY FELICES PASCUAS  
Y UN PROSPERO AÑO NUEVO 1921.

James Birch Poree  
Asociación de Agricultores del Ecuador  
Departamento de Agronomía  
Casilla de Correos 735  
Quayaguil.

5-30 Letter of Credit obtained from the  
National City Bank of New York  
(Bryant Building) on Nov. 3 1920 is  
No. 95-30, for \$3200<sup>00</sup> U.S. Cy.

Travelers checks on same bank, as  
follows:

10 checks of \$10 <sup>00</sup> each	Nos. A178751 to A178760
10 " " 10 <sup>00</sup> "	A178761 to A178770
10 " " 10 <sup>00</sup> "	A178771 to A178780

The duty of a traveller, then, is three-fold -  
to see beauty in Nature, to discover food that is  
comfortable to the belly, and to discover men  
of like mind to himself. - Hugh Walpole.

Quarterly account for quarter ending Sept  
30 1920, submitted as follows:

Salary, 3 mos @ \$216.	\$630.00
Travelling expenses	718.08
Total	\$1348.08

nobody ever cultivated me,  
Ha, Ha! I'm wild.  
I just grew up as you see,  
Ever since I was a child.  
I'm a little prairie flower  
growing wilder every hour.  
nobody ever cultivated me,  
Ha, Ha! I'm wild.

Cantares Colombianos.

Tres cosas hay en el mundo  
que no se pueden guardar:  
una cocina sin puertas,  
mujer y carnaval.

Quiero que no tengan madre  
las flores del campo santo  
y cuando las vea el viento  
paseen que esten llorando.

Los ajitos de mi cocina  
se lloran en estan secando.  
La culpa la tiene de  
que este estan aborreciendo.

En el otro caso grida  
mi negrita que en pace,  
Cocula que no he pasado -  
alajar pa que otro enlase.

Murio mi novio y Peche,  
un pamecito en la cara.  
Pa que no comencen tener  
Baquta que go desara.

*Impatiens* matter of nematodes on *Chayote*  
and send soil specimens to Da Costa

"Quien se mata comió  
y agua no bebió;  
No pregunta de que murió."  
- Refran Colombiano

Planters' Punch:

One of sour, two of sweet, three of strong  
and four of weak

dicen que el aguilón real  
Volando cura los mares -  
Oh! ¿quien pudiera volar  
Como los aguilas reales -

Varietal	Season Dates	Weight of Fruit in oz.	Weight of Seed	Shape of Fruit	Color of Mature Fruit
Florida	Dec. to Apr.	15-25	2.50 to 3.00	Spherical	Green
Florida	Mar. to Oct.	15-25	2.50 to 3.00	Obovate to Spherical	Purplish Black
Dinkham	May to Sept.	14-20	1.50 to 2.00	Spherical	Dark Purple
Dinkham	Sept. to Jan.	15-25	2.00 to 2.50	Spherical	Dark Purple
Florida	Nov. to Feb.	5-10	1.50 to 2.00	Spherical	Dark Purple

#### Chapala Town

Chapala Town has high Aliboncos hedges,  
Where February finds the nesting bird.  
In from the ranges, from the shifting herd,  
Vaqueros come for alken shirts, no pledges,  
And who whose coat is less than its renown,  
There water lilies, for the wind's caresses,  
Give it their sweetness; every breeze confesses  
The lemon groves wherethrough it dallied down.

Still the blue lotus floats there in the sedges,  
And still the dagger answers the quick word.  
Cruel is noon, but cool a lake mist blesses  
The twilight. Do you know Chapala Town?  
MARIAN STORM.

#### TROPIC SUMMER

(Major Stansan Douglas in the Southern Re-  
view)

Northward the spring still paints the  
hills.

Lingering yet with timid days:  
Summer in Florida now sets  
Ablaze its dawns and burnished days.

White hot the curtain of the sky,  
Crimson the poinciana lifts,  
And all our tropic ecstasy  
Marks where the summer heaps its  
gifts.

Purple the splendid spread of sea  
Creams on the sands its sunny tides;  
Fountains of green, the palm trees swing,  
Full in the wind the white gull rides.

Sunsets that burn the unroofed fire,  
Dusky blue and swift as heron's wing,  
Then from the darkening east the stars,  
Then from the sea the nights that sing.

Oh, velvet glory of the dark!  
Oh, living bosom of that sea!  
Regal your nights whose splendor sets  
On summer her full majesty.

¡ Aunque suene la Campana -  
No podemos ir a misa  
Porque nos llama la brava  
Galante de la mañana.

Por veces dan buenos consejos, cuando  
ya no pueden dar más ejemplos.

See A. J. Kusebe in Panama.

A. F. Parmelee

Foreign Freight Agent  
American Railway Express Co.  
New Orleans

M. Forchheimer Grocery Co.

Mobile, Alabama  
Ag. of P. W. Herfstree.

Hugh D. Chase

Asst. Engineer, Dunbar Coal Co.  
Lima, Peru. (nephew of J. S. C.)

HAB Box 932 Stanford

Central and South American Explorations.

Monday

Ibague, Tolima,

Nov. 8 1920

Colombia.

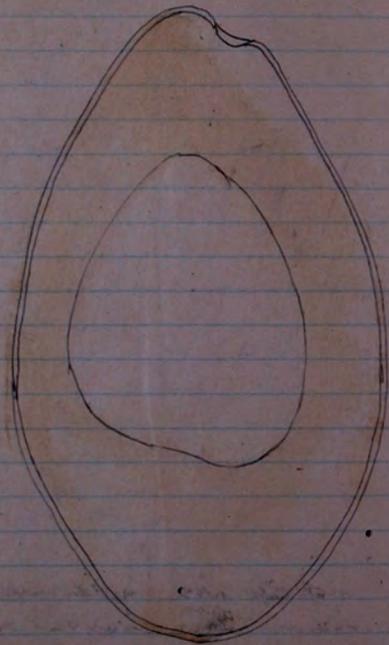
1

There are quite a few West Indian avocados on sale in the market here, and I have seen numerous trees scattered about the town. Several of the trees are in bloom.

The elevation of Ibague is about 4200 feet. The climate is rather moist, and the region would seem, on the whole, to be an excellent one for avocados.

The fruits so far seen look just about like those offered in the Bogota market. They are all green in color, and observed to slender pear-shaped long bottle-necked in shape. The largest are probably about 16-20 ounces in weight.

Following are outlines of two fruits purchased this morning at 3¢ and 5¢ each:



Surface yellowish green; flesh light cream color, with slight fiber markings; flavor nutty, quality good. Percentage of oil probably low.

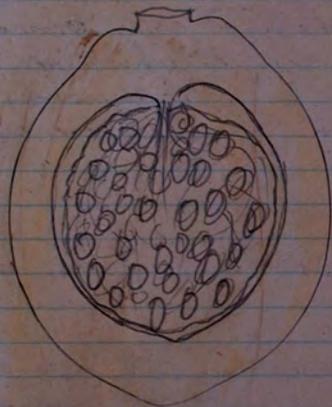


Color of surface yellowish green; flesh pale cream color with very slight fiber markings; flavor watery, quality poor; very tight of cavity. Percentage of oil undoubtedly low.

Carica

I find here in Ibaque, as a cultivated plant, a species of *Carica* which appears to me distinct from all others I have seen.

Herbarium specimens have been obtained, and bear my number 1190. The fruit is as below:



The exterior resembles that of the common papaya in color and texture. The flesh is milk-white in color, and full of latex. It has a faint apple-like odor. The seeds are not attached to the wall of the cavity over most of its surface (or arranged to give this appearance, as in the papaya)

but are suspended in a white, pulpy mass from the basal end of the cavity. The flesh has an acid taste, without much flavor. It is said to be used like *C. caribaeensis* to make a dulce.

The plant is very common in the gardens and dooryards of Ibaque. So far as I have observed, staminate and pistillate flowers are always borne on separate plants.

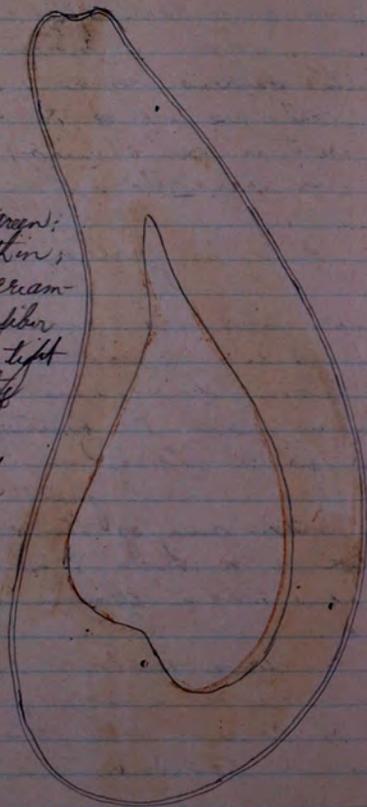
The common name of the plant is papayuela; tho' it is often called simply papaya.

The pulp surrounding the seeds may be eaten without cooking, but the flesh proper is good only in dulce.

Avocados purchased in the market for 3¢

Color light green;  
skin very thin;  
flesh light cream  
color, with fiber  
strands; seed light  
in the cavity

An ordinary  
West Indian



Tuesday Ibaque, Tolima, Nov. 9 1920  
Colombia

Avocados are very abundant here in Ibaque. There are trees in nearly all of the gardens. So far as I can ascertain, they are all of the West Indian race. The tree is called curo, and the fruit curo or aguacate.

The trees are further advanced than on the opposite side of the Magdalena valley, in Cundinamarca (around Chiboy, for example) and in addition, there seems to be much greater variation among the trees in regard to fruiting season. Here most of the trees are now in flower, and some with fruits maturing, on the other side of the valley (which I believe to be drier than this, I have seen very few trees in flower as yet).

In a region such as that of Ibaque, which has a moist, fairly warm and equable climate, the avocado seems to lose its periodicity to a certain degree, and to flower and fruit at various seasons of the year. In regions with well marked wet and dry seasons, or

the other hand, the trees seem to flower and fruit at a fixed time, and also agree.

I have seen here trees carrying fully grown fruits and also flowers. They are presumed with the Guatemalan ones. Never before have I observed this with the West Indian.

I have seen several palms here which I believe to be Geulasma utahis. The name given the species in Staque's is chontal duro. From what one scholar tells me, evidently the kernel is the part eaten: perhaps the form known here has so little flesh around the seed that it is not worth eating for the flesh. I have seen one palm in blossom and now carrying immature or ripe fruit.

Pisonium friedrichthalianum is found in gardens of Staque, but is not common. It is called guayaba agria, I am told. I find flowers and immature fruits at present.

Tuesday Cali, Colombia Nov 23 1930

Prepared the following material for shipment:

512a. *Carica* sp. "Papaquiela" from Itaque. See herb. no. 1190. Small quantity of seed (from 2 fruits) dry.

513. *Rhynchospora* from Cartago. 1 plant dry, for J. N. Rose

514. *Cactaceae*. Taken from same tree in Cartago as 513. For J. N. Rose.

515. *Phyllocactus*? From Hotel Caldas in Armenia. For J. N. Rose

516. *Cereus*? 6-angled columnar species from Cartago. For J. N. Rose.

517. *Cactus* (4-angled tall plant) coll. at Cartago. For J. N. Rose

518. *Cactus* from a rock below San Miguel Puro. For J. N. Rose

519a. *Brownea grandiceps*. Seed from Cartago, in powdered charcoal.

520a. Indit. *Leguminosae*. "Regenerador" from Cartago. See herb. no. 1205. Dry seed & flg.

521b. *Annona*. Specimens of fruit of species from mts. on road between Itaque and Guandío, to accompany herb. 1201. For W. E. Safford.

522a. *Rubia glauca*? *morae*. A prolific plant, fruit of excellent quality. Seen road above Sta. Cajamarca, at about 8000 ft. Pink label.

523a. *Carica* sp. Red-fruited papaquiela from near Armenia.

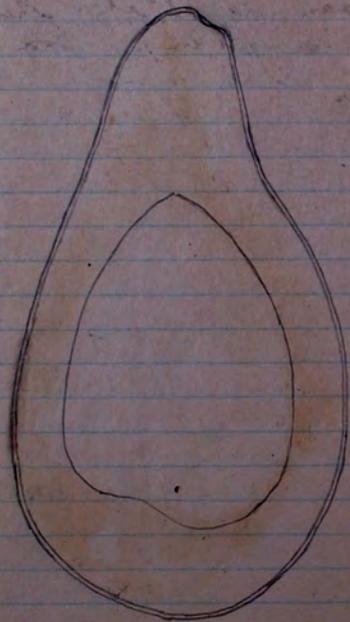
524. *Solanum tuberosum*. Large smooth compressed tuber, pale-brown. 5 lbs tubers from market, in specimen.

525. *Solanum tuberosum*. Papa cruller. Red skinned - yellow-fleshed - deep-eyed - small round. 5 lbs tubers from market, in specimen.

526. *Solanum tuberosum*. Oval brown-skinned yellow-fleshed deep-eyed. 5 lbs tubers from market. In specimen.

Thursday Cali, Colombia November 25 1920

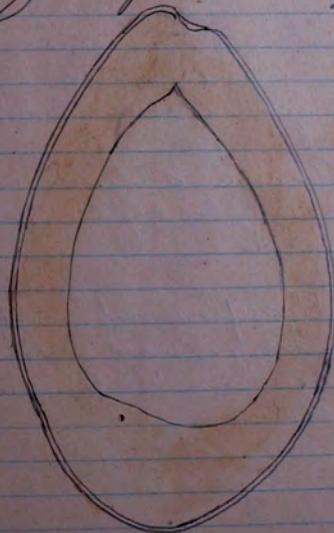
Following are outlines of the two best avocados I could find in the Cali market today. Both are very ordinary best Indigena, of no interest whatever to us.



Light green in color; flesh whitish green, fibrous; seed tight in cavity.

The fruit below was also light green in color - I have seen no other color here as yet. The flesh pale whitish green, somewhat fibrous. Seed tight in the cavity.

There are very few avocado trees in the town of Cali. These fruits were probably brought in from some outlying district.



Thursday Cali, Colombia Dec. 3 1928

Prepared for shipment the following:

527a. *Inset. mucosarum* tree, called  
"carbonero" from La Manuelita.

528a. *Rhodia* sp. "Madrono" from  
La Manuelita, near Palmira  
See herb. No.

529. *Solanum tuberosum*. *Café*  
*cuella* - same as 525. *Solanum*  
tuberos from Cali market

530. *Ananas sativus* Cambria or  
Cambrai pineapple from La  
Manuelita

531a. *Cassipoua* sp. *granadilla* from  
Cali market. Round green hard-shelled  
fruit 2" diam, with flavor much like that  
of *P. edulis*.

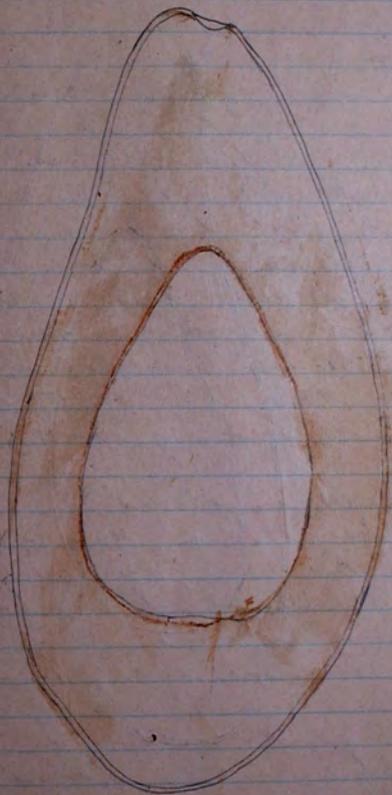
Tuesday Guayaquil Ecuador Dec. 21 1900

There is an abundance of avocados in the market here; the season being, probably, nearly at its height. I am told that the ripening season on the coast only extends over a period of 3 or 4 months, and that it comes at about the end of the dry season.

The fruits I have seen have all been ordinary West Indians, all green in color and elongated in form. I am told that purple fruited varieties are not grown here, but are said to exist north of here at Esmeraldas, and at Guayaquil.

The several avocados I have eaten here have been of very poor quality - the flesh somewhat fibrous in most cases, and in all, watery and lacking in flavor.

Dr. Sempere tells of a fruit grown at the hon. Barraganete, which weighed  $3\frac{3}{4}$  lbs. I have seen no large ones in the market. Following are outlines of 3 representative fruits from the Guayaquil market:



Flesh pale cream color, seed light in cavity.



Flesh yellowish cream color, seed  
light in cavity.



Skin rather thick; flesh rich  
yellow, seed tight in cavity.

Thursday Ambato, Ecuador Dec 30 1924

This afternoon Prof. Pachano and myself walked to the region known as Guachi Grande, about 5 miles from Ambato, to see the plantations of strawberries which exist only in that region.

Guachi Grande lies at an elevation of about 9500 or 10,000 feet. It is a series of rolling hills almost devoid of trees, and having a few sandy banks of volcanic origin, very loose and fragile.

The strawberry plantations cover these hillsides over an area of at least 60 acres. The plants are widely irrigated, and the soil all here is not heavy (see figures for Ambato). Three times a year the fields are cleared of weeds with a heavy hoe, the weeding also to break up the ground. Strangely one can find a sort of cultivation.

The plants do not grow to large size. The people say that when irrigated they make lots of large leaves but do not yield much fruit, hence they do not irrigate them. Fruit is picked one or more times throughout the year, but there are two seasons

when abundant crops are obtained: these are in February, in August, and in December.

The fruit is sent to market in portable boxes, which I estimated to hold 30 to 35 quarts; the present price obtained by the growers is four reales a box - less than \$2.50 U.S. per bushel of the fruit is sold in Ambato some is sent to Quito, and some to Guayaquil. As far as known to Prof. Pachano this berry (I have known in fruitilla) is not grown commercially anywhere else in Ecuador. He feels doubtless about the species being *Fragaria chilensis*.

Elevation of strawberry fields 9500 to 9750 ft

Prof. Pachano tells me the elevation of Ambato is 2066 metres = 6811 feet.



Rainfall at Ambato (from Bulletin No. 1,  
of the Quinta Normal de Agricultura)

Mean annual is 453 mm, or 15 inches

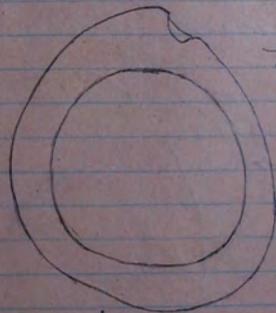
This is distributed as follows

Autumn	{ April May June }	151.6 mm
Winter	{ July August September }	61.0
Spring	{ October November December }	128.5
Summer	{ January February March }	112.5
		<hr/> 453.6

At Quito the annual rainfall is from  
1000 to 1300 mm; or 33 to 43 inches

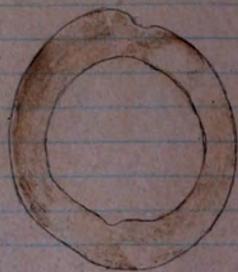
Sunday Ambato, Ecuador Jan. 2, 1921

The following aguacates, all of the  
Mexican race, were purchased in the mar-  
ket of Ambato today. They are said to  
have come from Patate, which lies at  
a lower elevation than Ambato. Those  
of the latter region will not be mature  
for several months yet.



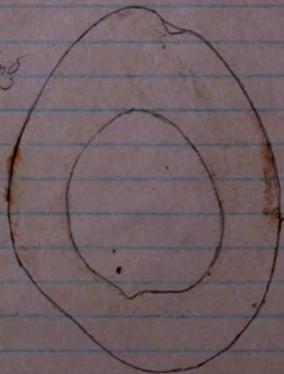
This specimen  
was photographed.

Deep purple at stem end, changing to  
slight green toward the apex. Flesh pale  
green. Seed coats not adhering very closely  
to the rough cotyledons.

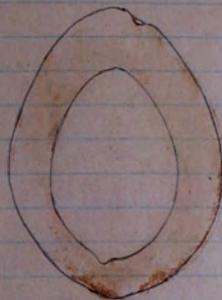


Color purplish black, flesh pale yellowish green, with fiber markings; seed tight in its cavity with both seed coats surrounding very closely the smooth cotyledons.

Not a bad looking fruit →



Color light green, hull maroon around stem, flesh ground green color, faint fiber markings; seed tight in cavity, both seed coats surrounding the cotyledons closely.



Color maroon and light green; flesh whitish green, with fiber markings; seed tight in cavity with both seed coats closely surrounding the cotyledons.



Color light yellowish green; flesh greenish cream color, with very slight fiber markings; seed tight in the cavity with both seed coats closely surrounding the cotyledons.

Wednesday Quito, Ecuador Jan 5 1921

Material prepared today for shipment to Washington via the Diplomatic Parcel.

- ✓ 532a. *Lycopersicon esculentum*. Small round tomato from the Ambato market
- 533a. *Carica* sp. "Babaco" 10 seeds obtained from 17 fruits purchased in Ambato. Oak-label.
534. *Fragaria chilensis* Ambato strawberry 10 plants of varying age, in sphagnum
- 535a. *Prunus* sp. Mirabel plum 200 seeds, from Ambato. In charcoal & sphagnum
- 536a. *Duranta triacantha* "Chiba" seeds from Ambato in charcoal Herb. 1234.
- 537a. *Prunus armeniaca*. 100 apricot seeds from Ambato. In charcoal
- 538a. *Prunus salicifolia* "Capuli" from Ambato. From ordinary fruits, for stock-plants. In charcoal

Tuesday Ambato Ecuador Jan 1921

Packed for shipment the following material:

539. *Rubus glaucus* "Mora de Castilla" or tropical American black raspberry. Plants secured from a huerta across the river from Ambato. Packed as follows:  
6 plants in moss, and a little sandy soil, in one package  
10 plants rolled up in a piece of sod, with a little moss, in another package
540. *Pyrus communis* "Pera nacional" from a huerta across the river from Ambato. About 35 suckers, in two packages, each packed with a small quantity of sphagnum and a little moist soil.
- 541a. *Bunchasia armeniaca*? "Ciruela verde" from Baños. 10 seeds in powdered charcoal and sphagnum
- 542a. Zea mays Yellow starchy corn from Ambato market
- 543a. Zea mays "Morochos blancos" white flint corn from Ambato market.

## Elevations on the Ferrocarril al Carrizay

Ambato	8700 ft
Pishilata	8250
Illina	8050
La Viña	8000
Pachanlica	
(Station for Quillán)	7800
San Francisco	7950
Salate	
(Station for Patate)	8050
Pelileo	8400

## Elevations of certain points between Ambato and Baños.

Puente de Patate	6900 ft
Hda. Pitula	7350
Hda. Panapi	6800
Baños	6100

From T. Wolf. Geografía y Geología del Ecuador, p. 425.

La Chontarusa (*Quilidema speciosa*), del tamaño del Pambil ó de una Chonta espinosa, se distingue por sus hermosísimas frutas comestibles, parecidas al albicoque y agrupadas en grandes racimos de a 50 hasta 70. Es de mucho uso entre los indios Cayapas en los meses de Mayo y Abril, cuando cogen las frutas maduras. Estas se comen cocidas y tienen el aspecto de la yema del huevo cocido y el gusto de una papa harinosa; del que se sabe al del coco.

According to the same author, the Pambil (referred to above) is *Iriartea* sp. and the Chonta and Chantilla are as follows: spiny species *Bactris*, smooth species *Euterpe*.

Walt (op. cit.) gives the following  
determinations:

Mamey de Cartagena  
(*Mammea americana*)

Mamey separado  
(*Achras mammosa*)

Nispero  
(*Achras sapota*)

Sapote  
(*Matisia coriata*)

On p. 439, in *Annuaire Chiriquí*

"En estado silvestre y formando bosques  
enteros encontré la *Psidium* en las  
montañas de la provincia de Loja, por  
ejemplo, entre Loja y Malacatos, en  
la altura de 1800 a 2000 metros"

1800 meters = 5886 ft

2000 " = 6540 "

*Crataegus* sp., known as *Inagua*  
*mammosa*, is found in Guano near the  
Paracillo, according to Prof. Pachano.

*Passiflora* sp., *Granadilla de Guinjo*,  
found in the Hacienda Guano near  
Baños, according to Prof. Pachano.

Sra. Teresa Herrera, at Baños, will  
furnish room and meals.  
Dr. Rafael Viera, Baños, knows  
plants of the region.

We should send Prof. Pachano, for trial  
at Ambato, the following plants:

Fuente Avocado  
Tamao Hagoat, and perhaps other varieties  
*Psidium cattleianum*  
*Eugenia uniflora*  
*Feijoa Selloniana*  
Tujube, Grafted varieties  
*Carissa grandiflora*  
*Casimiroa edulis*

Wednesday Ambato Ecuador Jan. 12 1930

Prepared for shipment the following:

544. *Prunus salicifolia* Ambato cherry  
Cosis from tree at the quinta Catigilla  
near Ambato

545. *Rubus glaucus* Red-fruited  
Andean raspberry, obtained from Prof.  
Abelardo Pacheco. 4 plants, in 2  
packages of 2 plants each.

546a. *Carica condomarcensis*? Chamber  
from Ambato market. Seed in powder  
between charcoal and sphagnum

547. *Carica* sp. Babaco, from  
Ambato, Ecuador.

4 cuttings in 1 pkg. in slightly moist sphagnum

3 cuttings in 1 pkg. in Spanish moss wrapped paper

3 cuttings in 1 pkg. whole paper than wrapped paper.

3 cuttings in 1 pkg. ditto

9 cuttings in 1 pkg. small wood (type mainly  
wet in my little slightly moistened sphagnum,  
whole paper, then wrapped paper.

548. *Solanum tuberosum* Tabla potato  
from Ambato. 6 tubers & Spanish moss

549. *Solanum tuberosum* Inglesa potato  
from quinta Normal, Ambato. 6 tubers

550. *Solanum tuberosum* Leona Pazmina  
potato, from quinta Normal Ambato  
7 tubers

551. *Solanum tuberosum* Domingo potato  
from Ambato. 10 tubers

552. *Solanum tuberosum* Negra Sinda  
potato. From Pelileo. 6 tubers in Spanish  
moss; about 20 in paper only

553. *Solanum tuberosum* Yungara potato  
from Ambato. About 25 tubers

554. *Solanum tuberosum* Leona potato  
from Ambato. About 20 tubers

555. *Solanum tuberosum* Calroche potato  
from Ambato. 14 tubers



"Pijiboe, bien grande, frondosa, que da tambien los dátiles amarillos oscuros, arenosos, poco dulces, y solo buenos para comer cocidos."

Re Strawberry, he says on p. 59.

"Frutilla. Casi llamada por antonomasia es la fraga quitense, pero grande que una equivalente a dos otras de las europeas. Se da todos los dias del año, y aunque se comen a diversas provincias, en ninguna son tan abundantes y perfectas como en la de Ambato."

On pp. 63 and 64 re Avocado.

Palta, llamada aguacate por los españoles. Es nombre genérico a muchas especies diferentes en la grandezza de los árboles, no menos que en el tamaño, color, figura y gusto de los frutos. Los árboles llorantemente altos, y algunos muy altos y corpulentos. Los frutos se asemejan en la corteza sutil y quebradiza; en la consistencia delicadísima y blanda de la medula, y en la interior almendra grande.

Se diferencian en ser unos redondos, otros ovales, y otros con cuelllos largos; unos de corteza verde, que son los mas, otros de negra, otros de morada: unos tienen la medula fibrosa y otros no; unos tienen la medula clara verde, otros casi blanca, y otros tan amarilla como la hiena de bucos. Ninguna de todas estas especies tiene dulce ni acido sensible, y se come con sal, o sin ella, y por lo comun con cuchara. Son tambien muy diversos en el tamaño, desde los mas pequeños, como un nuez, hasta los mayores de un palmo. En opinion de algunos compete con la Chirimoya y la Anana o Pina; y es comunísimo en varias provincias."

Papaya. - Velasco says that the papaya transplanted to tierra fria becomes Chilguacan, but that the Chilguacan transplanted to tierra caliente does not become papaya. And that the papaya is diocious, while the Chilguacan is monoecious.

Traves Científicos por la República de Ecuador, por el Dr. T. Wolf, 1879.  
I. Un viaje geográfico por la provincia de Loja. p. 80.

Los muchos ríos de este distrito de Malacatos, Vilcabamba y Piscobamba concurren a formar el caudaloso Catamayo, y se reúnen todos abajo del aislado cerro de Santa Cruz, no muy distante del pueblo de Malacatos. Esta región parece ser la patria propia de una de las plantas más delicadas de Sudamérica, hablo de la *Chiriquina*, que forma allí bosques espesos, cuya sombra, verdor intenso, y aroma balsámico halagan al viajero.

Joyapa = *Ceratostema peruvianum*  
" *grandiflorum*  
and two other species.  
*Macleania floribundia*

Altitudes (from Wolf) in feet:

Ayabamba	5,039
Zaruma	3,937
Loja	7,280
Hda Trinidad	
(Foot of Cerro Sta Cruz, near Malacatos)	5,187
Catococha	6,716

Dr. Wolf cited in previous page, III. Memorie sobre Esmeraldas, p. 41.

"La Chontadencia (*Guilielma speciosa*) llamó mi atención en alto grado, porque la conocí por primera vez en esos bosques. En su porte se parece algo a la Chonta ordinaria y su tallo es espeso. Su fruta forma uno de los principales alimentos de los indios Cayapas y de los negros en el río de Saraguro en los meses de marzo y abril, en que se maduran. Las frutas de un hermoso color amarillo que en la extremidad superior toma al colorado, son del tamaño y de la forma de un albaricoque y se hallan agrupadas en grandes racimos pendientes (hasta 50 y 70 en un solo racimo). La parte

exterior, del espesor de un dedo, sea carnosa, y después de cocerla parece en el aspecto a la yema de un huevo cocido, y en el gusto a una papa bien mizada y bien sazonada. La pulpa de la fruta se parece a un coqueito y sus nucleos se tambien comestible y sabe a el del mismo coco.

And in a footnote to the above:

"Esta palma me parece la misma que los indios del Oriente llaman "Chontauru" (chonta cualquier palma, y suru fruta), y su extension geografica en este continente a lo mismo hallándose tambien en las montañas del Brazil, de la Guayana, de Venezuela etc."

The tribe of Indians known as Cayápas are, teste Wolf, the only remaining aborigines of Esmeraldas proper. They live along the banks of the rio Cayápas and its tributaries.

Luis Corduro (p. 174) writes of Persea gratissima:

"Arbol americano que produce la excelente fruta que llamamos aguacate y los indios palta. Se da en las variedades de fruta mas abundante en parajes arborescentes, como en Yunguilla, y de frutas menores, pero particularmente sabrosas, en localidades menos calidas, como Panta, Gualaico, etc. Ejemplares de la primera variedad, a modo de selvaticas en algunos puntos de los bosques orientales de Chiquinda, el Rosario, etc. Quizá son reliquias de algunos antiguos estables o fundos que alli se hubieron proyectado; aunque bien pudieran ser vegetales indígenas de esos y otros lugares de nuestra fey, según Thesandini."

Common names of Fruits listed by  
Dr. Juan de Velasco, in his "Historia  
del Reino de Quito" 1789:

Achochcha  
Almendra quitense prov. of Maynas  
Almendra  
Anana  
Anona  
Arroyan Negro  
Arroyan verde Popayan.  
Ayuda montana Montalva prov.  
Bacca (O' Turbo)  
Cacao  
Cabeza de negro  
Capuli  
Caymito amarillo  
Caymito verde  
Caymito negro  
Cayje  
Cayhua  
Caymburo  
Chilhuacan  
Chimicua  
Chirimoya  
Choro Loja  
Cunda verde  
Curelo rojo

Curela morado  
Cugo  
Cucuna  
Dendi  
Fruittilla  
Granadilla tripana  
Granadilla de Quijos  
Granadilla de hueso Popayan  
Guaba  
Guaba verde  
Guaba bejuquera  
Guaba machetona  
Guabilana  
Guayaba amarilla  
Guayaba verde  
Guinea  
Giron  
Higuero  
Hijos de Quijos  
Hijos blancos  
Hyahico, Choglon y urbala  
Huamaga S' d' amogua  
Inchic (mani)  
Jahua  
Juyapa  
Limon  
Lucma  
Malroxo

Maynas  
Loja  
Ibarra  
Maynas  
Loja  
Loja

Mamey  
 Manihenga  
 Manzana de monte  
 Machón  
 Moras  
 Martiños  
 moquillo  
 Motilón  
 Naranja podrida  
 Naranja  
 Nuevos quitens  
 Obo hobo  
 Papaya  
 Palta  
 Pechiche  
 Pepinillo  
 Pichinchilla  
 Piñuelo  
 Pitahaya grande  
 Pitahaya pequeña  
 Platano  
 Purupuro  
 Quina  
 Quinilla  
 Quiques  
 Rebe  
 Saca  
 Sapan

Loja

Moras

made Cochacha

Guayaquil

Sapallo  
 Soraca  
 Sutu o' sata  
 Tapa  
 Tosta o' nuy quitens  
 Tomates  
 Toronja  
 Turas  
 Ullsumbi  
 Uva camayrona  
 Uva negra de vid  
 Uvella  
 Zambo  
 Zapote amarillo  
 Zapote blanco  
 Zapote negro  
 Zapote del peru

Loja

Moras

Loja

Monday Ambato, Ecuador Jan 31 1931

Hypothesis *Persea dumyfolia*, now common in the highlands of Ecuador, was perhaps introduced sometime between 1600 and 1700. At Ambato and at Quito it is called abacate - I have not yet heard the name Palta applied to it. Evidently it brought its Aztec name with it from Mexico, and as it was taken to a part of Ecuador - the highlands - where *P. americana* was not known, it did not acquire the name given to the latter in the coast, i.e. palta.

The origin of the name palta, as applied to *P. americana*, is interesting. It may perhaps be explained as follows:

*Persea americana* was known in Colombia long before the Discovery. It may be indigenous there as well as in Costa Rica. It had probably been carried southward into the lowlands of Ecuador long before the arrival of the Spaniards. Not long before the latter event took place, the Diccionario most of Ecuador. There is a distinct name Laja called Paltas. If this was the name of the district in pre-Colombian days, it may be that the invading Spaniards found *P. americana* there, and, taking it south into Peru, did so under the name Paltas, which may have been the aboriginal name of the fruit in southern Ecuador, or the name of the province, or both.

Saturday Quito, Ecuador Jan 29 1931

Prepared for shipment to Washington via the Diplomatic Pack, in following:

560a. Zea mays. Mais negro. From Ambato. Black corn, small ears 3 to 6 ins long. 7 ears.

561a. *Tacosma* sp. "Taco". From market of Ambato. Species with small orange-yellow fruits. Seeds in charcoal and sphagnum.

562a. *Duranta tricantha* "Chibo". From environs of Ambato. Seeds in charcoal and sphagnum. Herb 1234.

563a. *Medicago sativa*, from Ambato. One pound of seed. Common acañafa of the Ambato region.

564a. *Prunus salicifolia* Capuli. Seeds of the large-fruited tree at Patateña for which cañafa has been used. In charcoal and sphagnum.

565a. *Prunus* sp. Mirabel. About 200 seeds, from Ambato. For trial as a stock plant. In charcoal and sphagnum.

566a. *Delostoma* (*Bignonia*) *nervosa*?  
Cholan, variety with flowers of deep lilac  
color. From the Quinta Normal, Ambato  
Herb. 1301.

567a. *Delostoma* sp. Cholan Pal-  
lilac flowers, almost white. Probably  
a different species from 566a. From the  
Quinta Normal, Ambato. Herb. 1302

568a. Indet. Leguminosae. Shrub  
about 5 ft high found on dry hillside  
near Ambato. See herb. No. 1233.

569b. Scale insect on *Dryas* sp. from  
Ambato.

570b. *Datura sanguinea*. Two seeds for  
Wetland

571a. *Juglans honorei*? Toets from  
market of Quito. 100 nuts, hulled.

*Persea americana* cuttings:

Pop. No. 573 (avocado No. 47) - 8 poor; 13 dead.  
Pop. No. 574 (avocado No. 48) - 23 - all dead.  
Pop. No. 575 (avocado No. 49) - 5 poor; 15 dead.  
Pop. No. 576 (avocado No. 50) - 2 poor; 14 dead.  
Pop. No. 577 (avocado No. 51) - 3 poor; 20 dead.

THE EVER-BEARING ANDINE STRAWBERRY, from the highlands of Mexico, is doubtless, observes Dr. Spruce, one of those varieties of *Fragaria vesca* commonly cultivated throughout the Andes, within the tropics, where the perpetual spring of that favored region has had the effect of rendering the strawberry perennially fruitful, and many of the deciduous-leaved trees of Europe evergreen. In the equatorial Andes the province of Ababato is famed for its strawberries, which equal in size and flavor some of our best varieties, and are to be seen exposed for sale in the market-place of Ababato every day in the year. They are cultivated above altitude of from seven thousand to nine thousand five hundred feet above the sea, where the mean temperature of the year ranges between 59° and 67°; but the best are grown a little way out of Ababato, as you go towards Guayaquil, on the slopes of Guachi (lat. 1° 30' S.), at near nine thousand feet, and in a mean temperature of 60°; where, however, the thermometer does sometimes ascend, perhaps half a dozen times in the year, to the freezing point, in the early morning, scarcely ever on two successive days.

- Florist and Pomologist.

Republished in the American  
Journal of Horticulture, March 1870

572. *Ranunculus guzmanii* HBK.  
One plant presented by Don Ludovic Söderström, Quito.

This plant comes from the slopes of Pichincha, above the snow line. Mr. Söderström describes it as a beautiful thing which will not tolerate a warm climate. The common name is said to be *Uru-rosa*.

Thursday Quito, Ecuador Feb 24 1921

Prepared the following material for shipment to Washington via Diplomatic pouch:

573. *Persea americana* Avocado No. 47  
(No 1 from the Chota) from the hacienda San Vicente, Feb. 17.

574. *Persea americana* Avocado No. 48  
(No 2 from the Chota) from the hacienda San Vicente, Feb. 17.

575. *Persea americana* Avocado No. 49  
(No 3, from the Chota) from the hacienda San Vicente, Feb. 17.

576. *Persea americana*, Avocado No. 50  
(No 4, from the Chota) from the hacienda San Vicente, Feb. 17.

577. *Persea americana* Avocado No. 51  
(No 5 from the Chota) from the hacienda San Vicente, Feb. 17.

578. *Solanum muricatum*. "Pepina", long  
fruits, purple, from Conragui, near  
Ibarra, Feb. 10 1931.

579. *Fuchsia* sp. from La Esperanza,  
near El Angel, Cacha, Ecuador.  
See herb. no. 1260

580a. *Adichos*? "Torta" Plant. cubia  
bean, from Ibarra.

581a. *Zea* mays. "Chulpi sara" or  
sweet corn, from Ibarra, Feb. 19  
1931.

582a. Indet. Pink-flowered *bonif*  
plant, from Conragui. 10 Feb. 1931.  
See herbarium No. 1246.

583a. *Passiflora* sp. Granadilla de hueso  
from Ibarra.

584a. *Rubus* sp. "Mota de Rocota"  
from La Esperanza, near El Angel,  
prov. del Carchi. See herb. No. 1262

585a. *Berberis* sp. "Espino" from  
La Esperanza, near El Angel, prov.  
del Carchi. See herb. no. 1259

586. *Solanum tuberosum*. Wild potato  
from La Rinconada, prov. del Carchi.

587a. Indet. "Chuguiradua" from  
La Rinconada, prov. del Carchi. See  
herb. no. 1255. *Chuguiradua insignis*?

588. *Solanum tuberosum*. "Papa  
chaucha" from La Esperanza, prov.  
del Carchi, Feb. 14 1931.

589. *Solanum tuberosum* "Cumara"  
from La Rinconada, prov. del Carchi.

590. *Solanum tuberosum* "Morada"  
potato, from La Rinconada

591. *Solanum tuberosum* "Cueruda  
morada" potato, from La Rinconada

592. *Solanum tuberosum* "Margarita"  
potato, from La Rinconada

593. *Solanum tuberosum* "Amarga"  
potato, from La Rinconada

594. *Solanum tuberosum* "Rosa"  
potato, from La Rinconada

595. *Solanum tuberosum* "Cueruda  
blanca" potato, from La Rinconada

596. *Solanum tuberosum* "Leche"  
potato, from La Rinconada

597. *Solanum tuberosum* Yungara  
potato, from Ibarra market

598. *Solanum tuberosum*, Pastusa  
potato, from La Rinconada

599a *Jubans honorei*? Tucta, from  
Ibarra market. See herb. No. 1253

600a *Tacsonia* sp. Wild tacco, from  
La Esperanza, near El Angel, alt.  
above 12000 ft. See herb. 1261

Friday Baños, Tungurahua Mar 11, 1921

Naranjilla. This plant is listed in Ecuadorian works as Solanum quitense Lamour. The fruit appears to be the same as that of the lele of Cundinamarca, which latter is listed by Colombian botanists as S. sanctum Jacq.

The plant is commonly cultivated in the vicinity of Baños, where the fruits are carried to Ambato in considerable quantities and from there sent to other parts of the Republic.

The naranjilla is a soft-wooded, stiff, erect, and sparsely branched plant reaching to about five feet in height. The stout stems, as well as the leaves, flower-buds, and fruits are covered with soft, simple or stellate hairs on the young leaves and the flower-buds there are light purple in color, on the older fruits they are purplish white. The leaves, which are borne upon stout petioles up to six inches in length, are oblong-ovate in general outline, are 12 to 18 inches in length, clasping at the base and acute or shortly acuminate at the apex, with the margins serrate; they

are deep green above and light green (with a purplish tinge) below, soft in texture with the costa and primary lateral nerve conspicuously on both surfaces, but most prominently so on the lower one.

The flowers are borne on short spikes in the leaf-axils: they are white, star-shaped, about an inch and a half broad, with five large yellow stamens in the center. The fruits which are produced upon very short pedicels, stalks are round or round-ovate in form, about two inches in diameter, and bright orange colored when fully ripe. The coarse hairs with which the surface is covered are easily brushed off, it being the custom to remove them in this manner before taking the fruits to market. The skin is thick and leathery, it encloses the translucent, greenish or yellowish pulp in which are embedded numerous seeds similar to those of the tomato. The pulp is abundantly juicy, and of a refreshing salacid flavor which renders it suitable for preparing cooling drinks and water-ices.

Chirimote. This is an encaceous shrub which occurs in great abundance on the upper slope of the volcano Tungurahua, at elevations of approximately 11,000 to 13,000 ft. It is one of the characteristic plants of the paramo zone on the volcano.

The plant, which reaches four or five feet in height, forms a compact bush of very attractive appearance. Its leaves, which are sessile and produced abundantly from the slender stems, are lanceolate, entire and about half an inch in length. The flowers are tubular, slightly contracted at the mouth, about half an inch in length, and of a rich rose pink color; they are followed by round fruits which suggest lily-pursh in appearance; they are probably  $\frac{1}{2}$ " in diameter, translucent white in color and crowned at the apex and with the few small, sharply pointed calyx segments. They are very tender and crisp in texture, having an abundance of juice of pleasant subacid flavor and a few very minute seeds. While not an article of commerce in this region, they are gratefully eaten by the travelers who chance to pass through the elevated zone in which they grow.

Lucuma (Presumably Lucuma obovata) commonly pronounced Lugma at Baños, in which town it is abundantly grown.

This is a tree of somewhat smaller size than Calocarpum mammosum (Lucuma mammosa), attaining in this region to 35 or 40 feet in height and a spread of equal dimensions. When well grown it makes a coarse, fairly dense crown of deep green foliage and is a tree of very attractive appearance.

The leaves, which are commonly clustered toward the outer ends of the branchlets (or panicles) are obovate, ovate, or elliptic in outline, subacute at the base and acute to rounded at the apex, commonly 5 to 10 inches long, deep green in color, the margins entire, and the midrib impressed above and prominent below.

The small flowers are produced in great abundance upon the younger branches; they are about  $\frac{3}{4}$  inch long, the corolla tubular, deeply 5-lobed, and pale green in color.

The fruits are rounded to broadly oval in form, occasionally pointed at the apical end, and commonly 3 to 4 inches in diameter. The surface of the fully ripe fruit is deep

brownish green in color, heavily marked or asperated with aesset. The skin is very thin and easily broken. The flesh is deep yellow in color, quite firm when the fruit is fully ripe, and of a very sweet, typically sapotaceous flavor. The seeds are somewhat like those in number, broadly oval in outline and flattened on one side, they are  $1\frac{3}{4}$  ins long, brown and glossy & flat on the ventral surface.

This is a fruit which is not liked by foreigners as a rule, nor by many high-class Ecuadorians, but which is popular among the lower classes. It is so sweet as to be almost sickening for me. I prefer a good sapote (*Lycium* ~~maritimum~~) any day on the coast.

*Rubus* sp. No. 1294.

*Pandoa blackberry*. This is a very good blackberry which occurs abundantly as a wild plant on the slopes of the volcano Tungurahua, in the vicinity of the settlement known as Pandoa, at elevations from 7500 to about 10,500 feet. It is a vigorous species, sending up stout canes to a height of 15 feet. It does not climb, as a rule, but the canes frequently bend over and are supported by nearby vegetation. The leaflets are 5 in number, sometimes 3 when the leaves are from small wood. The canes are covered with stiff hairs of dark wine-red color. The racemes are often a foot in length; the flowers are small and pinkish white in color. The fruits are produced abundantly; they are oval to nearly round in shape, about  $3\frac{1}{4}$  inch long, purplish black when fully ripe, each one composed of many very small drupelets. The flavor is rich, and agreeably subacid; the seeds are soft and not troublesome in the mouth. This may be considered a very good blackberry, and one which seems to merit cultivation.

*Rubus* sp. No. 1295

*Hyagra mora*. A large fruited species of the raspberry group (*R.*), which grows abundantly as a wild plant upon the slopes of the volcanic Tanguarahu at elevations of 9000 to 12000 feet. It is probably the same thing as the *mora de rocota* obtained in Cuzco.

The plant is not a large shrub. It forms clumps about 5 feet high, or sometimes scrambles over stem plants, its canes reaching 8 feet in length. The leaves have only 3 leaflets, and these are glaucous bright green in color with a narrow fringe. The rosey purple flowers, about  $1\frac{1}{2}$  in. broad, are born in clusters of only a few; they are followed by oval or obovate fruits  $1\frac{1}{2}$  to  $1\frac{1}{4}$  in. long, crimson in color, juicy and of pleasant flavor. The seeds are not objectionably large nor hard. The individual drupelets of which the berries are formed are medium sized - about like those of our cult. raspberries. The plant does not seem very fringed but cultivation and pruning might change this.

*Rubus* sp. No. 1276

*Mora*. This is the common wild blackberry of *Banos*, which grows everywhere about the town, along roadsides, in fences, and the like. It is rather conspicuous because of the glaucous under surface of its leaves. It is a fairly strong grower sending up canes to a height of 10 or 12 feet. It is half-woody in habit. The racemes or panicles are slender, and commonly 4 to 5 inches long; they bear many small white flowers which are followed by small blackberries; these are scarcely over a quarter of an inch long, broadly oval in form, each composed of numerous very small drupelets. The seeds are soft, and the berries of good flavor, but their small size is against them. They are very little used by the people of *Banos*.

The most abundant fruits in Baños are:

The tree tomato, which grows in nearly every doorway, and springs up in cultivated places for miles scattered about;

The aguacate (Mexican avo.) of which there are perhaps few old trees scattered about the town;

The luesma, of which the number of trees is not much less than that of aguacate;

The granadilla (*Passiflora ligularis*) which grows everywhere;

The banana, of which there are very small plantings;

The potato, which has been planted in every garden; and a few small commercial plantings have been made;

The Coca, Chimburo (*Cordia alliodora*), higuacho, and tobacco - all very common;

The naranjilla, gum commercially in this region;

The orange, of which there are very old trees about the town.

Tuesday Ambato, Ecuador Feb 15 1921

Prepared the following material for shipment to Washington on the Ecuador parcel from Guayaquil:

691. *Prunus salicifolia*, The Ambato Cherry, a choice variety of the capulin, known locally as the Gonzales tree at Catiglate, near Ambato. Cione. See No. 544 for previous shipment of this same variety.

602 a. *Rubus* sp. Huagra mora from slopes of the Volcano Tungurahua at about 9000 feet. See Phil. No. 1295. Seeds in sphagnum and charcoal.

603 a. *Rubus* sp. Mora. The Pandoi blackberry, from Pando, on the slopes of the Volcano Tungurahua at about 9000 ft. See Phil. No. 1294. Seeds in charcoal and sphagnum.

The Apples of Ambato and vicinity

The mangona comina of this region was probably introduced in Spanish times, along with the peaches, pears and plums which are still grown in Ambato. It is not a variety, as far as I can determine, this name is applied to a number of small apples, all of them inferior in quality.

The first European variety propagated by grafting to be cultivated in the Ambato region, was the

Azotada. This somewhat resembles our Red Astorhoy. It is a fine apple for eating, when fully ripe. In form it is decidedly lobbed, tapering towards the apex. It varies from 2 to 4 inches in diameter. The cavity is rather deep, flaring, the basin also rather deep, and rounded. The surface pale yellow-green, abundant by splashed red streaks with light red. Flesh white, crisp, very juicy, firm in texture, of slightly subacid flavor. It seems to me the would be

an excellent cider apple.

Next to Azotada in abundance and in time of introduction, is

Balsosa. This variety resembles our Belle fleur very markedly. Don Augusto Martinez believes it to be the French variety Calville de Saint Simeon, here called Calvilla de San Salvador. It is a large apple, often up to 4 inches in length, oblong to ovate-conical in form, usually with three or four protuberances or bosses at the apical end. The cavity is rather deep, rounded, the basin deep, rather broad, slightly furrowed. The surface is pale yellow with some cheek overspread with full crimson-scarlet. Flesh white, crisp, of firm texture, fairly juicy and of mild salubrious flavor. For eating it is fairly good, when fully ripe.

A third variety, introduced about 1853 or 1854 by Sr Emilio Terán, from France, and believed by Don Augusto Martinez to be Reineta de Canade is now commercially cultivated in this

region under the name of

Emilia. This is the best eating apple commonly grown in Tungurahua at the present time, and it fetches 2 to 4 times the price brought by Delicias and Azotada in the markets. Emilia is oblate in form, flattened at both ends, and often somewhat narrower at the apex than at the base. Commonly it is about 3 ins in diameter. The cavity is shallow and flaring, the basin by gas, rather deep, and slightly flattened. The flesh is white, melting, very juicy, and of a very pleasant flavor, with plenty of sugar, a little slight tannin, and a delicate aroma. To my taste, this is far the best apple commonly grown in Ecuador.

Besides the above, a few other varieties are rarely grown. About 1904 or 1905 a nursery firm of Rochester N.Y. sent an agent here and sowed a lot of fruit trees. Some of them are now in bearing. A very good apple I saw on one occasion of the latter

market, called Americano, was probably from one of these trees.

Nearly all of the apples (as well as peaches and pears) sold here are picked too green. They are then brought in to the market, roughly handled, peached by all prospective buyers, and perhaps kept until the bruised spots have all turned brown. The result is that it is practically impossible to obtain here an apple, peach, or pear in fine condition for eating.

Enrique Fisseran, a Frenchman from the Imbabura gardens, Quito, who was brought to Ecuador in 1860 by Don Gabriel Alvarado, did much to advance fruit culture here by teaching the people how to graft; figs, pines, and others are for the trees.

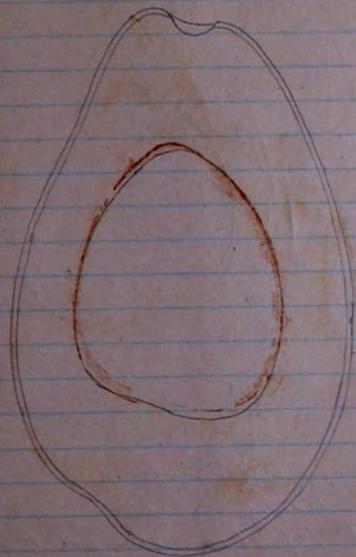
The commonest fruits at Baños are the tree tomato, the liguira, the aguacate (Mex. ace), the granadilla (Passiflora ligularis), the banana, the peach, the naranjilla, and the orange.

Sunday Laja, Ecuador April 3 1933

The following avocados, purchased here in Laja, were grown at La Tena, in the Cotacachi valley. The elevation of the spot, according to Wolf, is 1457 meters, or approximately 4750 feet.



Color light green-green with numerous dots of lighter color. Surface very smooth. Flesh whitish cream color. Seed tight in cavity. No fiber.



Color bright green, tinged yellow on one side. Skin almost glossy. Numerous small dots. Surface slightly rough. Flesh yellowish cream color. Free from fiber. Seed tight in the cavity.



Color yellowish green, with numerous dots of lighter shade; surface practically smooth. Flavedo pale whitish green, with some pale markings. Seed tight in the cavity.

All three fruits shown on the preceding pages are very evidently of the West Indian race. This is probably the only race cultivated in the valley of the Rio Catamayo.

The cultivated section of this valley which is visible from the Loja road (i.e. the road from Loja to the west at Santa Rosa which crosses this valley at its northern end) lies at an elevation of about 4000 to 5000 feet. Wolf gives 4750 ft as the elevation of La Toma, and my observation of the point where the road crosses the Catamayo river, not far from La Toma, was 4300 feet.

At La Toma there is quite a grove of fruit trees and small cultivated areas, all under irrigation. There are to be seen sugar cane, bananas, orange trees, papayas, mangoes, guabos (Inga sp.), avocados, and the enormous guayabo (*Cissidium guajava*).

When I passed La Toma yesterday on my way to Loja I noticed that several of the avocado trees were in full

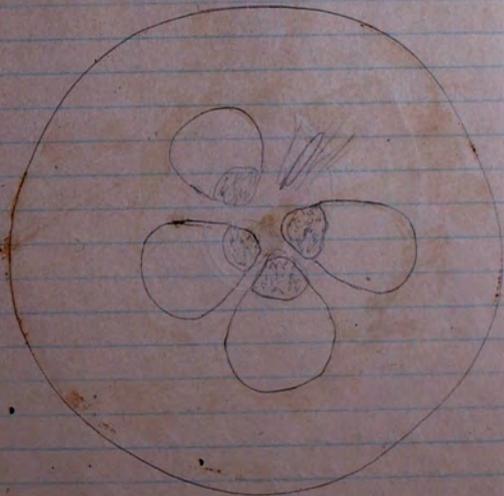
bloom. This is probably the normal  
flowering season. The fruits which  
I have obtained in Loji Hony, and  
which have come from the same area,  
probably from trees (the species to  
be fruits from 3 trees in the lot which  
I saw) which are bearing out of season.

There do not appear to be a great many  
avocado trees in the groves about La  
Toma. Perhaps there are between 50 and  
100, - more likely the former than the latter  
number.

Thursday Loji, Ecuador

April 7, 1927

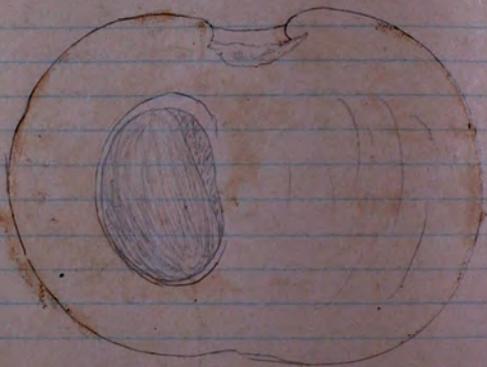
*Lucuma obovata* This fruit is known here  
as *Lucuma* (the *c* rarely silent, pronounced  
leuk'ma) and is commonly produced in  
the gardens and deyarros of the town. Below  
is a transverse section of an ordinary specimen.



The fruit is sometimes considerably larger  
than the one above outlined. The exterior  
is light green to light yellow-green  
in color, the skin membranous. The

flesh is very firm, dry, and somewhat mealy in texture, cutting like a firm dry cheese. The seeds are dark brown and shining, except on the ventral surface.

Below is a fruit in longitudinal section.



The flavor is typically capotaceous, but very sweet and luscious, and the flesh does not become agreeably soft. While popular among lower class natives here I do not believe the fruit is one which would ever be esteemed in the United States.

In the vicinity of Loja there are two species of Rubus which produce berries of sufficiently good quality to entitle the species to a place in the list of berries in our fruits. These two are:

Mora, or mora de Castilla (See Herb. no. 1295 from slopes of Tungurahua). This is not found close to the town, but it is abundant in the mountains east of the town, along the road to Zamora, at elevations of about 8500 ft upward. It grows only in very damp, cool regions.

This is the Pinagra-mora of Tungurahua and probably the mora de isocota of El Carchi. Since I have specimens from Tungurahua, I have taken none here. This species is not much used, but is considered better than the one following.

Mora común (See herb. no. from Loja). This species is common all about the edge of town, and also on the hills round about. It sometimes becomes a fruit in cultivated ground and pastures. The plant is subshrub in habit, making clumps 8 ft. high and quite dense. Its white flowers are produced abundantly in

terminal racemes sometimes a foot in length. The fruits, which are commonly oval or oblong ovate in form and  $\frac{1}{2}$  to  $\frac{3}{4}$  inch long, are deep purplish black in color, the drupelets rather large, and containing each a relatively large and quite hard seed. The flavor is similar to that of the northern blackberries, and probably as good. The large, hard seeds doubtfully afford quantity of juice under the, however, an infused fruit. It is not much used in Loja, but an agrapá for infusos is sometimes prepared from it.

Sunday Loja, Ecuador April 10, 1921

I am satisfied that Alphonse De Candolle is correct in considering "southern Ecuador, and the neighboring part of Peru" to be the native home of *Annona cherimola*. A few days since I visited a region south of Loja, in which the species forms small bushes, as it is said to do commonly in the southernmost part of Ecuador and in the adjacent portions of Peru. I have not, of course, seen the species in Peru, but have it on the authority of the Sr. Equigarran and others, who know the region of question, that it is just as abundant there as in Ecuador, and it stands to reason that it would be, for there is no change in the character of the country at the geographical frontier south of Loja. In Mexico or Guatemala, and elsewhere in Latin America I have seen the cherimola in the condition of an escape, or half-wild plant. It often grows along roadsides, where seeds have been dropped; and sometimes it almost takes on the appearance of an indigenous species. But I have never seen it, in other regions than Ecuador, growing in great abundance over a large region, and

remote from roads and cultivated places. The conditions of its occurrence in Mexico and Guatemala indicate that it is not, in those countries, a truly wild species.

Here in Ecuador, however, its behavior is such as to leave no doubt in my mind as to its being truly indigenous. I myself have only seen it in the wild state, absolutely at least, in two regions; one, the slopes above the Rio Los Playos (farther downstream called the Casanga) between Cangoana and (Cabo) Cocha, and the other, in the valley of a small stream tributary to the Rio Cacha, about 3 leagues northwest of Malacatos. In the former region I saw it at elevations of about 4700 to 5500 feet, and in the latter, at elevations of approximately 5000 to 6000 feet. The zone in which the tree occurs naturally there seems to be rather narrow, confined not more than 2000 feet, i.e., from 4500 to 6500, and I do not believe it occurs even more in quite so wide a zone as this, even though it is found principally between 5000 and 6000 feet. Wolf (p. 439) says that he has observed the plant commonly between 5100 and 6500 feet. The places in the zone a little higher than I have done, but the difference may

be due to the unreliability of the aneroid barometer more than anything else. I often find the elevations shown by mine to be less than 300 feet different from those published by Wolf.

Besides the two regions in which I have seen the tree growing abundantly in a state of maturity, I am told that it occurs in equal abundance near Necribaesay, Goveandain, and Malacatos; and from the section southward into Peru. Farther to the East the mountains fall away, to form hot dry regions where the Cheringas would not thrive.

While Wolf and others speak of the *bosques* of Cheringas which exist here, it should not be assumed that forests of any size are formed by his species alone. I have seen at La Capilla - where I was told by Enrique Witt some of the best bosques were to be found - groups and scattered trees forming single bosques a hundred yards in diameter. The predominant, but not the only species in these bosques, being the Cheringa. I have seen where seen pure cultures (so to speak) of the Cheringa, or bosque in which the Cheringa was the only tree.

The situations in which the trees are most commonly found, so far as I have seen,

on the slopes or sides of small ravines and the occasional rolling or level bits of ground which are found in the small valleys of these mountains. The alluvial soil of the valleys seems to be preferred, and the finest the best trees, but it is not on the good them on slopes where clay predominates. The climate of this region (La Capilla) is warm, as indicated by the elevation of 5100 feet, but it is not hot like the lowlands. It is a sugar-cane country (where anything at all is grown; very little of the ground cultivated) and is less moist than Loja. There is a dry season, rather severe, which extends from May or June to November. The trees reach about 25 feet in height, occasionally 30 or slightly more. Some of those which I have seen were as large as our best trees in southern California. Often they appear at the ground forming 3 or 4 main stems. The foliage is smaller than is common in California, except in the case of trees growing on moist, rich soil. There is a fungous disease which attacks a great many of the trees, forming black spots on the leaves and at length causing them to turn yellow and fall.

Federico Reaser of La Capilla says that

the fruits ripen from October to March, the season being at its height in January and February. He also says that the trees fail to bear when there are not good rains in October. They seem to bear very small crops in any event, as we would expect from our experience with this species in other countries. Because of the great number of trees, the fruit is very abundant in good seasons, and the hogs fattened on it. The best fruits are carried to Loja for sale, but this town can only absorb a small proportion of the crop which is produced in southern Ecuador in a good season.

The immature fruits are commonly attacked by an insect whose white larvae, about  $\frac{1}{4}$  inch long, burrow through the flesh and eventually exit through the skin, leaving a round hole in the latter.

Most commonly the fruits are fairly smooth, the carpellary areas being marked by raised lines; but in the relatively few trees I examined, I found most of the types with which we are familiar in the States. The chief one which I did not find was the mamillate form, with very pronounced protuberances. The form with the

chapelary, are slightly darker (some *impressa* & *silicea*) I found, as also the *ambrosioides* form, with short, rounded protuberances. Most of the fruits are small, and many of irregular form or shape, just as they are with us. Large fruits are said to be produced occasionally, some of them being up to 2 or 4 lbs in weight. The quality of the fruits seems to be about the same as of those produced in other countries.

### Fruits of Loja and Vicinity

*Prunus salicifolia* - *capuli*. Quite abundant about the towns and basin of Loja, but not abundant in the country between Loja and Zamora. To me, it distinctly has the appearance of an introduced tree in this province. The fruits produced here, as far as I have seen them, are not nearly so large nor so good as those of Ambato.

*Amygdalus persica* - *durazno*. Very common in the gardens and dooryards of Loja, and evidently quite successful here as a fruit-bearing plant. The varieties here (see below) appear inferior to those of Ambato. There are very few *gonytamboe* here, and those are said to be of inferior quality.

*Juglans honorei*? - *tocto*. I am not at all certain that the species grown here is the same as that of Ambato and Guarana. The trees in the latter town were in bloom when I was there in February, while the trees here in Loja are now carrying fruits which appear to be nearly mature - and the elevation of

Loja is about the same as that of Flora.  
The tree is fairly common in Loja de-  
gards, but not so abundant as Chimborazo.  
By any means, and the fruit appears here  
to be little-used.

*Annona cherimola* - chirimoya. One of the  
principal fruit trees of Loja - very common  
in degardos and gardens, but not cultivated  
in orchard form.

*Persea drymifolia* - aguacate. The Mexican  
avocado is grown in the town of Loja, but  
not commonly; there are only a few large  
trees about the place. The West Indian  
avocado, *P. americana*, is cultivated in the  
surrounding country, at lower elevations - na-  
tally at La Tona and Malacates - and  
the fruit is brought to Loja for sale.

*Cyphomandra betacea* - tomate. One  
of the commonest fruit-bearing plants of  
the town of Loja; seen in many gardens.  
Fruit sold in the market.

*Palmae* - coco (the cumbi of Ambato).  
Fairly common about the town. The fruit  
in long cocones, is sometimes offered for  
sale in the tiendas.

*Rubus* spp. - mora. See pp. 79-80.

*Taesonina* sp. - taese. I have not seen  
*T. mellissina* cultivated anywhere about the  
town, but there is a species which grows wild  
in the immediate vicinity, and which looks  
like the one collected near Ponder, on the  
slopes of the volcano Tungurahua. See  
herb. No. for specimen collected near Loja.

*Passiflora ligularis* -- Granadilla. Quite common in the gardens of the town.

*Passiflora quadrangularis* -- Tumba. The name barba does not seem to be known here. The plant is occasionally cultivated with fair success, in the gardens of the town, and fruits are brought here for sale from the lower country.

*Cucuma obovata* -- Luma (properly licuma). One of the commonest fruit trees of the town, grown in nearly every garden. There are said to be two varieties, viz. the comica and the limeña; the latter is the smaller of the two, and the best in flavor. The limeña is perhaps a different species; I have not seen it here.

*Psidium guajava* -- guayaba. Fairly common in the gardens of the town.

*Impa* sp. -- guaba. The species commonly grown about the town has a flattened pod about 8-10 inches long and 1 inch wide.

*Pyrus malus* -- manzana. Not commonly grown and not altogether successful here in the town.

*Pyrus communis* -- pera. A small variety, probably the same as the pera nacional of Chili, is cultivated in quite a number of gardens about the town, and is evidently fairly successful here. There is no fruit on the tree at this time. The fruit produced here is said to be hard and not of good quality.

*Jubaea spectabilis* -- coquito Chileno or coquito de Chile. There are several fine large specimens of this palm scattered over the town, and the fruit is sometimes sold in the tiendas; it is shaped like the  about 1/2 in long, and deep yellow in color.

*Cydonia vulgaris* --- membrillo. Cultivated very successfully in quite a few gardens of the town.

*Ficus carica* --- figs and figs, according to the variety. This is one of the best fruits of Loja, quite successful here, and cultivated in nearly all the gardens. Some of the large black figs, which appear to ripen well here (when given a chance) are very good. Usually the figs are picked before they are fully ripe, and steamed in sugar.

*Citrus sinensis* --- naranja dulce. Quite common in the gardens of the town. The fruit produced here is not considered so good as that from lower elevations, because it is so sweet.

*Citrus aurantium* --- naranja agria. Common and quite successfully grown in the gardens of the town.

*Citrus limetta* --- lima. The sweet lime is cultivated successfully in many gardens, and fruit is also brought into the town from the highland regions.

*Citrus limonum* --- limon real. The true lemon is not much used here. I have seen it in the garden of Sr. Witt, where it grows and bears well, but the fruit looks strange and coarse.

The mandarin is said not to be grown here. I have seen no trees.

*Eriobotrya japonica* --- nispero del Japon. Cultivated in a few gardens. Fruit produced here is small & acid, and not esteemed.

*Hesperomeles*? --- quiqui. Very common wild shrub on the hillsides about town. The fruits are eaten by children only, and are used to make strings of "beads" which they wear. Now in season. Said to be the huagra-manzana of Quito.

*Carica* sp. --- babaco. Same as the babaco of Ambato and the North Common by us very successfully cultivated in the gardens of Loja, several plants often being found in one garden. Fruit much esteemed here for dulces.

*Carica* sp. --- toronchi. This is the Chigüita of Baños. Relatively rare in Loja, not nearly so abundant as the babaco, in fact I have seen no plants at all, but I found a lot of the fruits in a tienda, and Obregón Witt tells me it grows here.

*Carica condomarcensis* --- chambuco. This is said not to be grown in the town of Loja, and I have not seen it there, but it does occur, mainly as a wild plant (not necessarily native, but perhaps so) in other parts of the province.

*Ericaceae?* --- tira. A shrub 6 ft high found upon the very moist paramo of the Cord. de Zamora, at about 8000-9000 ft. Fruit looks like the Chimote of Targuachua, and tastes much the same, but is not quite so good.

*Ericaceae?* --- salapa. From the paramo on the Cordillera de Zamora, at about 8000 ft. Small tree or suberect shrub.

*Ericaceae?* --- joyapa. Several kinds: see herb. Nos.  
From the wet paramo on the Cordillera de Zamora.

*Prunus armeniaca* --- albaricague. Has been planted in the town of Loja, but is not successful here, - the trees bear only an occasional fruit.

*Olea europaea* --- olivo. The tree grows well in the town, but only yields an occasional fruit. Very few trees here.

*Vitis vinifera* --- uva. It grows in quite a few gardens in Loja, but is not very successful here as a fruit-bearing plant, the climate being too moist for it. South of Loja, in the vicinity of Malacateño, there appear to be lands quite suitable for viticulture, and some good grapes are said to have been produced already, but only a few good varieties need to be introduced for trial.

*Solanum quitense* (?) --- naranjillo. Quite successfully grown in the town of Loja, where it is found in a good many gardens.

*Passiflora* --- granadilla de Quijo. This is said to be grown near Chahuacavaca and Guano, and to ripen in April; from the description given me I do not believe it can be the species I got at Baños under this same common name.

*Morus nigra* (?) --- morena. The European mulberry is grown in a few gardens of the town.

*Eugenia jambos* --- poma rosa. Grown in a few gardens about the town, but the fruit is of little value here.

*Fragaria vesca* grows wild along the trail from Loja northwest.

*Citrus*. The limón or lime is grown near La Valle.

Tuesday Cuenca, Ecuador April 19, 1922

Following are notes on the principal fruits observed in Cuenca and vicinity during the past three days:

*Carica andamascensis* (or the species which I have been designating by the name in various parts of Ecuador) commonly termed in this region, sigloin, sometimes siglabin and siglabin, and also known as chibitacón, though this name is not much used. The species is very commonly grown in and about Cuenca, and the fruit is regularly sold in the market, though not in large quantities. Dr. Cresson says that this species is the papaya of the coast, changed by the climate of Cuenca.

*Carica* sp. babaco. Here, as elsewhere in Ecuador, known only as babaco. Dr. Cresson says that it is a native of Peru, and only carried to Ambato (with) in the last half century. It is cultivated fairly commonly in Cuenca.

*Carica* sp. higacho. Here called chomburo, and fairly common in the districts of the town, though much less so than the siglabin. The fruit is often sold in the market.

*Tacsonia mollissima*. Called gullán instead of tacso. Very common all about the outskirts of town, scrambling over trees, walls, etc. The fruit is regularly sold in the market. I found what appears to be a white-flowered form of this species, though it may be distinct.

*Tacsonia* sp. There is another *Tacsonia* (at least, I take it to be specifically distinct) with leaves whose lobes are much narrower than those of *T. mollissima*, but the fruit quite similar in size and appearance. It is much less abundant than *T. mollissima*.

*Crataegus* sp. I have seen in the market a fruit which like the manzanilla of Guatemala, which is called manzanillo and is said to be grown near by. Probably it is the same as the huayra manzana of Quito.

*Citrus medica*. The cidra, seen in the market, and grown, not far away, perhaps in the Yunguillas section.

*Opuntia* sp. The tuna is abundant in the market.

*Vitis vinifera*. The uva or grapa is cultivated in quite a good many gardens of Quesaca, but is more successful in other parts of the Agency.

*Pyrus malus*. The manzana or apple is a common fruit of this region, but is not so successful in Quesaca as it is in other sections. The market just

now is flooded with small apples, of poor quality. The Bolsosa is also cultivated in this region, and I have seen it in the market.

*Angidalus persica*. The durazno or peach. Produced very abundantly, and of good quality, in the Quilacoo section; the tree is very common also, in the garden of Quesaca. I am inclined to think that the product of Quilacoo is of better quality, on the average, than that of Amato and vicinity.

The guayamba or freestone is almost unknown here - it is said to be cultivated occasionally. Most of the peaches now in market are white-fleshed clingstones, the surface yellowish white usually interspersed with red. There are some yellow clingings also. The size is not large, but the flavor of the white clingings is usually very good. This fruit is said to be extremely abundant in Quilacoo.

*Cydonia vulgaris*. The membrillo is quite commonly grown and the fruit is seen or sold in the market and the tinajas.

*Cyphomandra betacea*. The tomate, or tomate de arbol. Common in the gardens of Cuzco, and the fruit regularly sold in the market.

*Citrus sinensis*. The naranja dulce. Cultivated in the gardens of Cuzco, but the market is supplied from other sections principally Yunguilla & Imaigen.

*Citrus limetta* (?) The lima or cedrón here is cultivated rather commensally in Cuzco and the fruit is abundant in the market (Probably brought in from Yunguilla or elsewhere).

*Citrus* . . . The limón or lima. Not very common here.

*Mangifera indica*. The mango, not great in the near vicinity of Cuzco, but brought to the market from the Yunguilla and perhaps elsewhere.

*Solanum muricatum*. The pepino. Three kinds seen in the market: (1) a broadly ovate-acute to round, deep light yellow or straw-colored fruit, of very good quality; and (2) a very slender sharply pointed one pale yellow striped with light purple; and (3) a slender oblong, sharply pointed variety (sometimes long-conic), pale greenish-yellow, striped with light green. I believe the first is the best.

*Ananas sativus*. The pina. Cultivated in the Yunguilla, and brought upon here to Cuzco market. The variety grown seems to be a very poor one.

*Musa sapientum*. The guineo. Like the pina, cult. in the Yunguilla, whence it is brought to Cuzco in quantity.

Musa paradisiaca. Platano. Peruca can-  
cering genus apply to this also though it  
seems much less common in the  
Cuzco tentas and market.

Ficus carica. The brava and hija.  
Commonly and very successfully grown  
in Cuzco. The large fruits of the  
first crop are brava, the later and  
smaller fruits hija; I am told by Don  
Crisp. that some trees produce very large.

Passiflora ligularis. The granadilla, common  
about the town of Cuzco.

Juglans honoris (?). The tocto, a very  
common tree all about the town of Cuzco.

Rubus sp. The mora. The species found  
in Cuzco and immediate vicinity (See  
Lab. No. ) produces a round to oval berry,  
 $\frac{1}{2}$  to  $\frac{3}{4}$  inch long commonly, black in color,  
with rather large, juicy segments, each of  
which contains a relatively large and hard  
seed. The flavor is pleasant. The fruits are  
produced abundantly in large terminal clus-  
ters (sometimes a foot in length). The  
plant is exceedingly abundant here, it  
is found along roadsides, and in fences and  
hedgerows everywhere about the town. Appa-  
rently the same species which grows  
abundantly at Loja.

Pyrus communis. The pera. Cultivated  
in Cuzco, and also (and probably more  
extensively) in Gualeaco and other fruit  
regions. The common variety seems to  
be the pera nacional of Arellano.

*Prunus armeniaca*. The albaricoque,  
cultivated commercially at Quabaca.  
It is preserved in very heavy syrup and the  
sold at Cuenca throughout the year in  
cajetas. These prepared however the fruit  
lose not much of the characteristic apricot  
flavor.

*Annona cherimola*. The chirimoya, commonly  
grown in the gardens of the town.

*Persea drimifolia*. The aguacate trees  
are scattered here and there over the town -  
not one of the commonest trees here by  
any means. Apparently all are small  
planted varieties.

*Persea americana*. The aguacate (that  
Indian name) said to be grown in great  
abundance in the valley of Yunguilla,  
where the fruit is brought to Cuenca  
for sale.

*Palmæ*. The cumbe of Antotas here  
called coco or palma comuna. Fairly  
common about the town.

*Lucuma obtusa*. The Lucuma, fairly  
common in the gardens of Cuenca, but  
not so conspicuous here as in Loja.

*Inda* sp. The duaba. One species is  
quite common in gardens about town.

*Eriobotrya japonica*. The nispero del Japon.  
Rare in Cuenca gardens, and apparently not  
altogether successful as a fruit-bearing  
plant, though the tree grows well.

*Eugenia jambos*. The pomarosa. Grows  
in a few gardens, but like the logan,  
does not fruit well here.

*Olea europea*. The Olivo, said to fruit well  
in some parts of Ayacucho, but not in  
Cuenca.

Fragaria vesca. The fresa. The stems  
as a fruit-bearing plant, but found in some  
of the gardens.

Prunus salicifolia. The capuli.

Plants Used by the Ancient Ecuadorians,  
according to F. Gonzalez Suarez:

Maiz - sacas o zara  
Quinoa, blanca y colorada  
Orujo (mani)  
Frijoles de varias clases  
Papa  
Cajon  
Cucama  
Alloco  
Camote (batata) blanca y morada  
Uchu (Capsicum)  
Chucho  
Cacha o aguacate  
Pina  
Chirimoya  
Capuli  
Platano  
Yuca  
Maca  
Papaya  
Zapallo  
Jumbo

F. Gonzalez Suarez, in his Historia del Ecuador (Lib. I, 158) says:

"La Palma o Aguacate, que tan sabroso le pareció al Inca Tupac Yupanqui, se daba en los pallas obregados de la provincia de Saraguro."

Saturday Quito, Ecuador May 7 1921

Prepared for shipment the following:

604. Crataegus sp. Mangana silvestre or huagra-mangana, from Quito. 4 plants

605a. Compositae. Blue-flowered leaf-shrubby plant from Loja. See Herb. No. 1317. Very little seed. Pink label.

606a. Salvia sp. Pink-to scarlet-flowered salvia, from Loja. See herb. No. 1320. Small quantity of seed. Pink label

607a. Compositae. Gerbera-like plant with fls. of burnt orange color, from Loja. See herb. No. 1322. Small quantity of seed. Pink label.

608. Rhipsalis. Two plants from province of Loja, for Dr. J. N. Rose

609a. Rosaceae. Quigua, from Loja, for trace as stock plant. See herb. No. 1325.

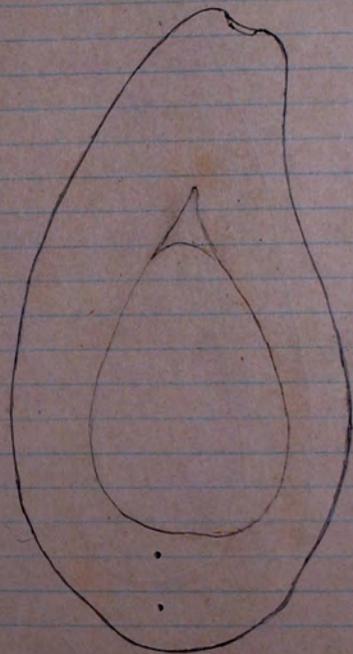
quantity of fruits in dry charcoal +  
splegnum dust.

610a. *Carica* sp. bigaço. The Chamber  
of Guato. Small quantity of seed in  
dry charcoal dust.

Wednesday Hda. Trumina, Ecuador May 25 1921

Arceado N<sup>o</sup> 52

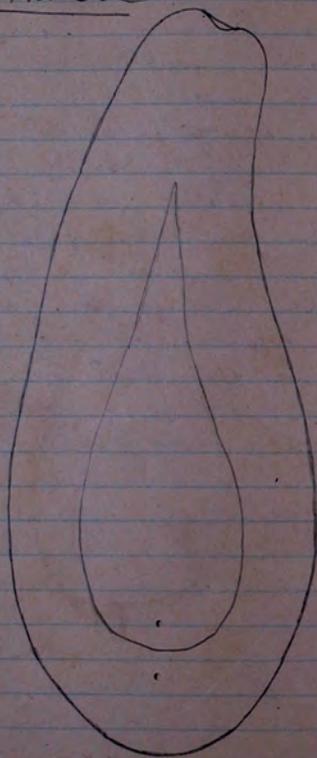
Elevation 6200 ft.



Weight 100g

$5\frac{3}{8} \times 2\frac{3}{4}$  inches

Arocado No. 52



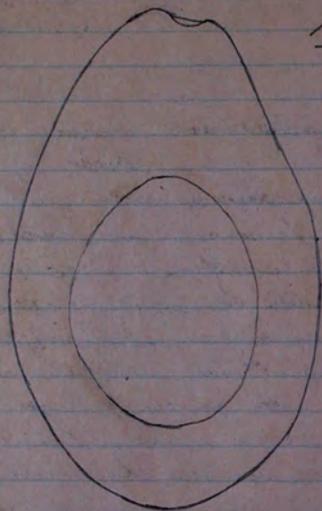
Weight 9 ozs,  $6\frac{1}{4} \times 2\frac{9}{16}$  inches

Arocado No. 52. From Hda. Juvenina

Form pyriform to very slender, pericarpium, naked, weight about 10 ozs, length commonly 5 to 6 ins, breadth  $2\frac{1}{2}$  to  $2\frac{3}{4}$  ins; base tapering, often curving to one side, the stem inserted centrally; apex rounded to broadly pointed; surface light green, with numerous greenish yellow dots; skin scarcely 0.5 mm thick, rather firm and tough; flesh cream-color, pale green near the skin, with a few fiber markings; flavor ~~is to be~~ very rich and pleasant; quality excellent; seed conical, rather slender, medium sized, loose or tight in the cavity.

Tree 50 ft high, erect in habit, with spread of about 30 ft. Probably 20 years old. Trunk  $15\frac{1}{2}$  thick at base, forked at 40 ft, first branches at 18 ft; limbs ascending. Last fruits of old crop dropping; tree now with flowers and fruits of new crop, up to 2" long. Said to bear heavily. Foliage faintly amara-scented.

A fruit of fine quality; flavor rich, nutty, flesh oily, not watery.

Avocado No. 53

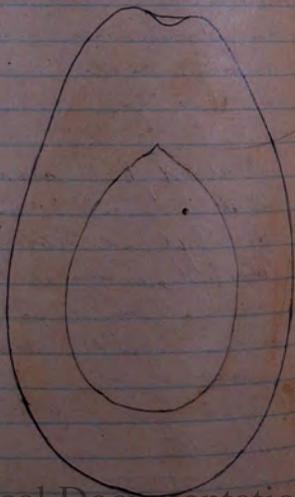
Weight 7 ozs

 $4\frac{1}{4} \times 2\frac{3}{8}$  ins

Weight 6 ozs

 $4\frac{1}{4} \times 2\frac{1}{2}$  ins

A fruit of very rich  
flavor, flesh gray, oily,  
quality excellent.

Avocado No. 53. From Sta. Trumina

Fruit oblong-obovoid, weight 6 to 7  
ozs, length about 4 ins, breadth about  $2\frac{1}{2}$   
ins; base bluntly pointed, with the stem  
inserted slightly to one side; apex rounded  
to broadly pointed; surface pale olive-  
green, blushed with maroon-purple and  
dots very numerous, large, whitish green dots;  
skin not quite 0.5 mm thick, firm and  
leathery; flesh rich cream-yellow, greenish  
quaint close to the skin, with few fiber  
markings. flavor said to be very rich  
and pleasant, quality excellent; seed  
oblong cone, light or slightly brown in  
the cavity.

Parent tree about 45 ft high, with spread of  
60 ft, at least 50 yrs old. Trunk 3 ft thick at  
base, fork at 100 ft above ground. Crown rather  
open, limbs almost horizontal in some instances tree  
now in bloom, and last fruits of all crop are now  
falling. Said to bear well. Foliage distinctly  
arborescent.

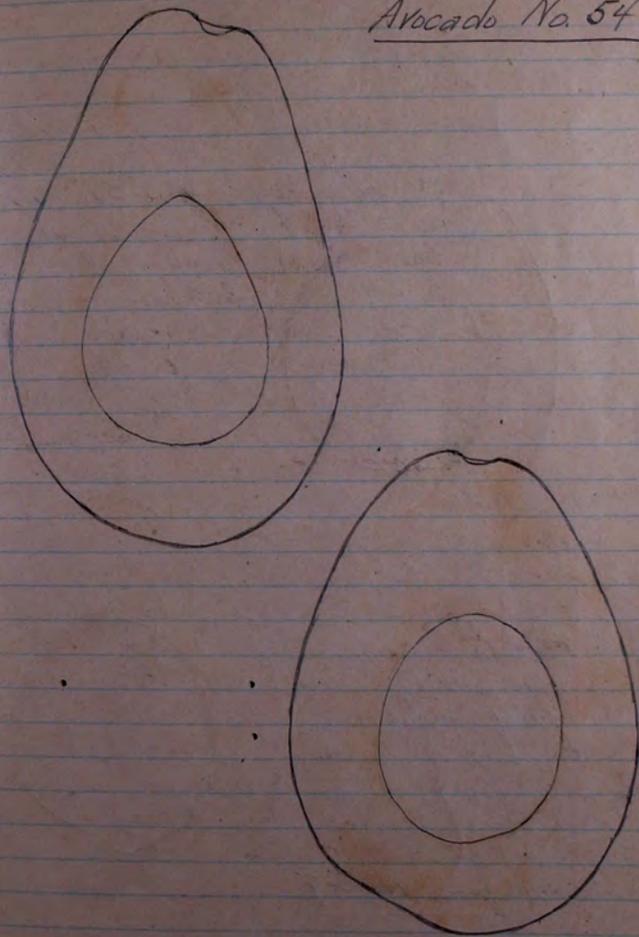
Thursday Hda. Carpuela, Ecuador May 26, 1933

Avocado No. 54. From the huerta of Rosa Gonzalez, in the hacienda Carpuela.

Form oblong-pyriform to oval-obovoid; weight about 90g. Length 4-4 $\frac{1}{2}$  ins, breadth about 2 $\frac{3}{4}$  ins; base broadly pointed, apex rounded to slightly and obliquely flattened; surface of ripe fruit glossy purple-black, with very few dots visible, though there are numerous on the surface of the green fruit skin less than 0.5mm thick, relatively tough; flesh yellowish cream color, tinged green near the skin and numerous fiber markings; flavor nutty, pleasant, quality good; seed rather small, ovate to oval in form; tight in the cavity with both seed coats adhering closely to the cotyledons.

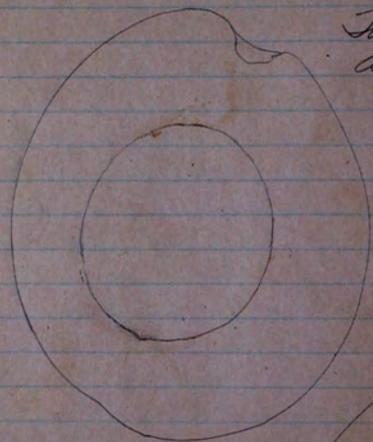
The parent tree is about 45 ft high, slender and erect in habit, with trunk 18" thick at the base, forked at 2 ft from ground. Crown moderate dense, oval, foliage flat-topped. Said to bear well. Now dropping last fruits of old crop and flowering for new crop.

Avocado No. 54



Friday Abasco San Vicente Ecuador May 27 1914

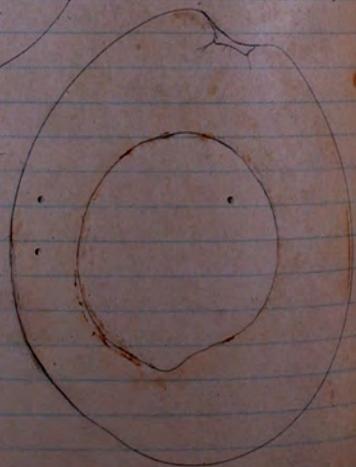
Following are outlines of avocados grown on this hacienda:



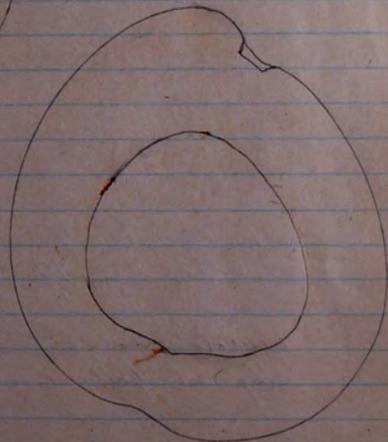
Two small fruits of Avocado No. 47 (No. 2 of San Vicente). Weight of the two, 20 gms.

Fruits immature and probably not fully grown.

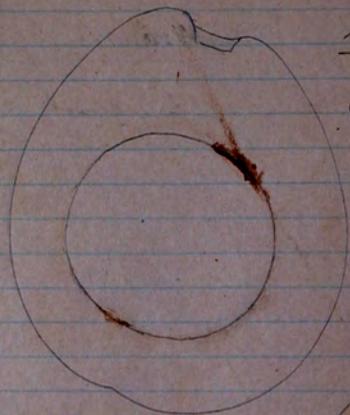
Avocado No. 47



Avocado No. 48



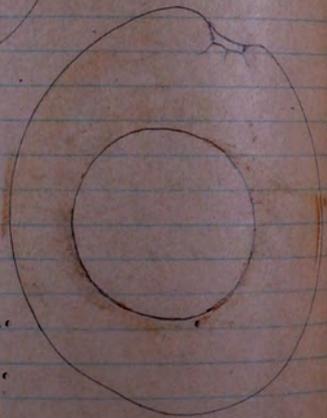
Two immature fruits of Avocado No. 48 (No. 2 of San Vicente). Combined weight 17 gms. Fruits immature and probably not fully grown.



Avocado No. 49.

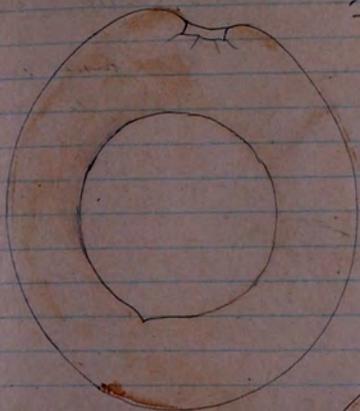
Combined weight of  
the two, 16 gms.

Two fruits of  
Avocado No. 49  
(No. 3 of San Vicente)  
immature and prob-  
ably not fully grown.

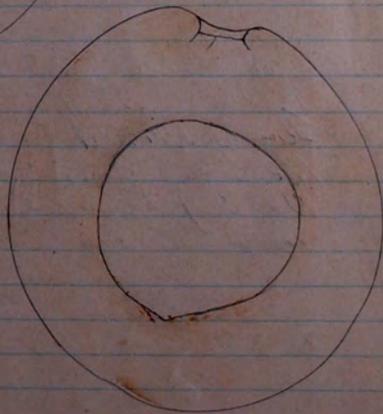


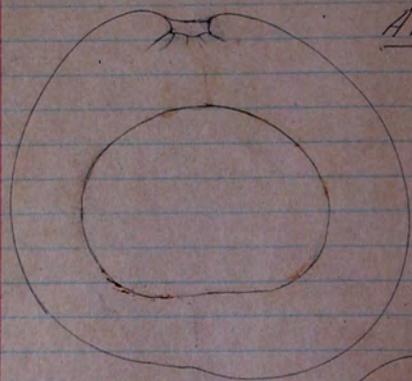
Avocado No. 50.

Combined weight of  
the two, 16 gms.



Two small fruits  
of Avocado No. 50  
(No. 4 of San Vicente)  
not characteristic of  
the variety in so far  
as size is concerned.

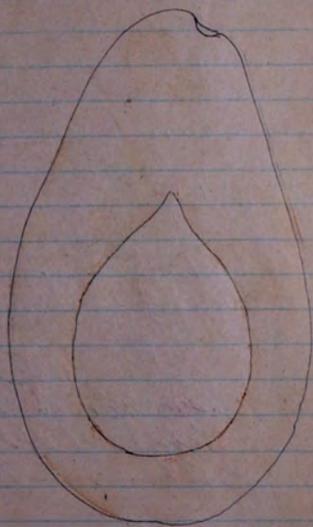
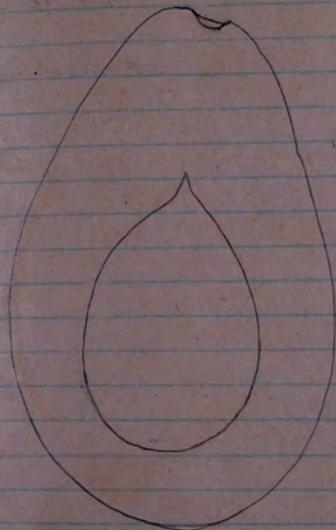
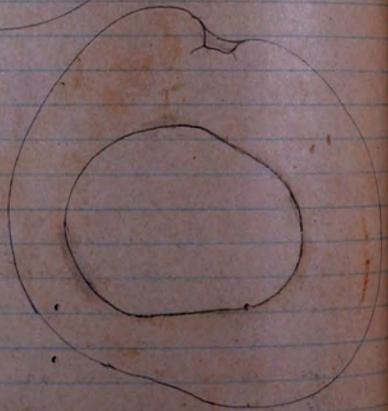




Avocado No 51

Combined weight  
of 2 fruits 20g

Two mature and  
typical fruits of  
Avocado No. 51,  
(No. 5 from San  
Vicente)



Two fruits (combined weight 150g) from  
tree here close by. Avocado No 47 of San  
Vicente (Avocado No 47). This variety has not  
yet been selected for trial in the United  
States, but seems worthy of further examination  
with the possibility in view.

Saturday Ibarra, Ecuador May 28, 1920

Shipment prepared to go forward tomorrow by Chacqui to Guayaquil and then to Washington via the Diplomatic Packet.

611. *Solanum muricatum* Yellow pepino, plants from Carpuela
612. *Persea americana* Avocado No. 47. From the Hda. San Vicente
613. *Persea americana* Avocado No. 48 From the Hda. San Vicente
614. *Persea americana* Avocado No. 49 From the Hda. San Vicente
615. *Persea americana* Avocado No. 50 From the Hda. San Vicente 2 phys. in sphagnum from Wadón, other Laja sphagnum
616. *Persea americana* Avocado No. 51

From the Hda. San Vicente

617. *Persea americana* Avocado No. 52 From the Hacienda Trumina
618. *Persea americana* Avocado No. 53 From the Hacienda Trumina
619. *Persea americana* Avocado No. 54 From the Hacienda Carpuela

Seeds to be sent to José Felipe Tamayo.

- ✓ Egyptian cotton some for Irumina
- ✓ Dates - early ripening varieties some seed for Irumina
- ✓ Rhodes grass
- ✓ Natal " some for Irumina
- Other forage crops
- Grape vines
- Jujube

"Forage Plants"  
by Cooper

- ✓ Wheat for La Puncmeda - cold, wet climate
- Sorghum for Carlos Freide
- Casaba mdon
- Collection of Roses; inc Rainbows + Tausandacheta from Karl Bruchchi
- Carnellias - Bromias
- ✓ Sweet Peas - collection of Spence
- Forage plants from Alaska

Sunday Ibarra, Ecuador May 29 1931

The following names have been selected for the avocado for the Chota valley.

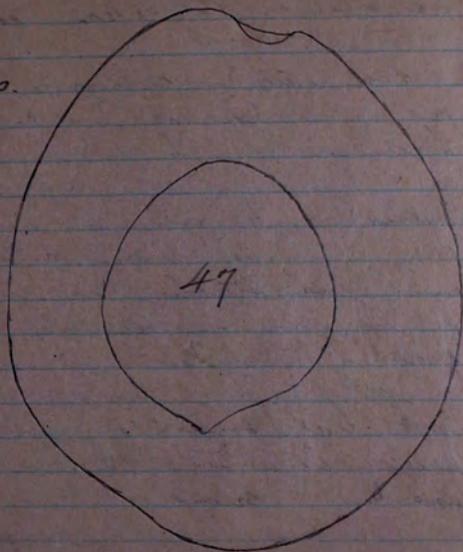
No	Origin	Name	Meaning
4270	117 d. San Vicente	④ Tamayo	Named for J. F. Tamayo
	118 " "	✓ Egas	named for José Efraim Egas
4271	119 eggs " "	⑤ Chota	Name of River
4272	50 " "	Coya	Queen
4273	51 " "	⑥ Carachi	Name of Province
	52 Irumina	⑦ Irumina	Name of Hacienda
	53 " "	⑧ Imbabura	Name of Province
4895	54 Carpuela	⑨ Capac	Prince; Sovereign
	55 San Vicente	⑩ Inca	Noble; Monarch
	56 Carpuela	⑪ Huira	Butter

Avocado No. 47 (No. 1 at San Vicente)

This tree is growing in the horta created by Rafael Jimenez, in the Hacienda de Vicente.

This variety is either a very common Mexican, or a hybrid between the Mexican and West Indian, as far as can be judged from an examination of the parent trees. The fruit is of good size, about 18 ozs in weight - and of considerable oil content. In appearance it is fairly attractive, the surface being smooth and light green in color, washed or overspread with maroon-purple at the stem end. The skin is not thick; it resembles both in thickness and character, that of many of the large-fruited Mexican varieties. The flesh is cream colored, with a few pice-markings. The quality is good. The seed is small, and tight in the cavity. The tree appears to be a fair, but not large, crop.

Wt. 18 ozs.



Pomological description:

Form broadly oval to obovoid; weight 18 ozs; length about 4 ins., greatest breadth about  $3\frac{3}{4}$  ins.; base slightly tapering, the stem inserted to one side; apex very slightly and obliquely flattened; surface smooth, light green with numerous whitish green dots, and overspread with maroon-purple or dull purple around the stem; skin thin,

like that of the largest-fruited Mexican varieties; flesh very abundant, cream-colored, tinged with green in a narrow zone near the skin, with fiber markings but no tough fibers, the flavor rich and pleasant; quality good; seed relatively small, ovoid in form, tight in the cavity, with both seed coats rather closely adhering to the rough cotyledons. Principle examined at San Vicente probably January and February.

The leaves have a very faint anise-scent, scarcely detectable.

Avocado No. 48 (No. 2 of San Vicente)

This is a Mexican variety, evidently prolific in bearing. For the large size of the fruit, combined with the relatively small size of the seed, it seems worthy of a trial in the United States. It has an avocado of attractive appearance, broadly obovoid in form, and about 12 oz. in weight (in the United States it will probably be up to 16 or 18 oz.) with abundant flesh, devoid of fiber and with only very faint fiber markings. The seed is tight in the cavity. The quality is good.

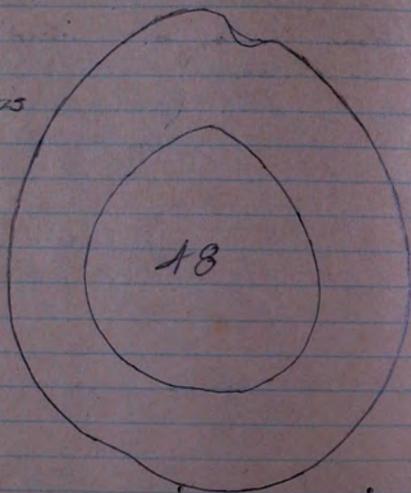
The parent tree is growing in the huerta rented by Rafael Jimenez in the Hacienda San Vicente.

Paranological description:

Form obovoid to broadly obovoid; weight about 13 oz.; length about 4 in.; greatest breadth about  $3\frac{1}{4}$  ins.; base broadly pointed, the stem inserted to one side of the longitudinal center of the fruit; apex obliquely flattened; surface

smooth, almost glossy, light yellowish green in color, sometimes speckled with pale purple on one side, and always with numerous large pale yellow-green dots, which

Wt. 130's



of average thickness for large-fruited varieties of the Mexican race; flesh yellowish cream-color, pale green close to the skin, with very few and inconspicuous fiber-markings; the flavor fairly rich, pleasant quality good; seed medium sized, broadly

ovoid in form, tight in the cavity with both seed-coats closely surrounding the somewhat rough cotyledons. Principal season at San Vicente December to February; like the other varieties grown in this region, however, its season is very irregular, because of the lack of well-defined climatic seasons.

Avocado No 49. (No. 3 of San Vicente)

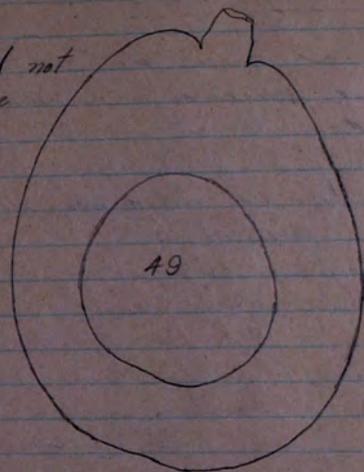
Parent tree in the huerta owned by Rafael Jimenez, in the hacienda San Vicente.

A Mexican avocado, of much the same general character as Puebla, but with a relatively smaller seed (in some specimens, at least). The fruit is broadly obovoid in form, 8 to 12 ozs in weight, will probably go up to 16 in the United States; glossy, maroon-purple in color when fully ripe. The skin is of average thickness for a large-fruited variety of the Mexican race, the flesh devoid of fiber and of good quality. The seed is tight in the cavity, in some specimens it is very small, in others medium sized. The tree, which is a very old and large one, is said to be very productive.

Pomological description:

Form obovoid to broadly obovoid; weight from 6 to 12 ozs.; length  $3\frac{1}{2}$  to 4 ins.; greatest breadth  $2\frac{1}{2}$  to 3 ins.; base broad

A small and not fully mature specimen  
wt 8 ozs.



with the stem inserted somewhat obliquely in a moderately deep cavity; apex flattened obliquely, though not conspicuously so; surface smooth, glossy, deep maroon-purple in color with very small, light maroon dots; skin of average thickness for large-fruited avocados of the Mexican race; flesh cream-color, devoid of fiber and with only faint fiber markings; the flavor rich and pleasant; quality good; seed small to medium-sized, broadly ovoid to almost

oval in form, light in the seed cavity with both seed-coats closely surrounding the nearly smooth endosperm. Season of ripening probably December to February at San Vicente, with a few fruits maturing at other times of the year because of the peculiar climatic conditions of the region.

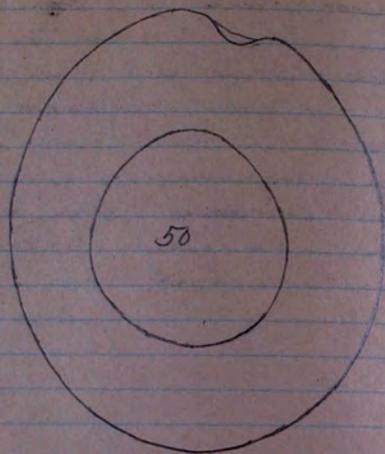
Avocado No. 50 (No. 4 of San Vicente)

Parent tree growing in the huerta created by Juan Manuel Armas, in the Hacienda San Vicente.

A few large *Mezquites* of attractive and convenient form, having a small seed and flesh of rich flavor, with, however, objectionable fiber in some instances. Some specimens I have examined showed no fiber at all, in others the fibers were abundant and tough. The difference may result from differences in the degree of maturity of the fruits, in which case the presence of fiber may be avoided by picking the fruit only when it has reached the proper degree of maturity.

The form is broadly elliptic to nearly round, the color deep purple on the ripe fruit, and the seed light in the cavity. This may possibly be a hybrid between the *Mezquite* and West Indian races, tho I am inclined to believe it is a fair-blooded Mexican of rather unusual character.

Wt. 10 gms.



### Pomological description:

Form broadly elliptic, oval, or nearly round; weight about 10 gms; length about  $3\frac{3}{4}$  ins.; greatest breadth about  $3\frac{1}{4}$  ins.; base rounded to bluntly pointed, with the stem inserted slightly to one side of the center apex very slightly and obliquely flattened; surface smooth, somewhat glossy, dark purplish maroon to purple in color, with large dots of pale maroon color; skin of average thickness for a large-fruited Mexican

avocado; flesh rich cream-color, with fine markings and sometimes objectionably tough fibers; flavor rich and pleasant; quality fair to good; seed small, round-ovoid, straight in the seed-cavity with both seed-coats surrounding fairly closely the slightly curved cotyledons. Principal season of ripening at San Vicente probably from February to April.

Avocado No. 51 (No. 5 of San Vicente)

Parent tree growing in the huerfano center by Rafael Jimenez, on the Hacienda San Vicente.

This variety might almost be called a Mexican Trapp. It has the form of the latter, and it also has a seed somewhat larger than the ideal; but if the size of the fruit increases when the variety is subjected to good cultural conditions in the United States, it may prove to be a valuable sort.

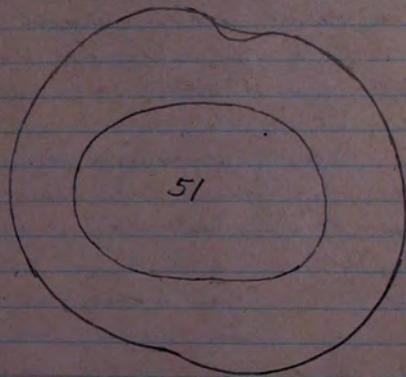
The tree has foliage of peculiar waxy appearance. The fruit is oblate in form, about 8 ozs in weight, purple when ripe, with yellow flesh of good quality. The seed is sometimes slightly loose in the cavity.

Pomological description:

Form oblate; sometimes oblique; weight about 8 ozs; length about  $2\frac{3}{4}$  ins; greatest breadth about  $3\frac{1}{4}$  ins; base rounded to slightly flattened; the stem inserted obliquely deep conspicuously, and usually somewhat

obliquely flattened; surface smooth, dull purple in the fully ripe fruit, with large dots of lighter purple; skin of about average

Wt. 8 ozs.



thickness for a large-fruited avocado of the Mexican race; flesh yellow, tinged pale green close to the skin, nearly free from fiber markings; flavor rich and pleasant; quality good; seed large, oblate, tight in the cavity, with both seed coats surrounding fairly closely the nearly smooth cotyledons; occasionally the seed is smaller, loose in the cavity, with the seed-coats

living the latter. Principal season  
at San Vicente about January to  
March.

The skin is thick enough to be peeled  
from the fruit. Flavour nutty; fibre thin.  
Coloration rather objectionable in some  
of the specimens examined.

The following account is copied from *Historia  
General de la Republica del Ecuador*, by  
Dionicio Gonzalez Suarez, tome I, Quito 1890:

"Pueblos sedentarios, que tienen hogar fijo,  
no podian menos de ser agricultores, y  
agricultores eran, en efecto, todas las  
provincias indigenas ecuatorianas. Cultivaban  
el maiz, cereal nativo de America, del cual  
tenian varias especies, acomodadas a deter-  
minados terrenos y temperamentos. El maiz lo  
comian cocido en agua, tostado al fuego  
en trozos, y molido. De su harina hacian  
panes para los sacrificios de sus dioses,  
y ciertas pastas delicadas cocidas en  
agua hirviendo, de las que usaban en  
ocasiones de regalo. La quinua, de dos  
especies, blanca y colorada, de cuya fécula  
tambien solian hacer panes, suplía ven las  
localidades frias al maiz, que requiere  
temperamentos más benignos. El Mani,  
llamado Inchie, y varias clases de fri-  
oles, cultivados a par del maiz, eran las  
plantas que tenian los indigenas de estas  
provincias entre las leguminosas. De las  
tuberculosas, cultivaban para su alimento  
no pocas variedades de la papa, la oca,

la jicama y el desabrido pero sustan-  
cioso ellocol en las provincias del  
litoral se daban además los camotes,  
conocidos generalmente con el nombre de  
batatas, de los cuales había dos especies,  
la blanca y la morada.

Las hojas de la quinua y la del  
nabo, de tallos delicados, que crecen  
espontáneamente en los campos, se  
aprovechaban para guisar una cierta ma-  
nera de ensalada, unas veces cruda, y  
otras hervida a masa, mediante el  
fuego, haciéndola hervir en agua ratonada  
de las cañas tiernas del maíz ultramarino  
dulce, exprimiéndolas con la mano el  
jugo apicardado; y el aji uclu, era el  
pendiente más apreciado, con que  
seguaban su comida.

En las partes frías y secas, donde  
las llanuras de arenales no proporcionan  
comodidad para otros cultivos, hacían  
plantaciones de altramuzes americanos,  
que llamaban chochos en las lenguas  
quichua; y de los valles calientes  
sacaban varias frutas regalesas. La  
pelta ó aguacate, que tiene espeso  
la parada al Inca Tupac-Yupanqui,

se daba en los valles abrigados de la  
provincia de Saraguro; la pita  
compeaba entonces como ahora en las  
playas ardientes y húmedas del litoral;  
el Chirimoya era cultivada en todos los  
puntos, donde un clima templado podía  
hacerla madurar y sazonar; los árboles  
frondosos del capulá hermoseaban las  
havadadas de los Cañaris, y eran por  
ellos adorados como diidades campestres;  
en fin, algunos especie de plátano con-  
plátano en lista de los platos ó postres  
en la sobria mesa de nuestros antiguos  
indios. . . . .

"De los puntos fércos de la costa sa-  
caban la yuca y la papaya; y, en  
compensación, en las tierras frías tenían  
plantas trepadoras de dos especies distintas,  
que les producían los gambos, de sabor  
dulce, frescos y abundantes, y los zapallos,  
de pulpa amarillada, con que así pobres  
como ricos orlaban los manjares de su  
mesa, permitiendo en un comercio rudimentario,  
los frutos de sus campos, mediante los fáciles  
esfuerzos de una imperfecta agricultura."

In a footnote, he gives the following

botanical names of some of the plants mentioned above:

Aji largo	<i>Capsicum annuum</i>
Rocoto	<i>Capsicum pubescens</i>
Capuli	<i>Physalis peruviana</i> (Duroc)
Zara (maiz)	<i>Zea mays</i>
Papa	<i>Solanum tuberosum</i>
Plátano	<i>Musa paradisiaca</i>
Chirimoya	<i>Annona cherimolia</i>
Aguacate	<i>Persea gratissima</i>
Piña	<i>Bromelia ananas</i>
Yuca	<i>Manihot aipi</i>
Camote	<i>Batata edulis</i>
Oca	<i>Oxalis tuberosa</i>
Olloco	<i>Ullucus tuberosus</i>
Massua	<i>Tropaeolum tuberosum</i>
Zapallo	<i>Cucurbita maxima</i>
Zambo	<i>Cucurbita pepo</i>
Quinua	<i>Chenopodium quinua</i>
Mani	<i>Arachis hypogea</i>

Sunday La Rinconada, Ecuador June 5, 1921  
Forage Plants at La Rinconada

Dr. José Felip Tamayo tells me that the following introduced grasses are now growing successfully in the pastures of La Rinconada:

<i>Lolium perenne</i>	called Rye-grass	English
<i>Lolium italicum</i>	" "	italiano
<i>Holcus lanatus</i>	"	holco
<i>Dalman</i>	"	orchard-grass

The agricultural zone in Ecuador extends to an altitude of 3500 meters. La Rinconada is at 3110 meters.



Material prepared for shipment to Washington

620. *Solanum tuberosum* Wild potato, from  
an altitude between 11,000 and 12,000 ft in  
the Hacienda "La Rinconada". Two lots, one  
in slightly moist soil, the other in sphagnum dust  
slightly moistened. Most of the tubers immat-  
ure. June 10

621. *Vaccinium* sp. "Martino." 5 plants from  
La Esperanza, elevation about 11,500 ft For  
F.V. (will) 5 plants; Rinconada sphagnum June 13  
Herb No 1342

622. *Berberis* sp. "Espino." From La  
Esperanza, elevation about 11,500 ft. 5 small  
clumps or plants; Rinconada sphagnum. June 13  
Herb 1259

623. *Rubus* sp. "Mora común" From the  
pastures of La Rinconada, elevations about  
11,000 ft. 5 plants in Rinconada sphagnum  
June 13 1921 See herb. No. 1345

624. *Rubus* sp. "Mora blanca" From the  
pastures of La Rinconada, elevation about 11,000 ft  
June 13 1921 See herb. No. 1346

625a. *Datura* sp. Yellow-flrd huantac  
 from Hda. La Reconada. Seeds in slight  
 moisture splanon dust Jun 13 1901

626. *Persea americana* Avocado No. 47,  
 from the Hda San Vicente

627. *Persea americana* Avocado No. 48,  
 from the Hda San Vicente

628. *Persea americana* Avocado No. 49,  
 from the Hda San Vicente

629. *Persea americana* Avocado No. 50,  
 from the Hda San Vicente

630. *Persea americana* Avocado No. 51,  
 from the Hda San Vicente

631. *Persea americana* Avocado No. 52,  
 from the Hda Sumera

632. *Persea americana* Avocado No. 53,  
 from the Hda Sumera

633. *Persea americana* Avocado No. 54,  
 from the Hda Carpuela

634. *Persea americana* Avocado No. 55,  
 from the Hda San Vicente

635. *Persea americana* Avocado No. 56,  
 from the Hda Carpuela

Monday Hda. La Reconada  
Cacha, Ecuador. June 13 1938

Notes on some of the potato varieties  
this region.

Chouchos. Cultivated at elevations between 8000  
and 12,000 ft. approximately. Not a prominent  
commercial variety, as it does not keep well  
but much cultivated for home use. Tubers  
of good size, some strains of excellent  
quality, others rather inferior. Color vari-  
able, both of surface and flesh. Its principal  
defect is that it does not keep well; its ad-  
vantages are: it matures much earlier  
than other varieties, requiring 5 months to  
reach maturity, while other varieties require  
7 to 8 months; and some varieties are of very  
superior eating quality. When the plant comes  
into bloom the tubers are mature. They may  
be dug and soon immediately for another  
crop, but being unnecessary to store the tubers  
until they sprout, before sowing them, as is  
done with other potatoes. The yield is  
fairly heavy, but less than the late-mat-  
uring varieties. Tubers sent from La  
Esperanza not of the best strain, in  
quality.

Cumors. A good variety, following the  
Cumoras in commercial importance.

Morada. Of little commercial importance  
of good quality.

Cuerudo morada. Commercially one of  
the best and most important, though not  
quite so extensively grown as Cuerudo  
blanca. Good keeper.

Margarita. Very susceptible to larcha;  
an important commercial variety, espe-  
cially in the vicinity of Barra. Tubers  
of attractive appearance and good quality.

Amorpa. Not an important or well-known  
variety.

Rosa. Not an important or well-known  
variety.

Cueruda Blanca. The most important variety of this zone (La Rincónada), called Pastusa in Ibarra, where it is one of the favorite varieties in the market. Yields well, tubers of good size and uniform in character.

Neche. A good variety, cultivated more extensively in Ibarra than in La Rincónada. Tubers large, good quality, yields well.

Yungara. Not one of the important varieties in this region as it is at Ambato. Yields well here.

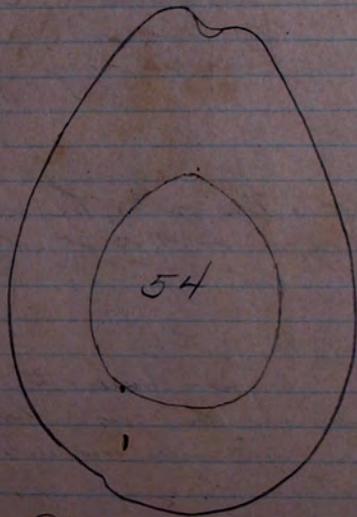
Pastusa. Synonymous with Cueruda. The Cuerudas are the most popular varieties in the markets of this region.

Friday Ibarra, Ecuador June 17, 1921

Chota Valley avocados, of which seed-wood is being sent to Washington:

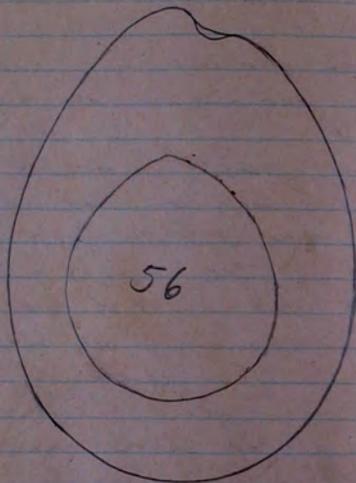
Avocado No. 54

From the huerta of Rosa Gonzales, at Carpuela.



Weight 8 ozs.

Avocado No. 56, from the huerta of  
negress called "la gorda", at Carpuela!



Height 8 in.

This is a Mexican variety of good size and  
quality. Its only visible defect is the rather  
large size of the seed. While not as fine  
as some of the other varieties in the  
collection from the Yota, it is worth testing  
in the United States.

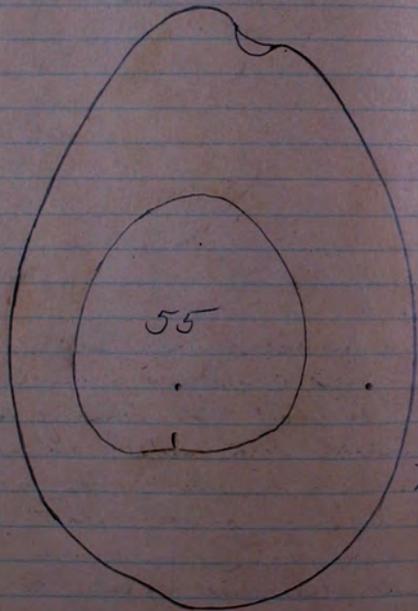
The parent tree is about 40 ft high, erect  
and shapely, and apparently a vigorous grower.

The foliage, when crushed, is distinctly amice-  
scented. The crown is fairly dense. The  
trunk is about 15 inches thick at the base,  
and branched 8 ft above the ground. At  
this time (June 16) the tree is in bloom, and  
also carrying a few half-grown fruits.

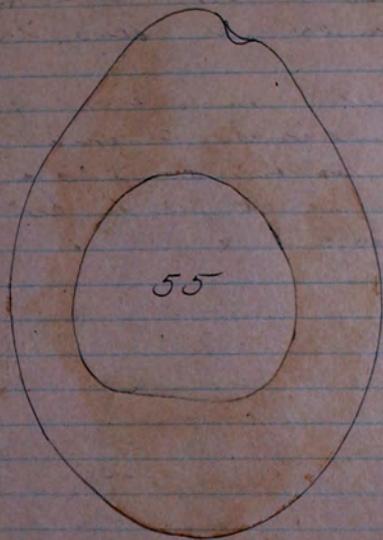
Form obovate; weight 8 ozs, length  
nearly 4 in, greatest breadth nearly 3  
in. base pointed, with the stem inserted  
obliquely; apex rounded; surface smooth,  
shining, deep purplish maroon in color,  
with numerous small, pale maroon spots;  
skin thin, as typical of Mexican race;  
flesh cream-yellow, tinged green near the skin,  
with a few fine markings; flavor  
unusually rich, nutty, quality excellent; seed broadly  
obovoid conic, rather large, tight in the cavity  
with both seed-coats closely surrounding  
the nearly smooth cotyledon. Season  
at Carpuela not definitely known; probably  
the main season is from October to January,  
but the seasons in this region are not  
well-defined.

Avocado No. 55, from the Huerta of the  
"Hacienda", at San Vicente:

Below are outlines of two fruits  
of this variety, showing the range in  
size, so far as I have been able to  
determine it from the few specimens ex-  
amined:



Weight  
15 gms



Weight  
18 gms

This is one of the most promising of the  
ten varieties obtained in the Chota valley, if  
not the most promising of all. It is an  
unusually large fruit, for a Mexican, and  
at the same time is of good quality and  
has a very small seed. So far as can  
be ascertained by an examination of the  
parent tree this appears to be a true Mex-  
ican; it may, however, be a hybrid between the

Mexican and the West Indian. This can be judged more accurately by the behavior of young budded trees and seedlings.

The parent tree, which stands in the forest closest to the hacienda house at La Uenta is about 50 ft high, and of erect, round-topped form, with an open, well-branched crown. The trunk is about 2 ft thick at the base, and gives off several large limbs about 10 ft above the ground. There is a faint anise-like odor to the crushed leaves.

#### Pomological Description.

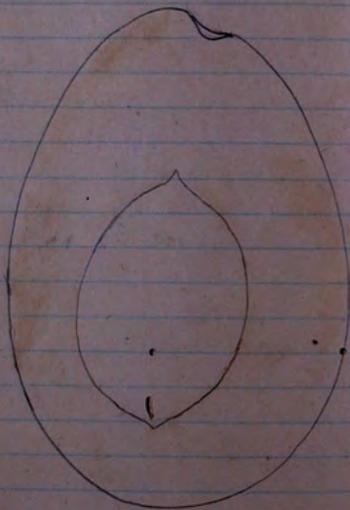
Form pyriform-obovoid to oblong-obovoid; weight 10 to 15 oz; length  $4\frac{1}{4}$  to 5 in; greatest breadth 3 to  $3\frac{1}{2}$  in; base broadly pointed, the stem inserted obliquely; apex slightly and obliquely flattened; surface smooth, pale yellow-green in color, with numerous large cream-colored dots; skin thin, less than 0.5 mm. of about average thickness of the Mexican race; flesh yellowish cream color, pale green very close to the skin, with very few fiber markings, and of smooth oily texture; flavor moderately rich, not watery, very agreeable, with pronounced nuttiness.

quality excellent; seed round conic, relatively small, tight in the cavity or nearly so, the seed coats sometimes separating over a portion of the seed's cotyledons slightly rough.

The season of this variety, as of others in the Chota valley, is difficult to determine accurately. At the present time (June 15) there are a few mature fruits on the tree (only 3 or 4) and a new crop is coming in, its fruits now being about 2" in length; probably they will ripen between September and December, and they doubtless are the main crop.

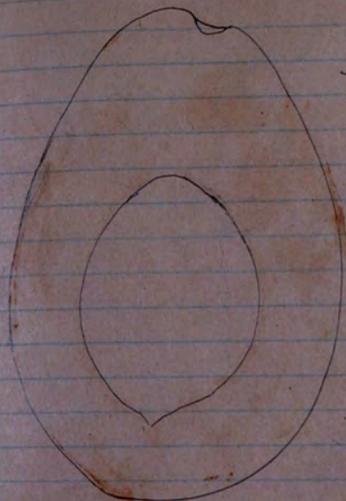
Saturday Barva, Ecuador June 18, 1930

The avocado satined below was purchased in a tienda here, and is said to have come from Ambigua (which I very much doubt). It appears to be an excellent fruit, and serves to increase the desire I already possess to return to the Chota next year in order to search every locality for the best available avocados.



Weight 8 oz.

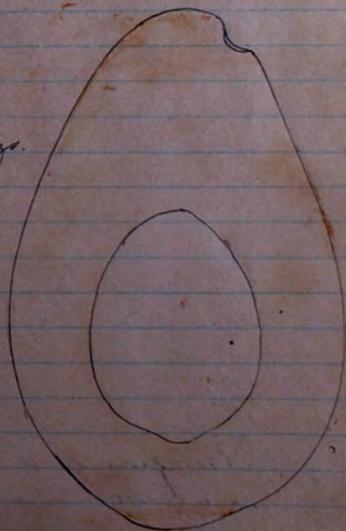
The four following fruits probably from the same tree as the above:

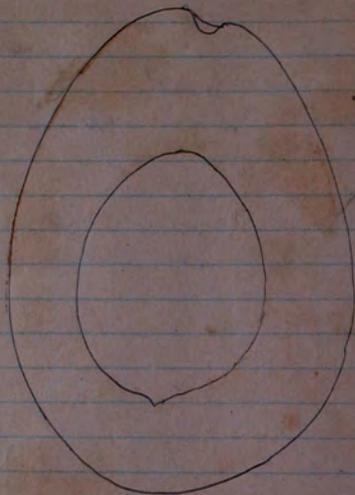


Weight 8 oz.

Weight 7 1/2 oz.

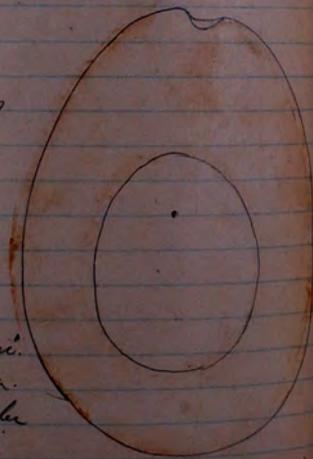
Surface light green, with three cream-colored dots; flesh yellow! devoid of fiber markings. Seed not quite tight in the cavity.





Weight  $8\frac{1}{2}$  cgs.

Weight 8 cgs



This variety is said to  
have been brought to  
market by Rosa  
Santander of Ambuqui.  
It may be a tree in  
Ambuqui or it may be  
in Carpudo or some  
other section.

Negatives forwarded June 21 1921  
P. 2300 to P. 2657 inclusive

636a. *Salvia* sp. Blue fl'd, *Salvia frons* var.  
used, not far from Cayambe

637a. *Fuchsia* sp. Zarcillojo. Seeds from the  
garden at La Rinconada. See herb. No.

638a. *Ribes* sp. Anderson current. From Hda  
La Rinconada. See herb. No. 1343

639a. *Solanum* sp. Slender shrub, clinging to  
tree trunks. La Rinconada. Herb. No. 1341

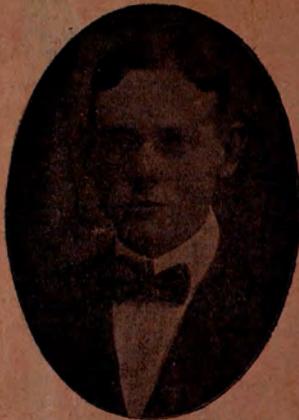
640a. *Rubus* sp. Mora blanca from La  
Rinconada. See herb. No.

641. *Ananas sativus* Pina de Milago  
12 plants.

"El Cóndor"

Ambato, (Ecuador) 27 de Enero de 1921

## Mr. Wilson Popenoe



Desde últimos de diciembre, hállase en este lugar el distinguido Explorador americano, Mr. Wilson Popenoe, en misión especial encomendada por el Departamento de Agricultura de Washington, para estudiar las variedades de plantas cultivadas y, en especial, de los frutales de origen tropical, que merezcan introducirse y propagarse en los Estados Unidos.

Aunque joven, Mr. Popenoe ha realizado ya largas y muy provechosas expediciones, y lleva descubiertas y clasificadas numerosas variedades de frutales.

Entre los países que ha visitado cuéntanse: la Arabia, Hawái, el Japón, la Península de Malaca, la India, Méjico, todas las repúblicas centroamericanas, muchas is-

las de las Antillas, Colombia, Venezuela y el Brasil.

Actualmente se dirige al Norte de la República, y proyecta, de regreso, efectuar una gira por las provincias del Sur, para continuar enseguida sus trabajos de investigación en el Perú, Bolivia, Chile y Argentina.

Mr. Popenoe es autor de muchas obras apreciables sobre horticultura tropical: entre ellas merece citarse especialmente su voluminoso y magistral estudio acerca de la historia, propagación, cultivo y variedades de un número muy crecido de frutales propios de las regiones cálidas. Esta obra que tiene por título: «Manual de los Frutales Tropicales y Sub-tropicales», constituye el primer trabajo ordenado\* y completo que, sobre tal asunto se ha escrito hasta la fecha.

De regreso a los Estados Unidos se propone publicar una serie de artículos y monografías relativos a la horticultura ecuatoriana, cuya riqueza y variedad le han entusiasmado. El interés del asunto y la importancia que habrá de darle el ser tratado por una autoridad de competencia tan reconocida como Mr. Popenoe, constituirá un medio de propaganda valiosísimo para nuestro país.

Quede constancia de nuestros votos por que su corta permanencia en la hospitalaria tierra ecuatoriana le sea no sólo provechosa, sino también grata y digna de un cariñoso recuerdo, ya que habiendo disfrutado del placer de tratarle personalmente, hemos podido apreciar, además de sus grandes méritos científicos, sus relevantes cualidades de cumplido caballero.

W. J. ROMER, President and Manager

B. A. WALDEN, Vice-President

R. M. WHITLEY, Superintendent

## The Coral Reef Nurseries Company

"Avocadoes with Ancestors"

#996

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 United Fruit Company,  
 Santa Marta, Colombia, S. A.  
 Shipped to Same c/o United Fruit Co.  
 Certificate No. 304228, 304229. New York City  
 State of Florida  
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3 Haden mangos	-----	2.00	-----	6.00
1 Maligoba "	-----		-----	2.00
1 Cambodiana mango	-----		-----	2.00
1 Paheri	-----		-----	2.00
				13.00

Express prepaid  
 to New York City 8.45  
 20.45

MAY 7, 1921.

## NOTICES OF BOOKS.

## Manual of Tropical and Sub-Tropical Fruits.\*

A description of the fruits of hot or warm countries is always of interest to gardeners, and the book under notice is written by an expert. The work contains some 460 pages and a number of illustrations. It is well printed and bound, is of convenient size for a "manual," and altogether reflects credit on both author and publisher. As Agricultural Explorer to the United States Department of Agriculture, the author has special qualifications to undertake such a work, and he has grasped his subject with ability and enthusiasm. The Avocado Pear (*Persea gratissima*), as might, perhaps, be expected, occupies first place, and some 78 pages are devoted to this fruit, which in recent years has attained considerable popularity in America. In California there is an Avocado Association. "In the tropics of the Old World, however, the fruit is not generally cultivated, being regarded somewhat in the nature of a curiosity. It is a good example of a salad fruit, and, when flavoured with wine or the contents of the

\*By Wilson Popehoe, New York: The Macmillan Company. Price 3s. net.

crust, it is much relished by some people. In America, where numerous species or varieties are recognised, the Avocado holds a leading place among table fruits, being regarded as an article of food as well as dessert. Thus a common saying with the Guatemalans is that "An Avocado, four or five corn cakes, and a cup of coffee form a good meal." The Avocado may sometimes be seen in Covent Garden Market, being occasionally imported in small quantities from the Canary Islands. It is very susceptible to injury, and therefore difficult to transport in good condition, so that a large proportion of the fruit is usually unfit for eating by the time it arrives at its destination.

The author deals exhaustively with the Mango (*Mangifera indica*), without which no book on tropical fruits would be complete.

Though of Eastern origin, the Mango has become thoroughly established in tropical America, the West Indies, and in other tropical countries. It is the fruit *par excellence* of India, and one of the really few tropical fruits which compare with the best of European fruits.

Several leading fruits have been omitted from the work, doubtless for sound reasons. These include the Banana, Pineapple, Orange, Fig, Olive, Coconut, and Grape-Fruit. The omission of the last-named is especially to be regretted in a work of American authority, for it is in America that the fruit has in recent years been specially popularised, and its merits made known and developed. The Grape-Fruit (*Citrus grandis*) is gradually, and

deservedly becoming better known in the Eastern tropics. A taste for the fruit, which is prized for its medicinal properties rather than as dessert, is also developing in England. It is now commonly imported from California, and sometimes from the West Indies. Here a fruit with good keeping qualities, it may often be seen for sale in fruiterers' shops in London and in provincial towns. Some time ago it was retailed at as much as 1s. 6d. each, and at the present time fruits are sold at 10d. to 1s. each.

We are indebted to America for many of our best tropical fruits as well as dessert, not the least important of which are the Paper, Pineapple, Cherimoyer, and Sapodilla. In addition to these, Mr. Popehoe introduces the reader to a number of others less well known, including the Mamoncillo (*Melicocca*), Sapota (*Calocarpum*), Canistel (*Locumna*), Añón (*Pouteria*), and Luemo (*Luema*). To most readers the merits of many of these will have to be taken for granted, as they are but little known outside their native habitat. A peculiarity of many of them, as with other tropical fruits, is that their merit largely depends on acquired taste. Individual opinion is rapid to these differs, however, very widely. A good example of this is the Durian (*Durio zibethinus*), the sensation of eating which is according to the late Russell Wallace, is well worth a voyage to the East. The majority of people of refined taste, however, would probably prefer to take an equally long voyage to avoid it, owing to its peculiarly offensive odour. It has been compared to French custard drawn through a gaspipe, though to some people the flavour is peculiarly subtle and alluring.

It will probably be felt by many readers that with such a variety of fruits, which differ so widely in size, character, &c., the author would give some hints on the etiquette of eating them. While most fruits should be eaten with a silver knife and fork, some have to be approached with an axe, as, for example, the Butternut (*Caryocar*) and the hard, woody shell containing the Brazil nut. The Jack-fruit, again, has to be classed in a special category, and can hardly be included among dessert fruits. It might be considered as a vegetable rather than a fruit, being of an enormous size, sometimes weighing as much as half a hundredweight. H. F. N.

Receta de Quincolita  
 Por seis huevos se pone, cuatro de mantequilla  
 y en los otros seis se pone el azúcar, el  
 polvo de maiz y el queso que sea molido  
 y chico; primeramente se bate la mantequilla  
 con el azúcar, cuando este viene batido se agre-  
 ga el queso, los huevos se bate aparte bien  
 batidos y se va poniendo poco a poco hasta  
 que el mezcla viene a poner el polvo de maiz  
 ya vinácula mezclada se agrega una copa  
 de vino, ~~se~~ canela y se poquito de  
 vicarvato: si se quiere se hace sobre o se  
 pone condemis de pollo ~~para~~ asustiones  
 y abmenchas el ~~de~~ ~~lo mismo~~  
 que los tamales.

# Angeles Sunday FARM and TRACTOR SECTION

SUNDAY MORNING, APRIL 24, 1921.

## A CALIFORNIA PLANT EXPLORER ABROAD—WHAT HE'S SENDING US.

BY WILSON POPENOE.

(Wilson Popenoe's work as a plant explorer for the United States Department of Agriculture has extended over a decade and has taken him around the globe. His experiences constitute one of the most romantic chapters in the department's history and his discoveries of foreign plants of value to American agriculture have been most important. A wanderer for years, he will call Southern California his home and in a letter to the Farm and Tractor Section, says: "My heart still lies in the Golden State and I hope that some day I shall return to live there and cultivate the plants which I am picking up in my wanderings." Mr. Popenoe's valuable book, "Manual of Tropical and Subtropical Fruits," was recently reviewed in this department of The Times.)

**QUITO, ECUADOR.**—I have just returned to Quito from a collecting trip northward to the Colombian frontier. I have worked at elevations above 12,000 feet, where the plants should be hardly enough to stand any frost we have in Southern California. I have brought back a considerable number of interesting things, and have spent the last two days in packing them and preparing them for shipment to Washington. Everything has to be done up very carefully, and sewed in muslin, to withstand that long and hard trip to the States. I am getting far from home, but I shall doubtless go farther, as I do not want to turn back until I can do so by rounding the Horn.

Colombia and Ecuador I have found very interesting regions in which to work. The latter particularly impresses me as a rich field; and when I tell you that the department had not, until I came here, introduced into the United States more than a couple of dozen plants from this country, you will realize that it is practically a virgin field as well. Already I have sent in about seventy-five numbers and I hope to get a many more.

### SPEAKING OF BERRIES.

One of the most interesting things I have found in South America is the Colombian berry or giant blackberry of Colombia, which I got from the Andes at an elevation

of about 10,000 feet. This species produces red fruits two and a half inches in length by an inch and a half in breadth; just skinned out a berry of these specifications and see if it does not look big to you! It is a very remarkable thing, and I believe it will prove of value to us. I think the Paet-Sand region and the molater parts of California will likely prove suitable for it.

I have obtained a considerable number of other interesting berries of the genus Rubus. The species cultivated here in Ecuador under the name of mora de Castilla, probably *Rubus glaucus*, is a magnificent thing and I have sent up many plants and quantities of seed. The fruits are an inch and a half long and nearly an inch broad, maroon-colored and of excellent flavor and quality. This will, I think, succeed in California admirably, and I predict a good future for it. It needs no improvement. As it stands, it is a berry of first-class quality.

Other berries of the blackberry group have been obtained, some of them very good, others only of interest to plant breeders. I have been agreeably surprised to find the genus *Rubus* so well represented in these countries, and so many of the fruits really excellent. I think this is a field which will yield something of great value.

### PROMISING PAPAYAS.

As you know, we have never had very encouraging results in California from papaya cultivation. I have here found, at high elevations, other species of Carica which will, I think, prove quite hardy in Southern California, and which will give us some interesting fruits very similar in character to the wild papaya. The babaco (not to be confused with tobacco), perhaps an undescribed species, is cultivated here; it has fruits a foot or more in length, and four to six inches thick. They are excellent when cooked. I also have obtained a smaller

(CONTINUED ON PAGE 180)

### Plant Explorer.

(Continued from Page 2.)

fructed species, whose fruits are rich red in color, and much seed of the sort known as "Cevica condensation" which has never received in California the attention it deserves.

From Cundinamarca, one of the provinces of Colombia, I sent seed of the splendid *Lupinus scutellaria cruckshankii*, a bushy lupin reaching five or six feet in height, and bearing flowers of various shades of yellow

*Calcutta.*

THE STATESMAN, FRIDAY, APRIL 15, 1921.

## BOOKS OF THE DAY

### THE SEEING EYE

OF KASHMIR: By V. C. O'Connor. Illustrated with iron plates and photographs. gma.

never was a more truthful say that "beauty is in the seeing those who have that inestimable sense of beauty could, no to an epic poem in Whitechapel

But when those happy et amidst the beauties of they are blest indeed. No refuse to admit to their the sordid and the un-

the sordid and the un- such scarcely exist. The Amir is of an insistent on the least inspired of been known to return from

with iris, and orchards of of the mysterious fairways of Srinagar, of silver nights on the river

So when one who is gazing not only surface inward charm and mean- the land, journeys into expect something exte- way of description, some at will live in the

precisely what the "Charm of Kashmir" not a mere record of ence to the occasional comforts incidental to wide-book for the world

to see the world "Kashmir in his of pictures, beauti- re-created for the of that summer parors—a romance surre—a little in the discovery of

### TROPICAL AND SUB-TROPICAL FRUITS

MANUAL OF TROPICAL AND SUB-TROPICAL FRUITS. By Wilson Popenoe, Agricultural Explorer, United States Department of Agriculture. Macmillan, 30s. net.

Mr. Wilson Popenoe's volume is a valuable and exhaustive work dealing with a hundred or more tropical or sub-tropical fruits, the possibilities of many of which have still to be explored. One of the allurements of the tropics has always been the choiceness of its fruit, but in spite of this the author states:

"It is a well-attested fact that the inhabitants of many tropical countries suffer from want of sufficient fresh fruit; and it is also true that much real starvation in densely populated hot regions, India for example, could be averted by planting on a wholesale scale

fruit-trees such as the avocado, whose product has a relatively high food value." The intention of the author has been, therefore, to bring together, for the guidance of those who live in the tropical and sub-tropical regions of the globe, the available information concerning the principal fruits culti-

ated or which may be cultivated, in those regions, concentrating on those which seem to merit extensive cultivation.

The treatment of each individual fruit is a work in itself, the fruit being dealt with thoroughly from different aspects, including botanical description, history (providing jolly anecdotes) and distribution, cultivation, propagation, etc. To Indian cultivators and botanists the work is of peculiar value in that a number of Indian fruits, some well known and others merely a name, are discussed. These include the popular mango, papaya, guava, litchi (the love of the Chinaman), pomegranate, jack-fruit, tamarind and many others.

While eating a blushing English peach it is not difficult to decide which is the best flavoured fruit of the West, and in the East, among Europeans, at any rate, the mango, yellow, juicy and fragrant, has a big following. But the native Indian

### RELATIVITY

THEORY, THE SCIENCE OF THE UNIVERSE. A. Einstein. W. Lawson.

It must always be a great general campaign or to philosophies such oppo when they originate

the expos- details of fourth as t minds of great thi explain a with his l

for succe- Expositio in the re- for lesser The bo- exception of theory of the fr-

given pr- that he physico-philosoph presents general abstract hard of side the physico-

Elino- ing a recent all wh- larger though of its air a view the re-

to be a dis- ite-

Nos quejamos diariamente de la crisis que nos circunda, cada cual desea que el remedio y la cura bajen del cielo, pero ninguno sacude su actividad, en busca de nuevas sendas que conduzcan a la riqueza, mediante el desarrollo de habilitadas múltiples y una tenacidad, rayana en apostolado.

"El Comercio" de Quito, de recomendable sentido práctico, habla conclenzadamente de fomentar la Agricultura, en términos tan apropiados, cuyos alcances no vacilamos en adoptarlos para las columnas de este periódico, siempre preocupado por la prosperidad de la Patria.

"Una casualidad —dice el diario capitalino— nos hizo que conociéramos al Profesor Popenoe, distinguido americano en la misión especial por el Profesor de Agricultura de Estados Unidos, a fin de que en nuestra República y en la vecina de Colombia, estudie las condiciones de vida y las difíciles clases de nuestra conocida y hermosa planta de aguacate.

"El Profesor Popenoe es muy joven, de educación esmerada, maneras agradables, sumamente instruido, parece que más late en sus venas la sangre latina, pues desciende de antecesores franceses, que la sangre americana heredada en último momento. Desde hace algún tiempo encuéntrase al servicio del Gobierno de la Unión como agregado al Ministerio de Agricultura, en el que sus conocimientos deben ser bien valorizados para que se le confíen misiones como la que le ha traído a nuestro país.

"En medio de una conversación agradable y muy espiritual, el Profesor Popenoe nos ha hecho saber el incalculable valor que en su tierra tiene el aguacate. Por cada uno de sus frutos, nos ha dicho, se paga en Estados Unidos el horrible precio de medio dólar. Hoy, unido a lo sabroso y alimenticio del aguacate ha influido en el espíritu de la administración pública de aquel país para intensificar el cultivo de esa planta, y tanto que según nos confiesa dicho profesor, tiene ya sembrados en California más de mil hectáreas de terrenos. El objeto de su misión ahora en el Ecuador es el estudio y la introducción a Estados Unidos de nuevas variedades que deberán ser plantadas y cultivadas en gran escala en las partes del territorio norteamericano que el Ministerio de Agricultura lo aconseja, teniendo

en cuenta la manera peculiar de vivir y desarrollarse cada variedad en las zonas originarias de nuestras tierras tropicales.

"Dentro de poco tiempo, cuatro o cinco años, a lo más, Estados Unidos no sólo tendrá lo suficiente de este prodigioso sustento para sus ciudadanos, sino que será un país exportador de aquella fruta y —probablemente— habrá implantado la industria del aceite que produce.

"¿Es así probada una vez más nuestra incapacidad industrial. Sonos el pueblo se impotentes, al que nada se le ocurre hacer con sus productos naturales, mientras algún extranjero no venga como inventor de la palabra, demostrar la utilidad que ellos no brindan. Dejemos trascurrir tiempos enteros sin examinar ni averiguar la riqueza que tenemos, y que nos están en la mano oculta, para dedicar a sólo lamentar y horrores la pobreza que nuestra ociosidad y dejadez nos han conatenado. Y nos quejamos de la falta de libertad de industria, de comercio, del método prohibicionista de exportación adoptado por el gobierno y de la ausencia de protección a las nacionales!!

"Ya ven, señores agricultores e industriales ecuatorianos: no sólo de libre exportación de víveres y artículos de primera necesidad dependemos nuestra riqueza, sino de la utilización de todos nuestros elementos, hasta del despreciado aguacate, que de adorno de nuestros huertos, va a convertirse bien pronto en un renglón de riqueza pública y privada de la gran Nación Americana.

"Mientras tanto, vergüenza es decirlo, hemos visto y vemos a cada momento rodar por el suelo preciosos y gemolares de este árbol gigantesco y los golpes demoleedores del hacha de un ganán a quien su patrón le ha ordenado tumbarlo. ¿Para qué? ¿Por qué? ¿Le estorbaba, ocupando mucho terreno de su finca, para sembrar coles!

"¿Pretendía, como sabio agricultor, ganar con el cambio! ¿De aguacates a coles! ¡Vengan las coles!!

Tienen ahora la palabra nuestros capitalistas y hacendados. Muy bien pueden, si desean, salvarse de la catástrofe que se perfila en el horizonte con la devaluación del cacao, a caso definitiva en los mercados del Extranjero. Aún hay, pues, en el naufragio, muchos maderos de qué agarrarse,...

## Elevations in the Chota Valley

Bermejál 5250

Ambuquí 5900

Trumina 6200

Paipuela 5300

Fusir 5250

Mira 8000

San Vicente 6150

Puente y Pueblo de Chota 5000

Hda. Pimán 6250

Hda. La Rinconada 3110 meters (Com. Geod.)

Los Angeles Daily Times.

NEWS IN BRIEF.

### TROPICAL AND SUBTROPICAL FRUITS.

A book of which California can claim at least proximate parentage though its author is really a horticultural citizen of the world, is a large volume entitled "Manual of Tropical and Subtropical Fruits" by Wilson Popenoe, explorer for the United States Department of Agriculture, published by Macmillan Co. of New York as one of Professor Bailey's Series of Rural Manuals. It has 474 pages, large octavo, fully illustrated, chiefly with original photos, and is calculated to make wise any one who knows what the hotter parts of the world look upon as "fruits." Some of them are already in the California commercial line such as the avocado, date, loquat, guava, persimmon and pomegranate; others may be near-commercial from our point of view like the cherimoyer and its botanical relatives, sapote and its group and others which have been grown here with commercial objective which remains unattained. Of all of these which have arrived and may be on the way, Mr. Popenoe gives interesting details of conditions and cultures which will be interesting and helpful to those who desire to grow them. Of others, too numerous to mention, which are too tropical or too foreign in style to please Californians, there are also characters and details given which must go to the credit of horticultural wisdom for the insatiable amateur, who is happiest when he knows more than his neighbor. Mr. Popenoe has observed, gathered and set forth things without which the library of the prosperous horticulturist will not be complete.

Pacific Rural Press  
Apr 9/21

### TO TRY GIANT BLACKBERRY.

Believed Colombia Product  
Will Grow Here.

Four Times the Size of the  
American Fruit.

Department of Agriculture is  
Experimenting.

(BY A. F. SHOOT WIRE.)

WASHINGTON, Jan. 24.—Predictions that the Colombian berry, discovered in a hitherto unexplored forest region of the South American republic for which it was named, would revolutionize the American berry industry in the same way that the navel orange, also of South American origin, marked an epoch in the history of citrus growing, are made by officials of the Department of Agriculture.

Extensive experiments with the giant blackberry, described by explorers of the Agriculture Department as four times the size of the American variety, have been begun by the division of foreign seed and plant introduction, which plans to distribute the new discovery to farmers after determining in what climates it will grow best.

#### EXTREME ISOLATION.

In a report to officials here, Wilson Popenoe, an agricultural explorer who was sent to Colombia to investigate the discovery of the new berry by Dr. Frank M. Chapman of the American Museum of Natural History, declared that only the extreme isolation of the region where the plant grows in proximity could account for the fact that it had not long since been given to the horticultural world. Plants and seeds thus far introduced to this country were brought by Popenoe from his travels between Ithaca and Fusagasuga, in the department of Cordoba, where the plant is said to be found in greatest abundance. As the experiments are under way, it is believed the berry will be planted in this country, in place of some of its native counterparts, because of the peculiar climate of the region where it was found.

#### GROWS IN HIGH ALTITUDE.

While the plant grows in Colombia at an elevation of 1,500 to 2,000 feet, it is believed to be impossible to grow it in this country.

To be obtained in Northern Ecuador

- ✓ Avocado budwood
- ✓ Pepino cuttings
- ✓ Wild potato tubers
- ✓ Plants & seeds of all good rubi
- ✓ Berberis seeds
- ✓ Quercus seeds
- ✓ Ferns for Mapon
- ✓ Sphagnum moss
- Gramalote

Get music in Itaver

## Height of Principal Peaks in Ecuador

Name	Height	Authority
Chimborazo	20,498 ft	Wymper
Cotopaxi	19,613	"
Antisana	19,335	"
Cayambe	19,186	"
Altar	17,730	Reiss und Steud.
Sangai	17,464	" "
Illiniza	17,405	" "
Tungurahua	16,690	" "
Carhuairazo	16,515	Wymper
Sincholagua	16,365	R. & S.
Cotacachi	16,301	Wymper
Guagua Pichincha	15,918	"
Rucu Pichincha	15,542	R. & S.
Corazon	15,871	Wymper
Puminahui	15,607	R. & S.
Sara Urcu	15,502	Wymper

## Conversion of Degrees Fahrenheit to Degrees Centigrade. (Degs F - 32 x 5/9 = C.)

Fahrenheit	Centigrade	Fahrenheit	Centigrade
125° F. = 52.3° C.		99° F. = 37.4° C.	
124	51.7	98	37.1
123	51.2	97	36.5
122	50.7	96	36.0
121	50.2	95	35.5
120	49.5	94	34.9
119	49.0	93	34.3
118	48.3	92	33.8
117	47.8	91	33.2
116	47.3	90	32.6
115	46.7	89	32.1
114	46.2	88	31.5
113	45.6	87	30.9
112	45.0	86	30.4
111	44.4	85	29.8
110	43.8	84	29.3
109	43.3	83	28.7
108	42.7	82	28.1
107	42.2	81	27.6
106	41.6	80	27.0
105	41.1	79	26.4
104	40.5	78	25.9
103	39.9	77	25.3
102	39.4	76	24.8
101	38.8	75	24.2
100	38.3	74	23.6

F°	=	C°	F°	=	C°
73		23.1	45		7.3
72		22.5	44		6.7
71		21.9	43		6.2
70		21.4	42		5.6
69		20.8	41		5.0
68		20.2	40		4.5
67		19.7	39		3.9
66		19.1	38		3.4
65		18.6	37		2.8
64		18.0	36		2.3
63		17.4	35		1.7
62		16.9	34		1.1
61		16.3	33		0.6
60		15.7	32		0.0
59		15.2	31		-0.6
58		14.6	30		-1.1
57		14.1	29		-1.7
56		13.5	28		-2.2
55		12.9	27		-2.8
54		12.4	26		-3.4
53		11.8	25		-3.9
52		11.2	24		-4.5
51		10.7	23		-5.0
50		10.1	22		-5.6
49		9.6	21		-6.2
48		9.0	20		-6.7
47		8.4	19		-7.3
46		7.9	18		-7.9

F°	=	C°	F°	=	C°
17		-8.4	-11		-24.1
16		-9.0	-12		-24.7
15		-9.6	-13		-25.2
14		-10.1	-14		-25.8
13		-10.7	-15		-26.4
12		-11.2	-16		-26.9
11		-11.8	-17		-27.5
10		-12.4	-18		-28.1
9		-12.9	-19		-28.6
8		-13.5	-20		-29.2
7		-14.1	-25		-29.8
6		-14.6	-26		-30.3
5		-15.2	-27		-30.9
4		-15.7	-28		-31.4
3		-16.3	-29		-32.0
2		-16.9	-30		-32.6
1		-17.4	-31		-33.1
0		-18.0	-32		-33.7
-1		-18.6	-33		-34.3
-2		-19.1	-34		-34.8
-3		-19.7	-35		-35.4
-4		-20.1	-36		-35.9
-5		-20.8	-37		-36.5
-6		-21.4	-38		-37.0
-7		-21.9	-39		-37.6
-8		-22.5	-40		-38.2
-9		-23.1			
-10		-23.6			

"Do I sleep, do I dream, do I wonder and doubt?  
Are things what they seem, or is vision absent?  
Is our civilization a failure, or is the  
Caucasian played out?"

Note: Be on the lookout for lime  
resistant plants, and when writing up  
inventory notes mention the kind  
of soil in which all plants grow.

Watch for potato disease.

Include: get *Huidoboro* apple used  
as aphid resistant stock, for all areas.  
Send buxwood and cecropia.

- ① Send any publications concerning Ecuador to  
Dr. José Gabriel Navarro  
Director de la Escuela Nacional de Bellas Artes  
O.B. of 282  
Quito

Luis Antonio Aguirre

(Loja - Ecuador)

Send any work which treats of  
Loja

Drancin Villacis Liza most aptado  
has hacienda near Zarora, at 1500 + 700 elev.,  
rains all the year, well drained, on slopes.  
Wants small quantity of ice of proper kind.

Cosas que hacer

At Ambato:

Get more tobacco cuttings, visit tobacco  
plants near Guachi for 3 flowers  
Send more strawberry plants from Guachi.

At Guayaquil:

Send pineapple plants to U. F. Co.

## EXTRACT FROM

The ~~Washington~~ Times

Date - 2 DEC 1920

See

## AGRICULTURE

af.

MANUAL OF TROPICAL AND SUB-TROPICAL FRUITS. By WILSON POPENOE. 81 x 6, xv + 474 pp. Macmillan Co. 30s. n.

Mr. Popenoe, who is Agricultural Explorer, U.S. Department of Agriculture, here brings together, for the benefit of dwellers in tropical and sub-tropical regions, simple particulars of some hundred fruits, including the avocado (the rival of the olive in its high oil content), the cherimoya, the sapodilla, the loquat, all fruits for the table, the mango, pomegranate, and breadfruit; but excluding the banana, coconut, pineapple, citrus fruits, olive, and fig, which have been fully treated elsewhere. Careful attention is given to the latest researches and experiments in culture. Twenty-four plates, many figures and tables. The volume forms part of the "Rural Manuals" series.

## CULTIVATOR

January 22, 1921

growth and replacement of worn-out nitrogenous tissues, would not be worth to the body as much as a pound of meat with 1,000 calories, but as a source of muscular energy the olive would be a most excellent supplement to foods such as meat or fish and cereals.

Summarizing in brief, then, it may be said that the ripe or mature olive is a very valuable, palatable and easily digestible form of food and should be considered as such and not as an accessory or condiment.

## MANUAL OF TROPICAL FRUITS

Wilson Popenoe, to whom avocado fanciers look for what is latest and

best in that fruit, has at last put into book form the results of his travels, experiences, studies and observations as agricultural explorer for the United States bureau of plant industry. Even now, as the book issues from the press, the author is in Costa Rica, rambling amidst avocado and other tropical fruits in their native wilds. This work is a large one, containing 475 pages, 24 full page plates and many line drawings, fully covering a list of nearly 100 of the leading fruits. The "Manual of Tropical and Subtropical Fruits," published by The Macmillan Company, New York, should be in the hands of all interested in the world's array of tropical luxuriance in fruits.

Review of "Manual" in Bulletin of the Imperial Institute, vol. XVIII, No. 4, Oct-Dec 1920, p. 573.

*Salvia popenoi* Blake, sp. nov.

Herb up to 2.6 meters high, apparently little branched, the base not seen; stem quadrangular, 3 mm. thick, glabrous below the inflorescence; leaves opposite, much shorter than the internodes; petioles slender, sparsely puberulous above, 8 to 17 mm. long, connected at base by a hispidulous ring; blades ovate, 5 to 6.5 cm. long, 2.5 to 4 cm. wide, with acuminate entire tip, at base broadly rounded or subcordate, serrate with about 10 pairs of depressed mucronulate teeth, firm-herbaceous, above green or brownish green, glabrous except for sessile glands, beneath much paler green, punctate, glabrous, reticulate-veined, but only the costa and primary nerves prominulous; racemes terminal, simple, on a peduncle 1.8 to 3.2 cm. long, densely stipitate-glandular and sparsely short-hispid-pilose with white gland-tipped one-celled hairs; verticils 1.5 to 2.5 cm. distant, 4 to 10-flowered; bracts deciduous, not seen, those of the lowest whorl sometimes ovate, foliaceous, 12 mm. long; pedicels 4 to 6 mm. long; calyx tubular-campanulate, in anthesis 12 to 15 mm. long, densely stipitate-glandular and sparsely hispid-pilose on the nerves with short conical rarely gland-tipped white hairs, dull green, the upper lip ascending, about 8 mm. long, entire, attenuate with almost cirriform bent tip, the lower lip 2-lobed, about 6 mm. long, the lobes subulate-attenuate from an ovate base; corolla "crimson-scarlet," 2.3 to 2.9 cm. long, glandular-pilose on the upper lip, otherwise glabrous, the tube about 6 mm. long, the ventricose throat about 1.8 cm. long, the upper lip porrect, 5 mm. long, the lower shorter, spreading, with small rounded lateral lobes; style barely exerted, sparsely pilose near apex.

Type in the U. S. National Herbarium, no. 980689, collected along road near Taetic, Alta Verapaz, Guatemala, at an altitude of about 1525 meters, January 9, 1920, by Wilson Popenoe (no. 928).

Closely related to *Salvia puberula* Fernald, of the series Fulgentes, which has a finely and densely puberulous stem. Its native name in the Kekchi dialect is given by its collector as "tutz unán."

This handsome species will be distributed by the Office of Foreign Seed and Plant Introduction under the No. 49380. Mr. Popenoe considers that it should be tried in the United States as an annual, but that it may prove to be a biennial in Florida and California.

\*\*\*\*\*  
BIG NEW BLACKBERRY  
S. FOUND IN COLOMBIA.

(BY A. F. NIGHT WIRE)  
WASHINGTON, Jan. 12.—A new species of blackberry, nearly four times as large as the domestic garden variety, has been discovered in Colombia by American scientists and is being experimented on by the Department of Agriculture with a view to distribution to farmers.



By the way, Wilson, while you are down in Chile, do not forget to secure some first class photographs of the pug nosed cattle. They look more like British bull dogs than anything else. I think they are called niakas. Your brother published an article in the Journal of Heredity on these cattle, but the photographs never were satisfactory. As this is one of the weirdest of all cattle breeds, I am anxious that the American public really learn something definite in regard to its existence. Find out if you can while you are down there how one of these cattle could be secured and how much it would cost, and I believe the Zoological Garden might like to get one of them. I cannot imagine any more interesting animal for the Zoo than this strange beast.

Do not forget to secure some good pictures of the mushroom which grows on the evergreen beeches in Chile. Since writing you, my request for material of this fungus has been challenged by the Federal Horticultural Board on the grounds that it is a disease of timber trees. Make an investigation, if you can, and find out whether it is a serious disease and what preventive steps we should take in order to insure its introduction into the United States without danger to our own deciduous beeches, upon which I suppose it will not grow, or such evergreen beeches as have been already established in Golden Gate Park.

With kindest regards and best wishes, I remain,

Very sincerely yours,

*F. C. Gillett*  
Agricultural Explorer in Charge.

F-3.

M. E. GILLETT

OFFICES:  
SUITE 1015 CITIZENS BANK BUILDING  
TAMPA, FLA.

ESTABLISHED 1880

**BUCKEYE NURSERIES**

**CITRUS FRUIT TREES**

ORANGE, GRAPEFRUIT, LEMON, LIME  
CABLE ADDRESS "GILLETT" TAMPA

NURSERIES:  
WINTER HAVEN, POLK CO., FLA.  
LUCERNE PARK, POLK CO., FLA.  
HOWEY, LAKE COUNTY, FLA.

TAMPA, FLA. December 7th, 1920.

SOLD TO

Mr. Wilson Popenoe,  
Altadena, California.

SHIPPED VIA Express To Dr. Murphy, o/c United Fruit Co.  
Prepaid and chgd. New Orleans, La.

ORDER NO.

Box #178 -- 4 Inman Late Grapefruit  
4 Inman Late Grapefruit  
8 Walter's Grapefruit  
4 Walter's Grapefruit  
4 Marsh Seedless Grapefruit

R. L. 2-yr  
S. O. "  
R. L. "  
S. O. "  
S. O. "

24

@ \$2.50 \$60.00  
Exp. Chgs. 6.34  
Mar Tax .32  
66.56

*For Quirigua orchard.*

Get seeds of  
*Gumma chilensis*  
 Tropical cherubs for Dr. Geo T. Moore -  
 those who will climb a brush wall

Mr. D. S. Bullock, a missionary formerly at Temuco, Chile, recommends the following Indian boy as a good plant collector.

Andrés Huichalef  
 Pitruelquen, not far from Temuco  
 in the Arancanman country.  
 Got wild potatoes 2" in diam. by 16 ins long  
*Aristotelia nasquei*

"*Salvia macrostachya* Kunth. A shrubby erect plant, six feet or more high, native to Ecuador and Colombia, where it grows at an altitude of 8000 to 10,000 feet. The lower leaves are up to 8 inches long and the pale-blue flowers, each about an inch and a half long, are borne in spikes a foot or more long."

Dr. Orton, of the Office of Cotton, Truck and Forage Crop Disease Investigations, has, as you probably know, been making a fight for his life for several years, through the use of starch free vegetables. He has maintained his own collection and has been experimenting with every kind of vegetable that we could give him. He has just called and has asked me if in your travels you would not be good enough to get seeds of any green vegetable which is used by the people with whom you come in contact. What is particularly wanted is a green vegetable, first, which will thrive here in the summer time; second, very early spring vegetables; and, third, vegetables which can stand the process known as thrice cooking and still retain their flavor. By thrice cooking, I mean a vegetable which can be cooked and the water drained off, cooked again and drained again, and cooked a third time. This process eliminates the sugars and starches almost entirely in many vegetables and leaves the green chlorophyl and the fibres or cellulose material.

Should you find anyone in South America who is keenly interested in this subject of diabetes, you might be interested in giving them <sup>the</sup> name of the book by Elliott P. Joslin, *A Diabetic Manual*, published by Lee Fibeger, Philadelphia, 1919.

OTÓN JIMÉNEZ, PR. G.  
SAN JOSÉ-COSTA RICA.

Ya gasté una página en "babosadas" Ahora vamos a tratar cosas serias."

Nuestro amigo Ureña, director de la escuela de San Pablo de Tarrazú, me trajo hace como un mes un ejemplar del legítimo agucate de mono de que tanto nos hablaron en nuestro famoso viaje a esas regiones. Es una fruta como de 2 1/2 pulgadas de diámetro, de cáscara delgada y verde con unos 2 milímetros de pulpa, escamosa, y el resto es una semillota de forma casi esférica, ligeramente achatada por la base. Como Ud. se puede imaginar no tiene nada que comerle, pero en cambio el aroma y sabor de esa delgadísima capa de pulpa es de muy superior calidad a la de cualquiera otra variedad en cultivo. Como se encuentra en completo abandono en los bosques de las regiones que habitaron indios (probablemente precolombinos) según se sospecha por la abundancia de entierros (huacas) me confirma la creencia de que fue objeto de cultivo en tiempos remotos y que los palcos abandonados a su propia suerte desarrollaron en alto grado los órganos reproductivos con sacrificio de la calidad de la fruta. Qué cree Ud? La semilla, desafortunadamente se me extravió, pero le dado orden de conseguir nuevas frutas y cuando las pueda obtener se las envío a Washington."

No olvido sus encargos sobre el agucate de aris y como me ha halagado mucho que este señor sea paisano mío, voy a ser cuestión de amor propio y de patriotismo que me convierta mas agucatero que Mr. Popenoe. Pierda Ud, cuidado por esa parte que daré caza a cuanto agucate me llame la atención con mas entusiasmo que si tuvieran diamantes en su interior."

Seeds from Tarrazú Costa Rica sent to Washington by G. G. Peck

## Los Angeles Sunday Times.

[Sunday, December 5, 1920.

### Book on Tropical Fruits.

Five dollars may seem quite an investment in a book, but when one sees it, considers its contents and its authorship, the ghost of price quickly fades away. The "Manual of Tropical and Subtropical Plants" is a work written by a Californian. For many years Wilson Popenoe, the "avocado scout," has been an agricultural expert for the United States Bureau of Plant Industry, traveling mainly through Mexico, Central and South America in the search for new things with which to tickle our palates. Even now, we hear from him in Central America and he has traveled from Bahia, Brazil, the native home of the navel orange, to North Africa and other wild haunts of the date palm. The work in question is an extensive one, covering nearly 600 pages dealing with nearly 100 varieties of the world's best fruits, their haunts, habits and peculiarities, as well as needs when grown in orchard and garden. The varieties, types, etc., are listed, described and illustrated; the book contains twenty-four full-page plates and many outline drawings of fruit and foliage. Altogether it is the most extensive, most comprehensive treatise on the subject written for American readers, with a special leaning toward the needs and possibilities of tropical fruit culture in California. No one having an interest in the subject matter can afford to be without this peerless work, which is published by the MacMillan Company, New York.

### Package No. 1, contents:

Anona - Canary flower	- 6 pounds
Canjuro - white	" 3 pounds
Cerezo, "	" 4 pounds

### Package No. 2, contents:

Cabriton - yellow flower	2 pounds
Chaparrón - "	" 1 pound
Conacaste - white	" 4 pounds
Guayacán - "	" 4 pounds
Nance - red & yellow	" 1/2 pound

### Package No. 3, contents:

Jaboncillo - white

Accounts for quarters ending  
Sept 30 1920 totaled - - - \$1387.58

Accounts for quarter ending  
Dec. 31 1920 totaled - - - 1391.82  
(not useful)

Panama Hats can be ordered direct, by mail,  
from Pedro Cedeño, Montecristi, Ecuador, give  
specifications. Mine are.

Circunferencia	57 cms.
Alo	5 cms.
Copa	10 $\frac{1}{2}$ cms.

José B. Carrion V  
Ibarra, Ecuador

Dead Geno N. La Fevre, Otavalo, Ecuador  
(missionary, lived at Agato)

Frank O. Carrigan M.D.  
1110 Euclid Avenue  
Cleveland, Ohio

Hermion Bartel 33 Edgemoor St. Harscoct, N.Y.  
Concha Spedlauer 848 Park Pl., Brooklyn  
Gladys Gosney 109 Leroy St. N.Y.

- ① Look up publications of the Comisión  
Genealógica 1900-1905 in Ecuador, and  
addre José Félix Tamayo.
- ② Send Indian mango to A. M. Tweedy  
per Portobello.
- ③ Ant. Rockwood re dates in Colombia

Village of Guallabamba 7133 ft (Mkyp)  
 Quito, Plaza Mayor 9343  
 Cayambe Village 9323  
 Robamba 9034

Papers to be written.

~~Pejibaye~~  
 Guacha Strawberry  
 Report to the California Academy of Sciences  
 The Fruits of Ecuador.

Jose Felipe Tamayo  
 Barro (recommended by A.P.)

Tree in Plaza Mayor & San Francisco.

Mr. D. S. Bullock,  
 c/o American Embassy  
 Buenos Aires, Argentina.

A. M. Tweedy  
 Box 655, Guayaquil

Sent Jan 18 1921

Wolf, Ecuador	\$ 36 -
Guia del Ecuador	12 -
Atlas Geografico del Ecuador	4 -
Flemming's map of Ecuador	2 -
Plan of Guayaquil	1 -
2 Maps Guayaquil	6
2 Maps Quito	5
Wolf set, complete	30 -
Quito a far Vista	8 -
Map of Vacas Galindo	6 -

Large fotos of Rinconada  
 Patio of house  
 Front view of house  
 Garden with cut of pine tree in upper left corner

① Telegram Roque P Sierra

C.H. Eckles, Dairy Cattle + Milk  
 Production  
 Macmillan + Co

For PP.  
 Textiles blue, brown & green; second  
 choice reds & yellows  
 Riding breeches 2 pairs  
 Leather boots suitable for shooting  
 Hip knife  
 Look up Dr Carlos Enrique Paz Soldán.  
 Lima.

Espero que se dignaria considerarme  
 como prueba de la distinguida atencion que  
 le profeso. Sin muy atto. S. etc.

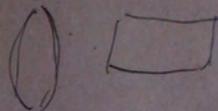
Get The Mariner's Handbook  
 International Text Book Co.  
 Scranton, Pa.

Prof Abelardo Pachans  
 Apartado 49, Ambato, Ecuador.

Toto at Home of Avocado 52, 54 + 57

54 200 F

Central and South American Explorations.



Wilson Topenzel  
 U. S. Department of Agriculture,  
 Washington, D. C.  
 E. M. S. A.

Ecuadorian Fruits

Determinations to be made or verified  
from herbarium material sent to Washing-  
ton:

Herb. Name

Nos.

1281  
1285 *Bunchosia armenica* DC. (?)

1299  
1237 *Carica candamarcensis* Hook. f.

The Chulhuacá of Imbabura,  
Chanturo of Tungurahua, and sigelóns of  
Ayacucho.

1264  
1263 *Carica* sp.

1265  
Higacho at Baños, Tungurahua,  
Chanturo in Pichincha and Imbabura,  
Chanturo in Ayacucho, Toronchi in Loja

1275 *Carica* sp.

Blabaco throughout the highlands. No  
flowers seen by me

1308 *Chrysophyllum cainito*?

1374 *Crataegus* sp.

See also 1356, from Umbalco, Peru;  
it may be the same thing, and there are  
fls. of which there are none with 1354.

1238 *Cyphomandra betacea*

1225 } *Fragaria chilensis* ?  
1226 }

1235 *Fragaria vesca*

→ Inga

1303 from Ambato

1251 " Ibarra

1335 " Cuenca

1324 " Loja

→ Juglans

1253 from Ibarra

1334 " Cuenca

1221 } *Lucuma obovata*  
1280 }

1352 *Matisia cordata* ?

1231 *Morus nigra*

1264 *Myrtus* ?

1272 } *Passiflora* Granadilla de Guayaquil  
1288 }

1348 *Passiflora* Granadilla de Guayaquil

1305 } *Persea americana*  
1306 }  
1307 }

1222 } *Persea drimifolia*  
1242 }  
1252 }  
1277 }  
1282 }

1239 *Physalis*

1228 *Prunus cerasifera* ? mirabil

1227 } *Prunus* sp. Damascos of Ambato  
1359 }

1232 } *Prunus salicifolia*  
1319 }  
1332 }

1243 *Psidium friedrichsthalianum*

1273 *Psidium Guajava*

1274 *Psidium guineense*, Sm. ?

1357 *Pyrus* sp.

1343 *Ribes* sp.

1350 *Rollinia*

- 1224  
1229  
1269) *Rubus glaucus?*
- 1333 *Rubus* mora of Cuenca (common)
- 1326 *Rubus* mora of Loja (common)
- 1310 *Rubus* mora of Catacacha
- 1345 *Rubus* mora común from La Pedernera
- 1346 *Rubus* mora blanca from La Pedernera
- 1294 *Rubus* Pandoa blackberry
- 1262  
1295) *Rubus* Huagra-mora from Tungurahua
- 1276 *Rubus* mora of Baños, Tungurahua
- 1248 *Solanum muricatum*
- 1266  
1267) *Solanum quitense?*
- 1223  
1244) *Tacsonia mollissima*  
See also the following:  
1261 from La Pedernera  
1316 from Loja  
1298 from Pandoa, Tungurahua

- 1220 *Tacsonia pinnatistipula?*
- 1284 *Tacsonia* from Baños, Tungurahua
- 1337 *Tacsonia*
- 1256  
1342) *Vaccinium mortina* Benth.?
- 1353 *Vitex gigantea?*
- 1292 Ericaceae para sylvatica, Tungurahua
- 1340 " Chagui-lulu, El Angel
- 1293 " " huahicon, volcan Tungurahua
- 1287 " " Chirimote, Tungurahua
- 1297 Indet. Motilon, Pandoa, Tungurahua
- 1330 " Joyapa, Loja
- 1329 " Joyapa, Loja
- 1328 " Joyapa, Loja
- 1325 Rosaceae Quiqui, Loja

- 1315 Indet. Salapa, Loja  
 1323 " Tina, Loja

Plants collected by me and determined  
 by Dr. S. F. Blake:

873. *Bouvardia leiantha* Benth.  
 880. *Parosela citrissora* (Cav.) Rose  
 883. *Annona scleroderma*  
 884. *Hufelandia anagy* Blake.  
 897. *Rubus verticillifolius* Poir.  
 916. *Crotalaria sagittalis* L.  
 917. *Bouvardia strigosa* (Benth.) Hemsl.  
 918. *Polygala floribunda* Benth.  
 919. *Labelia fulgens* Willd.  
 920. *Persia donnell-smithii* Mez  
 921. *Rubus glaucus* Benth.  
 922. *Rubus iraguensis* Liebm.  
 923. *Randia aculeata* L.

924. *Psidium molle*  
 925. *Psidium molle*  
 926. *Reibunium hypocarpium* (L.) Hand.  
 929. *Lamouropia lanceolata* Benth.  
 930. *Rubus adenotrichus* Schlecht.  
 931. *Persia donnell-smithii* Mez.  
 932. *Rubus adenotrichus* Schlecht.  
 933. *Rubus adenotrichus* Schlecht.  
 934. *Rubus coriifolius* Liebm.  
 935. *Coccyzsalum repens* Sw.  
 936. *Solanum seaforthianum* Andr.  
 939. *Indigofera* sp.  
 940. *Turnera ulmifolia* L.  
 941. *Phyllocarpus septentrionalis* Donn Sm.

943. *Step*  
 944. *Crotalaria maypurensis* H.B.K.  
 945. *Ceanothus azureus* Desf.  
 946. *Rubus eriscarpus* Liebm.  
 947. *Salvia lindenbergii* Benth.  
 948. *Cheirostemon platanoides* H.B.K.  
 949. *Crataegus stipulosa* (H.B.K.) Steud.  
 950. *Crotalaria longirostrata* H. and A.  
 951. *Salvia amarissima* Ort.  
 952. *Guaiacum guatemalense* Blanch.  
 953. *Caesalpinia* (?)  
 954. *Petraca arborea* H.B.K.  
 955. *Tecoma stans* L.  
 956. *Boeppigia procera* Presl.

957. *Jaquënia*  
 958. *Combretum*  
 959. *Cassia emarginata* L.  
 960. *Sernonia peters* H.B.K.  
 961. *Luehea endopogon* Turcz.  
 963. *Haematophylon brasiletto* Karst.  
 964. *Ocroidaca sylvestris* Schlecht.  
 967. *Bapa orellana* L.  
 968. *Melia azedarach* L.  
 969. *Cassia bicapsularis* L.  
 971. *Argemone mexicana* L.  
 974. *Casalpinia apostemma* Moq. & Sessé.  
 975. *Pinus occarpa* Schiede.  
 976. *Bambos aculeata* (Rupr.) Hitchc.

977. *Stemmadenia mollis* Benth.  
 978. *Tabernaemontana amygdalifolia* Jacq.  
 979. *Dalbergia*  
 980. *Cydista pubescens* Blake  
 981. *Plumeria acutifolia* Poir.  
 982. *Leguminosae*  
 983. *Bignonia unguis-cati* L.  
 988. *Rubus glaucus* Benth.  
 989. *Pourea schiedeana* Nees.  
 1000. *Rubus costaricensis* Liebm.  
 1001. *Nectandra sinuata* Mez.  
 1006. *Rubus adenotrichus* Schlecht.  
 1009. *Rubus costaricensis* Liebm.  
 1045. *Rubus urticifolius* Poir.

1072. *Persia americana*  
1077. *Prunus salicifolia* H.B.K.  
1085. *Persia americana*  
1122. *Prunus salicifolia* H.B.K.  
1132. *Weinmannia tomentosa* L. f.  
1138. *Eugenia*  
1187. *Persia americana*  
1188. *Persia americana*  
1189. *Persia americana*  
1190. *Carica*  
1192. *Persia americana*  
1193. *Nectandra cf. concinna* Nees.  
1194. *Persia cf. laevigata* H.B.K.  
1201. *Raimondia monovica* Safford.

- 13
1205. *Sebania grandiflora* Pers.  
1209. *Brownea grandiceps* Jacq.  
1211. *Rhedia madruno* Tr. & Pl.  
1216. *Eriobotrya japonica* (Thunb.) Lindl.  
1218. *Persia americana* Mill.  
1219. *Persia americana* Mill.

Tuesday Cuzco, Peru Aug. 30 1921

I returned Sunday evening from a 5-days trip to the Vilcanota (sometimes called Urubamba) valley. I visited Pisac, Yucay, Uro, Urubamba and Ollantaytambo, besides passing through several other small towns.

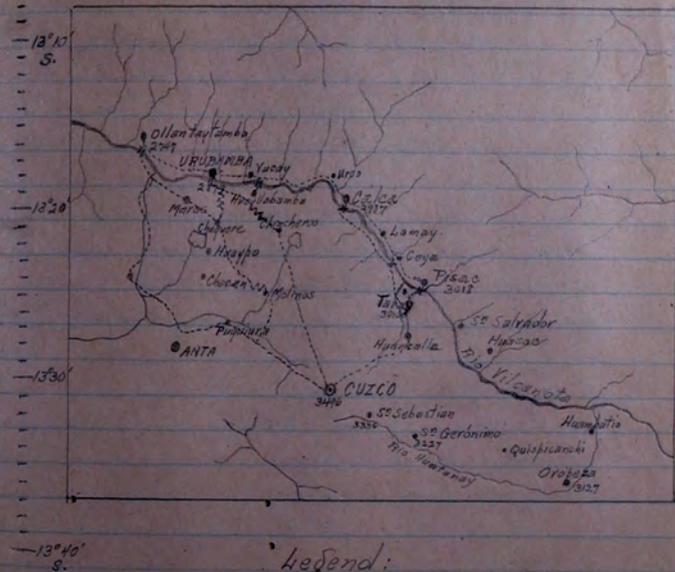
The elevation of the valley floor is nearly the same throughout the region visited. At Pisac (uppermost point) it is 3018 meters, and at Ollantaytambo (lowermost) it is 2744 meters.

Mr. T. E. Payne of Uro (near Calca) tells me that the rainy season in the valley begins about the middle or latter part of October and it ends in the latter half of April. The annual rainfall at Uro is about 36 inches. There is no rain, with mentioning, from May to the middle of October. The wettest months are January and February, and these are the months in which most of the fruits ripen.

The maximum shade temperature experienced at Uro is about 75° F. The minimum is just about freezing. Mr. Payne says he has seen a few snowfalls, seen a thin seam of ice form on water standing in cold spots. Usually the temperature does not go far below 50° F.

## Map of the Region

Latitude Cuzco-Huambatio-Ollantaytambo



### Legend:

- Road, usually suitable only for riding and pack animals and pedestrians.  
 X Bridge (at Pisac, Caya, Calca, Huayllabamba, Urubamba, and Ollantaytambo)  
 Elevations in meters.

Fruits of Urubamba and Yucay.

The principal fruit-growing region of the Vulcanota valley is that which lies between Urubamba and Yucay, including both of these towns.

Following is a list of the fruits grown in this region, so far as I have observed them:

*Crotogeomys* sp. (See herb. 1356). Called vispero, which name is often corrupted by the Indians into vispero and even visvero. A slender tree, reaching to about 30 feet, very common in dooryards. The fruits, which are produced in great abundance and which are now ripe, are globose, about 1 inch thick, orange-colored, with rather soft, mealy flesh of characteristic haw flavor. They are eaten, out of hand and used to make a heavy jelly.

*Tecsonia* sp. (See herb. 1355). Called tumbo. Much like *T. mollissima* in appearance. I have not seen the ripe fruit. Fairly common in dooryards. Herrera says the name tumbo properly belongs to *Passiflora quadrangularis*.

*Eriobotrya japonica*. Commonly vispera del Japon; sometimes called by the Indians vispero, and vispero del valle. Not common here, and the fruits said to be sour.

*Prunus salicifolia*. Capuli. One of the commonest trees apparently naturally in the region under consideration. The fruit is said to ripen in January and February. No Quechua name heard in any place. I think the species is not indigenous here.

*Malus sylvestris*. The mangana. quite common in the small orchards of Yucay and Urubamba. Fruit said to ripen Jan. to March.

*Amgdalus persica*. The variety with deep pink flowers and yellow-fleshed fruits (1) is called durazno; the one with white flowers and white-fleshed fruits (2) is called blanquillo. Both are abundantly grown in this region; the trees are sometimes planted in orchard form. But the orchards are quite small in size.

*Pyrus sp.* (See herb. 1357) The pera. quite abundantly cultivated. The fruit is said to ripen in Jan. and Feb.

*Cydonia vulgaris*. The membrillo. fairly abundant in this region, where it seems to be very successful.

*Prunus sp.* (See herb. 1359) Ciruelas. I saw more trees of this species at Ullaw - Uyutambo, than in either Urubamba or Yucay. It appears to be the purple plum known as damasco at Perote.

*Lucuma obovata*. The lucuma. Not abundantly grown in this region, but seen in occasional gardens. I photographed a large and handsome tree at Yucay.

*Plea europea*. The agustura. Not commonly cultivated in this region. I saw a few trees at Urubamba where it is said they produce fruit.

*Juglans regia*. The nuez. Only a very few trees were seen at Urubamba.

*Fragaria chilobensis* (?) *Frustrilla*. Commonly cultivated both at Uruapanla and Yucay, most attentively so in the Andean region of the latter region. The fruit is marketed in Cuzco. I feel pretty certain this is the same species as the *Frustrilla* of Ambato. Garcilasso de la Vega (quoting from Herrera *Flora del Cuzco*) says: "Otra fruta que llaman Chila. Llegó a Cusco año de 1557. Es de muy buena gusto y de mucho regalo. Nace en unas plantitas bajas, casi tendidas por el suelo. Hacen los granujos por cima como el uvaón, y es del mismo tamaño, no redondo sino algún tanto prolongado en forma de corazón."

There are several fields at Yucay, more than an acre in extent. The Cuzco fruit ripens about October 26<sup>th</sup>; the seed extends from this date until the end of January. It is, therefore, much shorter than at Ambato.

*Citrus sinensis*. The *Naranja Dulce*. Quite rare in this region. I saw a few trees, laden with handsome fruit, in a garden at Uruapanla. There seem to be no serious pests either in orange or lemon in this region, and the fruit acquires a high value.

*Citrus*. The *limón*. Sometimes here called (erroneously) *Torona*. The true lemon of commerce. I saw one tree at the Samanis hacienda in Yucay, and another in the edge of Cuzco, toward Uruapanla. Both looked vigorous and in fine condition; the fruit is of fair size, well-colored, and of excellent quality.

This region would probably be a good one for several of the citrus fruits at present. There is no commercial culture of any. Mr. Bayne would like to try the *Navel orange* and the *grapefruit*, and perhaps a good *Pandarin* or the *King orange*. The lemons and oranges now in the valley are seedlings.

*Vitis vinifera*. The uva. I saw a few plants at Mumbamba, but I am told by Mr. Payson that grapes are not altogether successful in this valley.

*Persea drimifolia*. The palta. I saw two small trees in Mumbamba, and others anywhere in the valley between Pisco and Allantaytambo. The West Indian avocado is grown farther down the valley.

*Carica caribaeensis* (?) Called papaya. Grown at Areo, where it is quite numerous and occasionally elsewhere.

The tree which is most abundant in the Vilcanota valley between Pisco and Mumbamba are

*Schinus molle*

*Salix* sp.

*Eucalyptus globulus*

*Purua salicifolia*, this last mainly from Calca downwards.

Sir Clements Markham (Los Incas del Peru, translated by Belling, p. 72) in describing the region between Pisco and Allantaytambo, says: "y en las laderas frutifican cherimoyos, paltos, lucumos y pacayas".

I was unable to find, or hear of, a single cherimoya tree in this region; the only paltos seen were two small trees of the Mexican race at Mumbamba; the lucuma is fairly common; and I saw no pacaya trees (Daga) anywhere in the valley, though there may be a very few present. Markham does not mention the important fruits of the valley, such as frutillas, pears, paches, apples, capulis, nisperos (Custage) and quinceas.

I have been unable to find Quichua names for any of the following:

*Cyphomandra betacea*, called *pinicito* and *tomate*, the former a Spanish and the latter a Mexican, name.

*Solanum muricatum*, called *pepino*, the Spanish name for the cucumber.

*Ananassa sativa*, called *piña*, the Spanish name for the fruit. I believe Cook gives *achapala*, but I am told that ~~the~~ fruit known by the latter name is quite distinct from the pineapple and not edible.

*Musa paradisiaca*, called *plátano*.

*Bixa orellana*, called by its Mexican name *achiote*, or a corruption of that (*Achihuite* at Ayacucho).

*Lycopersicon esculentum*, called *tomate*, a Mexican name.

*Prunus salicifolia*, called *capuli*, a Mexican name. At Lima, *Physalis peruviana* is said to be called *capuli*.

*Prunus salicifolia*.

While the *capuli* is very abundant in the valley of the Vilcanota, and is grown also at Cuzco I see nothing to indicate that the species is indigenous in the region. Dr. Fortunato Herrera is also of the opinion that it is not indigenous here.

It is known here correctly as *capuli*, but the Indians often transfer the accent to the penultimate syllable, making it *capuli*. The Srta. Angela de Tejada y de Obispo, who lives at Yucay, tells me that in Lima the name *capuli* is applied to *Physalis peruviana*.

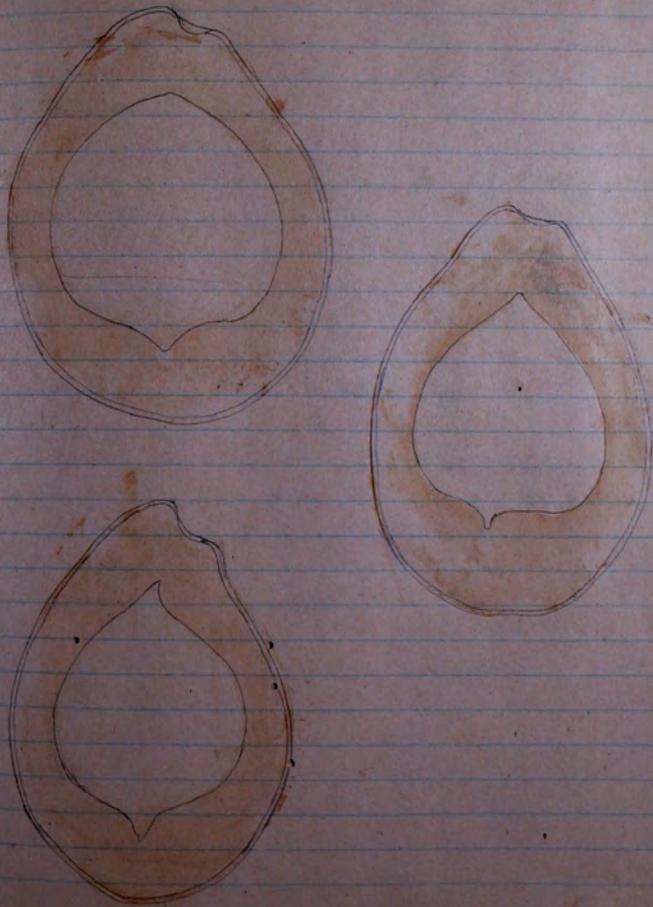
I saw very few *capuli* trees on the coast.

Here at Cuzco it blooms from August to October, and ripens its fruit from December to March. Mr. Payne of the Co. gave me an excellent jam made from *capulis*. He says an even better one is made by mixing *capulis* and guinces.

Quichua names of some plants  
known at Cuzco.

<i>Zea mays</i>	sara
<i>Canna liliifolia</i>	achira
<i>Ullucus</i> sp.	ullucu
<i>Chenopodium quinoa</i>	quinoa quinoa
<i>Amaranthus</i> sp.	parca <small>(Chino)</small>
<i>Annona cherimola</i>	chirimoya
<i>Annona muricata</i>	masasanta <small>(not quite)</small>
<i>Persea amaranca</i>	pata patai
<i>Tropaeolum tuberosum</i>	añu
<i>Oxalis tuberosa</i>	oca
<i>Psidium guajava</i>	sahuin
<i>Lucuma obtusata</i>	lucuma memo
<i>Inga feuillei</i> (?)	pacae pacai
<i>Physalis peruviana</i>	aguaricasta
<i>Calceolaria pubescens</i> (?)	toceato
<i>Ipomoea batatas</i>	apichu

Three Aracados (West Indian race) from Cuzco market



## The Avocado in Peru.

Name. The avocado, whether of the West Indian or Mexican race, is known in Peru as palta (the tree, palto). In the vicinity of Cuzco this word is sometimes corrupted to form paltai; there are two provinces in that region with the name of Paltubamba (from paltai, and bamba, field or level area). Dr. Fortunato L. Herrera of Cuzco tells me that the word palta, in Quechua, is used also to signify that which is added to, or placed on top of, a congá (the load carried by a pack animal) after the latter has been completed. I believe Herrera gives the meaning of the word as sobornal, and he adds that paltai means "ano sobre otro".

I think there can be little doubt that the word was brought to Peru from southern Ecuador, where there was a tribe of the name. The Paltos were conquered by the Incas, and Garcilaso recounts that Tupac Yupanqui saw the avocado in the territory of this tribe, liked it, and carried it home with him to the same valleys near Cuzco. Balboa states that Tupac Yupanqui reigned from 1471 to 1493, and it was probably during that period that the avocado first reached Cuzco.

Distribution. So far as I have been able to observe, the avocado is found in the coastal valleys of Peru, and it has also grown in the Interandean valleys, such as those of the Rio Apurimac and the Rio Urubamba where ever the climate (i.e., elevation) is suitable. On the coast I have seen both West Indian and Mexican races - though the West Indian is by far the commonest - and both exist also in the Interandean valleys, though here again the West Indian is the most important.

On the coast, the region of Huacho produces quite a few West Indians of rather small size and only fair quality. The valley of the Apurimac also produces quite a good many fruits of this race, but they are, in general, small and inferior in quality. Dr. Fortunato Herrera says that the region known as Coopa, in the valley, produces the best avocados which reach the Cuzco market. I have seen trees of the Mexican race in the town of Urubamba, and farther down the Urubamba river, in the region known as the valle de la Conversion, the West Indian race is grown.

Varieties. Nowhere in Peru have I seen any varieties of either race which were good enough to warrant introduction into the United States, nor have I received accounts of any varieties which sounded interesting, with the possible exception of the round avocados grown near Lima which the Hon. Benton Macmillan, formerly U.S. Minister to Peru, described to me. I have not seen a great many ripe fruits in Peru myself, since the present time of the year does not seem to be the principal ripening season. There are, however, at the present time, avocados on sale in the markets of Lima, and here in Cuzco.

Culture. No attention whatever is given to avocado culture in any part of Peru which I have visited up to this time. Conditions in this respect are even more primitive than they are in certain parts of Ecuador. We have I see anywhere in Peru avocado trees in considerable numbers. There may be regions where such exist, of course, for I have only seen a small portion of Peru.

## Chilean desiderata:

Cobihue (*Lopageria rosea*)

Melon

Gunnera chilensis

Huidobro apple

Rubus - Lucumas

Fragaria

Acerolos

~~Cajuputo~~

Cereza Argentino de Octubre

Damasco Mexico (235)

Dorados: 263 Almendruco  
290 Blanco de Junio  
293 Blanco Melocoton

## To be obtained at Santa Ines:

Manzana Huidobro 994

Lardizabala bitermata (cagiu de Chile)

Fruiteira blanca de Chile 558

" roja de Chile mejorada 575

" de Montevideo 580

Naranja Imperial 746

Aristotelia macqui 1032

To see if budwood can be had at El Salto  
Selecta orange

Benjamin Pumpin  
Garden Copihue  
Carmeraldas  
Valparaiso

Sept 18 1921 Santiago de Chile

Prepared to send to Washington the  
following photographic negatives

P-2658 to P-2783 inclusive  
Ecuador

P-2784 to P-2880 inclusive  
Peru

Thursday Santiago de Chile Sept 22, 1921

Yesterday I went to Quillota,  
primarily to look over the avocados  
and see if I could find Philippi's  
*P. gratusissima melanocarpa*, and also  
to observe the fruits grown in that  
region.

Note The elevation of Quillota is apparently  
given as 120 meters, or about 400 feet.  
The town lies on a broad, level plain,  
and the principal huestas or orchards  
run here northward to the station  
of La Cruz, some 4 or 5 miles dis-  
tant. Throughout this belt between  
Quillota and La Cruz (and to a less  
extent, in the southern, eastern and west-  
ern edges of the town) there are  
many small plantations of fruit trees,  
and much truck gardening.

The Avocados which are very numerous and  
which are now in bloom are all of the  
Mexican race. I was unable, even by  
looking over several hundred trees, to find one  
which was not characteristically Mexican,  
and I suspect that Philippi's melanocarpa

is merely an abnormal tree of this race. Probably there was never more than one tree of it in existence.

There are some thousand - perhaps 10,000 - trees of the Mexican race in this region, which is the largest avocado-producing district in Chile, I think. There are a few young orchards now that I saw more than 2 or 3 rows in extent - in which the trees have been planted in straight rows. The older trees are planted irregularly, usually with other trees among them. Conditions of cultivation are just about as at Queretaro and Atlixco - very little attention is given the trees. I saw none which were so large as the largest at Queretaro - probably few of those here are as old as many of the latter region.

Loquats are abundant in the huertas; all of them are seedlings, and some of the trees are of very large size. The fruit is now commencing to ripen, and is being picked in small quantities for sending to Santiago. I do not believe there are any valuable varieties of this fruit, either here or elsewhere in Chile.

Cherimoyos are abundantly cultivated in the vicinity of Quilota, this being the principal Chilean center of production of this fruit. There are, however, fewer regular cherimoya plantations than there are avocado plantations; most of the trees are scattered in gardens and mixed huertas. The fruit, many of which are of good large size, are now ripening, and many are sent to Santiago where they are sold at very high prices.

Oranges and lemons are fairly common in the huertas, but are not cultivated to an extent comparable to that in which either the avocado or cherimoya is grown.

Strawberries of two classes are cultivated commercially here. The most important one is the *putilla* (*Fragaria chilensis*) which is much used for preserving and canning. This species is now in bloom; the first fruits will ripen late in October. The second kind appears to be of European origin; a few fruits are now on sale in Santiago. They are small, but larger than the *Fragaria vesca* of Bogota. I think the variety here grown has

vesca blood. Both plants and fruits seem to show it. In place of being called putilla, the berry is known as fraga.

Pears are cultivated here.

Cherries ditto, and quite abundantly so. The trees are now in bloom.

Quinces are quite commonly cult.

Apricots also common; now in bloom.

Peaches very abundant, now in bloom.

Plums are grown; now in bloom.

Figs are grown, but there are not as many trees as of several other fruits. They are now leafing out.

Lucuma obovata, called here lucuma, is commonly cult. in the huertas. The never in orchard form. Scattered trees are seen. The fruit is now nearly full grown; quite a few are already on

sale in Santiago. The leaves of the species appear smaller here than in Ecuador, probably because of the cooler climate. The fruit also looks to be considerably smaller.

Carica candamarcensis, here called papaya and papayita, is commonly grown in the huertas of Quiloto. Before it appears to be quite successful. The fruit is much used to make a sweet preserve, sometimes mixed with others.

Sunday Valdivia, Chile Sept. 25. 42

This region is the Puget Sound of Chile - though I think, speaking seriously, that it differs from the latter in having a warmer climate. For I find here several plants which do not withstand, so far as I can remember, the winters of the Puget Sound region. These are: Eucalyptus globulus, fairly common here; Thymus canariensis, grown quite successfully in several gardens; Chamaemelum glabrum, abundant in dooryards here; and a species of Citrus, probably the sweet orange, which probably does not fruit here, and of which I have seen only two trees in protected situations. The men put this the orange tree can stand the winter here is evidence that it can survive a few below the freezing point.

The glory of Valdivia is its Camellias which are now in full bloom. There are various different colors of them, and the plants reach nearly 30 feet in height. They are planted in nearly all the gardens. Arales, Rhododendrons, Cicuta

and the deciduous magnolias are also fine just now. Added to these, the Dutch bulbs - mainly hyacinths and narcissus, make the gardens very interesting and attractive.

The Germans here - and there are many of them - almost invariably have attractive, well-kept dooryards in which are flowering shrubs, conifers, and other plants. The primulas are much used for bedding in borders, and are gone just now. Many of the Germans, especially those who live on the outskirts of town, have small orchards of fruit trees. I have seen many apple-trees, pears, and plums, but no peaches. Quinces also are abundant, and I saw one row of gooseberries.

Thursday Angel, Chile Sept 29 1931

Trees obtained at El Vergel

Peach:

- No. 21. Maibí  
 25. Blanquillo de Mayo  
 73. Monstruosa amarillo de Vina del Mar  
 (All on *Marianna* plum from cuttings.)

Plum:

- No. 20. Bunter  
 (Same roots; ground from cuttings.)

Cherry:

- No. 20. Tardío de El Vergel  
 (On cherry roots of uncertain descent.)

Japanese Walnut:

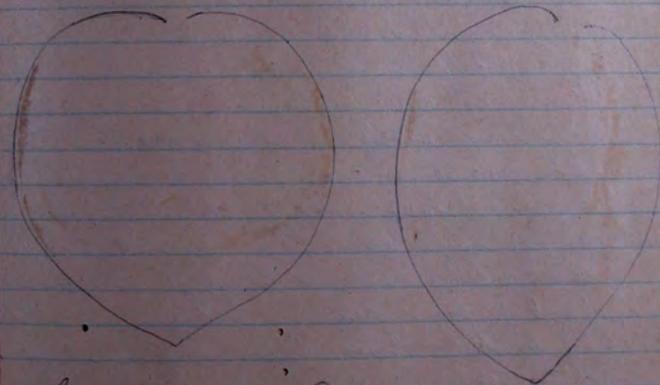
4 trees, seedlings probably 4 yrs old

Apple:

- No. 7. Huidobro  
 No. 70. Puchacay tempranera  
 No. 211. Verjel  
 (All on seedling apple roots - seeds from mixed lot of apples.)

Monday Santiago de Chile Oct. 3 1931

*Lucuma obovata*. This fruit, as grown in Chile (mainly in the Quillota region) is smaller than it is when grown in the warmer parts of Peru and Ecuador, but I think it is, without doubt, the same species. The fruits are more elongated in form than most of those I saw in Ecuador. Below are outlines of two which I purchased in the market for seed:



The fruit on the left contained two seeds, and that in the right, one: this probably accounts for the difference in form. The majority of the fruits are of the shape of the one on the right.

The flesh is softer than that of any specimens I have seen in Peru and Ecuador. It is of the same color - deep yellow, and very dry, finely mealy in texture, cutting like soft cheese. The flavor is sweet, sapotaceous, and rather agreeable. I find the fruit quite eatable here, though I never saw a specimen in Ecuador that I could describe. Perhaps there is some difference in the method of ripening employed in the two countries.

The surface of the fruits seen here in Chile is dull yellowish green to green, sometimes with a brownish tinge.

The lacuna is quite commonly cold in Santiago; indeed, it is to be found on nearly all the fruit-stands, and good specimens are high in price. I paid four pesos a dozen for those I bought today - the equivalent of 45 cents.

Material packed to be carried to Washington:

642. *Amygdalus peruvica*. Maipú peach. 3 trees, from El Verjel, Angol.

643. *Amygdalus peruvica*. Blanquillo de Mayo peach, from El Verjel, Angol. 5 trees

644. *Amygdalus peruvica*. Manzanillo Amarillo de Viña del Mar (Large Yellow Viña del Mar) peach, from El Verjel, Angol. 2 trees

645. *Malus sylvestris*. Nudobus apple, from El Verjel, Angol. 5 trees

646. *Cerasus* sp. Tardía de El Verjel cherry, from El Verjel, Angol. 3 trees

647. *Malus sylvestris*. Verjel apple, from El Verjel, Angol. 3 trees.

648. *Malus sylvestris*. Puchacay tempranera, apple, from El Verjel, Angol. 4 trees

649. *Prunus* sp. *Bunster* plum,  
from El Verjel, Angol. 5 trees

650. *Juglans* sp. Japanese walnut,  
from El Verjel, Angol. 3 trees.

651. *Lapageria rosea*. *Copihue*,  
from El Verjel, Angol. 2 plants

651a. *Lapageria rosea*. *Copihue*, from  
El Verjel, Angol. 10 seeds.

652a. *Lucuma obovata*. *Lucuma*,  
from market of Santiago, probably  
grown at Quillota. 30 seeds in  
*Sphagnum* moss.

Descriptions for the Inventory of the  
plants obtained at the "Criadero 'El  
Verjel,' Angol:

642. *Amgdalus persica*. *Maipú* peach  
presented by the Instituto Agrícola,  
Bunster, of Angol, Chile, through  
Wahon Popence.

It has seemed worth while to  
obtain for trial in the United  
States a small collection of  
Chilian peaches. These should be  
of especial interest in our Pacific  
West and Southwestern States, where  
the climate conditions approximate  
those of Chile. Probably we will  
not obtain from the latter country  
any peaches of better quality than our  
finest sorts; indeed, this should not  
be expected, but it seems entirely  
possible that some of these varie-  
ties may prove interesting because of  
resistance to disease, ripening season,  
or some other important characteristic.  
They are, so far as known, varieties  
which have originated in Chile as

seedlings.

Maipu is described as a very productive variety, with large, very sweet fruits, having a small stone and ripening in January. The trees which are introduced under this number are budded on stocks of the Marianna plum, grown from cuttings.

643. Amygdalus persica. Blanguilla de Mayo peach, presented by the Instituto Agrícola Bunster, Angol, Chile, through Wilson Popenoe.

This variety is one of the latest which is cultivated in Chile, its ripening season extending into May. It is not a large fruit, but is considered valuable for canning. The tree is said to be very productive. Budded on stocks of the Marianna plum grown from cuttings. See remarks under 642.

644. Amygdalus persica Mont-

strusso amarillo de Vinya del Mar (Large yellow fruit Vinya del Mar) peach. Presented by the Instituto Agrícola Bunster, of Angol, Chile, through Wilson Popenoe.

This variety produces fruits of large size, as indicated by the name. The flesh is yellow, and of excellent quality. Tree-stone. The ripening season in Chile is during February. The plants introduced under this number are budded on Marianna plum grown from cuttings. See general remarks on Chilean peaches under 642.

645. Malus sylvestris, Huidobro apple, presented by the Instituto Agrícola Bunster, of Angol, Chile, through Wilson Popenoe.

(Noted on the next page with the description given in Ojguero's catalog No. V.)

## 994—HUIDOBRO.—

De mérito ya reconocido e indiscutiblemente la mejor manzana de invierno y de guarda.

Sometida esta variedad a toda clase de esperiencias en el Criadero, ha resistido intacta.

Arbol vigoroso y muy cargador, produce un fruto grande, hermosísimo, de color amarillo claro unido, de una fragancia y gusto incomparables, de consistencia firme, lo cual hace que sea precioso para el trasporte comercial y de

gran porvenir para la plantacion de verjeles industriales.

En fruteros adecuados la manzana puede durar hasta los meses de Octubre y Noviembre con su sabor del primer día.

El Criadero, multiplicando esta variedad en grande escala, cree haber hecho una adquisicion para la arboricultura frutal.

Su orjen fué una semilla italiana sembrada en Chile en el «Principal», hacienda del señor Vicente G. Huidobro.

Enviada ya esta variedad por el Criadero a la Escuela de Horticultura de Versailles, ha llamado justamente la atencion de los pomólogos en alto grado.

He aqui como se espresa un importante periódico agrícola sobre ella, el *Journal de L'Agriculture*, redactado por M. Henry Sagnier, en artículo enviado por nuestro inteligente profesor de patología vegetal, M. Lavergne:

«El señor Inquierdo ha obtenido, en grande escala, resultados muy concluyentes respecto a la resistencia de este manzano al pulgón lanero, como se puede constatar por el grabado tomado del natural que damos. Este, debo insistir, ha sido efectuado tomándolo de hojas de una figura exactísima, y es muy interesante observar, gracias a él, cómo los parásitos no avanzan bruscamente más allá de la soldadura misma del injerto, pues ninguno la sobrepasa. Durante el curso de una experiencia de muchos días, M. Inquierdo ha mantenido amarradas juntas las dos ramillas paralelamente desarrolladas y juntas los pulgones han abandonado voluntariamente el tallo y las hojas de una para irradir las de la otra, dadas por el contrario, ha observado que si un insecto se desprendía por casualidad a causa de un choque de la manera de 1 portainjerto hecho sobre una hoja o el tallo del injerto «Huidobro», en lugar de fijarse, se ponía en movimiento de arriba abajo en su nuevo medio inestabilizado hasta que encontraba la manera de salir de él. Esta particularidad precisa del manzano «Huidobro» constituye una observación de las más interesantes y merces, a nuestro juicio, ser señalada a los jóvenes botánicos franceses.—G. LAVERGNE.»



El conjunto deja ver que el insecto llega hasta el límite del Huidobro, sin pasar más allá en sus ataques.

Also known as *Araucana* and *Araucana Huidobro*. In spite of the fact that Don Salvador Izquierdo, who disseminated this variety widely in Chile, states in his catalog that its fruit has "incomparable fragrance and flavor," and that "of all the apples which can be stored for winter use, it is indisputably the best," other Chilean pomologists with whom I have talked consider it a fruit of inferior quality. The Director of the national college of Agriculture even went so far as to characterize it jokingly as "una perqueria", which may be turned into English language. He considered it to be the sweetest and the flesh of very mealy character.

Huidobro cannot, therefore, be strongly recommended to North American horticulturists as a dessert apple and indeed it is not introduced as such; it has another quality which gives it interest and makes it valuable in Chile and perhaps elsewhere. I refer to its immunity from the attacks of the woolly aphid, perhaps the worst pest

of Chilean orchards. Izquierdo has found, that plants of this variety grafted on seedling apple roots with the stem attached by the pith only from the roots up to the union of stock and scion, not a single insect was passing on to the scion to cause on his nefarious activities.

Because of this characteristic, it is possible that Huindobro may have value in the United States as a stock plant on which to graft other and better varieties of the apple.

Huindobro is said to have originated on the hacienda of Sr. Vicente H. Huindobro, in Chile, from an Italian seed. The tree is described as very vigorous and productive, the fruit as specimens to large in size, yellow in color, of firm texture, sweet, aromatic, and juicy. Its ripening season is late Autumn (April to May) and the fruits can be kept in good condition, without cold storage, until the following October or sometimes November. Its shipping qualities are excellent.

The trees of Huindobro introduced under the present number are grafted on seedling apple roots.

✓ 646. *Cerasus* Tardía de tal Verjel (Verjel Late) Cherry. Presented by the Instituto Agrícola Bursátil de Angel, Chile, through Wilson Robense. Plants grafted on seedling cherry roots.

This is a cherry which was first disseminated by the Chacabro "El Verjel" of which the Instituto Agrícola Bursátil is the successor. It is either a seedling of one of the European cherries, or else a variety brought originally from Europe and given a new name in Chile. It is described as a large, bright rose-colored fruit ripening in January (which is late for cherries in Chile). The tree is recommended as very productive.

It is not probable that this variety will prove to be valuable in the United States. Because of its lateness in ripening, however, and the likelihood that it is of Chilean origin, it is worthy of a trial, especially in those regions of the United

States whose climate is similar to that of central and southern Chile.

- ✓ 647. *Malus sylvestris* Verjehl apple. Presented by the Instituto Agrícola Bunster, of Angol, Chile, through Wilson Popenc.

This variety originated at the Cusadero "de Verjehl," of which the Instituto Agrícola Bunster is the successor. It is remarkable because of its lateness in flowering, and for this reason is considered valuable. Early flowering varieties run the risk, in southern Chile, of having the crop destroyed by late frosts, or injured by the excessive and cold rains which occur.

Verjehl is described as a medium-sized, sweet apple. Messias, Crouse and Reed of the Instituto Bunster tell me that it is rather inferior in quality, and not likely to meet with favor in the United States. It is introduced mainly for trial as a stock plant; very possibly its tardiness in commencing vegetative activity in the spring might be

transmitted, in some measure at least, to other varieties grafted upon it. The tree is said to be notably productive here in southern Chile. The plants sent under this number are in seedling apple roots.

- ✓ 648. *Malus sylvestris*. Puchacay Tempranera (Early Puchacay) apple. Presented by the Instituto Agrícola Bunster, of Angol, Chile, through Wilson Popenc.

Albert Reed of the Instituto Bunster tells me that this apple ripens at the same season as Duchess of Oldenburg, and that it is, for a summer apple, of very fair quality. Salvador Izquierdo considers it to be synonymous with the European variety Calville Rouge d'Été. It is widely and favorably known in Chile, and is introduced into the United States that it may be a variety of Chilean origin, slightly distinct from the last-named sort (with which I take it, North American pomologists are already familiar).

Puchacay Tempranera is described as a

large, handsome fruit, with aromatic, slightly acidulous flesh of excellent quality. It ripens in southern Chile in January and February. The plants sent under this number are on seedling apple roots.

✓ 649. *Prunus* sp. Bunster plum.  
Presented by the Instituto Agrícola Bunster, of Angol, Chile, through Nelson Popenoe.

This plum originated at the Crauco "El Verjel", of which the Instituto Agrícola Bunster is successor. Elbert Reed, who now has charge of the orchards of the Instituto, believes that one of the parents of the variety was probably the Marianna plum; the other parent (if, indeed, the variety originated by crossing) is altogether unknown.

The tree has much the same character as the Marianna, but its fruit is larger and better; and it has the advantage of ripening nearly a month earlier than any other plum which has been planted at El Verjel. In addition, the tree is enormously productive, and easily

propagated by cuttings. The fruit is an inch or more in length, dark violet-red in color, with the flesh greenish. The ripening season at Angol is in November.

This variety is worthy of trial in the United States not only as an early plum, but also as a stock plant and which to graft other fruits. The tree introduced under this number have been grown from cuttings.



Tuesday Santiago de Chile Oct. 6, 1921

Packed for carrying to Washington the following strawberry plants, brought yesterday from Santa Ines:

653. *Fragaria chilensis*. Frutilla roja, or red-fruited Chilean strawberry. Introduced by don Salvador Iguarbo, of Santa Ines (Nos) Chile, through Wilson Popenoe.

575—Roja de Chile mejorada.—Fruto mas grande que la comun, muy dulce, de gusto exquisito, muy vigorosa y rustica. Estimada variedad.



Frutilla roja mejorada de Chile

This is a selected strain of the common Chilean strawberry, said to produce fruits of large size and good quality. It will be of interest to strawberry-breeders in the United States, and in addition it is worthy of trial in our South-Western States.

While the fruit of *Fragaria chilensis* is inferior in quality to that of our best cultivated strawberries, it is remarkable for its excellent shipping and keeping qual-

ities; and it seems to me that varieties might be produced by selection which would merit cultivation on a commercial scale.

The berry is extensively cultivated in Chile, and the fruit is much used for canning and preserving. It is also eaten as a fresh fruit. It is a curious circumstance that this species of strawberry, whose fruits are commonly an inch to an inch and a half long, should be called, in Chile, Peru, and Ecuador *frutilla*; ("little fruit") while the much smaller fruit of *Fragaria vesca* - rarely over half an inch long - is termed *frasa* or strawberry. This last named species is cultivated commercially at Quillota, Chile, where the fruit, which ripens earlier than that of *F. chilensis*, is sent to the markets of Santiago.

As far as I can ascertain by a careful examination of the plants and fruits, the *frutillas* of Chile, Peru, and Ecuador are of one and the same species. Neither in Peru

nor in Chile, however, do the plants bear all through the year, as they do on the sandy plains near Ambato, Ecuador. I imagine the difference in climatic conditions is the cause of this; on the Equator there are no well-defined seasons, and the plants remain active throughout the year; while here in Chile the seasons are fairly well-defined, and vegetative activity ceases during a part of each year, as with us. The ripening season of *F. chilensis* in the highlands of southern Peru, and in central Chile, seems to extend, approximately, from the latter part of October to January.

20 plants, in bloom! Packed in moist sphagnum and waxed paper.

✓ 654. *Fragaria chilensis*. *Frutilla blanca de Chile*, or white Chilean strawberry. Presented by Don Salvador Izquierdo, of Santa Ines, (Nos.) Chile, through Wilson Peñense.

This strawberry differs from No. 653

in the color of its points, which are of a much lighter shade of red than those of the latter. It does not seem to be nearly so well known or so extensively grown in Chile, but the

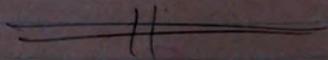
658 - Blanca de Chile. - Hermosa y enorme frutilla blanca chilena, de fruto perfumado.



Frutilla Blanca de Chile.

common as variety, but it is recommended by Sr. Izquierdo as a large and handsome fruit, highly perfumed. It is of interest to our strawberry breeders, and should be tried in our South

western states. I am inclined to believe that these Chilean strawberries will produce large and richly-flavored fruits only when grown on loose, sandy soil in a dry climate. They should however be tested under other conditions as well.



Yesterday I obtained the following material at Izquierdo's "Craadero de Arboles" (nursery), Santa Ines:

Peaches:

273. Aurora. 3 trees  
 522. Transparente de Conservas. 3 trees  
 Sport No. 1 3 trees  
 Sport No. 2 3 trees

Nectarine:

479. Cardinal Mora

Cherry:

- Precoz del Salto

Apples:

- Reina Cristina 4 trees  
 986. Bella Rosa  
 988. Chestnut 3 trees  
 994. Huidobro 3 trees

Friday Santiago de Chile Oct 7, 1922

Packed following plants to take home:

655. *Fragaria* sp. Strawberry.  
From Cascada del Salto, near Santiago  
de Chile. Presented by don Salvador  
Ezquierra. A European strawberry,  
grown last. excellent variety for  
this region. Clump of plants

656. *Citrus* sp. Capuchina orange.  
from Cascada del Salto, near Santiago  
de Chile. Presented by don Salvador  
Ezquierra. 1 tree.

657. *Malus sylvestris*. Huichol  
apple (994) from Santa Inés. 3 trees

658. *Malus sylvestris*. Bella Rosa  
apple (986) from Santa Inés. 3 trees

659. *Malus sylvestris*. Chesnut apple  
(988) from Santa Inés. 3 trees

ADMINISTRACION  
del  
CRIADERO de ARBOLES  
de  
Santa Inés (Nos)  
CHILE

Calle Los Angeles 28 (San Bernardo)

En correspondencia  
debe ser dirigida al Administrador

Caja de Remision N° 1154

Santa Inés, 5 de Octubre de 1922

(NOS)

Señor W. P. Paine

Sirva...se recibir lo siguiente:

Dupl. N.º

Cajon	Bulto	CONTENIDO
	1	3 Manzanos N° 994
		3 " 986
		3 " 988
		17 Reina Cristina
		3 Cerezo Pinar del Salto
		3 Duraznos Sport N° 1
		2

\* Sigue en la página

660. *Malus sylvestris* Reina Cristina  
apple, from Santa Ines. 4 trees

661. *Cerasus* sp. Pico del Salto  
cherry, from Santa Ines. 3 trees

662. *Amygdalus persica* Sport No. 1  
peach, from Santa Ines. 13 trees

663. *Amygdalus persica* Sport No. 2  
peach, from Santa Ines. 3 trees

664. *Amygdalus persica*, Transparente de  
Conservas peach (522) from Santa Ines  
3 trees

665. *Amygdalus persica* Almendruco  
peach (263) from Sta Ines. 3 trees

666. *Amygdalus persica* Cardinal Moca  
nectarine (478) from Santa Ines. 3 trees

Descriptions from Izquierdo's catalog  
of some of the foreign plants.

Capuchin orange (my number 656)

738—**CAPUCHINO**.—Variedad de fruto chico bien conocido y apreciado como ornamental por su porte y forma y comercialmente para la confitería. Es dulce cuando bien maduro para el consumo fresco. Para la confitería debe tomarse a media madurez, pero ya coloreado.

Apples, my numbers as shown below:

658.

986—**BELLA ROSA**.—Porte medio, carne fina, dulce, quebradiza, de I. y P., bueno para el cultivo en grande, variedad que recomendamos altamente.

659.

988—**CHESNUT**.—Porte medio, carne quebradiza, de O. e I. Variedad muy especial por prestarse para el consumo fresca, en compota y para la fabricación de cidra.

Peaches, my numbers as shown below:

664.

522—**TRASPARENTE DE CONSERVAS**.—  
(1) De carne blanca muy transparente, hueso incoloro, el primer blanquillo que madura, inestimable para las conservas, por su ardua especial, resistente a las enfermedades Extra.

665.

263—**ALMENDRUOCO REMONTANT PERPETUEL**.—Variedad del norte de Chile, que produce dos veces al año fruto, siendo los segundos chicos, muy dulces, llamados *Almendruocos*, con los cuales se fabrican los huesillos y dulce en almibar de tanto renombre, no prisco.

666.

## 478—GARDENAL MORA.—Obtenido de semi-

lla en Santa Ines. El mas notable de los duraznos pelados, por su enorme porte, fino gusto y rico colorido sangre. Prisco, de fines de Enero. Variedad que debe plantarse en gran escala.

- ✓ 667. *Criptomarya peumo*. Peumo, from Santa Ines. 2 plants
- ✓ 668. *Baldoa fragrans*. Baldo, from Santa Ines. 2 plants
- ✓ 669. *Populus* sp. *Alamo gigante de Santa Ines*. 2 plants
- ✓ 670. *Machserium* sp. *Tifa*, from Santa Ines. 2 plants
- ✓ 671. *Populus sempervirens* *Alamo de hoja persistente*, from Sta Ines. 2 plants
- ✓ 672. *Tricuspidaria dependens*. Patagua, from Sta Ines. 2 plants
- ✓ 673. *Bellota miersii*. Belloto, from Sta. Ines. 2 plants

✓ 674. *Litorea caustica*. Litre, from  
Santa Ines. 2 plants

✓ 675. *Laurelia aromatica*. Laurel de Chile  
2 plants, from Sta Ines.

✓ 676. *Maytenus boaria* Marten, from  
Santa Ines. 3 plants.

677. *Vitis vulpina* Huasco resin  
grape, from Prof. J. W. Gilmore

Sunday Santiago de Chile Oct 9 1921

The following persons here in Chile  
will be of interest to us in the future,  
and we should endeavor to keep in touch  
with them, sending them things which  
they want, so that they will, when  
occasion arises, expect themselves to send  
us material in return:

1. Señor don Salvador Izquierdo,  
Moneda 778, Santiago.

He wants California and Florida varieties  
of Citrus fruits to increase his collection,  
but big-fruited ones avoided; but summer  
and autumn from California of Apple, Peach,  
Plum, Pear, Cherry, almond, olive, etc.  
Can send us in return many Chilean  
varieties of above and other fruits, and  
Chilean horticultural material in general;  
he should not be asked or expected to obtain  
seeds or plants of species which are not in  
cultivation, or of wild plants, not of common  
occurrence in central Chile, as he is not  
able to secure such material since he has  
no collector at work and is not interested  
in the matter. Correspondence preferably  
in Spanish.

2. Señor don Vicente Valdivia U.  
Secretario de la Sociedad Agronómica de Chile  
Santiago

Now head of the Government Entomological Station in the Quinta Normal; went to States this year with total shipment of Chilean fruits. Wants horticultural & agric publications of all sorts for the Society. Will probably be a good man to furnish information on commercial fruit growing; not interested in purely botanical material & cannot obtain it for us; might send agric seeds of various sorts through his connection with the Society. Correspondence in English or Spanish.

3. Señor don Augusto Opazo G.  
Agrónomo Regional de la III Zona,  
Casilla 40 II, Santiago.

Wants agric literature. Can furnish information re agric matters in central Chile; is particularly interested in Forage plants for dry regions. Correspondence in Spanish.

4. Señor don Francisco Rojas. Humeus  
Director del Instituto Agronómico de Chile  
Santiago.

Should receive, as a matter of courtesy, agric. and hort. publications for the library of the Instituto. Could furnish information of various sorts; not inclined to be expected in the way of plants or seeds. Correspondence in English or Spanish.

5. Mr. Ralph C. Scott.  
Secretary, Asociación Cristiana de Jóvenes.  
Santiago.

Not interested in agriculture, but well acquainted in Santiago, very obliging, and might be useful in various ways.

6. Dr. Earl A. Robinson.  
Director, Santiago College,  
Agustinas 2050, Santiago.

Well acquainted in Santiago and might be useful, even though not greatly interested in horticulture or agriculture.

AGRÓNOMO REGIONAL  
DE LA  
III ZONA  
SANTIAGO  
Carras, Casilla 40 D  
Direc. Telég. AGRÓNOMO

DIRECCION GENERAL DE LOS SERVICIOS AGRICOLAS

Agrónomos Regionales, Casadanza Ambiental, Informaciones y Propaganda

N.º 541

El Agrónomo Regional de la TERCERA ZONA que comprende las provincias de SANTIAGO I O'HIGGINS, atiende GRATUITAMENTE toda clase de consultas, informaciones o datos que sobre cualquier punto de la producción agrícola, solicitan verbalmente o por escrito, los agricultores de la zona.  
— Se ruega escriban su dirección clara e indiquen la distancia de su propiedad a la Estación mas próxima del ferrocarril.  
— Cuando lo desearan les interesamos, visitará, sin costo alguno, sus propiedades, dándoles sobre el terreno mismo las informaciones necesarias.

7. Floyd H. Crouse

and  
Albert E. Reed.

Instituto Agrícola "Bunster", Angol.  
Probably can be of more real service to us than any other people in Chile. See list elsewhere of things they desire. Can send Chilean horticultural material from their region, and if plants of cult. species are desired from other parts of Chile, Reed could probably be induced to make a trip to get them, if we would cover the expenses. He is not a botanist, however, and could not therefore collect wild material; but for cult. plants, particularly fruits & farm crops, he would be oked.

8. Homer Brett

American Consul, Iquique.  
As long as Mr Brett remains at Iquique we can depend upon him to be of service if we want anything from northern Chile.

Descriptions, from Siquierdo's catalog, of plants I am taking to Washington:

**Peumos** (*Criolocarya peumus*.)

Hermoso árbol chileno, de hoja persistente, productor de un fruto coloreado de rosado, del tamaño de una aceituna chica, se come cocido por la pulpa aromática que rodea su hueso. Es de aspecto sumamente ornamental al fin del otoño cuando han llegado sus frutos a la madurez, debe figurar en todo parque o huerto.

	T. Medio	T. Granis.
Cada una en maceteros.....	\$ 1.00	2.00
Tamaño especial		3.00

1574—Peumo de fruto grande rosado.

1575—Peumo de fruto grande blanco.

**Belloto.**2042—**B. Miersii** (BELLOTO DE CHILE.)

Cada uno.....	\$ —	1.00 a 3.00
El ciento.....	—	90.00 a 250.00

Precios: Cada una  
planta de  
champa..... 4.00  
Arbol chileno de gran tamaño, de madera muy apreciada para la fabricacion de objetos de una sola pieza, como bateas, baldes, artesas, por el gran diámetro que adquiere su tronco. Es muy ornamental por sus hojas y por sus frutos (bellotas), color rojo cuando maduros, muy aparente para la alimentacion de cerdos, muy hermoso para parques por la gran sombra que produce.

**Boldo.**2043—**B. fragans** (BOLDO.)

Cada una.....	\$ 1.50 a 3.00
El ciento.....	130.00 a 250.00

Arbol chileno como el anterior, ornamental y medicinal a la vez. Sus hojas se exportan a Europa y se emplean en las enfermedades del hígado. Sus frutos, de agradable sabor, son comestibles. Sus sales en infusiones se recomiendan en la enfermedad llamada mal de Bacedow.

**Populus** (Alamos.)

Género bien conocido en Chile por los árboles ornamentales y productores casi todos de maderas excelentes para los usos de la industria y arquitectura que contiene.

El Criadero de Santa Ines posee una coleccion casi completa de estos valiosos árboles, contándose entre ellos las últimas novedades preconizadas en Europa y Estados Unidos. Posee, además dos variedades peculiares a Chile: el **álamo de hoja persistente** y el **Gigante**, de hoja caduca, variedad mejorada y fijada por el cultivo en Santa Ines siendo estos dos últimos y el álamo comun los únicos que pueden plantarse de tamaño grande, sin raíces y con éxito.

1867— " " **PYRAMIDALIS GIGANTEA**

(ALAMO GIGANTE DE SANTA INES). Variedad de hoja caduca, producida por accidente en el Criadero de Santa Ines, mejorada y fijada con el cultivo y la seleccion. Crece y engrosa con suma rapidez, formando sus arboles troncos gruesos a los 10 años de plantados en buenos suelos. Su madera es igual a la del álamo comun, pero menos nudosa a causa de la rapidez con que crece el árbol. Variedad digna de multiplicarse bajo todos conceptos.

Plantas arraigadas, cada una \$ 0.50 a \$ 1. Mayores cantidades, plantas cortadas, véase el cuadro.

1868— " " **PYRAMIDALIS SEMPERVIRENS** (ALAMO DE HOJA PERSISTENTE.)

Variedad formada en Chile por accidente. Crece muy rápidamente y en la forma del álamo comun. Da excelente madera, destinada a reemplazar sin duda alguna a la de aquél. Siendo su período vejetativo anual mas largo, su desarrollo total para la produccion de madera, es mas rápido; puede cortarse a los 12 o 14 años en buenos suelos.

2126—**Tricuspidaria dependens**

(Palagua de Chile.)

Arbol chileno interesante por su follaje, de adorno y por sus flores olorosas, blancas, en forma de campanitas. De gran valor ornamental.

Vejeta admirablemente en terrenos pantanosos.

1781—**Machoeerium** (TIPA.)

Cada uno... \$ 2.00 3.00 4.00

Hermoso árbol de adorno de la República Argentina, de follaje compacto y fino, aparente para paseos públicos y parques. En su país de origen se le compara en rapidez de crecimiento al *Eucaliptus globulus*. En el Jardín de Aclimatación de Buenos Aires se ha podido constatar en 3 1/2 meses de vegetación, brotes dados por este árbol de 4 y medio metros de largo. Plantas importadas por el Criadero han vegetado durante el verano en Santa Ines con mucho vigor y lozania. En los lugares abrigados de Chile, en la costa sobre todo, creemos que su desarrollo no será inferior al de la República Argentina. Es además árbol útil por su madera, que se emplea en mueblería y usos agrícolas. Sus ramas creciendo horizontalmente lo hacen un árbol de sombra por excelencia. Hai plantas chicas en maceteros.

**Litrea.**

2090—**L. caustica.** (*Litrea*)—Árbol indijena de Chile, mui resistente a la sequedad y de madera mui dura, empleada en la fabricación de carretones y carrocería pesada.

Precios: { Cada uno, en ma-  
ceteros ..... \$ 0.80 a 2.50

**Laurelia.**

2087—**L. aromatica.** (*Laurel del Sur de Chile.*)  
En maceteros.  
cada uno... 2.00 a 3.00  
Árbol de gran porte y hermoso aspecto por su follaje verde oscuro y aromático.

**Maytenus.**

2104— **M. BOARIA** (MAITEN DE CHILE.)

Precios: { Cada uno en  
maceteros... 0.80 2.50  
El ciento en  
maceteros... 70.00 200.00  
Cada uno, de  
champa..... 3.00 6.00

Árbol hermoso, indijena de Chile digno de cultivarse por el porte elegante que le dan sus largas ramillas pendientes, sirviendo éstas y las hojas finas que las cubren, como forraje de importancia para animales en los inviernos crudos. El grabado que damos dispensa mayores elogios sobre su hermosura. (Véase el presente grab. 40.)

Thursday Washington Dc Nov 17, 19

Sampled following persimmons from Chico.

22367. Latus-flower persimmon  
(*Quercus shi tze*)  
Rather astringent; can only be  
eaten when dead ripe. Irregular in  
size.

37947. *Pen te te*  
Lacking flavor and slightly  
astringent

37948. *Sze lung sze tee*  
Quite astringent, flavor other-  
wise fair or poor

13846. *Shakumi*.  
Good rich flavor, free from astringency  
when quite soft. A good one.

Tamopan. Very juicy. Flavor mild  
and very delicate. A good fruit.

Wednesday Lima, Peru

Oct. 19 1921

Notes on fruits observed today in the public market of Lima.

Strawberries. Quite a few on sale, and they are neither chilensis nor ultra, so far as I can judge. They look like our own cultivated sorts, all fruits being of a much brighter red than those of chilensis and about the same size as our cultivated strawberries.

Avocados. Very abundant just now. All are West Indians, and all green in color - not a single purple one has been seen. In size and form they are about like the seedlings of Southern Florida - mainly fruits of pyriform shape, and 10 to 15 oz. in weight. They are remarkably expensive, costing 50 centavos to a col. each.

Peaches. The market is filled with yellow hard-fleshed clings of fair size.

Lucumas. I saw a few fruits which I took to be of L. obovata.

Pepinos. These are quite abundant at the present time. Most of them are of rather large size - 4 to 5 inches long, and of about this shape: . They do not look to me to be as good as those of the Chota.

Loguats (Nispero del Japon) Very plentiful in the market, and of larger size, on an average, than the seedling plants I have seen elsewhere in tropical America.

Granadillas, Pasiflora ligularis, rather scarce at present.

Pineapples. The market contains abundantly small dull red pineapples of a variety I have not seen north of Peru. I think it is grown on the coast or the region of Tunjillo, or elsewhere in northern Peru. The fruits are oblong or

oblong-oval in shape, up to 5 inches long, nearly smooth on the surface (about like Sombath Cayenne in this respect) with yellowish white firm flesh. The variety appears to have excellent shipping and keeping qualities, but to be of inferior eating quality.

Avocado at Bell:

✓ ✓ ✓ ✓ ✓ ✓ ✓  
51, 50, 49, 54, 46, 42, 45, 47.

42, 45, 46, 47, 49, 50, 51, 54,

Bamboos suitable for paper production  
*Bambusa arundinacea*, *B. Tulda*  
*B. polymorpha*, *Cephalostachyum per-  
 gracile*, + *Melocanna bambusoides*.

Patent issued to John Lockhart  
 Jardine, for machine to prepare  
 bamboo for pulp extraction, 1372512

"Cotton and Other Vegetable Fibres"  
 by Ernest Goussier  
 Imperial Institute London

Reports on Timbers and Paper  
 Materials (Indian Trade Inquiry)  
 4 shillings. John Murray, London

Wm. Raitt, Cellulose Expert,  
 Imp. Forest Research Institute, Dehra  
 Dun India.

Notes on *Rubus* of tropical America  
(made by G. M. Dawson and myself, Feb. 24 1922)

*Rubus miser* Liebm.

Tactic, Guatemala. Interesting for  
South Florida only.

*Rubus bogotensis* HBK

Near Bogota. Seeds too large and  
hard to make the plant of value.

X *Rubus criscarpus* Liebm.

Slopes of Iragua. Only remaining  
black raspberry which we have not  
tried. To be crossed with our red rasp-  
berries to extend raspberry culture  
further south.

X *Rubus adenotrichos* Schlecht.

From Guatemala (Tactic) to Ecuador.  
Of interest to breeders on Texas who use  
many southern forms of blackberries.

to the dewberry group, <sup>Large clusters</sup> pe crossing with it.

*Rubus* ~~urt.~~ <sup>Pair.</sup> ~~caepulicus~~, (*trichomallus*)

X Guatemala, near Coban. Close to some of our southern dewberries. Might give more erect growth and larger fruit clusters to our very southern *Rubus*. Will worth trying.

*Rubus turckheimii* Regel

Near Guatemala City. A fair blackberry, useful about the same as *adventiculus*.

*Rubus floribundus* HBK

From Cuenca Ecuador. Not very thorny. Widely distributed, & therefore probably adaptable to various conditions.

*Rubus costaricensis* Liebm

From Los Frailes Costa Rica.

not much good - fruits small, with few large drupelets.

X *Rubus roseus* Pair.

From Tanguisagua. To cross with raspberries (chiefly) to get the large fruit character.

## Names for Ecuadorian Avocado

47. Tamayo

49. Egas

50. Chota

51. Carachi

52. Jurmína

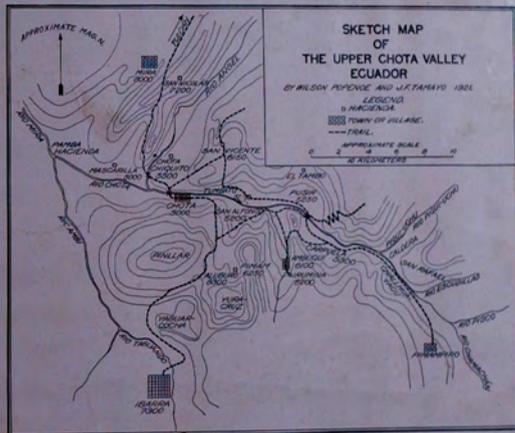
53. Imbabura

54. Capac

55. Inca

56. Huira





Pedro Correa

1609 Huérfanos Santiago  
(Chile)

Finca San Pedro

Fundo San

Miguel (El Monte)

Pedro Correa

1609 Huérfanos Santiago  
(Chile)

Olives

Milk Production

Feeding of Cattle

Breeds " "

Lemons

Oranges

General Agriculture

Alfalfa

Barley



August 19 1922.

332 JOURNAL OF THE WASHINGTON ACADEMY OF SCIENCES VOL. 12, NO. 14

men the collector states that the leaves are 7-lobed. The two leaves which the specimen bears are but 5-lobed. Doubtless the lower leaves have an additional pair of lobes.

*Passiflora* (*Granadilla*) *popenovii* Killip, sp. nov.

Vine, up to 8 meters in length, glabrous throughout, except the ovary and outer surface of the flower tube; stem terete below, 4 or 5-angled above, striate; tendrils wiry, up to 0.8 mm. in diameter; stipules narrowly linear-subulate, 1 cm. long, 0.5 mm. broad, deciduous; petioles slender, averaging 2 cm. in length, slightly tortuose toward the base, glandless; leaves oblong-ovate or elliptic-ovate, 8.5 to 14.5 cm. long, 4 to 7 cm. wide, acuminate, rounded at base, entire, papery or pergamentaceous, lustrous on both surfaces, featherveined (lateral veins 4 or 5 pairs) and prominulous-reticulate, without ocellae; peduncles slender, elongate, 8 to 10 cm. long; bracts distinct to base, concave, 2 to 2.5 cm. long, 1.2 to 1.5 cm. broad, rounded and often cleft at apex, narrowed at base, entire, minutely puberulent on the lower part of the outer surface; flowers showy, fragrant, up to 10 cm. wide; the tube 1.2 cm. long; sepals deep rose-colored, oblong, 3 to 3.5 cm. long, 1.5 to 2 cm. broad, slightly concave, wide-spreading when developed, obtuse, keeled on the outer surface, the keel terminating in a cusp 3 mm. long; petals white, linear-oblong, 3 to 3.5 cm. long, averaging 1 cm. wide, flat, slightly reflexed; filaments of faucial corona in 4 series, the 2 outer at throat of tube, white, banded with purplish-blue, the 2 inner 3 mm. and 2 mm. from the throat, the filaments of the outermost series filiform, 1.5 cm. long, 1 mm. thick at base, slightly divaricate, those of second series ligulate, fleshy, 3 to 3.5 cm. long, 2 to 2.5 mm. wide, those of third series capillary, 1 mm. long, those of the fourth series capillary, 2 mm. long; middle corona membranous, 5 mm. long, the lower half adnate to the floor of the flower tube, the upper half free, slightly recurved; basal corona none; gynophore stout, grooved, conspicuously swollen about 1 cm. above base; ovary globose, narrowed at base, densely tomentellous; styles clavate, 6 mm. long; stigmas 3 mm. in diameter.

Type in the U. S. National Herbarium, no. 1,060,000, cultivated in volcanic loam at Baños de Tarma, Ecuador, at an altitude of 1,850 meters, collected March 6, 1922, by Killip and Nelson Popenoe (no. 1272).

The nearest relative of *P. popenovii* is *P. laurifolia*, widely cultivated in the West Indies under the name water-lemon. The flowers of the two species are very much alike, the coronal structure being practically identical. *Passiflora popenovii* is to be separated, however, by its thinner, more acuminate leaves, by the absence of petiolar glands, and by its more slender and more elongate peduncles.

This species is one of several cultivated in Ecuador under the name of "Granadilla de Quijos" and the edible fruit is commonly on sale in the markets of Baños and Riobamba. It is said to be indigenous on the eastern slopes of the Andes.

Last photographie No. 3005  
 Last herbarium No. 1372  
 Last plant seeds No. 677

## BOOK SHELF.

*MANUAL OF TROPICAL AND SUBTROPICAL FRUITS*, by Wilson Popenoe, Agricultural Explorer, United States Department of Agriculture, MacMillan & Co., Ltd., London and New York. Pp. 474. Price 30s. net.

This book supplies a mass of information of the greatest value to all interested in the culture of tropical fruits, especially of those not generally known or widely cultivated. The author, who probably is the greatest authority on the subject, speaks from personal experience of many years in various parts of the tropics, and also from long experience in acclimatization experiments conducted in Florida and California. He also records his obligations to many others who have made investigations in the subject, as for instance, P. J. Wester in the Philippines, and J. E. Higgins in Hawaii, whose work is well known.

The author states that he has purposely omitted reference to the most important of the tropical fruits at present cultivated on a commercial scale, such as oranges, pine-apples, and bananas, as full information with regard to their culture and value is obtainable from other sources. This book is intended to give the results of the latest researches and practical experience in the cultivation of other promising fruits of the warmer regions of the globe, not at present much known outside of their native habitats, more than a hundred of which are discussed. After an introduction, the book is divided into chapters dealing with various classes of tropical fruits, as for instance, 'The Annonaceous Fruits', 'The Papaya and its Relatives', 'Fruits of the Myrtle Family', etc.; while separate chapters are devoted to dealing with some specially important fruits individually, such as the avocado, and the mango.

The resulting volume is a mine of information and instruction, clearly conveyed, and charmingly written. To anyone who has a taste in this direction, it is a pleasure to pick it up and dip into it anywhere. The descriptions of the trees are vivid, the qualities of the fruits are plainly set forth, and the cultural instructions are to the point. Another thing which adds to the value of the book is the number and excellence of the illustrations which accompany the text.

It is, of course, impossible within the limits of the present notice to enter into any extended review of the contents of the volume; it is sufficient to say that it would seem to be indispensable to anyone undertaking the cultivation of tropical fruits, either on a large or a small scale.

Tropical fruits have, with few exceptions, received very little cultural attention in the past, and such a book as this may well stimulate interest in their improvement by selection and vegetative reproduction.

In conclusion it may be noticed that there is a careful and comprehensive index attached, which is a most desirable feature in a book like this, meant for reference.

① Send to  
Dr. Charles L. Reese  
E. J. Dupont de Nemours Co.,  
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article on the hone of Marisa.

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American Bible Society  
Cristobal, Canal Zone  
would like our publications

Col. H. L. Fisher  
Chief Health Officer  
Balboa Heights, C. Z.  
wants any publications on avocados. Expects  
to settle in So. Florida late to grow them

Miss Anna Orton  
Box 174, Pasadena, Calif.  
wants American ornamental

"The Cape Times" (South Africa)

FRUIT CULTURE.

"Manual of Tropical and Sub-tropical Fruits," Wilson Popenco, (Macmillan Co., 1920, pp. XIV-474, 24 plates and 62 text figures).

Mr. Popenco, who is an Agricultural Engineer of the United States Department of Agriculture, has in this excellent manual collected all the important information available on tropical and sub-tropical fruits, with the exception of those which are most familiar. He excludes the banana, coconut, pineapple, citrus fruits, guava and fig, to include which would have swelled his book to thrice its present size. Most readers would be astonished, however, to find what a large number of fruits remain to be dealt with; and also to learn how many of these pomological rarities and curiosities have been studied experimentally in the United States. And further, the one might well be surprised at the number of cultivated varieties of some of the better known fruits—varieties differing in size, shape, flavour, packing and keeping qualities, habit of growth, cultural requirements and so on. For instance, three or four varieties of the Avocado are known, and Mr. Popenco describes fourteen cultivated varieties. A closer study of the cultural peculiarities of these and other varieties would certainly make possible a much wider cultivation of this unique and invaluable fruit in South Africa than is carried out at present. Its value as a source of fat in the edible part of the fruit may be as high as 20 per cent., and that of a pound of it yields as much as 1,200-1,300 calories (more than twice that given by lean beef). Such examples are full of encouragement for experimental work on the introduction and testing of exotie fruits in South Africa. Take the Litchi, for example, praised in verse by the illustrious Chang Chow-ling of the 17th century as the most delicious of all fruits. "While living in exile at Canton," the poet Su Tung-po wrote that "Litchi would precede a central throne." Yet he did not allow his enthusiasm to draw him into gastronomic indulgence, for he limited himself to a modest three hundred a day, while other men (so he says) did not stop short of all of a thousand. How the mouth waters at this, and at "the quite indescribably

delicious" flavour of the subgenus, the queen of tropical fruits! We do not know the account of the Durian, which, when one has overcome first impressions ("to those not used to it, it seems at first to smell like rotten onions, but immediately they have tasted it they prefer it to all other food," writes Palendang) is compared by Alfred Russell Wallace to a rich butter-like custard highly flavoured with almonds. . . . but intermingled with it come wafts of flavour that call to mind cream-cheese, onion-sauce, brown sherry and other incongruities. It is perhaps not too sweet for juicy, yet one feels the want of none of these qualities for it is perfect as it is. In fact to eat Durians is a new sensation, worth a voyage to the East to experience."

Of the fruits described two only are native to South Africa, namely the Kei Apple and the Amatungula. The latter, for its ornamental value as well as its edible fruits deserves to be cultivated throughout the tropics. An ingenious method is described of making it root readily from cuttings. But though the country is poor in native fruits, a great many more exotie fruits could be cultivated here with advantage and Mr. Popenco's book is an admirable guide for the professional and the private acclimatist. The Jubra, for example, which has been cultivated in China for at least 3,000 years, should succeed admirably in parts of the South-West, even in semi-arid conditions. The most useful Piango, the curious and locally popular Jaboticaba, and the Manzania suggest themselves for sub-tropical conditions, while there is a wide field of enterprise in Natal and the Low Veld for the many delicious and attractive products of the tropics. Even our most familiar fruits are capable of improvement. How much might be done with the Loquat, for instance, by judicious selection of good varieties and proper attention to cultivation and pruning. We have nothing but praise for this book, which is one of the excellent series of Rural Manuals edited by L. H. Bailey. It is well printed and bound, the illustrations are well chosen and representative, and the text is clear and informative. We congratulate Mr. Popenco on an admirable compilation of an attractive subject on which previous literature is scanty and inaccessible.



## DEL MILAGRO

Lo que producen las frutas. — Necesidad de intensificar los cultivos. — Los terrenos más apropiados.

Julio 10 de 1921.

Señor Director de EL GUANTE.

Se ha generalizado tanto el consumo de las frutas tropicales entre los habitantes de nuestras cordilleras y los de fuera del país, que todas, en general, han llegado a obtener un precio tan ventajoso que vale la pena darles a los árboles y plantas frutales la preferencia sobre otras plantaciones, sobre todo cuando se cuenta con terrenos apropiados.

Para que los lectores de ese prestigioso Diario se den una cuenta exacta de la utilidad que reporta una plantación de árboles y plantas frutales, consigno los siguientes datos, calculados por cosecha o sea por cada año:

Una cuadra de plátanos guineos produce 800 racimos a \$ 0.80 cju., 640 sucres.

Una cuadra de plátanos limeño produce 700 racimos a \$ 0.80 cju., 560 sucres.

Una cuadra de plátanos orito produce 600 racimos a \$ 0.50 cju., 300 sucres.

Una cuadra de piñas produce 2.000 a \$ 0.30 cju., 600 sucres.

Una cuadra de cañas dulces produce 3.000 a \$ 0.05 cju., 150 sucres.

Una cuadra de sandías produce 1.000 a \$ 0.10 cju., 100 sucres.

Una cuadra de melones produce 1.000 a \$ 0.15 cju., 150 sucres.

Una cuadra de jiquimas produce 30 sacos a \$ 2.00 cju., 60 sucres.

Un árbol de mangos produce 10.000 el ciento \$ 0.50—50 sucres.

Un árbol de naranjas produce 5.000 el ciento \$ 0.60—30 sucres.

Un árbol de mamey colorado produce 2.000 el ciento \$ 2.00—\$ 40.

Un árbol de figueros produce 3.000 el ciento \$ 2.00—60 sucres.

Un árbol de zapota produce 3.000 el ciento \$ 0.60—18 sucres.

Un árbol de aguacates produce 500 el ciento \$ 5.00—25 sucres.

Un árbol de mamey cartagena produce 500 el ciento \$ 5.00—\$ 25

Un árbol de cauje produce 500 el ciento \$ 2.00—10 sucres.

Un árbol de guabas de bejuco produce 500 el ciento \$ 2.00—\$ 10.

Un árbol de guabas de machete produce 500 el ciento \$ 2.50—\$ 12.50.

Un árbol de guabas de mico produce 1.000 el ciento \$ 0.40—\$ 4.00.

Un árbol de limas produce 1.000 el ciento \$ 1.00—10 sucres.

Un árbol de amonias produce 500 el ciento \$ 0.80—\$ 4.00.

Un árbol de guanábana produce 200 el ciento \$ 10.00—20 sucres.

Un árbol de papayas produce 60 el ciento \$ 10.00—6 sucres.

Un árbol de frutas de pan produce 10.000 el ciento \$ 0.20—\$ 20.00.

Un árbol de marañones produce 300 el ciento \$ 0.60—\$ 1.80.

Una parra de badeas produce 100 el ciento \$ 10.00—\$ 10.00.

Una palma de cocos produce 144 la docena \$ 0.80—\$9.60.

Un árbol de madroños produce 10 cajones a (\*) \$ 2.00 cju.—\$ 20.00.

Un árbol de limones produce 5 cajones a \$ 1.00 cju.—\$ 5.00.

Un árbol de guayabas de palo produce 2 cajones a \$ 2.00 cju.—\$ 2.00.

Un árbol de guayabas de puercoco produce 5 cajones a \$ 1.00 cju.—\$ 5 sucres.

Un árbol de guayabas de Chocó produce 5 cajones a \$ 3.00 cju., 15 sucres.

Un árbol de ciruelas de terro produce 3 cajones a \$ 0.80 cju.—\$ 2.40.

Un árbol de ciruelas de Nicaragua produce 2 cajones a \$ 0.80 cju.—\$ 1.60.

Un árbol de caminitos produce 10 cajones a \$ 1.00 cju.—\$ 10.00.

Un árbol de cerasas produce 2 cajones a \$ 1.00 cju.—1 sucra.

Un árbol de poma rosas produce 2 cajones a \$ 2.00—4.00 sucres.

Un árbol de pechichos produce 20 cajones a \$ 0.40 cju.—8 sucres.

Un árbol de niguitos produce 1 cajones a \$ 0.80 cju.—\$ 1.00.

Un árbol de grosellas produce medio cajón a \$ 6.00—3 sucres.

Una mata de revillas produce medio cajón a \$ 4.00—2 sucres.

Un árbol de bedobas produce un cuarto de cajón a \$ 8.00—2 sucres.

Una mata de granadas produce 50 el ciento \$ 5.00—\$ 2.50.

Una mata de higos produce 500 el ciento \$ 1.00—5.00 sucres.

Un árbol de guay-II produce 500 el ciento \$ 0.60—3 sucres.

S

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Por los datos que preceden se puede ver claramente lo necesario que es al incremento de la riqueza nacional, intensificar los cultivos de las expresadas plantas.

Todos los terrenos de esta extensa zona son apropiados para plantaciones de árboles de frutas, pero las riberas del río Yaguachi las producen de muy buena calidad, con excepción de las piñas que solo el Milagro las produce, de la mejor calidad del mundo.

Que esta correspondencia despierte en todos nosotros el entusiasmo por la agricultura, son los deseos de su atento

Corresponsal X X.

(\*) Cajoncitos de velas.

A. B. Pullen and Co.  
Casilla 687. La Paz, Bolivia.

Pullen is a capital fellow who would doubtless be glad to hear anything he could for us. Not greatly interested in agriculture, but well acquainted in the region and a horticulturist.

Quito, Ecuador.



Ludoric Soderstrom



Mrs. Hartman, The American Minister, Mrs. Lewis

## Telegrafos del Ecuador

Telegrama de Quito Núm. 46  
 a Paris el día 27 Palabras 30  
 de Febrero a las 7.40 Valor 160  
 pm pm

Sc.

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EL ANOTADOR,

El Telegrafista.



Review of the "Manual of Tropical and Subtropical Fruits"

"This book is quite a masterpiece in its way. We are not sufficiently expert in fruit-culture to speak with greater assurance of it, but have set it up in our bookshelf alongside Van Hall's "Cacao", Copeland's "Coconuts", Ridley's "Spices" and Fawcett's "Banana", which we know leave nothing to be desired for accuracy and thoroughness. There is another reason for this book to be on your bookshelf; the author gives it in his preface, viz., that the banana, coconut, pineapple, oranges and other citrus fruits, and, of course, cacao are not included in it. These have been exhaustively dealt with elsewhere, leaving Mr. Popenoe to fill up the gap—it needed filling—with other fruits.

"We are pleased to see tributes paid to those who have worked so hard to make fruit culture more popular, not only as an investment, but also—as we pointed out in our series of articles on "The Home Beautiful in the Tropics"—because it is important for the health and mentality of those living amidst the otherwise monotonous sameness of one estate, amidst many estates, planted to one crop, to have flowers and fruit to look at and enjoy in plenty. Even an estate with forest and pasture lands needs a fruit and flower garden; the eye and the system are better for them. For this reason Mr. Popenoe, as an agricultural explorer, to give him his official title or designation, is right to remind us what we owe to Professor Earle, the Reasoner Bros., of Florida, J.E. Higgins and his confreres in Hawaii, to P.J. Wester and the Philippine group, to O.F. Cook (all except Professor Earle have been "Our Friends"), and a host of others. May their good work long continue, and may Mr. Popenoe tell us how they progress every now and again.

"The chief fruits discussed are the Avocado Pear (pp. 9-78), the mango and its relatives the Cashew, etc (pp. 79-160), the Cherimoya (Anona cherimoya), sugar-apple and other annonaceous fruits (161-195), the Date (196-224, a well-written section), the Papaya and Granadilla (22-249), the Loquat (250-271), the Guava and other myrtles (273-311), and so on for seven more chapters or sections. Anyone wishing to cultivate such fruits as ~~xxx~~ his land and climatic conditions will allow, and the choice is wide, should have this book. The price is typical of the times, but well worth the money, so be wise in time and buy it now lest the next edition should cost more."

TROPICAL LIFE (London, England)  
January 1921, pp. 11-12.

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 Instituto Agrícola Bunster  
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 Floyd L. Crouse

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 Casilla 67  
 Santiago

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Send big slipper (per orange) to  
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 Repair watch.  
 1 cravat, knitted, dark blue  
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For Instituto Bunster, Angol, Chile:

Name of periodical devoted to Nursery trade  
 Nursery Catalogs California and Florida.

Sour orange, rough lemon, and grapefruit  
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For Institute Bunter cont'd:

Send Hamel's bulletin which will enable  
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See Piper and get forged grass & plants  
Fuerte & other Hardy avocados.  
Bardwood of Fuerte and other Hardy avocados

" Citrus Fruits:

Best strain Washington Naval  
Marsh grapefruit  
Foster "  
Valencia orange  
Eureka lemon  
Luz Jim Gong orange  
Nancy mandarin  
Dancy Tangerine  
Clementine satsuma  
Satsuma.  
Citron  
Kumquat  
Temple orange

Bardwood of best loquats (mispelo & pinnaceros)  
Tanaka and Champagne

Plants of yuzh: Seeds sour orange, rough  
lemon and grapefruit

Quayaquil, (Ecuador), Viernes 5 de Agosto de 1921

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Quayaquil, 31 de Julio de 1921.

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presentarlas antes de que se verifique la junta, para que sean inscritas y a

torzar, así, las boletas de votación.

Como algunas de las acciones de la Empresa han cambiado de due

ño, etc. etc.

La comisión de tiro del Club.

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General Ordinaria de accionistas, para el martes 5 de agosto próximo, a

De conformidad con el Arto. 30 de los Estatutos, se convoca a

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Plumas

Restaurant Napolitano

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De conformidad con el Arto. 30 de los Estatutos, se convoca a

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Revista de Agricultura, Comercio, y Trabajo. Habana, Cuba, Febrero de 1921.

## BIBLIOGRAFIA

UN BUEN LIBRO SOBRE FRUTICULTURA TROPICAL



MR. WILSON POPEAOE  
Autor del "Manual of Tropical and Subtropical Fruits"

Editado por la casa McMillan Co., 64-66 Fifth Ave, de New York y en forma de un elegante manual de 474 páginas, ha llegado a nuestras manos una obra maestra titulada "Manual of Tropical and Subtropical Fruits", producto de la competente y conocida personalidad del Explorador Agrícola del Departamento de Agricultura de Washington y eminentemente hombre de ciencia, Prof. Wilson Popenoe.

El Prof. Popenoe ha estado varias veces en Cuba, la que recorrió en todos sentidos, con el objeto de estudiar su fruticultura y especialmente los mangos y los aguacates.

Este libro constituye la obra más moderna y científica sobre fruticultura tropical americana; no debiendo faltar en ninguna biblioteca de los hombres estudiosos y agricultores progresistas.

El elegante volumen empastado se vende a \$5.00 el ejemplar.

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Cristolite Co. Box 17 Franklin Station

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① Send copy of "Manual" to  
Francisco Rojas Huancusi  
Director, Instituto Agrario  
Santiago de Chile

## Principal Indigenous Civilizations of America

1. Aztec, of Mexico, with its dependencies
  - (a) Tarascan (of Michoacan)
  - (b) Mixteco-Zapotecan (of Oaxaca)
2. Maya-Kiche', of Yucatan, Chiapas, Guatemala, and part of Honduras.
3. Central American, of Nicaragua and Salvador.
4. Chibcha, of Costa Rica, Panama, and the tableland of Colombia.
5. Peruvian
6. Diaguita or Chalchiqui, of Argentina

— From Beuchat, "Manual de Arqueología Americana," translated by Domingo Vaca.

The names of Peruvia americana and P. strimifera should be obtained in the following American languages:

Nahuatl

Otomi.

Tarasco

Huasteca

And any other idoms of Central America

Maya, and its principal dialects, including Kiche', Ketschi, and Coahuilteco.

Costa Rican idoms, many of Chiriquia, Serrano.

Chibcha, of Colombia

Quichua, of Peru

### I LIBRI

## Manuale di frutti tropicali e sub-tropicali

Grandissimo e per me di richiamare su questo libro l'attenzione dei botanici, degli orticoltori e di tutti coloro che in Italia si interessano allo sviluppo della nostra Colonia, per il merito intrinseco e veramente eccezionale di questa pubblicazione, ricalchissima come è di dati pratici e positivi, raccolti dal giovane autore, nei suoi viaggi in varie parti dell'Asia, dell'Africa e dell'America Centrale e Meridionale, nella sua qualità di « esploratore agricolo » per conto del Dipartimento di agricoltura degli Stati Uniti.

Come giustamente osserva l'Autore, tutti i paesi ora densamente popolati nelle zone tropicali si troveranno sempre più costretti a ricercare nelle zone tropicali, adesso poco popolate, i supplementi indispensabili alle loro risorse alimentari. Esempio tipico, ormai conosciuto da tutti, è quello delle banane, il cui movimento commerciale annuo aveva raggiunto, prima della guerra, quasi 200 milioni di lire, e presto salirà a cifre molto superiori.

Ma, non è soltanto per provvedere alle esigenze nutritive dei popoli più numerosi e più progrediti nelle zone temperate che sempre più necessario sarà di dedicare attenzione maggiore alla cultura di frutti tropicali, ma sibbene a vantaggio di queste stesse popolazioni, quasi primitive, le quali in mezzo alla feracità naturale del clima si trovano non di rado destituite dalle cariste. Basti citare l'esempio delle Indie orientali, dove sono tuttora frequenti, ed il « cannibalismo » nell'interno dell'Africa e nella Polinesia, non ha avuto per esatta impellente la deficienza di altri alimenti?

A noi italiani, questi studi devono interessare in modo particolarissimo. A buon conto già da molti anni siamo i principali esportatori di funghi in ogni parte del mondo — mentre, nelle bergamotte, siamo supremi produttori. Per l'olio di oliva siamo di poco inferiori alla Spagna, ma inferiori assai per le olive conservate. Nel Mezzogiorno possiamo, con vantaggio sicuro, introdurre altre culture sub-tropicali, come si si praticano di già nella del pistacchio e della cerimora. Nella Libia possediamo non meno di 10 milioni di palme da datteri, gran parte delle quali nel Fezzan, vale a dire, in condizioni ideali per ricchezza di zucchero e per lunga conservazione ed abbiamo grandi possibilità per le banane e per altre culture tropicali, le nella massima prossimità ai grandi mercati europei — in una porzione dell'Egitto, e nella quasi totalità della Somalia, sono possibilissime anche le culture più esotiche tropicali. Un'alta qualità della noce di cocco. — Ma non basta. Nel Brasil

le meridionale e nell'Argentina esistono adesso quasi 5 milioni di coloni italiani, in via di aumento progressivo; ed in un tempo più o meno prossimo nell'Ecuador, nell'Angola, ed in altre regioni africane prospereranno egualmente le colonie che il nostro insediamento.

Si intende che si bene del Popone e destinato anzi tutto agli Stati Uniti, i quali nella Florida e nella California meridionale, hanno sviluppato non poche culture tropicali, e sub-tropicali, mentre nell'ultimo ventennio i grandi progressi hanno saputo ottenere in Porto Rico, nelle Isole Hawaii, e nel vasto arcipelago delle Filippine, tutte regioni tropicalissime. Per non uscire dal campo delle applicazioni pratiche ed immediate l'Autore si è limitato a trattare soltanto della cultura che hanno importanza e prospettive maggiori, e di quella già stata felicemente iniziata nella Florida e nella California meridionale.

La materia è suddivisa in 14 capitoli, non tutti uniformi, necessariamente. Il secondo, e più esteso di tutti, occupando 70 pagine, tratta della *Persea gratissima*, nel Messico, suo paese nativo, detta « Abucate », ma negli Stati Uniti, per facilità di pronuncia il volga recentemente tramutare in « Avocado », al quale frutto si compete il primo posto e più diffuso trattamento per la importanza che ha dagli acquistati in Florida, e più che mai in California, anche dal punto di vista commerciale, e per le sue prospettive future, in tutti quei paesi dove si coltivano con profitto gli agrumi.

Segue il « Mango », *Mangifera indica*, un poco troppo tropicale per California e Florida e forse anche per la Libia, ma certo promettentissimo per la costa della Eritrea, e più che mai per la nostra Somalia. Il quarto capitolo tratta di vari frutti affini o parenti del Muzo, ciascuno però di importanza minore. Seguono i frutti della famiglia delle Anonacee (35 pp), fra i quali uno, forse il migliore di tutti, l'*Annona cherimola*, da quasi tre secoli si coltiva a Reggio Calabria.

Il capitolo sesto, molto condensato, benché di 30 pagine, è di grandissimo interesse per noi in Libia, come accennato di sopra, per quanto manca di informazioni precise sulle nostre eccellenti varietà di datteri del Fezzan, tuttora rimasti da raccogliere. Il settimo capitolo tratta della « papaya », *Carica papaya*, e suoi conspecifici che dovranno fiorire bene in Libia, a mo' di che mai sul Mar Rosso e in Somalia.

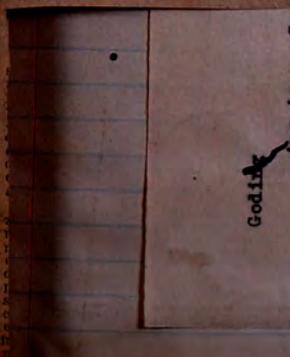
Segue il capitolo dedicato al « melone del Giappone », *Eurobotrys japonica*, tanto comune in Italia, ma sconosciuto di gran maggioranza. Il capitolo nono dedica 20

pagine ai frutti della numerosissima famiglia delle Miraceae, *Pachira*, *Eugenia*, *Felfoa*; e tanti altri, pochissimo tuttora conosciuti fra noi. Il capitolo decimo tratta del « litchi », *Nephelium litchi*, che si importa secco in Italia col nome di « ciliegine della Cina », ma è alimento delizioso quanto è fresco. Il successivo tratta di vari frutti della famiglia delle Sapotaceae, tutti strettamente tropicali, e pochissimo usati in Europa. Il dodicesimo e tredicesimo capitolo comprendono il « kaki », *Diospyros kaki*, il « Melagrano » ed il « Giugliolo », estesamente coltivati in Italia, ma che in America sono abbinamenti classici, non saprei con qual ragione, come, sub-tropicali. Tropicalissimi sono invece il « Mangostano » (*Garcinia mangostana*, e suoi affini della famiglia delle Guttifere (capitolo 14); come parente dell'albero del pane » ed affini, famiglia Artocarpeae (capitolo 15), del quali tutti non potremo tentare la cultura fuori che nella Somalia. Il 16. ed ultimo capitolo abbraccia una quindicina di frutti di varie famiglie e di importanza varia, i più interessanti per noi essendo il « Tamarindo » spontaneo nell'Eritrea, e la *Garcinia grandiflora*, che dovrebbe riuscire anche nel mezzogiorno dell'Italia.

Da questo comodo sommario apparisce chiaramente quanto sia da raccomandarsi il Libro del Popone anche all'attenzione di noi italiani. Dal medesimo sono stati prelevati i mesi di proposito l'Ananasso, il Banano e la Noce di cocco perché già stati trattati diffusamente da altri scrittori Americani.

Dot. E. O. FENZI.

*Popone W. — Manual of Tropical and sub-tropical Fruits — 1 vol. pp. 474, illustrated. Macmillan, New York, 1920 — (in lingua inglese).*



Godini American Consul General

Following cable received for Popone today quote Washington July 26 two numbers first photo shipment safe. Last lot encouraging. Congratulations. Signed Fairchild. End quote.

Hartman

Boston Transcript (2)

## TROPICAL FRUITS

Manual of Tropical and Subtropical Fruits.  
By Wilson Popehoe. New York: The Macmillan  
Company.

THE author is an expert, employed as agricultural explorer for the United States Department of Agriculture and the book is one of a series of Rural Manuals, brought out under the editorship of Dr. L. H. Bailey. On his title page the author announces his design of excluding from considering the banana, the coconut, the pineapple, citrus fruits, the olive and the fig. To the general reader the first thought would be to inquire, with these familiar fruits of the tropics left out of consideration, what is left? But those who have visited tropical or subtropical countries either in person or in books, find in this volume many familiar fruit-names, though, to be sure, they will find likewise very many more of which they have never before heard. Mr. Popehoe begins with the avocado, which many people in the regions where it grows often call the avocado pear. He displays his scientific knowledge by giving first a botanical description of the avocado, its history and distribution, its composition and its uses. He next describes the climate and soil best suited to its growth and follows with dissertations upon the methods of cultivation and propagation. He considers next the crop, its season, methods of gathering, packing and marketing. A section is devoted to pests and diseases which ravage the avocado and closes with description of the varieties of the fruit and its races and hybrids. All this is exhaustive and done with a thoroughness which is admirable.

The story of the avocado is followed by Mr. Popehoe with similar considerations of the mango, the date, the papaya and its relatives, the loquat, the guava and its relatives, the litchi, kaki, pomelo, breadfruit and a great variety of other fruits of lesser fame, about which few of us have heard. The volume is finely printed and is adorned with a profusion of illustrations, some in half-tone, others from line drawings made by an especial artist connected with the Government bureau of plant industry.

P.S. We have safe the following avocados sent in by you: No. 42, 4 plants; No. 45, 1 plant; No. 46, 4 plants; No. 47, 3 plants. The foregoing are all safe, even the one with one plant. The others were not saved.

June 15, 1921

## CALIFORNIA FARMER

## A New Book on Subtropical Fruits

By J. ELLIOT COIT

CALIFORNIA fruit-growers, both commercial and amateur, will welcome this new addition to pomological literature. "The Manual of Tropical and Subtropical Fruits" written by Wilson Popehoe, edited by Dr. L. H. Bailey, and published by the Macmillan Company, fills a long-felt need. Garden-lovers in California have not taken full advantage of the wonderful possibilities in tropical fruits, largely on account of lack of reliable information such as is supplied by this well-illustrated work of 450 pages.

In covering the subject the author includes the banana, coconut, pineapple, citrus fruits, olive and fig because they are considered to have been adequately treated in other publications. The principal fruits included are the avocado, date, mango, cherimoya, papaya, passion fruit, loquat, guava, litchi, sapote, kaki, pomegranate, manioc, carissa, breadfruit, tamar and a large number of nearly related tropical fruits which as yet are little known in English-speaking countries.

Under each fruit is given the botanical relationships, history and distribution, composition and uses, climate and soil adaptations, culture, propagation, harvesting and marketing, pests and diseases, and list of select varieties with descriptions.

The author, being agricultural explorer for the United States Department of Agriculture, has traveled extensively throughout the world, and in compiling the work has drawn largely on his own experience, both in California and Florida.

The material on the date, mango and avocado comprises about one-half the book and represents the most complete and up-to-date body of information available on these fruits.

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"El Telégrafo", Guayaquil, 1 Agosto 1921

## EL DESARROLLO DE LA INDUSTRIA FRUTERA EN EL ECUADOR

### UNA RIQUEZA INCALCULABLE EN PERSPECTIVA

Tuvimos ayer el agrado de recibir la visita del señor don Wilson Popenoe, especialista en frutas tropicales y miembro del Departamento de Agricultura de los Estados Unidos; acompañábase el señor Dr. Federico W. Goding, Cónsul General de aque-

lla nación en nuestro puerto. El señor Popenoe ha recorrido el fértil y ardiente litoral, y la suave y majestuosa sierra, y ha quedado maravillado de la esplendorosa naturaleza que el Ecuador; país en el cual la diversidad de climas y de paisajes, hace que él sea notable por su producción, que reúne en sí la mayor variedad imaginable.

Como es hombre versado y de entendimiento claro y penetrante, ha estudiado con exactitud nuestras ventajosas condiciones agrícolas, como exportadoras de frutas, así a los países del sur, como a los Estados Unidos del Norte, donde su consumo crece día por día, y brinda con una magnífica expectativa para el futuro. Nos ha dicho el señor Popenoe que el Departamento de Agricultura de su patria, mandará al Ecuador semillas y plantas, adecuadas para su cultivo en la región del litoral y en la región interandina, a fin de que de ellas se aprovechen quienes deseen la prosperidad de la fruticultura nacional, que, con el tiempo, vendrá a ser más importante que el comercio del cacao.

Según sus observaciones, el litoral puede exportar frutas por millones de sacos; cantidad que excede son muchos millones a la del cacao. Territorios inmensos, propios pa-

ra el cultivo de árboles frutales, aún permanecen abandonados, sin que la industria del hombre les extraiga la riqueza que encierran en sus entrañas fecundas e inagotables.

Opina nuestro visitante que, sobre la variedad de frutas ecuatorianas, hay la ventaja de que, la calidad de algunas, es insuperable, por su exquisito sabor y por otras condiciones.

La halagueña perspectiva del comercio de la fruta, mejorará con la introducción de árboles nuevos, con el ingenio, y el cultivo científico de las plantas.

La fruta de la costa y la fruta de la sierra, cuando los ecuatorianos se apliquen a su cultivo, será la principal riqueza del país, piensa el señor Popenoe, quien, benévolo y generoso, está dispuesto a ayudar a los agricultores con sus conocimientos científicos y experimentales, en tanto que permanezca entre nosotros.

Este viajero norteamericano ha ejecutado algunos trabajos en la Quinta Normal de Ambato. Su inclinación poderosa e irresistible a la agricultura, y su afición especialísima a la fruta tropical, le mantienen en actividad constante, la que, por cierto, ha de ser muy útil a nuestro país, supuesta la competencia de este notable miembro del Departamento de Agricultura de los Estados Unidos de Norte América.

Deseamos que los agricultores ecuatorianos, estimulados por voz tan autorizada, emprendan el cultivo intenso de la fruta, que será la mayor riqueza nacional en el futuro.



tible a la infección y, debe tomarse todas precauciones contra ella y también contra los cambios extremos, no debiendo someterse al animal un trabajo excesivo o muy duro. Cuando aparece la peste, todos los animales que están en peligro deben ser vacunados y se tomarán las medidas de precaución indicadas.

CONCLUSIONES.—La peste producida por el antrax, se ha presentado en la costa ecuatoriana; no hay duda que está muy diseminada y, los hacendados deben tomar precauciones contra esta enfermedad. Esta aparece aquí en la estación de verano y en los potreros que están inundados periódicamente y que tienen aguas estancadas. Para prevenir la diseminación de la peste, los cadáveres deberán ser que-

mados como se ha dicho, sin quitarles previamente el cuero. En cuanto aparece la peste se procederá a la vacunación contra el antrax, y se pondrán en otro potrero. Se sospechará que la enfermedad es antrax ha comenzado, cuando los animales empiezan a morir de repente y al parecer sin razón.

En casos sospechosos, se puede mandar un espécimen, para análisis bacteriológico, de la manera siguiente: Córtese la oreja del animal envuélvase en un trapo bien mojado en una solución de sublimado de mercurio al uno por mil; póngase en un cajón y mándese al laboratorio; esta operación deberá hacerse dentro de las veinte y cuatro horas después de la muerte del animal.

## Explotación Comercial del Aguacate

Por Wilson Popenoe, del Departamento de Agricultura de los Estados Unidos de América.

A los agricultores del Ecuador, quienes suelen considerar el aguacate como una fruta de poco o ningún valor comercial, puede interesarles el hecho de que en California y Florida (E. E. U. U. de A.) se ha dedicado ya más de mil hectáreas al cultivo de este frutal. —«The California Avocado Association»—que cuenta actualmente con unos cuatrocientos socios, y cuyo fin es únicamente la explotación comercial de esta valiosa fruta, y su estudio desde todo punto de vista.

Así es que el aguacate ha llegado ya a desempeñar un papel de importancia entre las frutas de cuyo cultivo ya hace la riqueza de los estados de California y Florida. Y esto, por qué? Porque los norteamericanos, una vez que han saboreado esta deliciosa fruta, suelen gustosos su dólares, no siendo cosa rara en

New York, Boston y Filadelfia que los aguacates alcancen un precio de 50 cents oro cada uno. Por supuesto, el aguacate es todavía desconocido para la mayoría de los norteamericanos, sobre todo en el centro del país; claro es que muchos no lo llegarán a conocer nunca si el precio baja hasta 10 o 15 cents. oro cada frutal. Además de eso, el consumo nunca puede ser muy grande mientras se mantengan los precios de hoy. Pero conforme se va aumentando la producción, será honesto aumentar el consumo, y para realizar esto habrá que poner el aguacate al alcance de todos.

El aguacate se mira en los Estados Unidos no solamente como frutal muy agradable al paladar, sino también como alimento de primer orden, capaz de ser plazar, en gran parte, a la carne. El

Boletín de Agricultura,  
Quinta Normal, Ambato

Año 1, N.º 3  
Febrero 1920

Ojalá estos ligeros apuntes, despierten la atención de las personas que se interesan en los problemas agrícolas, y se vaya conociendo que en nuestro país de tan grande y variada riqueza vegetal, abundan los recursos de los que no sacamos, por nuestra ignorancia o desidia, todo el partido que se podría obtener.

ANACARSIS MARTINEZ.



## EL CAPULI

(*Prunus salicifolia* H. B. K.; *Cerasus salicifolia* D. C.)

(Al Dr. Federico W. Goding.)

### ORIGEN

El capuli, que puede con razón considerarse como el cerezo nacional, es indudablemente indígena de las regiones interandinas del Ecuador. El señor N. Martínez asegura que le ha encontrado en estado silvestre, formando bosques en las faldas orientales del Pasochoa.

Es probable que crozca y se desarrolle con igual espontaneidad en otros países de la América del Sur, especialmente en el Perú y Bolivia. En Méjico existe una planta, descrita por el botánico español Antonio José Cavanillas con el nombre de *Prunus capuli*, que podría por su denominación específica, originar dudas o confusiones respecto de su identidad con la nuestra. Mas esta planta constituye en realidad una especie distinta de la ecuatoriana, si bien ambas poseen caracteres similares. (1)

(1). V. L. H. Bailey, «Cyclopedía of Horticulture», Second Edition, Macmillan Co. New York 1914—1917, Volume V, pag. 1842. Las descripciones que contiene el «Dictionnaire d'Horticulture» de G. Nicholson (Traducción francesa de S. Mottet, Librairie Agricole de la Maison Rustique, Paris, 1893) del *Prunus salicifolia* H. B. K. y del *P. capuli* Cav.—sinónimo del *P. capollin* de

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