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AVOCADOS IN SPAIN —AND ELSEWHERE

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It was, or up to that moment had been, a quiet morning in our old house in Guatemala. The postman arrived. Helen opened the mail and came running to my little study. "Hurrah," she shouted, "those Social Security people in Washington have sent your Old Age Certificate."

Can you imagine anything worse? Just as well come in and shout "Hurrah! Here's the deed to your lot in the cemetery!" The Spaniards do things much more gracefully. When they turn you out to pasture, they don't call it Old Age or even Retirement. They call it Jubilation. You are jubilated. Doesn't that fall softer on the ear?

After I had calmed down I said to Helen, "What am I going to do? No use going back to Florida. Ponce de Leon went there looking for the Fountain of Eternal Youth. Ponce de Leon is dead. No use going back to California, you can't live there on $116 a month. I guess we will go to Spain for a while. No Eternal Youth, but 116 a month will get you by. And what is much more important, I believe that part of the world is going to see the next great developments in avocado culture. Not Spain alone, but the whole Mediterranean region. Look what they have done in Israel. Let's go and see if we can help."

Of course, I am going to be a bit more conservative this time. No one allows me to forget what I said in print, back about 1911: "The avocado promises to vie in importance with the orange, here in California." I hope I can be forgiven for that. It was the exuberance of youth, plus an urgent need to build up a demand for our budded avocado trees. However, if you folks don't stop building airplane factories and movie studios and other things, maybe my prophecy will still come true.

I feel sure that the avocado has a commercial future around the shores of the Mediterranean in spite of the fact that many people in that part of the world insist that an avocado tastes like a cross between a Hubbard squash and a bar of laundry soap. I tell them fifty million people in the New World eat and like avocados, and fifty million people, Frenchmen or others, can't be wrong.

OUR WORK IN SPAIN

When we toured Spain in 1952, 1953 and 1955 we looked for avocado trees along the Mediterranean coast and saw a few. I wrote a brief account of them, which appeared in the 1952 Yearbook of the Society — based of course on our first trip. And finally, a rather curious chain of circumstances — the sort of thing which used to intrigue my beloved Chief, David Fairchild of the United States Department of Agriculture — got me

seriously interested in avocados in Spain.

Roger Magdahl, one of the very few Life Members of the California Avocado Society, and at the same time one of the most important avocado growers in Chile, had bought a small property in the valley of Almunecar, just about the best spot in Spain so far as avocado climates are concerned. A place to experiment with plants; a place to do something worth while toward the horticultural development of a region which still has tremendous untouched possibilities.

Knowing of my interest in avocados through the Yearbooks, Mr. Magdahl invited us to come to his little farm in Spain (which, and I like to say happily, he had named Rancho California), and we went. We settled down in a delightful modern apartment which he had prepared for his own use and occasional visits of his friends. The man in charge of Rancho California, Don Luis Sarasola, a Spaniard trained in France and Switzerland, welcomed us with the greatest hospitality imaginable and we got to work. The idea was to learn as much as possible about local conditions of soil and climate, and then help Don Luis introduce and establish those avocado varieties from other parts of the world which seemed to offer promise of proving valuable locally. He had already made a good start; Mr. Magdahl had sent from Chile scions of Fuerte and Hass and several others; and there were some 200 seedlings ready for grafting, most of them of the Mexican race, but some seemed to show hybrid blood — we were never able to get a clear picture of their origin. We solicited and obtained the cooperation of Dr. Coit and Dr. Schroeder in California, Dr. William C. Cooper in the Rio Grande Valley of Texas, Dr. John Popenoe and William H. Krome in southern Florida, Mario Jalil in Honduras, and several others. Scions began to arrive, nearly all of them in beautiful condition. Wrapped in polyethylene (usually Vinyl) without moss or added moisture; a week or two on the way; and chosen with a view toward suitability for veneer grafting, which Senor Sarasola had found much more successful, under his particular conditions, than shield budding.

While this work was getting started, we spent much time travelling up and down the coast, and inland to Sevilla, Cordoba and Granada; or we sat on our veranda overlooking the lovely valley of Almunecar, thinking about its past and its future. Half a mile wide and opening onto the Mediterranean, the valley floor is mainly in sugar cane. On the lower slopes are cherimoyas and loquats and pomegranates and quinces and Japanese persimmons and a few other fruits; higher up are almonds and olives and grapes. The reddish flanks of the sierras are dotted with tiny houses, white as snow, and so beautiful that I often said, "If I were a young man and going in for architecture, I would most certainly come over here and make a hundred measured drawings and take a lot of photographs and build houses just like these for people in California." Of course this has already been done to a certain extent. And my good friend Ralph Cornell, who worked with us at the West India Gardens until he, reformed and went in for landscaping, points out that this architecture may be lovely and all that, but you have to realize that times change and we must change with them. Of course he is right, but a few of us old die-hards cling to the past, uncomfortable as the houses (by modern standards) may be. For example, I held out for years against the installation of electric lights in our old house in Guatemala. I argued with Helen, "Doctor don Luis de las Infantas Mendoza y Venegas, when he built this house in 1632, didn't see any need for

electric lights, and am I, a veritable upstart, the one to question his judgment?"

AN AVOCADO SURVEY OF THE MEDITERRANEAN COAST OF SPAIN

As already mentioned, our first job was the introduction of propagating material, all of those varieties which seemed promising, and right here I must mention that this is just about the only region I know where all three races, West Indian, Guatemalan and Mexican are wholly successful, side by side. I suppose this statement may be questioned — but not by Californians!

Our next job was to look over the field carefully, and I am going to treat this matter in some detail because it occurs to me that 25 years from now, when, as I hope and believe, the avocado shall have attained commercial importance in southern Spain, people may ask — What of those early days? I have often wished that we had made more notes in California, between 1905 and 1910, when we were just getting started. I do not believe we have a perfectly clear picture of the beginnings of avocado culture in California. Ernest Braunton was the man who could best have given it to us, for he knew personally most of those grand old pioneers such as Juan Murrieta, J. C. Harvey, and all the rest. I particularly regret that we never got from Juan Murrieta, the story of his contact with Atlixco. If we did get it, I am not familiar with it. I believe it is safe to say that Atlixco has played a more important part in the development of the avocado industry in California than all the rest of the world put together, and I believe it was Juan Murrieta who started the contact which ultimately resulted in the introduction of Fuerte.

But to return to Spain. I will mention briefly what Luis Sarasola and ourselves have seen along the Mediterranean, and inland to Cordoba. We will start at the South and work to the East and North, and we will see that most of the avocados are on what is known as the "Costa del Sol" (the Sunny Coast), which is the region between Marbella and Motril. Get out your map. I believe this region in its most favored areas, has not only the mildest climate (freedom from damaging frosts) of any part of Europe, but I also believe it has many areas of better soil than most parts of the famed French Riviera, where perhaps because of better communications, great collections of exotic plants were formed during the last century, including an occasional avocado tree here and there.

Some 12 kilometers northeast of Marbella, toward Malaga, is the Finca Las Chapas, which belongs to Don Jose Rodriguez y Diaz de Lecea, presently Air Minister at Madrid. Here have been planted a number of trees from Cuba, including quite a few West Indian avocados, some of them budded trees, some of them seedlings. Fuerte also is here. The West Indians are coming into fruit and look well, though they are so close to the beach that salt spray seems to damage the foliage at times. But this group of trees is going to prove extremely valuable, by showing what grafted West Indian varieties will do in Spain — so far as we have been able to ascertain, they are the first grafted trees of this race to be planted locally -— or at least, the only ones now alive. Labels have been lost, so it is impossible to say just what varieties are represented, but this does not matter too much, since they came from a well-known nursery near Habana where only standard commercial varieties are grown.

In addition to avocados, there are at this place several seedling mangos from Cuba (we

ate some pretty good fruits from two of them) as well as feijoas, papayas, guavas and a few other exotics. I don't quite know what to think of papayas for southern Spain. I confess to doubts regarding the commercial possibilities. As for guavas (**Psidium guajava**) they are easily grown in this whole area and sometimes appear in the public markets. The fruit flies, of course, love them. Which suggests the comment that the Mediterranean fruit fly (**Ceratitis capitata**) is a real problem in southern Spain, but local horticulturists seem confident that chemical control is solving the problem.

Coming up the coast from Marbella toward Malaga, we reach what is, without doubt, the most interesting area in all Spain, so far as avocados are concerned. More particularly because it is almost certainly the region where they have been grown the longest. First comes Torremolinos, a rapidly growing resort town, where we saw a number of Mexican seedlings, fairly young trees. Slightly nearer Malaga is Churreana (just off the main highway) and here, in the Finca San Javier, property of a hospitable and cultured gentleman, Don Joaquin Ruiz de la Reina, are to be seen numerous old seedlings of the Mexican race, as well as a tree which is without much doubt the oldest and largest avocado in Spain. Don Joaquin says they have a written record regarding its origin. It was brought from Habana, Cuba, 122 years ago. The trunk, breast high, is slightly more than four feet thick; the crown has a spread of about 75 feet. Naturally, this tree intrigued me greatly. When I first saw it I thought I sensed a trace of anise odor in the leaves. We had just missed the crop but there were a few seeds on the ground. They were quite large. Later I saw the tree twice and began to be shaky about the anise odor (the longer I live with avocados the more shaky I become, we have so many hybrids nowadays and we have those wild avocados in Central America with hard shells and so much anise odor in leaves and fruit that you can't eat the latter). How would a tree brought from Cuba 122 years ago have Mexican blood? Not very likely. We took some scions of the San Javier tree to Rancho California and the young grafts look just like typical West Indians.

A few hundred yards from San Javier is the Finca Las Consulas, where also are to be seen some Mexican seedlings, perhaps 50 years old. And then, right in the center of the charming city of Malaga is the public park known as La Alameda with about 15 large avocado trees, perhaps 35 to 40 years old (I say this because I am told the Alameda was only planted some 40 years ago). Most of these trees produce fruit of the "small black Mex" type, but at least two or three, which do not have very pronounced anise-odor in the leaves, are yielding fruits too large for the "small black Mex" and may have some West Indian blood, perhaps from the old tree at Churreana.

This is probably a suitable point to mention the commercial aspects of avocado culture in southern Spain. The foreman at San Javier told us that they get 40 pesetas per kilogram for all their avocados, on the tree. Forty pesetas is a lot of money in Spain. It will buy you two square meals, three if you go to the kind of restaurants we patronize. At present rates of exchange, it works out at about 45 U.S. cents a pound. Most of the fruit (and the quantity is small) goes to Madrid where we are told it retails at 60 to 70 pesetas a kilogram. I suspect it is purchased by diplomats from Mexico and Peru and other Latin American countries; by Spaniards who once lived in tropical America and miss their beloved avocados and mangos; and by Latin American students who, when they see avocados on the fruit stands immediately write home and tell daddy that they urgently

need money to buy more text books.

In addition to the avocados which go to Madrid, they appear — and not too rarely, in the public market of Malaga. There is one dealer, in particular, who goes in for rare items. Twice on his stand we saw avocados on display, small, pear-shaped, thin-skinned green Mexicans, picked at least six weeks too soon. They were shriveled and their condition had not been improved by passers-by who wanted to know what an avocado feels like. I thought of the Italian in downtown New York who put up a sign: "If you mus' pincha da fruit, pincha da coconut."

East from Malaga, and off the road from Torre del Mar a few kilometers, is the picturesque old town of Velez Malaga. A few more kilometers, on the road to Ben Amargosa (it is interesting to note, in all this region, how many of the towns have names which come down from the days of the Arab occupation) is the small farm of Jose Clavero, who has four avocado trees about 25 years of age. These trees were brought from Habana by a member of his family. They are West Indian seedlings, no doubt about that. They bear good crops more or less regularly. They are fine healthy trees and I could see no indication that they have been seriously frozen back at any time. There are also two mango trees here, Cuban seedlings of the same vintage as the avocados. They have not grown to very large size, some 15 feet in height. They bear good crops of mangos as full of fiber as a dog is of fleas. If I lived in this part of Spain, I sure would have a few mango trees (of course grafted varieties such as Haden) in my dooryard so I could show my friends what a mango looks and tastes like, but I would not try to make a living and pay my income tax by growing mangos for market.

A little farther along the road toward Motril there is a turn-off for the village of Torrox (the x is pronounced as in sneeze) and incidentally, just as you leave the highway, there is a large house with a white sapote tree in front of it. This reminds me to say that there are two white sapote trees in the Alameda at Malaga, not far from the avocados which have been mentioned. All these sapotes seem to be of the kind we call **Casimiroa tetrameria**, instead of **C. edulis**, because the leaves are pubescent on the underside; but Paul Standley, that grand old master of Central American botany, has told me he really does not feel sure there is any specific difference between these two forms. The Mexican "white sapote" which I believe is the one commonly grown in southern California seems to produce better fruits. But maybe this is a question of **de gustibus non disputandum est**, as we used to say at Pasadena High School.

But let us go on to Torrox. Just beyond the village is a small experiment station, the "Granja Experimental," which has seen better days I would say. Obviously, an avocado nursery was started here at one time. Perhaps 30 years ago. Most of the seedlings were left in the nursery rows; they have grown up, crowded each other quite a bit, and when we visited the place in March 1958 we found fruit still hanging on several trees. They appeared to be seedlings of the Mexican race, but it seemed late for Mexican avocados to be hanging. I wonder if it might be true that in this remarkably equable climate there is not a tendency for avocados to lose track of the calendar? In this same region of Torrox there are a few other Mexican seedlings, of no particular interest.

Next comes the town of Almunecar, which as mentioned earlier in this report, served as our base in Spain. Rancho California, with its avocados, is a new enterprise. There are

no old avocados in this valley, with the exception of one which has been left at Rancho Chico, 250 yards from the beach, after several others were cut down, because after all, who wants to eat aguacates? This remaining tree, a Mexican seedling, has been utilized by Luis Sarasola to produce propagating material; he has cut it back, brought out strong sprouts, and grafted them to a regular Duke's Mixture of introduced varieties.

In the edge of the little town of Motril, 22 kilometers east of Almunecar, is another "Granja Experimental" which was probably started at about the same time as the one in Torrox, and perhaps by the same man, now dead, but if he were alive I would have another avocado enthusiast to include among those which, apparently, I can count on the fingers of one hand — so far as my Spanish experience goes. At this Motril station, today, devoted almost wholly to trials of sugar cane varieties (it is a pleasure to observe the importance of sugar cane in southern Spain) are to be seen some of the most interesting avocado trees one could find anywhere. I don't know where most of them came from. There is one grafted tree, which I believe to be Mayapan. The rest, some 20 in all, are seedlings of unknown origin, but to me they appear to be Mexicans and Mexican x West Indian hybrids. They are about 25 years old. Some of them will bear watching; the fruits are highly interesting. Don Luis Sarasola has already propagated one of them at Rancho California. This variety, if it is a hybrid, leans toward the Mexican side. The fruit is somewhat smaller than Fuerte, about 6 to 8 ounces, the seed medium size, the flesh free from fiber and of rich flavor. Another tree at this station produces its crop in September or thereabouts, pyriform green fruits about 12 ounces in weight, the seed not large and quality excellent, perhaps a Mexican x West Indian hybrid. In studying the trees at Motril we had the generous cooperation of Manuel Villena Salvatierra, to whom we wish to express our thanks.

And now, continuing up the coast, we found no more avocados until we got to Valencia, heart of the Citrus region, as every Californian knows. It is also a great rice-producing region, and in short, one of the most fertile and agriculturally important parts of Spain. Here is an experiment station where they work on problems of citrus culture, more particularly insect and disease control. And here' it is that grafted trees of three avocado varieties were received from the U.S. Department of Agriculture 25 years ago. These three were Puebla, Panchoy and Mayapan, according to the copy of the shipping order covering them which my friend W. E. Whitehouse was good enough to dig out of the files of the Division of Plant Exploration and Introduction in Washington.

We had heard that two of the trees sent from Washington were still alive and we went to see them. They appeared to be Pueblas. In fact I was quite sure about one of them, for numerous mature fruits were hanging at the time of our visit. The other tree did not have a crop but the foliage was very similar. A third tree, close by, may have come from the same shipment but if so, the graft probably died and the tree we saw was a sprout from the seedling root.

There is an old and very interesting botanic garden in Valencia. They say that a few years ago the river went over its banks and flooded this area to a depth of three or four feet. It does not seem to have done much harm. It left a lot of excellent silt. We went there, and asked one of the gardeners if they had any avocado trees. He, said, "Sure" and took us to a pair of fine old Mexican seedlings. There were a few fruits on the ground, "small black Mex," and mostly bone (as they say in Spain of any fruit which has

a large seed). No horticultural interest; still, they were avocados and were evidence that the avocado zone was moving northward — so far as we were concerned.

Then, on reading Volume IV of Aniceto Leon Carre's excellent "Manual de Agricultura" (Coleccion Agricola Salvat, Barcelona) I found a reference to a paper published by Professor Ramon Sala Roqueta entitled "El Aguacate en Nuestra Costa Mediterranea." In order that this almost unique publication may not be overlooked in future avocado bibliographies I will give the complete citation: "Anales de la Escuela de Peritos Agricolas y Superior de Agricultura, y de los Servicios Tecnicos de Agricultura, Vol. II, Fascicule IV, Barcelona, MCMXLII." There you have it.

This paper, the only serious account of avocados in Spain which I have seen, treats mainly of Cataluna or Catalonia as we put it sometimes. So I got out the Atlas and looked up Barcelona. Just a little bit north of Chicago, so far as latitude is concerned (don't forget that Mediterranean climate!) "What a bet I overlooked!" I said to myself . . . "It never occurred to me in my early days of exploration, to hunt for avocados around the shores of Lake Michigan. If I had found them right on the beach, in wet soil, they might have been resistant to Phytophthora root rot. Of course that might have left George Zentmyer out of a job, though there are other things to do in plant pathology, Tristeza disease for example."

So we hired a car, and off we went to Cataluna. I never kick much about where we go in Spain, it is all so interesting and the food is so good — on that $116 per mensem. Aniceto Leon Garre arranged for us to meet Professor Ramon Sala Roqueta at his home in Balaguer — not in the Province of Barcelona but the adjoining one of Lerida, a beautiful agricultural region. Professor Sala has an excellent property on which he grows apples and peaches, and he showed us with pride some fine feijoas. He asked, "Why don't you folks in California grow more feijoas? They are fine eating." And I had to confess that I didn't know why. Doctor Franceschi started us about 60 years ago; we eat a lot of things that are not as good as feijoas. We are just a queer lot of people, like some folks who won't eat avocados.

Professor Sala and his charming wife got in our car, and we rolled southward to see avocados. We reached the region of Reus — look it up on your map — and we saw most of the avocado trees which have attained bearing age in that part of Spain. Some fifteen Mexican seedlings, all hit pretty hard by the Big Freeze of February 1956. And now I began to feel at home again. The Big Freeze of 1956. Seems to me I recall one or two Big Freezes in California. Of course we don't call them Big Freezes; simply Unfavorable Seasons.

But we found the trees were coming back courageously. Some had fruit on them. Mostly "small black Mex." Some cut right down to the ground. It soothed the Professor a bit when I told him, "Oh, I have seen that happen elsewhere." Carob trees in this same region had been hit just as hard, some of them harder, and of course the orange trees had suffered terribly, but they were coming back. We saw one avocado tree at Cambrils which had not been so badly damaged by the freeze (I don't know why, of course) which had larger leaves than most others, and less anise odor. They gave me some figures for this region: the temperature went down to 10 degrees below zero (Centigrade) on two days; to seven degrees on three days. Don't get these figures mixed up with your

Fahrenheit temperatures. The avocados know the difference, even if you don't.

From the region of Reus we went southward to Tortosa, where Professor Sala knew a man who had a Fuerte tree, one that the Professor himself had imported from the Armstrong Nurseries in 1937. Of course we couldn't resist that — probably the only bearing Fuerte in Spain. It was just across the river. We were late for lunch, but after eating the best piece of fish I ever tasted, that didn't matter so much. So we crossed the Ebro, the largest river in Spain. Quite a bit more water than the San Gabriel carries, even in the wet season, if and when you have a wet season in Los Angeles county. In Spain, where big rivers are scarce, people are pretty happy about that Ebro. One fellow who came from up stream was taken down below Tortosa, where the Ebro empties into the Mediterranean. His host let him stand a moment looking out to sea, and then asked, "Now isn't that bigger than your Ebro? Whereupon the countryman said, "Well, it really is broader, but it is not as long."

So we rolled southward some 30 miles to an orange grove, and right alongside of the residence was that Fuerte tree. Thirty years old, and carrying some 250 fruits to ripen in February (we were there in September). Think of it, 41 degrees north of the Equator, and the tree did not show much damage from the Big Freeze. And incidentally, a sprout had come up from the seedling root; it was about 2½ inches in diameter at the base, and was carrying a fine crop of what looked like Mexicolas.

The unfortunate feature was this: The Fuerte was showing signs of decline and I suggest you go see it soon if you want to see it at all. Not the fault of the climate, any more than it was the fault of the climate that the parent Fuerte tree in Atlixco died; but they are dumping water on the tree, just as they dumped dishwater on the parent in Atlixco, and I am afraid they will kill it in a few years more. But how encouraging, to find a Fuerte 30 years old, at the latitude of Chicago (again, don't forget that remarkable Mediterranean climate). And Professor Sala, who "walks in his fifties" as they say in Spain, has never seen a freeze like the one they had in 1956.

This running account covers the situation on the coast of Spain. I have not mentioned the interior. I did not think we would find avocados far away from the sea, so imagine my surprise when we went to Cordoba, northeast of Sevilla, to give a couple of lectures to the agricultural students from Madrid who had come down for some field experience. Tomas Millan, a member of the local staff, spoke to me afterward. "Do you want to see some avocados here in Cordoba?" I promptly replied, "Sure, I do. I want to see your white blackbirds, also," not believing that there could be avocados in this region, though in the patio of the wonderful old mosque — one of the stupendous sights of Spain — there are sour orange trees.

Don Tomas took us out of town about eight kilometers to the old monastery of San Jeronimo, long since abandoned by the friars, but recently rebuilt as a country residence by the Marques del Merito who produces some famous wines at Jerez de la Frontera. A perfectly gorgeous place, on the mountainside overlooking the wide and fertile plain of Cordoba, where you get some of the best beefsteaks of Spain where good beefsteaks are awful scarce. Here we saw a total of ten avocado trees, mostly Mexican seedlings, but several young West Indian seedlings from Cuba, standing in the shelter of the wall of the old monastery. Trunks about five or six inches in diameter; the

tops had been hit by cold weather but had come back vigorously. One of them, we were told, had borne fruit. There was another tree which looked like a hybrid; in fact it looked like several of the trees at Motril which also looked like hybrids. The Mexican seedlings were in fine shape; they do not seem to have suffered from the cold and they bear fruit.

So here was really an eye-opener. If you can grow avocados in Andalucia as far north as Cordoba there is a large area available. We thanked Don Tomas and told him not to bother about those white blackbirds. But the more I think about it, the more I ask myself, why cannot avocados of one sort or another be grown almost anywhere in Spain where they grow oranges and lemons? Turn a few California realtors loose over here and watch the avocado orchards spring up within 90 days.

PORTUGAL, FRANCE AND ITALY

Not much to say about these countries, except perhaps Italy. In the Botanic Garden at Lisbon (a lovely spot) we again saw the two small trees, obviously of the Mexican race, which we had seen previously. By the strong anise odor of the leaves they surely are Mexicans. We have not seen other avocados in our travels through Portugal; there must be a few, but if they exist I will bet they are Mexicans.

On the French Riviera avocados have been reported from time to time, probably all of them Mexican seedlings. I remember reading about them in the accounts of those lovely gardens which existed, and in some cases still exist — in the vicinity of Hyeres and Cannes and Nice. But those avocados were, I am sure, considered more as horticultural curiosities than as potential commercial possibilities. The same is true of the trees on the adjacent Italian Riviera.

I recall that Doctor Fenzi of Santa Barbara (California) told me there was a, Mexican seedling in Rome. I recall that he had a photograph of it. This year we got a bit deeper into the Italian situation, thanks to Franco Fenzi, son of that grand old plantsman (whom we knew in the earlier days as Dr. F. Franceschi) who spent so much time and money introducing new plants into California. Which reminds me to add to the old saying "the way of the transgressor is hard," that the way of the plant introducer is harder and much more expensive. We learned that by spending five thousand dollars introducing the Fuerte (and a few minor avocado varieties) from Mexico in 1911, only to lose our shirts (my father's and one he had passed down to me) in a freeze at Altadena, a spot well known to be "above the frost and fog."

Franco Fenzi after being educated at Stanford, I believe, came back to the Old Country and has lived there for many years. I wrote him that we would be passing through Rome and what did he know about avocados in Italy. I quote the following paragraphs from his very interesting reply:

"A good friend of mine in Florence is Professor Abetti, an astronomer, and director of the observatory at Arcetri. A very active and interesting man. Some years ago, returning from Mount Palomar in California, he brought to Florence a few Fuerte fruits; planted the seeds; and had a tree blooming and fruiting in a sheltered spot near the observatory. It is still there if it was not killed by the freeze of two years ago.

"The climate of Sicily is ideal for avocados although in most places the wind is too

strong — though it does not bother the lemons very much. There are several bearing avocados around Palermo but only one produces fruit of very good quality. I am trying to propagate it. The bud came from California, and the fruit looks like a large Fuerte. Some years ago, a friend of mine owned some restaurants in New York and saved avocado seeds; he brought several hundred of them to Italy and turned them over to me. I, in turn, gave them to the Botanical Garden here in Palermo, but they did not have much luck. I think they kept them too wet. In the meantime, we put several buds on an old and unproductive tree and it is yielding fruit of two varieties. Those people who have tasted the fruit don't know (and therefore don't like) avocados. Because of this it is difficult to develop here, interest in avocado planting, even on an experimental scale. However, I have given away trees, here and there, and some of them are beginning to come into flower."

Mr. Fenzi's letter probably covers the Italian situation pretty well. Helen and I went down the coast below Naples, as far as Sorrento, hoping to see in a region where there are so many lemons, an avocado tree or two. But we failed to find one. The way they handle their lemons and oranges is interesting. I couldn't figure it out at first. They set high posts through the small orchards, stretch wires between them, and in winter run out half-shade mats made of wild cane (which they keep rolled up during the summer) and thus protect the trees from frost.

Apparently there is no good reason to expect extensive development of avocado growing in Italy during the near future. But if those Italians ever go in for avocados in a big way they are going to do a swell job of it. They are really great horticulturists.

THE EASTERN MEDITERRANEAN

Having read Chanan Oppenheimer's excellent book on tropical and subtropical fruits in Palestine, it was obvious that we had to go there — or more properly to that part which is now the State of Israel. So we hopped off at Rome, and stopped first in Greece to see if there were any avocado trees planted around the Parthenon. Not much agriculture at all around the Parthenon for good and obvious reasons, but when we got down to Olympia in the Peloponnesus, I began to feel more at home. Beautiful country! I said to Helen: "If it were not for so many Italian Cypress trees, I could easily imagine myself back in the Guatemalan highlands." I don't see how Olympia could help inspiring those ancient Greeks to break the records for the high jump, the shot-put and the one-hundred-yard dash.

As we rolled up the plain toward Patras it was a pleasure to see the olives and the figs and the grapes and the pistachios and the oranges and lemons, but where were the avocados? Back in the New World? Probably the Island of Crete would make a grand avocado country. Lemons everywhere. The Greeks drink lemonade like Georgians drink Coca Cola, which is saying a lot. But they don't eat any avocados. They should — and perhaps some day they will.

Israel is a small state with not much good land. What they have is being cultivated, or soon will be cultivated, intensively. Things are just getting under way. But those people are doing a wonderful job. For example, they already have more than 4000 acres of

Cavendish bananas in production. And they know what they are doing. I thought I knew something about banana culture, but those fellows threw figures at me so fast it made my head swim. And here's another side of the picture: Will you tell me where in California, you can ride down a road and admire on one side 50 feet away, a healthy banana plantation, and on the other side, 50 feet away, an apple orchard carrying a tremendous crop of fine fruit?

Doctor Oppenheimer started out, 25 years ago, to introduce tropical and subtropical fruits (I bet he has been sorry, financially, ever since; but those fellows in Israel don't think about money, they are just working, with a devotion I have never seen equaled, to develop the Homeland). We met several other excellent horticulturists: Asaph Goor, the Director of the Department of Horticulture; Zalman Rapaport, the Chief Horticulturist; and Robert Ticho, who handles the horticultural work up north (around Haifa) and numerous others.

At Mikveh Israel, an agricultural school about five miles out of Tel Aviv, there are grafted trees of the following avocados, imported 34 years ago: Dickinson, Duke, Taft, two strains of Fuerte, Anaheim and Collinson. There are also some Guatemalan and Mexican seedlings. Near Rehovot, which has been the base, more or less, of experimental work with tropical and subtropical fruits, Dr. Oppenheimer has an avocado variety collection which probably has no equal this side of the United States. Here, as in southern Spain, you can successfully grow all three races of avocados, side by side. That remarkable Mediterranean climate, again. I only know two remarkable climates in the world; this one, and the climate of the West Coast of South America, more properly speaking that part of it which comes under the influence of the Humboldt current.

As yet, they have not done much with West Indian avocados in Israel, nor with, the Florida hybrids. For commercial planting (and there are some 500 acres, not all in bearing as yet), the situation is about this: Fuerte, I would say, is definitely the leader. Next comes Ettinger, said to be a seedling of Fuerte — the seed was brought from Chile about 30 years ago. The fruit of this variety is very much like that of Fuerte, but matures a month or six weeks earlier, and the tree is just as tall and slender as Fuerte is low and spreading. No one seems to claim that fruit quality is quite up to that of Fuerte.

In the next bracket below Fuerte and Ettinger comes Nabal. Of course it shows a strong tendency toward alternate bearing, but when it does bear it produces tremendous crops and they say Nabal cannot be equaled in quality. Then along come Anaheim and Benik. I suppose for productiveness, Anaheim. For quality I feel safe in saying they prefer Benik. Just why Benik should have been the one of my Guatemalan varieties to stick up its head in this remote part of the world, I don't know. I would have put my money on Mayapan or Panchoy or Itzamna — after Nabal of course. As regards Hass, it hasn't had a thorough trial as yet. Some think it is too small, others think it extremely promising. They don't yet have that complex about sizes which exists in the United States; maybe they might be interested in Pollock and Nimlioh. I would be inclined to think Hass will gain ground as the years go by. And speaking of complexes, I don't believe there is any color complex to combat.

We went to see a young commercial planting at the Kibutz Gaash, not far north of Tel Aviv. I think I should explain what a Kibutz is, or Kibutzin are, because as one woman

said, "This is pure communism, but without fear" and I believe someone told us there are about 70,000 people living in the Kibutzin of this country. Everybody works, men and women. They shift you around from time to time, maybe cooking the meals, maybe hoeing potatoes. Nobody gets a salary. You have plenty to eat (always in the communal messhall); you are furnished quarters and clothing and your babies are cared for in the communal nursery. You are free to quit if you want to, but they say very few members of a Kibutz do so.

To go back to the avocado orchard at Kibutz Gaash, operated by Zwi Schacher who had been in Mexico for some years (you meet them from everywhere, here in Israel), the trees were planted between rows of Cavendish bananas — as a starter — and at fifteen months from setting in the field, were 6 to 12 feet high. I have never seen healthier young avocados. The following varieties were represented: Fuerte, Nabal, Ettinger, Beink, Anaheim and Hass.

Speaking of varieties, I asked one of the leading authorities what he would recommend for a commercial planting in Israel. He said about 50% should be divided between Fuerte and Ettinger, the other 50% about as follows: 30% Nabal, 10% Benik, and 10% Hass. I think these figures are extremely interesting and based on commercial results to date.

You can tell George Zentmyer that I did not see in Israel, nor did I see in Spain, anything which looked to me like Phytophthora root rot. Of course George will reply that I follow the ostrich policy in all such matters — I stick my head in the sand. But seriously, the symptoms as you know them in California, and as I know them in Honduras (oh, how well!), did not appear anywhere. In Israel, below Rehovot, I saw one small grove which was pretty well drowned out, but I don't believe Phytophthora had anything to do with it. I say this because I saw lots of avocados on pretty heavy soils which were healthy. (I hope some day I won't have to explain that these lines were not in my original text; it was the printer's fault.)

Dr. Oppenheimer is enthusiastic about mangos. He has a lot of them at Rehovot. They look good. But I doubt that Israel will be as much of a mango country as an avocado country. They have Haden, which so far would seem to top the list, and they have several varieties from Egypt, which perhaps came from India originally, and which are said to be good. And Dr. Oppenheimer has a seedling of local origin of which Haden was very likely the pollen parent, which impressed me very favorably, and which he has named Maya in honor of his charming wife — nothing to do with us Mayan Indians.

Plenty of other tropical and subtropical fruits have been introduced and tested in Israel. There seems to be almost nothing that they can't grow, though I wouldn't give much for their chances with such fruits as the mangosteen, for example. They can grow lychees, but the feeling seems to be that the trees are not sufficiently productive to be worthy of much consideration. However, Dr. Oppenheimer gave us fruits from one tree at the experiment station in Rehovot which were of finer quality than any I have eaten in Florida.

They have a few macadamias in production. No particular enthusiasm noted. Annonas, on the other hand, are becoming of commercial importance. They started with **Annona squamosa**. It was not popular in the markets — I would suspect that it did not hold up

well enough. The cherimoya does not produce much, nor too good, fruit in this climate. There were a few cherimoyas and squamosas side by side in the experiment station at Rehovot. Some volunteer seedlings showed up. The fruit of these was like the **atemoyas** which have been produced in several other parts of the world. The trees are more productive than cherimoyas and the fruits sell well in the markets. There are several small commercial plantings already in production.

On my last day in Israel, they took me to the agricultural college at Rehovot and made me give a talk on tropical fruits. I particularly enjoyed meeting the group of horticulturists who had come to hear me, in part because about half of them had studied at Davis or Los Angeles or Riverside. A few days previously I had visited with Dr. Oppenheimer the nursery of Mr. Homski near Tel Aviv. A perfect little gem of a nursery. So clean, so beautifully kept, I felt like getting down on my knees and thanking the Good Lord that we still have plantsmen like Mr. Homski in this sad world of ours. I wrote Knowles Ryerson about it, and he wrote back: "I remember Mr. Homski; he was a student of ours at Davis." The Director of Horticulture, Asaph Goor, is another Davis man. Robert Ticho spent some time at Riverside. I feel proud that California has contributed so much to the preparation of these men who are working so hard and unselfishly toward the development of agriculture and horticulture in the State of Israel.

THE CANARY ISLANDS

It did not seem very practical to visit North Africa in the summer of 1958, so we went back to Spain from Israel, to check up on the results which Luis Sarasola was getting with the avocado varieties introduced from California and Texas and Florida. There were some 20 of them; the grafting was highly successful; but there was a problem of chlorosis which was giving a lot of trouble. The soil of Rancho California is silt loam, derived from limestone; it has a pH ranging from 8.3 to 8.5. It does not drain well. We studied the Yearbooks of the California Avocado Society and decided we had a fine case of "lime induced iron chlorosis." We cut down the application of water; we tried to help by adding a lot of sand from the beach, and organic matter of a coarse nature, and everything else we could think of. The young seedlings in the nursery suffered the worst; many of them turned almost white and then developed necrotic tissue along the leaf-margins and then just quietly passed out of the picture entirely. We got the feeling that seedlings with West Indian blood were more resistant than the Mexicans, and that those plants which pulled through and got up to a yard or more in height might snap out of it. The whole problem will need some further study and a lot of experimentation.

We took off by air from Sevilla for the Canaries. They are a bit out of the world, but O! How interesting! Of course, bananas and tomatoes and potatoes are the principal crops. To my surprise the camels — of which I had seen illustrations in the literature — are not just for tourists to ride. At the southern end of Tenerife (the largest island and the only one we visited) those camels actually work. Not that they like it, however. There doesn't seem to be much enthusiasm of any sort in a camel.

To me, the great feature of Tenerife (and I might add, it is one of the great horticultural features of the world) is the Jardin de Aclimacion near Orotava. In 1788 the King of Spain decided Madrid was not a very good place to grow mangos and that sort of thing,

so he told the boys to develop a Plant Introduction Garden in the Canaries. The amazing feature is that this garden is not only still in existence, but that it is beautifully maintained and has almost everything in it but the African Baobab tree, which latter omission may be fortunate, for if there was an African Baobab on that ten acres of land there would not be much room for anything else.

For many years this garden was run by Juan Bolinaga, a fine gardener from northern Spain. More recently it has been under the direction of Andres Garcia Cabezon, assisted by Carlos Gonzales Martin.

Avocados are not as abundant in the Canaries as we expected them to be. Incidentally, we didn't see any Canary birds either, nor any wild specimens of **Phoenix canariensis**, that handsome palm which is such a feature of southern California landscapes. The center of avocado culture seems to be the little town of Guimar, down on the east side of Tenerife. We were told that there are between 2000 and 3000 avocado trees in this area — probably considerably more than half the total avocado population of the island. Practically all of these trees are West Indian seedlings, most probably of Cuban origin. There are no formal orchards; just dooryard trees and a few small groups, ten trees or so. The character and quality of the fruit is not too good; just about like the poor avocados one sees in the markets of Cuba; not up to the best ones. I have read that avocados have been shipped from the Canaries to London. No one says they ever went in great quantities. I assume it is something like the exportation of cherimoyas from Madeira to London.

The present avocado situation in the Canaries is this: Andres Garcia Cabezon has introduced a number of good varieties in recent years. He mentioned Simmonds, Waldin, Lula, Booth 7 and 8, Taylor, Pollock, Hall Choquette and Tonnage from Florida. Fuerte, Hass, Rincon, Bacon, Zutano, Emerald, MacArthur and Corona from California. Most of these are very recent introductions; Fuerte, Nabal, Puebla and one or two others of somewhat earlier introduction have produced fruit in the Jardin de Aclimatacion, and in a few cases, elsewhere.

In addition, they have a variety which Ing. Garcia Cabezon says originated in the Jardin some years ago — probably a Fuerte seedling as he had been in California and sent home some seeds. He has named this Jeva and it has been propagated to a small extent. There is another tree in the Jardin which he calls Java. This is obviously a Guatemalan — I saw fruit more than half grown — and he is not sure whether it is a California variety which he introduced in the form of budwood or grew from a seed he got in California.

There are two small commercial orchards near Guimar, probably the first plantings in regular orchard form which have been made on Tenerife. These are very young, not more than two years old, and are made up of Fuerte and Jema and Java. In the outskirts of the city of Santa Cruz de Tenerife a banana grower, Sr. Fumero, has about 150 seedling avocados (West Indians) which he is gradually top-working to Fuerte. These trees, of large size, were cut back to stumps 8 or 10 inches in diameter and cleft grafted with results which have been far better than I would have expected.

One of the objects of our trip to the Canaries was to get avocado seeds to take back to Rancho California. It is practically impossible to get seeds of the West Indian race in

quantity anywhere in Spain. We watched the market in Santa Cruz de Tenerife; we bought up avocados as fast as they appeared, and in a week's time accumulated about 350. And this in August, just about the height of the avocado season. From which it can easily be inferred that the production of avocados in the Canaries does not constitute a great industry. It could, and perhaps in time it will.

**Dr. Wilson Popenoe is the son of F. O. Popenoe who established and operated the West India Gardens of Altadena, California for ten years prior to his retirement from active the in 1919. It was through his association with the West India Gardens that Wilson Popenoe became interested in the avocado, and later as agricultural explorer for the United States Department of Agriculture he spent ten years searching for good avocado varieties from Mexico to Chile.*

Leaving his position with the government, Wilson Popenoe accepted a position with the United Fruit Company as Research Horticulturist and in 1942 established the agricultural school financed by that company at Tegucigalpa, Honduras. There Wilson established a planting of avocado varieties and earned on research with avocado root rot and trials with wild avocado species in the search for resistant rootstocks. In 1946 Wilson Popenoe was presented with the Society Award of Honor in recognition of his long and valued service to the California Avocado industry. On retiring as director of the Escuela Agncola Panamencana, Dr. Popenoe retired to his home in Antigua, Guatemala, and from there has traveled in countries around the Mediterranean studying the distribution of the avocado and other subtropical fruits.

The following excerpt from a letter by Wilson Popenoe to the editorial committee of the 1959 Yearbook, presents an interesting introduction to his article on AVOCADOS IN SPAIN — AND ELSEWHERE:

“I *promised you the report on avocados in Spain and Israel and the Canaries in time for the Yearbook, which you said would go to press in June. Here it is. I am sorry it has gone to such length, and you may feel it is too long for you; in which case you can perhaps trim it down a bit. I feel in general that it covers a field about which we have known very little in the past, and that as a matter of historical value it is worth publishing. I particularly feel this way because I am confident that — as I have said in the early paragraphs of the report — the Mediterranean region is going to become a pretty important center of avocado production. If it does, this report will be referred to with interest, 50 years from now. And fifty years isn't so long, when you remember that we can look back on 50 years of avocado history in California."*