



Hunt Institute for Botanical Documentation
5th Floor, Hunt Library
Carnegie Mellon University
4909 Frew Street
Pittsburgh, PA 15213-3890
Contact: Archives
Telephone: 412-268-2434
Email: huntinst@andrew.cmu.edu
Web site: www.huntbotanical.org

The Hunt Institute is committed to making its collections accessible for research. We are pleased to offer this digitized version of an item from our Archives.

Usage guidelines

We have provided this low-resolution, digitized version for research purposes. To inquire about publishing any images from this item, please contact the Institute.

About the Institute

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

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

Main Office:
RAHWAY, N. J.
NEW YORK
161 Sixth Avenue
PHILADELPHIA
916 Parrish Street
ST. LOUIS
4528 So. Broadway

MERCK & CO.
INC.
MANUFACTURING CHEMISTS

Cable Address:
MERCK NEWYORK

Works:
RAHWAY, N. J.
PHILADELPHIA

In Canada:
MERCK & CO. Limited
MONTREAL
TORONTO

April 16, 1940

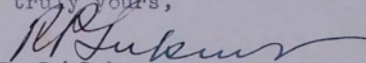
Dr. Wilson Popenoe
Antigua
Guatemala, C. A.

PLEASE REPLY TO
RAHWAY, N. J.

Dear Dr. Popenoe:

I am enclosing a translation from the French of a paper on Cinchona by Stoffels. I have also ordered several copies of the original article. When these are received I will see that you get a copy. I have found the attached extremely interesting.

Very truly yours,


R. P. Lukens

RPL:CS

Antigua, Guatemala, 14 July 1940

Mr R P Lukens,
Merck and Company,
Rahway, New Jersey.

Dear Mr. Lukens:

The Commercial Attaché of our Legation here, Dr. W.E.Dunn, spoke to me yesterday about the forthcoming National Fair in Guatemala City, which I believe takes place in November. This is a pet project of President Ubico's, I understand, and is becoming bigger and better every year.

Doctor Dunn is anxious to have American concerns well represented, and is working up a list of exhibitors. He asked me if I thought you might be interested in staging a modest exhibit covering Quinine - perhaps a few young trees, and some bark and quinine in various stages of preparation, and some photographs. I told him I knew you would be interested, and anxious to cooperate if possible. You will probably hear from the Committee in charge.

I assume that Mr. Perkins will wish to decide regarding your policy in this connection. I pass the word so that you may be thinking it over.

Yours sincerely,

Wilson Popenoe

cc Dr W E Dunn

Antigua, Guatemala, 20 Sept 1940

Mr. R.P. Lukens,
Merck and Company,
Rahway, New Jersey.

Dear Mr. Lukens:

Fritz and I have just come up from Naranjo and Panamá. Fritz met me at Nahualate station on the 19th and told me that he believed it would be best for me to take up with Franke the matter of his future, before I left Guatemala. I therefore did so. Franke took the matter in the finest spirit possible, and gave me his word that we can depend upon him to play ball with us 100%. I told him that Fritz would be glad to have him stay on here, until later in the autumn - at least until Pennock comes - but that if he wished to leave earlier it would be alright. Franke said he might like to leave earlier, as he hopes he can get back to Germany, and he thinks the sooner he starts the better his chances will be. He asks, however, that nothing be said about this. I told him you would carry him on the payroll for six months after the termination of his service, if he cooperated in every way, and this pleased him very much. He asked, however, if it would be possible for you to give him the money in a lump sum if he leaves this country for Germany as he hopes to do, and I told him I felt sure you would be willing to do so.

Since you left, one or two matters have come up which make Fritz and myself feel that it might be well for you to make very clear to Pennock, when he comes through New York, that his duties are strictly on the investigational side, and that we do not want to make any major changes in nursery or field practice until ample experimentation has shown that they are justified. The fact is this:

Benitez is anxious to please, sometimes almost too anxious, and he looks up to anyone with Penneck's background. Fritz has tried to make it clear to Jorge that we will make no major changes in practice without ample experimentation and full discussion among all of us. But to help things remain on solid ground we believe it would be desirable for you to stress again with Penneck the nature of his duties, pointing out that he is to limit himself to the investigational end, and that he has no administrative duties whatever. I think you have already made this clear to Penneck, but when you see him again we believe it would do no harm to mention the subject again.

Things at the Finca are going along splendidly. We have told Hartleben that Mr Gibson will come down next week and spend several days, showing him how to handle the accounts. Both Fritz and I feel that Hartleben is capable of taking full care of this end of the work. We have talked with Jorge, telling him that he will be held responsible for the field operations. We have talked with Don Pancho, telling him that he has a permanent job at Naranjo, which news very obviously pleased the old man tremendously. Personally, I feel fully satisfied with the present set up, and am glad that we have had an understanding with Franke before I left, and that there is every assurance of things working out smoothly.

The road is in good condition; we had no trouble driving up to Naranjo in a hard rain. The Casa Grande is taking shape: it is now framed and begins to look like a house. Thirty-five ranches are completed. Benitez will move down with his family next week, since his house is now ready.

I leave Monday the 23rd for La Lima, where I shall probably stay a month or so. I don't know what plans the boss has for me,

3.

but I think it is quite probable that I shall be back in Guatemala around the first of November. If so, I shall of course go down to Naranjo promptly and look things over with Fritz. My address in Honduras is care Tella Railroad Co., La Lima, Honduras, C.A.

Gordon Smith is still at Quiriguá and we understand is likely to remain there for some days yet.

Best regards always,

Sincerely yours,

cc Mr Rosengarten

Main Office:
RAHWAY, N. J.

NEW YORK
161 Sixth Avenue

PHILADELPHIA
916 Parrish Street

ST. LOUIS
4528 So Broadway

MERCK & CO.
INC.
MANUFACTURING CHEMISTS

Cable Address:
MERCK NEWYORK

Works:
RAHWAY, N. J.
PHILADELPHIA

In Canada:
MERCK & CO. Limited
MONTREAL
TORONTO

September 27, 1940

PLEASE REPLY TO
RAHWAY, N. J.

Dr. Wilson Popenoe
c/o Tela Railroad Co.
La Lima
Honduras, C. A.

Dear Dr. Popenoe:

I arrived home safely last Saturday and had hoped to get a chance to write to you sooner, but as usual there was quite an accumulation of things that needed doing quickly.

The trip by plane to Panama went without incident and I arrived in Panama City late in the afternoon. Panama City is certainly a busy place nowadays, so much so that I could not get accommodations in the Hotel Tivoli and had to stay in one of the smaller hotels in Panama City proper. The next morning I took a car and went out to Summit and called on Mr. Linsey and Mr. Kennan. They were both very cordial and glad to hear from you indirectly. They could tell me very little about the Krukoff seeds sent them last winter, as they had been turned over to native growers up in the highlands, and had not been seen by them since that time. They promised, however, to investigate and let us know.

Again I can tell you that I enjoyed being with you while in Guatemala and thank you for all the assistance you gave us in the past months.

I have had a chance to talk to Mr. Perkins once since I returned and he is thoroughly satisfied with our decision concerning the management at Naranja.

I have also to acknowledge your letters of September 3rd and 20th. I am entirely satisfied that you have already told Franke of our decision to release him. Under these conditions I think he should actually leave the plantation just as soon as possible, and I am writing to Fritz telling him that as soon as Franke's services are ended we will be glad to give him six months

Dr. Wilson Popenoe

-2-

September 27, 1940

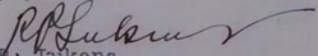
pay and if he wishes this in a lump sum that can be arranged also.

When Mr. Pennock comes back thru New York, I will stress the point raised in your letter about Cinchona propagation. I believe that he has common sense enough to understand that experimental operations should never be carried out on a large scale production until we are sure of their value. Of course, the secret of any success that we have down there with the management is going to be the complete cooperation of Fritz and Pennock, and I hope that I can make both of them see this clearly.

I am sending you under separate cover, by ordinary mail, additional notes on Cinchona propagation prepared by Dr. Krukoff. Copies were sent to Naranjo for distribution.

Hoping that your stay in Honduras is quite pleasant, I am

Sincerely yours,


R. F. Lukens

RPL:CS

La Lima, Honduras, 28 Sept 1940

Mr. R.P. Lukens,
Merck and Company,
Rahway, New Jersey.

Dear Mr. Lukens:

I am sending you under separate cover, by steamer mail, two copies of the manuscript I have prepared on Cinchona cultivation in Guatemala. If you still think there is no objection to publishing something on this subject, I will be obliged if you will go over this MS carefully, and make all the changes you think in any way desirable. Then please have it re-copied, and send to me at Antigua, two copies. One I will turn over to Don Mariano Pacheco, who has offered to have the paper translated into Spanish and published by the Government in the same form as the paper by Sands. He says they always print 3000 copies of these bulletins. No doubt they will give us all we want for our own use.

I have put through a memorandum, asking the Boston office to bill Merck and Co. for my salary during the period May 16 to Sept 15 inclusive - four months. I am not putting in an expense account for the period Sept 1 to 15, as there were only a few small items and I will leave them for collection at some later time.

As you will note from the enclosed copy of a letter to Fritz, I plan to be back in Guatemala October 15th, and will probably be able to maintain close contact with the Cinchona project from that date until the end of the year, when it is likely that I shall go to the West Indies.

Best regards always,

Main Office:
RAHWAY, N. J.

NEW YORK
161 Sixth Avenue

PHILADELPHIA
916 Parrish Street

ST. LOUIS
4528 So. Broadway

MERCK & CO.
INC.
MANUFACTURING CHEMISTS

Cable Address:
MERCK NEWYORK

Works:
RAHWAY, N. J.
PHILADELPHIA

In Canada:
MERCK & CO. Limited
MONTREAL
TORONTO

September 30, 1940

PLEASE REPLY TO
RAHWAY, N. J.

Dr. Wilson Popenoe
c/o Tela Railroad Co.
La Lima
Honduras, C. A.

Dear Dr. Popenoe:

Just to keep you informed, I have recently written to all our friends, advising them that Fritz has been made executive head of Experimental Plantations, Inc. in Guatemala, and that Mr. Pennock is going to act as horticulturist. I have dared to intimate to some of them that we hope you will be able to act also in an advisory capacity. I have written to the following:

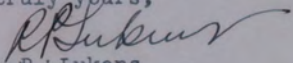
Messrs. Smiths, Pettersen, Gibson,
Sanchez, Helmrich, Williamson,
and the American Legation.

All our friends are, therefore, informed of our activities.

Fritz wrote to me recently, suggesting that we purchase some of the personal property that Franke had at Naranjo and I have advised him that it is quite in order.

I note also the agreement with the Smiths regarding seedlings at Los Andes, which I believe is well to have in writing.

Very truly yours,


R. P. Lukens

RPL:CS

La Lima, Honduras, 3 October 1940

Mr R P Lukens,
Merck and Company,
Rahway, N E.

Dear Mr. Lukens:

Yours of the 27th ultimo has just come.

As I think I have already advised you, I am going back to Guatemala on the 15th instant and shall remain in that country - according to present plans - until early January. As long as I am there I shall be happy to give Fritz all the help that I can, and will drop in at Naranjo every few weeks. I haven't heard anything further from Fritz about Franke's plans. I note that you think it would be well to make the move just as promptly as possible, now that Franke understands it is to be made. If nothing has been done by the 15th, perhaps I can help Fritz in this connection. I am sure there won't be any difficulty.

I note that the Coban samples are not yet assayed. My copy of the results - as any other mail from now on - had best be sent to Antigua as usual. If these samples turn out as we hope and expect, Fritz and I will visit Coban again and try to get things lined up properly with Don Gustavo Helmrich.

In your letter to Fritz of the 27th ultimo, you mention the Jacarantia trees. When at Lancetilla a few days ago, I noticed that some half dozen are growing there, but are smaller than the ones at Owen Smith's. I will get details on these trees when I go over to Lancetilla again next week. As for Casimiroa edulis and Gliricidia sepium, I will help Fritz get these when I return to Guatemala. Both are common trees on the West side.

I am sorry to learn that the folks in Panama haven't done much with the Calisaya seeds you sent them last winter. From Jamaica I hear that Swaby, the forest officer who received the batch of seeds you sent there, is having a hard time getting any support from the local government for his Cinchona project. I don't know how the seeds turned out - how many plants he has on hand.

Will you please hand the enclosed to Mr Perkins? Thanks.

Sincerely yours,

October 8, 1940

Dr. N. C. MacPhail
United Fruit Company Hospital
Quirigua
Guatemala, C. A.

Dear Dr. MacPhail:

Please let me express at this time my appreciation of the courtesies extended to me on my visit to the Quirigua Hospital. I enjoyed greatly meeting you, Dr. Fletcher and Dr. Castaneda, and would appreciate it if you would pass my regards along to them.

Dr. Fletcher asked me if I would pass along to him some of our literature on Sulfanilamide derivatives. Under separate cover, by regular mail (printed matter) I am sending you the following articles:

The Treatment of Pneumococcic Pneumonia with Sulfapyridine Sodium Monohydrate Merck.
Determination of Free and Total Sulfapyridine in Blood.
The Clinical Use of Sulfapyridine in Pneumococcic Pneumonia.
Comparative Efficacy of Sulfanilamide and Sulfapyridine in the Treatment of Gonococcal Infection by Russell D. Herrold. Reprinted from Publication No. 11 of The American Association for the Advancement of Science, pages 140-144.
Sulfapyridine in the Treatment of Gonococcal Infections Revised August 1940, Merck & Co. Inc.
Sulfapyridine Annotated Bibliography, April 1940, Merck & Co. Inc.
Sulfapyridine Bibliography compiled December 1939, Supplement No. 1, Merck & Co. Inc.
Sulfanilamide Merck compiled March, 1938, First Revision September 1939, Merck & Co. Inc.
Sulfathiazole, revised August 1940, Merck & Co. Inc.
Sulfathiazole Annotated Bibliography Merck & Co. Inc.

He also asked whether I could find a copy of The Merck Manual ~~for the~~, for the use of the hospital.

Dr. N. C. MacPhail

-2-

October 8, 1940

This is entirely out of print and a new edition is in preparation. Just when this will be ready I do not know. I am, therefore, sending you under separate cover by regular mail (printed matter) my personal copy, and hope that you will find it of use.

With best personal regards, I am

Very truly yours,

R. P. Lukens
R. P. Lukens

RPL:CS

cc Dr. Popenoe ✓

October 10, 1940

Mr. L. Lind Pettersen
"El Zapote", Escuintla
Guatemala, C. A.


Dear Mr. Pettersen:

I believe Mr. Rosengarten has turned over to you a complete list of the Quinine assays from the bark samples taken at Zapote. A few of these samples are promising.

Due to the quantity of ledger material that we have available in other locations for grafting, I doubt if we will wish to take advantage of the contract provision which allows us the right to 50% of the grafting material at Zapote. It is conceivable, however, that something may happen to the grafts that we have made and also to the mother trees which we propose to use for grafting, in which case we might wish some of your stock. Will you, therefore, please notify us at the time you are ready to take grafting material in the summer of 1941 so that a division can be made, if necessary.

With best personal regards to you and Mrs. Pettersen, I am

Very truly yours,


R. P. Lukens

RPL:CS

cc Mr. Perkins ✓
Dr. Popenoe ✓
Mr. Rosengarten

Main Office:
RAHWAY, N. J.
NEW YORK
161 Sixth Avenue
PHILADELPHIA
916 Parrish Street
ST. LOUIS
4528 So Broadway

MERCK & CO.
INC.
MANUFACTURING CHEMISTS

Cable Address:
MERCK NEWYORK
Works:
RAHWAY, N. J.
PHILADELPHIA

In Canada:
MERCK & CO. Limited
MONTREAL
TORONTO

October 10, 1940

Dr. Wilson Popenoe
Antigua
Guatemala, C. A.

PLEASE REPLY TO
RAHWAY, N. J.

Dear Dr. Popenoe:

Many thanks for your letters of September 28th and October 3rd from Honduras. I will be on the lookout for the manuscript and will also ask Mr. Perkins to take a look at it. He agrees with me on the statement that I made to you down in Guatemala, which was that the name Merck should not appear in the paper.

I passed your letter addressed to Mr. Perkins along to him, and both he and I are very much pleased that you are going to be in Guatemala for the next few months. Perhaps we will both be able to get a chance to see you during that time, and I know that Fritz will like to have you in the country where he can go to you for advice when needed.

Fritz told me in a recent letter that he was very much worried about the Krukoff series No. 116, fearing that they had been over-fertilized by Pennock and that he had used Am~~u~~phos too freely. He may have told you about this also.

Pennock should be leaving Puerto Rico about October 8th and will probably be in the country before long, and I will go over with him very carefully matters of this kind, making it plain that there should be no large scale experimental work done. I certainly hope that all of the #116 series have not been damaged.

The assays of the Coban ledgers have started to come thru and I am enclosing about 30 of them, in duplicate. The assays show this stock to be very promising. As you requested I will leave it to you to handle this with Helmrich and will tell Fritz not to pass the information along to him. It is entirely satisfactory to us to make Helmrich an offer of \$1.00 per gram for the seed, making it plain, of course, that we cannot commit ourselves to buy any given quantity but hope to be able to take substantial quantities nevertheless.

Dr. Wilson Popence

-2-

October 10, 1940

I see no objections to making this seed available to our friends as well - in fact there is no way to stop them if they want to buy. The above may be a little confusing. What I really meant to say is that we can tell the Smiths and Pettersen that Helmrich has some high grade stock and probably the seed will be available for sale. It is not quite clear in my mind whether or not you wanted to make an agreement with Helmrich about the ^{seeds} for the account of Experimental Plantations, or whether you want us to do it from this office. If you will advise me about this point I will be guided by your decision. Would there be any point in trying to buy some grafting stock from these trees after they have flowered and gone to seed?

I have our advertising man working on plans for the Fair and spoke to him again this morning, so that he will hurry the matter along.

In regard to the Smith contract, which we thought was indefinite in some respects, we have decided not to try to clarify in writing but leave it for discussion with Owen Smith on the next visit of either Mr. Perkins or myself.

I mailed you recently a copy of a letter to Dr. MacPhail giving him some information that he had requested at the time of my recent visit.

I am enclosing copy of a snapshot taken of you and the barber, which I thought you might like to have.

With very best regards to you and Mrs. Popence,
I am

Very truly yours,

R. P. Lukens
R. P. Lukens

RPL:CS

enc.

Antigua, Guatemala, 16 Oct 1940

Mr R P Lukens,
Merck and Co.,
Rahway, New Jersey.

Dear Mr. Lukens:

Two days ago I returned here from Honduras. Yesterday I had a chat with Fritz at the Palace Hotel, and today he spent the morning with me here at Antigua. We have gone into things as thoroughly as possible at this distance from the scene of action, and tomorrow I am leaving for the West coast. Fritz and I have arranged to meet at Mazatenango day after tomorrow and will spend several days visiting Panama, Naranjo, Helvetia and Patzulin.

Thanks for yours of October 10th with various enclosures, all interesting. Above all, I am delighted with the bark assays. The Samac samples have not let us down, so far, and the one Coban ledger at Helvetia - H-2492- which has shown up well, is even more surprising on second analysis than it was on the first. The only drawback is this: we shall probably have to do a good many further analyses of Coban ledgers if we are not to miss any bets!

We will probably visit Coban - Fritz and I - after the Samac returns are all in, and discuss with Don Gustavo arrangements for obtaining seed. Our idea was simply this: we would prepare some sort of an agreement, under the terms of which Don Gustavo would agree to protect the trees from cross pollination as outlined by us, and give us first chance at the annual seed crop. This is about all. We will of course not make any

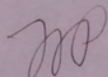
any definite agreement until Fritz has submitted a draft to you for approval.

Last evening I called on Gordon Smith in Guatemala City. He is in better shape than he was two weeks ago, and was keenly interested in talking Cinchona. John's approaching departure, about which Fritz has written you, may hamstring their activities to a certain extent; I hope not.

This is just to let you know that I ~~am~~ back in Guatemala and will be glad to help out in any way possible. I will write you more at length when I get back from the fincas next week.

With best regards always,

Sincerely yours,



On reading over the above lines I realise that they sound as though I am still under the impression that I am running this job. I'll get over it before I write again.

Main Office:
RAHWAY, N. J.
NEW YORK
161 Sixth Avenue
PHILADELPHIA
916 Parrish Street
ST. LOUIS
4528 So Broadway

MERCK & CO.
INC.
MANUFACTURING CHEMISTS

Cable Address:
MERCK NEWYORK
Works:
RAHWAY, N. J.
PHILADELPHIA

In Canada:
MERCK & CO. Limited
MONTREAL
TORONTO

October 17, 1940

Dr. Wilson Popenoe
Antigua
Guatemala, C. A.

PLEASE REPLY TO
RAHWAY, N. J.

Dear Dr. Popenoe:

I am returning attached, one copy of your article on the Cinchona cultivation in Guatemala. I think the article is excellent. Mr. Perkins is also entirely satisfied. There are only a few corrections that we would suggest. On Page 2 we suggest the following:

"experiments were started with a view to developing a Cinchona culture capable of supplying the North American market with quinine. These experiments were heartily supported by the Guatemalan and United States governments and by Merck & Co. Inc. of New York through its subsidiary, Experimental Plantations Inc."

The reason for the above change is that we do not wish to appear to be the prime movers in the Cinchona work in Guatemala.

There is also a small correction at the bottom of page 2. On page 7 we would suggest that "Merck & Co. Inc." be left out entirely.

I have seen copies of letters written by the United Fruit Co. to Mr. Perkins, in which they give promise of full cooperation as far as you are concerned. This is the best news that I have had in a long while. We will try not to make a nuisance of ourselves, but nevertheless we are gratified that we have you to call on in case we do get into trouble. I am sure that Fritz will be well pleased also.

I had letters recently from both the American Legation and also the Consulate in Guatemala and they promised us the fullest cooperation, as far as they are concerned.

Dr. Wilson Popenoe

-2-

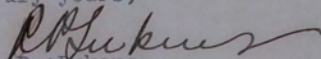
October 17, 1940

You will remember that you asked me to try to get you a copy of *Die Kine cultuur* by A. Groothoff. I cannot find any in this country and the chances of getting one from Holland are rather slim. I will keep it in mind, however.

I am enclosing in duplicate, the remainder of the assays on the Coban material, and we leave it to you to pass along to Mr. Helmrich. I am writing to Fritz also, sending him copies of the assays.

With best regards to you and Mrs. Popenoe, I am

Very truly yours,


R. P. Lukens

RPL:CS

enc.

Main Office:
RAHWAY, N. J.
NEW YORK
161 Sixth Avenue
PHILADELPHIA
916 Parrish Street
ST. LOUIS
4528 So Broadway

MERCK & CO.
INC.
MANUFACTURING CHEMISTS

Cable Address:
MERCK NEWYORK
Works:
RAHWAY, N. J.
PHILADELPHIA

In Canada:
MERCK & CO. Limited
MONTREAL
TORONTO

October 22, 1940

Dr. Wilson Popenoe
Antigua
Guatemala, C. A.

PLEASE REPLY TO
RAHWAY, N. J.

Dear Dr. Popenoe:

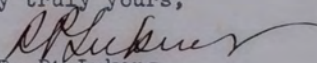
Many thanks for your letter of October 16, 1940 and let me tell you right at the start, that it was not at all necessary for you to add a postscript in which you criticize your own letter for taking a proprietary attitude towards the Cinchona project. We all hope that you will continue to feel this way.

As you can see from the enclosed copy of letter to Fritz, that I have reservations about hiring Hoehn. Perhaps either you or Fritz can convince me that he is absolutely necessary.

I am enclosing photostatic copy showing analyses of the soil samples taken at Naranjo. As I interpret them certain parts of the Finca can stand some fertilization. I have taken the liberty of asking Fritz to speak to you about these assays.

With best regards, I am

Very truly yours,


R..P. Lukens

RPL:CS

enc.

Antigua, Guatemala, 23 October 1940

Mr. R.P. Lukens,
Merck and Company,
Rahway, New Jersey.

Dear Mr. Lukens:

After having been away from the Cinchona work for one month, I have spent five days going over the experimental plantings and the activities at El Naranjo, and desire to place on record the following comments:

Los Andes, Panamá. The Krukoff seedlings are coming along satisfactorily. Quite a few are now large enough to move, but Benitez points out that they must be hardened off before transplanting, which will take several weeks yet. He has lightened up the shade to commence the hardening-off process, and thinks that transplanting can commence about the middle of November.

Grafts made from the high-yielding Helvetia Ledgers have not been overly successful. Of H-1213 eleven are dead and two growing; of H-1229 35 are growing, 22 dead. Of the very interesting "Coban Ledger" H-2492 fifteen are alive and five dead. These results stress two points: (1) it is going to be much easier to graft the hybrid types (so called "robustas") than the true Ledgers, and (2) it is difficult to get good results when using grafting wood from blossoming trees. Benitez is emphatic about the last-named point, and I think he is right. I do not believe results obtained this year with wood from the high-yielders at Helvetia need to discourage us too much. We know they get satisfactory results from grafting in

Java, and if they can do it, we can do it.

Some of the first trees grafted this year, which have now made two leaves or more, are commencing to show the "red mottling" which we believe attributable to some nutritional deficiency. I feel sure it would be wise to use fertilizer on all grafts of the high-yielding Ledgers. I will take up this matter further with Fritz and with Benitez.

Trees in the field planting - the "Merck enclosure" have shown no marked response to the applications of Sodium nitrate which have been given to date. They are now receiving Ammophos. The "original Ledgers" in this field are continuing to die off, and we must do all we can to check this. The grafted trees, especially those from Zapote, look well in general. I believe we should increase fertilizer applications. We know that the Ledgers in nursery which were fertilized heavily with Nitrophoska something over a year ago, showed a definite and favorable response. But they got frequent and heavy applications. I still believe we can do something to put life in these failing original Ledger seedlings if we fertilize heavily. Since these trees are of great importance as possible sources of future high-yielding clones we ought to save as many of them as possible.

In August, after all material from the Helvetia Ledgers had been used, Owen Smith arranged for the boys to graft all remaining seedlings (suceirubras) at Panama with miscellaneous material of unknown value, to give them grafting experience. This was an excellent move. Julio had just checked the results at the time I visited Panama, and told me that of the grafts made by Carl s Oyalle (John Smith's man from Helvetia) 24%

school boy from Naranjo) 39% had grown; of those made by Vidal Cabrera (Owen Smith's man) 49% have grown; and of those made by Julio himself, 54% have grown. Before taking these figures as final I would like to see another check made; they may represent in some degree Julio's regard for the other fellows, rather than their grafting ability. Anyway, they are interesting.

Finca El Naranjo. Construction of the main building has reached the stage where you can get a good idea of how it will look, and I am very much pleased with it. While a bit "institutional" in character, it is going to be a comfortable and on the whole, attractive building.

The Krukoff seedlings are coming on very satisfactorily with the exception of one or two beds in which there is higher mortality than we would like to see. There is no doubt in my mind that the use of ~~Amphibios~~, mixed with the soil in beds prepared to receive young seedlings, is a mistake. This will not be repeated. Preparation of the nursery area is coming along satisfactorily. It will probably not be desirable to commence transplanting of seedlings from the seedbeds to this area for another month yet.

Indications are that grafts of the high-yielding Helvetia Ledgers made at Naranjo are going to turn out about as they have done at Panama. That is, we are not going to get much more than 50% in general. I feel that Benitez is right in blaming this low figure largely on the character of the grafting wood available this year. We took everything we could get, including much flowering wood; and this is never satisfactory. Benitez has made 200 grafts of the best Helvetia

numbers, using wood from the young grafted trees growing at Loja; these may be expected to give better results than those from the parent trees at Helvetia. Benitez points out that we are going to have good quantities of grafting wood available next year from many of these young trees at Loja.

All of the Naranjo field plantings - Huasibamba, Loja and Chimborazo (you can change these names some day if you dont like mine!) are coming along very satisfactorily except for the "red mottling" evident on some of the Ledger seedlings. I am coming more and more to feel that this is nothing new; that it is just what they talk about in Java, - the unsuitability of anything but the very best virgin soils for Ledger seedlings. We do not note this trouble on Ledger trees grafted on succirubra stocks, to any extent at least. As far as we can gather from the scanty literature available, they are using nitrates and superphosphates in Java. Ammophos should provide just these elements. I believe we should continue to use Ammophos abundantly on those trees which are showing red mottling, and continue investigations to determine if there is anything better. We simply must overcome this trouble, if we are to save the maximum number of the original Ledgers now growing in Guatemala. It does not matter that this treatment is relatively expensive; we are not considering its commercial use on a large scale, but saving these Ledger trees as sources of grafting material.

Helvetia. Fritz and I looked over El Nil and Guardiania in company with Messrs Davies and John Smith. Mr Davies was much concerned regarding the increase of red mottling on the original Ledgers at El Nil. My remarks above apply to this situation. It seems probable that the abundant flowering which

occurred this year has taxed the vitality of many of these trees and if we do not build them up with fertilizers we are going to see a good many of them die out. Symptoms of which we do not know a great deal, but which we believe indicate root disease (a thing we do not know how to combat, nor do they in Java, apparently) are not so abundant at El Nil as I had feared in advance might be the case. This I think is encouraging.

On the whole, the original Ledgers at Guardiania seem to be less affected by red mottling than those at El Nil. They are younger trees, and have not yet flowered so heavily, which may or may not be responsible in part. Perhaps the soil here is more favorable. In any event, there are at Guardiania a good many fine Ledgers which on later analysis may turn out to be the sources of good clones, and I would strongly recommend abundant fertilization of all these trees to keep them in the best possible growing condition.

We were all very much interested in looking over, once more, the "Coban ledger" H-2492, which on first analysis showed 6% quinine sulfate and on second analysis a month or so later has shown 7%. This tree, and others of its type, certainly merit much further attention. They will probably grow twice as fast as Ledgers, and they propagate by grafting very easily.

Most of the Krukoff seedlings which were started at Helvetia have been moved to Patzulín. They are discussed below.

Patzulín. The Smiths are concentrating work with the Krukoff seedlings at this place. In addition to the stock which was planted in seed boxes here, they have moved much stock from their other areas and are now transplanting to nursery

beds shaded with "teja manil" or thin shakes. On the whole, the appearance of the Krukoff seedlings, both those which have been transplanted and those still in seed boxes, is not too good. Many have suffered from insufficient light and are "leggy". They need hardening-off before transplanting. We went over the situation with John Smith as fully as possible and recommended more light and less water.

The field planting at 4000 feet is coming on beautifully. It is still the only planting in Guatemala which shows no red mottling. This may be due in major part to the fact that these trees, of true Ledger type in the main, are all grafted on succirubra stocks. Anyway, they are making very rapid growth and inspire confidence in our ability to grow commercial Cinchona in Guatemala.

The Herrera Nursery on Lake Atitlán. Fritz and I visited this place, about which Fritz has written you fully, in company with Don Arturo Herrera. The seed bed which was recently sown with Krukoff seed by Benitez has every appearance of being in satisfactory condition. For field plantings of Ledger trees I doubt that the situation is satisfactory. The soils are not of the best, and the area probably has too low a rainfall. I believe it would be worth while to try out a few grafted trees of the broad leaved types such as H-2492 and Zapote A, if any commercial types will succeed here, these are probably the ones. Any in any event, a test under the climatic and soil conditions of this region (altitude 5300 feet) would be of interest and value.

With best regards,

Sincerely yours,

Antigua, Guatemala, 23 October 1940

Mr. R.P. Lukens,
Merck and Company,
Rahway, New Jersey.

Dear Mr. Lukens:

Many thanks for yours of the 17th enclosing the remainder of the Samac analyses. These are to me highly satisfactory. Among the original Ledgers there is not a single tree of really low quinine content. Some of those which only show 6 or 7% will, I believe, run up considerably higher when the trees have two or three years' more growth.

I will send these figures on to Don Gustavo Helmrich and tell him that Fritz and I will visit him again shortly to talk about arrangements for propagating these trees. Fritz and I discussed this matter yesterday and decided that Fritz would draw up terms of agreement to be submitted to you before we offer them to Helmrich.

Regarding the proposed publication on Cinchona cultivation in Guatemala: I will revise the MS as suggested by you, then get it put into Spanish, add about a dozen of the photographs of which I believe Fritz sent you copies a few weeks ago, and then take up the matter of publication with Don Mariano. If for any reason he cannot handle it through the government printing office, I know there will be no difficulty in getting it printed in *El Imparcial* or *Nuestro Diario*, after which we could probably get separates struck off at an insignificant cost, and hold them for later distribution.

Thanks for looking up the Groothoff publication. Franke says Zoller at *El Porvenir* has a copy, so there is at least one in Guatemala, to which we can have access some time.

I am glad you have been officially informed by United Fruit that I will continue to assist on the Cinchona project. I don't think I need to tell you how keenly I am interested in the work, and what a pleasure it is to help out in any way I can.

What chance is there of Mr Perkins and/or yourself coming down before New Year's? I fully expect to be in Guatemala up to that time, you know; but after that I think it probable that I shall hop off for a trip around the Caribbean something like the one I made early this year, if not longer. I would particularly like Mr Perkins to see those trees at Patzulin, though I know his confidence in the future of this project does not need any bolstering.

Best regards to you both.

Sincerely yours,

Antigua, Guatemala, 25 October 1940

Mr R P Lukens,
Merck and Company,
Rahway, New Jersey.

Dear Mr. Lukens:

Some time ago you inquired regarding results of the Jacaratia seed supplied to United Fruit Company. This seed was sent by me to Lancetilla Experiment Station at Tela, Honduras. When I visited Lancetilla last month I found that there are six trees growing there, 3 to 4 feet high at present. In addition, there are two trees growing in the garden at the Research Laboratory at La Lima, Honduras, 8 to 10 feet high.

This is not a great amount of material, but may furnish seed for later propagation if such is desired.

Yours sincerely,

Wilson Popenoe

cc Mr Rosengarten

Antigua, Guatemala, 25 October 1940

Mr R.P. Lukens,
Merck and Company,
Rahway, New Jersey.

Dear Mr. Lukens:

I enclose copy of a note I have written Don Gustavo Helmrich, transmitting results of bark analyses of the Samec trees. Fritz is having George Sanchez draw up an agreement covering rights to seed and grafting wood, which he will submit to you shortly. In view of the fact that we consider this batch of trees offers the very best source of good Ledger seed in this part of the world, Fritz and I believe it would be wise for you to corner all this seed if Don Gustavo will give you exclusive rights to it for not more than \$200 per annum. Probably you will not want it all yourselves, but if you have it in your hands, you can distribute it to your cooperators, either gratis or at a figure which will let you out. In accordance with your suggestion, we are including a clause covering grafting wood, which I think you ought to have, from a few of the best trees. After you see the terms of the agreement you can let Fritz know what you want to do.

I am going to the Pacific coast tomorrow with the rubber boys for ten days or so. We shall probably drop in at Naranjo next week for a look around.

My letters to you of day before yesterday failed to show that carbon copies have been furnished to Fritz, but this was the case. I will send him copies of anything I write which may

Sincerely yours



Antigua, Guatemala, 5 November 1940

Mr. R.P. Lukens,
Merck and Company,
Rahway, New Jersey.

Dear Mr. Lukens:

During the past week I was on the West coast with two members of the Rubber Survey Party sent out by the United States Department of Agriculture. One of these men is C.B. Manifold, who has had much experience with tropical soils; the other is T.J. Grant, plant pathologist, who used to be with me in Honduras. Feeling that both might be able to offer helpful suggestions regarding some of our Cinchona problems, I took them up to Naranjo for a day.

Mr. Manifold was particularly interested in seeing the soils of the finca, and in discussing fertilizer problems. Fortunately I had just received the photostat copy of the analyses made by the New Jersey Experiment Station, which you were good enough to send me. (This, by the way, is a fine job; very practical and of real value to us). Studying these analyses on the ground, while looking at the soils themselves, was extremely interesting.

Before telling Mr. Manifold that I had been jointly responsible with several others for the choice of Naranjo as a site for the Cinchona work, I asked him what he thought of the soils. He said he thought they were some of the finest volcanic loams he had ever seen. I again asked this question, several days later, after we had finished our survey of the entire coastal region, and he again said he thought we had made an excellent choice.

Basically, then, we seem to be allright; that is, our soils are texturally good. But as shown by your analyses and as shown

by the behavior of many of our Ledger seedlings, they lack something. Nitrates are high enough in the surface soil, except in areas where erosion has taken place, but potash and phosphorous seem to be low throughout. I believe one of the first things Penneck should do, when he gets on the job, is to inaugurate further fertilizer experiments.

Now to the pathological angle. When you were here, we talked about getting down a pathologist from Washington, to orient us with regard to some of our disease problems - at least to make a start. I suggested Dr F L Wellman, who is with the Division of Horticultural Crops and Diseases, Bureau of Plant Industry. Grant knows Wellman and I asked him if he thought he might be willing to come down. Grant thought it quite probable that the matter could be arranged. If you have not yet done anything about this, I suggest you give it consideration on some such basis as the following: Ask the Department to lend us Wellman's services for three months, you to pay his travelling expenses and subsistence while in the field. They ought to be willing to cooperate to this extent, inasmuch as Cinchona is a National Defense project. If Wellman could come here for three months he could get us lined up so we would at least have some idea of what we are facing.

I took Grant up to the Loja planting where we spent a couple of hours. He found evidence of several fungous parasites on the plants there, but of course could not offer much definite information based on so sketchy a visit. In the young African Ledger seedlings there was much evidence of a foot rot of some sort: Numerous plants were girdled close to the ground, and in cases where the roots also were infected, the plants were dying.

Grant also saw indications of what he took to be a canker disease, originating either in the roots or at the ground level. This causes internal discoloration, spreading up the stem and affecting the cambium, then breaking out and killing the outer bark tissue. In one case he saw what he took to be Corticium salmonicolor, which as you know causes the "Pink disease" of Cinchona in Java.

From the appearance of affected plants, Benitez thinks the foot-rot mentioned above is the thing which played havoc with Franke's original nurseries at Moca.

Grant made several other observations, but there is no need to bring them up now; they are too preliminary in character. But the desirability of increasing our knowledge on the general subject of Cinchona diseases seems to me patent, and I believe we could advantageously start soon.

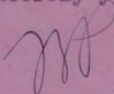
And by the way: you will recall our various discussions regarding a good chemist for this job, within another year or so. I feel sure you will want someone on the ground, someone who will live at Naranjo and devote his time to studying the chemical side of the whole problem. We need to know the affect of altitude on quinine content, age on quinine content, fertilizers on quinine content, light on quinine content, and a host of other things. Mr. Perkins mentioned this the last time he was down here. When I was over at La Lima I met a young chemist who was employed last year by our Research Department and who, it seems to me, would fill this bill admirably - if he could be had. He is George Stewart, a Canadian from McGill University where he specialised in alkaloid chemistry. He has worked seven years in the Canadian Department of Agriculture and has been at La Lima about a year now. He likes the tropics, is unmarried, and I believe is a keen fellow all

4.

round. He is most certainly worth keeping in mind. You would not want to take him away from United Fruit if they did not feel they could spare him, but I think with ample notice they would be willing to let him go to a better job.

With best regards always,

Sincerely yours

A handwritten signature in dark ink, appearing to be 'M. J. R.', written in a cursive style.

cc Mr Frederic Rosengarten Jr.

Main Office:
RAHWAY, N. J.
NEW YORK
161 Sixth Avenue
PHILADELPHIA
916 Parrish Street
ST. LOUIS
4528 So Broadway

MERCK & CO.
INC.
MANUFACTURING CHEMISTS

Cable Address:
MERCK NEWYORK
Works:
RAHWAY, N. J.
PHILADELPHIA
In Canada:
MERCK & CO. Limited
MONTREAL
TORONTO

November 8, 1940

Dr. Wilson Popenoe
Antigua
Guatemala, C. A.

PLEASE REPLY TO
RAHWAY, N. J.

Dear Dr. Popenoe:

Many thanks for your letters of October 23, 25 and November 4 and 5.

I can only repeat what I have already told you, that all of us appreciate greatly the time and effort you are putting in to aid us with our Cinchona project.

In your letter of the 23rd, you speak of the rather indifferent success we have had with grafting high yielding Ledgers. This will certainly be an excellent field for Mr. Pennock to investigate, our suggestion being that grafts be made all thru the year at various times, when trees are in bloom, etc., to get some more information on this subject.

I am sorry about the delay in shipping the fertilizer, but our Purchasing Department has been overwhelmed and that is the only excuse I can offer. I have recently ordered a ton of Potassium Sulfate and hope that this will go forward soon.

Many of the questions raised in your letters, you will find answered in the enclosed copy of a letter to Mr. Rosengarten.

As you can see I will try to make arrangements to have Dr. Wellman come. Failing to get him I will probably ask you for the names of others who might be able to help us.

I wish particularly to call your attention to the reference to Benitez in my letter to Fritz. He is of great value to us. I certainly hope nothing will happen which will cause him to leave.


Dr. Wilson Popenoe

-2-

November 8, 1940

In your letter of the 5th you speak of a chemist for Naranjo. This undoubtedly will be warranted eventually, but I agree with you that this will probably not be necessary for a year or so. In the meantime do not hesitate to send any bark that you wish analyzed to us. We will have it taken care of here in Rahway.

Very truly yours,


R. P. Lukens

RPL:CS

enc.

Antigua, Guatemala, 13 Nov 1940

Mr R P Lukens,
Merck and Company,
Rahway, New Jersey.

Dear Mr. Lukens:

Fritz has just come in from Naranjo and has shown me a copy of his letter to you of the 7th instant, concerned mainly with the future relations of Benitez with the Cinchona project. He has further told me that he has had a long and friendly talk with Benitez today, and that the latter has expressed a desire to have a contract covering the next five years or so.

I do not know just how you will feel about this. I have never been favorably inclined towards contracts in general, but in this case it is more a matter of providing peace of mind for Benitez than of binding either party. George Sanchez can draw up a contract which will protect you against all eventualities, and will at the same time make Benitez feel that he is going to be continued on the job, regardless of changes in administration locally. I am inclined to feel that such a contract would be a good thing. Benitez would not have any fears that Hoehn has been taken on to learn the business and that he, Benitez, will be kicked out as soon as Hoehn knows the ropes. Consequently he will cooperate with Hoehn more fully and will try to help him learn the horticultural end of the Cinchona business. And he will also be more interested in teaching young fellows all the can.

Fritz tells me that he has promised Benitez \$150 per mensem beginning December first. This is news to me. I want it clearly understood by all concerned that I have not suggested a raise for Benitez, though I think he will give you value received and more. If any contract is made with him, I would not suggest that he be promised any further increase in salary. In my opinion, \$150 is mighty good pay and he will be fully satisfied with it.

In fact, the whole problem is not so much one of remuneration as of confidence and security. If you can give Benitez some sort of a contract which will make him feel secure, I think it will be desirable from all points of view.

Yours sincerely,

Antigua, Guatemala, 18 November 1940

Mr. R.P. Lukens,
Merck and Company,
Rehway, New Jersey.

Dear Mr. Lukens:

This for your files - about Hans Franke.

As you know, he made up his mind that he would like to return to Germany, after being told that you were going to let him out. The approved and official route right now seems to be via Japan and the Trans Siberian. Hans figured on sailing from Mexico, but when he applied for a visa to go through Mexico he was refused. He then came to me, and asked if I could help him get a visa to go through the States. I talked with Captain June, our Naval Attaché, who said there had been a number of such requests and that most of them had been turned down. He advised me, however, to talk with the Consul, Mr. Williamson. This I did, explaining my long association with Franke, my personal liking for him, and my belief that he has been engaged here in no Fifth Column stuff. Mr. Williamson finally agreed to give a transit visa, provided Franke obtained a booking on a steamer from California to Japan.

Yesterday Captain June informed me that Mr Williamson has issued the visa and that Franke is sailing from Guatemala for New Orleans on the 23rd instant, - as Fritz has already informed you I believe.

Sincerely yours,

cc Mr Rosengarten

16

Antigua, Guatemala, 18 November 1940

Mr. R.P. Lukens,
Merck and Co., Rahway, N.J.

Dear Mr. Lukens:

In your letter of the 8th instant, you mention the desirability of Mr. Pennock's efforts ^{being} devoted in part to investigation of the best method of grafting the high-yielding ledgers. This is a good point, and has caused me to turn over in my mind numerous other problems which presented themselves during the work last summer, problems on which I feel sure Mr Pennock can do useful work. After he has looked over the field, he will be better prepared than am I to say just what are the things to be tackled first, and the things on which he should put most of his time; but in the hope that it may start the ball rolling, I am going to offer a few suggestions.

Seed Beds. We should by all means test the sphagnum-moss method of germinating - the method used at Bell, Maryland - and I know that Pennock already has this in mind. We should give some thought to improving the construction of our seed beds, so as to permit more light without direct sun. Pennock and I have already discussed this problem. And we should make experiments with liquid fertilizers on young seedlings. I feel that work on all of these points should be commenced right away.

Nurseries. The main problem at the moment is the right sort of shade to use, but I have little fear that Pennock and Benitez together can ^{not} solve this satisfactorily, at least so far as regards immediate needs. We are now entering the dry season and the difficulty experienced up to now, in protecting young plants

from heavy rain, will disappear. But it would be well, when opportunity offers, to work out the proper technique for handling nurseries during the rainy season, since the time will come when it will be necessary to do a certain amount of transplanting at that time of year. We should also work out the best means of fertilizing young plants in nursery. I am becoming convinced that Calisayas and Ledgers are going to require a certain amount of fertilization during this stage, if we are to get best results.

Grafting. I am not convinced that the method used by Benitez is the best. In any event, so much depends upon grafting that we should not stop short of further study of this problem. And there is the additional one brought up by you - determination of the best season (though I think we already know that; what we need to know is, Can we graft also at other times), further study of kinds of propagating material (since it is important that we get the largest possible number of grafts out of high-yielding trees at this stage) and so on. I am convinced we can improve somewhat upon our present technique though I am not sure we can do a great deal. Weather and the condition of grafting wood are recognized factors in the propagation of any tree and there will be a limit to our ability to beat the game. At the same time, there is every reason to believe that the general problem of grafting can be handled here as satisfactorily as it is in Java, where it seems to give no trouble.

Fertilization of Trees in the Field. This has been discussed at length in the correspondence and most certainly is one of our major problems at the moment, if we are to save the maximum number of seedling trees now growing in experimental plantings here. Unless something is done at Monterrey, many of the Washington Ledgers, African Ledgers, and similar promising things are going to die out before we are able to get bark analyses and save promising strains

by grafting them on succirubras. I think we all agree that "Red Mottling" (as we call it) indicates nutritional deficiency of some sort and if we can check it in the near future we can save a lot of promising material. I would put this problem high at the top of the list and without waiting for final results, go ahead and fertilize as many as possible of the trees which are not growing satisfactorily, using an N K and P formula until we know just what is needed.

Future Supplies of Ledger-Type Seed. In the planting of Original Java trees at Samac, near Coban, and in the planting at Helvetia, we have potential supplies of good Ledger seed - the only supplies which, in all probability, will be available to us for the next several years. I believe Mr Pennock should devote particular attention to this subject, doing all he can to "rogue" these plantings so that we will get seed of the best possible parentage, and preventing pollination by any but Ledger-type trees of satisfactory yield.

Development of Good Clones. This work was started during the past summer, but we have only made a beginning. Obviously this will be one of the major problems to which Mr Pennock will devote his attention. As further trees reach suitable size, he will take bark samples and get them analysed. And as the grafted trees from these high-yielding mothers develop, he will want to watch them, with a view to picking out those which show greater vigor of growth, resistance to disease, freedom from tendency to blossom at an early age, and the like.

There is nothing new in the above suggestions. They have all been discussed among ourselves, at one time or another. Mr. Pennock probably has them all in mind, and others which I have

U
overlooked.

In your letter of the 8th instant you refer to the possibility of getting Dr. Wellman or some other competent plant pathologist to spend a few months down here. I believe this should be one of our next steps. While we are not seriously menaced by any disease as yet, I believe technical knowledge of the diseases which are present, and which may sooner or later assume economic importance, should be a fundamental feature of the general program. A few months' work should serve to show us what we have to face, and prepare us to face it intelligently.

As regards a chemist, who will make his headquarters at El Marenjo and work on the numerous angles of our program which only a chemist can handle, and which can only be operated satisfactorily right here on the ground, I fully agree that the time is not yet ripe. By the middle of next year you may want to consider this step; and it is quite possible that 1942 will be early enough. There is still quite a lot of work to be done, before we shall get down to the refinements.

With best regards,

Sincerely yours,

Wilson Popenoe

cc Mr Rosengarten

Main Office:
RAHWAY, N. J.
NEW YORK
161 Sixth Avenue
PHILADELPHIA
1649 N. Broad Street
ST. LOUIS
4528 S. Broadway

MERCK & CO.
INC.
MANUFACTURING CHEMISTS

Cable Address:
MERCK NEWYORK
Works:
RAHWAY, N. J.
PHILADELPHIA

In Canada:
MERCK & CO. Limited
MONTREAL
TORONTO

November 20, 1940

Dr. Wilson Popenoe
Antigua
Guatemala, C. A.

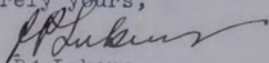
PLEASE REPLY TO
RAHWAY, N. J.

Dear Dr. Popenoe:

Many thanks for your letter of November 14th, and we continue to appreciate the interest that you are taking in our Guatemala experiments.

You can see from the enclosed copy of a letter addressed to Fritz what I think about the Benitez case; in fact I think there is a limit to the amount of babying Benitez should get. It seems to me that after all these years Benitez should have confidence in us, and the fact that we have recently raised his salary would seem to indicate that we have no desire to get rid of him. I have, therefore, advised Fritz that in my opinion a one year contract is sufficient. I think you might explain a little bit further to Benitez that all our technical men here in Rahway get no more than a one year contract; in fact you might say it is a company policy not to go beyond this limit. ^(X) In my 25 years association with Merck & Co. no employee has ever been released as long as his work was entirely satisfactory.

Sincerely yours,


R. P. Lukens

RPL:CS

enc.

^(X) P.S. I know of only one exception.
We gave Popenoe a two year
contract.

Antigua, Guatemala, 8 Dec 1940

R.P. Lukens, Esq.,
Merck and Co., Rahway, N.J.

Dear Mr. Lukens:

Yours of 26 November has come. I am sorry to learn that Dr Wellman is not available for a few months' preliminary work on the fungous diseases which may become of economic importance in connection with Dinchona cultivation in Guatemala. However, I do not feel that there is any great rush; and my suggestion is that we let the matter ride until next spring. The ideal time, I believe, for work of this sort would be during the wet season down here; that is, after the first of next June. Before that time comes around we can canvass the field and see what is best to be done.

I am glad you are sending down some more fertilizer. When at Naranjo last week with Penneck and Fritz, we looked over the plants which were treated earlier in the summer and though indications are not too definite, we all felt that Ammophos was showing results. I still think we can save a good many of the Original Ledger trees by fertilizing them before it is too late.

Tomorrow Fritz, Penneck and I go to Cobán to look over the Samac ledgers and try to make definite arrangements with Helmrich for supplies of budwood from a few of the very best trees and for all of the seed. With this stock tied up I believe we are in shape to go ahead in fine shape. Fritz will of course advise you of results of our visit so far as arrangements with Helmrich are concerned. I may have a few suggestions to offer regarding selection of desirable trees for vegetative propagation.

I was most favorably impressed by the progress which has been made on the nursery area at Naranjo. Things are coming along in fine shape. And there is no trouble from damping off in the seedbeds planted at the end of the wet season. In general, things look very well at Naranjo. I did not get to Patzulin to see how the Smiths are getting along with their nursery work but from what I hear, they are not doing so well. The absence of John, coupled with the usual heavy schedule of coffee operations at this time of the year, are handicaps.

I am looking forward with great interest to the visit of Mr Perkins.

With best regards always,

Sincerely yours,

Wilson Popenoe

Main Office:
RAHWAY, N. J.
NEW YORK
161 Sixth Avenue
PHILADELPHIA
1649 N. Broad Street
ST. LOUIS
4525 S. Broadway

MERCK & CO.
INC.
MANUFACTURING CHEMISTS

Cable Address:
MERCK NEWYORK
Works:
RAHWAY, N. J.
PHILADELPHIA
In Canada:
MERCK & CO. Limited
MONTREAL
TORONTO

November 26, 1940

Dr. Wilson Popenoe
Antigua
Guatemala, C. A.

PLEASE REPLY TO
RAHWAY, N. J.

Dear Dr. Popenoe:

Many thanks for your two letters of November 18, 1940. I am particularly glad to get your suggestions on problems that Mr. Pennock should investigate. I note that Mr. Rosengarten has a copy of your letter and I will ask him to show this to Mr. Pennock. Any additional suggestions that you may have will undoubtedly be helpful.

Some time ago I wrote to Dr. Wellman and just today received a final answer from him. Although he is greatly interested personally, he advises that the Bureau of Plant Industry consider his work in the department too important to spare him for the study of Cinchona diseases. This means that we must look elsewhere for a plant pathologist. I would welcome any further suggestions that you may have.

Many thanks for the information concerning Franke. As he is entering the country thru New Orleans I suppose he will be required to go immediately to California.

With regard to fertilizers, I have placed orders for experimental lots of Ammonium Sulfate, Potassium Sulfate, Amiphos and Superphosphate in quantities ranging from 500 lbs. to 2000 lbs.

With best regards, I am

Very truly yours,


R. P. Lukens

RPL:CS

Antigua, Guatemala, 14 December 1940

Mr. R.P. Lukens,
Merck and Company,
Rahway, New Jersey.

Dear Mr. Lukens:

Fritz has doubtless written you regarding the arrangements made with Don Gustavo Helmrich of Finca Samac for grafting wood and seed of the Original Ledgers at that place. Personally I am of the opinion that this batch of plants is going to prove of immense value in connection with further development of Cinchona in Guatemala. Penneck, Fritz and I went over the lot, tree by tree, and I think we all agree in feeling rather enthusiastic about them. There is only one tree of the 50 sampled this year which definitely shows no promise. The analysis of this tree is so far out of line with the others that we took a new sample which Fritz will send you; if this shows approximately the same figure as the first sample - approximately 1% - the tree will be cut out immediately. Two others, which have shown about 6%, may do better another year when they are slightly larger, and are being left on this basis.

The big point about the Samac Ledgers is that the collection will contain - when weeded out next year - nothing but pure Ledgers of fairly uniform character and quality. This is not true of the lot at Helvetia, where there are a good many broad-leaved trees, some of which run quite low in quinine, but which cannot be cut out, at least for several years yet. Samac will be the only source of really high-grade Ledger seed for some years to come.

There is the further probability of getting some fine cones

out of Samac. Pennock pointed out that one of the trees, which analyses 13%, also has the best bark thickness of any Ledger yet brought to light in Guatemala, and is a fine strong tree to boot. In fact, he was greatly pleased at the growth and condition of the Samac Ledgers in general. As you know, "red mottling" is practically non-existent at this place, the trees being more healthy than any other batch of Ledger seedlings in Guatemala.

This last fact makes us all feel that possibilities of Cinchona cultivation in the Verapaz are worth further consideration. Though most of the lands up there are clay hillsides, which we do not believe well suited to Ledger seedlings, there are a good many bits of fairly flat alluvial lands in the valleys of the Coban - San Cristóbal-Tactic area which altogether might total a thousand acres or more, and which may be well suited to Cinchona. The great difficulty is that most of these lands are in the hands of Indians who probably would not be much interested in planting Cinchona. But there are sufficient bits in the hands of coffee planters to make up quite a total, and with the present coffee situation, and the admittedly poor prospects, some of these people would probably be glad to have an alternative crop. In any event, we all feel that further small-scale experiments, especially with Ledger seedlings, are indicated.

Best regards always.

Sincerely yours,

Wilson P_opence

cc Mr Rosengarten

Antigua, Guatemala, 22 Dec 1940

Mr R P Lukens,
Merck and Co.,
Rahway, N J

Dear Mr. Lukens:

Some of us down here have been wondering what method the Dutch in Java use to test the quinine content (and consequently the value) of their seedling trees, and we have particularly been wondering if some quick test could be devised, which would show us, without too much laboratory work, whether a given tree contained, for instance, in the neighborhood of 1% or in the neighborhood of 8%. An error of 2% or 3% even, in a preliminary quick test, would not be serious: it would still enable us to throw out probably 75% of the trees tested, and we could then get down to finer points with the rest. I have in mind, of course, the enormous amount of testing which is going to be necessary in the next few years - and especially when the Krukoff seedlings come into production.

A friend of mine in the U.S. Dept of Agriculture, Dr R D Rands has been in Java and seen something of the Cinchona industry there - not much perhaps, but he attended the Fourth Pacific Science Congress in Java in 1929 and brought back a pamphlet on Cinchona prepared for the delegates by Dr. C. Spruit P. Pzn (I defy you to pronounce that). Dr Rands has sent me this pamphlet which I have found very interesting. Presumably the Dutch did not tell the delegates anything they did not want them to know: but there are some points in this pamphlet which are of great interest to us down here. And there is a description of the method of analysing bark which I would like to quote, so that you can tell me whether or not it is the same you have been using, and whether or not it would save

I quote from the pamphlet in question:

"In order to test the value of cinchona bark, a chemical analysis is necessary. The method of analysing, in general use now, has been worked out, to a great extent, by the staff of the Government Cinchona Estate and is based on former investigations.

"The analysis is carried out in the following way. In order to free the alkaloids, the bark is mixed with lime and caustic soda. The alkaloids are then extracted with benzol. A normal solution of hydrochloric acid is added and the benzol can be removed by distillation. The excess of hydrochloric acid can now be neutralised with the aid of caustic soda, and the percentage of total alkaloids can be calculated. Tartaric soda is then added and the tartrates of quinine and cinchonidine will be precipitated. From the weight of these tartrates the sum of the percentages of quinine and cinchonidine is determined with the aid of a polarimeter, and the contents of quinine and cinchonidine can be found separately. The percentage of quinidine must be calculated independently. By subtracting the percentages of quinine, cinchonidine, and eventually that of quinidine from the percentage of total alkaloids, the percentage of cinchonine and amorphous alkaloid may be found".

In my ignorance, and so far as I can recall, this sounds to me very much like the method you are using at Rahway, as described by you when last down here. I doubt therefore that it will interest you very much. But in any event I would like your comments on it.

This pamphlet (which I will show to Fritz and to Pennock as soon as I have an opportunity) contains some interesting statements regarding the method used in selecting ledgers for vegetative propagation, and on fertilizers. Particularly interesting is the following statement regarding selection:

"In this, the selective period, cinchona cultivation owes much

to practical persons, scientific men having taken but a passive part." If the Dutch planters have been able successfully to pick out trees worthy of propagation, we ought to be able to do the same thing here.

Dr. C. Spruit P. Pzn (again I defy you to pronounce it) gives some excellent details regarding the method of bark sampling used in Java, which I believe will be extremely useful here, since this is a point on which we have had little information.

And also on the matter of fertilizers. He points out that the quality of the land has a highly important effect on the quinine content of trees. This is worth keeping in mind. We have an opportunity, here in Guatemala, to get some information on this point; and since we probably are not as hard-pressed for good lands here as they are in Java (an assumption on my part), we may be able to influence ultimate results considerably by choosing the right types of soil.

After talking about the use of artificial manures some years ago, and subsequent use of green manures, he says:

"Since then it has been proved that in many cases manuring with nitrate and phosphate is advisable. Also many cases have occurred in which, on rather small areas, the development of the cinchona tree is in direct proportion to the quantity of easily soluble phosphate in the soil, a fact that is determined by analysis."

This, it seems to me, should encourage us to go ahead with our tests of Ammophos and other materials. You will recall that the soil analysis you had made at the New Jersey station showed that Naranjo soils are very low in phosphorus. Fortunately, it should not be a very expensive matter to add this element to our soils commercially, if it is found to be advantageous.

The good doctor, who writes in an English which smacks strongly of Dutch construction, says little about the actual yields which are obtained in Java. I suspect you have a better idea from the yields you are getting from Java bark in your factory. The following statement is of interest:

"External conditions have a great influence on the quinine content and the total production of alkaloids. Especially does a good nourishing soil increase the yield. This is the reason why the percentage of quinine in the trunk bark (*Italics mine*) of the vegetative offspring of a high-yielding tree of *C. ledgeriana* may vary from 6.5 to 11%." Perhaps this is the average range, but we have seen other statements to the effect that it is not rare to attain 14% in the trunk bark of the best Java trees; and as you know, we have already passed 13% in some of the trees here, which according to the doctrine that trees attain their maximum quinine content not earlier than the eighth year, should go still higher. This argues one of two things, either (1) we have some especially fine trees here, or (2) Guatemalan soils are sufficiently favorable so that we are going to get excellent yields. Perhaps both. Or maybe the doctor is not telling us all he knows. Doctors have a way of doing that, you know.

Sincerely yours,

Wilson Popenoe

cc Mr Rosengarten

Main Office:
RAHWAY, N. J.
NEW YORK
161 Sixth Avenue
PHILADELPHIA
1649 N. Broad Street
ST. LOUIS
4528 S. Broadway

MERCK & CO.
INC.
MANUFACTURING CHEMISTS

Cable Address:
MERCK NEWYORK

Works:
RAHWAY, N. J.
PHILADELPHIA

In Canada:
MERCK & CO. Limited
MONTREAL
TORONTO

December 24, 1940

Dr. Wilson Popenoe
Antigua
Guatemala, C. A.

PLEASE REPLY TO
RAHWAY, N. J.

Dear Dr. Popenoe:

Many thanks for your interesting letters
of December 8th and 14th.

I am very glad to get your opinion on
the matter of plant diseases and will let the matter
of a plant pathologist rest until next June. If at
that time you have any suggestions, we will certainly
be glad to receive them.

As you can see from the copy of a letter
to Fritz we are having a little trouble getting the
fertilizer out of the country. I believe, however,
that this is only a temporary holdup and that eventually
we will get export permits.

The reports from Coban are certainly
most encouraging.

I judge from your letter that the
"red mottling" disease certainly points to a soil
deficiency of some kind, which should not be too difficult
to remedy.

I have told Fritz that it would certainly
be advisable to develop some experimental plots in the
Coban area.

Mr. Perkins is receiving copies of this
correspondence and I know that he will like to go into
further details with you.

With best regards to you and your family,
I am

Very truly yours


R. P. Lukens

RPL:CS

746 R.345-G

TELA RAILROAD COMPANY

Research Department
La Lima, Honduras
6 August, 1941

Mr. R. P. Lukens
Merck & Co., Inc.
Rahway, New Jersey

Dear Mr. Lukens:

On arriving yesterday, I found your letter of 30 July. I am very glad to have your approval of the Colombian plan to send one of their agronomists to Guatemala for the purpose of familiarizing himself with the details of cinchona propagation and care. We are to-day advising Colombia that this man can come any time after September 1. We are setting this date because I expect to be in Guatemala during September and would like to be on hand when he arrives. His subsistence expenses during any time he spends at Finca El Naranjo will, of course, be for account of the United Fruit Company. We shall also expect to handle any traveling expenses he incurs while in Guatemala, as well as subsistence when he is staying at other points.

I am not dead certain that he will actually come, but I think it is a pretty safe bet. I understand they have in mind sending a Señor Zapata, who graduated some years ago from the Agricultural School at Medellin and has since then been doing technical work on coffee. For the past few months he has been in Puerto Rico, studying the technique of coffee culture in that island.

You asked about Santo Domingo, and I unfortunately have no first-hand information to give you. I have just been talking with our Dr. Dunlap, who knows the island pretty well. I have told him that I have the feeling that volcanic loams are the real thing for cinchona, and he says he does not believe there are any volcanic soils in Santo Domingo. He says there are some good forest lands at high elevations in that island, but he thinks the soils basically are of the kind found in the Blue Mountains of Jamaica. I have been to the old cinchona planting in the Blue Mountains and do not feel that the soils are the kind we would choose to-day for anything but *Succirubra*. They are clays, inclined to be rather stiff, and not at all like the soils on the Guatemala west coast where *Ledgers* are growing satisfactorily.

Obviously, I have very little on which to form judgment, but my hunch is that Santo Domingo is not nearly so favorable as

6 August, 1941

some of the regions I have recently seen in Colombia and Ecuador. There is no doubt in my mind that there are some high grade cinchona lands in those two countries. The only way we can clear up the problem in Santo Domingo is for someone who knows cinchona soils to go over there and look around.

While on this subject, I wonder if I have told you that I talked with Tom Fennell in Washington, and he told me that on further investigation of the areas in Haiti which he thought suitable he finds that the elevations are around 2500 feet, which probably is not high enough. It will be a fine thing if we can have a look at Haiti at the same time we clear up the Santo Domingo situation. If I ever get over there, I will do this personally, but right now a trip to that area is not on my itinerary. As a matter of fact, I would like nothing better than to stay here in Honduras and Guatemala for the next twelve months. I have traveled so fast since the first of this year that it has made my head swim.

I do not think that I have told you much about the situation in Colombia. In the Departments of Caldes, Valle, Cauca, and Nariño there are large areas of volcanic soils at the right elevations. The situation is very similar to that on the west coast of Guatemala, but I am inclined to believe the climate is even more favorable. Of course, there is the fact that this is the native home of cinchona, and this fact alone pretty nearly clinches the deal. Offhand, I am inclined to think there are better prospects of doing something in Colombia than in Ecuador because the Colombians are in general a more enterprising people. (Do not quote me on this in Ecuador.) Where they fall down, however, is on horticultural technique. As far as I have been able to discover, there is only one man in Colombia who understands plant propagation reasonably well, and this is a Bolivian who was trained at the experiment station maintained by our Government in the Canal Zone. I have been and am doing all I can to help the Colombians train some of their own men along horticultural lines. Within the next five years we can expect to see some of these men prepared to do the type of propagation cinchona requires. If and when their man Zapata comes to Guatemala, I am going to drum into him the necessity of paying great attention to the details of seed bed and nursery practise. I shall try to make him realize that he must go back to Colombia and do this work himself. If he thinks he can learn the business by watching Jorge for a few days and then going back to Colombia and telling the mozos what to do, he is mistaken, and the sooner he finds it out the better for all concerned.

We are glad to know that Fritz and his wife are safely back in Guatemala. I look forward to seeing them both next month. When I get over there I shall, of course, give myself the pleasure of running down to Naranjo for a few days. If there are any points you want me to keep in mind, send me a memorandum before the end of this month. In any case, I will send you a general commentary on what I see over there.

Mr. R. P. Lukens

-3-

6 August, 1941

Do you folks know about a man named Samper who is turning out something in the Totaquina line at Bogota? I did not hear about it until my last day there or I would have looked him up. I understand he is getting local bark and selling Totoquina commercially.

With best regards, I am

Sincerely yours,

Wilson Popenoe

Main Office:
RAHWAY, N. J.

NEW YORK
161 Sixth Avenue

PHILADELPHIA
1649 N. Broad Street

ST. LOUIS
4528 S. Broadway

MERCK & CO.
INC.
MANUFACTURING CHEMISTS

Cable Address:
MERCK NEWYORK

Works:
RAHWAY, N. J.
PHILADELPHIA

In Canada:
MERCK & CO. Limited
MONTREAL
TORONTO

August 27, 1941

PLEASE REPLY TO
RAHWAY, N. J.

Dr. Wilson Popenoe
Antigua
Guatemala, C. A.

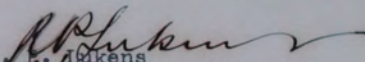
Dear Doctor Popenoe:

In a recent letter which I received from Fritz, he spoke about the fact that you are expected back in Guatemala during September. As you know, I am particularly anxious to make arrangements to see you in Guatemala and would like very much to bring Dr. Krukoff along.

The latter part of September would be fine as far as I am concerned. I do not know, however, whether you will definitely be in the Country and also whether you will have time to devote to Experimental Plantations' affairs.

If the above schedule cannot be worked out satisfactorily for September, will you kindly let me know what time our visit can be planned.

Very truly yours,


R. L. Arkins

RPL:DLC

Main Office:
RAHWAY, N. J.
NEW YORK
161 Sixth Avenue
PHILADELPHIA
1649 N. Broad Street
ST. LOUIS
4528 S. Broadway

MERCK & CO.
INC.
MANUFACTURING CHEMISTS

Cable Address:
MERCK NEWYORK
Works:
RAHWAY, N. J.
PHILADELPHIA

In Canada:
MERCK & CO. Limited
MONTREAL
TORONTO

September 8, 1941

Dr. Wilson Popenoe
Antigua
Guatemala, C. A.

PLEASE REPLY TO
RAHWAY, N. J.

Dear Dr. Popenoe:

I do not believe that I have acknowledged your letter of August 6, 1941. As usual both Mr. Perkins and I read your letter with a great deal of interest.

If and when opportunity offers I would like very much to be able to accompany you on a trip thru Haiti and Santo Domingo.

Fritz has advised that he will do everything possible for Sr. Zapata. He is somewhat worried, however, about the attitude of the Guatemalan Government, his thought being that they may have the idea that the Cinchona project is entirely for the benefit of Guatemala, and that they would not relish the fact that we passed valuable information along to a representative of another Government. I would advise Fritz to be as diplomatic as possible and would certainly suggest that Sr. Zapata take no plants from the country. I see no objection, however, to some seeds. You may have some idea of how this should be handled, and I am sure Fritz would appreciate a word from you in this connection.

In the last paragraph of your letter you ask whether we know about a man named Samper who is turning out Totaquina at Bogota. As far as I know we have no information on the man himself but we do know something about the Totaquina from Bogota. Last June we had a letter from the Department of Commerce in Washington, over the signature of E. G. Holt, Chief, Consumption Materials Unit, stating that he was in receipt of three samples of Totaquina from the American Commercial Attache in Bolivia, and asking us whether or not we could analyze the samples. Mr. Holt was advised that we could take care of these. For some reason or other, our answer was addressed to Mr. L. A. Barber of the same Unit, and a copy of our letter to him is attached. You will note that the three samples are relatively low in Quinine and extremely high in other

Dr. Wilson Popenoe

-2-

September 8, 1941

Cinchona Alkaloids. My guess is that the Totaquina was prepared from Succirubra stock. As you may know Totaquina is a preparation made by extracting a bark and precipitating all of the alkaloids at the same time. For large commercial production I doubt that the material will be of particular interest, due to the large quantities of Bi-alkaloids.

I am attaching a letter dated August 22, 1941 from Dr. Krukoff, concerning Strychnos toxiferra and Oiticica plants. After noting, will you please return to the writer. I do not believe that the Strychnos is of interest to the United Fruit Co. but it is possible that the Oiticica may be, as I understand this is a source of oil similar to Tung Oil. If they are of interest, I will try to arrange to bring them down to Guatemala with me on my next visit.

Hoping that I will be able to see you early this fall, I am

Very truly yours

R. P. Lukens
R. P. Lukens

RPL:CS

cc Mr. Perkins
Mr. Rosengarten

Main Office:
RAHWAY, N. J.
NEW YORK
161 Sixth Avenue
PHILADELPHIA
1649 N. Broad Street
ST. LOUIS
4529 S. Broadway

MERCK & CO.
INC.
MANUFACTURING CHEMISTS

Cable Address:
MERCK NEWYORK
Works:
RAHWAY, N. J.
PHILADELPHIA

In Canada:
MERCK & CO. Limited
MONTREAL
TORONTO

November 14, 1941

Dr. Wilson Popenoe
Antigua
Guatemala, C. A.

PLEASE REPLY TO
RAHWAY, N. J.

Dear Dr. Popenoe:

I wish to thank you again for the time that you spent with us and for the help given.

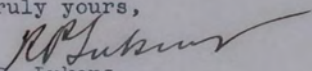
I assume that you have received by this time a copy of the Cinchona Notes, and hope that you will make any suggestions or corrections that you may have.

You will note in the attached copy of letter to Fritz that he is authorized to go ahead with the purchase of the plot below Castanos.

I met Mr. Stanwood when I was in Guatemala and was very much impressed with him. What do you think of him? What I had in mind was the possibility that we might use him in Pennock's place.

With best personal regards, I am

Very truly yours,


R. P. Lukens

RPL:CS

November 14, 1941

Mr. Frederic Rosengarten, Jr.
Finca El Naranjo
Chicacao, Such.
Guatemala, C. A.

Dear Mr. Rosengarten:

Many thanks for your letter of November 5, 1941, and needless to say I had a very pleasant trip back. What really saved the day was the trip from the City down to Barrios with Mr. Standwood. I later had a chance to get to Lancetilla with him and see the experimental work being carried on. He suggested that he would be glad to try some *Ryania* for us. It seems to me to be an excellent spot, due to the elevation and heavy rainfall.

I just received today the carton containing the additional bark samples which will be assayed as soon as possible.

In your letter of November 5, 1941 you asked us to change tree listed as Z-402 to P-402. We find that we do not have the Individual Tree Record for this in our file, so will you please send us a copy.

I have had only one opportunity to see Mr. Perkins and talk with him about general conditions in Guatemala and the general program we have outlined. Later we will go into details. I did tell him, however, about Naranjito, and he has authorized us to go ahead with the purchase, it being understood that the price will be in the neighborhood of \$1600 - \$1700.

On my return I found a letter from Mr. Rodriguez in Costa Rica, a translation of which is attached. You will note that he offers us *Cinchona* seeds from their native stocks. I am also attaching a copy of my letter to him in answer to his of October 15, 1941.

While in Guatemala I gave you four assays covering the Quinine content in samples 1 and 2 from Los Alpes and 3 and 4 from Sachamach. Unfortunately

Mr. Frederic Rosengarten, Jr.

-2-

November 14, 1941

no bark thickness was taken on these samples, and my only suggestion is that when you have small additional samples they be sent to us for this purpose.

Very truly yours,

R. P. Lukens

RPL:CS

cc Mr. Perkins
Dr. Popenoe ✓

copy by regular mail to
Apartado postal numero 284
Guatemala City

P. S. I have also had approved the extra payments for Benítez and Hoehn. These are not to exceed \$100 each and would suggest that you draw the checks from Mr. Gibson and pass them to these two men at the proper time.

Antigua, Guatemala, 22 Nov 1941

Mr R P Lukens,
Merck and Co.,
Rahway, N J

Dear Mr. Lukens:

Yours of the 14th, suggesting that I send you my comments on the program prepared at the end of your stay here, was received a couple of days after I had sent you the comments in question. I have nothing to add now on that score, but desire to say that I quite agree with you regarding Ed Stanwood. He is a fine chap. He has been at Lancetilla now for about a year, and our people there are enthusiastic about him and about his wife. He is a hard worker; he is fond of plants; and he has an excellent personality. For handling the research end of your work here his training is not as good as it might be; nevertheless I believe he would do a good job. And if Fritz ever wanted to return to the States, I doubt that you would find anyone better than Stanwood to head up your work here.

Two days ago Fritz staged a little demonstration of Cinchona grafting at the Fair. It went off beautifully. There was a large crowd present - some 75 or 80 people - and Jorge gave a good talk on grafting and showed how it was done. I think the whole thing was an excellent idea, particularly with a view to showing the public that you are not holding out on them. Mariano Pache was there, and Jack Armstrong, and Manuel Herrera, and several other important people. Undoubtedly interest in Cinchona culture is increasing.

In your letter to Fritz of the 14th, copy to me, you mention Rodriguez in Costa Rica. I do not know him. I talked with Fritz the other day about his trip to Costa Rica, and as I wrote you, I have given him letters to five people down there. Perhaps he can get anything he wants from Rodriguez; but if not, I am sure he will be able to do so through one of the others.

You also mention the possibility of testing Rynia at Lancetilla with Stanwood. This will give you better results, I believe, than anything you might try to do at long range in the lower Motagua valley in Guatemala. Stanwood is equipped to give the material good care and he is interested. You might want to place other material with him for trial. I can assure you that we will be glad to supply the land for anything of this sort, if Stanwood will do the rest - and I know he will.

Best regards always.

Sincerely,

Main Office:
RAHWAY, N. J.
NEW YORK
161 Sixth Avenue
PHILADELPHIA
1649 N. Broad Street
ST. LOUIS
4528 S. Broadway

MERCK & CO.
INC.
MANUFACTURING CHEMISTS

Cable Address:
MERCK NEWYORK

Works:
RAHWAY, N. J.
PHILADELPHIA

In Canada:
MERCK & CO. Limited
MONTREAL
TORONTO

December 22, 1941

Dr. Wilson Popenoe
Antigua
Guatemala, C. A.

PLEASE REPLY TO
RAHWAY, N. J.

Dear Dr. Popenoe:

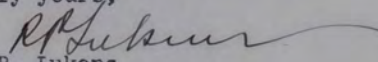
I wish to acknowledge your letters of
November 30th and December 1st, 1941.

I was very glad to get your opinion
of Mr. Stanwood. I was with him, of course, only a
day or so, but was certainly well impressed. From
my description Mr. Perkins also thinks well of him,
and if he gets down to Guatemala during January, he
is going to try to make arrangements to see him.
Naturally I am not positive that Stanwood would be
interested in coming with us, but I have a feeling
that he would be. Nothing was said to Stanwood
directly in this connection. We have had in mind
a couple of men from the States, but if we could find
someone already in the tropics, it certainly would
be a safer bet.

I note the correspondence with Mr.
W. E. Whitehouse. I have heard nothing from him
and I will sit tight until he sees fit to get in
touch with me. Naturally we will be only too glad
to cooperate in any experimental work that he wishes
to try.

I hope that you and your family have
an excellent Christmas and with Best Wishes for the
coming Year, I am

Very truly yours,


R. P. Lukens

RPL:CS

cc Mr. Perkins

Antigua, Guatemala, 2 January 1942

Mr. R.P. Lukens,
Merck and Co.,
Rahway, New Jersey.

Dear Mr. Lukens:

As Fritz has written you, Bert Muller and I spent some time at El Naranjo between Christmas and New Year's. It has been pretty dry down there of late, but on the whole things are looking very well.

Muller made a careful search for pests and diseases, especially in the nurseries. The result was very satisfactory, from our point of view. There were no new fungous diseases in evidence; in fact, he found less than when he visited Naranjo a year ago. He took samples of the "red mottling" and one or two other things for further study in the laboratory, though I doubt that he is yet fully equipped to make the cultures of "red mottling" which Dr. Krukoff wants. Young plants in some of the seed beds and nurseries, the seed beds more especially, showed a certain amount of damage from insect attack. Muller collected quite a few specimens. These have the appearance of being common leaf-eating insects, which he found to be attacking other plants in the vicinity as well as Cinchona. The season is favorable for them right now, due to scarcity of rain. They are on the order of squash-bugs, and nothing which is likely to develop into a major pest. If they should occasionally become troublesome they could easily be controlled.

The Krukoff seedlings which have been transplanted to the field, and which you saw, are coming on very satisfactorily. Some of them have made new growth, and all seem to be standing up very well against the dry weather. We did not get up to Chimborazo, where Benitez says growth is not at all satisfactory. Benitez begins to feel that Chimborazo is too high. He thinks the ideal zone may prove to be 3500 to 5500 feet. Naturally, it is too early to form any conclusions on this point. In the meantime, however, we should probably keep in mind that we do not yet have any good evidence that commercial cultivation of Cinchona can go as high as 6000 feet.

Grafted Ledgers and grafted hybrids in the Loja planting are coming on beautifully. As Fritz puts it, the grafted Ledgers look as hopeful as the seedling Ledgers look hopeless. So far, the only place in Guatemala where seedling Ledgers have done well is at Helvetia. It is mighty fortunate that a large proportion of the original Ledger stock from Java went to that place. Were it not for the trees at El Nil, we would be up against it for high-grade Ledgers to serve as the basis of grafted clones.

My principal object in visiting Naranjo at this time was to take up with Benitez the general problem of grafting. I have never felt that we have done quite enough investigating on this score. I found some very interesting material at this time: a batch of shield buds which Pennock put in, back in mid-September; also a batch which Benitez had put in somewhat later; and a batch of grafts which Benitez made in mid-September. As you know, we have found in the past that shield-buds united well with the stock-plant but did not break into growth satisfactorily. By cutting back the stock-plants hard, soon after a union has formed, Benitez has now been able to bring out the buds in pretty good shape. The method may not prove as satisfactory in general as the Java-type of graft which he has been using, but it may have value: it is very economical of propagating material, which is a point of importance when you are building up stocks of new varieties, and it may prove more successful in dry weather. One of the main difficulties with grafting in the dry season seems to be that the long scion presents too much surface for evaporation, and the grafts dry and die, even after a union has been formed. This was the most striking thing I observed in looking over the material at this time. Of the grafts put in mid-September, practically every one had formed a good union, but many had failed out. It occurred to me that we might be able to get around this by using shorter scions, and might reduce evaporation by using a waxed paper sleeve around the grafts,

tied closely above and below. Benitez and I did some experimental grafting, trying out both these ideas. I feel rather hopeful. The fact that Cinchona grafts so readily when conditions are right - the fact that a union between stock and scion is so readily formed - is very encouraging. I think we need some more experimental work on this grafting problem, and from now on I propose to give it personal attention every time I am at Naranjo. Benitez is good at it; and would probably have done a lot more experimenting already if he had not been so swamped with nursery work in connection with the Krukoff seedlings.

Another point on which I wanted to get myself better oriented on this visit was the fertilizer problem. I do not think this is one of our major problems, of course, but I have felt that we might learn something from fertilizer experiments even though we do not take up fertilizing as a general practice - and I doubt that we shall take it up, in the near future at least. I went over the experiments which Pennock laid out, and which you saw, - those on the Krukoff seedlings in the field. These are too limited, as regards number of plants, to give us any very definite results. His program does not call for any additional applications of fertilizer, only the one made at time of planting. He planned to take growth measurements every six months. With the small number of plants involved, results cannot have great significance, hence I doubt that it is worth while to do more than made a careful series of growth measurements at the end of one year's time from planting. To be of practical value, fertilizer experiments must be conducted on a large scale, so as to absorb variations in soil, moisture conditions, and the like. I doubt that we can do any very convincing experiments in the field until we have a large quantity of Krukoff material in the field, well established, on which to work. We can give this subject consideration later. In the meantime, there is quite a stock of fertilizer on hand and we discussed with Hehn the program adopted at the time you were here, which is, that we will use this material, beginning with the rainy season about May 1, to push forward the more promising trees in the field, such as H-1239, on which we want to get propagating material as rapidly as possible. That H-1239 is a most promising clone, by the way: you know all about it, but I think we have hit it rather lucky, to get a tree which shows such high quinine content, and at the same time promises to be such a strong grower. Undoubtedly it is one of the easiest to graft of all the Ledgers, to date.

We talked over the experiments at Maxbal, and the trip Fritz has just made to Costa Rica. I want to say in the first place that I think he did a fine job in the latter country. And I believe it is the ideal time to plan a few tests down there of Krukoff seedlings and Ledgers. Due to this trip, the local people are very much interested in Cinchona. They will be likely to cooperate energetically in carrying out planting trials. The description Fritz gives of climatic conditions in the zone of wild Cinchona makes me feel that there are excellent possibilities there for the better commercial sorts. I would be in favor of planting a thousand Krukoff seedlings, a hundred Ledger grafts, and a thousand Ledger seedlings down there just as soon as material is available here. Shipment can be made by air express without much risk of loss. As for the Maxbal experiments, Fritz has told me all about your plans to go ahead up there and I am strongly in favor.

I go back to Honduras tomorrow, but hope to spend Easter week in Guatemala and if I do will make another trip to Naranjo.

With best regards always,

Sincerely yours,

Wilson Popenoe
Wilson Popenoe

Federic Rosengarten Jr. *FR*

RAINFALL FINCA EL NARANJO

1941

Month	Head quarters	Loja	Chimb.	Aconcag.
JAN.	1.21	.88	.36	
FEB.	.19	.30	.00	
MAR.	11.45	14.26	13.43	
APR.	11.10	6.69	4.58	
MAY	30.32	30.31	28.94	
JUN.	25.06	12.17	9.54	
JUL.	16.17	13.62	13.35	
AUG.	14.83	11.56	12.86	
SET.	27.09	25.25	20.28	19.58
OCT.	21.09	20.37	15.45	11.90
NOV.	5.57	5.03	4.52	4.12
DEC.	3.25	1.47	.69	.32
TOTALS:	167.33	141.91	124.00	35.92

Antigua, Guatemala, 18 March 1942

Mr. R.P. Lukens:

Cinchona Propagation

Having stopped off here on my way to the States, I took advantage over the last week-end to visit Naranjo. I was interested primarily in seeing the results of the small grafting experiment Benitez and I put on foot when I last visited the finca about New Year's.

As I wrote you at the time, I have wanted to test the possibility of increasing the percentage of success in grafting - especially during the dry season - by protecting the grafts with "sleeves" of waxed paper. Benitez and I made fifteen grafts on this basis, and another fifteen in the ordinary manner, scattering these among the ones with sleeves so as to give a fair comparison.

While this was a very small experiment, the results are such as to encourage further work along this line. All fifteen of the grafts protected with waxed paper sleeves have "taken" and have already broken into growth. The controls, or grafts made in the ordinary manner, have been just half as successful - eight out of fifteen have "taken" but have not broken into growth as well as the protected ones.

In making all these grafts, we also used some shorter scions than those which have been used in the past. We had the feeling that this might help, through offering less surface for transpiration (drying out); I think I wrote you that there have been losses in the past from drying out of the scions even when they have made good unions.

The results obtained from the fifteen grafts protected by sleeves are all the more interesting when we remember that they were made in the driest part of the year. There was practically no rainfall during the ten weeks succeeding the grafting. And Benitez feels that the use of the waxed paper sleeves serves to force the grafts into growth much more promptly. This is likely to prove of importance. There has been some trouble in the past, from grafts "taking" but failing to break into growth.

Benitez has already carried this experiment further by making an additional number of grafts with waxed paper sleeves; and he is also trying sleeves made out of ordinary brown wrapping paper. I would strongly recommend that this work be continued and extended. Even if we find it is not necessary, during the most favorable season for grafting, to use the sleeves, they may prove valuable in assisting us to build up stocks of new clones with a minimum of loss.

I believe it also worth while to go further in testing short scions - about three inches long - in comparison with the type used in the past, which have been four or five inches long. It seems possible that we will get a higher percentage of successes, and at the same time economise in material - a very important factor at this stage of the game, when we have very limited quantities of propagating material available.

Sincerely

Wilson Popeace

cc Geo. W. Perkins Esq
Mr Frederic Rosengarten Jr.

April 6, 1942

Mr. Edward T. Stanwood
Lancetilla,
Honduras, C. A.

Dear Mr. Stanwood:

I confirm recent cable as follows:

"Saw your superior in Washington last week.
Have made tentative arrangements for your
release provided we reach an agreement.
Letter to follow."

As you know I have been away for a short time and, therefore, the delay in bringing to a head a possible employment with Merck & Co. Inc.

First let me say that I had a very pleasant visit with Dr. R. W. Rands and Dr. E. W. Brandes in Washington, last Thursday. Naturally your department heads have no desire to see you go but at the same time they realize the importance of the Cinchona project, and also the opportunity for advancement that lies with Merck & Co. Inc. It was agreed that I would write to Dr. Brandes and that Merck & Co. Inc. would allow the department sufficient time to get a replacement for your work. As you pointed out in your letter it is certainly possible that you can continue your contact with the rubber development in Guatemala. This would not take a great deal of your time and I believe would be helpful to your present employer.

I would like to refer to your letter of March 7, 1942. In the first place, as far as salary is concerned, the company will agree to a salary of \$4200 per year, payable monthly (\$350 per month). No one can guarantee permanent employment but we are firmly convinced, however, of the importance of the Cinchona project and the company has every intention to continue their efforts to produce Cinchona commercially. We believe your opportunities for advancement are excellent.

I cannot go into great detail as to life on our Finca. We have available for your use, a brand

Mr. Edward T. Stanwood

-2-

April 6, 1942

new house which has never been used, and which was built for Mr. Pennock. I am sure that this would meet the requirements of your family.

There is a company car on the premises which can be used to get to our other plantings or to the railroad station. Naturally with the present tire situation, the use must be restricted to absolutely essential business.

It is our idea that if conditions work out as expected, you will assume the direct management of the Finca and act as an advisor to those cooperating in the Cinchona project. Mr. Rosengarten will remain Guatemala manager but I can foresee that his duties are going to take him over much of Central America and possibly South America. Your duties also may take you to other Central American countries. This is the plan in general and may leave some open questions which I hope can be readily ironed out.

Washington has intimated that they will need two or three months to obtain a replacement for you. We will agree to this, but naturally would like to have the time as short as possible. No definite time can be set until I hear further from Dr. Brandes.

Yours very truly,

R. *RSK* Lukens

RPL:CS

cc Mr. Perkins
Dr. Popenoe
Mr. Rosengarten