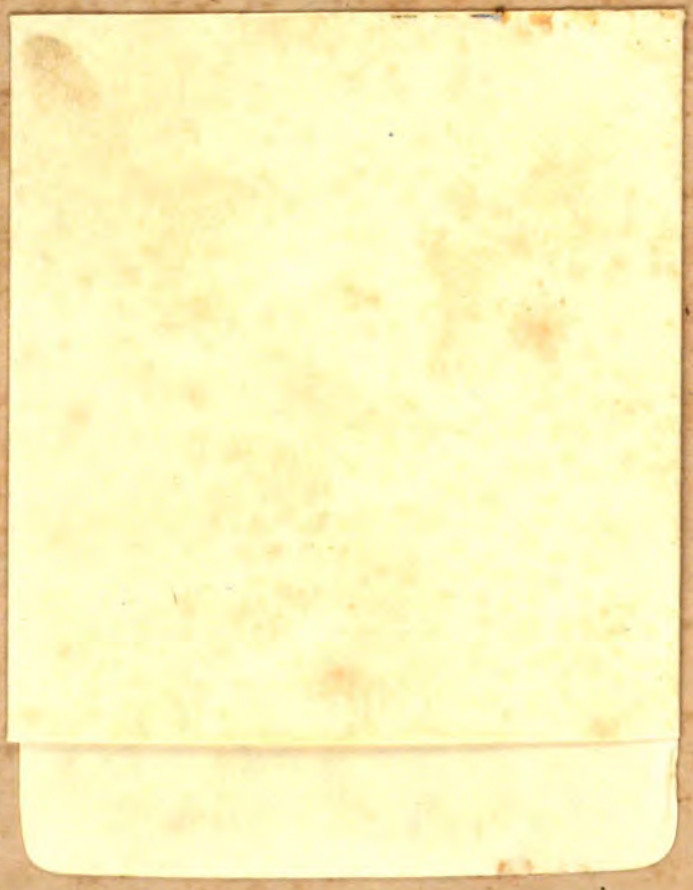

PROCEEDINGS OF THE MEETINGS OF THE ADMINISTRATIVE COMMITTEE OF THE INTER-AMERICAN INSTITUTE OF AGRICULTURAL SCIENCES

HELD IN TURRIALBA, COSTA RICA

MARCH 31 - APRIL 3, 1947

Pan American Union
Washington, D. C.
May, 1947

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MEETINGS OF THE ADMINISTRATIVE COMMITTEE OF THE INTER-AMERICAN INSTITUTE OF AGRICULTURAL SCIENCES HELD IN TURRIALBA, COSTA RICA

MARCH 31 - APRIL 3, 1947

At the meetings of the Administrative Committee held in Turrialba in August and September, 1946, it was decided that the Committee should meet again in March 1947 giving time, therefore, for the development of the program of work previously outlined, for the completion of the construction work, purchase of laboratory equipment and other material necessary for the efficient operation of the Institute, and for the initiation of certain specific projects which were considered at the time of the first meeting to be of great importance and usefulness. The opening session took place on March 31 at eight o'clock in the office of the Director of the Institute with the following members in attendance:

Dr. H. Harold Hume, Provost, College of Agriculture, University of Florida, Gainesville, Florida (Chairman)
Dr. Robert E. Buchanan, Director, Agricultural Experiment Station, Iowa State College of Agriculture and Mechanic Arts, Ames Iowa
Dr. Manuel Elgueta, Director of the Department of Plant Genetics, Ministry of Agriculture, Santiago, Chile
Ing. Luis Cruz, San José, Costa Rica
Mr. Ralph H. Allee, Director of the Institute
Mr. J. L. Colom, Secretary of the Institute

When called upon to discuss their respective programs of work, the following staff members of the Institute participated in the discussions:

Mr. Albert O. Rhoad, Chief, Animal Industry Department
Mr. Norton C. Ives, Chief, Agricultural Engineering Department
Mr. Julio O. Morales, Chief, Department of Agricultural Economics and Rural Welfare
Mr. Joseph L. Fennell, Horticulturist
Mr. Ernest H. Casseres, Olericulturist
Dr. Ora Smith, Plant Physiologist
Mrs. Ora Smith, Nutritionist
Mr. George M. Slater, Business Manager

Also present at some of the meetings and participating in the discussions, particularly of the nutrition program, were the following guests:

Dr. Wallace R. Aykroyd, Food and Agriculture Organization
Dr. J. Lossing Buck, Food and Agriculture Organization
Dr. Arturo Vergara, Food and Agriculture Organization

APPOINTMENT OF NEW MEMBERS TO THE COMMITTEE

The first matter to be discussed was the appointment of a new member of the Administrative Committee to replace Dr. Manuel Elgueta who will resign as member of the Committee as soon as he assumes the duties of head of the Department of Plant Industry of the Institute next May. The Committee suggested that the substitute for Dr. Elgueta should be picked from among qualified persons in Argentina, Brazil, or Chile, and in due time the Committee will make specific recommendations to the Board of Directors of the Institute on this appointment. The Committee also recommended that another member be added to the Committee who could possibly be selected from among competent candidates from Mexico, Colombia, or Venezuela.

Consideration was also given to the appointment of a replacement for Mr. Luis Cruz from Costa Rica, whose term of office will expire next December. The Committee is studying the candidates both in Costa Rica and in other countries of Central America for a suitable substitute for Mr. Cruz.

DATE OF THE NEXT MEETING

It was decided that it would be advisable to have the next meeting in Washington in order that the Chairman of the Committee could report personally to the Board of Directors, and, if possible, a joint session

of the Board of Directors and the Committee might be convened to exchange views on the work and future program of the Institute. The time was set for November 1947, and the exact date will be fixed by the Director in consultation with the other members of the Committee.

TECHNICAL ADVISORY COUNCIL

A general discussion on the status of the Technical Advisory Council of the Institute organized under the terms of the Convention to assist the Director in technical matters pertaining to the program of the Institute gave light to numerous problems involved, including the fact that to date most of the members of this technical council are not technical men. It was agreed that it would be advisable for the Administrative Committee to suggest the names of various scientists and experts in the different countries to the departments of the government concerned with the appointment in order that a more representative group of the agricultural scientific field be incorporated in this Council. It was also recommended that the Technical Advisory Council meet as frequently as possible. (See Appendix I, page 17)

GENERAL PROGRAM OF THE DEPARTMENTS

In accordance with the policy followed at the last meeting, the members of the staff, including the heads of departments, reported to the Committee on the progress made in their respective projects and answered questions pertaining to the problems involved. A thorough analysis of the work entailed in each project was made, and recommendations as to changes in policy and techniques were made by the members of the Committee to the staff. (See Appendix I, page 18, for general discussion of projects.)

The reports on the work of each department appear as appendices to this report as follows:

Plant Industry - Appendix II
Animal Industry - Appendix III
Agricultural Engineering - Appendix IV
Agricultural Economics and Rural Welfare-Appendix V

Coffee Improvement Program

Dr. Frederick L. Wellman, prominent pathologist and expert on coffee diseases, will be stationed at the Institute starting June 1, 1947 and continuing for at least one year. In cooperation with Institute staff members and Costa Rican officials and producers, Dr. Wellman will initiate a study of the various coffee diseases which are considered to be one of the most serious limiting factors in coffee production in the different coffee producing countries.

The Institute has started the development of a coffee experimental and demonstrational area which consists of about thirty hectares (seventy-five acres) and has at present one experiment under way covering fertilizers and various types of ground control. Cover crop, pruning, shade, and other experiments will be installed as conditions permit.

The Committee discussed the desirability of advancing the coffee improvement program and in this connection expressed considerable interest in the project which is now under consideration involving cooperation between the Institute and the Central-America-Mexico Coffee Federation.

Fruit and Vegetable Program

Aside from the various cultural practices in breeding investigations under way in vegetables and the introductions which are being

made on an extensive collection of tropical fruits, chief emphasis will be given in the future to a citrus program. This will be based largely upon vegetative reproduction of superior individual trees selected locally or introduced. Root stock varieties will also be collected and studied comparatively. It is expected that the citrus orchards now being planted will supply a basis for the establishment of higher quality varieties fruiting over a longer period of the year.

The corn and potato projects being developed at the Institute are illustrative of the types of problems on which service can be given to member countries in both temperate and tropical zones. Aside from the usual plant breeding and agronomic activities involved in the improvement of a crop, it is anticipated that the Institute can perform a service to all countries by maintaining a reserve of germ plasm such as would be represented in a collection of potato species upon which institutions in the member countries could draw.

Seed Improvement and Selection Program

It is recognized that enormous losses have occurred each year, particularly in the hot humid countries of the Americas, through the selection of seeds unadapted to conditions or of inferior quality and loss in germination due to conditions of storage. Not only does this problem demand investigation because of its present economic importance, but the Institute will require a means of providing for the increase and distribution of the planting materials which it produces. Provision for seed analysis and a development of adequate types of storage facilities are agreed to be of first importance. The problems leading up to the actual increase of certain stocks, distribution to farmers or seed producers, and such aspects of the certification

problem as may appropriately come within the activities of the Institute should receive attention in the not too distant future. (See Appendix VI for details on the program planned.)

Forestry Program

It was agreed that, since such a large share of the American countries is devoted at present to natural forests, the forestry research and educational program of the Institute should receive prominent consideration. However, since funds are limited for the proper execution of projects already under way, it is believed that a forestry program cannot be initiated during the forthcoming fiscal year.

Herbarium

It was agreed to establish as soon as possible a herbarium in the Institute and invite a botanist familiar with herbarium organization to start this work. This scientist would be loaned by a cooperating organization, and for this purpose the name of Dr. Rafael A. Toro, who is at the present time head of the Division of Biology and Botany of the College of Agriculture of the University of Puerto Rico, has been mentioned. Dr. Toro is qualified to perform this task since he contributed to the organization of the herbariums of the School of Agriculture of Medellín and the Academy of Sciences of Bogotá in Colombia. He has a long record of collecting in the American tropics and has written extensive works on the flora of these regions. Other botanists who desire to collect in the neighborhood and would be willing to add to the collection of the Institute will be welcomed.

Foot-and-Mouth Disease

The sudden appearance of foot-and-mouth disease in Mexico has caused great alarm among livestock breeders and dairy producers not only in Mexico and the United States but in the Central American Republics as well. Definite control measures have been taken by both the Department of Agriculture of Mexico and that of the United States. The Congress of the United States approved an appropriation of nine million dollars to start the work of controlling and eradicating the disease in Mexico and preventing it from spreading into the territory of the United States. Proper authority has been given to the Secretary of Agriculture of the United States to carry out the necessary work in Mexico and other countries of the Americas. A meeting of the Ministers of Agriculture of the Central American Republics and Mexico was held last February in San Salvador to discuss the problems of the spread of foot-and-mouth disease in Central America and also the control of grasshoppers in these countries. Officials of the Institute have been in constant touch with officials of the Departments of Agriculture of Mexico and the United States as well as with the Pan American Sanitary Bureau in Washington for the purpose of establishing the means of cooperation of these international agencies with the governments involved at the present time for any help that can be supplied in connection with the control of the disease in Mexico. If, unfortunately, the disease spreads south into Central America, the cooperation of the Institute will be expected not only because of its location, but because of its international character, since the disease will become then an international problem rather than a bilaterial one as is the case now.

Nutrition Program

One of the most important points for discussion at this meeting of the Administrative Committee was the future relationship between the Food and Agriculture Organization of the United Nations and the Institute. With this purpose in mind, officials of the Institute in the past months have been in touch with the Food and Agriculture Organization discussing the possible means by which a greater collaboration between the two organizations could be established in order to correlate the work in those projects and activities which have parallel objectives.

In accordance with this feeling, the Food and Agriculture Organization courteously recommended that Dr. Wallace R. Aykroyd, head of the Division of Nutrition of the organization, Dr. Arturo Vergara, nutritionist, and Dr. J. Lossing Buck, head of the Land Use Branch of the Agricultural Division, visit the Institute during the meetings of the Administrative Committee. On April 2 they attended one of its sessions, and they held various informal discussions at several other times. Dr. Aykroyd made a statement explaining in general terms the work of F. A. O. (See Appendix VII), and Dr. Buck explained the functioning of the Agricultural Division (See Appendix VIII, page 56.) Dr. Vergara also made several statements which are useful contributions to the knowledge of the problems of nutrition with which the American Republics are faced today. (See Appendix IX)

Preliminary discussions on the establishment of a nutritional project by the Food and Agriculture Organization in cooperation with the Institute were held. Detailed accounts of these discussions are given in Appendix VIII.

SPECIAL PROJECTS

It was agreed by the Committee that the Institute program should be enlarged by the acceptance of special grants when these are available under conditions which are not prejudicial to the policy of the Institute. The acceptance of funds for such projects is amply provided for in the Convention and is a common practice among many research and educational institutions in the member countries. Several projects are under consideration at the present time involving support for research and education in the field of cacao production, the testing of various new chemical compounds possibly applicable to control measures with crops, and the establishment of a new department in the Institute for the training of agricultural teachers and demonstrators.

Grant to the Institute by the American International Association

Last summer the Director of the Institute had preliminary conversations with Mr. Nelson Rockefeller and Dr. Kenneth Kadow of the American International Association relative to the possibility of the Association's carrying out a project at the Institute consistent with the aims and objectives of both organizations. Early this year, Albert Rhoad, head of the Animal Industry Department, and J. L. Colom, Secretary of the Institute, conferred with Dr. Kadow, Mr. Tucker, and other officials of the Association in New York on this subject, at which time Mr. Rhoad presented a detailed project for the development of the Animal Industry Department of the Institute embodying a plan of operations. (See Appendix X.) The Association officials approved this preliminary project in principle, and Dr. Kadow agreed to visit the Institute and study conditions in the field pending

further study of the matter aiming at a definite proposal to the Institute from the Association. This proposal finally arrived in a letter to Mr. Colom dated March 25, 1947 and was replied to by Mr. Allee's letter of April 10, 1947 to Mr. Berent Friele. (See Appendices XI and XII.)

This plan was studied by the Committee members, and it was agreed to accept it in principle. The project as presently stated involves a grant of $158,000 to the Institute which will be used for increasing the farm facilities principally in the animal enterprises. In return, the Institute will supply training of agricultural teachers and demonstrators for the Association. The Committee recognized that this project would make it possible for the Institute to initiate a vocational education phase of its research and teaching program soon, which otherwise would not have been possible for several years. Since this training of farmers, and the institutions and programs provided for this purpose in the member countries, is of such importance, the project was considered to have widespread potentialities.

Cacao Production and Improvement Program

For some time the need for improvement of the cacao plantations in the producing countries of the Western Hemisphere, as well as the improvement of the processing of the product for shipment to the manufacturing centers, has been a problem of great importance. This is true particularly now when the manufacturers find themselves with a shortage of raw material and are faced with a situation that progressively gets worse. If steps are not taken to improve the condition of the cacao plantations in the producing countries, in a short time a complete lack of cacao beans will exist.

The American Cocoa Research Committee, an organization of the most important chocolate manufacturers in the United States, has shown great interest in improving this situation, and representatives of the organization have been discussing with the Institute ways in which to increase production and improve the quality of the product. When the Director of the Institute was in Washington and New York in March, several conferences were held between the Cocoa Research Committee and Department of Agriculture officials, and it was decided that the development of such a program of work with the Institute was most desirable. For details of this program and what it entails, see Appendix XIII.

Chemical Trials in Cooperation with the Standard Oil Development Company

The Standard Oil Development Company has proposed that the Institute undertake a study of the uses of various chemicals now being produced as byproducts of the petroleum industry in the production of economic crops in the equatorial parts of the Americas. This will involve a grant by the Company under which the part-time services of a leader and a graduate student fellowship would be supplied to investigate the growth promoting, herbicidal, fungicidal, and insecticidal properties of a series of hydrocarbon compounds. Since results derived from the project would be of general benefit to the member countries, it was agreed that this project should be entered into as the funds are actually made available by the Company. It was agreed that the contract should be developed along the lines of those currently being used where industrial concerns supply funds to public institutions for research and education. A series of items which are calculated to prevent misunderstanding and assure freedom of research and publication to those involved in the project were discussed and agreed upon (See Appendix XIV.)

TEACHING PROGRAM

The teaching program of the Institute was reviewed with particular attention to the number and kinds of students who could be given adequate instruction during the year 1947-48. As previously decided, teaching will be based upon research, extension, and training projects under way. It was agreed that approximately sixteen students can receive adequate instruction in the various projects now developing. If certain special projects which are under consideration materialize, this number could be raised to approximately forty. It is anticipated that the Institute can serve three general types of students: (1) those desiring to use the library of the Institute and to confer with its staff in connection with a specific technique or advances in a given field but who would not be interested in an advanced degree; (2) advanced graduate students in need of an opportunity to carry out research and fulfill doctoral requirements for which they are registered at other institutions, and (3) students desiring to spend from one to two years in concentrated systematic research and study leading to greater competence in their professional activities and increased ability in their fields of work for the welfare of their countries. (See Appendix XV.)

Travel and Study Grants for Students

In cooperation with the Departments of State and Agriculture, the Institute is studying the question of accepting several students from the United States under grants made by the Department of State for the purpose. These trainees will receive training in different fields of agriculture and agricultural economics and engineering.

Arrangements have also been made for the students from the other American Republics, who have received grants from the United States Department of State to get training in certain fields of agriculture in the United States, to stop at the Institute on their way north to discuss their future program of work and to return to the Institute on their way back to study practical applications of the knowledge they acquired during their training period in the United States. The principle of this plan is to apply theory to practice and enable the trainees to start work in their home countries without undue delay.

LIBRARY AND PUBLICATIONS

A thorough discussion was held with the Acting Librarian relative to the progress made in the library. Great improvement is evident in this department of the Institute, and it is expected that the library will continue to grow and its usefulness to increase. Publications are now received from most of the national departments of agriculture as well as agricultural colleges and experiment stations. Technical publications and agricultural magazines are received from all the American Republics, comprising most of what is published in Latin America in the field of agriculture and livestock. New books have been added to the library, including a collection of books worth $1500 made available by the American Library Association. New equipment has also been added to the library. For complete details on the status of the library, see Appendix XVI.

It was agreed to give an index number to all the publications issued to date by the Institute and all the material published by staff members and in the future to issue these publications with uniformity of format, cover page, etc. A series of technical bulletins

and a journal will be started eventually. The policy of publishing articles of a technical nature in scientific journals will be continued as well as that of publishing the more popular material in magazines of general nature and distribution. The Information Bulletin will be issued on a monthly basis in the future.

FINANCIAL STATUS OF THE INSTITUTE

It is estimated that the Institute will remain within the budget for the current fiscal year as previously submitted. This will be true in spite of the fact that a considerably greater expenditure for laboratory equipment than was previously indicated will be incurred. It has also been necessary to add younger scientists to the staff, and the Institute is very fortunate in having obtained the services of Dr. Manuel Elgueta of Chile, who will become head of the Plant Industry Department in May, 1947. The additional expenditures have been made possible by economies in the use of labor, a considerable reduction in the expenditures of the Rubber Substation in Panama, and by an increase in farm income. A complete analysis of the financial status of the Institute will be reflected in the 1947-48 budget which will be submitted for the consideration of the Board of Directors in due time.

MINUTES OF THE OPENING SESSION OF THE MEETINGS OF THE ADMINISTRATIVE COMMITTEE OF THE INTER-AMERICAN INSTITUTE OF AGRICULTURAL SCIENCES HELD IN TURRIALBA, COSTA RICA ON MARCH 31.

The opening session of the meeting of the Administrative Committee began at 8:00 on March 31 with the following members in attendance: Dr. Robert E. Buchanan, Dr. Manuel Elgueta, Dr. H. Harold Hume, Ing. Luis Cruz, Mr. Ralph H. Allee, Director of the Institute, and Mr. J. L. Colom, Secretary of the Institute.

Appointment of New Members to Administrative Committee.

The first matter to be discussed was that of appointing new members to the Administrative Committee to replace Dr. Elgueta, who will be retiring from the Committee in June to become a member of the Institute's staff, and Ing. Cruz, who will be retiring in December. Mr. Allee suggested that since the American International Association is going to do some very important work, it might be a very good idea to have a member of that organization on our Committee, although it would be difficult to add another North American to the Committee since there are already two. Dr. Hume stated that (now that Mexico is a member) we might enlarge the Committee when Argentina joins. Since as Mr. Colom stated, Mexico has signed and ratified the Convention of the Institute and the ratification has been mailed to Washington to be deposited, the possibility of having a Mexican on the Committee was brought up. It was Dr. Hume's opinion that South America should be represented, and Dr. Allee suggested that the number of members be increased to five, and therefore three new members would be appointed in the near future. Since Argentina is about to sign the Convention, Dr. Elgueta suggested that it might be well to have an Argentine on the Committee in order to have the various sections of the hemisphere represented, that is both the tropical and temperate zones.

After this preliminary discussion, various candidates were discussed. Dr. Elgueta suggested Dr. Camargo Cruz, an animal husbandman from Argentina who has produced a vaccine against foot-and-mouth disease. Among the Mexicans, Mr. Allee suggested Contreras Arias, a meteorologist at the agricultural college at Chapingo, who is chairman of the national student program in Mexico and handles all students who go outside the country. As to Costa Ricans to take Mr. Cruz's place, Mr. Allee suggested as possible candidates, Enrique Macaya, who is secretary of the University of Costa Rica and representative of International Harvester in Costa Rica, has a Ph.D. from Cornell University in history, is a very active man and has ideas which would make him a good addition to the Committee. Another Costa Rican to be considered would be Mariano Montealegre, head of the Coffee Board and prominent in the agricultural field. He was educated in England. Further suggestions on the part of Mr. Allee were Alfonso Tejera, Secretary of Agriculture of Panama; Josa María Zelaya, Minister of the Interior of Nicaragua and a graduate of Cornell University in agriculture, and Dr. R. Alamo Ibarra from Venezuela should the Committee be increased to six members. Dr. Buchanan suggested that Carlos Madrid, Dean of the College of Agriculture of Colombia is also a

good man to be considered. Mr. Colom suggested that in regard to the retirement of Mr. Cruz, although it is not absolutely essential, there is a feeling that another Costa Rican should be appointed, especially since the Costa Rican Government has contributed so much to the Institute.

Although as Mr. Allee pointed out, the Board of Directors actually makes the appointments of members of the Committee, as Mr. Colom declared, it is felt that a recommendation from the Committee itself would facilitate the work of appointing new members. He declared that the qualifications of the man were far more important than the country from which he comes and suggested that, since Chile is one of the most advanced countries in the agricultural field, a Chilean might be considered. Dr. Buchanan summed the matter up by stating that we would look forward then to having representatives on the Administrative Committee from Argentina, Brazil, Chile, Costa Rica, and Mexico in addition to the two from the United States, making a total of seven members, and it was decided that during his forthcoming visit to Argentina and Brazil Dr. Elgueta would look for possible candidates, as well as in his own country, Chile, and the whole matter would be taken up later.

Date of the Next Meeting of the Administrative Committee.

Dr. Hume then brought up the next matter for discussion - that of the time and place of the next meeting of the Administrative Committee since the arrangements for the meetings have to be made well in advance. He suggested that the next meeting might take place in Washington in late October or early November and all present agreed on this. Mr. Colom pointed out that since Mr. Allee had been asked to speak on the Institute before a Committee of the Board of Directors and before the Economic and Social Council during his last visit to the States, holding a meeting of the Administrative Committee in Washington would give the chairman of the Committee a chance to make a statement before the Board and give the Board members some more definite idea of the work of the Institute. As Dr. Hume pointed out, with the exception of Mr. Colom's connection with the Institute, the Board knows very little about the organization. Because of this, the Administrative Committee is actually the backbone of the whole setup.

Mr. Allee suggested that it would be a very good idea to have representatives of other organizations attend the next meeting to be held in Washington, such as those from the Pan American Sanitary Bureau for the Animal Disease Program and the Nutritional program, the Inter-American Statistical Institute in regard to the 1950 census, and the National Research Council. Dr. Elgueta suggested that a policy of having two meetings a year, one in Turrialba and one in Washington, be decided upon, and all agreed that this was a good idea, the one in Washington to take place in the fall and the one in Turrialba in the spring. Mr. Allee believed that at the Washington meeting more emphasis might be given to closer relations with the Food and Agriculture Organization and UNESCO. There is also a possibility that some future meetings might be held away from Washington and Turrialba.

Technical Advisory Committee

Mr. Allee then brought up the matter of the Technical Advisory Committee, members of which are appointed by the various member governments. The Committee now consists of eight members, some of which are not too satisfactory. Dr. Hume pointed out that when the appointments are made by the governments, it is hard to separate them from political elements; however, it is a good idea to have in this Committee men who may represent different fields, and the Institute could call on them for advice on matters within their particular scope. Also, as Mr. Allee stated, they are a point of contact with the various countries. Dr. Buchanan suggested that it might be better to have temporary groups in the various fields, such as animal husbandry, for consultation rather than an over-all group consisting of various types of individuals. However, as Mr. Allee pointed out, the Advisory Committee is set up in the Convention and has a different function from special committees, but other advisory committees specializing in various fields such as Dr, Buchanan suggested, might also be useful, and all might be established on a temporary basis so as not to be left on our hands when they are no longer needed. Dr. Hume wondered if it might be possible for Mr. Rockefeller or someone else to finance meetings of the Advisory Committee every five years or so. It was Mr. Colom's opinion that it would not be too difficult to get the various governments to finance the trip for their representatives to such meetings if they were not held too often. In accordance with the Convention, as Mr. Allee stated, the Institute is supposed to hold such meetings in Turrialba once a year, but thus far this has not been done. The Convention states that each contracting country may appoint a representative to the Technical Advisory Committee to serve for five years and the Committee shall meet at least once a year, although the Director may call special meetings. No member is to receive any compensation, but the Institute may pay travel expenses. When the provision was made for such a committee, it was Mr. Allee's idea that no director should be expected to stand alone under a purely political Board of Directors but should have an advisory committee consisting of one representative from each country. Mr. Colom added that eleven appointments have been made, but there are actually only eight still active, and since it was found that this committee could not actually get going for some time, the more practical Administrative Committee was set up. The value of the Advisory Committee, as pointed out by Dr. Hume is that each member will have a first-hand knowledge of things in his own country or area. Dr. Elgueta stated that the governments often do not appoint the people with the best qualifications for the committee. Mr. Allee stated that a list of proposed nominations is being prepared and such suggestions can be made to the governments by the Pan American Union. Mr. Colom mentioned that Dr. Poponoe was suggested as a member of the Administrative Committee and would like to be connected with the Institute in a more official capacity. However, since he was not appointed, he might become a member of the Technical Advisory Committee as the Representative from Honduras. Submitting a list of candidates to the governments would be much more satisfactory than requesting them to send representatives to fit certain qualifications. Mr. Allee suggested that this matter could be studied

at the next meeting, and in the meantime the members of the Administrative Committee could be compiling a list of likely candidates. Mr. Colom pointed out that it might have been easier to get signatures to and ratifications of the Convention had the Institute actually had a representative in each country to explain what the organization is.

Projects of the Institute.

The next subject to be taken up was the various projects which have been and are being carried out at the Institute. These have been compiled, numbered, and filed by Mr. A. W. Allen, a graduate of Cambridge University in England, and former mining engineer, who has retired and is now living in San José and has kindly devoted his time to taking charge of the Institute's technical reference work. Mr. Allen is also editing the Information Bulletin. Dr. Hume declared that there has been quite a diversity of opinions on the matter of projects, that is, to what extent should a man be allowed to browse around and make extraneous investigations that are not definitely projected or under control. There are some dangers in allowing such freedom, but many good things have come out of it in the States. Mr. Allee stated that it has been the feeling at the Institute that a considerable amount of browsing around is essential. Mr. Ives, for example, has a dozen or so projects under way, and most of the staff members have tended to have sideline interests. Dr. Hume stated that in the initial stages of the work, something of this kind is necessary, but as Dr. Buchanan pointed out, the Institute must not tie up its funds in projects which do not make sense or have any value.

In this connection, Mr. Allee mentioned the new program of the Standard Oil Development Corporation which is planning to offer a sort of sabbatical leave to its research workers, like the Universities do, for a period of six months or a year during which time they will receive their salary but have no definite requirements from the company - a kind of "inspirational leave". Dr. Elgueta, however commented, that in the case of the Institute, the staff is small and a very definite program must be insisted upon. Dr. Buchanan declared that the browsing activities under discussion would be carried out by people supported from outside the Institute who would not need to be working on definite projects. Something of the sort is already in operation, as in the case of the work being done by Dr. Ora Smith, Mr. Cassores will however, as Mr. Allee declared, carry on the program started by Dr. Smith. People like Fennell, as Mr. Colom stated, have been given a good deal of freedom in their work.

The form in which projects are to be presented and recorded was next taken up. It was decided to add a paragraph (d) as follows under the heading I - Projects: "It is understood that each staff member will have sufficient time to browse into new and possibly productive aspects of his field without such activities being definitely projected. Such activities will, however, be described in the regular quarterly or annual reports of the staff members concerned." Mr. Allen declared that all work should be written up

into projects, and it was agreed that there should be a definite record of these projects. Mr. Allee declared that the projects will all be typed up along the same form so that there will be some general pattern of presentation. Copies of the forms proposed were passed out and discussed. Also the project files set up by Mr. Allen were shown to the committee.

Deviating from the matter under discussion, the question of numbering the publications and reprints of the Institute came up. Dr. Buchanan suggested that there ought to be some scheme of keeping track of the articles and publications that originate in the Institute since in the long run the standing of the Institute will to a considerable degree depend on the publications. Mr. Colom suggested that a cover page including the name of the Institute and the number of the publication could be worked out for the reprints and other publications. Mr. Allen declared that though the Institute has the Information Bulletin, this is not technical, and the technical publications should be numbered in order to identify them so they can later be incorporated in the journal and in the reports. Eventually most of the information which comes out of the Institute will be technical.

Discussion of the project form involved the question of who is to approve the projects, and it was pointed out by Mr. Allee that the Director of the Institute, the project leader, and the cooperating agency would approve the projects. Mr. Allen suggested that the chief of the Department concerned should also sign the project. Dr. Buchanan added that the project leader might or might not be the head of the Department, but nevertheless the head of the Department should approve the project.

Mr. Allen then explained that he has listed all the projects from 1944 to 1947 and numbered them according to the date of receipt or chronologically as far as possible, starting with number 101. Dr. Buchanan questioned the fact that proposals have been numbered the same as projects, but Mr. Allen replied that no one knows how many have gone through or are still active, and Mr. Allee pointed out that the numbers are merely for reference purposes. Dr. Buchanan also questioned the fact that the project numbers start with 101 instead of 1. In presenting his list of the projects which have been recorded and also a list of tentative projects which have not been definitely recorded, Mr. Allen pointed out that it is impossible to determine how many of the early projects have been finished or abandoned because the records available are so incomplete. Dr. Buchanan asked if there is a committee to pass on the projects, and Mr. Allee replied that the committee is composed of the Director of the Institute and the four department chiefs. Incidentally he mentioned that projects of the departments are not numbered separately, but all new projects of the Institute are numbered as they are proposed. Mr. Colom expressed the opinion that some of the projects are concerned with more than one department, and Mr. Allen declared that quite a few of them are confined to one department, especially the Plant Industry Department. Dr. Hume warned that we must guard against a situation whereby each individual keeps a wall around himself, and Mr. Colom remarked that until less than a year or so ago, this was exactly the situation at the Institute. Each individual objected to others entering his field.

As an example of this, Mr. Allen mentioned the Service Department of the Institute which was divided into two major departments, Engineering Services, which handled construction, road repairs, etc., and the Technical Services, which handled the office work, laboratory work, photography, etc. Mr. Allee declared that the Service Department would be a major factor in the development of the Institute which has to be pretty self-sufficient. Mr. Colom remarked that although reports had been requested on them, at one time none of the projects could be found in the files, and Mr. Allen declared that there seemed to be a resistance among the staff to any innovations, but some sort of system had to be established.

At this point Dr. Buchanan brought up the question of the allocation of the funds - that is, whether there is to be a definite allocation for each project. Mr. Allee explained that it is very difficult to budget each project, and in the forthcoming budget the allocations will be made to each department. Later when things are sufficiently developed, allocations may be made for each project. Dr. Buchanan asked if in addition to this, a general allocation for research is planned, and Mr. Allee replied that many of the projects are not research projects but service material, and the Institute will be having some teaching projects. As an example, Mr. Allen said Mr. Ives' project on road construction would be a service project. Dr. Buchanan declared that accurate records must be kept on each project so that if one staff member leaves, someone else can carry on, and Mr. Allee declared that this is the present procedure.

Dr. Elgueta to Join Staff in June.

At this point, Mr. Allee requested Dr. Elgueta to make some statement on his plans for leaving the Administrative Committee and becoming a member of the staff of the Institute. Mr. Colom said it would be a good idea to discuss the appointment and when it would become effective. Dr. Elgueta declared that he plans to be ready to leave Chile at the end of May and come to Turrialba with his family and be ready to start working by June 1. He wants frank opinions and open criticism about his work and would like an outline of the work he is to do. Mr. Allee declared that the appointment has gone through and only another exchange of letters giving the actual date of employment is necessary. Mr. Allee said the question of additional staff members would come up later.

Grant to the Institute by the American International Association.

Dr. Hume declared that Mr. Colom had a feeling that the arrangements with Mr. Rockefeller's organization should be expedited, and Mr. Allee brought the members of the Committee up to date with a brief account of his visit to New York last summer to see officials of the American International Association who had expressed a desire to assist in the development of the Institute's program. A project of the financing of the animal industry program was submitted to the A.I.A., which studied it and then decided to make an outright grant to the Institute of $158,000, instead of a loan, in exchange for which the

Institute would give them two services (1) train educational people for them at the Institute and (2) give them consultants on their projects in the various countries. Certain changes in the proposal were suggested by the Institute -- the number of students was reduced from forty to from ten to twenty, etc. Mr. Kadow came to the Institute and went over the whole proposal. Instead of paying the A.I.A. back in money, the Institute will invest the money in an Educational Department. The question is whether or not the Institute should go into this field which hasn't been planned for. No students would be accepted until January 1, 1948, and for the first two years, the Institute would have to finance it. Later the income from the investment would pay for it. The A.I.A. would advance $108,000 on July 1, 1947, $25,000 on January 1, 1948 and $25,000 on July 1, 1948, but it is estimated that the Institute would need $35,675 in addition for the first two years for this program for training teachers.

Dr. Hume asked what would be the basis of the level of education, and Mr. Allee replied that for the first year all the students would come from Venezuela, since the money is actually coming from Rockefeller's investments in the Standard Oil Development Company in that country through the A.I.A. The Institute would train ten to twenty students a year. The man in charge of the program here in cooperation with the A.I.A. men would select them. All should be of the graduate level, and our guess is that they could never find twenty students a year in Venezuela qualified to take up this work. Mr. Colom thought it might be difficult to find even ten the first year.

Dr. Hume asked what the students would do upon their return to Venezuela, and Mr. Allee replied that the United States oil companies which own fifty percent of the oil in Venezuela have combined to improve the welfare of Venezuela and have appropriated nine million dollars to pay for it on a pro rata basis as to the percentage of petroleum taken from Venezuela. The students are going to be used on demonstration teaching farms, and we could give them a lot of help in carrying out this program in Venezuela since there are more practical farm stations through the world than anything else of the sort and it is a fertile field for work. Dr. Elgueta pointed out that most of the students in the established stations are below the graduate level and have only a few years of high school training. Mr. Allee declared that the Institute would train two kinds of people (1) people to do research in farmer training, (2) teachers in one kind of institution or another -- demonstrational or otherwise, and it would not accept students without a Bachelor's Degree. Mr. Colom remarked that otherwise the Institute would be running into Dr. Popenoe's program. Mr. Allee said that both Kadow and his man in the field, John Camp, agree that the students should be of the graduate level since the place to train farmers would be in Venezuela, not in Costa Rica.

Mr. Colom declared that putting this project into our program would help to solve a problem that we have, which is that most of the member countries are asking the Institute to train men on a lower level, and we cannot do it under our present budget. Actually they are requesting that this type of work be done in preference to the research work. It has been stated that we should have trainees in preference to research.

Dr. Buchanan asked if the students would have had any work in theoretical education, and Mr. Allee replied that they probably would not.

Dr. Hume declared that the Institute would have to do two things in this program: (1) give the students a certain amount of subject matter and technical information as applied to agriculture, and (2) give them some information on how to teach and how to supervise. The Institute is equipped to take care of technical subject matter, but not the teaching. Mr. Allee said that an educator would have to be hired from the funds granted by the A.I.A., and Dr. Hume suggested that we would need a good man from the standpoint of vocational agriculture. Mr. Allee suggested two possible candidates. The first was Mr. Draheim, from New Ulm, Minnesota, a graduate of the University of Minnesota, who taught at Smith College, got his M.A. with a major in vocational education, spent two years at Cornell as an assistant to Professor Stuart, took his Ph. D. in rural education with minors in several other subjects, worked in South Dakota for one year and is now in charge of courses at the Department of Agriculture in the office of personnel. During the last three or four years he has worked in 46 of the 48 states organizing these courses. He is about 36 years old and doesn't know anything about Latin American or Spanish but would be excellent at outlining curricula and planning the program. The second possible candidate was D. Spencer Hatch, a graduate from Cornell University in agriculture, who has a Ph.D. in education and has done a great deal of graduate work. He developed the rural construction in India for the YMCA, has published various books, and has been concerned with training farmers, which he is now doing in Mexico. He trains men to teach the farmers. He worked with FAO for a while and was secretary of the extension program at the Conference in Quebec. He is about fifty years old, knows Spanish and has spent about four years in Mexico. Dr. Hume suggested that it would be a good idea to get a man to handle the program and give him perhaps six months to organize it in relation to the whole setup here, and Dr. Buchanan commented that we don't want a man who is too extension minded but rather one who will train teachers.

Dr. Hume commented that this program stretches across the whole field of agriculture and might well be our only contact with many of the countries. Mr. Colom declared that certain countries which cannot now send the type of men we want, will be able to train a certain group of men who are badly needed in all the countries through this program. Dr. Hume said it will give the people who can participate an interest in what we are doing, and then he asked Mr. Allee if it would preclude our reaching to other countries. Mr. Allee replied in the negative, and Dr. Hume asked what would be the length of time that the students would spend at the Institute. Mr. Allee said they would come for one year and if they could benefit by remaining a second they could do so. Dr. Buchanan remarked that although they would not be so much concerned with research, they would have enough contact with it to get the right concepts. Mr. Colom commented that it would give them a desire for greater training and greater knowledge to take home with them, as we are not sufficiently agriculturally conscious yet.

Mr. Cruz expressed the opinion that this would be of great benefit to agriculture and to the Institute. In Costa Rica, as in the other countries, what is needed is production and to train young men to do the work on the farms. Dr. Hume declared that the future progress of most of the Latin American countries lies in the development of their agriculture, and Mr. Colom added that even the countries with mineral resources, such as Venezuela are beginning to recognize the futility of trying to live on their non-renewable natural resources alone.

Dr. Hume inquired as to the prospective age limits of the group of Venezuelan students, and Mr. Allee replied that there would be no special limit but that all must have a B.A. degree. Dr. Hume then inquired what sort of a job could be done with them in one year, and Mr. Allee declared that practically all of them would have to be here two years and that the training would be on an individual basis. Mr. Colom remarked that the A.I.A. has already indicated that a period of three years will be necessary to get the program really going. Dr. Hume asked if the program looked feasible financially, and Mr. Allee replied that it would be very difficult at first, especially during the second year when the Institute would have to borrow from funds allocated for other purposes. Dr. Hume asked how this program is tied to the animal industry program, and Mr. Allee replied that the program is based on that, but we are to pay back the A.I.A. for the money granted in training students rather than in money. To this Mr. Colom added that after the first three years the Institute will derive enough funds from the animal industry department to finance this program. It takes a great deal of time and care to purchase animals, and in the meantime it could be used for something else.

Discussion of the Proposals of the A.I.A. and the Counter Proposals of the Institute.

After this preliminary general discussion of the grant, Dr. Hume read the proposals of Mr. Kadow to the members of the Committee while Mr. Allee read the counter proposals of the Institute, and various comments were made. The Institute is to receive $108,000 on July 1, 1947, $25,000 on January 1, 1948, and $25,000 on July 1, 1948. Considerable discussion was made of the facilities which the Institute promises to furnish for the program. Dr. Elgueta remarked that there would be considerable difficulty in getting the fruit and vegetable crops we would need under way, to which Dr. Hume added that for example we have no citrus orchard. Mr. Allee declared that the program would require more acreage in vegetables than we would otherwise need, and Dr. Hume declared that we would be going into a farm operation that must be self-supporting. Mr. Colom remarked that this is more or less what we have been doing and mentioned the fact that during the war we sold tomatoes and other vegetables to the United States Army in the Panama Canal Zone. He suggested however, that paragraph 2 of Mr. Kadow's proposal be modified so as not to give the impression that the Institute is going entirely into a business enterprise.

Dr. Buchanan questioned the phrase "separate autonomous department" in paragraph 2 which requires separate handling of funds. We want to be sure, he said, that there is no intimation that no research can go on at the same time with the animals purchased for this program. Dr. Elgueta remarked that we will have to have a real farm inside the Institute, and Dr. Buchanan declared that if the program means a separate farming enterprise not under the one we already have, we would get off on the wrong footing. Dr. Hume asked if this would preclude the use of the funds granted by the A.I.A. for the Institute, to which Mr. Allee replied that in our counter proposals, we don't agree to set up a separate farm or to allocate the funds exclusively to the training of the A.I.A. people. For this, we substitute merely the responsibility to train their men. Dr. Hume remarked that Latin American agriculture has a lot in it that is definitely established and worthwhile, and we should take this as a basis from which to work. We must also, he said, be very guarded about the new head of this department and be sure that he comes to the Institute with the idea in mind of cooperating with the departments already in existence. Mr. Colom said that when Mr. Rhoad talked originally to Kadow about this, there was some indication that he wanted too much control over the work and we want to be sure that we don't make the Director of the Institute subservient to the A.I.A. To this Mr. Allee added that Mr. Rhoad had made it clear in his original proposals that the Institute would forego the grant were such a condition to be included in the agreement. Dr. Hume remarked that we would need perhaps to concentrate on certain fruits and vegetables for these students, such as citrus fruits, pineapples, etc. Mr. Allee declared that it will not be necessary to disrupt the whole program of the Institute for these students. They will need to know certain skills such as budding and grafting, and we will have to have someone to teach them. An autonomous organization, again referred to by Dr. Hume, will not be necessary, as Mr. Allee said the general scheme will be to have an assistant to help the head of this new department and he will have different skills from his chief, and also we would depend greatly on artisan teachers, chosen from among the laborers, to teach certain skills to these students. This would be in addition to the assistance they would get from the staff members.

Mr. Allee then read to the members of the Committee the acreage of various crops and number of livestock and poultry and other facilities that would be made available to the vocational education unit for the training of these students, and some discussion was made of them. The funds granted by A.I.A. would permit, he said, the construction of the creamery, slaughter house, feed mill, and freezing unit for this program. Dr. Hume declared that we must realize that this program is in addition to the work being done by the Institute now and will not be taking it over. He also questioned whether the $15,000 for two years allowed for operational expenses of this program would be sufficient. Mr. Allee said that it had been considered that aside from purchases of equipment, $10,000 would be sufficient for operational purposes, and then $5,000 had been added. Also, some income would be derived from the poultry and swine during the first year.

Dr. Hume asked whether after the 300 people agreed upon are trained by the Institute, the agreement would be terminated, whereupon Mr. Allee declared that it might be terminated before that since the program is scheduled to run over a period of 30 years. However, in accordance with the agreement, we would undertake to train 300 people for whatever time is necessary. Dr. Hume remarked that the medical costs for these students would be rather high, but Mr. Allee explained that under the social security system it costs only $1.80 a month per person. Dr. Hume also questioned the idea that the A.I.A. would do all the picketing of the students. Dr. Buchanan remarked that there is no reason why the man in charge of this program could not also have a research program as well. Mr. Allee suggested that a good share of the students who would be held over for the second year could work as graduate assistants. Dr. Elgueta declared that it would be very difficult to separate the costs of operating this farm from the general costs for animals, orchards, vegetable plots, etc. Mr. Allee believed that it would not be too difficult since certain plots and certain numbers of animals would be allocated to them and the students would want to learn farm management as well as agricultural skills. Dr. Hume remarked that although specific requirements have been listed by Mr. Rhoad in the animal industry field, buildings and facilities must also be provided for in the fruit business. Mr. Colom remarked that in 1952 the Institute might ask for more money as suggested in the proposal, and Mr. Allee agreed.

Some discussion was then made of the teaching methods to be used. Dr. Hume suggested that half a day could be spent in lecture and laboratory work and the other half in practical work. Mr. Allee declared that the problem is to combine the two things and remarked that Dr. Popenoe has his students work on the farm in the morning and they fidgit all afternoon in the classroom. Dr. Hume's comment on this was that the best way would be to make the field the laboratory and have lectures there. Mr. Colom commented that there are cases of Latin American students in the States wanting to discontinue the academic work altogether, in preference to practical field work. Dr. Buchanan agreed, for unless the teacher knows plant genetics, etc., he cannot be a good teacher; therefore some laboratory work is necessary to explain why certain things happen in the field.

Mr. Allee then indicated that there is a possibility that the lawyers of the A.I.A. might turn down our counter proposals and consider that we could not give them the sort of training they desire, although Mr. Kadow has written an enthusiastic letter about the program. All agreed however, that this was unlikely. Dr. Hume summed up the discussion on this matter by saying that if this program can be worked out on a mutually satisfactory basis and does

not involve any loss of integrity on the part of the Institute, it would bring to Latin America the agricultural progress the experimental stations have been trying to do in the states, for the objective is to improve agriculture and to make it a worthwhile way of life. This program, if developed, would be a means of bringing this to the other Latin American countries. It was decided that the Institute should continue the discussions with the A.I.A. along the lines of their proposal with the modifications offered by Mr. Allee in his letter to Mr. Kadow.

PRELIMINARY OUTLINE OF WORK OF THE PLANT INDUSTRY DEPARTMENT

Manuel Elgueta G.

INTRODUCTION

This outline provides a working basis for the immediate and future development of the department.

Results obtained and materials produced or introduced in active projects already under way will be used in so far as consistent with the program herein outlined.

ORGANIZATION

I. Records

A. Introductions: A special record book will be kept for all plants. Each introduction will receive an accession number, and the source, use and location of the plant will be noted.

B. Projects: All work shall be carried out on the basis of projects. Each project will state clearly the objectives, methods, duration and necessary equipment or materials. A folder file will be kept for each project and progress reports and other pertinent data shall be attached from time to time. Certain standard printed forms will be used for general types of projects.

C. Field Notes: These shall be kept in special notebooks.

II. Field Experiments

Experimental work shall be planned on the basis of randomized blocks. Preliminary work shall have 8 replicates due to possible soil variation but the number can be reduced later on in the light of experience obtained. Preferably small blocks of 50 to 100 m. will be used except in single rows for certain breeding work or larger plots in rotation studies.

III. Assignment of personnel

A. Each plant breeder or agronomist will be assigned to one crop.

B. Work with each crop will be divided into two parts: agronomic improvement and breeding. Cultivation problems will be considered of great importance.

The person in charge of breeding work with a crop will also be responsible for cultivation and production studies with the same plant and will thus gain a rounded experience with his crop and a full grasp of the problems involved.

C. As the project develops and becomes larger, means must be sought to get an assistant agronomist to take over certain phases or problems with the crop under the direction of the specialist in charge.

D. Pathologists, entomologists and other technicians in the Plant Industry field will also work according to well defined projects and will assist in solving problems of interest to the crop specialists.

IV. Location of experimental work

Location will be mainly at the Institute and at other places when the climatic requirements so demand it. Regional tests can be carried out once preliminary results have been obtained at the Institute.

V. Orientation

Special attention will be given to make the work of international value in order to get different countries to participate.

Exchange of planting materials, careful planning of cooperative experiments, and the carrying out of certain phases of breeding projects in different countries, are some ways to achieve these results.

WORK PROGRAM

I. Meteorological Data

Necessary equipment must be installed in front of the Central Building as soon as possible in order to obtain data on rainfall, atmospheric humidity, maximum and minimum temperatures, and hours of sunlight.

II. Introductions

A. This section shall test systematically all species and varieties of potential interest in the tropics, excluding species and varieties of the major crop plants already assigned for special departamental projects.

Fundamentally the work will consist of growing samples of each kind for study on which systematic observations will be kept which will permit determination of the causes of failure, such as lack of blosooning, absence of tuber formation, fungous diseases, etc. A written record shall be kept on all observations and field results.

B. A collection of useful plants of the tropics, except those otherwise studied in main research projects, will be maintained by this section.

C. The present arboretum will be enlarged to include other important trees, with particular emphasis on the citrus collection.

III. Permanent Rotation Studies

A. This project will be set up to determine the best rotation for tropical soils, particularly by comparing cropping with different rotations.

Plots for continuous cropping of corn and sugar cane will be set up as part of several types of rotation that may be of interest in the tropics. The experiment will be planned with a minimum of 5 replicates, but will be increased if the soil is too variable.

A study of the soils in each treatment will be made to determine loss or increase of organic matter and changes in pH of soils. A main project will be started on level land and a secondary one on land with a 15 to 20% slope.

IV. Corn Improvement

This work will consist of the following phases:

A. Variety Collection: A complete collection will be made of all important varieties grown in Central America and adjoining territories. Studies will be made on field plantings and seed will be kept from year to year.

B. Variety trials: The purpose will be to measure performance and determine which are the best varieties in the country. Varieties from the collection which seem promising may be added to this testing from time to time.

C. Production studies: Experiments will be conducted to obtain information on the best cultural methods, such as spacing, method of planting, intercropping, etc.

D. Fertilizer studies: Nutritional deficiencies (Ca, P, N, K,) as affecting yields will be studied.

Fertilizer placement methods and related topics will be investigated.

E. Fungus and insect pests: A careful survey of insect and fungus pests attacking corn in the region will be made. Seriousness of damage and control methods will be the objects of experimental investigation.

F. Seed Production: Possibilities of producing improved seed in the very near future will be studied. The best native kinds and other improved varieties at the Institute can be increased.

G. Breeding Work: The breeding program will be developed through production of pure lines and single and double crosses. An effort will be made to produce the various types used for different purposes.

H. Genetic studies: Heredity studies will be made, partially for teaching purposes, especially of problems that have not been previously investigated.

V. Sugar Cane Work

A. Variety Collection: An attempt will be made to establish as complete a collection as possible using such kinds as are now available and obtaining others through quarantine stations abroad. A series of single rows of varieties will be maintained. Vegetative propagation can increase kinds that prove desirable.

B. Insects and Diseases: A survey will be made of insects and diseases attacking sugar cane in the country.

C. Variety performance studies: Production data will be obtained from local varieties. Others will be added from the collection after introduction.

D. Fertilizer: Tests will be made with the usual and large fertilizer applications to study the reaction of various varieties.

E. Production: Investigations will be started on the problem of harvesting at different ages and on annual replanting versus the use of stubble for new plants. Additional experimental work will be undertaken to study all phases of importance with this crop.

F. Breeding Work: Clonal selection will be initiated at first to provide superior planting stock of the best performing varieties. An effort will be made to obtain true seed by planting under appropriate conditions or elsewhere and using any special methods deemed necessary. The possibility of using sexual methods of breeding will be investigated.

VI. Potato Improvement Program

A. Location: It will be necessary to establish this project at a higher elevation than that of the Institute.

B. Variety Collection: A study will be made of similar and imported varieties from regions with different day-lengths to study their performance and to determine the possibility of producing seed stock for sale and export.

C. Diseases and Insects: Preliminary surveys made in Costa Rica show that the particular insect vectors that transmit virus disease on potatoes may not exist here. If confirmed, this would make possible the production of disease-free foundation stock tubers for distribution and sale.

The serious problem of the late blight will be investigated experimentally. Testing of the immune strains and varieties produced by Reddick will be continued and other useful material should be obtained. A complete study will also be made of other limiting diseases and insects, such as early blight (Alternaria Solani) and potato flee beetles.

D. Variety Performance Studies: Yield and other factors will be measured in such varieties as show promise in the variety collection.

E. Production studies: Problems dealing with cultivation practices, storage, etc. will be investigated.

F. Breeding Work: Clonal selection will be initiated from the beginning with the best varieties and others that indicate some merit. Should foreign immune or resistant varieties turn out unsatisfactorily, sexual reproduction will be resorted to in an effort to obtain the desirable production, quality, and resistance in new varieties.

VII. Bean Improvement Program

A. Orientation: Beans constitute a staple food of primary importance in North, Central and South America. Fungus and virus diseases, as well as insects, are seriously limiting under certain conditions. Types showing resistance or some superiority otherwise may be found or produced and will serve as foundation stocks for other countries.

B. Variety Collection: As complete a collection as possible will be made.

C. Survey of diseases: A survey should be made to determine geographical distribution, also as an aid in finding resistant types.

D. Breeding: A way shall be sought to obtain resistance in certain types of Phaseolus vulgaris, even going into inter-specific crosses. Such material can be tested in several different countries.

VIII. Crops for main projects when personnel is available.

A. Cacao: Work should be started on this crop as soon as funds are available.

B. Coffee: Investigations will be started when possible.

FORM TO BE USED FOR RECORDING RESEARCH PROJECTS

INTER-AMERICAN INSTITUTE OF AGRICULTURAL SCIENCES

Research Project No. _____ (Date)

Title:

Leaders and Associates:

Cooperators:

Location:

Reasons for Undertaking the Study:

Objectives:

Procedure:

Progress:

Publication Plans: (including agreement between cooperators)

Date of Initiation of Project:

Probable Duration:

Estimated Annual Expenditures:

Approved: _____ Date _____

_____ Date _____
Director

The following information is to be attached:

1. Review of literature.
2. Annual budget estimates including sources of funds.
3. Annual expenditures
4. Progress reports.
5. Annual reports.
6. Titles of publications. (copies if possible)
7. Date of completion.
8. Additional equipment and facilities needed.

APPENDIX III

PROGRAM OF THE ANIMAL INDUSTRY DEPARTMENT

(Albert O. Rhoad)

INTRODUCTION

In considering the over-all or master program of the Animal Industry Department certain basic facts should be taken into consideration that point towards the objectives of the master program. These facts may be enumerated as follows:

1. The importance of the livestock industry in Latin America in regard to both internal economy and export position is well recognized. Improvement of livestock and livestock products, therefore, is to receive the attention of the Institute as a major field of investigation.

2. In the tropical regions it is further recognized that the quality of livestock in general is inferior in type and productive capacity.

3. Disease and parasitic control methods are available for the major causes of death and debility, due for the most part to the lack of financial support and organization to put control methods into effect. Considerable work needs to be done, however, on certain diseases and parasites peculiar to the tropics.

4. Considerable immediate improvements in health and production may be obtained through a more adequate plan of nutrition by adapting known procedures of pasture improvement, supplementary feeding of minerals, etc. There, is, however, a paucity of information on the nutritive value of numerous forages and by-product feeds.

5. That considerable long time improvement in type, resistance, and production may be obtained through genetic means is recognized. Certain breeding-systems generally employed in temperate climatic regions have not been satisfactory under tropical conditions with northern types of cattle. Types of livestock suited to tropical conditions and breeding systems applicable to the situation need to be improved or evolved.

6. In contrast to plant investigations there has been only limited experimental work done with farm animals in tropical America.

7. The processing of livestock and livestock products is often very crude, resulting in inferior products for the consumer and for export.

In consideration of the above well recognized facts the master program for each unit of the department is given below. In these over-all or master programs specific projects on nutrition, breeding, physiology and pathology of the various classes of farm animals are already under way or are contemplated.

BEEF CATTLE PROGRAM

OBJECTS

A. To determine the most suitable breeding system or systems in the improvement of tropical range beef cattle.

B. To develop superior strains.

MATERIAL:

A. Animals: Not less than 200 breeding females, the foundation herds to be composed of 150 criolla and 50 Zebu cows. One, criolla and one Zebu bull are to be purchased with foundation herds. Two Santa Gertrudis and two Brahman-Angus bulls have been purchased for use in this program.

B. Equipment: A series of cattle corrals, chute, holding pens, scale house, meats laboratory, and pastures.

PROCEDURE:

The 150 criolla cows are to be divided into 4 breeding herds and bred respectively to Zebu, Santa Gertrudis, Brahman-Angus and criolla bulls. The Zebu cows are to be divided into three herds to be bred to Zebu, Santa Gertrudis and Brahman-Angus bulls respectively.

The first and subsequent generation females from criolla cows are to be bred to bulls of the same breed as their sires. The first generation females from all Zebu cows are to be backcrossed to the Zebu. The second generation females, that is, those carrying 1/4 Santa Gertrudis, 3/4 Zebu, the others 1/4 Brahman-Angus 3/4 Zebu, are to be bred inter-se with bulls of similar breeding. Bull calves not retained for breeding purposes are to be scored and castrated at 140 days of age. Steer calves after weaning are to be grown and fattened on pastures until 18 months of age at which time they are to be processed in the meats laboratory.

Individuals from the foundation and crossbred herds are to be tested for heat tolerance by the Iberia test as well as in the climatological laboratory. All animals are to be retained on pasture properly supplemented with mineral mixture and salt, taking into consideration any approved nutritional studies.

All animals are to be protected through the use of vaccines, sprays, etc. from the most prevalent diseases and pests except when otherwise used in approved experiments. All animals are to be tested regularly for tuberculosis.

DURATION: - Continuous.

DAIRY CATTLE PROGRAM

OBJECTS:

A. To determine the suitability of various breeds and types of dairy cattle to tropical climatic environment as measured by heat tolerance, production, growth and breeding efficiency.

B. To determine the efficiency of milk production following a pasture versus soilage method of management.

C. To develop superior strains.

MATERIAL:

A. Animals: Not less than six head of females, purebreds of established dairy breeds and not less than three breeds, the Holstein, Friesian, Guernsey and Jersey. Likewise a group of six native or criolla dairy females. Aside from the above foundation females a group of about 40 crossbreds selected on basis of showing adaptability and showing breeding of one of the specialized breeds mentioned above.

Male breeding stock to be Scindhi, established breeds and crossbreds.

B. Equipment: Milking and test barn, calf and bull pens, pastures.

PROCEDURE:

A. Purebred females are to be acquired as long yearling from dams with known records. Native or criolla females are to be selected on basis of type and records, if obtainable. Crossbreds will be selected on the same basis as criolla. It is anticipated that all or most of the females will be acquired in Costa Rica.

B. The Indian dairy bulls are to be obtained in India. Purebred bulls of established dairy breeds may not have to be acquired as it is anticipated that semen from superior sires may be obtained through air service from artificial insemination breeding rings or colleges in the United States. Crossbred sires are to be from Institute herds or approved herds in this or other countries.

Breeding Program:

OBJECTS: To determine the genetic worth of various straight bred and crossbred types for suitability to tropical environment.

PROCEDURE: The six representative females of specialized breeds are to serve as check on production of their respective breeds. All females (18 purebred and 6 criolla) are to be bred to Scindhi bulls; if this is not possible the purebred females are to be artificially bred to bulls of their respective breeds and the criolla to the Holsteins. Foundation crossbred cows are to be bred to crossbred bulls of similar breeding.

First generation crossbred heifers produced from purebred parents at the Institute are to be backcrossed not more than one generation to purebred sire. First and subsequent generations are to be bred inter-se. First generation crossbred bulls from selected dams are to be bred to purebred females of the breed of their dams or bred inter-se as circumsntaces indicate.

All animals are to be kept on an adequate plane of nutrition, taking into consideration systems of management and demands of any approved experiments in nutrition. All producing cows are to be tested for heat tolerance. All animals are to be protected, through the use of vaccines, sprays, etc, from the most prevalent controllable diseases and parasites. All animals are to be tested regularly for tuberculosis.

DURATION: Continuous.

Program on system of management:

OBJECTS:

A. To produce milk within the purchasing power of the average earner.

B. To determine genetic worth of individuals as a source of breeding stock.

C. To obtain the results of system of management on production.

PROCEDURE:

All producing females, not on merit test, are to be maintained on pasture the year round (except during inclement weather as in temporales), milked twice daily at which time they will receive a concentrate mixture in relation to production, with mineral and salt supplements ad lib. All pasture-maintained animals are to go on merit test.

Animals on merit test are to be full-fed for production, maintained in comfortable quarters and milked twice daily. The duration of the test shall be for one complete lactation, preferably the second, after which test the animal is to go into one of the pasture-maintained herds or be disposed of if so indicated.

DURATION: - Continuous.

SWINE PROGRAM

OBJECTS:

A. To determine the breeding and productive efficiency of native versus improved breeds.

B. To develop superior strains that would make maximum use of tuberous crops and pasturage.

MATERIAL:

A. Animals: Not less than 8 head of brood sows, 4 of which are to be native stock and the others to be of established breed or breeds available in Costa Rica.

B. Equipment: Hog house and pastures.

PROCEDURE:

The native sows are to bred in alternate breeding seasons to native boars and to boars of established breeds following a system of mating in which sows of established breeds are to be bred to boars of the same breed. Backcrosses to establish breeds will be made for two generations or until feeding trials indicate differently. The native pigs are to be bred inter-se following an inbreeding scheme, the object of which is to determine the genetic makeup in contrast to purebreds in the same herd.

Efficiency of production especially in relation to growth and fattening will be determined mostly by use of barrows. Due to low production and the high cost

of corn in many areas of the wet tropics, the basic rations will be made up of various tuberous crops readily and cheaply grown. Evaluation of the various types will be based on the efficiency with which such feeds are converted into pork and pork products. All animals are to be kept on an adequate plane of nutrition, taking into consideration any nutritional studies, and are to be kept in a satisfactory healthy condition through known management methods.

POULTRY PROGRAM

OBJECTS:

A. To determine the most suitable breeds for tropical conditions.

B. To develop superior strains.

MATERIAL:

A. Birds: Not less than 500 breeding females of not less than 4 breeds including the criolla type. A foundation flock of 200 birds of criolla type to be acquired locally and 50 birds, or hatching eggs, of superior strains of each of the established breeds of Leghorn, New Hampshire Red, and Plymouth Rock to be acquired where available.

B. Equipment: Four laying houses with individual pastures, a central building for incubators and brooders, range for growing flocks.

PROCEDURE:

A foundation flock of 200 criolla birds is to be trapnested to facilitate selection of parent stock for improved criolla strain. Some of the offspring are to be bred inter-se, others are to be crossed with established breeds for successive generations.

Birds from the foundation criolla, purebred and crossbred flock are to be tested for heat tolerance. All birds are to be maintained on an adequate plane of nutrition tion, taking into consideration approved nutritional experiments. Every precaution is to be made to keep the flocks free of prevailing diseases and pests when not on pathological experiments.

DURATION: - Continuous.

APPENDIX IV.

GENERAL STATEMENT FOR RESEARCH PROJECTS OF
THE DEPARTMENT OF AGRICULTURAL ENGINEERING
(Norton C. Ives)

Herewith assembled are the research projects proposed at this time for Agricultural Engineering.

Two of the projects are now underway:

No. 153 - Erosion control plots
No. 150 - Tile drainage

A series of machinery projects have been prepared in a systematic attempt to set up the basic farm machinery requirements of the Institute. An introductory statement and list of machinery preface these projects.

No. 143 - Rice
No. 144 - Corn
No. 145 - Peanuts
No. 146 - Potatoes
No. 147 - Cane
No. 148 - Grain Sorghum
No. 160 - Beans
No. 161 - Yuca

The initiation of these projects will depend entirely upon getting the machinery and a competent man and graduate personnel (preferably from the States) to properly put into use, operate and care for this machinery. It is hoped that most of them may be started by February 1948.

A group of Service and Research projects have been written up. Due to the nature of this work, that of introducing and developing better methods for jobs that must be done in the operation and development of the Institute anyway, these projects have been entitled service and research projects.

They are:

No. 149 - Field stone removal
No. 151 - Roads
No. 152 - Drainage of lagoon
No. 156 - Grassed waterways

Two other projects that deserve high priority are the dehydration study and the design and construction of a small grain drier.

No. 157 - Dehydration of tropical crops
No. 158 - Design and Construction of a Grain Dryer.

A capable person devoting full time to these two projects will be a necessity under present conditions, as direct supervision and even performance of all work are absolutely essential.

SOIL AND WATER RUNOFF FROM CONTROL PLOTS ON 16 AND 45% SLOPES

Proposed Research Project No. 153.

A high percentage of agricultural lands in the tropics are in mountainous regions. Good virgin soils are found on very steep lands in many areas of the tropics. The general statement could well be made that "it is a steeper agriculture in the American tropics than in the temperate zones".

Since good, deep soils are found on steep slopes and more and more of the steeper lands are being deforested to be placed in cultivated crops, the question arises as to how severe the soil and water losses are for the varying conditions of slope, soil type, vegetal cover, kind of drop, cultural practice and with the frequency of intense rainfalls that occur in the tropics.

It must also be remembered that the intense characteristics of the rain storms that occur in both the wet and dry tropics are conducive to severe erosion. Observations of erosion losses have shown that one intense rain storm often causes more soil loss and runoff than all the other rain storms of the year put together. Therefore, it would appear that cultivated land in the tropics could be subject to severe erosion and that steep slopes could not be farmed for long. However, observations in the Turrialba region for example, do not appear to substantiate this.

In the States intertilled crops are generally not recommended on slopes greater than 15%. In the tropics that is about the slope where cultivated crops begin, and there are many examples of land with more than a 50% slope being planted to intertilled crops. This indicates that work should be started on land with a slope between 15 and 50%.

The approach to an erosion control program in a new area is first to determine in the most expedient manner possible the amount of soil and water losses and a quantitative value of the factors affecting these losses - thus the control plot approach outline below.

Objectives:

1. To determine the soil and water losses from small control plots, as affected by:

   a. Rainfall characteristics
   b. Degree of slope, 16 and 45%
   c. Kind of cover
   d. Kind of crop
   e. Cultural practices followed
   f. Cropping period

2. To determine the erosiveness of a typical tropical soil.

Procedure: A control plot site has been selected on a knoll in Section IV of the Institute. This knoll has a uniformly deep soil that is free from rock. There are areas of sufficient size for the location of control plots that have slopes of 16 and 45% with considerable uniformity of soil on these various slopes. This soil appears to be representative of several of the upland soils in this region.

Test Procedure: Permanent plots.

PLOT GROUPS A AND B will be planted to grass by March 15, 1947 and left in grass until February 15, 1948, except plots A-3 and B-3 which will be made bare after the grass becomes well established and the ground firm by a series of rains, probably August 15th.

Plots 2 and 3 in A and B will be left permanently in grass and bare respectively as indicators or check plots to compare storms in the future. They will be considered maximum and minimum runoff for the respective conditions of soil and slope.

Plots 1 and 4 in A and B will be used to obtain direct measurements of runoff from such crops as sorghum, peanuts, potatoes, yuca, beans, legume pastures, etc. They will simply show the amount of soil and water runoff for the various crops on these slopes and soils.

Plot Group C is designed to compare crops, cultural practices, and treatments as to their ability to retard soil and water losses for this soil and slope (average of 45%).

Due to the more extensive nature of these plot areas, no attempt was made to even or equalize the ground surface to a uniform slope. The plots have been accurately staked out and spaded to a uniform depth.

Starting March 15, 1947, five treatments will be compared:

1. Cane - planted in 10 in. deep hand spaded furrows, spaced 4 feet apart and on the contour.
2. Corn - surface planted up and down hill - 3 foot rows.
3. Corn - contoured but surface planted - 3 foot rows.
4. Bare
5. Grass

These treatments will be compared in triplicate plots, with each of the five treatments placed at random in each of the 3 sections.

The two corn plots will be replanted in August, 1947. The other three will continue. Thus these five treatments will be compared for a one-year cycle.

The second year starting February 15, 1948 all but the cane will be discontinued, and the following 4 treatments, located in each of the 3 sections at random will be started, to run for at least a 3-year cycle and beyond which no plans are made.

1. Corn-Contoured Legume cover

   This is a practice that could easily be followed with present equipment on almost any tropical farm today. It is an attempt to grow continuously one good crop of corn per year and to hold the soil and maintain the soil fertility on such slopes.

   Corn would be surface planted on the contour in February the best time to plant, so the natives say. It would be cultivated until laid by, at which time a good cover crop legume would be seeded in between the corn rows. Velvet beans will probably be tried first. After harvest the stalks would be left standing and the cover crops permitted to grow and cover all the ground. No attempt will be made to harvest any part of the cover crop.

   The field would be plowed probably with a disk plow incorporating all residue sufficiently previous to the time of planting to provide enough decomposition for a good seedbed. Variations to improve this basic system will be incorporated from year to year.

2. Same as above - except corn would be lister-planted. This would show the value of lister furrows in holding soil and water during the seeding and small growth stage. It also introduces the problem of machine use on such slopes.

   A possible variation would be to disk down the residue and list the ground about a month before planting. Then the ridges would be broken down at the time of planting with the rows placed in the furrows. The ability of a small garden tractor or row crop tractor to work on these slopes to do this work will be thoroughly studied.

3. Corn - volunteer

   Corn will be planted February 15 of each year, but after being laid by no further care or treatment will be given except harvesting. The weeds will be allowed to grow. Seedbed preparation the next year will be that necessary to get a weed-free seedbed. Burring might have to be used.

4. Corn - listed, fertilized, cover crop - two crops a year.

This will be an intensified treatment to more or less determine possibilities and limitations. Commercial fertilizer will be applied with a planter attachment. A fast growing legume crop will be planted between the corn rows when corn is laid by. Ground will be disked once or twice as necessary and then lister-planted immediately, the commercial fertilizer stimulating early plant growth during the period the organic matter is processing to make nitrogen available. Two crops per year will be grown.

Plot Management - Considerable difficulties are expected in the use of even small garden tractor type of machinery on these steep slopes. All work will be done on the contour except the up and down hill plots, but on a 45% slope this is still far from the so-called "level farming on hilly land". Plot borders will be made removable for any or all field operations. Experience in working on these slopes will be an integral part of the study.

Measurements -

1. Yields:

Yield data will be taken on all crops through the cooperation of the Plant Industry Department.

2. Runoff:

Temporary installations and procedure for measuring soil and water losses will consist of three barrels and a catchment funnel for each plot. The plot will have a full-time attendant at all times during a rainy period, with perhaps 2 or 3 attendants during a heavy rain.

All material will run into the first barrel. This barrel will provide for some settling and will over-flow alternately (changed manually as often as necessary) into 2 other barrels placed below it. These barrels will be sampled and dumped as fast as necessary.

The amount of labor to properly attend this crude catchment system will probably be prohibitive, and thus the results from these plots may be incomplete and/or inaccurate until permanent catchment facilities can be installed. For example, assume the following rather conservative set of data for this region.

Rainfall:

Maximum rate: 4.5 in/hr.

Total: 10 in/12 hours

Infiltration rate at maximum rainfall: 0.5 in/hr.

Average infiltration rate: 0.3 in/hr.

The maximum rate of runoff from a plot 3x20 meters for this rain would be then; 4 in/hr. or .06 c.f.s This would be a 50 gallon barrelfull every 2 minutes. The total runoff to be handled during the 12-hour rain would be 2600 gallons or 52 barrelfulls.

A sampler will be made out of a 1/2 inch diameter pipe with a closable plug on the lower end. The outside of this pipe will be calibrated according to read depth of water. Thus this rod will first be used to measure the depth, then to thoroughly stir the contents of the barrel; then by inserting it with the end open, and closing it when it strikes the bottom, it will take from each barrel a vertical sample, which will later be evaporated and dried to determine solids content.

If and when this manual method can be properly handled, it can give:

a. Rate of runoff
b. Density of runoff and both of these with respect to time, and in turn to the rate or intensity of rainfall.

Until an automatic rain gauge can be secured, rainfall rate or intensity will be obtained by manual observation at proper intervals using an ordinary can type rain gauge. Permanent sedimentation tanks, multi-slot divisors, etc. will be installed, of course, as soon as funds and time permit.

Progress: All plots laid out and seeded, March 26, 1947.

Publications and Plans:

Date of Initiation of Project: January 1, 1947

Probable Duration: 10 years.

Estimated Annual Expenditures: To build and equip with instruments two thousand dollars; to operate, read, record and analyze data and maintain plots - one thousand dollars per year.

APPENDIX V

REPORT OF THE DEPARTMENT OF AGRICULTURAL ECONOMICS AND RURAL WELFARE
(Julio O. Morales)

PROPOSAL ON WELFARE STUDY

This project has been expanded to cover as many of the social and economic problems of the people living in District No. 1 of Turrialba County as possible. A complete survey of the labor problems will be undertaken by two members of the staff of the Labor and Social Welfare Department of Costa Rica in cooperation with the Institute's Department of Agricultural Economics and Rural Welfare.

A complete census of the agriculture of the district is being arranged with members of the Department of Agriculture of Costa Rica. These two surveys will provide the setting and background information for a proposed Institute of Census Techniques to be established at Turrialba in 1948, if approved by the Inter-American Statistical Institute. This will be essential in the development of personnel for the 1950 Pan American Agricultural Census.

The rest of the work will be performed by Institute personnel and other cooperators as outlined in the draft of the project and the introductory note attached. The principal problem at present hinges in finding a person qualified in home demonstration work, with good basic training in nutrition. Mrs. Smith will handle the specific nutritional aspects of the study. The process of translating her findings, as well as those of other aspects of the study, into improved welfare for the fifty families is definitely an experienced home demonstration specialist's job. A thorough command of Spanish, together with a feeling of the problems of these poor Costa Rican families, is also required. Once the best techniques are developed and established through experience, this same person must be in a position to foster their wider application over the hemisphere.

Cooperation has already been secured from the Health Department of Costa Rica and from the Social Security Organization. They will make available a doctor to examine carefully the members of the fifty families to be studied. The Health Department is planning to conduct a similar nutrition study in the Cartago Region for which our questionnaries will be used. This Cartago study will furnish a check on the results obtained in the Turrialba study as to geographical differences. The questionnaires on food consumption and other nutritional problems have been tested with five families. The most wholehearted cooperation has been encountered in the government, farmers and laborers.

Other questionnaires covering housing, clothing, social participation, lot experience, etc. will be devised as the corresponding segment of the study comes under consideration. It is believed that two students can be trained in relation with this project during the coming teaching period.

PROPOSED NEW PROJECTS

There seems to be a definite need for two new projects:

1. A collection of all available data from large coffee farmers who have been keeping financial and cost data on coffee, sometimes as far back as the twenties. Many have already offered this information to the Institute. There seems to be no trouble in securing the cooperation of these farmers. A study of this readily available information is invaluable for teaching purposes as well as for the orientation of farmers in the future.

2. A survey of the sugar industry of Costa Rica, with special emphasis on panela sugar manufacture. This must be a project in cooperation with the agricultural Engineering Department. It will be similar in nature to the Coffee Processing and Marketing Study. These two studies are referred to as surveys because they will also include a general coverage of the problems of the coffee and sugar cane industries in an effort to determine their most pressing problems.

PROPOSAL ON COFFEE PROCESSING STUDY

The draft on this project has not been written yet because the leaders have found it desirable to do more exploratory work than anticipated before a matured conception of its scope was outlined.

Considerable information already has been assembled and a few processing plants have been visited. The owners and operators of these processing plants were interviewed as to the desirability and usefulness of such a project. A survey of the literature is in the process of being completed. The general impression of the leaders is that the project is useful and timely. The scope of the study, however, should be broadened to serve as a survey of the coffee industry with special emphasis on processing and marketing.

Proposed procedure (preliminary)

A. An economic survey of the coffee industry in this hemisphere with special emphasis on Costa Rica.

B. Detailed study of 25 beneficios in Costa Rica.

1. Cost analysis for all years for which data are available.

2. Time study of all beneficio processes for each beneficio.

3. Floor plan and flow sheet of each beneficio.

4. Detailed study of all mechanical processes for each beneficio.

C. A search, development and study of new methods for processing and marketing coffee.

PROPOSAL ON PROJECT RELATING TO THE INTER-CROPPING OF RUBBER TREES

Two alternatives seem to be open at the present moment on this study:

1. To end the project with only the Goodyear Company data, or

2. To continue collecting data from other growers, publishing only a report on the Goodyear data. Some additional data will provide some idea of the experiences of other farmers, who in many ways would be closer to the type of rubber cultivator of the future. On the other hand, the chances that farmers may plant rubber extensively in the coming years are rather doubtful. It is likely that the personnel and funds available for this project can be diverted to fields where the need is more pressing.

A PROPOSED SEED PRODUCTION AND CERTIFICATION ASSOCIATION

By Ralph H. Allee and Staff
January 24, 1947

Introduction:

Among the agricultural problems that confront most of Latin America, one that seems to demand urgent attention is that of supplying growers with quality seed of named varieties, disease free and known to be adapted to the particular areas where the crop is to be grown.

It is well known that in the food growing areas of many of the American countries the planting stocks used are either of common local parent material or of imported seed which many times is not adapted to the area or loses its quality through poor management in transit and storage. There is a need to show growers that good seed is as basic as machinery, fertilizers or spraying schedules. The New York Seed Improvement Cooperative Association, Inc. states in its 1946 Directory: "No one other item in crop production investment entails so little outlay or returns so much in proportion to cost as does the money spent for pure, healthy and well adapted seed."

The Inter-American Institute of Agricultural Sciences is at a point today where it could use Costa Rican farmers, in general considered to be progressive and cooperative, in starting and carrying out a program of seed stock production and certification, beginning with a starting example, two basic crops, provided the necessary personnel and equipment can be made available. Indications from early pioneer work on corn and potatoes in Costa Rica lead one to believe that the considerable improvement that can be brought about through supervised seed production and certification will interest farmers to take an active part in such a program with the view of becoming partners in it and eventually taking it over as a self-sufficient cooperative business enterprise. It must be realized, however, that a period of time must elapse before growers are convinced of its value and take a part in this type of cooperative enterprise. The Inter-American Institute of Agricultural Sciences would administer the funds until such a time as the service can be taken over by the growers. The Institute would in every case remain as technical consultant. What is achieved with two crops can lead to an extension of the program to cover other food crops and field seeds embracing several countries.

Inter-related Research and Development:

Two distinct but closely related types of activities will be involved initially. Ten thousand dollars per year for two years is estimated to be required for the purpose of intensive research into the ways and means of establishing a seed production and certification service, using the improved materials now available. This sum would undoubtedly be mainly unrecoverable but would make possible the income producing phases of the work.

A smaller sum of five thousand dollars per year for two years is required to set up the seed production and certification service on a self-liquidating basis, using corn and potatoes as an example. On the basis of present estimates this sum of ten thousand dollars should have a period of ten years for complete amortization. The system to be used will be patterned after successful cooperative seed certifying agencies in the United States and elsewhere with such adaptations as are necessary. Income will be derived mainly from:

1. Sale of seed produced by the proposed production and certification organization.
2. Initial entry fees once the service gets under way.
3. Fees based on number of crops and acreage of crop to be certified.

Estimate of Gross Income to Association for Corn Crop Per Year:

The amount and yearly rate of income to be derived by a production and certification organization cannot be determined accurately at this point. However, the fact that improved open pollinated corn where grown has doubled the yield of common local corns and that hybrid seed available has in some cases tripled the common average yield, gives basis to the following conservative estimate of gross income from sale of seed corn in a year of full production and certification after about two years of investigation and development. Small sales would, however, be possible during these two years.

The following is based on open pollinated corn seed production: Twelve corn growers can be found each producing 50 fanegas (570 bushels) of dry shelled corn per year. It is important to note that lowland areas produce two to three crops of corn per year, thus substantially increasing the total crop. Total production by twenty member growers would total one thousand fanegas (equivalent to 800,000 pounds), each selling at a minimum of two hundred colones or 33.3% increase over present market prices for corn used for food. The sale of this corn would bring the growers two hundred thousand colones, of which 10% could be claimed by the certifying agency, or twenty thousand colones - roughly equivalent to a three-thousand-five-hundred dollar gross income per year.

When hybrid corn seed is produced the yield may be lower and the cost of production higher. It is believed, however, that growers would pay a substantial increase over common seed. In the experience of several seed improvement associations, the higher prices paid for certified seed are justified from the standpoint of the buyer by the common experience that, on the average, higher yields of better quality are obtained by the use of such seed.

Crop for Seed Production and Certification:

As a result of more than three years of work, hybrid seed corn was produced in Costa Rica in an experimental way by Dr. W. N. Bangham, Director of Research of the Goodyear Rubber Plantation Company. The unrivalled high yields obtained by the Banco Nacional de Costa Rica, the United Fruit Company and others when this seed was planted in lowland areas seems a good indication that with further refinement of

method and procedure, single and double crossed seed of known parent lines could be produced for sale following a planned program, using techniques and methods already known to give good results elsewhere.

Potatoes are a popular staple food from Mexico to Chile among those who can afford them. Improved seed can make this valuable food available to a much larger proportion of the low income groups.

In Costa Rica the varieties Morada Blanca, Morada Negra and Estrella are the main kinds in use at present. Seed tubers planted are of local origin from any grower or from previous plantings, which often are attacked by late blight. Blight and the use of undersized, poor quality seed tubers are basic reasons for relatively poor yields in Costa Rica and many other countries. Such improvement is possible in a relatively short period. Spraying for blight and use of fertilizers, now gaining favor, are of little use if the initial planting material is diseased or weak through generations of improper selection. In potato growing areas of the United States, by far the most severe diseases to control are those of the virus group. These diseases can be detected only during the growing season and are spread from plant to plant by aphids. Aphides are difficult to control by even the best known spray methods. In general, cool regions of high altitude produce better potatoes for seed than warm sections which are of lower altitude. This is thought to be due to the lesser aphid population at the cooler, higher areas.

As a result of a preliminary survey, it seems possible that certain highland areas may be found in Costa Rica where aphids do not exist and where, it would therefore, be possible to grow foundation stock of United States and local varieties free from virus diseases. Such seed could be sold at a premium in the United States as well as in other American countries.

Plant Material Now Available:

A. Corn

1. One white, open pollinated variety, Institute 451, and one similar yellow variety Institute 452, which have been mass selected three generations.

2. Corn breeding plant material turned over to the Institute by Dr. Bangham which includes 30 pure lines (F_5 or more).

3. Over 500 lines of white corn in various stages of segregation and imbreeding for study and use in pure line formation.

B. Potatoes

1. Three main local varieties from which superior material can be obtained by selection rather than using culls as is the current practice.

2. Fifteen late blight immune varieties produced by Dr. D. Reddick of Cornell and now under trial and increase in four potato growing regions of Costa Rica. Steps are being taken to obtain and test several other improved standard commercial varieties of the United States and other countries.

APPENDIX VII.

REPORT ON THE WORK OF THE FOOD AND AGRICULTURE ORGANIZATION
(Wallace R. Aykroyd)

The Food and Agricultural Organization of the United Nations (FAO) was conceived at a Conference held in 1943 at Hot Springs, Virginia, U.S.A. This Conference, convened in the middle of the war by President Roosevelt, was attended by delegates from more than forty countries. It resolved to set up an international organization concerned with development of agriculture and the improvement of nutrition throughout the world. It was not, however, until late in 1945 that FAO was finally established, at a second Conference held in Quebec. Some forty-four nations have accepted its Constitution and have undertaken to cooperate in its work. FAO has at present an annual budget of about five million dollars, each member country contributing in accordance with its means and the size of its population. It is one of the "Specialized Agencies" of the United Nations and works in association with the United Nations. The headquarters of FAO are at present in Washington, D. C., U.S.A.

The functions of FAO are set out in its Constitution. Its essential objectives are the improvement of food supply and the raising of nutritional levels, with all that these involve. It will work in close collaboration with member governments and will furnish them on request with technical advice and assistance. Already FAO has sent an advisory mission to one member country, Greece; during the summer months of this year it is sending a mission of a similar type to Poland. In order to carry out its work, FAO is organized into a number of Divisions. These are: Agriculture, Forestry, Fisheries, Economics and Statistics, and Nutrition. The technical staff of FAO, which may number four hundred when the organization is fully developed, is international in character and selected on a wide geographical basis. The present Director-General is Sir John Boyd Orr, a distinguished Scottish scientist who has worked in the fields of nutrition and agriculture for many years.

When FAO first came into existence late in 1945, it found it necessary to turn its attention to the immediate food situation. In May 1946 it convened a meeting on "Urgent Food Problems" in Washington, D. C., as a result of which the International Emergency Food Council was created. This body has been concerned with the allocation of various foods in short supply to food importing countries. At a conference held in Copenhagen last September, the Director General put forward proposals for the creation of a permanent World Food Board which would have the responsibility of improving the distribution of foods throughout the world for the benefit of the different countries and stabilizing the prices of agricultural products. These proposals were discussed at great length by a Preparatory Commission representing twenty nations. While the Commission did not accept them <u>en toto</u>, it has nevertheless put forward a program which is designed to prevent the recurrence of agricultural surpluses and economic depression such as occurred in the early thirties, provided the nations cooperate and work together along the lines suggested by the Preparatory Commission.

It is proposed that each member country should set up an FAO Committee. This has already been done in most countries in Europe and also in a number of countries in other continents. The FAO Committees provide a channel of communication between FAO and member governments, and will help to develop FAO activities in the countries concerned. FAO Committees have not yet been set up in Central and South America, but it is hoped that these will be established in the near future. Apart from these Committees, it is proposed to appoint three special representatives of FAO who will be concerned with programs for the improvement of agriculture and nutrition in Latin America. One of them will work in Central America, and the other two in South America.

In addition to cooperating with governments, FAO also plans to work in association with already established organizations engaged in agricultural research and related activities, such as the Inter-American Institute of Agricultural Sciences at Turrialba, Costa Rica. Three members of the technical staff of FAO - Drs. W. R. Aykroyd and Arturo Vergara of the Nutrition Division and Dr. J. Lossing Buck of the Agriculture Division -- visited Turrialba in the first week of April to discuss problems of mutual interest with the Administrative Committee and the Staff of the Institute. Preliminary plans have been made for carrying out nutritional surveys in Central America. The object of these is not only the collection of important information, but also the devising of practical methods of improving nutrition. FAO and the Inter-American Institute will collaborate in this work.

Central America has abundant resources for increasing food supply, and if these are energetically developed, the diet and health of the people will be greatly improved. Among the most important means of improving nutrition is education in better dietary habits.

Only a few of the current FAO activities have been referred to. Mention may be made of the fact that a forestry conference, concerned with the timber resources of Central America, is being convened by FAO in the near future. FAO is not a large organization, and the problems with which it is confronted are enormous. It can achieve very little without the full cooperation of member governments and of institutions and scientists working in the same field toward similar ends.

APPENDIX VIII.

REPORT ON THE ACTIVITIES OF THE FOOD AND AGRICULTURE ORGANIZATION GIVEN TO THE ADMINISTRATIVE COMMITTEE AND STAFF OF THE INSTITUTE ON APRIL 2, 1947

Dr. Aykroyd: Our Nutritional Division now has ten technical people on its staff. The Geographical Division has a Dutchman, an Egyptian, a Colombian, a South African, an Australian, an Indian, a Greek, two Britishers, a Filipino, and two Americans on its staff. We are definitely beginning on a technical program in nutrition following the recommendations of the standing advisory committee which met last year in Copenhagen. We are making surveys in school feeding, etc. and studies of certain problems. For example, we have on our staff a distinguished worker from the Dutch East Indies who is studying the rice problem with a view to feeling out lines of future policy with reference to milling and fortification of rice, etc. We hope in due course to hold a nutrition conference in the Far East to deal with these problems. FAO is convening a rice study group which will meet in India in May of this year. It will be concerned with supply rather than with nutrition. Another man is studying wheat and its nutritive value in the various countries, such as England, Canada, and Australia. We have a number of other activities proceeding, for example, collecting data on school feeding programs in the different countries. We are also concerned with European problems and getting as accurante information as possible about present nutrition in Europe and are therefore organizing committees to collect such data.

The general activities of the preparatory commission following the Copenhagen Conference meeting in Washington from October to January of this year have been concerned with nutrition. It didn't achieve what Sir John Orr hoped it would but has issued a report and the World Food Council has emerged. We hope that our conference this year will follow a different course than we have followed in previous years. We have asked the different countries to give us a periodic report outlining FAO's field of interest. This data will be related to the member countries by the secretariat, and it is hoped that the Conference this year will be divided into small technical groups dealing with the problems in the countries. This will be a sort of experiment this year to see how it works.

The Agricultural Division is divided into various subdivisions. The Economics and Statistics Divisions is going ahead with vigor and has recently issued a report under Dr. Tolley. Fisheries Division has had definite difficulties in recruiting. Forestry is going ahead rapidly under its French Director, and it has quite an active program.

After this preliminary discussion of the work of FAO by Dr. Aykroyd, Dr. Buck gave some explanation of the Agricultural Division in particular:

Dr. Buck: The Agricultural Division has been rather slow in getting started because of delay in the selection of the head of the Division. Dr. Ralph Phillips came to FAO in early December to head the Animal Industry Branch of Agriculture and assumed the responsibility of Acting Head of the Division. Dr. Robertson, the newly appointed head of the Division, is coming in April.

There are now four branches in the Division - Animal Industry, Plant Industry, Extension, and Land Use. In Plant Industry there is one assistant, an entomologist who is now studying insects and will produce a monograph for distribution in the member countries. In the Land Use Branch, there are two members, myself and a soils fertility specialist. In May Dr. A. B. Lewis will join the branch. The overall approach in this branch is related to land development on land already under cultivation or which might be put under cultivation on an economical basis. We will have two other soils specialists, one in soils classfication and the other in soils physics. Farm machinery and small implements come within this branch. We plan to initiate a study of small implements in China and India to ascertain the best types that can be used on small farms. Later, developments will be initiated in the other countries also. We will have one or two specialists in irrigation and drainage and one on progress organization. We must get the farmers together in some sort of organization to utilize the water and keep it off the land. We have to select men who know their own field, and their job is to be acquainted with what is going on in their own countries, be up to date on matters pertaining to their own fields, prepare monographs from time to time for distribution among member countries, answer inquiries, and send specialists or recommend technical persons to go to countries which might request help with special problems.

We have two or three monographs under preparation. For instance, there have been many arguments over the use of organic and inorganic fertilizers, and a paper is being prepared on this under the leadership of Dr. Bradfield. We have been asked to prepare a monograph on soil erosion showing what has been done in the various countries, using illustrative material from the different countries and pointing out practices that have proved successful. The paper is to be called "Soil and Water Conservation". The attempt will be made to give proper balance to all the elements involved, but emphasis will be placed on underlying principles and managing practices. Another paper is to be prepared on the potential increase in agricultural production on the basis of known practices and knowledge of the increase in production that could be expected. This is very dfficult to do, but it would seem possible to give some idea of what might be anticipated. This paper is to be prepared by Dr. A. B. Lewis. FAO is actively recruiting now and hopes to be of greater service by the end of the year.

After Dr. Buck's discussion, Dr. Aykroyd attempted to explain what FAO proposed to do in Latin America.

Dr. Buck: There are three Latin American members on the Executive Committee. We are going to have three regional offices in Latin America, one in Central America, a second on the East Coast of South America, and a third on the West Coast of

South America. Specialists from these areas are going to be asked to join FAO for a certain period and then return to their countries and act as liaison officers for FAO work. In these regional offices we will have our own staff and send down technical representatives from FAO to encourage the development of work in the countries that are concerned. We will probably start the first regional office in Central America. The Director General is in the near future going to make a tour of Latin America; he is supposed to be here the first week in May.

The Forestry Division is holding a timber conference in Central America in the near future. This is the first visit of members of the staff of FAO to Latin America, and we have great opportunity for developing work in this particular part of the world.

Mr. Allee: We have a communication from FAO giving the date of April 26 when this forestry commission will arrive in Turrialba. There will be three members and they hope to stimulate an inventory of forestry resources.

Dr. Buchanan: Has FAO progressed to a point where it has made an announcement of its probable future headquarters? You have divided Latin America into three parts. Could these be defined more definitely?

Dr. Vergara: There has been some difference of opinion about defining the limits of Central America, but it has been considered best to include the area from Mexico to Panama inclusive and also the Caribbean countries. The west and east parts of South America would be separate regions.

Mr. Allee: It has been said that the divisions would be made among the countries facing north, those facing east, and those facing west. Colombia and Venezuela might well be included with either group.

Dr. Elgueta: I don't understand the division of South America into east and west regions. From the standpoint of production and way of life, it would be better to divide it into northern and southern portions.

Mr. Allee: You mean the La Plata countries and Chile would constitute one region, while Colombia, Venezuela, Brazil, Ecuador, and Peru would constitute the other division.

Mr. Colom: This was the grouping that we had talked about.

Dr. Aykroyd: I don't think we have finalized this at all.

Mr. Colom: No, but this has been the general course of the conversations.

Mr. Halle: The division then is more or less between the temperate and tropical zones.

Mr. Colom: It is on the basis of similarity of products and type of production. Another consideration is that of the Amazon Basin which includes a tremendous region, parts of Brazil, Colombia, Ecuador, Venezuela, Peru, Bolivia, and might be considered a separate region.

Dr. Buchanan: We are thinking more of men than of offices. The offices will merely serve as headquarters, and the men will be traveling around.

Mr. Halle: Does FAO plan to do a great deal of original research on its own, or coordinate research done by other organizations, or cooperate on research with other organizations?

Dr. Aykroyd: We are not in a position to do regional research ourselves and we coordinate research and cooperate to some extent with other organizations by sending technical staff members and advisors to them and securing help for such organizations through foundations which have money for various fields.

Mr. Ives: Is this to be a sort of world agricultural extension organization?

Dr. Aykroyd: We will undertake actual research, make studies, and get together information from the different countries made available to us from workers in our particular fields. The extension work will be directed to educating the governments rather than the agriculturalists, and to this extent it will be an extension body.

Mr. Colom: Doesn't this apply more to agriculture than nutrition? Are you not planning to do research on nutrition in this hemisphere as in the rest of the world?

Dr. Aykroyd: We are trying to get other bodies to do this research for us and then coordinate it.

Dr. Buchanan: Would you possibly send missions to the Institute and elsewhere?

Dr. Aykroyd: We are sending a nutrition worker to Greece in the near future; one will go to Poland this summer; and South Africa is going to ask for a mission.

Mr. Halle: Will these be financed by the governments which request them?

Dr. Aykroyd: Yes, but FAO will probably take care of transportation to and from the country. The mission would not necessarily consist of FAO's own people. A balance would be maintained between members of FAO's own staff and outside technicians.

Mr. Ives: Would it be a definite objective for you to allign yourselves with outstanding men in the agricultural field?

Dr. Aykroyd: One of our policies is to establish in the various countries F.O committees consisting of an administrator and technical people in the different countries. Such committees have been set up in all the European countries, but they haven't been started in Central or South America yet.

Mr. Colom: When we first heard about the establishment of these national committees, the idea was for these units not to receive compensation or a specific sum of money for operations, but rather technical men would be selected who, because of their positions could best help FAO's program. Is this true now?

Dr. Aykroyd: The type of committee differs from country to country. In some countries there is the FAO administrator only, and in others there are outside people.

Mr. Colom: Would FAO finance the operation of these committees?

Dr. Aykroyd: Definitely not.

Mr. Colom: It is a very important activity to have regional offices in each country, but if they do not receive some financial help from the central organization, the work will be rather limited.

Dr. Buchanan: In many of the countries there would be technical men as members who would be in direct communication with FAO in order to dodge too much communication between FAO and the other countries. FAO then could communicate directly with the representative in each country.

Mr. Allee: Those committees would appear to be somewhat similar to our Technical Advisory Council where each country appoints one individual who informs the Institute as to the problems it ought to consider and in turn keeps the country informed as to the functions that the organization might perform.

Dr. Aykroyd: These are very valuable; for example, should we desire a report on school feeding in Canada, we would write the FAO committee there. Perhaps, however, you are confusing the committees with the regional offices which would be financed by FAO itself.

Mr. Colom: I was thinking of a committee of 5 or 6 men that you would have in each country, whose purpose would be to cut the red tape and supply accurate information as promptly as possible. To me the establishment of these committees is very important because the Pan American Union has suffered greatly by not having a representative in each country. It would be interesting to look into the actual disbursement of some funds, not salaries, in order to make the members of the National Committee responsible directly to FAO as this would add greatly to the effectiveness of the work of such a committee.

Mr. Hall: This has been done by international organizations. UNESCO has representatives in many countries, not on a full-time basis for many of the people, but they may meet once a week, once a month or so to discuss these problems, but there is nothing that involves the expenditure of funds by them.

Dr. Aykroyd: We hope that in some countries the committees will be more than channels of information but will help to spread knowledge of FAO in the various countries. It would be physically impossible to finance these committees, but we hope to keep them active by giving them plenty of work to do and bombarding them with questions. Otherwise, they will tend to fade out.

Mr. Colon: These regional officers could also move into other countries and stimulate work.

Dr. Aykroyd: This will be one of the most important jobs of the regional offices.

Mr. Colon: I was not thinking of the payment of salaries when I referred to financing the committees, but to transportation expenses, rent, telephone, telegraph, and like items.

Dr. Aykroyd: We have 44 countries and if we financed one of them, we would have to finance the lot.

Mr. Allee: I believe the Secretary of Agriculture was to be the chairman of the FAO committee in the United States and have members representing the various government departments and various farm groups throughout the country of the committee. The committee was to have a permanent secretary.

Dr. Aykroyd: We might also have a broader group within each country, such as the old League of Nations Units or the not exactly official body interested in UNESCO which meets from time to time.

Mr. Rhoad: There are several other organizations like this Institute that have parallel objectives. Does FAO visualize any organic tie with these organizations?

Dr. Aykroyd: Associations with the other specialized organizations are improving. We have a permanent representative at UN who is concerned with the coordination of the work of FAO with other organizations. We overlap with the World Health Organization in the field of nutrition, but we have sent a member of the Nutrition Division to Geneva to attend a meeting of WHO, and this is being straightened out quite satisfactorily. There will be great danger of overlapping with the work of other organizations unless there is close coordination. FAO got off to such a flying start that it feels a bit superior, but this is all taking shape now.

Dr. Morales: It would be wasteful if FAO had a full fledged program in the Latin American countries which duplicated that of the Institute.

Mr. Halle: There is the problem of working out relations between the various organizations. The best way to do this is through experimentation and practice, and the people doing the jobs should get to know each other and get the habit of working together.

Dr. Buchanan: The countries themselves need to know the kinds of services they can secure from these organizations. To whom, for instance, would one of the Central American countries turn at the present time for some special information on grasshopper control - to FAO, the Institute, or the Pan American Union perhaps?

Mr. Halle: I have a feeling that these things work themselves out satisfactorily when the men know each other and are used to cooperating.

Dr. Aykroyd: It is a definite point of policy with FAO that where a job is being done by any other body, FAO does not interfere with it or vice versa, as FAO does not attempt to overlap with the work of other bodies.

Mr. Halle: An example is the Amazon project of UNESCO which claims that it is doing pure science and other organizations may take advantage of these scientific investigations.

Mr. Allee: Regional representatives will go a long way in working out the relationships with other organizations.

Dr. Aykroyd: We do feel that UNESCO is going to be a problem in some respects. They feel that this so-called science lets them into any field.

Dr. Hume: Possibly certain facilities here might be of use and value to FAO in working out the local setup.

Dr. Buchanan: I think it would, since we were definitely asked whether, if FAO sends three men to the country, we would have facilities for them here for perhaps three or four weeks.

Mr. Allee: It seems to us like an excellent idea in every respect.

Dr. Buchanan: I think on the whole that it would be very favorable, but I am troubled about one element. The Institute is supposed to work with all of the American countries, and this would make the headquarters a subdivision of the Central American area. We would not want it to complicate our relations with the other areas.

Dr. Hume: I hardly think this would be likely to come into the picture at all. I do not want it to develop that the Institute is an organization exclusively for Central America, but if there are other locations besides the Central American one, I cannot see where any criticism of this kind would be levelled at us.

Dr. Buchanan: I would want the other regional offices of FAO to feel equally free to use the services of the Institute.

Mr. Allee: There are two points that we have discussed with Mr. MacDougall in relation to this (1) representatives to the other countries would pass through here for a sort of orientation, and (2) we would be glad to offer facilities here to the FAO representative here and would like to have FAO representatives in other countires represent the Institute in those countries.

Mr. Rhoad: More likely the men on the FAO committees would be members of our Technical Advisory Council.

Dr. Elgueta: It is difficult for the Institute to reach the far away countries like Chile, Uruguay, and Argentina, and this might be a way to reach them.

Dr. Hume: What facilities would FAO require from the Institute to establish its office here?

Dr. Aykroyd: I am not in a position to answer this at the present time. If the representative were stationed here, this would be a sort of central point from which he could operate. He would need a room so to speak.

Dr. Hume: What could the Institute do to further your objectives? This is a new item to us as a committee and we would like to have the requirements of the situation in order to act upon them at a later hour.

Dr. Buchanan: It would require some office space, some clerical assistance perhaps, living space for the family, space in the dormitory for the man himself to stay when here, laboratory facilities possibly. However, if laboratory facilities were involved, it would probably mean that the two organizations would be joining on some project.

Dr. Aykroyd: My own idea is that the man would be able to pay rent for living facilities and would not need laboratory facilities. He would make use of the library certainly, but much of his time would be spent in traveling around the different countries of this area.

Dr. Buchanan: When here he should have what you might call faculty status.

Mr. Rhoad: Would FAO visualize using the Institute for special conferences such as on cacao, etc.?

Dr. Aykroyd: FAO could sit in on conferences of your organization and if there was one of particular interest to FAO, we might share the expenses of such a conference.

Mr. Allee: A conference for the Latin American region on the exchange of scientific information might appropriately be held here.

Dr. Hume: It seems then as though an invitation should come from us to FAO to establish a regional office here or that FAO should make such a request of us.

Mr. Allee: We have a letter from Sir John Orr to which we might reply in order to start the formal procedure.

Dr. Aykroyd: FAO is of course in its preliminary stages, but it is a rapidly growing organization.

Mr. Halle: One of the most important reasons for the avoidance of duplication is that the Congress of the United States may begin to ask questions as to why we are paying money to FAO and to the IAIAS if they are doing the same jot. Actually the budgets of the organizations are jeopardized unless there is an avoidance of duplication.

Mr. Cruz: I was thinking that if FAO has in mind doing something for the health of the Costa Rican people, the office should be placed in San José. In this case the project should be taken up with the Costa Rican Government.

Mr. Colom: The work on Costa Rica would be taken up with the Costa Rican Government, but this work would include as well the five Central American countries and the Caribbean area. Work done in a particular country would of course have to be taken up with the government of the country, but the work contemplated here will ramify more. When we discussed the Convention of this Institute we were careful to construct it so as never to encroach on or duplicate the work done by the national governments.

Dr. Aykroyd: Costa Rica has not as yet joined FAO, but we hope that it will do so in the near future.

After a brief recess, the Administrative Committee and FAO representatives reassembled and discussed in more detail the nutrition program of the Institute and its connection with FAO.

Dr. Aykroyd: On general principles it is desirable to initiate cooperation with an Institute of this kind.

Dr. Buchanan: It is equally important that we recognize that many other organizations will be doing nutrition studies.

Dr. Aykroyd: It is very important to discuss the relationship between any work done here and FAO. As things are at the present time we have practically no information on nutrition in this part of the world, although there have been studies done in Mexico and a little in Guatemala, nothing has been done in Costa Rica and neighboring countries. It would be extremely valuable to have surveys in this particular country. Let me make some specific suggestions about the nutrition work in an institution like this. Apart from the survey work, would it not be useful to carry out also some work on the analysis of foods. A good deal of work has been done on the foods of Central America in Mexico, particularly the work done by Harris, but a lot more could be done. I imagine that in the course of the work of the Institute the need for studying food varieties, etc. might arise. Would it be useful here to have a small department for the analysis of foods? With regard to survey work, we have been studying to some extent the Dodge survey and may be in a position to advise on the sampling methods, how to select the person to make the survey, and the technique required.

Dr. Vergara: We think that a program for studies in nutrition should be started as soon as possible in the countries belonging to the Institute. (Dr. Vergara's report is attached. See appendix IX)

Mr. Allee: That latter point applies to a great deal more than nutrition. This really involves entering the life of the family.

Dr. Vergara: It will be quite possible for the nutrition team to travel to other countries and establish relations with the governments and with the health departments. Some of the countries have already established nutrition work and they could make some kind of coordination.

Mr. Allee: How extensive are the laboratory and staff requirements to do a job in food analysis?

Dr. Vergara: The laboratory is rather expensive.

Dr. Aykroyd: It depends on how much we want to go into the vitamin and other analyses. We know that an Institute of Nutrition has been created in Guatemala; the situation is that two countries have joined and paid their subscription, one has joined and not paid its subscription, and two others have not done anything. The Nutrition Institute has some promises of money from the Kellogg Foundation and the United Fruit Company. (This is Harris' group). Emphasis was placed on the analysis of foods. If this Nutrition Institute goes ahead, it would relieve this Institute of a great responsibility in this field. We felt that this type of survey work, studying the people's habits and how to improve their food was really important. I can't quite say at the moment how this can quite be cleared or what is going to happen to the Nutrition Institute. If it will have considerable money for the analysis of foods in Central America, we do not want to do the same thing here.

Mr. Allee: Can foods be sent to places like the Massachusetts Institute of Technology for analysis without deteriorating?

Dr. Vergara: In 1944 they were analyzing Mexican foods, and green vegetables were sent by plane in carbonic acid. It did not interfere with the quality of the work.

Mr. Allee: Eventually we would want to equip ourselves for food analysis in connection with the demonstration work and teaching. Dr. Williams, botanist who works with Dr. Harris, is collecting food samples to send up to the Inter-American Food Institute in Guatemala. We might depend on them for that kind of work for some time to come.

Dr. Aykroyd: You can make arrangements for the analysis of unknown foods and new varieties.

Mr. Allee: What we have to do is give Harris a complete botanical description of the plant and pay him a certain sum for the analysis of the food in his laboratory.

Mr. Cruz: Most of the food in Costa Rica has already been analyzed at the laboratory in San José.

Mr. Allee: There is a resource that would be of tremendous value.

Dr. Morales: The Dean of the College of Pharmacy in San José has said that if we want to take him a special problem in our work in nutrition here, he would give us a special student under close supervision to do it for us.

Dr. Aykroyd: Many Mexican foods are similar to other foods in Central America.

Dr. Vergara: The analyses carried on by the Massachusetts Institute of Technology are protein, fat, vitamin A, calcium, iron, phosphorus, etc. They have also made some analyses of foods from Ecuador.

Mr. Allee: We would think of the School of Nutrition at Cornell to do this work, but the MIT must be an equally good place for these analyses.

Dr. Vergara: I believe more teaching has been carried out at Cornell than at MIT which has specialized in analysis.

Mrs. Smith: Cornell has not so much gone in for teaching as for the technical side.

Dr. Buchanan: (Commenting on one of the food analysis tables prepared by MIT) One is puzzled by some of these tables, for example the one on beets which does not explain that they are used both for their roots and their leaves.

Mr. Allee: Food analysis is somewhat isolated, as there are many more aspects to the problem such as what goes on in the family kitchens and around the family table.

Dr. Aykroyd: We felt that too much emphasis was put on food analysis, but we want some group on food in this part of the world with which we can be in contact. We also feel that there has been some loss on interest in the Nutrition Institute in Guatemala. Dr. Popenoe was originally very much interested in it, but seems to have lost this interest. I understand that governmets in this part of the world are reluctant about financing different groups and would rather welcome the idea of reducing the number of organizations. They have gone quite far with the Nutrition Institute and have held their conference, but for the moment it is being held up.

Mr. Allee: Bob Harris is largely responsible for this Nutrition Institute. Dr. Popenoe has no interest in it, but rather in the botanical side of the thing which he is perfectly capable to direct. Harris has an excellent botanist under him. The program is bound to be a bit nebulous at present for it takes more than an enthusiastic man from MIT to make the thing go. I feel that the Nutrition Institute will not operate unless it is affiliated with an organization such as ours. We might go ahead with the program we need keeping in touch with the work done by other institutions.

Dr. Aykroyd: I think that is the answer. Their interest is clearly in food analysis. This Institute might handle the surveys and food studies. You would have to do something in the field of food analysis, but there would not be such urgency in establishing this completely since you would have these other organizations to handle it for you.

Dr. Hume: Analysis is only a tool, only one element in what we are trying to get at. Many times in these nutrition studies food habits are more important than anything else.

Dr. Aykroyd: I should think that the function of this Institute would be to make nutritional studies which would not overlap with Harris' work. It is important that you study dietary habits, but it must be much broader than that and include the whole social environment and background. That is the only way you really get a picture of why people eat what they do. Studies should be planned on a much broader aspect; with that we are in the fullest agreement in FAO. You want to get the whole picture. The work of E.S. Platt in connection with the colonial problems of the British Empire is an example of what you want. When he studies nutrition, he does it in cooperation with an agriculturalist, a sociologist, etc. in relation to all the various aspects.

Mr. Allee: I wonder if Dr. Platt's approach doesn't have a great deal of guidance for us. He goes into an area and very soon determines what things can be done to correct glaring problems and then comes up with his team. For instance, the Nutrition Institute he set up at the West Indian University will go on with the work he has started. We should equip ourselves to attack certain problems, do some demonstration teaching, and look forward eventually to establishing a nutrition institute which could go into the thing fundamentally.

Mrs. Smith: The social side, food analysis,and how the food is used in the body must be considered. Doing the sort of thing that Platt has done is getting a full picture, and in establishing a nutrition institute here, we must know how the people cook and eat their food. You cannot study nutrition in isolation; methods of education must go along with it.

Dr. Buchanan: To what extent is the medical profession going to be used in this particular type of thing? In general our physicians are wholly incompetent in the field of nutrition. A knowledge of nutrition has come almost entirely from laboratories and agencies other than medical. It is exceedingly important that our medical men be trained in nutrition but I would hesitate to put any great amount of nutritional work under the medical men. Nutrition has in general developed quite independently from medicine. How should we get all that medicine can contribute to it without having the blind leading the blind? We want chemical analyses, sociology, etc., properly integrated, and if we can have a properly developed testing ground for these things, we can benefit all the American countries.

Mrs. Smith: We do recognize that the medical profession has much to contribute or rather we try to supplement what they already know about the functions of the human body. Therefore, we have to have a medically trained man and give him a good background in nutrition.

He must have more chemistry, practical experience in foods, and be able to recognize subclinical evidence of malnutrition. The only way that they can fit it with us is through special training.

Dr. Morales: The important thing is how we are going to proceed in the near future with this problem. We have to set up a team including a rural sociologist, an economist, an M. D., a nutritionist, and a home demonstration specialist. We have in the rural sociology field a student from the University of Michigan coming down. We have Mrs. Smith who is willing to take over the job of nutritionist. The two problems left are the M. D. and home demonstration specialist. The health department of Costa Rica is willing to order the doctor of the health unit here to do the job. Social security is willing to cooperate and send a man here but they are short of men at the present time. I went to see two doctors to find out if they would be willing to come here and do the job. Of course we have to work through the health center because they have the facilities there and even a small laboratory for analyses.

Dr. Vergara: Could they do some chemical work?

Dr. Morales: Dr. Aykroyd and Dr. Vergara are going to see Dr. Nuñez and find out if there is a person adapted to this work who could be attached to the unit here.

Dr. Aykroyd: I think Dr. Vergara would hold the view that a local man would want a little more training before he could become a member of an adequate team. A young man from the public health department here cannot be expected to be a first class member of the team.

Dr. Vergara: You don't have facilities to do the type of clinical chemistry.

Mr. Colom: You understand, Mr. Morales, that there are many nutrition institutes all over Latin America. There is one in Mexico and one in Puerto Rico, and if we are going to do routine work here, we would be duplicating their work.

Dr. Morales: We are going to get dietary information and then some clinical analyses and put them together to see what is needed.

Dr. Hume: We are starting out with all the knowledge we can bring to bear on the initiation of this program, but when you actually initiate the work you will learn that there is a great deal more to it.

Mrs. Smith: We hope to get information here which the other nutrition institutes can adapt and use in their own countries. It is not specifically for Costa Rica.

Mr. Allee: Costa Rican officials have agreed to cooperate in this thing, and this area will become a sort of laboratory out of which methodology, techniques, etc. can be applied to other areas.

Mr. Colom: The work done here must be exemplary for similar work in the other countries.

Dr. Morales: We have to find first a person who has all the qualifications which will make him an exemplary member of the team. The process will evolve into finding through Dr. Nuñez the person who seems to be qualified and bring him up as close to perfection as possible. If he comes down here and starts getting the idea of what we are going to do, goes over it there, and then gets his training and comes back to do more specialized work, things will run smoother than if we send him to the States without the preliminary work here and then bring him back.

Dr. Vergara: A good doctor with a general practice has already a little background and can go immediately to the States without waiting for any training here, but Dr. Morales' point is very interesting.

Mr. Allee: The period of acquaintance with the program might be very short, perhaps only a few weeks.

Dr. Aykroyd: I wonder if you couldn't get a little help on this program from a country such as Mexico which already has a functioning Nutrition Institute, where they would have done quite a bit of nutrition work. Would it be possible in helping to start this program for someone to come down from Mexico to advise on the program?

Mr. Colom: At the meeting of the executive committee of FAO, they offered to make the food analyses and also to come here and do any kind of work to establish cooperation with our Institute. I believe we can get from Costa Rica, and possibly from other countries, men who can do the work and train them gradually, but I believe that a basic knowledge of the problems involved should be had before you recruit anyone. Other members of the team could be trained, but not in the medical field, so this member of the staff should be studied very carefully.

Mr. Allee: Could not the Pan American Sanitary Bureau be brought into this and perhaps one of their men come down for six months or so?

Dr. Vergara: The Pan American Sanitary Bureau has done some important work in Guatemala. I will get in touch with the doctor there and also with the doctor in Mexico on my way back to the States.

Dr. Morales: This would be a temporary solution. We would still have the problem of selecting the permanent man.

Mr. Allee: The choice of the full-time man is very important and in the meantime we might have two or three men working on the problem which would put us into a much better position to look around for the right person.

Mr. Cruz: I wouldn't be surprised if you would find the right man in Costa Rica because many of these doctors have studied in the United States.

Mr. Allee: Besides technical qualifications, such things as temperament are involved.

Dr. Aykroyd: In the actual technique of the dietary survey, a person experienced in the eastern part of the world would be good in setting up this program.

Dr. Morales: Up to the present, we have just been touching the question, and anything that would improve the quality of the work will be welcome.

Dr. Buchanan: Would this individual be qualified to give suggestions as to the samples to be taken?

Dr. Aykroyd: There should be a statistician in the group to advise on the selection of the samples. People sometimes go very far astray on dietary surveys.

Mr. Allee: You do have someone on your staff in this particular field?

Dr. Aykroyd: Yes, but at the moment he cannot give very practical advice on this matter.

Mr. Allee: We can foresee a sort of coming and going of people here for spot studies in this field. Could we not expect some cooperation on transportation, etc. from the PASB.

Mr. Colom: Yes, they have already a project on nutrition for which they have received almost $200,000.

Mr. Allee: Perhaps when Dr. Vergara returns to Washington, you can get in touch with Dr. Soper on this.

Mr. Colom: We have talked to Dr. Soper about this before and it was agreed that Dr. Vergara would look over the situation here and talk to him again. A lot of agencies, including the PASB are involved in the work done at the Nutrition Institute in Guatemala, and the Guatemalan government has gotten the impression that this work has agricultural and other programs. I am going to Guatemala to try to clear up that matter and explain the matter and explain the differences and relationships in question.

Dr. Aykroyd: Although you want to get your facts first, the emphasis is on action. You want to lead up to systems of education in nutrition and any practical measures for nutrition such as school feeding or a program for growing vegetables in the gardens of the people in the survey.

Dr. Morales: The other point to consider is the matter of the home demonstration specialist. It boils down to a matter of funds, fast action and the person concerned.

Mr. Allee: This person would deal with cooking problems, sanitation, etc. It could be the same person who takes the data for the survey and who would know the people.

Dr. Buchanan: I am not yet satisfied with reference to the statistical setup. In the United States the last place to ask for help in getting data analyzed would be the Bureau of the Census. There are several other centers which have more efficiency for this kind of work - the University of North Carolina and Cornell University for example. If this is going to be the testing ground for similar work to be done in the other countries, we want to be very sure that this program will be well set up. Does Mr. Corcoran (in the Bureau of the Census) have a knowledge at the moment of modern experimental design?

Mr. Ted Grant: He might be able to modify the design so that it would fit the condition, but he doesn't have much background in experimental design.

Mr. Colom: He is a very capable man, but I don't know whether he would be willing to do the work personally.

Dr. Morales: I would send the information to him, and I also intend to consult Cornell University on the matter as it is not good to take the opinions of just one institution.

Mr. Allee: It is likely that Cornell people would be willing to apply themselves to this.

Mrs. Smith: We have been offered the help of both Cornell and the Iowa State College.

Dr. Aykroyd: You want to get a very intelligent statistician, although no matter what he recommends you sometimes have to choose your families on other grounds. However, the Costa Ricans seem to be a rather homogenous group. All the families seem to be about on the same level and it would not be too difficult to get a typical group.

Mr. Ted Grant: In this survey do you intend to distinguish between land owners, workers, etc.?

Dr. Morales: We are working with hired laborers.

Mr. Allee: The home demonstration specialist is perhaps the most strategic person, and this position would require a person whose native language is Spanish and who has training in home economics. Miss Morales (no connection with Dr. Morales) is the only person we have considered.

Dr. Morales: She was trained in the States in home demonstration after being selected from a group of girls in Puerto Rico, and upon her return worked as home demonstration agent and in a few years became home demonstration supervisor of a district. Now she has been working with the Institute of Inter-American Affairs getting home demonstration girls started in Costa Rica. Her experience and training seem to qualify her for the job. She is single and about forty years old.

Mrs. Smith: She is able to teach what she knows and able through demonstration to bring to the people with what little they have certain of the best principles for improving their lot. She has helped the young women to establish the school feeding in the rural schools in Costa Rica. She got a group of girls interested in furnishing a home

for fifty colones. All of her thirty girls have gone to each center and she has shown them what to do. She inspires confidence. If a person like this could do the survey, I would feel that the material she gathers is worth taking the time of the bionutritionist to analyze.

Both Dr. Hume and Mr. Allee thanked the FAO representatives for their attendance at the meeting and the interesting report they had given on the work of FAO and the problem of nutrition and cooperation with the Institute. The meeting was then adjourned.

APPENDIX IX

REPORT OF DR. A. VERGARA FROM THE NUTRITION DIVISION OF THE FAO TO THE COMMITTEE OF THE INTER-AMERICAN INSTITUTE OF AGRICULTURAL SCIENCES AT THE SESSION OF APRIL 2, 1947

We think that a program of studies in nutrition should be started as soon as possible in the countries belonging to the Institute, principally in those that have not yet made any studies in this field. The nutrition program would help research for selection and development of the most appropriate food cultures to different types of lands and climates.

For a good start of nutrition studies it is necessary to have personnel with the technical training to carry out the job successfully. Some preliminary work could be started in Turrialba which would provide some experience and later on, when the work will be more developed and adequate personnel available, an institute of nutrition could serve as a demonstration place to teach people from member countries.

FAO could help start the program, for instance, suggesting methods for sampling people for dietary surveys, methods of education in nutrition and also helping to get some fellowships for the training of one medical doctor in nutrition and technician in dietary surveys, home economics and other necessary studies to carry out the program. We feel that it is necessary to continue the work already started in a small way by Dr. Morales. That should be a useful experience for the studies in the future.

We also think it is very important to establish a laboratory, if there is not any available, in Costa Rica or in any other convenient place, to do the food analysis and some clinical biochemistry. Properly trained chemists could already be available in the member countries and brought here for the work.

Important data to evaluate nutritional status in different groups of population properly selected in each member country should comprise:

a) Dietary surveys
b) Medical examinations to appraise defficiency diseases or subclinical stages of malnutrition
c) clinical biochemistry to complete the appraisal of deficiency diseases.

The orientation and direction of the clinical aspects of the studies must be done by a medical doctor with as good background as possible in general medicine and also with very careful and specialized training in the field of nutrition.

We feel that for the selection of the medical doctor who will be trained in nutrition, if he is not already available, it is very important to have in mind that he must have some knowledge of the habits, social life and psychological aspects of the people living in the areas where it is supposed that the studies are going to be carried out. That should be very important to avoid any possible failure as to the accurate results of the mentioned nutritional studies.

APPENDIX X

MEMORANDUM

To: Mr. K. J. Kadow and Mr. Nelson Rockefeller

From: A. O. Rhoad

Subject: Livestock Development and Educational Unit, Turrialba, Costa Rica

Date: February 5, 1947

The following comments are made on the proposal by Mr. Kadow of AIA as outlined in his memorandum of conference with Mr. Rhoad on February 4, 1947.

From Paragraph 3:

A - Joint objectives in certain fields of activity of IAIAS and AIA are possible but must be secondary to recognized objectives of IAIAS, namely, research and training in experimental techniques.

B - "Could work sufficiently close to us" may entail considerable deviation of IAIAS efforts, time, etc. to this phase of work as it is the conception of Mr. Kadow to draw IAIAS "to us" rather than assist IAIAS in its approved program and prescribed objectives.

C - "to help supply high level technical assistance in many activities". To give assistance in one or a few of their projects is within IAIAS possibilities, to bind IAIAS to "many activities" would be imprudent.

D - Training vocational training teachers is within the scope of recognized educational program of IAIAS. However, to carry out this activity would require at least one well-trained member of staff not now planned for in next annual budget.

E - "20-40 trainees on manual labor level" is entirely too large for Animal Industry Dept., 8 to 10 would be ample for size of unit under consideration. If income from Animal Industry Dept. is to pay for this labor, then no more than 8 could be trained per year in livestock production. The question of housing and boarding is important. The present accomodations at Institute would not be made available for this class of trainee.

It is assumed that their instruction would be given by minor members of the staff, i.e., "ingenieros" employed by IAIAS as foremen. The general outline or program of training to be set up by the head of Dept.

From Paragraph 4:

The Director of IAIAS is interested in vocational training at manual labor level especially in teaching techniques used and its place in overall agricultural education. That is, the IAIAS should be in a position to give, as it already has in case of El Salvador, advice on training program at this level. Whether such a program should be an integral part of IAIAS program at Turrialba is a matter for Administrative Committee, Director, Staff and Board to decide.

It is quite possible that specialized training on post-graduate level and at elementary level could be undertaken at same time, each with different group or class of trainees and staff. In fact, this is now in effect at IAIAS.

From Paragraph 5:

The formation of a non-profit operating company would necessarily be decided by Board and legal adviser to IAIAS if approved by Administrative Committee and Director.

The reasons given for organizing a company instead of facilitating a loan is valid in case of established policy of AIA, but to form a company "to guarantee the basic levels of training desired (by AIA)" would predicate free action by IAIAS on managerial policy, especially where some overlapping with exporimental program would occur.

From Paragraph 6:

This is a satisfactory arrangement on a stock-company basis but less desirable to IAIAS than applying net earnings of entire enterprise to amortization of loan with free managerial responsibilities.

From Paragraph 7:

It is seriously questioned whether the Administrative Committee, the Director or Head of the Animal Industry Depart. would under any circumstances "assure operating control" to pass into hands of other than officials of IAIAS.

Conclusions:

As presented in memorandum of February 4th the proposition of AIA is not acceptable to IAIAS.

Counter-Proposals:

In view of some parallel objectives of IAIAS and AIA in increasing food production and general economic level and well being of the Americas a mutual assistance relationship should be possible. It is proposed, therefore, that AIA obtain for IAIAS:

A - A grant of funds to set up income producing units at Turrialba in exchange for:

1. Vocational training of limited group of laborers annually.

2. Technical assistance to several AIA projects.

3. Vocational teacher training.

B - A loan, for the same purposes above in exchange for:

1. Vocational training of limited group of laborers.

2. Technical assistance to several AIA projects.

Item 3 of proposition "A" would be possible only if the income from producing units were applied to this work as no funds are now in sight for this type of program i.e., vocational teachers training.

Proposition "B" omits this work, for if a loan is obtained the income would be required for interest and amortization.

CONFERENCE BETWEEN DR. A. O. RHOAD, MR. KENNETH J. KADOW, ON FEBRUARY 4, 1947.

Subject: Livestock Development and Educational Unit at Turrialba, Costa Rica.

Paragraph

1. Dr. Rhoad lunched with Mr. Kadow and discussed in considerable detail the proposition made to the American International Association under date of September 5, 1946, by Mr. Ralph Allee, concerning AIA's financial assistance to Turrialba in the development of its livestock demonstration and teaching unit.

2. The proposition as set forth calls for the loan of $158,000 to develop practical demonstration and teaching units in the fields of dairy production, milk products, beef, slaughterhouses, poultry, swine and crops related to their maintenance.

3. Mr. Rockefeller, in conversations with Mr. Kadow, had indicated a desire to cooperate with Turrialba in such a way as to further the objectives of this Institute, and at the same time further the objectives of our own corporate activities, especially the proposed training and demonstration farms of AIA. It was thought by Mr. Rockefeller and Mr. Kadow that perhaps Turrialba could work sufficiently close to us so as to help supply high level technical assistance in many activities throughout the Americas, to serve as a base for the training of vocational training teachers, and at the same time from 20-40 actual trainees on the manual labor level per year.

4. Some of these objectives, especially the training on the manual labor level, appeared to be slightly out of the scope of the recognized activity of Turrialba, but since they would be considered as part of the necessary mechanism of accomplishing the training of teachers, it is more than likely that Turrialba could accept this challenge, provided it passes the Board of Directors.

5. The difficulty in the objectives set forth by Mr. Rockefeller and Mr. Kadow, as presented in the plan submitted by Mr. Allee, is the form in which the assistance should take place. Mr. Allee's proposal calls for a loan at 5% interest of $158,000, this loan to be amortized over a period of ten years. Mr. Kadow expressed to Dr. Rhoad in his conference; that he did not feel it was among the objectives of AIA to lend money, especially in view of the fact that there would be absolutely no collateral for this loan, because of the international nature of the Inter-American Institute of Agricultural Sciences. Mr. Kadow felt that in order to guarantee the basic levels of training desired, and to keep this whole training program on an academic level commensurate with the educational picture thoughout Latin America, the entire training program should be set up in the form of a non-profit operating company. The stock in this company would be issued in equal proportions of common and non-voting participating preferred stock, and AIA would control 60% of the voting stock. The equity of the Inter-American Institute of Agricultural Sciences would be $252,376, whereas the equity of AIA would be $158,000.

Paragraph

6. It was further proposed by Mr. Kadow that the Institute purchase from earnings from their share of the company, stock of AIA at its original values, taking up first the preferred and then the common stock, in order that at the end of about ten years, the AIA funds would be completely liquidated.

7. Such a procedure would assure operating control of this enterprise by AIA on a practical working level, at least until such time as it had actually been able to show the practicality of the agriculture that it was teaching.

APPENDIX XI

AMERICAN INTERNATIONAL ASSOCIATION

for economic and social development

30 ROCKEFELLER PLAZA - NEW YORK 20 - NEW YORK - ROOM 5101

March 25, 1947

Mr. Jose Colom
Chief, Agricultural Division
Pan American Union
Washington, D. C.

My dear Mr. Colom:

As you know, there has been an interchange of correspondence between the Inter-American Institute of Agricultural Sciences at Turrialba, Costa Rica, and this Association with respect to a possible program of financial aid to the Institute. More recently Dr. A. O. Rhoad, who is associated with Turrialba, conferred in New York with Mr. Kenneth J. Kadow of our organization on the terms and conditions of such aid.

As a result of this exchange of views, a possible plan of cooperation between our two organizations has evolved and is set out below in tentative form. If your organization desires to submit a proposal to this Association along these lines, I shall be glad to present it to the Board of Directors with my recommendation.

The general terms of such a plan would be:

1) The Association will grant to the Institute at Turrialba, Costa Rica, the sum of $158,000 for the purposes hereinafter indicated, which sum shall be made available in installments over a two-year period commencing July 1, 1947, on a mutually agreeable basis.

2) The Institute shall establish and operate on a sound business basis and as a separate autonomous department or administrative entity a general demonstration farm. Such farm shall:

   a) Engage in a general farming operation including not only the raising of beef and dairy cattle and of hogs, the operation of a dairy and creamery and of a poultry enterprise, all as more particularly outlined in the Institute's letter of September 25, 1946, but also the raising of fresh vegetables, fruits, feed crops, and other farm products, and training in the use and maintenance of agricultural equipment.

b) Be used to furnish training to persons designated by the Association as hereinafter provided as well as to other persons in any comparable training program sponsored by the Institute or by third persons.

3) The Institute, in recognition of the importance of the farm to its general program and in order that it may have ample facilities for its success, shall make available to the farm land and buildings, equipment, livestock, poultry, orchards and vegetable producing facilities which shall have a value of not less than $250,000 and which shall be approved by the Association and be listed as Exhibit A to the final agreement.

4) The Institute shall utilize the funds contributed by the Association for the purpose of adding certain additional facilities, equipment and livestock to the mentioned farm and for the purpose of creating an operating fund for the farm. The additions to be made and the amount of the initial operating fund shall be subject to the approval of the Association and shall be detailed in Schedule B attached to the final agreement.

5) The Institute shall provide each year, commencing not later than January, 1948, a full year's training in practical farm operations and management and training as agricultural vocational teachers to not less than ten or more than twenty residents of Venezuela, or other persons designated by the Association, until three hundred shall have been trained under the terms of this agreement, provided, however, that in any year in which the Institute can satisfactorily handle and the Association can provide a greater number of trainees the maximum shall be increased accordingly for that year. The Association shall select the trainees, and, after consulting the Institute, shall fix the number of persons within the stated maximum and minimum to be trained in each year. Such training shall be furnished primarily on the demonstration farm, but to the extent necessary to furnish the training required, all of the facilities and staff of the Institute shall be made available. While in attendance the trainees shall be subject to the scholastic and training regime and to the discipline of the Institute, and shall perform such work in connection with the operation of the farm as the Institute deems desirable to accomplish the objectives of the program. The Association will arrange and pay for the transportation of the trainees from their homes to Turrialba and return.

6) The Institute without expense to the Association or the trainees will provide satisfactory living quarters, food and medical care to the trainees while in residence, will make available the necessary textbooks and facilities for study and will furnish a monthly allowance to each trainee, the amount and conditions of which shall be subject to agreement between the Institute and the Association.

7) The Institute will be responsible for and will provide the farm and training program with managerial, administrative, and technical direction including the services of an experienced teacher in the field of agricultural vocational training, it being understood that the Institute will from time to time advise the Association with respect to the policies being pursued by the Institute in managing the farm and conducting the training program, and with respect to the qualifications and functions of the supervisory personnel employed thereon.

8) The Institute from time to time at the request of the Association will furnish the Association without charge technical consultative services and the benefit of its research in agriculture, with a view to assisting the Association in the realization of its objectives to improve agricultural methods and standards of living in the Americas. The Association shall pay the traveling expenses incurred in the event that such services to the Association require travel by a member of the staff of the Institute.

9) The gross receipts from the operation of the farm shall be used to pay the expenses of the said operation, and for the performance of the Institute's other obligations under the agreement with the Association. Any balance remaining shall be allocated between reserves and the expansion and improvement of the farm. However, in 1952 the Institute and the Association will re-examine the matter of income and expenses to determine whether any other or different use of such balance should be provided for, but such balance will in any event be used for the benefit of the farm or other programs of the Institute relating to vocational training.

10) The Institute shall keep separate books on the operation of the farm with appropriate methods of cost accounting so that the cost of each of the operations of the demonstration and training farm may be determined. At intervals of six months, on the first of January and July of each year, the Institute will furnish the Association with complete reports on the operation of the farm and training program, including balance sheets and profit and loss statements.

Any such proposal should be accompanied by the following additional data relating to the farm and training program:

a) A statement of the general plan of operating the farm.

b) A statement of the general plan of operating the training program.

c) A statement of the names, positions and qualifications of the supervisory and teaching personnel for the farm and training program.

d) A statement of the projected operating revenues and expenses (the source of the revenues should be given).

We should also have the following information with respect to the operation of the Institute as a whole:

a) A statement of the income and expenses of the Institute for 1945 and 1946 and a budget covering the same items for 1947 (the sources of all income items should be stated).

b) A statement of the plant and equipment of the Institute.

c) A statement of the names, positions and qualifications of the staff of the Institute other than those previously described in connection with the farm and training program.

The data mentioned as future exhibits A and B should also be included.

I am hopeful that the points mentioned are sufficiently in line with the program communicated to the Association by Mr. Allee to serve as a basis of cooperation between us. If such is the case, I recommend that you submit a definite proposal in order that it may be presented to the Board of the Association. Once it is adopted by the Board, we may proceed to the drafting and execution of the formal agreement between the two organizations.

Please be assured of the very great and continuing interest of this Association and of our President, Mr. Nelson A. Rockefeller, in the success of the Institute.

Most sincerely,

/s/

Berent Friele
Vice-President

APPENDIX XII

10 April 1947

Mr. Berent Friele, Vice-President
American International Association
30 Rockefeller Plaza, Room 5101
New York 20, New York

Dear Mr. Friele:

In reply to your letter of 25 March addressed to Mr. José Colom, we are submitting a proposed plan of cooperation between the American International Association and the Inter-American Institute of Agricultural Sciences. Briefly, this plan foresees the setting up of a new department in the Institute, the purpose of which shall be to apply known vocational education techniques to the preparation of demonstrators, teachers, and supervisors in the field of farmer training.

The purposes of this Institute are to encourage and advance the development of agricultural sciences in the American Republics through research, teaching, and extension activities in the theory and practice of agriculture and related arts and sciences. It is our conviction that no field within this very broad mandate is more important than that which involves the training of farmers and farm families to utilize the advances made by science.

1. A grant of $158,000 will be made by the Association to the Institute. Since this sum will be used mainly for the development of facilities the following installments are suggested:

$108,000	1 July 1947
25,000	1 January 1948
25,000	1 July 1948

2. The Institute will establish a Vocational Education Unit the head of which shall be at the same level of responsibility as other department heads in the Institute.

a) The Vocational Education Unit will have at its disposal sufficient land, livestock, and equipment to provide ample experience in all phases of farming. Aside from the gardens, orchards, crops, livestock units, and shops of the Institute, facilities are available on other farms in the vicinity where experience can be obtained by those concerned with growing crops, such as cacao and bananas on a large industrial basis.

b) These facilities and such others as may prove to be desirable and feasible will be utilized in training persons designated by the Association as hereinafter indicated.

3. The Institute will make available to the Vocational Education Unit facilities to the value of $300,000 as indicated on schedule A attached.

4. The Institute shall utilize the funds contributed by the Association for the purpose of adding certain facilities required to supply training and to produce income for the training program. The chief expenditure will be in the livestock enterprises since investment in beef, dairy animals, poultry and attendant buildings and equipment will produce greatest returns for eventual reinvestment in vocational training.

5. The Institute shall provide each year, commencing in 1948, a full year's training in practical farm operations and management and training as agricultural vocational teachers to not less than 10 or more than 20 (unless more can be handled by the Institute) students selected by the Association until 300 have been trained under the terms of this agreement. Such training shall be furnished primarily on the vocational education farm unit but, to the extent necessary to furnish the training required, all of the facilities and staff of the Institute shall be made available. While in attendance the trainees shall be subject to the scholastic and training regime and to the discipline of the Institute. The Association will arrange and pay for the transportation of the trainees from their home to Turrialba and return.

6. The Institute without expense to the Association or the trainees will provide satisfactory living quarters, food and medical care to the trainees while in residence, will make available the necessary textbooks and facilities for study and will furnish a sufficient amount of work on a wage basis to supply a reasonable personal expense allowance to each trainee.

7. The Vocational Education Unit of the Institute and its farming facilities will be provided with adequate managerial, administrative, and technical direction including the services of an experienced teacher in the field of farmer training, it being understood that the Institute will from time to time advise the Association with respect to the policies being pursued by the Institute in managing the farm and conducting the training program, and with respect to the qualifications and the functions of the supervisory personnel employed thereon.

8. In general the Institute agrees to develop an adequate and effective vocational training unit competent to carry out its obligations to the Association as indicated in previous paragraphs. It will throughout the years expand this unit beyond the training requirements of the Association so as to provide for the American Republics a center from which the development of training for farmers and farm families can be advanced to the maximum extent possible. Reports on the progress of the program will be prepared for the Association each six months including a complete financial analysis. It is anticipated that the program will be reviewed at least once each year by representatives of the Association and the Institute in Turrialba. At such time adjustments can be agreed upon so as to advance our mutual interests to the greatest advantage.

9. The Institute from time to time at the request of the Association will furnish the American International Association without charge technical consultative services and the benefit of its research in agriculture, with a view to assisting the Association in the realization of its objectives to improve agricultural methods and standards of living in the Americas. The Association shall pay the traveling expenses incurred in the event that such services to the Association require travel by a member of the staff of the Institute.

All our estimates of expenditures and income have been calculated taking into account prices at which purchases will be made and known prices for farm products over the next several years. This development of the animals enterprise and the farm training facilities simultaneously will require careful management, but this can be done. The financial aspect as well as the aims and objectives of this proposed cooperation have been studied by the Administrative Committee of this Institute and given its unanimous approval.

Most sincerely,

Ralph H. Allee
Director

c.c.: M. G. Tucker
J. L. Colom
Adm. Com.

Statement of General Plan for Supplying Farming Experience

The farm of the Institute of Turrialba includes 2500 acres of relatively rich volcanic soil devoted to a variety of crops, pastures, and forest areas. A portion of this area and attendant facilities will be allocated specifically to the Vocational Education Unit Farm. Schedule A attached indicates the allocation to the training and demonstration farm which will be made initially, subject to revision as necessary.

Schedule A: Land, Buildings, Equipment, Livestock, Poultry, Orchards and Other Facilities Made Available to the Vocational Education Unit

Enterprise:		Estimated Value 1/	Size
Sugar cane	: land	$ 3,000	10 acres
Coffee	: land	5,000	10 acres
Vegetable Crops	: land	6,000	20 acres
Fruit Crops	: land	12,000	40 acres
Other Crops	: land	22,500	75 acres
Poultry (3,000 birds)	: land	3,450	7.5 acres
	: buildings	460	
	: animals	72	
Dairy (100 cows)	: land	96,488	310 acres
	: buildings	10,900	
	: equipment	211	
Beef Cattle (300 head)	: land	125,500	650 acres
	: buildings	6,000	
	: animals	1,920	
Swine (12 sow herd)	: land	4,650	12.5 acres
Creamery			350 gals. daily
Slaughter House			
Feed Mill			
Required Machinery and Equipment			
Carpentry Shop			
Machinery Repair Shop			
	TOTAL	$ 298,151	

1/ Not including facilities to be obtained from the American International Association contributuion

The Training Program

Type of Instruction

All training will be based on the performance of farm jobs. Work experience will be provided to assure professional competence in carrying out the skills and managerial operations required and imparting these skills and abilities to others. In relation to jobs being performed at a given time information will be given and study assigned by the vocational training staff. Such instruction, rather than emphasizing the usual academic groupings of subject matter, will present the elements of botany, soil science, etc. as they are required to develop an appreciation of an increased competence in farming.

The initial course will be an example of the type of program which the trainees will be required to carry out on their return to their home country. As individuals with superior ability to develop they can be carried on for an additional year with special emphasis on teaching and supervising if this is desired by the Association.

The trainees sent by the Association will be housed with other graduate students at the Institute and given opportunity to become acquainted with current developments in agricultural science. Although their farm work will be supplied on a commercially organized farm, any opportunity which may exist to advance their vocational objectives by participating in other enterprises of the Institute will be made available.

Selection of Trainees:

Individuals to be sent to the Vocational Unit of the Institute should be chosen upon the following considerations:

a) The requirements of the Association program

b) The types of individuals available for training

c) The types of training which can be given to the best advantage at Turrialba

Rather than imposing the usual academic requirements for entrance into graduate work, these trainees should be chosen on the basis of their ability, only one factor of which would be previous training. As soon as possible the head of the Institute's proposed Vocational Educational Unit should work out with Association personnel concerned the necessary details concerning selection.

Staff

Since the Staff is in the process of formation, the attached personnel outlines represent only a part of the personnel which will be available. The following additions are contemplated for the near future: Plant Pathologist, in charge of coffee investigations; Horticulturist, in charge of cacao program; Plant Physiologist, in charge of weed control, hormone, insecticide and fungicide investigations; Veterinarian; and Human Nutritionist.

Supervisory and Teaching Personnel

Head of Vocational Education Unit

To be chosen (candidate under consideration)

Responsibilities: In charge of all vocational training, selection and follow-up of students; supervises farm training and hence is responsible for operation of farm areas specifically allocated to his unit.

Qualifications: Farm reared, B. Sc. in Agriculture, Ph. D. with major in vocational agricultural education or its equivalent, at least five years experience in vocational agricultural education, demonstrated capacity to organize and administer. Should have had experience in Latin America and know Spanish, but creative ability is more important.

Assistant Vocational Educationalist

To be chosen

Responsibilities: To assist the head of the unit and replace him during his absence, to be in charge of the dairy until a full-time assistant is required.

Qualifications: Farm reared, B. Sc. in Agriculture, M. Sc. with major in vocational agricultural education or its equivalent, at least three years professional experience. Should know Spanish.

Artisan Teachers

(To be chosen from present farm foremen or elsewhere)

Herdsman
Gardener
Orchardist
Field Crops Foreman
Tractor Operator
Oxen Driver
Poultryman

Responsibilities: Under detailed supervision of Head or Assistant Head of Unit, to serve as teaching foremen of the trainees responsible for professional performance and learning of skills.

Qualifications: High degree of ability in their respective jobs, demonstrated capacity as foremen, and personal integrity.

Consultants

From present or prospective staff of Institute

Responsibilities: Consult with Head of Unit on technical features of training program in their respective fields, assure that latest proven developments are incorporated in all enterprises and conduct seminars periodically with trainees.

Animal Husbandry - A. O. Rhoad

Head of Animal Industry program of the Institute

Date and place of birth	: 26 September 1902, Mt. Airy, Pa.
Education	: Germantown High School, Phila., Pa., Pennsylvania State College, 1926 B.S. Cornell University, 1928 M.S.
Positions - 1926 - 1929	: Instructor, Cornell University, Ithaca, N. Y. $1750.00 per year.
1929 - 1935	: Professor Cathedrático e Chefe de Departamento de Zootechnia, Escola Superior de Agricultura e Veterinaria, Vicosa, Minas Gerais, Brasil, 24:000$000 per year.
1936 - 1945	: Superintendent in Charge, Iberia Livestock Experiment Farm, USDA Jeanerette Louisiana, Civil Service P4 $4800.00 plus war overtime.
1945	: Jefe de Industria Animal y Decano de la Facultad, Instituto Interamericano de Ciencias Agrícolas $8,000 per year.
Publications	: About 40 original titles mostly on technical subjects in Brazilian, English, German and American Periodicals. Contributing author to "New Crops for the New World". Macmillan Co., 1945.
International Meetings	: Seventh International Genetics Congress, Edinburgh, 1939- Eighth American Scientific Congress, Washington 1940- Second Inter-American Agricultural Conference, Mexico 1942- Third Inter-American Agricultural Conference, Caracas 1945-
Memberships	: American Society of Animal Production The American Genetic Association Fellow, American Association for the Advancement of Science Fellow, The American Geographical Society Delta Upsilon, Gama Alpha
Activities	President, Student Body, High School President, Agricultural Club, Penn. State President, Rotary Club, Jeanerette, La.

Agricultural Engineering - N.C. Ives

Head of Agricultural Engineering program of the Institute

Born: 6 March 1917. Rolfe, Iowa -on a farm

Parents: Mr. and Mrs. A. W. Ives, both living and in good health. One brother and one sister, living and in good health.

Family: Wife and 4 children, all in excellent health

Education: Graduated Rolfe Public High School, 1933
B.S. in Agricultural Engineering, Iowa State College, 1938
M.S. in Agricultural Engineering, Iowa State College, 1939 - Major in Farm Structures

Professional and Honorary Societies: Member of American Society of Agricultural Engineers. Member of Phi Kapha Phi.

Experiences: Born, raised and worked on the home farm all free time until graduating from college, 18 March 1939

Extension Agricultural Engineer, University of Minnesota from 1 May 1939 until 30 August 1944. Salary $2,000 - $3,200. Appointed Assistant Professor 1 July 1943.

Extensional Agricultural Engineer, Iowa State College from 1 September 1944 until 30 June 1945. Salary $3,780.

Present position - 1 July 1945 until present

Present responsibilities:

1. As chief of Department of Agricultural Engineering

   a. Organize, set up and do all teaching
   b. Organize and serve as leader for all research

2. As superintendent of Institute Service

   a. Farm operation and development
   b. Physical plant operation
   c. All maintenance
   d. Building construction

   Organize, supply and initiate all the above.

Agricultural Economics - J. O. Morales

Head of Agricultural Economics and Rural Welfare program of the Institute.

Born: 21 March 1917, Guaynabo, Puerto Rico

Training:

1938 B.S. in Agriculture, College of Agriculture, University of Puerto Rico

1943 M.S. Cornell University

1945 Ph. D. Cornell University

Experience:

1937-1938 Assistant in Animal Husbandry, College of Agriculture, University of Puerto Rico

1938 Farm Operator in Puerto Rico

1938-1942 Economist, Experiment Station, University of Puerto Rico

1945-1946 Assistant in Farm Management, Cornell University

1946 Economist, IAIAS, Turrialba (since May)

Agronomy - Manuel Elgueta

(Field Crops, Seed Production and Pastures)

Head of Plant Industry program of the Institute

Born 3 November 1902 in Talca, Chile

High School: Instituto Nacional 1913 to 1918

School of Agriculture - 1919 to 1921

Degree of Ingeniero Agrónomo - July 1922

From 1923 to 1925; work on private farms

May 1926; Second Assistant, Plant Genetics Division. Experiment Station. National Society of Agriculture

January 1926: First Assistant in same Division

From June 1931 to February 1933: Studies in Plant Genetics in University of California and Cornell with a Guggenheim Scholarship.

1933: Director, Experiment Station, National Society of Agriculture.

1933: Professor of Plant Genetics. School of Agriculture University of Chile

1937 to 1940: Professor of Plant Genetics. Catholic University

November 1938: Director, Department of Plant Genetics and Agronomy. Ministry of Agriculture.

1940: Delegate of the Government to the VIII Scientific Congress at Washington, D. C.

October 1945: Acting Director General of Agriculture to November 1946

August 1945 to May 1946: President, Colegio de Ingenieros Agronomos.

December 1945: Elected as a member of the Administrative Committee of the Inter-American Institute of Agricultural Sciences

May 1946: Member of the Chilean Delegation to the Meeting on Urgent Food Problems of the World at Washington, D. C.

May to August 1946: Travelled through the United States and Canada

August 1946: Attended the meeting of the Administrative Committee at Turrialba, Costa Rica

Lines of Work

At the National Society of Agricultural Experiment Stations was in charge, mainly, of the work of the Division of Plant Genetics. Personal work was on wheat. All the main varieties of wheat which are grown in the central region of Chile were introduced by this Division. The Division produced the first wheat hybrid in the country. Before leaving the Experiment Station in 1939, selected a line that was to be the new variety Baflo which showed an outstanding resistance to black stem rust. From November 1939, Director of the Department of Plant Genetics -- work dealing with organization of the Department for its actual work, training of new agronomists. In 1939 there were only seven agronomists and the Director alone specialized on experimental breeding work -- the Department had no technically planned trial or breeding program. Today there are 34 agronomists in the Department -- thirteen of whom have studied in North American Universities..

The program of the Department is comprehensive on crops in which there is work. Each crop has its program of breeding and an agronomic experiment with the purpose of investigating every phase of its growth. Work is especially complete on wheat, the main crop of the country; but work has been done on barley, beans, potatoes, sugar beets and forage plants -- also a general plan of soil conservation.

Plant Breeding and Botany - J. L. Fennell

Plant Breeder on Institute staff

Born: Cynthiana, Kentucky - October 19, 1905

Education:

Elementary School	: Cynthiana, Kentucky, Public School
High School	: University of Kentucky High School (3 years)
High School	: Dade Co. (Florida) Agricultural High School (1 year)
College	: University of Miami (Florida) (about 3 years)

Practical Experience:

Lifetime association with tropical plants in great variety.

Thirteen years with the United States Department of Agriculture.

Division of Rubber and Other Tropical Crops (6 years). Propagation and culture studies with Hevea (para rubber), Castilla, Cacao, Coffee, Cotton, Banana, and a large assortment of miscellaneous tropical plants of possible economic value.

Division of Plant Exploration and Introduction (7 years). Identification, propagation and cultural studies with a great number of tropical economic and ornamental herbs, trees and shrubs. This has afforded an invaluable opportunity to obtain experience and acquaintance with thousands of tropical plant species and with taxonomic botany in general.

During this time made special study of Florida flora and prepared and identified hundreds of specimens for United States National Herbarium.

Has had wide experience in pure culture method of orchid propagation and orchid culture in general.

One and one half (1 1/2) years with Coordinator of Inter-American Affairs.

Spice and Food Crop Investigation, with titles Spice Production Technician and Food Production Specialist, with P4 Civil Service rating.

Two and one half (2 1/2) years with Inter-American Institute of Agricultural Sciences.

Previous salary (Coordinator's Office)	Base Pay	$3800.00
	Overtime	950.00
	Living Allow.	1800.00
	Total income per year	$6550.00

Vegetable Crops - E. H. Casseres

Horticulturist on Institute Staff

Born: 13 August 1918, Limón, Costa Rica

Training:

1943 B. S. in Agriculture with honors, University of Florida

1946 M. S. Cornell University

Experience:

1939-1940 Export Clerk, New York City

1939-1943 Nursery and Seed Production, W. Atlee Burpee Co. (summers)

1943-1945 Nursery and Seed Production, W. Atlee Burpee Co. (Full time)

1946 Vegetable Crops Investigation, IAIAS, (Since April)

Cane Agronomy, - L. A. Serrano

In charge of the Institute Cane program (reporting for duty 1 July 1947)

Born: Quito, Ecuador

Citizen: American

Education: Colegio Mejía, Quito, Ecuador, 5 years
Conway Hall, Carlisle, Pennsylvania, 2 years
Cornell University, Ithaca, New York, 4 years
B. S. in Agriculture

Experience:

Assistant Sugar Cane Agronomist - Agricultural Experiment Station, Río Piedras, P. R., 1923-28.

Agronomist in Charge - Experimental Substation, Isabela, P. R., 1928-43.

Field Superintendent, Okeelanta Growers and Processors Cooperative, South Bay, Florida, 1946-47.

Schedule: Additional Facilities, Equipment, Livestock
B - and Operating Fund Requirements

Item	Cost
Buildings	$
Calf and heifer barn	3,500
Manure Pit	450
Slaughter house	8,000
Trench silos	1,400
Creamery	18,000
Manager's residence	7,500
Central Poultry building	1,800
Laying houses	800
One-sire flock house	200
Central Hog house	5,500
Fattening pens	2,400
Boar houses	500
Portable houses	120
Beef corrals	4,128
Electric and power installations	3,000
Dryer	500
Fences	
Dairy	3,500
Poultry	960
Hogs	1,500
Beef	5,000
Pasture Improvement	
Dairy	1,377
Beef	3,200
Animals	
Dairy	22,487
Beef	17,875
Swine	720
Poultry	250
Equipment	
Dairy	5,218
Creamery	16,500
Slaughter house	2,500
Swine	230

Equipment (cont.)	Cost
Poultry	$ 1,010
Beef	1,575
Operational fund	15,000
Training Program	
Combine	800
Miscellaneous tools and equipment	500
	$158,000

SCHEDULE C: STATEMENT OF PROJECTED OPERATING REVENUES AND EXPENSES:

Expenses	Dairy	Creamery	Poultry	Beef	Swine	Sugar Cane	Coffee	Vegetables, Fruits and Other Crops	Vocational training exp. and other	Total
Salaries and wages	$ 4,900	$9,400	$ 660	$1,700	$1,300	$ 730	$ 570		$8,800	$28,060
Supplies	4,350	24,330	720	280	1,000	200			250	41,330
		4,000	200							
		6,000								
Other	2,145	2,052	760	1,000	500	200	100		8,650	15,407
Total	$11,395	$45,782	2,340	$2,980	$2,800	$1,130	$670	Will probably come even or result in a loss	$17,700	$84,797
Income										
Sale of animals	$2,678	$9,855	$ 450	$3,163	$3,090					$20,236
			1,000							
Sale of milk and milk products	9,000	53,071								62,071
Sale of eggs			2,250							2,250
Sale of cane						1,610				1,610
Sale of coffee							750			750
Sale other crops										
Other		300								300
Total	$11,678	$63,226	$3,700	$3,163	$3,090	$1,610	750			$87,217
NET INCOME	$ 283	$17,444	$1,360	$ 183	$ 290	$ 480	$80		$17,700	$ 2,420

APPENDIX XIII

SUGGESTED CACAO IMPROVEMENT PROGRAM

SITUATIONS:

This critical cacao shortage is due to various factors, significant among which are the various diseases, general problems of husbandry, and preparation for market. From information at hand it is apparent that improvements can be made. Some of these will require years; others should increase production or improve quality immediately.

SHORT-TIME PROJECTS:

1. Harvesting Methods
2. Spraying for disease and insect control
3. Fertilization
4. Prunning and Thinning
5. Weed control and Tillage
6. Irrigation (where feasible)
7. Market Preparation (Fermentation, washing, curing, drying, packing, storage, shipping)
8. Treatments to Reduce Number of Wilted Pods.
9. Removal of Parasitic Plants from Trees.
10. Replacement of Unproductive trees.
11. Control of damage by rats, squirrels, birds and other animals.
12. Extending Cacao Culture to New Areas

LONG-TIME PROJECTS:

1. Testing and Screening of Supposedly Superior Trees Now Being Planted
2. Research for Superior Trees in the Amazon, Orinoco and Elsewhere
3. Multiplication by Cuttings and Buds of Proven Trees
4. Establishment of Varietal Collection
5. Breeding for Disease Resistance, High Yield and Quality
6. Study of Effect of Altitudes, Soils, and Climates on Production
7. Study of Growing Cocoa in Rotation and in Combination with Other Crops
8. Economic Studies of Production
9. Utilization of Pod and Pulp as By-Products

ORGANIZATION:

The guidance and support of all concerned will be necessary if any appreciable results are to be obtained. For this purpose a committee could be formed under the auspices of the Pan American Union representing:

1. Officials of interested countries
2. American Cocoa Research Committee
3. Major private producers

The purpose of this committee would be to create a complete understanding of the program in all interested countries and to enlist cooperation. It should meet as soon as possible and plan to convene at least once per year in the future.

In the meantime plans for increased production can be initiated by direct negotiations between the American Cocoa Research Committee, the United States Department of Agriculture, and the Inter-American Institute of Agricultural Sciences (an institution located in Turrialba, Costa Rica and set up under the auspices of the Pan American Union to carry out research and education for all the American Republics).

Obviously work would be stimulated or initiated in all the producing countries. This would, where possible, be based on work now under way such as the projects of the United Fruit Company in Costa Rica and Panama, those of the United States Department of Agriculture in Ecuador, and other activities in Colombia, Mexico, Venezuela, and the British areas.

The extent to which the work can be advanced in the various countries will depend upon their willingness, ability and facilities. Most important will be technical guidance and the provision of competent local staff. The attached outline suggests a means of providing consultation and training personnel for the various countries in a program centered at the Inter-American Institute of Agricultural Sciences in Costa Rica.

Although this plan foresees centering the work at Turrialba, the project leader, consultants, and advanced graduate students on the program would survey the field and stimulate activities in other areas. The more successful graduate students could be recommended for work with the various cooperating agencies.

The advanced graduate students would come mainly from the United States. Most of the others would be chosen from the producing countries with prior arrangements covering their return to work on cocoa improvements.

Eventually the general committee mentioned above may require a full-time executive secretary. For the time being it is assumed that the project leader located at the Institute in Turrialba could be responsible for carrying out the decisions of the Committee. A competent American horticulturist now working in the tropics would be available for this position by July 1, 1947. An able Ecuadorian with twenty years' experience with cocoa work may be engaged as assistant leader.

CACAO PROJECT

1.	Leader		$ 6,000.00
2.	Assistant Leader		3,000.00
3.	Consultants: Various staff members of the Institute and the Departments of Agriculture of member countries and specialists of the cocoa and chocolate manufacturers.		
4.	Associates: Various employees of producing concerns, staff members of cooperating experiment stations, and others.		
5.	Assistants:		
	a. Advanced graduate students Pathologist Horticulturist (orchard mgt. Physiologist Soilsman	) $1800 per) 14 months	7,200.00
	b. Graduate students - 8 at $1200 per year (from producing countries)		9,600.00
	c. Technicians - 8 at $800 per year (from producing countries)		6,400.00
	d. Clerk and data analyst		1,200.00
6.	Equipment and supplies		1,200.00
7.	Local transportation		1,200.00
8.	International transportation		5,000.00
			$ 40,800.00
9.	Institute overhead at 10%		4,080.00
			$ 44,880.00

Provision for testing of cacao from selected trees for quality will be required. This might best be arranged by the American Cocoa Research Committee. Because of the danger of introducing diseases, this should be done in an area which does not produce cacao.

ADVANCED GRADUATE STUDENTS

Board and room, 14 months at $50	$ 700.00
Travel to and from Costa Rica	400.00
Stipend at $50 per month	700.00
	$ 1,800.00

GRADUATE STUDENTS

Board and room at $50 per month	600.00
Travel to and from Costa Rica	240.00
Stipend at $30 per month	360.00
	$1,200,00

TECHNICIANS

Board and room at $30 per month	360.00
Travel to and from Costa Rica	240.00
Stipend at $16.66 per month	200.00
	$ 800.00

APPENDIX XIV

PROJECT ON A STUDY OF THE USES OF VARIOUS CHEMICALS IN THE PRODUCTION OF ECONOMIC CROPS IN CENTRAL AND SOUTH AMERICA

Leaders: Ora Smith and Fred L. Wellman

Consultants: Various Institute staff members and guest scientists

Cooperators: The Standard Oil Development Co., the United Fruit Co., and growers of coffee, sugar cane, potatoes, rice, vegetables and other crops.

Associates: Three advanced graduate students.

Location: Turrialba, Quepos and areas where the other important economic crops are grown.

Reasons for Undertaking the Study and Objectives

1. Weeds occur wherever crops are grown and compete with the crop plants for plant nutrients, moisture, light and other necessary growth factors. Weed control by usual methods of cultivation is often injurious to the crop plant roots and is always slow, expensive, and consumes much man labor which usually is available in insufficient quantity. It is our purpose to study the effects of various concentrations, time, and method of application to the soil, seeds and plants of many promising chemicals on the control of weeds in economic crops of importance in the tropical and temperate regions of Central and South America.

2. During the next few years several million cacao cuttings will be rooted and placed in permanent plantations for high quality and quantity production. At present 40 to 50 percent of the cacao cuttings fail to produce roots and hence are discarded.

Several root promoting chemicals have been applied successfully to many species of plants. It is our purpose to study the effects of various growth substances or hormones on the rooting of cacao cuttings in an effort to decrease the percentage of discarded plants.

3. Flowering of the coffee plant in many areas occurs over a period of several months. Likewise, the berries ripen during a period of 3 to 4 months later in the season. To avoid loss of a portion of the crop by over-ripeness and subsequent shattering, it is necessary in some areas to pick the crop 7 to 10 times in one season. It would be extremely valuable to coffee growers if the plant could be induced to flower over a shorter period of time and subsequently to mature the berries over a shorter period, or if the ripe berries could be prevented from shattering until a later harvest could be made. It is our purpose to study the effects of application of various hormone-type chemicals for the purpose of cutting costs and losses during coffee harvest.

4. We propose to study the effects of the hormone samples submitted on any phase of plant growth with the possibility of their application to stimulation of stem and foliage growth, hastening growth and maturity, stimulation--or hastening--of flowering and fruiting, etc.

5. The prevalence of and damage done by insects and diseases to economic crops probably is greater in tropical areas than in other portions of the world. Many insecticides and fungicides which have proven effective control materials in temperate regions are unsuitable for control of some of the insects and diseases which occur in the tropics. It is our purpose to study the effects of the chemicals on the plants and on the control of various insects and diseases prevalent on the important economic crops of Central and South America.

Date of initiation of project: 1947

Probable duration: Three years minimum

Estimated annual expenditure:

Approved: _____

_____

Dr. Ora Smith (Physiologist)	Consultant, 3 months annually [1]
Dr. Fred L. Wellman (Pathologist)	Consultant, part time throughout year [2]

Weed control, hormones, etc.	Insecticides and fungicides
2- Advanced graduate students (14 months)	1- Advanced graduate student (14 months)
2- Graduate students	1- Graduate student
2- Technicians	1- Technician

1- Analytical chemist [1]
1- Data analyst [1]

Note:
1. Cost to be determined
2. No cost to this project

EXPENDITURES

Advanced Graduate students

Board and room 14 months at $50.00	$ 700.00
Air travel to and from Costa Rica	340.00
Per diem enroute 5 days at $7.00	35.00
Incidentals	25.00
Student stipend at $50.00 per month	700.00
Total per fellowship.....	$ 1,800.00

Graduate students

Board and room at $50.00	600.00
Travel to and from Costa Rica	215.00
Expenses enroute	25.00
Student stipend at $30.00 per month	360.00
Total per fellowship.....	$ 1,200.00

Technicians

Salary, 12 months at $66.66 ($400)	$ 800.00

Analytical chemist

Data analyst

Operating fund

Local transportation - 3 groups at $300 per group	$ 900.00
Equipment - 3 groups at $200 per group	600.00
Total	$ 1500.00

Overhead at 10%

TEACHING PROGRAM, INTER-AMERICAN INSTITUTE OF AGRICULTURAL SCIENCES

Teaching at the Institute will be carried out as a function of research, extension, and training projects. The existence of projects in these fields will consequently be the chief requisite for a teaching program. However, if our teaching is to complement that available in member countries and to produce optimum results, certain policies and practices, some of them peculiar to our situation, must be evolved.

Proposals:

A. That the Institute anticipate service to three general types of students:

1. Qualified individuals on leave or vacation from their jobs who desire hospitable surroundings in which to make a job of studying. These would be concerned with learning a specific technique, covering advances in a given field, or perhaps merely in preparing for publication the results of previous work. They would be required to demonstrate competence sufficient to merit use of Institute facilities, but would not be candidates for any degree or required to submit evidence of work accomplished. When staff members of experiment stations or other official institutions of member countries, they would be given the visiting scientist rate which is at present ₡10.00 (ten colones) ($1.80) per day, (sufficient to meet actual costs). Otherwise, the regular rate of ₡15.00 (15 colones) per day would be charged. Gift funds should be sought to provide a certain number of such opportunities at lower rates for younger members of certain of the official institutions. The number of this type of student who could be accepted would be determined by space available after other requirements had been filled.

2. Advanced graduate students in need of an opportunity to carry out research in fulfillment of doctoral requirements for which basic education is obtained in other institutions. These would be accepted on their records plus the recommendation of the institution at which they are registered for the doctor's degree. They would require library facilities and some supervision from the Institute staff in charge of the field or fields in which they desire to work. They would be expected to contribute to work under way and to achieve a standard of performance acceptable to the Institute and their degree committee. They would pay the usual rate for board, room and tuition which is at present $900.00 per year except in cases where fellowships are awarded.

3. Students desiring to spend from one to two years in concentrated, systematic research and study leading to

greater competence in their professional activities and increased ability to contribute to their fields of work and the welfare of their communities.

These students will be accepted on the basis of demonstrated qualifications to do graduate work, important elements in which will be the equivalent of a Bachelor of Science degree in Agriculture, professional experience, character and personality, desire and apparent opportunity to advance their fields of work and the welfare of their communities. They will be candidates for the degree, Master of Agriculture. For such students a course should be available consisting of supervised participation in research, extension, or vocational education plus library study and organized discussions. Preparations for such students will include:

a. Major and minor projects in which they will participate as worked out in consultation with the Institute staff member under whom they will work, in collaboration with other staff members as required.

b. A plan for study in relation to work to be done similarly arrived at but in all cases including the assistance of the Librarian.

c. Collateral study and observation, not specifically required by the projects undertaken but contributing to a broader understanding of the general field of work and its implications to the individual and his community.

d. A composite course under the chairmanship of the director and participated in by staff members from the various fields represented in the Institute's program. The course will be a series of projects participated in by students, demonstrations, and discussions. Its aim will be to promote an understanding of science as a body of knowledge as well as a procedural technique and to advance the student in his ability to see the relationship between branches of science and their contributions to human welfare.

B. That the process of student selection be publicized among member countries:

1. The quota contributions should be intended to maintain a strong nucleus at the Institute and promote its continuity. With the exception of one fellowship per year (including board, room and tuition)

which will be made available to each member country (when teaching opportunities and qualified students are available), all other students will require board, room and tuition from the country concerned, the individual, or from such grant funds as may be available and applicable.

APPENDIX XVI

ORTON MEMORIAL LIBRARY REPORT

August 1946-March 1947

Library collection

The library's main collection is composed of several collections that were donated to the Library or were purchased at a very low cost. The following are included:

1. Orton's collection (which belonged to the Tropical Plant Research Foundation) consists of about 600 books and 10,000 separate items including pamphlets and periodicals. The materials in this collection are old and are on the subject of agriculture.

2. Pearson's collection is composed of 60 books and about 300 periodicals. The materials in this collection were ordered by the Department of Agricultural Economics and Rural Welfare and were bought at a reasonable price.

3. Sancho's collection was donated to the Library by the relatives of the late Mr. Francisco Sancho Jiménez of Cartago. It consists of 103 books, most of which are on chemistry.

4. Myers' collection is composed of 139 bound volumes of pamphlets on economics and farm management.

Budget

The library budget for this year was very limited. The library was assigned $4,080.00 allocated as follows:

Salary of Librarian	$ 2400.00
Supplies and services	180.00
Books and periodicals	1500.00
Equipment	720.00

From July 1946 to January 1947 we incurred the following expenses:

Staff	$ 1258.27
Supplies and services	183.10
Books and periodicals	354.93
Total spent	$ 1796.30

This leaves us a balance of $2,283.70 to be spent before next June. These figures do not include all of our orders of last year; but only the ones which we have received, which have been very few, and have been paid for.

Selection and ordering of materials

The selection of the materials to be ordered has been made by the faculty and the Librarian.

The following materials have been ordered:

150 books including a set of the Encyclopaedia Britannica
1442 Experiment Station bulletins
Library supplies (book cards and pockets, mending supplies, etc.)

A list of 440 titles was placed with the American Library Association in order that they may buy for us books up to the amount of $1,500.00, donation that we received from the United States Department of State and the Rockefeller Foundation.

Periodicals

Last year the Library subscribed to 22 periodicals from the States. Twenty new subscriptions were added at the beginning of this year increasing the number of our periodical subscriptions to 42. All of these are technical periodicals. We have also requested 17 complimentary subscriptions or subscriptions on an exchange basis for periodicals published by Experiment Stations or other government or commercial agencies. Most of the periodicals from Latin America are received on an exchange basis.

A periodicals' checking file is kept arranged alphabetically and by countries where periodicals are checked immediately upon arrival. They are stamped with the library's ownership stamp and placed on racks in the reading room. Back numbers of periodicals are kept back in the stacks arranged by countries.

Cataloging and classification of materials

702 sets of Library of Congress cards have been ordered through the Library of the Pan American Union. Of these we have received 625 sets.

105 books have been classified and 520 have been fully cataloged. These 520 books are in the stacks arranged according to the Dewey classification system and are ready to be charged out.

The records for this division include the following:

Card catalog with 2,021 cards alphabetically arranged
Shelf list with 520 cards arranged in the order of the books in the shelves
Accession record with 520 cards

A total of 3,061 cards have been prepared for these records.

Processing of the books:
520 book cards have been typed
520 book pockets have been pasted
520 date-due slips have been pasted

A total of 3,085 pamphlets have been classified and have been put in envelopes properly labelled.

Reference work

The books of reference value are kept outside in the reading room. The Encyclopaedia Britannica and other reference tools that were ordered last year have not arrived yet.

About 175 reference questions have been answered.

Circulation

Library materials circulate among staff members, students, and visiting scientists. A circulation file is kept arranged alphabetically by names of borrowers in a tray. The cards for all materials charged out are kept in this file. Cards of three different colors are used: white, for books from the general collection; yellow, for reference books; green for periodicals.

Circulation statistics: During the period covered from August to December 1946,257 volumes (books and periodicals) were charged out of the library.

426 volumes were recorded as going out in January-March of this year. This increase is explained by the fact that many books and pamphlets that had gone out of the library before the librarian arrived were recorded in the circulation file for the first time.

The total number of items that have been recorded in the circulation file since last August amounts to 683.

Microfilm service

The Library has a collection of about 100 pieces of microfilm material. A microfilm reader was ordered and is supposed to arrive here soon.

Preservation of materials

A 5-gallon can of mildew inhibitor was received and we have started treating some books with it.

Correspondence

106 letters have been sent out of the Library. These include memorandums to Washington, thank-you letters, and orders for materials.

Binding of materials

25 periodical volumes and 8 books have been bound at the Libreria Universal in San José. 10 periodical volumes are now at the bindery being bound.

Equipment

The following pieces of furniture were made at our carpentry shop:

2	6-drawer card cabinets
2	3-shelf book trucks
2	magazine racks
2	newspaper racks
1	reference shelf
1	dictionary stand
1	bulletin board
2	waste paper baskets
1	charging tray
1	display shelf

Supplies ordered made at printing press in San José

1,000	date-due slips
1,000	stickers
1,000	book plates
1,000	periodical checking cards
1,000	book order cards
1,000	book pockets
500	reference book cards
1	library ownership stamp

Plans for next year

The library budget for next year should be raised to $10,000.00 in order to meet the expenses which we would incur if we were to carry on our program. The items of major expense would be the following:

Salary of the Librarian
Employment of an Assistant Librarian with a salary of $1200.00
Employment of a full time clerk with a salary of $600.00
Building 16 shelves at Carpentry shop) This building program
Ordering 40 chairs for reading room) would cost around
Making 4 large tables for reading room) $800.00
Ordering 1000 pamphlet binders $300.00
Binding of 100 periodical volumes $1000.00
Getting at least 15 new magazine subscriptions
Putting a smooth coat of cement on floor in stacks
Getting as many Spanish titles as possible
Filling in gaps in the collection

FECHA DE DEVOLUCION			
2 NOV 1982