

21 May 1970

File EA-17

TO: Executive Committee

FROM: Donald E. Stone

RE: Information on "Accreditation of OTS courses by the
Graduate School of Duke University"

The enclosed document was presented to the Graduate School for consideration of adoption. I appeared before the Executive Committee of the Graduate School, emphasizing the positive handling of the situation at Michigan, and underplaying the record of U.C.L.A., Washington, and Indiana.

The Duke Graduate School endorsed the recommendations en toto. Perhaps OTS would be a little more conspicuous and stronger if more schools would do same. Also note that our administration has agreed to grant release time with pay to faculty during academic year providing the Department concurs.

6-17 Accreditation Procedures - folder 7-17

DR. JOHN C. MCKINNEY
DEAN OF THE GRADUATE SCHOOL
AND THE EXECUTIVE COMMITTEE OF THE GRADUATE FACULTY

RE: Accreditation of OTS courses by the Graduate School of Duke University

Duke University is one of 25 universities that constitute the consortium known as the Organization for Tropical Studies. We in the sciences view OTS as an extension of our graduate program in the tropics. Students awarded national, competitive fellowships sponsored by OTS and funded by the National Science Foundation receive transportation, living expenses, and tuition to attend the OTS courses in the tropics. Most courses operate 6 to 7 days per week for a period of two months, either Feb.-Mar. or July-Aug. and are accredited through the University of Costa Rica for 8 graduate units.

We are requesting formal recognition of the course offerings and standardization of the process by which course credits are reported and entered on the transcript at the Duke Graduate School. In effect the Graduate School is being asked to treat the OTS program in the same way that interchange of registration is received in the "Cooperative Programs with the Consolidated University of North Carolina." Thus, credit earned under this arrangement would not be defined as transfer credit.

The following recommendations are made to cover the graduate program at Duke University

- 1) Students attending OTS courses during an academic semester be required to register for a minimum of 3 units of research at Duke University.
- 2) OTS course credits be accepted and entered on the student's Duke Graduate School transcript.
- 3) Time spent in OTS courses be applied towards the residence requirement.
- 4) Announcements be placed in the Graduate Bulletin under Special and Cooperative Programs and appropriate inserts noted under substantive departments.

Donald E. Stone
Associate Professor
Department of Botany

ert for the Graduate Bulletin: Special and Cooperative Programs)

Organization for Tropical Studies

Duke University is a member of the consortium of universities created to promote an understanding of tropical environments and their intelligent use by man. To achieve these objectives, OTS fosters research and education programs in the New World tropics.

Fellowships are available for travel and subsistence in the field-oriented programs in Latin America. The basic course, Tropical Biology: An Ecological Approach, runs for a two-week period in February-March and July-August. Advanced offerings in agriculture, zoology, botany, earth sciences, forestry, geography, marine biology, meteorology, and geology are periodically scheduled.

The course schedules and application deadlines vary from year to year. Consult the respective university departments for current information on OTS activities.

ert for the Graduate Bulletin: Courses of Instruction - Botany)

Program in Tropical Biology

Fellowships are available for travel and subsistence in field-oriented programs in Latin America. Refer to the announcement in this Bulletin under Special and Cooperative Programs: Organization for Tropical Studies.

JUSTIFICATION OF THE REQUEST

In the following pages are presented background information on OTS. Specifically, synopses are provided of the (i) organizational structure, (ii) scope of the organization, (iii) academic and research programs, (iv) evidence of the need, quality and participation in the programs, (v) facilities and other resources, and (vi) a soul- and pocket-searching look into the future of OTS.

The relation of graduate schools to the Organization seems fairly clear. The consortium provides the critical mass of educational and financial resources that no single institution can muster. OTS is in reality an outgrowth of Harvard's and Michigan's realization that long-term commitment to excellence in tropical biology requires international support. Given that the scientific merit of tropical education and research is unchallengeable, OTS offers the best promise of providing the necessary broad-base of operation.

The benefits to Duke are very great indeed. Since our initiation fee of \$2,500 in 1967, we have been paying yearly dues of \$2,000. While there is no direct preference given to Duke applicants, we have placed 14 students in OTS courses, at an average cost to the Organization of \$3,000 per student. In these days of tight monies, OTS is looking for ways to diversify its funding and take some of the pressure off the National Science Foundation. One way the universities can play a stronger role in the Organization is to release faculty for teaching in OTS courses, such as the Duke administration has recently consented to do. It should be pointed out, however, that the recruiting of faculty for OTS courses is done on an international basis with faculty quality, familiarity with the American tropics, and availability for a rigorous and rugged field program serving as the prime requisites.

We are convinced that there is no better way to provide high-quality training of tropical scientists on a continuing basis. The courses are educationally sound and fully worthy of 8 units of credit. Since Duke is a member of the consortium, with a stake and control in the type and content of OTS courses, we recommend that OTS courses be afforded full academic credit and be treated as an extension of Duke's graduate program in the tropics. We suggest that the "Cooperative Programs with the Consolidated University of North Carolina" be used as a model for handling the course credits.

This request represents, in a way, a token gesture of good faith in one of our investments. To date the Graduate School has acted favorably on all individual requests to accept OTS "transfer" credits. Since it is inconceivable that a Duke student would ever receive (or want to receive) more than two competitive fellowships to attend OTS courses, his maximum credits would not exceed 16 units. Thus, he would be taking far less than the 30 graduate credits that can be transferred in and applied toward the Ph.D. program. Why then place a ceiling on OTS units if no possibility exists of reaching it? The same rationale applies to the residency requirement. As far as we can ascertain, all of the graduates in the biological sciences far exceed the minimum residency requirement. Full accreditation of OTS courses should in no way lower the standards of the Graduate School of Duke University.

The stipulation that academic-year participants in OTS also register for 3 units at Duke recognizes the fact that full-time graduate study, prior to passing the preliminary examination or otherwise completing all requirements except the thesis is based on a load of 9-15 units per semester. An OTS student would carry a minimum of 11 units, 8 units received through the University of Costa Rica and 3 or more units through Duke. The registration for 3 units at Duke is suggested as a reasonable minimum. Graduate students are deprived of income during the OTS courses. Those that are not on tuition-paid fellowships would be hit particularly hard if they had to bear a heavy out-of-the pocket expense on the home campus.

THE ORGANIZATION FOR TROPICAL STUDIES:
CONCEPTS AND GOALS IN 1970

ORGANIZATION

Recognizing the urgent need for mobilization of forces for an attack on tropical problems, nine North American universities and the University of Costa Rica joined in 1962 in setting up the Organization for Tropical Studies (OTS). With later additions, it now includes 25 universities and research institutions of which two are Latin American. OTS is a non-profit corporation of the State of Florida with its central administrative and business offices in Coral Gables and a field operating center at the University of Costa Rica. Each member institution has two representatives on the Advisory Council. The affairs of the Organization are managed by a 17-man Board of Directors, the members of which are elected for three-year terms by the Advisory Council (see attached Organizational Chart). For 1970, the officers are Mildred E. Mathias, President, U.C.L.A.; Joseph M. Reynolds, Vice President, L.S.U.; Marion E. Marts, Secretary, University of Washington; Donald E. Stone, Treasurer, Duke University; and Stephen H. Spurr, Past President, University of Michigan.

Responsibility for operations rests upon the Executive Director, appointed by the Board. Jack T. Spencer, formerly a staff member of the National Science Foundation, is the first full-time incumbent of this position. The Resident Director in Costa Rica, Mr. Jorge R. Campabadal, supervises all operations in the Republic and to a considerable extent in other areas of Central America. An Operating Committee recently has been established to supervise all OTS operations in Guatemala.

SCOPE

OTS was established to promote the study of science in the tropics, to conduct organized programs of graduate training and research on tropical problems and to serve as a national and international agency for coordinating and facilitating the work of individuals and groups in the tropics. Its intent is to serve the entire scientific community, not merely the interests of its member institutions. Its central purpose is to acquire and disseminate a broad understanding of tropical environments by means of a sound program of basic research and teaching which is not oblivious to the spread of human populations in the tropics or to man's complex relations to tropical environments.

Basic to the concept of OTS from the beginning was the fact that this consortium was organized as an extension of the graduate schools of all its members and was to represent their basic interests in tropical studies in all pertinent disciplines. Also basic to the OTS concept was the multidisciplinary nature of its programs, with special emphasis on ecological and environmental studies (but not necessarily limited to these aspects).

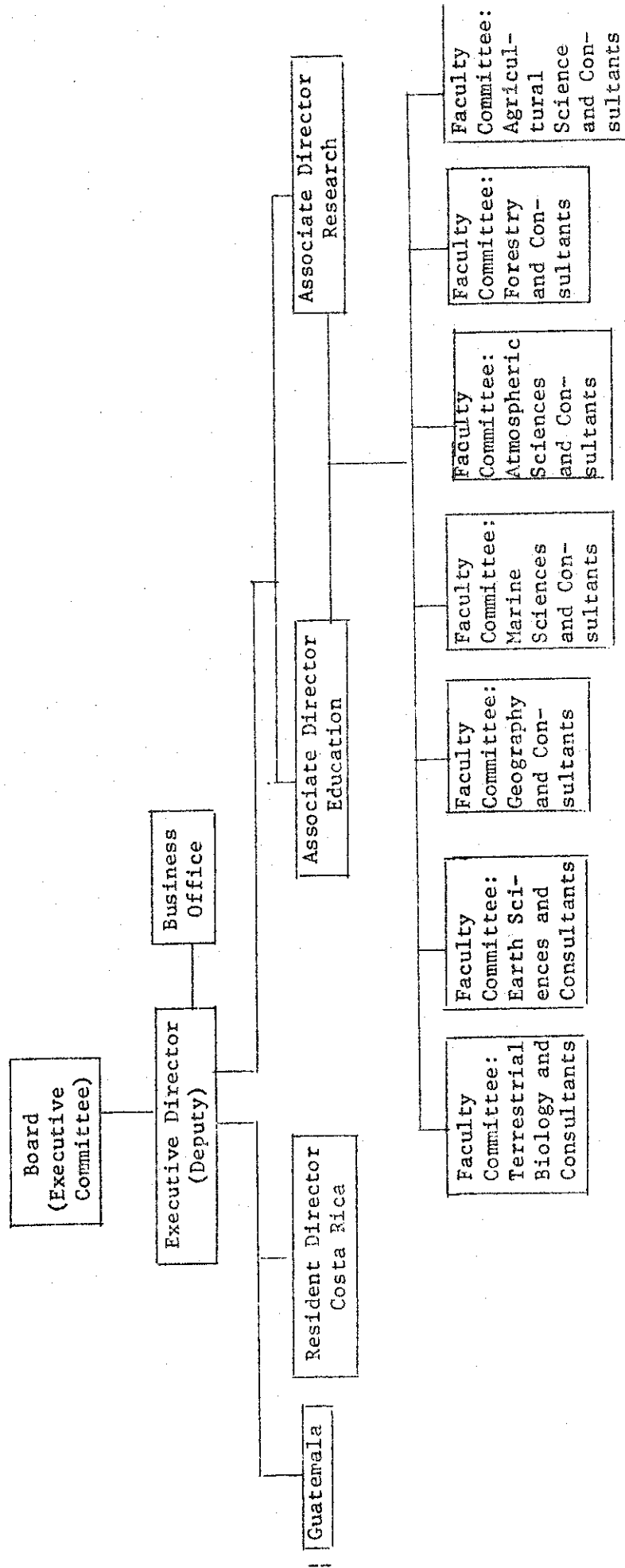
ACADEMIC PROGRAMS

General Aspects of the Educational Program. Because the training of more investigators was seen as the most urgent need and the essential first step toward its objectives, the Organization began by concentrating on its educational program. Graduate level courses in tropical biology were established, all stressing ecology and all conducted almost entirely in the field. To the original introductory course in tropical biology, advanced offerings have been added in several disciplines. Since 1964, two 8-week sessions have been held each year: one in February and March (the dry season) and the other in July and August (the season of heavy rains). In 1969, course offerings were extended to the April-June period. Courses offered are assigned full graduate credit transferable to any

OTS ORGANIZATIONAL CHART

APRIL 1, 1969

INSTITUTIONAL REPRESENTATIVES



(As approved by Executive Committee at
Meeting of March, 1969)

university, and most member institutions permit the use of OTS courses as partial fulfillment of residence requirements for advanced degrees.

It must be emphasized particularly that OTS courses are designed primarily to give the student that experience in the field which can be attained by no other means. In other words, these courses cannot be duplicated anywhere outside of that particular region and focus of the tropics which bears upon each specialized subject.

Courses are developed and the staffs for them are recommended by faculty committees appointed from the faculties of member institutions by the OTS president. The faculty committees are assisted by consultants representing each member institution. Faculty committees and consultants have been appointed for the following disciplines: Terrestrial Biology, Marine Science, Geography, Forestry, Meteorology, Earth Sciences, Agriculture, and Anthropology.

Each series of courses consists of one or more sections of a basic introductory biology course entitled "Tropical Biology: An Ecological Approach" and two or more offerings in other disciplines and specialized biology subjects. In all courses, students and professors are in the field together for about seven of the eight weeks of the session. Class activities are carried on with little reference to either the clock or the calendar. Time is spent in several contrasting lowland and highland environments with field observations and experiments being supplemented by staff lectures on related topics.

The Organization does not have a permanent teaching staff and sees no need for one. The instructors serve either on the basis of released time or off-campus assignment from their home institutions and are selected on the basis of competence, desire to participate, and the ability to teach interesting and demanding courses under sometimes difficult field conditions. Two or more faculty members and teaching and field assistants serve continuously with every course during the entire eight-week period. In addition, several visiting scientists spend two or more weeks with each course in the field. Local scholars and visiting research personnel frequently lecture on topics related to their work.

Impact of Past OTS Training on Future Careers in Tropical Science. In December of 1968, questionnaires were circulated to a large number of former OTS students with the objective of determining the impact of the original training upon their future careers in tropical science. Although in some respects it is difficult to establish criteria by which a quantitative assessment of the impact could be measured, it was believed that data on number of dissertations, amount of field work carried out in the tropics, number of articles published in tropical science, and plans for future work would provide at least broad indications of the OTS influence. It is essential to keep in mind that graduate students tend to be highly mobile in their early careers and it is extremely difficult to reach many of them. Indeed, 63% of the questionnaires were not answered.

Out of the 153 respondents, 44 (29%) completed a dissertation on some subject directly concerned with the tropics. A total of 56 (37%) carried out further field work in the tropics following completion of their OTS training. A total of 121 (79%) definitely plan to do future research work in the tropics. The 153 trainees contributed a total of 107 articles on tropical research to recognized scientific journals.

Refer to the APPENDIX for a perspective of the type and "quality" of OTS courses, students, and faculty.

RESEARCH PROGRAMS

Because the training of more investigators was seen as the most urgent need and the essential first step toward its objectives, the Organization began by concentrating on its educational program. However, the conduct and facilitation of research on tropical problems

also is an integral part of the Organization's aims. There are several means by which OTS can promote tropical research, including the following:

1. Facilitation, by giving access to OTS facilities and furnishing logistic help to individual investigators or research groups whose projects are compatible with OTS objectives.
2. Direct support, through pilot study grants funded initially by the Ford Foundation and the National Science Foundation. These are small grants which are intended to encourage investigators without previous tropical experience to test the feasibility of some new studies in tropical science.
3. Major OTS projects, by sponsorship of a limited number of large, long-term projects with the cooperative efforts of specialists in several disciplines. The first of such projects, the Ecosystem Comparison Study, has been in process for nearly two years and is well advanced in the analytic comparison of the composition and dynamics of contrasting types of lowland forest ecosystems in Costa Rica.

EXISTING FACILITIES AND RESOURCES

OTS presently owns a large tract of land (1,400 acres) in northeastern Costa Rica which consists largely of undisturbed lowland wet forest. Finca La Selva is accessible by surface throughout the year and also may be reached by a combination of air and surface routes.

OTS also utilizes many additional sites in Costa Rica by means of lease arrangements (see attached map). The field sites are scattered throughout the Republic and represent all major subdivisions of the environment. Substantial usage is made of San Andres Island in the Caribbean for marine studies since this location boasts a superb tropical coral reef. Facilities of other institutions are widely used throughout Central America, including the El Salto property in Guatemala, the introduction gardens of United Fruit in Honduras, the Escuela Agricola Panamericana in Honduras, the Instituto Interamericano de Ciencias Agricolas at Turrialba, the Smithsonian Tropical Research Institute in Panama, the University of Costa Rica, etc.

THE FUTURE OF OTS

The Organization should be viewed as an instrumentality for doing a task that is of vital importance, both in the national interest and for the future of all mankind. Considering its breadth of scope, its multi-institutional and multidisciplinary character, the large emphasis given to ecological research, and the importance and urgency of its mission, the Organization can be viewed as comparable with some of the national laboratories that are supported wholly by federal funds. Although it does not have this status, the Organization is seeking broad support from both public and private sources.

As indicated in its general development plan for the next three to five years, OTS at this early stage is seriously in need of several kinds of support, including strengthening of its graduate academic programs, facilities for both terrestrial and marine programs, acquisition of natural resources, funds for faculty committees, development of the new center in Guatemala, initiation of a new center in the North Andean region of South America expansion of research on tropical ecosystems, and general strengthening of the administrative and logistical structure.

It is obvious that the needs are so varied that it may be difficult to assign accurate priorities at this point in history. However, some of the more critical elements are indicated as follows:



Costa Rica, showing the mountainous regions (shaded), the Caribbean and Pacific slopes and coastal plains, the two peninsulas, and the course of the Inter-American Highway (heavy line). From the Cordillera Central rise four great intermittently active volcanos that reach heights of 7,800 to 11,000 feet: Poas (P), Barba (B), Turrialba (T) and Irazú (I), the last of which erupted in 1962-63. Much of the crest of the Cordillera de Salamanca lies above 10,000 feet, with its highest point, Cerro Chiripó (C) attaining an elevation of about 12,400 feet.

The numbers indicate the areas most often used by OTS field classes: (1) the Osa Peninsula, with one of the finest examples of wet lowland tropical forest, and Golfo Dulce, with mangrove-bordered shores; (2) Guanacaste, relatively dry, with semideciduous forest and grazing land; (3) Guapiles, with wet lowland forest of different type than that on the Osa Peninsula; and (4) Cerro de la Muerte, with montane forests on the slopes and with páramo-like environments on the crests and peaks of the Cordillera de Talamanca.

1. Graduate Courses in Specific Disciplines. We are hopeful of the continued support of the National Science Foundation in several disciplines, but it seems rather unlikely that all eight disciplines could be funded in 1971 and beyond (we have support for seven disciplines in 1970). We would especially look for support in the more applied aspects of such disciplines as Agriculture, Forestry, Meteorology, and Geology.

2. Teaching Equipment for Selected Disciplines. Since OTS has had relatively small sums available for teaching equipment, it has been essential to move apparatus from station to station as the classes rotate throughout the Central American area. It would be helpful if scientific equipment could be stockpiled at several of the major sites in order to simplify the logistical requirements. Also, specialized equipment is needed initially for some of the newer disciplines and courses. Atmospheric Sciences is a good case in point as is the course in Tropical Limnology which is being offered for the first time in 1970.

3. Participation of Latin-American Students and other Foreign Nationals in OTS Programs. Under present guidelines of the National Science Foundation, we are limited to a ten percent admission quota of Latin students in OTS courses and no funds may be used for their international travel. Admission of other foreign students requires special permission from NSF in each particular case. As a result, very few Latins or other foreigners have enjoyed the opportunity to participate in these high quality courses. OTS would like to have at least one-third of its total student slots made available to qualified Latins.

4. Support for Faculty Committees. Most of the academic strength of OTS is inherent in the Faculty Committees which are responsible for development of the academic and research programs in each of the major disciplines. Each Committee consists of six individuals appointed for staggered three-year terms. The authority of the Committee extends to the development of courses to be offered over a definitive period of years and to the nomination of the senior faculty representatives for the conduct of such courses. In the research areas, the Committees stimulate the initiation of pilot studies and develop plans for major research studies.

Obviously it is extremely important that the Faculty Committees establish a high degree of communication if they are to function effectively. As a minimum they should meet at least once a year for the development of detailed plans. Support is needed for travel expenses for the annual meetings as well as limited secretarial and office services during the year.

5. Strengthening of Logistical Capabilities in Costa Rica and Guatemala. Although the Costa Rica center has been in operation for several years, it is inadequately equipped with vehicles to handle the large teaching and research loads. There also is an urgent need for a Deputy Resident Director to assist the present Director who has accomplished such remarkable results with limited assistance. In Guatemala, we need to plan for a part-time Resident Director, the acquisition of limited teaching and research equipment, and the development of a small pool of vehicles.

6. Facilities. In its early stages, the marine science program is being focused on San Andres Island in the Caribbean where there are outstanding coral reefs available for study. Here, OTS needs to acquire shore property suitable for the construction of a modest marine laboratory. For several years, our Tropical Biology classes have been held on San Andres with no laboratory facilities whatsoever. This location also lends itself well to support from our present well-developed logistical network in Costa Rica.

At our forest station at Finca La Selva in northeastern Costa Rica, OTS needs to replace the existing wooden field house with a modern field laboratory which will provide first class research and teaching space for the large number of students and investigators who now visit this site each year. We also need to develop suitable residential housing for

investigators working on long-term projects. The development of such facilities also makes essential the construction of a limited road system and a suitable network of trails and bridges in the forest.

OTS for several years has been planning the construction of a building on the campus of the University of Costa Rica which could serve as a home for its Central American Office as well as a focus for its academic and research activities in the Republic. The authorities of the University has allocated a prime site for this building in the center of the main campus.

At the present time, OTS is severely handicapped by the lack of suitable facilities for teaching and research on the Osa Peninsula in the southwestern portion of Costa Rica. This area contains one of the finest large remaining tracts of tropical forest in the entire region of Central America. As a preliminary to improvement of existing facilities (which are leased), it would be essential for OTS to acquire the necessary land on which to construct the building.

7. Land Acquisition. Although OTS has acquired Finca La Selva with 1,400 acres of excellent lowland tropical forest, this acreage is inadequate for needed sanctuaries, research preserves, teaching areas, buffering zones, etc. The existing acreage should and can be doubled by the acquisition of adjacent property. Considerable preliminary work already has been undertaken with respect to options and related legal matters.

The need for the acquisition of land on the Osa Peninsula was noted above. However, if OTS is to proceed with a major ecological study of all phases of tropical ecosystems, it will be essential to acquire a substantial tract encompassing one or more large watershed areas. Preliminary exploration has not made clear whether this can be approached most easily under a purchase or lease arrangement. However, there are good reasons for believing that one of these approaches would prove successful. As OTS moves in this direction, it will attempt to fulfill many or most of the objectives of the tropical biome component of the International Biological Program. Steps are now being taken to develop and coordinate this position with the appropriate officials responsible for IBP activities.

8. Expansion of Research on Tropical Ecosystems. This point has been covered to some extent in discussing land acquisition on the Osa Peninsula. However, we should note that despite the intense work which has been launched by OTS on the Ecosystem Comparison Study in the northern part of Costa Rica, the areas available do not easily lend themselves to the analysis of an entire watershed system. This is the kind of resource required by many ecologists who wish to use a modeling approach to the analysis of ecosystems in the tropics but who could not be accommodated on the land areas now available in our ongoing programs. Once the necessary land areas are available on the Osa, rather limited funding would allow a modest beginning of work on the tropical biome along the lines suggested in the International Biological Program schedules.

9. Establishment of North Andean Center. For the past couple of years, OTS has considered the development of a tropical center in the northern Andes region of South America. Due to various geographical and political considerations, it seems likely that such a center would be located either in Ecuador or in Colombia. OTS sponsored a brief survey of northern Ecuador this past year and the report is now under consideration by the Board of Directors. However, additional support is needed to further the planning work and to initiate a limited academic program for a period of two years. With this experience as a basis, OTS would be able to assess the nature and future direction of its programs in South America.

(Prepared by J.T. Spencer at the North American Office, Coral Gables, Florida, January 1970; amended by D.E. Stone, April 1970)