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RESEARCH POLICY AND PROGRAM OF THE PAN AMERICAN HEALTH ORGANIZATION

Chapter V of the Director's Annual Report (Official Document No. 62) presents a general review of substantial progress in research activities of the Organization during 1964, indicating, as well, a number of important studies which are coming to fruition in 1965. As in previous years, great indebtedness is acknowledged to the PAHO Advisory Committee on Medical Research. The Committee continues its dedicated interest in the organization's research program by its helpful responses to questions regarding specific research projects and regarding the program as a whole, its balance as to major emphases, and its priorities (Annex I).

Some indication of the scope and nature, as well as the financial commitments of the program, is shown in the document Current PAHO Collaborative Research Program, which was prepared for the Fourth Meeting of the ACMR, 14-18 June 1965. In it, it is noted that fifty five projects are active in 1965, representing an investment of \$2,769,213 funds which were contributed by twenty two (22) voluntary and governmental agencies. The total amount requested to complete these projects in future years aggregates \$7,915,005. The grant requests under current consideration, totaling nine (9), are in the amount of \$1,146,249 (Annex II).

These figures, however, do not reflect the whole story, for, with the approval of successive Meetings of the Directing Council since 1962, the PAHO regular budget has allocated gradually increasing amounts to research and training purposes at the AFTOSA, and Zoonosis centers, and INCAP.

The general efficacy and efficiency of the program, as planned and coordinated by the Organization staff, is indicated by the fact that, while the research program continues to expand, the budget of the Office of Research Coordination remains at about the same level as it was when it was organized

in 1962 (under an NIH grant of \$200,000) and when it was incorporated in the regular budget in 1964. Rather than increasing the number of permanent technical expert personnel, the policy is to appoint short term consultants, as needed, to explore research resources and potentialities, in specific subject-matter fields of priority value to PAHO program activities, related to the program and responsibilities of the Organization. Upwards of 200 such appointments of leading bioscientists, including experts in public health research, have responded with enthusiasm and productivity to these assignments. The quality of the program, as well as its breadth and balance, reflects the value of their reports and recommendations.

PAHO has attempted to marshal and draw upon the experience and creative ideas of the best talent available, with which to support and stimulate the advisory and service program of the Organization in research. This gives the professional expertise needed to move forward vigorously to work with the Governments in carrying on research required to solve their health care problems, including the creation and strengthening of Regional and National institutional resources for research and for the training of scientific, teaching and research manpower, toward regional self-sufficiency.

In reviewing the Director's Annual Report for 1964 it will be noticed that, departing from previous formats, Chapter V on Research consolidates the entire PASB research program.

One of the most important studies the Organization has ever undertaken is now in its fourth year and will be concluded in 1966. This is the Inter-American Investigation of Mortality; the results so far are described in the Report. The preliminary findings indicate significant and unexplained differences in death rates by some diseases in these cities, eg. tuberculosis, cancer by organ systems, cirrhosis of the liver, arterio-sclerosis and degenerative heart diseases (including Chagas Disease), among others. Already local investigations are establishing studies to determine the reasons for the differing rates.

The high incidence of deaths from Chagas Disease in Riberão Preto, Brazil, for example, stimulated an intensive study of the pathogenesis of this condition as it affects the heart and autonomic nervous system, by two consulting pathologists. Their Report and the recommendations of the ACMR (to be forwarded later) deserve careful study, for major advances in knowledge of this disease, as well as preventive and control implications, are set forth. Some matters of controversy among medical men about the pathogenesis of the disease are finally laid to rest.

Finally, the Colombia pilot research study of Health Manpower and Medical Education is reported. The study is testing research methods of measuring health-manpower and medical education requirements in relation to the health conditions, health-care facilities, and to the

socio-economic development of a rapidly growing population. This study, by the Ministry of Health and the Colombian Association of Medical Faculties with the technical and financial support of the Milbank Memorial Fund and the PAHO, is well advanced. After the study is completed (in 1966) a Pan-American seminar will be convened to review the findings and possible applicability of the methods used and of the findings to other countries of the Region.

Attention is called also to the Report on Environmental Health (Chapter I.B) which indicates substantial progress in activating the Centers for training, research, and advisory services on environmental and industrial health, including water and air pollution. These Centers in Chile, Venezuela and Brazil will become important regional resources for the training of sanitary engineers and research personnel who are in such short supply to meet the expanding requirements of the Region.

The tempo and pace of the present times, stimulated in part by the dynamics of science and technology, pose unusual problems for governments and the societies they serve. Science today is involved in or at least touches almost every policy question considered by governments. In Latin America biomedical scientists are of great importance in the society both in and out of Governments, yet few Governments have adequate policy, structure and financial support for biomedical research. Recognizing this the ACMR at its Third Meeting (1964) called for a study of the problem. The Report by Dr. Charles Kidd, Chairman of a Special Committee on Biomedical Research Policy was reviewed by the ACMR. The Committee reported that for historical reasons a scientific tradition has been slow to develop in Latin American countries. The basic need, therefore, is to foster a climate of opinion that understands the role of scientific research as part of the cultural life of the community. Research and teaching must go hand in hand, and the Universities are the natural centers for developing a research tradition. In many cases, however, changes in the organization of the Universities and in the scope of their curricula are needed before they can play their part effectively. The Committee stressed the importance of the part that can be played by scientific and academic organizations that already exist. There is need for strong bodies of this kind, with due care to avoid unnecessary overlapping and duplication.

The ACMR pointed up the serious problem of the loss of scientific manpower by emigration to seek better working conditions elsewhere and recommended that PAHO make a detailed study of the extent of this "drain of scientists" from the developing countries of Latin America. Such a study is already in progress under the direction of Dr. Kidd.

Another closely related report dealt with public health research in Argentina, a report that was requested by the Minister of Health. It made specific recommendations, which the ACMR approved, looking toward the development of a national policy on public health research in which the "Community is the

laboratory", and desirable ways of organizing resources and research support mechanisms that would be responsive to national health policy requirements and Ministry decisions in a systematic sustained manner, including the training of needed research manpower.

Most of the medical libraries of Latin America have not kept up with the pace of growth of scientific literature. As a result, teachers, research workers and students in large areas are seriously handicapped in their studies and scientific investigations. This is a world wide phenomenon. However, the National Library of Medicine of the USPHS provides bibliographic and literature services, upon request, to scientists throughout the world; Latin America being the biggest user. "Over half of the Library's interlibrary loans to foreign countries go to Latin America". During the past year several reports of conferences, including a PAHO consultant's report, were reviewed by the ACRM. There is agreement that a Latin American Regional Library Centre, to be serviced by and closely related to the National Library of Medicine of the USPHS should be established in South America, where an existing library and other necessary services of modern communication technology are well developed.

Such a center would be based on local resources which would be expanded to augment the library resources for teaching, research and training of medical school, hospitals, and institutes elsewhere. Such a center would be expected to become an active continuing force in "promoting and encouraging medical library development in the Americas through functioning as a demonstration and training Center", and in "fostering cooperative library and bibliographic programs among its constituent groups" and by "utilizing modern photocopy and communications technology in improving such accessibility."

The proposal of the consultants, strongly supported by the ACRM, is that such a Latin American Regional Medical Library should be under the joint sponsorship of the PAHO and the Pan American Federation of Associations of Medical Schools.

Detailed recommendations include among others the suggestion that "policy for the regional library would be established by the Board of Governors appointed by PAHO, which would include representation from the Pan American Federation of Associations of Medical Schools, and the member nations of PAHO, as well as a member of the host institution, and its services would be available to all eligible users in Latin America." The Director would be expected to have a technical advisory group of experts in contemporary library and communications science.

The proposed budget for non recurring capital investment cost and for the first year of operations is \$205,600, which would fall to \$153,000 in the second and third years.

A program such as this is basic to a program of research and to improve the quality of health manpower training, and, in the long term, the quality of health care programs of the Region. The matter of financing has not yet been considered by national or international bodies.

Following on Resolution XXXI of the XV Meeting of the Directing Council which, among other things, took note of the importance of population growth in relation to community and individual health in the context of socio-economic development, urban and rural, and recommended a comprehensive program of research and research training in medical demography and human reproduction, significant conferences and program developments have taken place. These were reviewed and endorsed by the ACMR.

The 1965 World Health Assembly adopted a resolution related to this, but, which also "requests the Director-General to develop further the program proposed:

(a) in the fields of reference services, studies on medical aspects of sterility and fertility control methods and health aspects of population dynamics; and

(b) in the field of advisory services on the understanding that such services are related, within the responsibilities of WHO, to technical advice on the health aspects of human reproduction and should not involve operational activities."

The PAHO and WHO programs are being developed concurrently. The PAHO program, it might be noted, places stress upon institutional resources development, manpower training, and community research studies under the following main headings:

- 1.- Epidemiological study of mortality;
- 2.- operational research on methods of collecting data on births, deaths in areas of limited facilities;
- 3.- demographic research on pregnancy, natality and mortality;
- 4.- medical demography faculty training centers, and
- 5.- The encouragement of research and teaching in the biology of human reproduction. It is a field in which much is yet to be learned about this complex process. Findings will surely emerge which have practical implications for preventive medicine and community and family health.

The Council will recall that the Third Meeting of the ACMR (1964) held a one-day Special Session on The Environmental Determinants of Community Well-Being. Because of the growing interest in this subject, from the standpoint of the aggravation of the problems of modernization of cities by the rural-urban migration phenomenon and because of the low standard of living and lack of well-being of village people who do not migrate, the ACMR returned to this subject and recommended:

"(1) that a research consultant mission of PAHO in this subject matter area visit selected areas in Latin America for the purpose of analyzing and evaluating the research potential of the institutions and other centers. The consultants should give special attention to the availability of existing facilities and to the interest of the scientific staff.

(2) The report of the research consultants should provide a practical basis for developing a specific series of projects and would serve to explore sources of research support to supplement local resources and,

(3) That the Committee delineate several specific areas of research which would be most fruitful in supporting the on-going environmental health programs in Latin America. For practical reasons, attention might be concentrated for the time being, on the fields of urban and rural water supply, waste disposal, and air and water pollution."

This program is being implemented. This is an area of research which is obviously of enormous practical importance to the health and well-being of the people of the Region.

Growing out of the 1964 discussion of Environmental Determinants of Community Well-Being, the Committee suggested that the Special Session for their Fourth Meeting be devoted to the subject of Deprivation in Psychological Development, thus rounding out the consideration of both the biosocial and the biomedical aspects of some of the basic determinants of health and well-being.

In the Special Session seven consultant experts reported in some detail on various aspects of knowledge, and state-of-the-experimental-art of this complex field, dealing specifically with mechanisms and forces affecting psychological development. These included: Molecular-Cellular Aspects of Coding and Information Storage in the Nervous System, Current Concepts in the Neurophysiology of Learning, Studies in Animals and in Man on Nutritional Deprivation in Psychobiological Development, Psychosocial and Cultural Deprivation in Psychobiological Development, and, finally, Research Needs and Opportunities in Latin America for Studying Deprivation in Psychobiological Development. The Report of this session will be available at the Meeting of the Council.

In a separate Report, the Committee heard of the results of several study conferences in which experts from the Americas considered various means of developing research in protein-malnutrition. Discussion focused on the possibility of establishing through experimental studies under field conditions, a relationship between mental health and nutritional status. Future meetings will consider the problem of research design in this subject field. The Committee considered that, while many different factors, of which nutrition is only one, may affect mental development, nevertheless, concentration on the role of nutrition is justified on scientific grounds, and because this is a factor which is susceptible to improvement.

In conclusion, it is felt that the research policy and program of the PASB, as approved at successive Meetings of the Council, is developing according to plan, with increasing emphasis on the biosocial and biosanitary engineering fields without neglecting biomedical studies in communicable diseases and problems of psycho-biological determinants of human behavior.

For long term development, measured in decades it is to be noted that a substantial program proposal for Regional Centers for faculty teaching and research training is being developed. Also, increasing attention is being given to the problems of national policy and structure for the support of biomedical, biosocial and biosanitary engineering studies and training. And, rounding out the policy proposal of supporting the development of institutional resources for teaching and research, is the recommendation for establishing a Regional Library Center for bibliographic and reference purposes and for research and training in library and communication science.

Latin America is in the main stream of international medical science and technology, but its resources for self-sustained activity need strengthening. The Ministries of Health and the Universities carry the main responsibility for marshalling local resources to take advantage of the international cooperative support which is available, and which PAHO endeavours, to help materialize in support of the health programs of Governments.

Attached: Annexes I and II

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ANNEX I  
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RESEARCH POLICY AND PROGRAM OF THE PAN AMERICAN HEALTH ORGANIZATION

PAHO ADVISORY COMMITTEE ON MEDICAL RESEARCH

Report to the Director

Document RES 4/13



**PAN AMERICAN HEALTH  
ORGANIZATION**

**ADVISORY COMMITTEE  
ON MEDICAL RESEARCH**

**FOURTH MEETING**

**14-18 JUNE 1965  
WASHINGTON, D.C.**

## **REPORT TO THE DIRECTOR**

**Ref: RES 4/13**

**30 July 1965**

**PAN AMERICAN HEALTH ORGANIZATION**  
Pan American Sanitary Bureau, Regional Office of the  
**WORLD HEALTH ORGANIZATION**

**WASHINGTON, D.C.**

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PAHO ADVISORY COMMITTEE ON MEDICAL RESEARCH

Report to the Director

1965

The meeting was opened by the Director of the Pan American Sanitary Bureau, Dr. Abraham Horwitz, who expressed the continuing interest of PAHO in the development and strengthening of research, and reemphasized the futility of attempting to separate basic and applied research. He then summarized the subjects which the Committee would discuss during the course of the week.

1. Review of Current Research Activities

1.1 The Committee expressed great interest in the results already achieved by the Interamerican Investigation of Mortality and warmly approved the extension of the study to subjects under 15 years of age in rural and urban areas. In this age group there are likely to be many deaths which do not occur in hospitals, and which are not certified by physicians, thus greatly increasing the difficulty of classification and diagnosis.

1.2 The Committee welcomed the statement by Dr. Horwitz that additional funds will become available for strengthening and continuing the work of the Institute of Nutrition of Central America and Panama (INCAP). The Director of the Institute emphasized that it still faced the lack of official recognition by its member governments of the need for

basic research, without which advisory services and personnel training cannot be effective. PAHO support of INCAP's research program is of great importance.

The Committee was gratified by the emphasis that has been put on absorption studies in malnutrition, since malabsorption may be contributory to a vicious cycle. The evidence suggesting that protein-calorie malnutrition interferes with the enzymatic mechanisms of transport in the intestinal wall is of great interest. It is hoped that work along these lines will be continued.

Studies to improve the nutritive value and acceptability of vegetable-protein supplements are in progress. Cooperation with food producers and distributors has been very successful in promoting INCAPARINA in Guatemala and Colombia, and serves as an example of fruitful collaboration between basic science and technology. Important results may also be obtained from studies now being undertaken with Purdue University in whose laboratories genetic methods for increasing the lysine content of corn have been developed.

Another aspect of the work of INCAP is the study of the relationship between nutrition and infection being carried out in three villages. The investigation, now in its final stages, has pointed to the difficulty in reducing the prevalence of diarrhea without improving the water supply.

The Committee commended INCAP for its research program and stressed the valuable contribution that it is also making in the training of personnel.

1.3 The Committee considered with great interest the reports on the work of both the Pan American Foot-and-Mouth Disease Center and of

the Pan American Zoonoses Center. It emphasized the great economic importance of foot-and-mouth disease, because of its adverse effect on the availability of protein-rich foods, thus contributing to the development of protein-calorie malnutrition.

1.4 The collaborative research program on endemic goiter continues to make satisfactory progress. The evidence obtained so far suggests once again that the majority of cases are related to iodine deficiency. Health authorities are aware of this and of the prophylactic value of the iodization of salt, but a major problem in control programs is to obtain the cooperation of the producers and distributors of salt. It is hoped that some of these difficulties may be resolved following the PAHO seminar on endemic goiter prophylaxis to be held on 21-25 June 1965 in Salta, Argentina.

1.5 As in the case of endemic goiter, the problem of the nutritional anemias is being approached from an epidemiological viewpoint through the international collaboration of interested laboratories. The program, however, is not as far advanced as the one in endemic goiter. A reference laboratory has now been set up in Caracas with the object of standardizing laboratory methodology and of training laboratory personnel.

1.6 It was recognized that the major impediments to effective malaria control are the mosquito's resistance to insecticides and the failure of insecticides to reach the mosquito. Intensive research is being done on these problems by WHO on a world-wide scale, and the studies in Latin America are integrated with this program. Thousands of candidate insecticides are being screened in California and a promising new chemical (WHO-33) is being tested. The possibility of breaking the transmission cycle by the

use of antimalarials in table salt was again discussed. Encouraging results have been obtained in British Guiana and further studies are being conducted in the interior of Surinam. It is doubtful, however, whether this is a practicable approach in many countries because of the difficulty in controlling the salt supply.

The question of toxic effects of insecticides to man was raised. The Committee was assured that the WHO criteria for screening insecticides for toxicity are extremely strict and that casualties, when they occurred, were mostly due to accidents or to human errors.

1.7 The Committee noted that the International Brain Research Organization (IBRO) is compiling lists of centers where brain research is being done throughout the world and expressed the desirability that the PAHO Mental Health Information Center on Latin America maintain contact with the IBRO, as well as with the incipient program of WHO in this area.

1.8 The Committee reviewed the report on dental public health research and noted that steps are being taken to expand research activities in this field and to increase the number of competent investigators.

1.9 With respect to the PAHO program in radiation and isotopes, the Committee again noted the studies being continued in areas of Brazil with high background radiation and in Chile on manganese poisoning.

Experimental findings suggest that attempts to control Rhodnius prolixus by male sterilization through ionizing radiations are not likely to be successful because of biological factors related to the mating habits and to the habitats of this vector. Research continues in order to obtain further information on the ecology of Rhodnius by the use of radioactive

tags. The Committee hoped that studies of this kind might be extended to include other insect vectors.

1.10 The Committee agreed that there are many unsolved questions about tuberculosis which need urgent study, and that these can most suitably be answered by research in the Americas. Although many scientists are interested, it has, nevertheless, proved difficult to find qualified investigators in Latin America who are willing to participate in the studies. The research problems fall into five groups: (a) study of the most effective routes of administration of BCG vaccine; (b) study of reactions to BCG vaccine in relation to nutritional and allergic states; (c) diagnostic value of bacteriologic methods; (d) atypical bacteriology in tuberculosis; and (e) isoniazid resistance. The procedure for these studies has not been defined in detail. It was suggested that standardized protocols be drawn up so that comparable data can be obtained from several countries. The Committee considered it desirable that these programs be developed and coordinated through PAHO.

1.11 The Committee noted the report on the training program in microbiology already underway and recommended that it be expanded to cover related fields such as pathology and preventive medicine. Full use should be made of existing centers before creating new ones. It was pointed out that in a number of countries, such as Brazil and Venezuela, a major problem is the recruitment of suitable candidates for training in these centers, since graduates from faculties of science are not often sufficiently prepared for, and those from medical faculties are not always interested in, basic research. Curriculum changes in the biomedical



sciences are urgently indicated to overcome these deficiencies. Steps in this direction have already been taken in one university in Brazil.

## 2. Immunology in Latin America

Immunology is rapidly assuming increasing importance as a central subject in a variety of fields of biology and medicine, such as transplantation, immunopathology, protein structure and synthesis, cellular dynamics and differentiation, somatic genetics, as well as the traditional fields of immunization, serum therapy, serodiagnosis and allergy.

Various applied activities in immunology are of considerable public health importance, e.g., the preparation and control of vaccines and sera, and the organization of transfusion services and of serodiagnostic laboratories. In most countries, each of these functions is conducted in large institutes requiring trained and specialized personnel.

For orderly progress in immunology, the first essential is to provide training and teaching in the subject. In the opinion of the consultants, the emphasis should be on establishing and insuring continuity of groups of Latin American research workers in basic immunology who can provide inspiration and training as well as a link to current world-wide developments in this field.

The consultants made contacts with a large number of immunologists and identified groups of highly intelligent and progressive basic research workers in this discipline in Brazil, Argentina, Chile and Mexico. Many of the investigators indicated that the main difficulties for their continued activities were low salaries, lack of assurance of a permanent

research career, and lack of recognition of the importance of their endeavors. Although most of them had tempting offers from active departments of immunology abroad, it would seem that often a comparatively small encouragement could induce them to stay in their own country.

The identified groups of immunologists in all four countries were enthusiastic to undertake teaching, training and research. It was suggested by the consultants that these groups be supported by PAHO and WHO through such means as the designation of research and training centers, the awarding of fellowships, the arrangement of visits for extended periods by foreign specialists, and the persuasion of governments to channel more resources into this vital area.

The Committee agreed that immunology is a field which has expanded considerably in recent years and that in Latin America there are only very few well organized immunological research centers. It concurred that it is indeed necessary to give immediate help to the few good and progressive Latin American groups of immunologists in order to prevent their disintegration. Attempts should be made to obtain full-time university appointments for the members of these groups and provide them with adequate salaries, stable academic tenure, collaborators, technicians and the necessary equipment for conducting their work. Opportunities should be made available for exchanging ideas and knowledge with their colleagues in the Americas and in other areas.

These efforts would fit in with the world-wide program being developed by WHO for establishing research and training centers in basic immunology in all continents. A point of great importance is to offer young investigators, upon completion of their training, adequate career positions and opportunities in their own country.

The Committee, therefore, unanimously endorsed the recommendations specified in the consultants' report and hoped that means would be found to give rapid support and substantial help to the groups in Latin America who are presently pursuing excellent work in immunology.

### 3. Chagas' Disease in Brazil

In the states of São Paulo, Minas Gerais and Goiás all available epidemiologic indicators show that several million people have been infected with Trypanosoma cruzi. These indicators are the high prevalence of potential domesticated triatomid vectors, the high rates of sero-positivity of the Machado-Guerreiro (M.-G.) reaction and the high frequency with which clinical Chagas' disease is seen. There is, however, evidence that the M.-G. reaction underestimates the true infection rate by an appreciable extent and it is, therefore, important to establish the degree of underestimation.

Acute cases are probably less rare than believed. The brunt of the damage to vital structures seems to take place in the acute stage and falls on the myocardium and on the peripheral ganglion nerve cells. This has been found in the hyperacute human cases, such as follows accidental transfusion of infected blood, as well as in the experimental animal. In animals that survive, dilatations of hollow viscera are common. In the human such dilatations, the so-called megasyndromes, are extremely common in the region, have a very high correlation with positivity to the M.-G. reaction and are explicable by the severe destruction and loss of peripheral ganglion cells that have been demonstrated.

Cardiomyopathies in this area are also unusually common and are often seen in young adults with large hearts without organic valvular

lesions. These are apparently almost all due to Trypanosoma cruzi infection which results pathologically in a myocarditis, in frequent conduction defects of unexplained pathogenesis, and commonly in the production of endocardial protrusions at the apex of either or both ventricles. These lesions appear to be unique to Chagas' disease and, with the epidemiologic evidence, the clinical picture and the electrocardiographic changes, enable a firm diagnosis of Chagasic heart disease to be made clinically and pathologically.

The pathogenesis of these unique ventricular lesions is not yet explained but it is reasonable to suggest that they result from the destruction of the ganglion cells in the cardiac auricles - that has been demonstrated - and that they are a consequence of a slackening of special muscle bundles of the vertex of these partially denervated hearts. The pathogenesis of these megasyndromes and of the cardiac lesions poses very many pathologic problems and opens a wide field for functional and pharmacologic studies if the clinical management of these chronic cases is to be improved.

The situation in these States would seem to be so serious as to demand urgent action through vector control by insecticides to reduce new infection. This can be done with facilities now available in those regions but not used because the seriousness of the problem has not been appreciated. Two equally important recommendations are that local systems of registration and notification be set up and that the importance of this be signaled by the creation of a special category and rubrics for Chagas' disease in the International Classification of Diseases. The Committee underscored the importance of these recommendations in Chagas' disease control.

The Committee strongly urged that longitudinal studies be set up to provide information now lacking on the fate of those infected. This information is of vital importance to several million people who presently regard a positive M.-G. reaction as a death warrant. It is clear that a positive serologic reaction with an abnormal ECG - and even more so with clinical evidence of heart disease - carries a poor prognosis. It is not clear whether serologic positivity in the absence of clinical disease or abnormal ECG changes implies a worse life expectancy than that of the uninfected in the area. It is imperative that longitudinal studies be set up to establish the facts and determine the effects of such variables as sex, racial origin, age at first infection, occupation, locality, and possible strain differences. To effect this and to estimate the medical needs of the infected persons a system of notification and registration is essential.

#### 4. Epidemic Typhus

Although epidemiological data indicate that epidemic typhus is not the important human disease it once was in some Latin American countries, several outbreaks have taken place recently and the actual incidence is undoubtedly higher than is reported, particularly in more isolated areas.

Renewed interest in the natural maintenance of typhus has been aroused in the last decade by studies in Ethiopia, Egypt, Equatorial Africa and Turkey demonstrating the presence of typhus antibodies in high titer in domestic animals and by the actual isolation in Ethiopia of epidemic strains from blood of livestock and from their ticks. Evidence in the Ethiopian studies has been confirmed both in the Pasteur Institute in Paris

and at the Rocky Mountain Laboratory in Montana. The presence of antibodies to epidemic typhus in selected animal sera reported by Imam has also been confirmed. Isolates in 1965 in Ethiopia were confirmed as a strain each of endemic and epidemic typhus from livestock ticks, Hyalomma rufipes, as well as an endemic isolate from human body lice. Serological methods included complement fixation, toxin neutralization and agglutination re-suspension.

On the basis of this accumulating evidence, preliminary surveys in 1963 of sheep and donkey sera from the Puno focus of Perú and in 1964 of various animals on the Altiplano of Ecuador revealed, unexpectedly, specific antibodies to epidemic typhus only in donkeys (in both countries) but not in other livestock. However, since occurrence of antibodies in slaughtered animals in Cairo has been shown to be highly seasonal (October to December), the Committee recommended that further surveys at different seasons and in different localities in Latin America be undertaken. Foci in Mexico, northern Argentina, and southern Chile should be studied.

##### 5. Smallpox Vaccination by Jet Injection

Three studies in the Territory of Amapá, Brazil, were reported with results paralleling those obtained elsewhere by the Communicable Disease Center in Atlanta, Georgia. Using 1:50 and 1:10 dilutions under field conditions, vaccination by jet injection techniques produced results consistently superior to those by the house-to-house multiple pressure method. At 1:50 dilutions, the Brazilian lyophilized calf vaccine compared favorably with the U.S. lyophilized vaccine in performing primary vaccinations, but a difference of poorly understood significance exists between the two

vaccines at that dilution level in obtaining satisfactory revaccinations. No difference was found to exist between the Brazilian egg and the Brazilian calf vaccines at 1:10 dilution.

The method of mass vaccination by jet injection was found to be applicable in the Brazilian campaign against smallpox. Advantages including reduction in vaccine costs, in manpower needs, in transportation costs and in higher rates of successful vaccinations were documented. The usefulness of the method in the rapid control of epidemics and the favorable response of the population to the procedure was noted. Although no post-vaccination encephalitis was reported among 92 thousand persons thus far vaccinated by jet injection (48 thousand of whom were followed at least one time 14 days or more after vaccination), the Committee emphasized that attention be given to this problem as the number of vaccinees by jet injection increases.

#### 6. Biomedical Research Policy in Latin America

The Committee noted with commendation the draft report on biomedical research policy.

For historical reasons a scientific tradition in Latin America has been slow in developing. The basic need, therefore, is to foster a climate of opinion which realizes that scientific research is part of the cultural life of the community.

Research and teaching are inseparable and the University, therefore, is the logical center for developing research traditions. Changes in the organization of the University and in the scope of its curricula are sometimes needed before it can play its part effectively.

The development of scientific research is a process that occurs by geometric progression. Although exceptional individuals can work in isolation, it is important to build up a "critical mass" of investigators and research centers. This leads to a dilemma: on the one hand, science is world-wide and recognizes no national boundaries; on the other hand, in a country where the development of research is in its early stages, the loss of even a small number of able scientists is likely to be a serious setback. For this reason the Committee gave much attention to the problem created by the tendency of scientists in Latin America to leave their own countries and seek better conditions of work elsewhere and particularly in the United States of America. The Committee recommended that PAHO make a detailed study of the extent of and the reasons for the drain of scientists from countries in Latin America and report to the Fifth PAHO/ACMR Meeting.

In regard to the utilization of scientists, the Committee discussed the difficulty in maintaining proper balances between the number of trained personnel and the number of positions available. In some countries the main shortage is that of trained workers while in others the openings for those who have been trained are too few.

7. Standing Advisory Committee for Medical Research in the British Caribbean

The Committee noted with interest the report on the origin and functions of the Standing Advisory Committee for Medical Research in the British Caribbean (SAC). A rather unusual feature of this Committee is that both scientists and administrators are members. The annual meeting is preceded by a special session which is open to the lay as well as the



medical public, an arrangement which brings home to governments and to the community at large the realization that they both have an interest in supporting scientific research.

The SAC advises the British Government on medical research projects financed by the United Kingdom. An interesting aspect of SAC is that it has at its disposal a block grant from which small allocations are made with minimum bureaucracy and delay. The purpose is not to promote any particular program, but to stimulate young men to enter the research field. The results have been encouraging and the Committee raised the question whether this system of block grants, locally administered, might not be more widely used.

The SAC also organized an annual scientific meeting which brings together workers in the biomedical sciences from all parts of the Caribbean area. These meetings have done much to break down the scientific isolation of the small islands and to promote the development of research tradition in that region.

#### 8. Regional Medical Library Center

The Committee welcomed the excellent report on the proposed Regional Medical Library Center in Latin America in response to its earlier recommendation. It recognized the great importance to biomedical research of the effective communication of scientific literature but also looked upon the proposed center as a major resource in supplementing on a regional scale the urgent library needs of educational institutions in medicine and allied fields in Latin America. The Committee approved the proposal for the Center in accordance with the principles suggested in the report and recommended that the site of the Center be determined by the Director of PASB.

9. Public Health Research in Argentina

The Committee, in approving the recommendations in the consultants' report, indicated the desirability of extending to other countries in Latin America this type of approach in formulating national public health research policies. In spite of some countries' excellent organization for biomedical research, no systematic research policy in public health exists at national levels. The Committee recommended that PAHO support the proposed development of a public health research program in Argentina by the assignment of consultants, coordination and consultation, and selective training.

10. Special Session on Deprivation in Psychobiological Development

As fundamental background to its session on Deprivation in Psychobiological Development, the Committee heard with great interest the papers presented by Drs. Hydén, Hernández Peón and Widdowson.

Dr. Hydén had shown, by means of microanalysis of components of the central nervous system, that the learning process in rats is associated with the synthesis, in both glia and neuron, of RNA that has a base ratio similar to that of chromosomal nucleic acid. This is in contrast to what occurs after chemical (tricyano-amino propene) and physiological stimulation, when an increase of RNA of base ratio characteristic of ribosomes is encountered in the neurons, whereas the RNA content of glia cells decreases to a corresponding extent. The experimental evidence accumulated so far suggests, therefore, that changes in RNA induced by learning are characteristic.

Dr. Hernández Peón had explored, by means of electrophysiological techniques, the indirect changes in excitability associated with plasticity of the nervous system during learning. This type of research augments the knowledge of the mechanisms involved in the reception of selective information and is germane to studies on the learning process.

Dr. Widdowson's investigations on the role of caloric and proteic undernutrition on the relative size of brain and body in rats and pigs suggest that the time of life at which undernutrition occurs has an important bearing on its final effect. Comments by Committee members indicated that malnutrition as well as undernutrition may have a marked effect on the animal's development and on its resistance to infection.

The above papers are of great importance to the understanding of basic mechanisms in certain aspects of psychobiological development, even though their bearing on the practice of public health may not yet be apparent.

In considering nutritional deprivation in psychobiological development in man, Dr. Cravioto provided evidence on the widespread and ubiquitous nature of malnutrition and on the increasing number of survivors who are now at risk of subsequent dysfunctions. In man, nutrition is related to food, to stimulation and to psychosocial experience. Malnutrition, therefore, involves a multiple pattern of disturbed experiences, with nutrition, activity and infection interacting to produce multiple disorders.

Evidence indicates an association in the child between a history of malnutrition and low intellectual capacity. This relationship is also reflected in reduced height which in later years is correlated with a less effective adaptive behavior ( $r$  between .60 and .70). Diminution in function

appears to be most severe if nutritional deprivation occurs during the first 6 to 9 months of life. In the Guatemalan community studied, no systematic relationship was found between infantile deprivation and family income. In an effort to determine if intersensory functioning was affected by malnutrition as expressed by differences in height among rural school age children, systematic differences favoring taller children were obtained. In groups of upper class urban children who differed in height on a genetic basis and had never been at risk of malnutrition, height groups did not differ in intersensory function.

These findings suggest primary integrative dysfunctions which may manifest themselves in disorders of learning, particularly in the acquisition of academic skills.

The discussion centered on the possible explanation for the motor precocity reported in these and in African children, on motivational variables as possible contributors to differences in intersensory performance, and on the psychological effects of premature weaning in these children.

In presenting his paper on psychosocial aspects of psychobiological development, Dr. Richardson distinguished between two meanings of deprivation, one as methodological device in experimentation and the other as a patterning of social opportunity. For the second meaning he identified a variety of different denotative and connotative meanings - all implying rights and inequities both of which are value judgments having historical and social bases. He then introduced the concept of expectancy for age-specific functioning as a critical basis for considering deprivation. Whenever scientific interest in the problem coincides with social concern, identification of factors associated with an outcome below expectancy is sought.

Dr. Richardson considered a variety of factors including social class, deprivation of specific experiences, food and maternal care, which may produce inadequate outcomes. He referred to observations on children of lower social class families and to the effects on the child's psychosocial development produced by conditions of life. He made particular reference to U.S. and British experiences on educational difficulties in poor children. Evidence points to the necessity of early intervention in order to prevent subsequent worsening of function. Particularly important are the needs for language enrichment and for object experiences pertinent to schooling.

Dr. Richardson raised the question of what effect the child's own awareness of his deprived status might have on his functioning. He suggested that insufficient attention was being paid to the development of social relation skills because of a preoccupation with cognitive functioning and concluded by relating his presentation to the UN Declaration of Rights of Children.

In the discussion of Dr. Richardson's paper a number of points were raised by Dr. Zigler. The subject of social and cultural deprivation is vast and most controversial with a literature which is contradictory and from which evidence to support almost any set of arguments can be obtained. There has been a style in studies of deprivation moving from maternal deprivation to sensory deprivation, to include overstimulation as a type of deprivation. At present intellectual functioning is of central concern. There is need for a thorough analysis of the concept of deprivation.

There has been a pre-judgement that IQ is directly related to experience, genetic features being significantly ignored. A synthesis

between the two positions is needed. Dr. Zigler suggested that an interactionist position be assumed but noted that there has been insufficient work done from this standpoint. He emphasized inherent differences in intellectual capacity among individuals. He argued that much mental retardation does not reflect deprivation - but rather individual genetic variation - and suggested the usefulness of polygenic models to explain variability. Experience is, of course, important but how it affects the development of intellect is as yet unclear.

Dr. Zigler raised a note of historical precaution and indicated that 100 years ago enthusiasm for experiential remediation resulted in disillusionment. He argued for greater concern with non-cognitive and motivational issues.

The concluding discussion of Drs. Richardson and Zigler's presentations touched upon such points as: the necessity for considering social variables, e.g., ordinality, family size, family organization, social structure, and community organization in studies of nutritional deprivation; greater consideration by the behavioral scientists of the polygenic models; and the magnification by conditions of life of genetic differences.

Dr. Thompson then introduced the subject of the dimensions of early experience. In defining families as minimally two generation structures, he suggested that the focus be upon the younger generation since deprivation affects younger individuals more than older ones. Dogs who were experientially deprived showed major differences in responsiveness, including excessive activity and puppy-like behavior. This behavior seemed in some ways to resemble that observed by Goldforb in orphanage

children. He suggests that at different ages there are different mechanisms available for learning and that different environmental influences are effective in different ways at different ages. In early life the fact of stimulation might be more important in affecting development than the kind of stimulation. The influences of experience acquired during one age period upon function at later stages need to be defined and examined.

Dr. Birch addressed himself to the research needs and opportunities in Latin America for studying deprivation in psychobiological development. He made the distinction between research needs and research opportunities indicating that a need becomes an opportunity only when certain logistical prerequisites are satisfied, i.e., coexistence of highly trained and motivated personnel, adequate laboratories, and especially advantageous situations. In deprivation studies, it is also important to differentiate between objective and effective environments in that different environments can be constructed out of the same situation depending on the organism, and on the other hand, the same environment can have different effects on different organisms.

Poor nutritional status of pregnant mothers may affect the fetus, in contradiction to the parasitic model. Hence children born of these mothers may already be adversely changed. The critical periods of development during which certain kinds of deprivation, however mild, are likely to have long-lasting effects and the styles of child rearing in relation to nutritional risks are problems well worth studying. More data on the qualitative and quantitative requirements at any given age and on their temporal sequence are needed. Laboratory studies are useful but behavioral aspects will best be examined by using other than biochemical indices.

Although opportunities for studying deprivation problems at the molecular-cellular levels are available, there exist in Latin America circumstances deriving from special social and cultural conditions which are unique and which make possible studies of the effect of these factors on psychobiological development in man. These include mass cultural studies to delineate crucial dimensions of deprivation and critical ages at which these can occur; ways in which deprivation is or is not associated with maternal or parental care; and policies and methodologies of nutrition as these relate to health and child care.

#### 11. Population Dynamics

The Committee noted the report of the Conference on Population Dynamics convened by PAHO/WHO for the exchange of information among agencies interested in research and training in this field. It was informed of the several steps which the Pan American Health Organization took following the Conference to implement the recommended proposals for epidemiological studies of natality, for demographic research of pregnancy, natality and mortality, for operational research in demography in areas with limited facilities and for the establishment of research training centers in demography.

The Director communicated to the Committee the resolution adopted by the XVIII World Health Assembly requesting that WHO further develop the program a) to study medical aspects of sterility and fertility control methods and health aspects of population dynamics; and b) to render technical advice on health aspects of human reproduction. The Director indicated that this recent resolution will also guide PAHO research policy in the field of population dynamics.



## 12. Malnutrition and Mental Development

The Committee heard the report on malnutrition and mental development and on the meetings convened by PAHO to consider general outlines for research in this field. It noted a) the difficulty in identifying competent investigators, especially in the behavioral sciences, to participate in the proposed studies and b) the necessity of devising or adapting for each community the methodology to be used. The Committee approved the research program proposed by PAHO and commended the studies being conducted in México by Dr. Cravioto.

The Committee is aware that nutrition is one of the many factors influencing mental development. It agreed, nevertheless, with the emphasis given to nutrition in the PAHO program since it is a factor amenable to manipulation and improvement.

## 13. Environmental Determinants of Community Well-Being

The Committee took note of the report summarizing last year's Special Session on Environmental Determinants of Community Well-Being and recommended that a research consultant mission of PAHO travel to selected areas in Latin America to analyze and evaluate the environmental health potential of the institutions visited, giving special attention to the availability of existing facilities and to the research interests of the scientific staff. For practical reasons emphasis will be given, for the time being, to the fields of urban and rural water supplies, waste disposal, and air and water pollution. The consultants' report should provide a practical basis for developing specific projects which would be useful in exploring sources of research support to supplement local resources.

A progress report on the implementation of this recommendation will be reviewed by the Committee during the fifth meeting in 1966 for its delineation of specific areas of research which would be most fruitful in support of ongoing environmental health programs in Latin America.

#### 14. Closing Session

The Committee discussed the selection of subjects of the next Special Session and chose as its topic the adaptation of man to high altitudes.

The Fifth Meeting of the PAHO/ACMR was scheduled for 13-17 June 1966.

CD16/20 (Eng.)  
ANNEX II  
11 August 1965  
ORIGINAL: ENGLISH

RESEARCH POLICY AND PROGRAM OF THE PAN AMERICAN HEALTH ORGANIZATION

CURRENT PAHO COLLABORATIVE RESEARCH PROGRAM

CURRENT PAHO COLLABORATIVE RESEARCH PROGRAM\*

I PROJECT LIST (Items 1-55, pages 1-9)

II GRANTS UNDER CONSIDERATION (Items 56-64, pages 10-11)

\*Prepared for the Fourth Meeting of the PAHO Advisory Committee on Medical Research, 14-18 June 1965.

## Abbreviations

CDC/USPHS	=	Communicable Disease Center
ESSO	=	ESSO Research and Engineering Company
FFRP	=	Foundations' Fund for Research in Psychiatry
GM	=	General Mills Incorporated
ICCND/USPHS	=	Interdepartmental Committee on Nutrition for National Development
MIT	=	Massachusetts Institute of Technology
MMF	=	Milbank Memorial Fund
NF	=	Nutrition Foundation, Incorporated
NIH/USPHS	=	National Institutes of Health
NRC/Brazil	=	National Research Council of Brazil
OAS/TCP	=	Organization of American States Technical Cooperation Program
PAHO	=	Pan American Health Organization
RF	=	Rockefeller Foundation
ROCAP/AID	=	Regional Office for Central America and Panamá
UNICEF	=	United Nations Children's Emergency Fund
UNTA	=	United Nations Technical Assistance
US AID	=	Agency for International Development
US Army MRDC	=	Medical Research and Development Command
USPHS	=	U.S. Public Health Service
WHO	=	World Health Organization
WKKF	=	W.K. Kellogg Foundation
WWF	=	Williams-Waterman Fund

## CURRENT PAHO COLLABORATIVE RESEARCH PROGRAM: PROJECT LIST\*

No.	Principal Investigator and Institution	Title of Research Project (and source of funds)	Amount for Current Year (renewal or starting date)	Total Amount Requested (duration in years)	Year of Grant Termination
A	B	C	D	E	
1	C. ABELA DEHEZA National Department of Nutrition La Paz, Bolivia	"Survey on Extent of Protein-Calorie Mal- nutrition in Pre-school Children" (WWF)	\$5,722  (June 1964)	\$10,444  (2)	June 1966
2	G. ARROYAVE INCAP Guatemala, Guatemala	"Biochemical Evaluation of Nutritional Status" (NIH/USPHS)	\$48,514  (Jan. 1961)	\$238,283  (5)	Dec. 1965
3	W. ASCOLI INCAP Guatemala, Guatemala	"Interrelations between Diarrhea and Malnutrition" (NIH/USPHS)	\$35,000  (Sept. 1958)	\$471,736  (7 1/2)	Mar. 1966
4	M. BEHAR and J. MENDEZ INCAP Guatemala, Guatemala	"Comparative Biochemical Study of Atherosclerotic Lesions with High and Low Frequencies of Coronary Heart Disease" (NF)	\$6,000  (July 1957)	\$58,400  (8)	June 1965
5	M. BEHAR INCAP Guatemala, Guatemala	"Metabolic Factors in Protein Malnutrition" (NIH/USPHS)	\$60,507  (Jan. 1961)	\$471,845  (7)	Dec. 1967

\*Compiled by the Office of Research Coordination in draft form on 9 June 1965.

## CURRENT PAHO COLLABORATIVE RESEARCH PROGRAM: PROJECT LIST. (Cont'd.)

No.	A	B	C	D	E
6	M. BEHAR and G. ARROYAVE INCAP Guatemala, Guatemala	"Significance of Diets Low in Animal Protein and Other Nutrients" (NF)	\$2,500  (Jan. 1951)	\$67,300  (14 1/2)	June 1965
7	R. BRESSANI INCAP Guatemala, Guatemala	"Amino Acid Metabolism in Children" (NIH/USPHS)	\$41,089  (Jan. 1960)	\$349,455  (8)	Dec. 1967
8	R. BRESSANI INCAP Guatemala, Guatemala	"Assistance for Division of Agriculture and Food Chemistry" (WKKF)	\$75,000  (Sept. 1964)	\$225,000  (3)	Aug. 1967
9	R. BRESSANI INCAP Guatemala, Guatemala	"Chemical and Biological Testing of Protein Con- centrates and Food Mix- tures" (UNICEF)	\$2,000  (Nov. 1964)	\$2,000  (10 mos.)	Aug. 1965
10	R. BRESSANI INCAP Guatemala, Guatemala	"Experimental Study of the Metabolic Fate of Gossypol upon Ingestion of Cotton- seed Products by Animals" (UNICEF)	\$8,000  (Nov. 1964)	\$8,000  (10 mos.)	Aug. 1965
11	R. BRESSANI* INCAP Guatemala, Guatemala	"The Nutritive Value of Vegetable Protein Isolates made into Textured Foods" (GM)	\$15,000  (Feb. 1965)	\$15,000  (1)	Feb. 1966

\*See also Project No. 55, page 9.

## CURRENT PAHO COLLABORATIVE RESEARCH PROGRAM: PROJECT LIST. (Cont'd.)

No.	A	B	C	D	E
12	J. CHOPRA PAHO Trinidad, W.I.	"Pathogenesis and Prevention of Anemia in Trinidad" (NIH/USPHS)	\$22,310 Nov. 1964	\$60,410 (3)	Oct. 1965
13	D. DAYTON* NIH Bethesda, Maryland	"Mental Development in Re- lation to Nutrition" (NIH/USPHS)	\$6,667 April 1964	\$15,000 (27 mos.)	June 1966
14	M. GOLDENBERG National University Buenos Aires, Argentina	"Research in Mental Health" (FFRP)	\$7,500 July 1965	\$22,500 (3)	June 1967
15	R. GONZALEZ PAHO Washington, D.C.	"Mental Health Information Center on Latin America" (NIH/USPHS)	\$41,000 March 1964	\$81,819 (2 1/2)	Sept. 1966
16	G. GRAHAM British-American Hospital Lima, Perú	"Infantile Diarrhea and Mal- Nutrition in Perú" (NIH/USPHS)	\$56,967 Sept. 1964	\$265,839 (5)	Aug. 1965
17	W.M. HENDERSON PANAFTOSA Rio de Janeiro, Brasil	"Portion of OAS/TCP for Center Devoted to Research" (OAS/TCP)	\$346,000 Jan. 1965	\$346,000	*

\* On assignment at INCAP, Guatemala

\*\* Not applicable since this is annual budget proposal for continuing projects.



## CURRENT PAHO COLLABORATIVE RESEARCH PROGRAM: PROJECT LIST. (Cont'd.)

No.	A	B	C	D	E
18	W.M. HENDERSON PANAFOSA Rio de Janeiro, Brazil	"Development of Modified Live Virus Vaccines Against Foot-and-Mouth Disease" (NRC/Brazil)	\$7,742 (Jan. 1965)	\$15,484 (2)	Dec. 1966
19	A. HORWITZ PAHO Washington, D.C.	"Health Manpower and Medical Education" (MMF)	\$100,000 (July 1964)	\$200,000 (2)	July 1966
20	A. HORWITZ PAHO Washington, D.C.	"Research Training Program in Microbiology" (RF)	\$15,000 (May 1965)	\$15,000 (1)	May 1966
21	J.J. KEVANY PAHO Washington, D.C., and J. BARZELATTO Hospital del Salvador Santiago, Chile	"Reference Laboratory and Training Center for Iodine Determinations in Endemic Goiter Prophylaxis" (WWF)	\$10,900 (Nov. 1964)	\$32,700 (3)	Oct. 1967
22	J.J. KEVANY PAHO, Washington, D.C., M. ROCHE, and M. LAYRISSE IVIC, Caracas, Venezuela	"Reference Laboratory and Training Center for Applied Research in Nutritional Anemias" (WWF)	\$13,760 (Nov. 1964)	\$41,280 (3)	Oct. 1967
23	W. LOBATO PARAENSE Instituto Nacional de Endemias Rurais Belo Horizonte, Brazil	"Schistosomiasis Snail Identification Center for the Americas" (PAHO)	\$1,000 (Jan. 1965)	\$1,000 (yearly)	Jan. 1966

No.	A	B	C	D	E
24	I.M. LOURIE PAHO, Washington, G.C. COTZIAS, Brookhaven Lab. N.Y., and I. MENA Catholic University Santiago, Chile	"Manganese Poisoning - A Metabolic Disorder"  (NIH/USPHS)	\$40,530  (Oct. 1964)	\$130,000  (3)	Sept. 1966
25	L. MATA INCAP Guatemala, Guatemala	"Interrelation of Viruses, Diarrhea and Nutrition" (NIH/USPHS)	\$33,794  Oct. 1962	\$110,010  (3)	Sept. 1965
26	J. MENDEZ INCAP Guatemala, Guatemala	"Relation of Atheroscle- rosis to Environmental Factors" (NIH/USPHS)	\$58,444  Jan. 1957	\$398,031  (9)	Dec. 1965
27	J. MENDEZ INCAP Guatemala, Guatemala	"Training in Nutritional Sciences" (NIH/USPHS)	\$55,642  June 1961	\$273,527  (5)	May 1966
28	J.D. MILLAR Smallpox Unit CDC/USPHS Atlanta, Georgia	"Studies of Smallpox Vaccination by Jet Injection in Brazil" (PAHO)	\$16,000  Jan. 1965	\$16,000  (2/12)	Mar. 1965
29	V. MOYA CEPANZO Azul, Argentina	"Studies on Methods of Treating Canine Echino- coccosis" (CDC/USPHS)	\$10,351  Dec. 1965	\$31,242  (3)	Nov. 1966
30	R.R. PUFFER PAHO Washington, D.C.	"Etiology of Congenital Malformations" (NIH/USPHS)	\$19,510  Dec. 1963	\$19,510  (1 1/2)	May 1965
31	R.R. PUFFER PAHO Washington, D.C.	"Regional Development of Epidemiological Studies" (NIH/USPHS)	\$97,932  Jan. 1965	\$706,590  (5)	Dec. 1965

No.	A	B	C	D	E
32	W.F. SCHERER School of Medicine Cornell University New York, New York	"Studies on Arthropod- borne Viruses"  (U.S. Army/MRDC)	\$41,046  July 1964	\$41,046  (yearly)	July 1965
33	W.F. SCHERER School of Medicine Cornell University New York, New York	"Research Training Pro- gram in Virology, Orni- thology, Ecology and Tropical Medicine" (NIH/USPHS)	\$54,388  July 1964	\$251,087  (5)	June 1967
34	C. TEJADA INCAP Guatemala, Guatemala	"Atherosclerosis in Latin America" (NIH/USPHS)	\$37,472  Oct. 1959	\$278,972  (6)	Nov. 1965
35	L. VALLEJO National Institute of Nutrition Quito, Ecuador	"Assistance for Research and Training"  (WWF)	\$12,030  Jan. 1964	\$83,830  (4)	Dec. 1965
36	H. VELEZ School of Dentistry University of Antioquia Medellin, Colombia	"Salt Fluoridation Studies in Four Colom- bian Communities" (NIH/USPHS)	\$60,000  May 1961	\$250,961  (5)	June 1968
37	F. VITERI INCAP Guatemala, Guatemala	"Infection and Human Nutritional Status in the Tropics" (NIH/USPHS)	\$46,676  Jan. 1961	\$224,818  (5)	Dec. 1965
38	F. VITERI INCAP Guatemala, Guatemala	"Infection and Nutrition: Mechanisms of Interaction" (MIT & US Army/MRDC)	\$24,913  Sept. 1964	\$50,829  (1 10/12)	July 1966

## CURRENT PAHO COLLABORATIVE RESEARCH PROGRAM: PROJCT LIST (Cont'd)

No.	A	B	C	D	E
39	F. VITERI INCAP Guatemala, Guatemala	"Studies on the Influence of Nutritional Status on Physical Working Capacity" (US Army/MRDC)	\$47,203  (Sept. 1964)	\$146,363  (3)	Aug. 1967
40	R. WOOD* NIH Bethesda, Maryland	"Investigation into the Nature and Prevalence of Anemia in Protein Mal- nutrition" (NIH/USPHS)	\$13,380  (May 1964)	\$29,000  (1 1/12)	June 1965
41	INCAP Guatemala, Guatemala	"Assistance to Applied Nutrition Program" (WKKF)	\$51,349  (Jan. 1958)	\$541,745  (10)	Dec. 1967
42	INCAP Guatemala, Guatemala	"Nutrition Research"  (PAHO)	\$192,448  (Jan. 1965)	\$192,448  (yearly)	Jan. 1966
43	INCAP Guatemala, Guatemala	"Nutrition Surveys in Central America" (ICNND)	\$213,000  (Jan. 1965)	\$213,000  (1)	Jan. 1966
44	Chief, Communicable Disease Branch, PAHO Washington, D.C.	"Chagas' Disease Research"  (PAHO)	\$4,500  (Jan. 1965)	\$4,500  (1)	Jan. 1966
45	Chief, Communicable Disease Branch, PAHO Washington, D.C.	"Plague Investigation in Venezuela" (PAHO)	\$4,800  (Jan. 1965)	\$4,800  (1)	Jan. 1966

\*On assignment at INCAP, Guatemala.

No.	A	B	C	D	E
46	Chief Health Promotion Branch PAHO Washington, D.C.	"Training Program in Dental Epidemiology"  W.K. Kellogg Foundation. . US Public Health Service . PAHO . . . . .	\$10,000* \$16,385* \$14,900*	\$23,370* \$32,310* \$29,800*	Dec. 1966
			*(Jan. 1965)	*(2)	
47	Chief, Health Statistics Branch, PAHO Washington, D.C.	"Demographic Research  (PAHO)	\$3,200  (Jan. 1965)	\$3,200  (1)	Jan. 1966
48	Chief, Malaria Eradi- cation Branch, PAHO Washington, D.C.	"Malaria Epidemiology Team"  (WHO)	\$33,366  (Jan. 1965)	\$33,366  (yearly)	Jan. 1966
49	Chief, Malaria Eradi- cation Branch, PAHO Washington, D.C.	"Insecticide Testing Team"  (WHO)	\$138,118  (Jan. 1965)	\$138,118  (yearly)	Jan. 1966
50	Chief, Malaria Eradi- cation Branch, PAHO Washington, D.C.	"Operational Research in Malaria Eradication"  (WHO)	\$150,000  (Jan. 1965)	\$150,000  (yearly)	Jan. 1966
51	Chief, Malaria Eradi- cation Branch, PAHO Washington, D.C.	"Screening Center for Drug Resistant Malaria Para- sites"  (WHO)	\$22,300  (Jan. 1965)	\$64,677  (2 1/2)	May 1965
52	Chief, Office of Re- search Coordination PAHO, Washington, D.C.	"Research Coordination in the Americas"  (PAHO)	\$126,110  (Jan. 1965)	\$126,110  (yearly)	Jan. 1966

CURRENT PAHO COLLABORATIVE RESEARCH PROGRAM: PROJECT LIST (Cont'd)

No.	A	B	C	D	E
53	Chief, Medical Education and Res. Trg. Unit PAHO Washington, D.C.	"Research Training Insti- tutions in Health Sciences"  (US AID)	\$30,000  (July 1964)	\$30,000  (1)	June 1965
54	Director, Pan American Zoonoses Center Azul, Argentina	"Zoonoses Research" UNTA. . . . . PAHO. . . . .	\$52,500*  \$88,749*  *(Jan. 1965)	\$52,500*  \$88,749*  *(1)	Jan. 1966
55	R. BRESSANI INCAP Guatemala, Guatemala	"The Use of WO-100 Protein in Vegetable Mixtures for Human Feeding" (ESSO)	\$20,000  (Jan. 1965)	\$20,000  (1 1/2)	Oct. 1966
Total (55 grants):. . . . .			\$2,769,213	\$7,915,005*	

\*This sum is an underestimate. It does not accurately reflect total funds committed to the above-listed projects.

II. CURRENT PAHO COLLABORATIVE RESEARCH PROGRAM: GRANTS UNDER CONSIDERATION\*

No.	Principal Investigator and Institution	Title of Research Project (and source of funds)	Amount re- quested for First Year	Total Amount Requested	Expected Duration in Years
	A	B	C	D	E
56	M. BEHAR INCAP Guatemala, Guatemala	"Request for Assistance to INCAP" (WWF)	\$55,250	\$165,750**	3
57	M. BEHAR and The American School of Guatemala INCAP Guatemala, Guatemala	"In-service Training of Teachers in the Produc- tion and Use of Nutri- tion Education Materials" (WKKF)	14,307	80,624	5
58	R. BRESSANI INCAP Guatemala, Guatemala	"Utilization of Legumi- nous and other Indigen- ous Seeds of Central America as Feedstuffs in Animal Production and as Protein Sources in Human Diets." (ROCAP/AID)	50,000	100,000	2

\*Compiled by the Office of Research Coordination in draft form on 9 June 1965.

\*\*Metabolic Unit: \$86,000  
Field Training Unit: \$69,760  
Revolving Fund: \$10,000  
(Basic Research)

No.	A	B	C	D	E
59	C. CANOSA INCAP Guatemala, Guatemala	"Influence of Nutrition on Growth and Development in Children" (NIH/USPHS)	\$133,910*	\$133,910*	1*
60	J. CHOPRA PAHO Trinidad, W.I.	"Pathogenesis and Pre- vention of Anemia in Trinidad" (NIH/USPHS)	\$36,900	\$99,100	3
61	R. de LEON INCAP Guatemala, Guatemala	"An Integrated Method for the Evaluation of Nutri- tional Rehabilitation Services" (WWF)	\$25,339	\$44,156	3
62	L. MATA INCAP Guatemala, Guatemala	"Colonization of the Intes- tine of Small Children by Viruses, Bacteria and Parasites" (NIH/USPHS)	\$49,528	\$147,918	3
63	C. TEJADA INCAP Guatemala, Guatemala	"Nutrition Training" (UNICEF)	\$30,000	\$30,000	1
64	C. TEJADA INCAP Guatemala, Guatemala	"Training in Nutritional Sciences" (NIH/USPHS)	\$67,100	\$344,791	5
Total: 9 grants (No. 56-64) . . . .			\$462,334	\$1,146,249	

\*Initially requested for one year but project will last 7 years.