REPORT TO THE DIRECTOR

Advisory Committee on Medical Research
Pan American Health Organization

Eleventh Meeting 19-23 June 1972 Washington, D.C.

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The Eleventh Meeting of the Pan American Health Organization's Advisory Committee on Medical Research, held in Washington from June 19 to 23, 1972, was opened by the Chairman, Professor John Waterlow. Professor Carlos Chagas was appointed Vice-Chairman, and Professors Guillermo Soberón and Thomas Weller were appointed Rapporteurs.

The passing of Dr. Bernardo Houssay was noted, and the Committee stood for a moment of silence in his memory.

The Organization's Director, Dr. Abraham Horwitz, welcomed the Committee's members, in particular the two new members, Drs. Alfredo Lanari and Guillermo Soberón, and outlined the program for the meeting. Dr. Horwitz noted especially the establishment in several hemispheric countries of private foundations that are potential major philanthropic supporters of health activities. He called this a welcome development, particularly for areas where in the past there has been little voluntary mobilization of private resources in the health sector. The Director also placed special emphasis on the agenda item reviewing patterns of financial assistance to biomedical research in developing countries. He voiced his wish that the Committee examine critically the experiences of the several public and private agencies that had supported biomedical research so that PAHO might profit from their successes and failures.

The meeting's agenda was then undertaken, beginning with the presentation of the summary reports that follow.
1. **Symposium on the Support of Biomedical Research in Developing Countries by External Agencies**

The purpose of this half-day symposium was to enable PAHO to profit from the experience of other organizations in the planning of its future research program. Reports were presented by representatives of four governmental agencies (the National Institutes of Health (NIH) of the United States, the British Medical Research Council (MRC), the Swedish International Development Agency (SIDA), and the U.S. Army Medical Research and Development Command (USAMRDC)), and two private bodies (the Rockefeller Foundation of New York and the Wellcome Trust of London). Including a wider range of organizations in the discussion was not possible in the allotted time, but it was hoped that the speakers who took part in the Symposium would reasonably represent the policies and attitudes of both official and private agencies in developed countries that finance research in the emerging nations.

As could be expected, there were both differences and similarities in the approaches of the various agencies whose representatives spoke. The establishment and operation in developing countries of research units and institutes run mainly by staff from the supporting country has been and still is a prominent part of the policy of the MRC and USAMRDC. In its early days the Rockefeller Foundation also followed this approach. NIH, in contrast, now has only two institutes overseas. Such units and institutes clearly provide an excellent means of starting and maintaining a long-term program, but difficulties arise in recruiting researchers to undertake long-term careers outside their own countries.

All the organizations in varying degrees finance the training of research workers for developing countries. NIH, with its large program of postdoctoral research fellowships, particularly emphasizes this. All the organizations also finance short-term projects by scientists in developing countries. NIH is setting up long-term collaborative programs, e.g., with Japan and the U.S.S.R., and to some extent this has also been SIDA's policy in its work in Ethiopia.
Except for a small schistosomiasis program, the Rockefeller Foundation has unfortunately restricted its interest in biomedical research in the past 10 years to indirect support in the form of strengthening developing countries' universities. The Foundation is now giving money to seven universities (one in Latin America) in this way.

The Wellcome Trust, a smaller and younger organization with more limited funds, sees its major role as encouraging change and experimenting with different ways to finance research in developing countries. It attaches great importance to breaking down the isolation of scientists in developing countries by promoting interchange and collaboration among workers in different countries.

Finally, all six organizations pay for considerable research in their own countries on important problems in the developing world. They do this partly because some of the research is more suitable to advanced centers and partly to encourage their own nationals to interest themselves in foreign problems while providing their citizens working overseas a home base.

The first discussion point made was that in Latin America, research support should come fundamentally from local and internal sources. Attention was then drawn to the frequently competing demands of economic development and health. Nowadays the major emphasis in foreign-aid programs is on economic growth, but this does not by itself improve the quality of life, of which health is a part. Economists tend to neglect the needs of medical research because its results can seldom be expressed as economic benefits. It is important, therefore, that developed countries continue providing money for research for its own sake, as a contribution to increasing scientific knowledge, without requiring tangible ties to economic development. It may be noted in this connection that the United Kingdom, in its administration of overseas aid, makes a sharp distinction between research and all other forms of technical assistance.

Although much of value may be learned from experience gained in Africa and Asia, Latin America's research problems are in many ways
different because of that area's generally higher level of technical and cultural development. A better comparison may be with Europe, where the great differences between one country and another in the financial support given to research depend largely on each country's institutional framework. This framework in many cases has not been flexible enough to meet science's changing needs. Similarly, there is such diversity in Latin America and the Caribbean that each area and perhaps each country should be considered separately. In general there is much less need in Latin America than in some other parts of the world to rely on expatriate personnel from the developed countries. The main emphasis everywhere should be on the support of indigenous institutions and investigators. Private foundations that are being set up could help fill this gap.

Group or team research is likely to be more viable, and isolated projects not connected with other academic research are usually less valuable. Many of the agencies that have promoted research in developing countries have therefore done so through links with universities. On general principles this is probably the channel of choice, but unfortunately many Latin American universities are now experiencing social and political upheavals that make research quite tenuous. The strategy of building up specialized institutes therefore becomes increasingly attractive. Some of the Region's major problems in both research and its application can be tackled only through a multidisciplinary and multi-institutional approach, and their solution depends on mobilizing the efforts of a variety of national and international institutions.

The Committee emphasized that whatever the institutional arrangements, great importance must be attached to promoting contacts between individual scientists in developed and developing countries. The private agencies, in particular, will always play a special role in supporting talent that might otherwise be neglected if all depended on official backing. The Committee also stressed the value of multinational research efforts.
Continuity in research is essential. Supporting organizations cannot be expected to maintain a program or policy indefinitely, but sudden program abandonments or policy changes may cause great frustration. It is therefore vital that a developing country be able to take over a program whose financing a foreign agency wishes to relinquish. Ensuring this is the responsibility of both donor and recipient. Examples of success and failure in this regard are to be found in the Region's history of research programs. Moreover, continuity of research is impossible unless an adequate infrastructure exists to supply supporting personnel, facilities, and maintenance. This requires a local commitment of men and money, and the danger exists that when resources are scarce, research will receive a low priority compared to basic education and training.

Perhaps the most difficult task is to decide on the areas in which research should be concentrated. The objectives are twofold: to build up new knowledge and to solve the Region's health problems. Donors and recipients may not always agree on the balance they wish to achieve between basic and applied research. One agency, for example, was said to frown on supporting applied research programs because its funding decisions were made entirely by academic scientists. Another problem is that some donor organizations have special interests that may distort research patterns in countries receiving support.

PAHO's research program is directed to the solution of practical problems, but the Organization has always recognized that this cannot be achieved without a solid base in modern science and technology. The Committee reemphasized that a holistic approach is needed: basic research must be supported not only to provide new knowledge, but equally to stimulate the educational process, particularly at the postgraduate level. It also emphasized that the special problems and diseases of developing countries, especially in epidemiology and human ecology, provide immense intellectual challenges that are not always fully appreciated. Such problems constitute an ideal target for the application of new scientific techniques.

In determining the strategy and tactics of research support, much must depend on who makes the decisions and how. While this subject could
not be discussed in detail, the Committee agreed that there must be a partnership. Members of the Committee expressed their gratitude and appreciation for the support of research that outside agencies had given in the past.

In the future, the pattern of support should be viewed as a combined effort in the accumulation of man's common heritage—knowledge. The developing countries offer opportunities of immense scientific interest that should be explored for their own sake. There is no longer a place for what has been called "technologic colonialism." The concept of partnership, however, underlines all the more the responsibility of the Region's countries in sustaining and increasing their own efforts.

The information the representatives of the grant-giving agencies presented was of great value to the Committee. Its members felt, however, that more time was needed for a fuller discussion of the many points of principle that were raised, and the Committee therefore recommended that this subject be given further consideration at its meeting in 1973.

2. Symposium on Epidemiologic Studies and Clinical Trials in Chronic Diseases

a. Panel on Arteriosclerotic and Hypertensive Cardiovascular Disease

The panel reviewed some of the comparative data on cardiovascular mortality in Latin America. Many of the data were drawn from the Patterns of Urban Mortality study (edited by Puffer and Griffith) of 10 Latin American cities, San Francisco, and Bristol, England. The results of the study, in which care was taken to adjust and evaluate the assignment of causes of death, led to two major and now well-known conclusions: age-adjusted death rates for ischemic heart disease (IHD) are higher in San Francisco and Bristol than in any of the Latin American cities examined, while age-adjusted death rates for hypertensive heart disease and cerebral hemorrhage are generally higher in Latin America. There is thus a converse relationship between these two premature causes of death, particularly in younger people.
There is clearly a broad spectrum of geographic rates that represent severalfold differences in both men and women. From the data available to it, the panel agreed that there are many demographic differences in IHD mortality that correlate well with socioeconomic conditions. The variety of ethnic groups in Latin America is great and not all ethnic groups have been observed in diverse socioeconomic conditions in sufficient numbers for firm conclusions to be drawn, but the data indicate that genetic differences between races are far less important influences on IHD than is culture.

If one adds to the study of urban mortality such data as have been gathered by the International Atherosclerosis Project, which embraced some Central and South American countries, it appears that coronary atherosclerosis is most closely associated in both Latin and North America with two factors, the percentage of total fat calories and the serum cholesterol concentrations.

The panel concluded it would be worthwhile to gather more data about the epidemiology of atherosclerosis and hypertension in Latin America. Much could be learned by questionnaire techniques that are not very expensive and have been shown to be reliable.

The questions were raised as to how little is actually known about the prevalence of hypertension in Latin America, and how well hypertension is treated there once it is recognized. It was acknowledged that case-finding and treatment standards are deplorable in the United States.

Standardization of cholesterol and triglyceride measurements was discussed, and greater use of the World Health Organization standardization program was suggested. The problems of centralizing and standardizing data collection and death registration in the Hemisphere were addressed.

The panel heard an opinion that salt intake and heredity are the only factors known to be related to the etiology of hypertension. Data from a U.S. Veterans Administration study indicate that there is no longer any question that it is necessary to treat patients with moderate hypertension, i.e. those with diastolic blood pressures over 105. Today's major question is the role and value of treating mild hypertension, i.e.,
diastolic pressure between 90 and 105. Several such studies are contemplated in the United States but none is actively under way.

The panel ended its discussion with an appeal to Latin America to consider how it may avoid the increasing atherosclerosis mortality that plagues the United States. Urgent attention should be given to measures that will counteract the proved association between cigarette smoking and high fat intake on the one hand and ischemic heart disease on the other, and the probably negative correlation between physical activity and death from IHD. This obviously means educating the young and perhaps creating a health-conscious counter-culture. The latter would be something of a novel social experiment, and a novelty if proved successful.

b. Panel on Diabetes

Diabetes is one of the major chronic diseases of the old. The life expectancy of diabetics today is reduced by at least one-third. Insulin has been most useful in eliminating the morbidity and mortality associated with defects in carbohydrate and fat metabolism characteristic of the severe, symptomatic type of diabetes.

It is now evident that a major cause of death among diabetics is cardiovascular disease, which accounts for approximately three-fourths of deaths. This phenomenon occurs throughout the world and seems to exist independently of blood glucose control.

The causes of mortality trends in diabetes, as described in the report of a PAHO-financed study in 12, mostly Latin American cities, were discussed. Variations in the availability of medical care and demographic differences such as varying ages, family size, and smoking and dietary habits, may account for many of the differences. Recent studies in five social classes in England and Wales showed interesting changes in mortality between 1931 and 1951, some of which were related to changes in cigarette consumption, diet, and perhaps the use of oral hypoglycemic agents.

Some discussion occurred about the difficulties in determining diabetes mortality rates more precisely. Such difficulties were
attributed to periodic changes in the international classification of
diseases, failure to provide multiple-cause coding, and the well-known
inaccuracies in death certificates executed by physicians either
uninterested in form-filling or ignorant of the usefulness of such data
collection.

Variations in the prevalence of diabetes in various discrete
populations around the world were described using standard methods of
diagnosis. It was clear that a group of Indian tribes studied in the
southwestern United States had far more diabetes than has been described
in U.S. Caucasian and other cosmopolitan populations. Findings in a
current study sponsored by the National Institute of Arthritis and
Metabolic Diseases of the epidemiology of diabetes in the Pima Indians
of Arizona were described. Specific microvascular complications of
diabetes were related to the level of the two-hour plasma glucose test
after 75 g glucose challenge, the level of 200 mg/100 ml apparently
being the dividing line. Increases in plasma glucose above that con-
centration were not associated with any greater frequency of complications,
however. An interesting and perhaps important correlation between hyper-
tension and the development and progression of diabetic retinopathy
raised the possibility that vigorous treatment of hypertension might be
beneficial.

Results of the University Group Diabetes Program (UGDP) study,
a controlled clinical trial of currently available hypoglycemic
therapies, were described. It was found in the trial that neither
tolbutamide nor phenformin gave evidence of benefit after a mean
follow-up of five years. The possible implication of oral hypoglycemic
agents in higher cardiovascular mortality needs to be considered
cautiously until additional data are available.

Data from another study were presented showing that among 200
patients randomly drawn from a total of 2,000 diabetics whose oral
hypoglycemic treatment was abruptly stopped, 60 per cent could be
controlled just as well by diet alone but the other 40 per cent required
the addition of relatively small amounts of insulin. It was estimated
that good control of plasma glucose could be achieved without oral agents at a cost 10 per cent less than that previously required, and with the additional benefit of eliminating the possible hazards found in the UGDP study. If the use of oral hypoglycemia-inducing drugs were eliminated the financial savings would be in the millions of dollars.

c. Panel on Chronic Parasitic Diseases

(i) Chagas' disease. Strains of *Trypanosoma cruzi* may differ from each other in morphology, infectivity, virulence, tissue tropism, and antigenicity, but the extent to which these characteristics may be related is poorly understood. Studies to establish such correlations should be conducted on recently isolated, stabilized strains that have not been subjected to prolonged maintenance in culture or animal passage. Preservation of such strains through storage at low temperatures is now possible. The accumulation and preservation of strains for such studies would be greatly facilitated by the establishment of a strain bank.

Longitudinal studies are essential to assess the prognostic significance of clinically inapparent infection, to determine the role of reinfections, the incidence and distribution of clinical forms, the problem of transplacental infection, and the evolution of cases after detection of the acute phase.

There is no specific treatment of Chagas' disease. Evidence exists that materials prepared from physically killed *T. cruzi* organisms are antigenic, and it seems probable that a consistent effort in this area might eventually yield a vaccine suitable for field trial.

It should be emphasized that the possible infectivity or pathogenicity for man of strains avirulent for small animals cannot be estimated, so that the trial of such strains in man should not be considered at this time.

There is little knowledge about the disease's cause in nonhuman primates. Accumulation of information about this point might eventually allow adequate testing of a live vaccine prepared from an avirulent monkey strain.
The best method available for interrupting the domestic transmission cycle of Chagas' disease is the application of residual insecticides, but if long-term results are to be achieved, housing conditions must be improved.

(ii) Schistosomiasis. The development of semifield conditions or epidemiologic models as a high-priority item in schistosomiasis investigation was emphasized. Cross-section and longitudinal studies were considered essential for better understanding of the natural history of the disease. Longitudinal studies should be conducted in areas of different endemicity so that the outstanding events in the epidemic nature of schistosomiasis may be recorded.

The present methodology of schistosomiasis control was reviewed. The limitations and inconvenience of the two specific control methods—chemotherapy and mollusciciding—were stressed, and the need for new control methods was emphasized. Biologic control was said to deserve vigorous attention. Combining control methods was stressed, as was the integration of control methods in community health programs.

The development of a methodology to study the economic importance of schistosomiasis was mentioned as a worthwhile goal.

The importance of careful selection of experimental animal models in the study of schistosomiasis was stressed. The establishment of a reference source or registry of data on experimental animal models, more specific and informative than a simple list of bibliographic references, is considered important. The use of available experimental models rather than the development of new ones was stressed.

d. Panel on Cirrhosis of the Liver

Cirrhosis is an important worldwide disease. Nomenclatural problems hamper the study of its epidemiology, and an updated and standardized classification must be developed. Evidence exists that cirrhosis is increasing in many of the American countries. The occurrence of the disease peaks in middle age and, interestingly, decreases in frequency in old age.

In general, it was emphasized, nutrition is no longer considered a key factor in causing cirrhosis, although it does contribute signi-
ficantly to its aggravation and the transition from chronic hepatitis to cirrhosis. Many factors apparent in poor, inner-city areas but not elsewhere probably cause cirrhosis. Alcohol is the disease's major cause, and liver injury due to alcohol is a much more significant cause of morbidity and mortality than are the disease's psychiatric complications.

Alcoholic liver injury is easily recognized clinically and through liver biopsy. It is harder to predict which liver-injury cases will progress to cirrhosis, and harder to manage cirrhosis once it develops. The only successful therapy is alcohol withdrawal, but this can be accomplished in fewer than 40 per cent of patients. There have been at least four randomized, controlled trials of steroid therapy for acute alcoholic hepatitis, and it appears effective in mild but not severe cases.

Nonalcoholic hepatitis has been identified as a sequel to chronic viral hepatitis associated with the hepatitis B antigen (Australia antigen), sensitivity to certain drugs, and exposure to fungal toxins such as aflatoxin. The extent of the last two is unknown, but they are probably not very common.

Gammaglobulin prophylaxis against acute disease has been clearly demonstrated for hepatitis A, or infectious hepatitis. Controlled trials of the prevention of post-transfusion hepatitis have yielded equivocal results, and it has been shown that elimination of the use of commercial blood donors would be a much more effective preventive measure. Trials of gammaglobulin with high hepatitis B antibody titers are just getting under way.

Finally, therapy for chronic progressive hepatitis is most important in preventing cirrhosis. Three trials have shown steroids to be effective, and details were presented of a 110-patient study in which steroids were found much more effective than azathioprine or placebo.

e. Symposium Summary

Chronic diseases are becoming increasingly important among the world's health problems. It has been pointed out that the prevention or amelioration of chronic diseases requires unusual patience, persistence,
and--perhaps most difficult of all--that kind of public education in which the prevention or treatment may extend over much or all a person's life span.

The four panels, in addition to their specific substantive contributions, brought out the need for clinical trials in medicine's future efforts to deal with the chronic diseases.

The Committee extended its warm thanks to the Symposium's organizers, panel leaders, participants, and rapporteurs for their contributions to its success.

3. Research Program of the Pan American Health Planning Center

In 1961, PAHO began supporting research in health planning methodology. The Center for Development Studies (CENDES) of the Central University of Venezuela was commissioned to prepare a training manual, which subsequently formed the basis for an international course in health planning.

Certain basic principles have underlain the philosophical approach of health planning research: Health is a social problem, requiring multidisciplinary consideration. Ill-defined, health is an ever-changing condition varying from person to person, community to community, country to country, and region to region. Optimal health is essential to social and economic development. Health planning is an instrument of and fundamental tool for change.

Health planning is defined in the light of these considerations as an element of a broad plan and a permanent and self-sustaining process. The health sector should be considered as a whole in allocating resources.

There are gaps in our knowledge of health planning. A major area of concern exists with respect to the use of the knowledge of the social sciences.

Regional differences in health and the provision of health care underscore the need for localization of research. Research and training should be integrated and progress simultaneously.
Research is directed to two large areas. First is an analysis of needs and systems, an area primarily methodologic in nature. Models have been constructed, especially the numerical experimentation model. The second major area concerns the strategy of achieving goals and catalyzing change.

Initial CENDES research focused on the construction of a so-called "link" as a global health-sector model. It does not make use of a cost-benefit analysis. CENDES published the first revision of the model in 1970, but lack of facilities has prevented widespread application of the model. Progress has been made using data from Argentina. The Center is now developing submodels of finance, investments in the health sector, human resources, and political factors.

The Committee recognizes that the need for health planning is widely accepted by ministries of health throughout Latin America and the Caribbean. It is therefore essential that PAHO give every support possible to the development of planning techniques. The establishment of the Health Planning Center in Santiago, Chile, is an important step in this direction, and the Committee fully endorses the initiative that PAHO has taken. The subject is so important that every available strategy must be used. The cost-analysis approach to the development of health programs presents particular difficulties and dangers. Because of the diversity of conditions in Latin America, it may be necessary to begin with rather theoretical models; with some reservations, it was agreed that this approach is potentially productive, but the Committee emphasized that it is important to maintain close contact with real situations and problems, and to develop models appropriate to those conditions.

4. Delivery of Health Care in Latin America: Current Problems and Future Perspectives

A description of the inadequacy of the Latin American health care system in coping with demands was of great interest to the Committee. The problem is of great complexity, and many factors intervene to prevent proper delivery of medical care to an increasing population.
It was felt that one of the most important factors was the shortage of appropriate human resources—physicians, nurses, and para-medical workers. Not only are greater numbers badly needed in most countries (with respect to physicians, Argentina is the exception since it has a ratio of 1:500 citizens), but it is also necessary to establish some mechanism for their better geographic distribution since health workers tend to concentrate in cities. The Committee felt that an investigation of the reasons that prevent young physicians from serving in rural areas would be in order. It also noted that the residency system, which is not well established in Latin America, would tend to improve the working conditions and training of young physicians.

The desirability of training medical students intensively in the medical problems most commonly seen in the population was also emphasized, as well as the need to develop and use paramedical workers to the optimum. Nonprofessional persons should also be involved in medical care.

The need to implement to a greater extent the regionalization of medical care, and to use recent technologic innovations to facilitate the provision of medical care to greater numbers of people was stressed. Coordination between public health agencies and agencies in charge of delivering medical care should be implemented.

The Committee recommended that the Director suggest that the health ministers carefully consider the problem of medical care, which calls for urgent action in different countries.

5. The Inter-American Investigation of Mortality in Childhood

Analysis of extensive data about 35,000 deaths of infants and children under five years in the Americas indicates an urgent need for immediate action in health programs throughout the Hemisphere. The results of the childhood mortality study substantiate the need for specific programs:

First, methods are required to determine the quality and completeness of death reports, which are a foundation for health planning and
research. Second, only through study of associated as well as underlying causes of death will the seriousness of health problems be defined. These analyses indicate that nutritional deficiency is directly or indirectly a major factor in the health problems of infancy and childhood in Latin America. Study of multiple causes of death as well as the surrounding social and biologic factors will clarify the nature of the problems. Third, studies of reproduction patterns and reproductive wastage reveal the great value of analyses of such variables as birth order, maternal age, birth weight, and the results of previous pregnancies, and their fundamental importance in the study of human reproduction. Fourth, analyses of socioeconomic variables indicate excessive mortality in vulnerable groups of the population and the need of a multidisciplinary and multisectorial approach to health planning.

The Committee considered that the Inter-American Investigation of Mortality in Childhood, whose value is already widely recognized, represents a major achievement for PAHO. The organization of such a collaborative study presents great difficulties, and the methods developed provide guidelines for future research. The results of the study will be published as a monograph entitled, "Patterns of Mortality in Childhood," by members of PAHO and other agencies. It is important that a study of this kind should lead to action, the Committee felt. The findings indicate the need for examination and reorientation of health programs, and provide a basis for further coordinated research.

The Committee supported the recommendation that community-centered research be an essential part of PAHO activities. It recommended that the Organization promote and support such research, and use such projects for the training of research-oriented personnel. The use of operational research in a demonstration area was recommended as a way to develop methodology and new approaches in the field of maternal and child health.

The Committee noted specific proposals for (1) operational research for maternal-and-child-health programs, (2) study of pregnancy outcome and newborn survival, (3) an intensive program for the improvement of vital and hospital statistics, (4) a study of the effect of
malnutrition on the immune response to infectious diseases, (5) a study of patterns of breast feeding, and (6) a study of perinatal morbidity and mortality. It recommended that support be sought for their implementation by the Organization.

6. **Pan American Health University**

Examination by PAHO of the tremendous advances in education and research during the past 20 years has revealed that the local or national approach to the solution of health problems has continuing limitations. Analysis emphasizes the need for an integrated regional or hemispheric approach. While regional cooperation is progressing, there would appear to be a need for some supplementary integrating machinery capable of seeking solutions unimpeded by circumstances imposed by local conditions. A hemispheric approach would facilitate comparative investigation of problems common to several regions but differing in each.

If one focuses on the training of human resources using the fellowship program as an example, some inadequacies are clearly apparent. Decisions are often haphazard with respect to the establishment of priorities, the choice of training centers, fellowship stipends, and reassimilation of the fellowship holder into the health system of his own country. International machinery for identifying high-quality centers for training purposes and capable of resolving current problems in the selection, training, and subsequent use of fellows is clearly needed. Many centers are underused.

A Pan American Health University is proposed that would provide the machinery to give postgraduate training under optimal circumstances. It is proposed that the administrative structure be composed of two bodies, a central coordinating body at PAHO and operational units that would be institutionally autonomous. The proposed organizational and institutional responsibilities were presented to the Committee in written form.
The Committee strongly supported the concept underlying this imaginative and far-reaching proposal. There is a real need for some machinery for coordinating advanced studies and fellowships to ensure that the careers of young scientists are developed in the most fruitful way. The machinery must be such that training is tailored to the needs of each individual. The organization of such an institution presents difficulties that must not be minimized. Concern was expressed about the possibility of conflict between the University and existing degree-granting bodies. These would be more appropriately referred to as "participating" rather than "operational" units. It must also be recognized that, in general, participating institutions could not be expected to organize special courses and teaching programs.

The Committee strongly recommended that PAHO support the principle of such a University, whose basic approach to health problems must be a holistic one. Considerations of institutional structure and organization are important, but secondary to the main principle.

7. Development of a Multimedia Learning Resource in the PAHO Regional Library of Medicine

The Committee was pleased to learn of plans to develop a multimedia learning resource at the Regional Library of Medicine in São Paulo. The establishment of such an activity was taken as an expression of the Library's past success and a need for expansion of its services.

The Committee fully supported the proposed RLM expansion and recommends that the Library develop its potential for providing information to established scientists and fulfill more adequately its regional character by increasing its services to Latin American countries other than Brazil.

Procedures for conveying current information are of great significance because of the increasing demands of medical education at the student and teacher level. In this respect, the possible use was mentioned of an experimental program being developed at the Federal University of Rio de Janeiro to create a new Latin American center for educational technology in the health sciences.
The current view of the function of health science libraries is that they should be an educational aid for the student, an information bank for the health practitioner, and a research tool for the experimenter. To be most effective in this mission, libraries must harness the potential of currently available communications technology for the benefit of their users. Prominent among nonprint communications tools are a wide range of visual and auditory media such as motion pictures, videotapes, audiotapes, slide-tape presentations, microfiches, and programmed instructional materials that are of proved worth in the information transfer and learning process.

During the year a consultant in educational technology spent 10 days in São Paulo meeting with key personnel at the Library and the Escola Paulista de Medicina, studying the physical layout of the Library, and becoming acquainted with its programs in order to formulate a plan for the development of audiovisual facilities at RLM to: (1) provide multimedia learning facilities for students, (2) provide faculty and postgraduates with discussion and study areas equipped for the use of audiovisual media, (3) design the layout of an auditorium suitably equipped for meetings, conferences, and training activities, and (4) provide a facility for the storage of learning media and their distribution to other institutions.

This resource will extend and enhance the information services the Library now provides. When completed, the unit, with its four separate but interrelated functions, will be a demonstration center of educational technology developments and a focal point for the training of librarians and others in aspects of information science, for providing students with self-instructional learning materials, and for the development of a new pedagogic laboratory for teaching health-science teachers how to teach.

8. Research Training in Clinical Medicine

Results of the program begun in 1969 for advanced training in clinical medicine were presented. Candidates must be less than five years
out of medical school, must be engaged in research, and must desire to work in a Caribbean or Latin American institution. A technical review panel of eight members was established. Of 15 suitable applications, 10 were approved, and nine of the 10 candidates received awards. A variety of clinical and basic science disciplines was represented among the candidates, whose average age was 33 years. Both the number of applicants and their quality have been less than anticipated, but it should be realized that the program is not yet widely known.

In discussion, the experience of the Wellcome Trust was described, and it was noted that publicly advertised fellowships may attract candidates who are more interested in travel than science. The observation was made that clinical research is not recognized as a career opportunity to the same degree as are opportunities in the basic biomedical sciences. The Committee agreed that fellows should work full-time in the institutions to which they are assigned. Brochures describing fellowship opportunities might well describe briefly the institutions in which applicants would be welcome. The Committee recommended that the program being developed be consistent with the needs of clinical medicine. It further recommended that the recruitment of suitable candidates for research fellowships be carried out primarily by those academic departments interested in attracting research fellows. It also recommended that the review panel be enlarged, and its existence be publicized.

9. Virus Research Facilities in Latin America

The report noted that a virus research laboratory's responsibilities may be divided into two general categories. The first embraces investigations of viral diseases transmitted from man to man or directly from animal to man. Investigations of these two types of viral entities as well as epidemiologic studies are relatively straightforward, and, in the main, require a knowledge of virologic techniques and clinical infectious disease. On the other hand, the second category, which consists of research on vector-transmitted agents, requires in addition to physicians a sophisticated group of experts in a variety of other disciplines such as
entomology, ornithology, and sociology, for proper epidemiologic and virologic investigation.

The laboratories in the Hemisphere that have the broad competence to investigate and make recommendations about the control of disease outbreaks caused by viruses in the second category are few and for the Hemisphere's needs inadequate. It was noted that the annual budget of a broadly competent virus research laboratory ranges from $200,000 to $500,000. Epidemiologic competence is an essential part of the research institution. The laboratory must be charged with continuing surveillance, not only to detect outbreaks promptly but also to determine by monitoring antibody levels when countrywide vaccination programs become imperative.

The Committee noted with deep concern that the number of virus research laboratories in the Hemisphere is decreasing as private support diminishes. Current dengue epidemics in Colombia and the large Venezuelan encephalitis outbreak last year in Mexico and Texas dramatize the continuing importance of arbovirus research. Furthermore, hemorrhagic fever in Argentina, which has a 20 per cent mortality, continues as a temperate-zone problem.

The development of epidemiologically qualified regional laboratories is a logical solution to this problem, and they could well be patterned along the lines of the Trinidad Regional Virus Laboratory. Educating the practicing physician about his essential role in the surveillance process should be promoted. There is a continuing need for better coordination between basic virus research workers and those investigating practical health problems. In view of the ever-present danger of epidemics, the Committee urged the Organization to promote virus disease research and development by all possible means.

10. **Workshop-Symposium on Venezuelan Encephalitis Virus**

A unique symposium was sponsored by PAHO in September 1971 that brought together workers concerned with Venezuelan encephalitis virus.
Since the meeting had been planned before the disease spread into the Rio Grande area, the Workshop-Symposium turned out to be timely. The meeting covered several broad areas:

1. **The virus**

Similar to other Group A arboviruses, VE virus is now known to be a complex of antigenically related agents with four subtypes.

2. **The victims**

VE was first recognized as a disease of horses, with a high mortality. That man could be infected was first recognized from accidental infections in laboratory workers. Although the illness usually exhibits only influenza-like symptoms, a fraction of patients (estimated at 1 to 3 per cent) show central nervous system involvement. VE is therefore a serious health problem, and is now known to have infected hundreds of thousands of people during the past 25 years.

3. **Epidemiology**

It has been established that several wild rodents are susceptible, that many mosquitoes can serve as vectors, and that there are enzootic foci of the virus in nature. Furthermore, important outbreaks in man and horses occur periodically. The spread of VE northward during 1969, 1970, and 1971 illustrates the serious problem created by this agent. Now—in 1972—a focus is active in Mexico.

4. **Prevention**

Newly available vaccines are of proved value in the protection of horses, and may indirectly protect man by minimizing opportunities for his infection.

The summary presentation was highly complemented by the Committee, as was the role of PAHO in catalyzing a hemispheric consideration of a major health problem. It was observed that in Venezuela, clinical observations suggest that infection of the pregnant woman may result in congenital anomalies, although such observations are virologically
unconfirmed. This possibility further emphasizes the urgent need to support research on human VE disease. Ironically, this is yet another example of the political process providing money for virologic research when economically important animals are at stake but failing to support comparable studies of human disease.

*Aedes aegypti* reinestation of Latin American urban centers not only exposes large populations to the threat of dengue and yellow fever, but also to Venezuelan encephalitis, which the mosquito has now been shown capable of transmitting.

An informal summary was presented describing PAHO's support for VE research in Venezuela. One problem there is the fact that many locally obtained animals have antibodies, indicating past infection; such animals, of course, cannot be used for studies of vaccine protection. Longitudinal studies are in progress on antibody patterns in infected horses. Vaccines, both attenuated and inactivated, are under investigation. The range of vector susceptibility is being explored.

The Committee's discussion emphasized that vectors other than mosquitoes must be investigated. Some evidence incriminates horseflies as capable of mechanical transmission. Similarly, there is the possibility that *Simulium* may transmit the disease at altitudes of about 1,400 m above sea level, where mosquitoes are not abundant.

It was recommended that PAHO continue already established investigations and promote research on the consequences of the disease in man and on the fundamental aspects of the epidemiologic behavior of the virus.

11. **Second Meeting of the Scientific Advisory Committee on Dengue**

The report of the Committee, which met in Trinidad in March 1972, was reviewed. Recent extensive outbreaks of dengue in the Caribbean have raised the prospect that the Hemisphere may shortly experience hemorrhagic dengue fever in epidemic form. This supposition is based on the current
concept that the hemorrhagic disease reflects a second infection with a different but related strain of virus. Recent work has led to an understanding of the immunologic nature of the vascular damage occurring in the sensitized host. Antigen-antibody complexes form in the blood, and 90 per cent of the C-3 fraction of complement is converted to C-3a anaphylatoxin.

A dense human population is required for several different types of dengue virus to remain active in a community. Such conditions may obtain ever more widely as population pressures build up in Latin America. The vector of dengue, *Aedes aegypti*, persists in or has reinvaded large areas of the Region. Before 1963, epidemic dengue occurred in the Hemisphere at about 10-year intervals. Since then the epidemic pattern has changed, with dengue type 2 activity occurring almost yearly. Dengue type 3 has caused independent but concurrent epidemics in the same area. The islands of the Caribbean now represent endemic foci.

Since hemorrhagic dengue may have a 20 per cent mortality, epidemiologic surveillance must be expanded and maintained. Information exchange must be improved, and virologic laboratory resources should be expanded.

In discussion, the current experience in Colombia was reviewed. Water is an expensive commodity in dry areas and stored in houses, and the containers used to store it are ideal for *A. aegypti* breeding. The Colombian coastal area was reinfested by *A. aegypti* in 1969, after which the mosquito spread inland along lines of communication. Dengue appeared in July 1971 and spread west and south, with infection rates reaching 22 per cent in some localities. It is estimated that no fewer than 450,000 people have already experienced infection. There is evidence that the disease has become endemic in different areas. In retrospect it is clear that surveillance for *A. aegypti* reinfestation was not adequate.

The fact that hemorrhagic dengue has not yet been seen in the Caribbean area can probably be explained statistically; the syndrome occurs primarily in children, and perhaps in less than in one in 100 of
those experiencing a second attack early in life. No ethnic predisposition has been demonstrated.

Moreover, serious preoccupation was expressed once more regarding the risks of yellow fever in areas with *A. aegypti*, mainly in those reinfested recently and heavily.

The ACMR agreed that the recommendations of the Scientific Advisory Committee deserved full support. Those recommendations include the establishment of a well-planned program for surveillance and the promotion of research aimed at understanding natural endemic and epidemic dengue cycles and eventually controlling the disease. It was clear that the current outbreak in Colombia offers opportunities for the study of certain epidemiologic features of the disease.

12. Recent Developments in Foot-and-Mouth Disease Vaccines

Foot-and-mouth disease occurs in many areas of the world, and influences all regions by inflating the price of beef. No accurate figures are available on the financial losses caused by foot-and-mouth disease. The highly contagious nature of the disease, its persistence in the carrier state in domestic and wild animals, and the antigenic lability of the causative virus are characteristics that make it hard to control. Combined use of vaccine and sanitary measures, including the slaughter of infected animals, however, has freed some countries from the disease. A good vaccine should possess the characteristics desirable in all vaccines, i.e., it should be innocuous, induce a solid and lasting immunity, and be amenable to economical and wide-scale production.

Two general types of vaccine—attenuated live virus and killed virus—are in use; the former is proscribed in meat-exporting countries. Over 400 million doses of inactivated vaccine were produced in 1971 for use in the Western Hemisphere.

In the search for improved live-virus vaccines, efforts are focused on the production of mutant strains by chemical and physical treatments and subsequent selection by plaquing techniques. Virus for
production of inactivated vaccines is now generally produced in culture cell lines or in newborn rabbits. Much effort is now devoted to the methodology of concentration and purification of virus. New inactivating agents are under investigation, as is the potentiation of antigenicity through the use of adjuvants. There is a need, as yet unmet, for standardization of the methodology of quality control. Only those vaccines that have been independently evaluated in an official control laboratory should be released for use in the field.

Questions were raised by the reported use of Poly (IC) as an "adjuvant." It was indicated that the material did not potentiate a specific antibody response. In discussion, the complexities of vaccine production and use were considered. The social, economic, and health significance of foot-and-mouth disease was emphasized and the importance of continuing research underlined.

The Committee approved the actions that PAHO had taken with regard to foot-and-mouth disease during the previous year, and emphasized its support of the Organization's program.

13. Symposium on Shiga Dysentery

A symposium was held in Guatemala in July 1971 to review the situation and present knowledge on the acute dysentery outbreak caused by the Shiga bacillus. The outbreak began near the Mexico-Guatemala border and spread through the southern part of Mexico, the whole of Guatemala, El Salvador, Honduras, and Nicaragua. A few cases were reported in the northern part of Costa Rica. Reports from Mexico and Guatemala indicate that the Shiga bacillus was endemic in Middle America before 1968. The interplay of environmental factors altering the established relation between the bacillus and the human population might be responsible for the epidemic and spread as well as for its later disappearance and confinement to the affected territory.

The isolation and identification of the Shiga bacillus and the clinical features and pathologic lesions were described. The epidemiologic
aspects of the outbreak, which included retrospective investigation of specific antibodies to the Shiga bacillus, were also defined.

The fact that the strain responsible for the Central American epidemic had the multiple drug-resistance factor not present in the preepidemic strains caused concern to the Committee.

The Committee, acting on the recommendations of the participants in the symposium, advised the Director to proceed as follows:

1. To recognize the Institute of Nutrition of Central America and Panama as the Central American reference laboratory for enteric infection.

2. To organize a laboratory course for workers in Central America and the Caribbean to provide training in the diagnosis of enteric infection, with emphasis on Shigella and Entamoeba. The course should be carried out in Guatemala and monitored by PAHO/INCAP and the U.S. Public Health Service's Center for Disease Control.

3. To organize a meeting of interested scientists and local authorities to evaluate the status of Shiga dysentery, the emergent antibiotic-resistant pathogenic strains (Shigella, Salmonella, and others), and other related topics.

4. To publish the proceedings of the Symposium on Shiga Dysentery as soon as possible.

14. Dental Caries: An Infectious Disease

For almost a century it has been postulated that dental caries is caused by specific bacteria. Tooth destruction was thought to follow acid production derived from the fermentation of dietary carbohydrate by specific organisms. In the interim, the relationship between dietary carbohydrate and prevalence of caries has received overwhelming epidemiologic and experimental support. Nevertheless, definite incrimination of the basic role of bacteria has been more difficult; it was first elucidated in 1954, when it was shown that germ-free rodents maintained
on a cariogenic diet did not develop carious lesions. Later work with hamsters demonstrated that strains of *Streptococcus mutans* were cariogenic, that the condition was transmissible on contact, and that antibiotic dosage regimens that suppressed growth of the streptococcus in vivo would also protect the animals from tooth decay. More recently, studies have shown that strains of streptococci isolated from the human mouth are capable of inducing caries in primates, and that caries has followed transmission of this organism from monkey to offspring. Koch's postulates about the causative role of *S. mutans* have now been satisfied.

Progress in elucidating the pathogenesis of the carious lesion has resulted from studies of dental plaque. Dental plaque is initially composed of denatured salivary glycoprotein, provides an excellent milieu for bacterial growth, and is enhanced by dietary carbohydrate. It is therefore an enhancement and containment medium to keep bacterial fermentation products in contact with tooth enamel. On theoretical grounds, our knowledge of the pathogenesis of dental caries suggests that vaccination would not provide antibody at the site of the destructive process, and that this approach to prophylaxis would not be productive. While the mechanism remains unclear, it has been demonstrated that primates vaccinated with a live streptococcal vaccine do obtain protection against dental caries.

The chance observation that children in Heliconia, a semi-isolated village near Medellin, Colombia, have a low incidence of dental caries, in sharp contrast to children in comparable villages nearby, has led to a PAHO-sponsored collaborative study involving research workers at the University of Antioquia, Medellin, and the Royal College of Surgeons, London. A unique phenomenon in Heliconia is the high carbohydrate intake in the form of sugar bricks (*panelas*), a staple food. Previous work indicated a negligible fluoride content of water and food. The study now under way is directed toward investigating features of the microbial flora that could account for caries resistance.

The Committee considered in some detail the data presented on vaccination. It was brought out that while vaccinated primates continue
to harbor cariogenic organisms, formation of dental plaque is much reduced. The discussion emphasized that fluoridation of drinking water per se achieves a 40 per cent or better reduction in dental caries incidence, and that this approach to the caries problem must be pursued vigorously. Ingestion of appropriate levels of fluoride is safe and effective, and is now the only public health weapon against caries. The Committee complimented all participating in the Heliconia project on their vision and initiative in exploring this experiment of nature.

The Committee strongly supported the principle of investigating the infective nature of dental caries, urged that the results of this work should be brought to the attention of research coordinating institutions in the Latin American countries, and recommended that attention should be paid to identifying situations similar to that in Heliconia.

15. **Sporozoite-Induced Immunity in Mammalian Malaria:**
   **A Review of Recent Work**

The progress achieved in the investigation of sporozoite-induced immunity in rodent and simian malaria was reported to the Committee. It covered the production of antispore antibodies in simian malaria, protective immunity, the antigenic analysis of sporozoites of simian malaria, the immune mechanism in rodent malaria, and sporozoite purification through density-gradient centrifugation.

An effective vaccine and the use of immunologic procedures for determining the antigenic relationship of geographically different malaria strains would contribute a great deal to the goal of eradication of malaria. Currently, emphasis in antimalaria campaigns is on the vector, but the development of insecticide resistance constitutes a serious complication. If a sporozoite vaccine is to be logistically feasible, methods for mass production, as in tissue culture, will have eventually to be developed.

The Committee enthusiastically endorsed the continuation of these studies.
16. **First Pan American Symposium on Paracoccidioidomycosis**

The first Pan American Symposium on Paracoccidioidomycosis, held in Medellín, Colombia, in October 1971, originated in February 1970 when a Coordinating Committee for the Mycoses was formed under the PAHO Department of Research Development and Coordination to oversee research in this field. The paracoccidioidomycosis symposium covered a wide variety of subjects and provided the grounds for a thorough discussion that defined the "state of the art" for this disease. The Coordinating Committee has defined the objectives of medical mycology and also identified some of the problems that should be solved. Thus, a 10-year program has been proposed in which emphasis is given to applied research, personnel training, standardization of diagnostic procedures, and development of regional centers, among other things.

It was suggested that the Coordinating Committee look for ways to improve the histopathologic diagnosis of mycotic disease in autopsy and surgical material. It was agreed that PAHO should give even more emphasis to the development of centers for research and training in medical mycology in Latin America.

17. **Field Trial of Spherulin**

Coccidioidomycosis is the most widespread of the systemic mycoses in the Western Hemisphere. Some 55,000 new symptomatic cases occur yearly, 35,000 of them in the United States. The disease is certainly underdiagnosed in Latin America. Intradermal testing with coccidioidin is now a commonly used adjunct to diagnosis, although a percentage of known patients (1 to 10 per cent) fail to respond. In contrast to this material, which is prepared from the saprophytic mycelial phase, a new antigen known as spherulin has been produced from the parasitic tissue phase, i.e., cultured spherules.
When assayed in infected mice, spherulin gave an 82 per cent delayed dermal reaction whereas coccidioidin yielded a 35 per cent rate of reactivity. After animal testing, a human field trial was mounted in a hyperendemic area near Ciudad Obregón in Mexico. In comparison to the standard coccidioidin, positive reactors increased from around 40 to 70 per cent. A control group in Mexico City gave negative reactions with both antigens. Cross-reactions were not obtained when spherulin was applied to patients with other mycotic diseases or those with other infectious diseases.

In discussion, it was noted that small amounts of spherulin are available for distribution. Sporadic cases can be detected in drier areas in Argentina. Obviously, many patients with pulmonary involvement are erroneously treated as tubercular in etiology. The Committee expressed its appreciation for this excellent diagnostic advance, which has important epidemiologic implications.

18. Needs for Future Research in Nutrition

The recommendations of the fourth meeting of the Pan American Health Organization Technical Advisory Committee on Nutrition, held in 1972, were reviewed. The recommendations were summarized under eight headings: (1) defining the extent of the problem; (2) the impact of food supply on nutritional status; (3) the epidemiology of malnutrition in young children; (4) factors affecting growth and development; (5) effects of nutritional deprivation on work output; (6) methods for improving nutritional status; (7) the epidemiology of overnutrition and chronic diseases linked to nutrition; and (8) collaborative studies on the prevalence and sequelae of protein-calorie malnutrition in fetal growth retardation. The Committee endorsed the recommendations.

In discussion, it was noted that the science of nutrition is unique in that the primary physiologic requirements have been defined. Paradoxically, while sophisticated techniques are available in the research laboratory, simple methods applicable to the field need to be developed.
The basic problem is that of applying already available knowledge, but before such knowledge can be applied the problems require further definition. For example, the various types of protein-calorie malnutrition are ill-defined. Even more important, we do not know the levels of malnutrition at which significant impairment of function or development occurs. Little is known of the comparative effectiveness of different rehabilitation regimens. It was suggested that data on congenital anomalies be collected as a corollary to the collaborative study of the effect of malnutrition on fetal development. Facilities for training scientists in nutrition research are limited, and the numbers of scientists so engaged are small in terms of the long list of research priorities.

Up to now, work on the behavioral consequences of malnutrition has been descriptive and concerned with estimating the size and frequency of negative consequences. Attention must in the future be directed to the mechanisms through which such effects are produced and to the feasibilities for functional rehabilitation through both nutritional and stimulational intervention.

19. Seminar on Malnutrition in Early Life and Subsequent Mental Development

An international seminar was held in 1972 under PAHO sponsorship on the effect of malnutrition on mental development. Four problems were considered: (1) how the structure and function of the brain are altered; (2) how behavior is altered in the malnourished child; (3) how the malnourished child is influenced by concurrent environmental and social conditions; and (4) useful multifactorial models for studying the problem.

It was agreed that malnutrition influences brain structures adversely as assayed by several criteria. Changes could not be fully reversed by rehabilitation programs. For example, a reduced cell number is not correctable at an older age. Corrected nutritional status does not repair defective myelinization if carried out past the age of active myelin formation.
Studies on functional competence of children who had earlier experienced malnutrition showed definite impairment of functional activity. Adverse environmental factors play a synergistic inhibitory role. Not only are IQ and learning ability adversely influenced, but damage is also reflected by an impaired social behavior pattern. Affected children tend to withdraw from their social group and inter-relate poorly with their peers.

The papers presented at the seminar are now being prepared for publication as a PAHO monograph.

As an example of the issues involved in studying behavioral sequelae of malnutrition, a brief outline of results obtained so far in a long-term INCAP study in Guatemala was presented. Food supplements are provided in two study villages, but not in two other study villages. A multidisciplinary project staff is supported by 100 subprofessional workers.

The following are preliminary findings in the study: Supplemental feeding during pregnancy increases the birth weight of babies. Food supplementation has a definite beneficial effect on the growth of preschool children. In all four villages, a medical-care program based on the use of nurse auxiliaries has resulted in a marked reduction in the death rate. The response of infants to novel stimuli has been studied, using heart rate deceleration as an index. While well-nourished infants initially show a significant fall in rate to a tone stimulus, malnourished infants do not. The differing responses of the two groups to a verbal stimulus is even more striking.

In discussion it was brought out that in certain tests of behavior, impaired growth correlated well with poor performance. In all instances, the social environment interacts with malnutrition to affect the functional outcome, but the degree of interaction differs with the nature of the test.

Some of the difficulties—moral and logistic—of doing controlled studies in nutrition research were discussed. The environment, biologically and socially, is inevitably altered in control as well as in test groups, and these changes also influence the results and must be the subject of intensified research.
The Committee recommended that continuing attention be given to the subject of malnutrition and mental development. Future research must be directed to the mechanisms by which functional consequences of malnutrition are produced. Special efforts should be made to engage the participation of scientists in laboratories concerned with basic aspects of nervous function. Much potential capacity exists which, if harnessed, could make an important contribution to this problem. Attention must also be focused on ways in which rehabilitation may be enhanced. In view of the importance of the subject, a fuller report of the work at INCAP should be presented at the next Committee meeting.

20. Conference on Research in Sanitary Engineering in Latin America

The progress of research and teaching in sanitary engineering in Latin America has been steady during the last five years. It started by taking advantage of the potential of universities to train professional and subprofessional personnel. Thus, the creation of PAHO’s Pan American Center of Sanitary Engineering and Environmental Sciences in Lima, Peru, which plays a major role in the development of the applied research possibilities at the universities, provides a further opportunity. The conference on research in sanitary engineering held in Lima, Peru, from August 31 to September 3, 1971, appraised research development carried out in universities, stressed the importance of research in the field, and concluded that research is an indispensable component of training. It also examined the impact of research on costs of sanitary engineering projects, how to derive funds for such activities, and ways to increase laboratory facilities.

The desirability that public health schools and physicians engage in the effort of furthering sanitary engineering research was discussed.

The Committee affirmed the desirability of furthering sanitary engineering research, education, and training. It recognized the central importance of sanitary engineering in public health and the degree to
which major illnesses affecting populations derive from the fact that well-established principles of sanitary engineering have not been applied. The great cost of such applications was recognized, and research on cost reduction and other factors affecting the application of sanitary engineering was noted as being of great importance.

21. **Next Meeting of the Committee**

The Committee agreed to include on the agenda of its next meeting, to be held at PAHO Headquarters in Washington, D.C., from June 25 to 29, 1973, a day-long symposium in two parts, the first, on the application of basic research to practical problems, and the second on general problems of the organization of medical research in Latin America, to be led by Profs. Soberón and Waterlow, respectively. In addition, there will be a half-day session on the use of medical auxiliaries, to be developed by Prof. Weller.
Pan American Health Organization

ELEVENTH MEETING OF THE
ADVISORY COMMITTEE ON MEDICAL RESEARCH

Headquarters Building
Conference Room B
Pan American Health Organization
525 Twenty-third Street, N.W.
Washington, D.C.
19-23 June 1972

AGENDA

Monday
19 June

9:00 a.m. 1. Opening of the meeting - Chairman: J.C. Waterlow

2. Introductory statement - A. Horwitz

9:15 3. Virus research facilities in Central and South America - W.J. Downs (20 mins.)

9:35 Discussion

10:05 4. Dental caries: an infectious disease - B. Cohen (20 mins.)

10:25 Coffee

10:40 Discussion


11:30 Discussion

12:30 p.m. Lunch

2:00 p.m. to 5:30 p.m. 6. Symposium on "Support of Biomedical Research in Developing Countries: Problems and Experiences" - Moderator: J.C. Waterlow (for details, see page 9)
Tuesday
20 June

8:45 a.m. to 5:30 p.m.

6. Symposium on "Epidemiological Studies and Clinical Trials in Chronic Diseases" - Moderator: R.Q. Marston (for agenda, see page 11)

Wednesday
21 June

8:45 a.m.

7. Research program of the Pan American Health Planning Center - D. Tejada and R. Vargas (20 mins.)

9:05

Discussion

9:30

8. Development of a multimedia learning resource in the PAHO Regional Library of Medicine - M.S. Ferguson (20 mins.)

9:50

Discussion

10:15

Coffee

10:30


10:50

Discussion

11:15

10. Research training program in clinical medicine - H. Torloni (15 mins.)

11:30

Discussion

11:50

11. Pan American Health University - R. Maciel (15 mins.)
12:05 p.m. Discussion

12:30 Lunch

12. Reports on current and future research projects and scientific meetings

2:00 12.1 Sporozoite-induced immunity in mammalian malaria - R. Nussenzweig (20 mins.)

2:20 Discussion

2:50 12.2 Field trial of Spherulin, a new diagnostic reagent in coccidioidomycosis - H.B. Levine (20 mins.)

3:10 Discussion

3:40 Coffee


4:15 Discussion

4:45 12.4 Recent developments on foot-and-mouth disease vaccines - M. Fernandes (20 mins.)

5:05 Discussion

Thursday 22 June

9:00 a.m. 12.5 Symposium on Shiga Dysentery - L.J. Mata and E.J. Gangarosa (20 mins.)

9:20 Discussion
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<tr>
<td>9:40 a.m.</td>
<td>12.6 Workshop-Symposium on Venezuelan Encephalitis Virus - T. Work (20 mins.)</td>
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<td>10:00</td>
<td>Discussion</td>
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<td>10:20</td>
<td>12.7 Pan American Symposium on Paracoccidioidomycosis - L. Ajello and H.B. Levine (20 mins.)</td>
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<td>11:15</td>
<td>12.8 Seminar on Malnutrition in Early Life and Subsequent Mental Development - H.G. Birch (20 mins.)</td>
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<td>Discussion</td>
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<td>12.9 Second Meeting of the Scientific Advisory Committee on Dengue - P. Russell (20 mins.)</td>
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<td>2:00</td>
<td>12.10 Conference on Research in Sanitary Engineering in Latin America - E. Elmore (20 mins.)</td>
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<td>13. Selection of topic for the special session of the Twelfth PAHO/ACMR Meeting</td>
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<td>3:15</td>
<td>14. Other matters</td>
</tr>
<tr>
<td></td>
<td>Coffee</td>
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Friday
23 June

10:00 a.m.  15. Committee recommendations

12:00 noon  16. Closure of the meeting
PAHO ADVISORY COMMITTEE ON MEDICAL RESEARCH

Dr. Hernan Alessandri
Ex Decano, Facultad de Medicina
Universidad de Chile
Santiago, Chile

Dr. Herbert G. Birch
Professor, Department of Pediatrics
Albert Einstein College of Medicine
Yeshiva University
Bronx, New York, USA

Dr. G. Malcolm Brown
President, Medical Research Council
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Diretor, Instituto de Biofísica
Universidade Federal do Rio de Janeiro
Rio de Janeiro, Gb, Brasil

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Universidad de Buenos Aires
Buenos Aires, Argentina

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Secretary
Dr. M. Martins da Silva
Chief, Department of Research Development and Coordination
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Washington, D.C., USA

*Unable to attend
### PAHO Consultants

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ELEVENTH MEETING OF THE
ADVISORY COMMITTEE ON MEDICAL RESEARCH

Headquarters Building
Conference Room B
Pan American Health Organization
525 Twenty-third Street, N.W.
Washington, D.C.

19-23 June 1972

SYMPOSIUM

SUPPORT OF BIOMEDICAL RESEARCH
IN DEVELOPING COUNTRIES:
PROBLEMS AND EXPERIENCES

Moderator: John C. Waterlow

Monday
19 June

2:00 p.m. to 5:30 p.m.

The purpose of the symposium is to provide an opportunity to granting agencies to exchange information about the principles on which they have supported biomedical research in developing countries, and to speak frankly on the success or failure of their efforts.

Participants will be called in the following order:

1. R.Q. Marston
2. S.G. Owens
3. O. Mellander
4. V.C. Scott
5. P.O. Williams
6. A. von Muralt
7. R.R. Taylor
SYMPOSIUM

SUPPORT OF BIOMEDICAL RESEARCH
IN DEVELOPING COUNTRIES:
PROBLEMS AND EXPERIENCES

Participants

Dr. B.E.C. Hopwood
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London, England

U.S. Army Medical Research
and Development Command
Washington, D.C., USA

Dr. Robert Q. Marston
National Institutes of Health
Bethesda, Maryland, USA

Dr. Alexander von Muralt*
Nestlé Foundation for the Study
of Nutritional Problems in
the World
Lausanne, Switzerland

Prof. Olof Mellander
Swedish International
Developing Authority
Stockholm, Sweden

Dr. John C. Waterlow (Moderator)
Department of Human Nutrition
London School of Hygiene and
Tropical Medicine
London, England

Dr. Samuel G. Owens
Medical Research Council
London, England

Dr. Peter O. Williams
The Wellcome Trust
London, England

Dr. Virgil C. Scott
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Dr. M. Martins da Silva (Secretary)
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*Unable to attend
Pan American Health Organization

ELEVENTH MEETING OF THE
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19-23 June 1972

SYMPOSIUM

EPIDEMIOLOGICAL STUDIES AND CLINICAL TRIALS
IN CHRONIC DISEASES

Moderator: Robert Q. Marston

Tuesday
20 June

9:00 a.m. Introductory remarks - Robert Q. Marston (15 mins.)

9:15 1. Panel on Arteriosclerotic and Hypertensive Cardiovascular Disease

Chairman: D.S. Fredrickson

Discussants

a) E.D. Freis  b) D.D. Reid

c) F. Rojas-Villegas

10:45 Coffee
11:00  2. Panel on Diabetes

Chairman:  M. Miller

Discussants
a)  P.H. Bennett  b)  J.K. Davidson
   c)  C.R. Klimt  d)  D.D. Reid

12:30 p.m.  Lunch

1:45 p.m.  3. Panel on Chronic Parasitic Diseases

Chairman:  A. Prata

Discussants
a)  F.S. Barbosa  b)  H. Garcia-Barrios
   c)  F.C. Goble  d)  F.C. von Lichtenberg

3:15  Coffee

3:30  4. Panel on Cirrhosis of the Liver

Chairman:  H. Popper

Discussants
a)  J.T. Galambos  b)  C.M. Leevy
   c)  J.W. Mosley  d)  W.H.J. Summerskill
   e)  G. Ugarte  f)  H.J. Zimmerman

5:00  Summary discussion by Panel Chairmen (30 mins.)
SYMPOSIUM

EPIDEMIOLOGICAL STUDIES AND CLINICAL TRIALS
IN CHRONIC DISEASES

Participants

Dr. Federico Simões Barbosa  
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National Institutes of Health  
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Dr. Hyman J. Zimmerman  
Medical Service  
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