



directing council

PAN AMERICAN
HEALTH
ORGANIZATION

XV Meeting

regional committee

WORLD
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XVI Meeting



Mexico, D.F.
August-September 1964

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RESEARCH POLICY AND PROGRAM OF THE PAN AMERICAN HEALTH ORGANIZATION

Pursuant to Resolution XXVI of the XVI Pan American Sanitary Conference, which requests the Director "to submit annual reports to the Directing Council", this report on the Bureau's research activities during the past year is presented.

However, since this report was prepared before the Third Meeting of the Advisory Committee on Medical Research (15-19 June 1964), an addendum containing the observations and recommendations of that distinguished group of scientists and educators, which provides advisory guidance in the development of the Organization's research program, will be forwarded to the Governments at a later date.

It will be recalled that, after a period of two years of planned development under a grant from the USPHS/NIH, the Office of Research Coordination was incorporated as from January 1964 in the regular activities of the Bureau.

The Office, with the assistance of 141 consultants and advisers and 41 staff members of PAHO and WHO, had reviewed and appraised the needs and opportunities for research in environmental health, dental health, maternal and child health, congenital malformations, nutrition, endemic goiter, Chagas' disease, malaria, schistosomiasis, leprosy, plague, cancer, respiratory virus diseases, arbovirus diseases, tuberculosis, zoonoses, mental health, radiation and isotopes, health economics, medical care, scientific communications, and research training.

By January 1964, an analysis of the 45 currently active research projects directly fostered by PAHO showed that the cost of 17 projects totaled \$1,239,000 while 3 projects whose estimated cost was \$2,425,000 were under active consideration by grant-awarding agencies. Including continuation grants obtained during 1962, the total research funds available during 1963 were approximately \$2,377,000.

As the program has grown and as an increasing number of institutions have become involved, the demands on the Organization have increased. For example, the Services and Supply Section of the Bureau is meeting an

increasing volume of requests from Governments for the purchase of equipment and supplies for research and research training laboratories, and is thus expediting their activities. Likewise, the unique resources of the Organization are being used to assist universities and research institutions of the United States of America and other Governments to work out cooperative programs. Programs of this type facilitate exchange of personnel and equipment and foster a true partnership in research and the research training of graduates.

In the field of standardized biological reagents and drugs, for research purposes, the Communicable Disease Branch, which acts as a clearing house, provides technical advisory services and guidance and, when requested to do so, makes all possible arrangements for the supply of such materials to qualified laboratories of Governments. Potential sources of supply are the laboratories of Governments, in particular the USPHS Communicable Disease Center, the National Institutes of Health, and certain U.S. State Public Health Laboratories.

The social and economic development of Latin America of which progress in health is an integral part presents research workers with a whole gamut of problems whose solution may well call for decades of sustained effort. Their solution involves several different categories of investigations and applied research.

First, the collection, analysis, and dissemination of accurate vital and health statistics. Although as a result of the training and investigation programs that PAHO is carrying out in cooperation with the Governments, progress is being made in establishing needed institutional processes, more skilled biostatisticians are needed. In addition, many training schools for the health professions still do not include among their faculty a professor of statistics who, moreover, is capable of conducting field research that provides undergraduate and graduate students with training opportunities as a by-product. Lack of accurate statistical information impedes planning for health and the implementation of health plans, and may result in scarce resources being inefficiently used.

Second is the problem of the analysis of health care systems including hospitals, on a continuing basis, sometimes called "evaluation", "administrative research", and "operational research". This type of research calls into play a wide range of statistical and mathematical methods and models, from the very simple to the highly complex. Here again accurate measurement and statistical records are essential. Statistical record librarians and clerks are needed in large numbers.

The analysis and improvement of existing and expanding systems of health care, however, must be linked with the coordination and integration of the several health care systems in each country. Only by an

exchange of information and its evaluation can investigation evolve and lead to the attainment of a fully coordinated, perhaps even unified, system of medical care that includes the private sector.

Third, however important the analysis of existing health care programs may be for the improvement and coordination of such services, it is only a step towards the solution of the problem of reaching the great mass of people in rural areas. Progress in this field is being made in some countries through imaginative studies in community development. Investigation of attitudes, community based studies of health conditions, and methods of inducing the people to concern themselves with their own welfare, are the key to community development.

The new PAHO Program of Rural Sanitation and Well-being centering around the establishment of water supply systems through the cooperative efforts of the people and their governments, is a prime example of the coordination of community development and national development. The social sciences have a key role to play both in research and application of research findings in such a program, as in any program, in preparing the ground for acceptance of change and modernization.

Fourth. There is a growing conviction in Latin America that health progress, or the lack of it, depends on overall national development, which in turn is influenced by population dynamics. All the health-related ramifications of this phenomenon must be investigated from the countryside to the city, differential birth rates by geographic areas and ethnic groups, economic and social conditions, and the environmental determinants of health generally. Some of these problems will be studied and analyzed in the PAHO/Milbank/Colombia study of Health Manpower and Medical Education against the background of the social and economic development of that country. Other aspects, including not least the role of auxiliary and ancillary health personnel in health programs, will also be examined in Colombia as well as in other countries that may undertake similar studies. There is a great need for biosocial-epidemiological-demographic studies to elucidate more of the facets of complex inter-relationships and problems confronting aggregates of people planning for and working towards rapid socioeconomic development. Poverty is to be found everywhere in the world, but a research attack on the socioeconomic determinants of illness and lack of well-being is needed. The Advisory Committee on Medical Research (ACMR) is expected to have some recommendations in this regard which will be included in the addendum to this report.

As will have been gathered from this description of the four categories of need for increased biosocial studies, they do not call for the application of new techniques and methods. The research techniques and methods to be applied in dealing with the problems outlined above are tried and tested ones. International cooperation in the research approach is available and can within the limits of budgetary resources be provided through the resources of the PAHO by specialist consultants.

With respect to biomedical research per se, the bulk of the present research program of the Organization, as reported last year, is concerned with "certain communicable and other diseases and malnutrition, about which knowledge to bring about their control is deficient or non-existent," and "with biostatistical problems." What is now felt to be needed in order to achieve a well-balanced research program, is an acceleration and expansion of studies of the environmental determinants that prevent well-being and cause ill health.

Finally, in all of this undertaking it is felt important to improve and expand scientific communications and institutional resources for research and research training within and among Governments (international as well as national centers). The Task Force on Health at the Ministerial Level declared in 1963 that, "...it is important that research in the biomedical, bioengineering and biosocial fields be closely coordinated with the operational and information requirements of health services, health planning agencies, and the institutions engaged in the education and training of health personnel." It added, that "Research is needed to develop better methods of acquiring the necessary health information data, its processing, analysis, and use in the administration of all pertinent programs."

On the matter of research resources (personnel, facilities, and finance) the XVI Pan American Sanitary Conference in Resolution XXVI noted, among other things, that "...the Governments through their national research councils or other appropriate bodies are recommended to assess national biomedical and public health research resources." Some countries have completed or are currently conducting such assessments, but many have yet to undertake them. This information is essential to health progress within the framework of balanced national development and will be made available on a regional basis as it becomes possible to assemble sufficient data.

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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-3/8

**PAN AMERICAN HEALTH
ORGANIZATION**

**ADVISORY COMMITTEE
ON MEDICAL RESEARCH**

THIRD MEETING

**15-19 JUNE 1964
WASHINGTON, D.C.**

REPORT TO THE DIRECTOR

Ref: RES 3/8

19 June 1964

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

1964

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PAHO ADVISORY COMMITTEE ON MEDICAL RESEARCH

Report to the Director

1964

Dr. Abraham Horwitz, Director of the Pan American Sanitary Bureau, opened the meeting and spoke of the sense of urgency which pervades all efforts towards economic growth and social development in Latin America. Under these conditions it is not simple to transfer knowledge from the laboratory to the people. He expressed the gratitude of the Pan American Health Organization to the National Institutes of Health/USPHS for the planning grant that enabled PAHO to establish its Office of Research Coordination and to expand its research activities. The research policy of PAHO has been approved by the Governing Bodies of the Organization. The program now consists of approximately 45 projects involving the participation of scientists and institutions over the entire Hemisphere. An essential problem is the task of applying medical knowledge in the socio-economic settings of the various communities.

A special session of the present meeting devotes itself to a discussion of Environmental Determinants of Community Well-Being. Studies of this complex problem are urgent and of particular relevance to the Latin American community with its broad cultural spectrum and with the rapid changes to which it is subjected. The study of the growth of human populations is gathering increasing momentum throughout the world. An exploration of the problems concerned could be initiated in terms of epidemiological and demographic investigations.

The Committee was presented with a brief analysis of the research projects currently fostered by PAHO. The solution of the problems posed in these projects may call for decades of sustained effort, involving several different categories of research. These include: (1) health statistics and the development of methodology for their collection and analysis; (2) operational studies aimed at improvement of existing and expanding systems of health care; (3) studies of community development as exemplified by the PAHO Program of Rural Sanitation and Welfare; (4) studies of manpower needs of medical and health personnel at all levels against the background of social and economic development and of population dynamics; (5) biomedical laboratory research; (6) scientific communications; and (7) the expansion of institutional resources for research and research training. On this last point, the XVI Pan American Sanitary Conference in 1962 stated "the Governments through their national research councils or other appropriate bodies are recommended to assess national biomedical and public health research resources" (Resolution XXVI). Some countries have completed or are currently conducting such assessments, but many have yet to undertake them. The information will be essential to health progress within the framework of a balanced national development.

Research Activities of PAHO*

The Committee, in its review of the research activities of PAHO in selected fields, returned to a previous discussion of the common distinction between "fundamental" and "applied" research which had been

* RES 3/3, 15 May 1964, and RES 3/3, Annexes, 29 May 1964.

summarized as follows in its first report (RES 1/19, 1962): "All genuine good quality research is fundamental if it contributes to the more complete understanding of the multi-faceted aspects of complex problems. This is particularly so when dealing with man, who is the central object of its (the Committee's) concern. Fundamental science is not distinguished by the use of mathematical, physical or chemical methods per se, but rather by the relevance of the research to an intellectually and practically satisfactory solution of the problem at hand."

In spite of agreement among scientists that there is no controversy in this respect, and that science and the application of science constitute a single balanced effort, the problem of basic versus applied research has to be dealt with because it continues to exist in the minds of many people who are in a position to influence research development.

Scientists engaged in basic research are sometimes accused of overlooking their social responsibilities because the results of their research may have no immediate value for the solution of a recognized practical problem. It is therefore often difficult to obtain local support for fundamental scientific projects in Latin America. It should be emphasized, however, that a reservoir of good basic scientific talent is needed in a country in order to place all types of research on an advanced level.

Training in basic research fosters qualified competent men and its neglect would constitute a backward step into mediocrity. On the other hand, some basic problems may be better dealt with elsewhere and

care should be taken that studies of currently important medical problems obtain support. Many of these studies can be done well using simple means and it should be recognized that they are worth doing.

It was pointed out that certain research objectives do not require the use of expensive apparatus or complex biophysical or biochemical procedures. Much epidemiological research is of this kind though demanding considerable sophistication in other directions. Where technical laboratory developments are lacking, epidemiological research can lead to important advances in knowledge as well as to the development of the intellectual discipline essential to all kinds of research.

Thus, both so-called "fundamental" and "applied" aspects of biomedical science remain essential parts of the research process directed toward the acquisition of new knowledge. The important policy problem for PAHO is to maintain a balanced emphasis in these respects.

Environmental Health

The Committee welcomed the emerging success of the development of university institutes closely allied with governmental agencies. This situation reflects the PAHO policy in general, as well as the persistence of effort of its consultants. Emphasis, for the time being, is wisely being placed upon providing better teaching facilities and opportunities for investigation and development.

Research, by whatever definition, is still minimal. It is true that traditional technology is quite ample for immediate application to

South American problems, but it is equally true that this situation should not blind one to wide opportunities for innovation and for imaginative adaptations to the local and sometimes peculiar problems.

Emphasis should be placed on meeting the community water requirements of South and Central America. They demand the creation of the socio-political institutions and the fiscal machinery required for their implementation. These efforts should not be diluted by diverting too much attention to some emerging problems that may be discernible in North America, such as the potentialities of chemical synthetics, viruses, etc. in the production of diseases through water contamination.

The first responsibility of PAHO in this field is to get ample quantities of water to millions of people now deprived of it. This responsibility is likely to retain first priority for many years to come.

Dental Public Health

The Committee considered the studies on salt fluoridation that are being done in Colombia and recommended that research be continued. The Committee was of the opinion that the training of research workers in this field must be strengthened and recommended the establishment in São Paulo of a Latin American Center for Dental Research and Epidemiology. Such a Center will stimulate the participation of the Latin American dental profession in dental research.

Radiation and Isotopes

The Committee noted the unexpected high frequency of chromosomal aberrations found in Guarapari, Brazil. If confirmed, these findings will be of very great interest. Further studies are in progress, including observations on plants and small animals from this region.

Some of the other projects listed in the report have not yet begun. A pilot project has been set up in Chile for the study of copper metabolism. Interest was expressed in following up the observation of radiation-induced impairment of the central nervous system of donkeys. The Committee received favorably the idea that a Radiobiology Training Center be set up in Latin America to serve as a focus for research and to provide a continuing program of formal training on the effects of radiation on biological systems. A center of this type might also deal with problems of radiobiology technology that are important for Latin America, such as food preservation by radiation.

Congenital Malformations

Interest was expressed in the actions being taken by PAHO to implement Resolution XIV of the XVI Pan American Sanitary Conference in 1962 concerning the reporting of congenital defects and current tabulation and analysis of collected data. The Organization should continue to serve in a coordinating role to ensure as far as possible the development of comparable procedures. To improve the quality of the recording of congenital malformations it is advisable to initiate medical reports of births completed on discharge of the infants such as will be

tried out in New York City. The complexity of the task, especially in the completion of comparable examinations of newborns when these are done in different hospitals, makes it desirable to take advantage of the experience gained in the collaborative study of around 50,000 births by the National Institute of Neurological Diseases and Blindness, NIH/USPHS.

It is important to study the frequency of malformations in several areas. These should include an area with nutritional deprivation and an area of high altitude.

Inter-American Investigation of Mortality

The Committee was pleased with the progress of this project. Thirty five thousand completed questionnaires have been received from the 12 cities in the study. The work of the medical referees is approximately 50 per cent complete and about one-third of the data have been processed. Because of unavoidable delays, the total material will not be finally tabulated until 1965.

Two subjects were treated in the report to exemplify the kinds of results that are emerging from the analysis of the data. The Committee noted in particular striking variations of data having a high degree of validity of diagnosis in the mortality between cities from cancer affecting different levels of the digestive tract. The excessive mortality among young adults from cardiac disorders in Ribeirão Preto, Brazil, compared with the United States is also clearly evident in the

material presented. This excess would seem to be due to a chronic cardiopathy associated with long-standing infection with T. cruzi.

The Committee further noted that, in a high proportion of deaths coming to autopsy, the postmortem findings necessitated changes in assignment of causes of death, and that many of these changes are of a major nature. It is obvious that, in order to provide a firm basis for detailed epidemiological research, there is need for reliable data to supplement official statistics based on death certification.

Mental Health Information Center on Latin America

The Committee took cognizance of the continuing work at this Center in assessing mental health resources in Latin America and in collecting basic information. It recommended that, in addition to the current program, an epidemiological survey be undertaken on mental disorders in Latin America. It is understood that a seminar on the epidemiology of mental disease is planned for 1965, in cooperation with the World Health Organization.

WHO Reference Serum Bank for the Americas

The Committee noted a report on progress in the planning and execution of a nation-wide serological survey in Brazil, based on a sample of military recruits comparable to that carried out in the U.S.A. in 1962. The pilot stage of the survey is completed and the main study will be executed in July 1964. Approximately 3,500 sera are to be collected.

While the Committee recognized that this kind of survey could be criticized on epidemiological and biostatistical grounds, it was believed that it would yield useful information regarding the distribution of selected diseases which might then be elaborated by more specifically oriented studies.

The Committee pointed out the potential usefulness of the facilities of the Bank for the long-term storage of sera collected in genetic and other studies mentioned in this meeting.

PAHO Schistosomiasis Snail Identification Center for the Americas*

The Committee noted with satisfaction the designation of this Center and considered it to be an essential step in attempts to find a solution to this most important health problem. It congratulated the Center on the remarkable accomplishments attained in less than one year, in particular the preparation of a snail identification manual which will help greatly in elucidating epidemiological problems in Latin America.

The Committee also noted the substantial progress in achieving coordination of research activities in this field. It strongly recommended support of this program.

Endemic Goiter

The Committee felt that the work of the consultants in this field could serve as an example of how significant problems can be identified,

* RES 3/3, Annexes, 29 May 1964, pp. 20-22.

interested workers brought together and stimulated, and collaborative studies undertaken.*

The results thus far reported once more show the central role played by iodine deficiency in the production of goiter, and again suggest that other subsidiary factors may enter into play. Studies of the genetic component of goiter do not seem to have so far yielded results of major importance to the understanding of the disease. Further research in this area is indicated. Future studies should continue to explore the relationship between endemic goiter and thyroid carcinoma, since conflicting results have been obtained by two Latin American workers. The extent of the damage due to endemic goiter upon the activity and achievement of population groups was discussed. Basic research on the importance of thyroid hormone for the activities of the central nervous system might receive more support.

The question of why so few countries have succeeded in implementing the simple policy of providing iodized salt should be investigated. The excellent results obtained with this procedure in Guatemala since 1960 are notable.

Anemia of Pregnancy

It has been shown that in Trinidad iron deficiency anemia is by far the most frequent type of anemia of pregnancy.** Since there is much indirect evidence that the same is the case in many other areas of Latin America, and in view of the ease with which this condition can be

*RES 3/3, Annexes, 29 May 1964, pp. 1-11.

**RES 3/3, Annexes, 29 May 1964, pp. 12-19.

treated, the Committee advised that research in this field be extended to other countries in the region.

The Committee discussed the possibility of studying iron balance in primitive populations, since the problem of iron deficiency in man in the context of his evolution and dietary customs is not well understood. Studies of the possible occurrence of iron deficiencies in wild and domestic animals might also be revealing.

The Committee also recommended that research be undertaken into the practicability of adding iron to table salt.

Institute of Nutrition of Central America and Panama

The INCAP occupies a unique place not only in Latin America but indeed in the world among scientific institutions devoted to the study of nutritional problems. Its range of activities encompasses the technology for the production of food from materials which are locally available at low cost; the fundamental nutritional requirements of man; new clinical and laboratory techniques for the detection of nutritional deficiencies; and the effects of such deficiencies, both overt and sub-clinical, on the development and maintenance of physical as well as mental characteristics. In brief, INCAP constitutes the one institution in the world where all aspects of nutrition are being studied simultaneously in an integrated manner.

The holistic approach of INCAP is of particular importance in Latin America because, at the present stage in the history of this continent, the technological aspects of the production and utilization of foodstuffs cannot be dissociated from the economic aspects. Moreover, the medical aspects of nutrition are profoundly conditioned by social influences.

INCAP has been consistently productive of new knowledge and practical techniques in the medical, technological, and social aspects of nutrition; it represents at its best the concept of a center of excellence applied to a field of great theoretical and practical importance. Finally, it constitutes a teaching center in which the most advanced methods of science are applied to the immediate problems of health and of national economies.

The Committee noted with regret that certain important parts of the INCAP program had already been discontinued and expressed the hope that means could be found for their reestablishment.

In the judgement of the PAHO/ACMR any limitation or curtailing of the scientific activities of INCAP would be a tragic setback for the application of science to the prosperity of Latin America and for the health of its people.

Pan American Foot-and-Mouth Disease Center

The Committee was greatly impressed by the large amount of important work already done by this Center. There is no doubt that

this is one of the world's best organized and most competent laboratories in this field. Apart from isolating and identifying new subtypes of the viruses that occur in Latin America, and from making valuable contributions to the production and testing of inactivated vaccines, the Center has succeeded in developing three strains of modified virus that have been demonstrated to be of great value in the preparation of highly protective live vaccines. Experiments have shown that good immunity is obtained by applying two virus types as a bivalent vaccine. The application of a trivalent vaccine is under study. Good advances have been made in the application of tissue culture techniques in the production of these vaccines, and vaccination projects are under way in various Latin American countries.

Other parts of the program of the Center concern epizootiological surveys, studies of the duration of vaccination protection, and interferon studies. Considering not only the fact that conservative estimates indicate that Latin America suffers a yearly loss of 500 million dollars due to foot-and-mouth disease, but also the outstanding work that the Center is consistently conducting, and the great importance of its role in the future, the Committee strongly recommended that PAHO give highest priority in its support of this Center.

Pan American Zoonoses Center

The Committee noted with satisfaction that the work of the Center has been concentrated on a few important subjects, in contrast to the somewhat diffuse program commented upon last year. The choice of subjects

was approved and the activities reported revealed satisfactory progress.

The Committee especially endorsed the extension of activities in rabies and rabies vaccine, and noted with commendation the plans for the coming year to further develop this area with strengthened staff.

The Committee believes that an increase in the support of the Center is necessary in order to extend its usefulness to the countries of Latin America and its activities into other fields, especially food hygiene. The Committee lent its full support to the efforts now being made to find additional resources for the Center.

Malaria

The Committee discussed the informative report on the field work in malaria performed by PAHO in collaboration with the governments of Latin America. The report discloses the following significant and even disconcerting phases:

A number of pockets of malaria persists, particularly in some Central American countries. Although the number of cases are relatively small, these pockets will delay eradication of the disease.

Morbidity in these pockets has remained almost static for some years.

In the areas discussed in the report, the resistance of mosquitoes to the usual insecticides, such as D.D.T., has

necessitated elaborate screening of new compounds - aiming at the development of cheap insecticides active against resistant forms.

Difficulties have been experienced with residual spraying of houses built of materials not easily susceptible to spray efficiency.

Because of these unexpected adverse developments, eradication will undoubtedly be delayed beyond earlier expectations. In the meantime, the disease eradication procedures need the addition of more old-fashioned ecological and chemical control methods of the mosquito species. A revival of interest in larvicides thus has appeared. Perhaps there is no escape, in some areas at least, from the effort at total environmental control via the old principle of "building out" the offensive species.

All of these observations point up the desirability of pursuing diligently the objectives indicated in the report, carefully coordinating the activities with those of other national and international groups engaged in similar studies.

The Committee gave attention to the work of the Screening Center for Drug-Resistant Malaria Parasites in Ribeirão Preto, Brazil. Resistant strains of P. falciparum have been recognized in increasing number from four areas of Brazil, from two in Colombia, from Venezuela, and possibly from the Brazil-Bolivia border, as well as from British Guiana where they were possibly carried by population movements. As the total number of

new cases of malaria has declined markedly in the areas where active spraying campaigns are going on, the situation does not appear insuperable. There is further encouragement in the observation that cases previously resistant to both chloroquine and pyrimethamine do respond to a combination of pyrimethamine and sulfadiazine. With respect to the Brazilian studies of malaria spread by mosquitoes breeding within bromeliads, the Committee expressed caution in attempting control by airplane spraying with calcium arsenite.

In view of the above discussion the Committee strongly urged further research especially in those areas where transmission has not been stopped even by well-conducted programs.

Aedes aegypti

From the investigation conducted in Jamaica, which has demonstrated that all the strains of Aedes aegypti collected in the Caribbean region are resistant to DDT and dieldrin, it is evident that this region is potentially at risk of having epidemics of yellow fever and dengue.

Deuterated DDT has given very promising practical results in preliminary studies which may have basic significance and should be further investigated. The Committee reiterated its opinion that a study in depth of the ecology of the mosquito is urgently needed.

Chemotherapy of Chagas' Disease

The Committee heard with interest an account of the round table meeting of the Chagas' Chemotherapy Research Group which PAHO organized in conjunction with the VII International Congresses of Tropical Medicine and Malaria in Rio de Janeiro, September 1963.*

Particular interest was expressed in the findings that point, for the first time, to the possibility of effecting a radical cure of the disease by prolonged intensive chemotherapy. Further research in this area should receive full support.

With relevance to the chemotherapeutic approach, further studies of antigenic differences and differences in virulence and drug resistance among various strains of T. cruzi as well as of other immunological aspects of the disease should be pursued.

The Committee was of the opinion that another meeting of the group concerned with chemotherapeutic trials should be organized to meet at the time of the International Congress of Parasitology in Santiago, Chile, in 1965.

Epidemic Typhus

Studies in Ethiopia and surrounding areas, with confirmation of laboratory results by the Rocky Mountain Laboratory staff, have demonstrated the existence of the rickettsias of epidemic typhus in certain domestic animals and their ticks. So far, very preliminary studies in

*RES 3/3, Annexes, 29 May 1964, pp. 23-29.

the Department of Puno, Peru, of only one hundred serum specimens from sheep and 9 from burros have failed to reveal evidence of typhus infection in these animals. During 1964 a more extensive study will be carried out in Peru by staff of the Rocky Mountain Laboratory under joint PAHO and Peruvian auspices to include the collection of ectoparasites and blood samples from humans and a wider variety of animals.

The Committee strongly supported these efforts since confirmation in other areas where typhus is endemic of the observations made in Ethiopia might bring about a profound change in our concept of the epidemiology of this disease.

Plague

The Committee noted with pleasure evidence of renewed interest in the development of research on the ecology and epidemiology of plague as formulated two years ago by Drs. K.F. Meyer and R. Pollitzer. It was pleased to note that the proposed study of plague in Peru involving the Peruvian authorities and the Walter Reed Army Institute of Research might be funded through the U.S. Army Medical Research and Development Command. Similarly, it noted the suggestion by the Peruvian authorities that the study might be expanded to include Chagas' disease, leishmaniasis, leptospirosis and bartonellosis.

The Committee expressed satisfaction with the impending publication of "Plague in the Americas" (RES 2/12) prepared for the Second PAHO/ACMR.

Arbovirus Diseases

The Committee noted the reports of the two meetings held in Rio de Janeiro, in September 1963 on "Arbovirus Problems in the Large River Basins of Equatorial South America" and on "Recent Arbovirus Epidemics in the Americas and Information Exchange Activities."* One hundred eleven participants from 18 countries attended. There is no doubt that the meetings served as a significant stimulus to future cooperative and individual research on arbovirus diseases and showed how PAHO might assist in developing work in this important field. A considerable amount of valuable data, particularly on recent epidemics, is contained in the reports. The Committee noted with approval that dissemination of information regarding epidemics and the prevalence of A. aegypti in the Americas had already been started in the PAHO Weekly Epidemiological Report.

During discussion of the program for the establishment of reference centers, the Committee was informed that WHO had approached Yale University with a view to establishing at the University the World Reference Center for the Arboviruses when the Rockefeller Foundation Virus Laboratory moves there from New York early in 1965. Negotiations are in progress.

With respect to the regional centers it has been agreed that the laboratory at the Adolfo Lutz Institute in São Paulo, Brazil, should collaborate with the Regional Reference Center at the Communicable Disease Center in Atlanta, Georgia, although formal designation has not yet been made. The Committee recommended that this designation be expedited.

* RES 63.1, 15 October 1963.

Respiratory Virus Diseases*

Latin America continues devoid of any significant program of research in respiratory virus diseases although there is much interest in the field and many problems in the clinical, epidemiological, and laboratory aspects await resolution. In clinical diagnosis there is the question of terminology, the practices of which differ widely in different countries. Knowledge and experience of modern laboratory techniques is lacking and there is urgent need for training. It is believed that this would best be done by sending experienced scientists from the U.S.A. and elsewhere to work in Latin American laboratories for periods up to two years, sending abroad for training only select key individuals. Once the laboratory procedures have been established, the visiting scientists might conduct training courses for virologists from other laboratories in the country and from neighboring countries. The problem of obtaining technicians is not easy to solve. It was recommended that, as in most countries in the world, the best solution is for the professional staff of a laboratory to initiate training programs for their own technicians. In this way, completely inexperienced workers can be trained to perform specific techniques quite quickly. It will, of course, be essential to supply specific virus strains and sera in order to initiate research in this field. The need for a technical laboratory manual in Spanish was recognized. A modified and translated version of the training manual at the professional and technical level prepared at Yale University might serve this purpose.

*RES 63.2, 5 November 1963.

While there is no doubt that respiratory virus diseases are important in Latin America, as they are everywhere in the world, there are very few data regarding the extent of the problem or the types of viruses prevalent from time to time in different countries. This must be determined if advantage is to be taken of the preventive measures (vaccination) now under development. It was, therefore, suggested that initially, research should be directed to epidemiological studies of the nature and distribution of respiratory virus infections, and that steps be taken towards improving the notification of respiratory diseases.

Leprosy

In September 1963, a Work Conference on the Serology of Leprosy was held in Rio de Janeiro.* The enthusiasm with which much neglected serological problems of leprosy were now being studied was noteworthy. The Committee was particularly interested in the search for methods for identifying asymptomatic carriers of the organism, that might explain why the majority of leprosy cases arise without apparent contact with previous cases. Further work on this disease, and particularly on its immunological aspects, deserve full support.

The Committee noted that a seminar on the control of leprosy in Latin America had taken place in Cuernavaca, Mexico, and that PAHO had undertaken a study of administrative methods employed in leprosy control programs.

* RES 63.3, 27 November 1963.

Tuberculosis

At last year's meeting an international panel of consultants joined with the Committee in a day-long analysis of the present status of our knowledge of tuberculosis. From this scrutiny emerged several major conclusions which the Committee reaffirms today:

The body of scientific knowledge concerning tuberculosis chemotherapy, tuberculosis vaccination, and tuberculosis and nutrition, is sufficiently complete to permit reasonably accurate prediction of the influence of any one of these factors, introduced alone and in the carefully managed circumstances of a clinical experiment. What is not so predictable is the influence of these factors on each other and, above all, what would be their net influence on tuberculosis in its natural habitat in a human population subsisting at various levels of socio-economic development.

Tuberculosis research is, therefore, needed but the major questions now requiring study are not of a kind that can be settled definitively in the laboratory. Instead they are of a kind that would require large-scale field studies with appropriate laboratory support.

Latin America represents a specially suitable locale for such studies because, unlike other areas in most of the world, communities with a high tuberculosis prevalence, and well organized laboratories for the meticulous observations so important to proper field studies, exist in juxtaposition. Moreover, in Latin America there are both a willingness to attack the problem and reasonable prospects of local financial support to aid in its study.

Illustrations of the kinds of research needed are listed in the 1963 Report of the PAHO/ACMR to the Director.* Among these, high priority should be given to carefully designed prospective field studies on such questions as: to what extent qualitative deficiencies of diet impair the overall effectiveness of tuberculosis vaccination; final demonstration of the accuracy of laboratory assays of the immunizing effectiveness of BCG by assay on human populations exposed to infection; to what extent a high prevalence of tuberculous disease in slum areas is principally a consequence of conditions that favor transmission of the microbe, i.e., the household environment, rather than factors having to do with the host; to what extent chemoprophylaxis of tuberculosis disease can be successfully employed without consistent alteration of either the diet or the household environment; whether the isoniazid resistant tubercle bacilli, inevitable in any isoniazid therapy program, would neutralize the transmission "block" provided by drug-induced reversal of the infectiousness of large numbers of diseased persons in the community.

Studies of such questions obviously require the expertise of epidemiologists, biometricians, economists, behavioral scientists and operations analysis experts as well as laboratories for meticulous microbiologic studies and investigation thoroughly acquainted with the behavior of tuberculous infection and tuberculous disease in humans.

For the above reasons, the PAHO Advisory Committee on Medical Research is deeply convinced that the time is here to mount a major research attack, of the sort briefly sketched out above, on the

* RES 2/33, 21 June 1963.

remaining key questions in tuberculosis - the questions whose answers would provide the proper scientific base on which to build rational and economically feasible programs of tuberculosis control. The Committee is further convinced that nowhere can such a research program be conducted more satisfactorily than in Latin America and it strongly urges PAHO to serve as the initiator and catalyst of such studies.

Research Training and Medical Education

The Committee noted with satisfaction that the proposal to create regional research training centers as discussed in previous meetings is soon to be implemented. It agreed that emphasis in the following fields is appropriate and timely: biosocial studies including demographic and epidemiological aspects of population dynamics; preventive medicine and community health; microbiology, virology, parasitology and medical entomology, and pathology. These efforts together with the PAHO project for strengthening the training of medical school faculties are the corner stones for the continuing development of research manpower in health in Latin America.

The Committee expressed approval of the steps taken by PAHO to assist countries in the study of their health manpower needs in relation to socio-economic health problems and to medical education programs. It praised PAHO and the Milbank Memorial Fund for the Report of the Conference on Health Manpower and Medical Education in Latin America which is now serving as the basis for a pilot study on the subject in Colombia. It is anticipated that other Latin American countries will wish to apply these methods once they are tested in Colombia.

Multidisciplinary Studies on Primitive Populations

The Committee took great interest in the pilot study that had been undertaken of the Xavantes Indians in Brazil.* Because of the ephemeral nature of these remnant primitive communities, which are rapidly becoming absorbed into Western culture, the Committee felt that a high priority should be given to this type of study.

A study of disease patterns in these communities might reveal interesting data. It is possible that these people are less subject to certain diseases that are frequent in the rest of the world. From the pilot study it would appear that neither the infant mortality nor the birth rate is as high as in more well-known underdeveloped regions of the world. Genetically meaningful data were also collected, such as the frequency of color-blindness, but some doubt was expressed with respect to the possibility of obtaining insight into human evolutionary processes through a study of these isolated tribes.

In the opinion of the Committee, the survey and description of physical and mental disorders and their absence under the special conditions of tribal culture, nutrition, and stress; the collection of valuable anthropological data; and, not least, the humanitarian aspects of the project, more than justify PAHO support of a continued pursuit of such timely studies.

* RES 3/1, 9 March 1964.

A Program for Collaborative Research in the Nutritional
Anemias in Latin America

The Committee was presented with a summary of the available information about the frequency and types of anemia in Latin America and with an outline of the proposed research approach.* Everything points to a preponderance of iron deficiency anemias. Hookworm plays an important part, and the availability of dietary iron and its absorption seem to be relevant in some areas. Research should be pursued on work performance and productivity in iron deficiency.

Further surveys are necessary to determine the incidence and type of anemias in the various Latin American countries. For an accurate determination of the etiology of these anemias, the establishment of a regional reference center is indispensable. The Committee strongly recommends that such a center be established. Caracas was considered to be the obvious choice for its location. Pilot trials are proposed involving studies in the Caracas area and in Trinidad; these will include various biochemical investigations but will likewise provide an opportunity to study sampling and shipping problems. Plans are also being made for the training of physicians and technicians during the coming year. These important activities of the proposed center deserve full support.

The PAHO research program which is closely linked to the studies undertaken by WHO includes a study of pregnant women and an evaluation of tissue-iron content in livers obtained at necropsy.

* RES 3/5, 28 May 1964

Protein-Calorie Malnutrition

The Committee discussed the present knowledge concerning protein-calorie malnutrition that had been reviewed by the PAHO Scientific Group on Research in Protein-Calorie Malnutrition* at its meeting in Bogotá in March 1964. A great deal of the fundamental findings in this field are due to Latin American research. Protein-calorie malnutrition constitutes one of the most serious health problems in Latin America, although it does not figure in the mortality statistics. In different regions 20-80% of child deaths may actually be due to malnutrition precipitated by an infection that the child would otherwise have survived. The condition is most severely concentrated in pre-school age children, a group that is difficult to reach. It is emphasized that the focus of research should be on the whole child rather than on malnutrition alone. In order to facilitate the interpretation of results it is important to develop seemingly simple methodological aids, such as manuals on procedures to procure comparable basic measurements, and reliable tables of age and weight data.

It is important to continue supporting the development of practical solutions for the provision of food mixtures and dietary supplements.

The Committee was impressed by a very important aspect, namely that deprivations - including malnutrition - in early life may leave irreversible effects on man.

* RES 3/2, 13 April 1964

The perspective should be on the totality of man's development, and efforts to overcome administrative and scientific compartmentalization of problems should be supported as a long-term undertaking.

The Committee concentrated on a neglected aspect, namely the pronounced mental retardation manifested by deficits of language, personal, social and psycho-motor development in children severely impaired by protein-calorie malnutrition. Higher neural functions, involving language, are more retarded than lower functions, serving motor responses. Retardation is greater the longer the period of malnutrition, and the potential for future psychological development might be permanently affected if the child is younger than six months of age.

Major attention has been recently given in the U.S.A. to mental retardation, with the determination that in most cases the impairment is attributable to a deprivation of sensory, socio-cultural and educational influences which constantly impinge, during the period of development of the child, upon the plastic neural substrate of the higher levels of the brain serving intellectual maturation.

Parallel studies of a more basic nature have tentatively suggested a nucleic acid coding system for information storage and retrieval in the central nervous system. The cytoplasm of the nerve cell has been found to contain more ribonucleic acid than most other cells of the body. This might provide the neural substrate whose replication leads to mental and intellectual development.

To relate these recent concepts to the study of protein malnutrition, it would appear that in addition to the factors of socio-cultural and educational deprivation which may be involved, they may provide an opportunity for investigating the consequences of nucleic acid deficiency in impairment of learning and memory in man.

It might be of interest to observe the effect of administration of yeast RNA which has recently been claimed to be of benefit in improving gerontological memory defects in man. Because of recent demonstration of the importance of temporal lobe mechanisms of the brain in information processing, tests of temporal lobe function - memory, learning, and language - are likely to provide the most sensitive index of improvement.

Population Dynamics*

The Committee discussed the research aspects of the growth of human populations, and agreed that the immense importance of the problems posed call for studies of the highest quality. This research would include studies of human reproduction, hereditary and environmental factors in sterility and fertility, preventable malformations; demographic studies of live births, abortions, fetal deaths and maternal deaths; and studies of family size and constitution in relation to socio-economic factors in urban and rural communities. It would also necessitate training in epidemiology and demography in relation to socio-economic development in schools of medicine and public health, and a search for improved methodology in the analysis of demographic data.

*RES 3/7, 18 June 1964.

The Committee proposed that long-term studies in this area be initiated by PAHO in cooperation with the World Health Organization. Such studies would be the foundation of further research in human genetics. Genetic effects often show up as disease many years after birth, and these investigations would be of great importance for a better understanding of many degenerative diseases.

Methodical studies of population dynamics relate to all branches of medicine and public health. The Committee recommended that PAHO accept an obligation to undertake research in this field.

This research should be very wide in scope including studies of various factors that have influenced population growth and decline in the past, and should be linked to epidemiological investigation of problems of immediate importance such as improvement in maternal and child development, urbanization, natural resources, etc. Assistance should be sought from the general medical profession and from medical faculties, including those engaged in the basic medical sciences.

A Survey of Selected Primary Biomedical Periodical Publications in
Latin America

This survey* was an implementation of the Committee's decision last year to study what immediate needs in Latin America in this field might be met by conventional methods.

*RES 3/4, 25 May 1964, and RES 3/4, Annex, 4 June 1964.

In Latin America, as in other parts of the world, there appears to be an excess of journals. Consultations have taken place with the editors of six selected journals. A proposal was made for an experiment of one or two years' duration designed to improve the use, distribution and, to some extent, the financial situation of the journals selected. Five hundred copies of each journal would be purchased at the full subscription rate including airmail postage to the users. Journals would also be sent to the various abstracting and indexing services. The journals receiving this assistance would agree to appoint editorial referees from more than one country to encourage better regional and world contribution of papers by prompt publication and wide distribution.

The Committee endorsed this project and recommended a further study of the other suggestions that have been made in the report.

It is also considered recent advances made in the solution of library problems in the U.S.A. For Latin America it is important to obtain current information on scientific developments and findings in other parts of the world. A step in this direction would be the provision of abstracts in Spanish or Portuguese from the world literature.

Special Session on
Environmental Determinants of Community Well-Being

The Committee devoted a whole day to the discussion of this subject, Professor Abel Wolman acting as Moderator.

Opening Statement

Professor Wolman opened the proceedings by pointing out that the ideas of Hippocrates, 2500 years ago, expressed in his treatise on "Airs, Waters and Places" have been developed through the advances of science and technology into the concepts of "holism" of Smuts and of the "constellation of causes of disease" of Dubos. The environment of man, embodying the biological, physical, chemical and social components confronts us as a primary part of the ecosystem shared by man with other living organisms. Our concern is with the interaction of man and his environment, both natural and man-made.

In adopting an ecological approach to the problems of community well-being, we must seek to ask specific questions. What, for instance, does existing knowledge offer for sound action? What are the areas of research most pressing for immediate maximum values and for the best long-range promise? What are the socio-cultural obstacles to success in any of the environmental control endeavors? How may these be hurdled most rapidly? In Latin America, as elsewhere, the impatience of people is high. Half a century ago, Wallace asked "how human nature responds to the conditions of the complex urbanized life which industrial and mechanical civilization has created." We do not yet have the answers.

In Latin America millions of people effectively span two centuries of cultural and political contrasts. How can these gulfs be bridged in terms of the provision and acceptance of modern sanitary measures? What are the priorities in the face of limited resources and rising expectations? and finally, what are the areas of ignorance which must be illuminated to facilitate the actions of tomorrow?

The Environment in Human Ecology

In introducing this topic, Dr. A.M.-M. Payne pointed out that the problem of rural-urban migration was not a new one, that it had occurred in the most highly developed countries during the industrial revolution in the last century. While some solutions have been found, especially in the form of environmental control, many problems still cry for answers as exemplified by the plight of underprivileged groups, whose state is comparable with that found in many less developed countries, and by the increase of juvenile delinquency, crime, alcoholism and mental disease. The reason for this seems to lie in the failure to adopt an ecological approach, to see man not just as a biological animal but equally as a social animal whose behavioral and social needs may be at least as important as those that are purely biological. The complexity of the human community makes the identification and characterization of these needs exceedingly difficult. Therefore we turn to the ecologist, who has started his studies with systems much less complex than those of man, for the elements of theory which may be elaborated or extended to man.

Dr. J. R. Audy presented his paper on "Artifacts: The Significance of Modified Environment" and pointed out that separation of organisms from environment is artificial and encourages confused thinking about the integrity of an ecosystem. Environmental structures are modified by animal behavior and in this sense an artifact may be regarded as the product of the behavior of an animal which is produced de novo or by modifying a pre-existing structure. The most conspicuous artifacts are nests and burrows. Others are the cases of certain larvae, the camouflage of arthropods and the clothing of man.

The word artifact has proved unsatisfactory because of its sense of "something manufactured," the physical article being thus separated from the behavior which initiated its development and dictated its use. The term "ethophane" is suggested in the sense that the animal's behavior "shows through" or is manifest in the structure concerned. It is a function of the organism rather than a mere physical structure in the environment. Dr. Audy provided a number of illustrations of this concept, including those in which species differences could more readily be determined by examination of their ethophanes than by the biological structure of the animal.

Changes in the characteristic ethophane may also be an expression of deranged behavior, for instance, socially deranged female rats are unable to make proper nests. Changes in a spider's web have been used as an indicator of the effect of certain drugs on the spider.

The specific artifact or ethophane may be regarded as an extension of the organism itself. This was illustrated by the evolution of the

bower birds in which the elaborate display plumage of the male by genetic change becomes replaced by the display of colorful objects, flowers, berries, etc. collected in the environment, the male losing its colorful plumage pari passu with the increasing complexity of the ethophane. In man, decoration of his body, his clothes and his environment are obvious analogies.

Studies of a wide variety of species have shown that ethophanes are almost always the result of genetically determined behavior and it is inconceivable that man differs in this respect, although cultural modifications of its expression are overwhelming and tend to obscure the common genetic pattern. Such complications make the application of these ideas to man much more difficult. For instance, except in primitive societies, man no longer builds his own "nest", his home. Especially in urban areas, he has to accept the patterns decided by a wide variety of social, economic and technical influences, whether rational or irrational. Yet the influence of immediate surroundings, which are susceptible of individual modification, on one's feeling of well-being or behavior, while subtle, are definite and may be profound. The personal changes introduced make the home, or part of it, an extension of oneself. The same may apply even to collective artifacts such as a city or an urban district, and may profoundly influence behavioral patterns.

Man must have some form of recreation if he is to preserve his mental and social health. This may take the form of relaxation from responsibility, but increasingly it seems to be an attempt to escape from human artifacts which without conscious realization have become insufferable.

The need to construct artifacts or ethophanes ensuring a life of warmth, interest and variety is evident. The supermarket may be very efficient but it cannot replace the social function of the small grocer's shop. Relocation from slums to greatly improved but unfamiliar circumstances has proved much more traumatic than relocation to only moderately improved conditions. This is particularly relevant to rural-urban migration.

The "social use of space" is a growing field of study. Crowding, companionship and privacy are all involved and the devices adopted to attain the desired objective or to give the feeling or symbolism of its attainment are many and varied. A window box or an aquarium can reduce claustrophobia. The Japanese have superbly developed such arts.

In applying these ideas, it is essential to acquire greater understanding of social systems and to recognize that one can seriously damage a system by imposing too advanced "sterile" conditions. New stresses created by technological advances may act through neuro-secretory mechanisms altering behavior, mating habits, resistance to disease and causing increased fetal loss.

In the ensuing discussion the question was asked as to the importance of the ethophane to a species whose survival was in doubt for reasons such as shortage of food, inclement conditions, etc. Dr. Audy indicated that the artifact might indeed be modified but that in some circumstances it might acquire increased importance as a protection against whatever was causing the stress. Dr. Payne underscored the importance

of the fact that certain forms of behavior are genetically determined and postulated that stresses arising from frustration of behavior determined in this way might act through paths (hormonal systems for instance), other than those of more superficial psychological origin. He cited the experience in New Haven where resettlement of a slum population in small suburban houses on the one hand, and in large apartment blocks on the other, apparently resulted in a decrease in juvenile delinquency in the former but not in the latter. He suggested that this was directly due to the environmental conditions, that the former had space for socially acceptable play whereas the latter did not. He indicated that play falls into the category of genetically determined behavior and that where it could be expressed in harmony with the social system, aberrant behavioral reactions, juvenile delinquency and the like, were less likely to arise. Migrants from a wide variety of rural settings could not be expected to adapt with equal ease to the same urban setting and adaption of the urban setting to individual groups might greatly improve matters. He proposed socio-anthropological studies of various groups to determine the patterns of behavior in their home setting which might provide clues to the ethophane that could make their adaptation to city life easier.

In the course of further discussion other examples of the importance of an understanding of these concepts were cited, such as the absurdity of building schools underground or without windows on the thesis that it improves educational efficiency. It was pointed out that urban renewal and urban development should be designed for people and not for the benefit of architects or city planners.

Epidemiological Methods in the Appraisal of Environmental Influences

Dr. J.C.S. Paterson pointed out that in epidemiological studies, if they are to be quantitative, denominators are essential and equivalent to the numerators of the demographers. Unless a population can be defined numerically and demographically, including information regarding population dynamics, whether due to natural increase or to population movements such as migration, only qualitative epidemiological studies are possible except in very limited groups. He pointed out that the population of Cali, Colombia, had increased about fivefold during a period of ten years and would probably increase tenfold over the 19 year period from 1951, the date of the last census, to 1970. Special methods are needed for epidemiological studies in such circumstances. He illustrated these by describing a sampling survey conducted by the ICMRT (International Center for Medical Research and Training, NIH/USPHS) based on an initial aerial survey, followed by stratification of communities, numbering of houses and finally investigation of a 5% sample of randomly selected houses. In the discussion it was suggested that methods such as these might be the only way in which valid health data can be obtained for large areas in Latin America where there are inadequate health services. In particular, it was emphasized that in such areas it is impossible to place reliance on the conventional "case counting" methods used in the more highly developed countries.

However, even using such methods, difficulties were experienced owing to the extreme mobility of the populations. There appeared to be definite patterns of migration, possibly stimulated and facilitated by

the degree of education of the migrants. As a result of such movements, social customs changed, free unions being as common as marriages. Traditional kinships appeared to be broken up and new cultural patterns emerged.

Dr. Paterson emphasized that sociological research is urgently needed for a fuller understanding of what is happening and what the effects might be on human health. He stressed the difficulty of such studies and the importance of meticulous design. He illustrated the problems that may be encountered by accounts of the research programs in progress under the auspices of the ICMRT.

In the discussion great interest was expressed as to why these extensive rural-urban migrations were taking place. Several factors were suggested including the image of the "city paved with gold," dissatisfaction with local failure to develop, and, sometimes, government policy, acting either directly or indirectly. The question of the exchange of information between the city and the country was raised as possibly an important factor, especially in influencing the attraction of kin by those who had succeeded in establishing themselves in the city. However, one view was expressed that the motivation for rural-urban migration was rather a lottery in which one in a million wins, but wins so much that the others are prepared to have a try and take the chance.

The Committee felt that regardless of whether such population movements are or are not regarded as desirable, it is most important to undertake research to determine the motivations or causes behind them.

Adaptability of Human Behavior

Dr. H. Rotondo discussed this problem by pointing out that adaptation is a standard way in which an organism adjusts to an environment which it cannot alter. It might involve an individual or a group and result in the emergence of a new behavioral pattern.

Inertia or conservatism handicaps adaptation. Cultural and physical resources which are culturally acceptable are needed for success. In some societies the inhabitants may undertake modification of the environment by traditional methods of mutual assistance, e.g., intra- and inter-familiar relations, group support and guidance, and integration resulting from such things as clubs which may owe their formation to a wide variety of superficial motives. In other societies competition may be the rule. Sometimes this is successful, resulting in an educational drive which includes adults. Sometimes it fails from "warfare". The importance of violence as a health problem in some Latin American countries was stressed.

Considering the question of "preadjustment" and its possible influence on rural-urban migration, it was pointed out that many residents of the "barriadas" did not come directly from rural areas but had often been residents of slum areas of the cities for some time before moving to the barriada. However, when a direct rural migrant brought stabilizing factors with him, i.e., family structures or when he had kin in the city, adaptation might pass smoothly. On the other hand, some individualist migrants may abandon traditional life and may as a result be able to adjust more rapidly and completely to urban life.

* Syn. "favela" or "shanty towns."

It was pointed out that there are differences between the "classic" slums and the *barriadas* which need sociological study. Cross cultural studies, as for instance those between Midtown, N.Y., and Lima, Peru, show surprising similarities in attitudes such as mistrust, suspicion of authority, etc. This needs further study.

Urbanization without industrialization may exaggerate poverty, contrary to the expectations of the immigrant. This may produce serious social difficulties. The importance of being able to sustain an attitude of hope and rising expectations in the migrant and the dangers of being unable to do so was stressed.

One point of particular importance seems to be the common occurrence of an attitude of fatalism. Essentially this seems to reflect an attitude of dependency, the wish to rely on a "father figure", which may be lacking. Whatever the cause of this, it may sometimes be used to influence attitudes for self-help and development if the right person is found to act as the father figure. In the absence of such a figure the results may be disastrous.

In general, it was concluded that, in the situations created by rural-urban migration, attitudes must be determined by sociological studies.

The Role of Social Organization in Improving the Environment

Dr. W. Mangin, in a most stimulating report, presented an immense amount of information which must be read in the original to be

appreciated. Perhaps the most important point was that many of the concepts about the barriadas are incorrect. Often the inhabitants have lived in the city slums for a long time and only moved to the barriadas recently, the barriada being regarded as a privileged place to which admission is rigorously restricted by a local organization. Other concepts such as that they are primitive indians, unproductive, incompetent, politically united (communists), economically destituted, etc., are apparently largely untrue, although it was not clear how generally observations could be applied to similar situations in other Latin American countries. There seemed to be a general consensus of opinion that indeed they might be more generally applicable than is realized. Studies to determine the real situation were strongly recommended. Unless the results from these studies are available, no logical solution can be devised.

The Committee concluded that common concepts regarding the barriadas are based mostly on ideas and hearsay and that there is an urgent need for facts. These studies should include not only investigations of the actual sociological and health situation in the barriadas but also of the sociological determinants of rural-urban migration and the factors which lead to success or failure.

Evaluation of Selected Environmental Factors

Supply of Drinking Water. As one of the environmental factors affecting community well-being, Mr. H.G. Hanson reviewed some of the present-day problems of providing satisfactory drinking water supplies

in the United States. Comparable problems could be expected in any program for providing community water supplies to the 63% of the urban population and the 90% of the rural population in Latin America that are now estimated to lack a satisfactory water supply. In the U.S.A. 13,000 communities of an average population of 700 do not have a public water supply and must rely generally on individual wells and springs. Maintaining municipal water supplies free of chemical pollution is an increasing problem, with such pollutants as detergents, pesticides, and natural sources of bad odors and tastes posing particular subjects for further investigations. Likewise, keeping water supplies free from infectious organisms still requires constant watchfulness. In this respect, viral diseases raise some special questions. Many municipal systems will require modernization and expansion to meet increasing numbers of consumers, especially in suburban areas where individual supplies can no longer be used with safety, and to meet increasing per capita and industrial water uses. Efficient and safe operational procedures must be maintained. To help assure this, many states have voluntary or compulsory water plan operator training programs. Some specific studies relating to the U.S.A. program were cited. It was reasoned that the research needed to support a program of community water supply in Latin America would be of a socio-economic nature rather than technological but that research in various directions would be necessary to attain the objectives in the Charter of Punta del Este regarding water supplies as well as in the environmental health activities of PAHO.

Air Pollution. Reasoning from the contemporary air pollution problems arising out of industrialization and urban population growth in the United States, Mr. Vernon MacKenzie pointed out the opportunity to plan for the future in Latin America by drawing on past and present experience. In the United States, as in Europe, the air pollution problem tends to exist in the larger communities where the industrial revolution has transformed a once predominantly rural, agricultural society into a highly industrialized and urbanized complex. Early limited efforts to control smoke did not completely solve the community air pollution problem. Technological advances in industrial processes, automobile traffic, power plants and refuse disposal compound the problem. Through lack of understanding or attention many communities have neglected to face a problem that is now difficult to overcome. Economic damage from air pollution is very great. Health studies continue to add to the body of knowledge linking air pollution with chronic respiratory disease, including asthma, bronchitis, emphysema and lung cancer. Air pollution control is found to be worthwhile and a bargain even in areas where control efforts are the most extensive.

Studies in Latin America indicate that trends in industrial and urban growth are destined to produce serious air pollution problems. Major population centers are already affected but conditions are not yet generally unmanageable. The greatest immediate need is study and surveillance, air quality sampling, inventories of sources and a watchfulness which can provide information on which to base sound control measures. PAHO could participate especially by facilitating the exchange of technical information and by arranging for the training of technicians needed in such programs.

The discussion stressed the political and social nature of the problem but many research questions remain to be answered from a technological viewpoint. Generally, it was pointed out that physiological disturbances from air pollution are likely to be more immediately productive of evidence of health damage than epidemiological studies, although these also hold promise of long-term worthwhile results.

It was thought that effective support would be forthcoming for prevention of both water and air pollution, if physicians could be convinced of the health significance of these matters, through training introduced at the proper stage in medical schools.

The Committee noted that the Institute of Occupational Health and Air Pollution Research at Santiago, sponsored by the Government of Chile, WHO and PAHO, has been recently established and could serve as a basis for research in this field.

Basic Sanitary Services. Prof. Humberto Olivero, Jr., reviewed some of the information available on rural-urban migration and its relation to the provision of basic sanitary services, principally water and sewerage, in shanty-towns. The accelerated urbanization in Latin America which concentrates population in a limited number of cities, particularly capital cities, has created difficult and complex sanitation problems.

One of these is the impossibility for many low-income families of finding housing with minimum facilities. Thus the resulting shanty-towns, or self-built dwellings, generally on public lands in the outskirts of the cities appear, at first, as the most important problem of this urbanization. Actually, it is only an external manifestation

of the larger and more complicated problem of the economic and social development of the country. The attitude on the part of governmental and municipal authorities may influence the growth of shanty-towns. It is thought that the main problems of shanty-towns would be solved by the extension of the city's water and possibly sewerage systems. In exceptional cases, and for economic reasons, privies and leaching pits may be continued in use for wastes.

Housing Improvement. Prof. J.O. Buxell, in his discussion, raised the possibility of a high priority for housing improvement programs, through the Punta del Este Charter funds and through PAHO support, and for the greater use of urban planning and development techniques. Minimal housing requirements, locally determined and applied through education, enforcement, extension of essential sanitary services, including water supplies, sewerage and waste removal, cautiously and even selectively applied, might serve to rehabilitate the shanty-towns and near-slum areas. New construction of dwellings should be controlled through such well-know urban planning techniques as land-subdivision regulation, zoning, capital budgeting, etc. These may help prevent the development of substandard housing areas. In any case, great possibilities exist for worthwhile socio-economic, administrative and technological research, on which more effective methods of securing housing improvements and preventive urban planning could be based.

PAHO might undertake to support or encourage, in relation to Latin American universities where possible, such research efforts and to cooperate with regional and ultimately national research and training centers for urban planning.

The Committee raised the question of the availability of funds for these purposes, and recommended a high priority for community water supplies.

Closing Session

The Committee noted the important place that immunology now occupies in spanning over a variety of biomedical fields, and discussed the role of PAHO in the development of this scientific discipline in Latin America.

Immunology has experienced a rapid development which has carried it far beyond its traditional link with microbiology. It ranges from very basic aspects of biology, such as protein synthesis and cellular and molecular recognition problems, to direct large-scale practical applications, such as diagnostic serology, skin tests, and vaccination. It also deals with clinical problems in pediatrics and in degenerative diseases many of which have autoimmune components. It comprises transfusion and transplantation problems, is important in cancer and leukemia research and in genetics, and in questions of perinatal development, differentiation and somatic mutation.

The Committee was of the opinion that PAHO should explore in which ways immunological research and application could best be furthered in Latin America, and how such efforts could be linked with the program of the World Health Organization in this subject. Perhaps one or more immunological training centers could be established in Latin America, initially with the participation of a few eminent immunologists from the U.S.A. or from Europe who might be invited for periods of about six months to organize the teaching of interested students. It was felt that, if successful, such a program would also increase the interest of immunologists in the U.S.A. and Europe in

immunological problems that are important in Latin America, such as the immunological aspects of parasitic diseases. The Committee asked the Secretariat to explore these possibilities and to report on the subject at the fourth PAHO/ACMR meeting.

The Committee discussed the matter of subjects for the special session of the next PAHO/ACMR meeting and listed the following:

Deprivation as a factor in psychobiological development

Adaption of man to the physical environment

Process and structure for national policies relating to biomedical research.

The Committee recommended that the final selection of the subject be made by the Secretariat.