

Pan American Health Organization

PAHO/ACMR 9/19

NINTH MEETING OF THE
ADVISORY COMMITTEE ON MEDICAL RESEARCH

Washington, D.C. 15-19 June 1970

PAHO SCIENTIFIC ADVISORY COMMITTEE FOR
THE PAN AMERICAN ZOONOSES AND FOOT AND MOUTH DISEASE CENTERS
THIRD MEETING

(Item 14.8 of the Agenda)

REPORT TO THE DIRECTOR

SCIENTIFIC ADVISORY COMMITTEE PAN AMERICAN ZONOSSES CENTER PAN AMERICAN FOOT-AND-MOUTH DISEASE CENTER THIRD MEETING

RAMOS MEJIA, BUENOS AIRES, ARGENTINA
RIO DE JANEIRO, BRAZIL
NOVEMBER 4-12, 1969

REF: ST/VMS

1 January 1970



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

Washington, D.C.

PAHO SCIENTIFIC ADVISORY COMMITTEE FOR
THE PAN AMERICAN ZOOSES AND FOOT AND MOUTH DISEASE CENTERS

Dr. Otto Bier
Director
OMS Centro de Pesquisa e Formação
em Immunologia
Instituto Butantan
Caixa Postal 65
São Paulo, SP, Brasil

Dr. J. B. Brooksby
Director
The Animal Virus Research Institute
Pirbright, Woking
Surrey, England

Dr. Jerry J. Callis (Rapporteur)
Director, Plum Island Animal
Disease Laboratory
U.S. Agricultural Research Service
Greenport, L.I., New York 11944

Dr. Sanford S. Elberg
Graduate Division
University of California
Berkeley, California 94720

Dr. J. L. García Gutiérrez
Chief, Special Technical Services
Pan American Health Organization
525 23rd Street, N.W.
Washington, D.C. 20037

Dr. Karl Habel
Scripps Clinic and Research Foundation
Department of Experimental Pathology
La Jolla, California 92037

Dr. Hilary Koprowski (Chairman)
Director, The Wistar Institute
Thirty-Sixth St. at Spruce
Philadelphia, Pennsylvania

Dr. Stewart H. Madin
School of Public Health
University of California
Berkeley, California

Prof. Dr. Anton Mayr
Director, Institut für Mikrobiologie und
Infektionskrankheiten der Tiere
8 München 22, den
Veterinärstrabe 13
Sammelruf 21801
München, Germany

Dr. Manuel Moro Somo
Director, Instituto Veterinario de Investi-
gaciones de Enfermedades Tropicales y
de Altura
Facultad de Medicina Veterinaria
Universidad Nacional Mayor de San Marcos
Apartado 78 - Barranco
Lima, Peru

Dr. Frank Mulhern
Deputy Administrator
Agricultural Research Service
United States Department of Agriculture
Washington, D.C. 20250

Dr. Ramón Rodríguez T.
Director, Departamento Relaciones
Internacionales
Universidad de Chile
Casilla 1641
Santiago, Chile

Dr. Calvin W. Schwabe
Chairman, Department of Epidemiology
and Preventive Medicine
School of Veterinary Medicine
University of California
Davis, California

Dr. James H. Steele
Chief, Veterinary Public Health Unit
National Communicable Disease Center
Atlanta, Ga. 30333

Dr. Charles L. Williams
Deputy Director
Pan American Health Organization
Washington, D.C. 20037

SECRETARIAT

Dr. Pedro N. Acha
Chief, Veterinary Medical Services
Pan American Health Organization
Washington, D.C. 20037

Dr. Martin M. Kaplan
Chief, Veterinary Public Health
World Health Organization
Geneva, Switzerland

Dr. Harold B. Hubbard
Veterinary Medical Services
Pan American Health Organization
Washington, D.C. 20037

Table of Contents

	<u>Page</u>
PAHO Scientific Advisory Committee for the Pan American Foot-and-Mouth Disease Center	
Introduction	1
1. Site of the Center's Laboratories	3
2. Personnel	3
3. Exchange of information and techniques	3
4. Supplies and equipment	4
5. National Laboratories	4
6. Center's industrial production of FMD vaccines	4
7. Budget	4
8. Control, Field Activities and Training	4
8.1 Training activities	4
8.2 Control programs	5
8.3 Field activities	5
8.4 Surveillance	6
8.5 Training facilities	6
8.6 Epidemiological Bulletin	7
8.7 International Veterinary Service Corps	7
9. Laboratory Services	7
9.1 Diagnosis and typing	7
9.2 Serum Assay	8
9.3 Carriers	8
9.4 Cell Lines	8
9.5 Inactivated Vaccines	8
9.6 Modified Live Vaccines	9

	<u>Page</u>
PAHO Scientific Advisory Committee for the Pan American Zoonoses Center	
Introduction	10
Comments of Dr. Miguel Albornoz, UN Representative	12
1. Personnel	14
1.1 Permanent staff	14
1.2 Consultants	14
2. Rabies Program	14
2.1 Neuroparalytic accidents from rabies vaccines	15
2.2 Vaccine production	15
2.3 Rabies control programs	15
2.4 Reduced vaccine dosage schedule	16
2.5 Dog carriers	16
2.6 Dog ecology project	16
2.7 Surveillance	17
2.8 Ecological and virological studies of bat rabies	17
2.9 Evaluation of bovine vaccines	17
2.10 Post-exposure treatment experiment in dogs	18
2.11 Rabies diagnosis	19
3. Hydatidosis Program	19
3.1 Treatment of dogs	20
3.2 Echinococcus infection in the dog	20
3.3 Biology of Echinococcus eggs	20
3.4 Immunological studies	20
3.5 Epidemiological studies	21
3.6 Training	23

	<u>Page</u>
4. Brucellosis Program	23
4.1 Field services in Brucellosis	23
4.2 National Brucellosis control programs and surveillance	23
4.3 National Brucellosis Reference Centers	23
4.4 Epidemiological studies	24
4.5 Laboratory services	24
4.6 Methods of standardization	24
4.7 Vaccines studies for prevention of caprine Brucellosis	24
4.8 Serological response of vaccinated young calves	24
4.9 Wildlife reservoirs of Brucellosis in Argentina	25
4.10 Search for phages in Brucella cultures	25
4.11 Rapid diagnostic test for <u>ram epididymitis</u>	25
4.12 Swine Brucellosis control	25
4.13 Testing of <u>B. abortus</u> strain 19 vaccine	26
4.14 General	26
4.15 Brucellosis Epidemiology	26
5. Tuberculosis Program	27
5.1 International meeting	27
5.2 National coordinated planning, control and research	28
5.3 Field and training activities	28
5.4 Control methods	28
5.6 Standardization of tuberculin	28

	<u>Page</u>
6. Food Hygiene Program	29
7. Training	30
8. Laboratory Animals	30
9. Leptospirosis	30
10. Anthrax	30
11. Epidemiology	30
12. Biological Reagents	31
13. Physical Facilities	31
14. General	31
15. Biohazards Control	32
16. Financing	32

PAHO SCIENTIFIC ADVISORY COMMITTEE FOR THE PAN AMERICAN
FOOT-AND-MOUTH DISEASE CENTER

Report to the Director

1969

INTRODUCTION

Dr. Charles L. Williams, Deputy Director, Pan American Health Organization, opened the meeting of the Committee on November 5, 1969 at the Pan American Foot-and-Mouth Disease Center, Rio de Janeiro, Brazil.

Dr. Williams welcomed the Scientific Advisory Committee to Rio de Janeiro in behalf of Dr. Horwitz, Director of the Organization, informing them that Dr. Horwitz regrettably had a conflicting commitment during this time which had to take preference.

He welcomed the new members of the Committee:

Dr. Frank Mulhern
Deputy Administrator
Agricultural Research Service, USDA

Dr. Anton Mayr
Director, Institut für Mikrobiologie
und Infektionskrankheitender Tiere
Universität München

Dr. Williams commented that the activities of the Pan American Foot-and-Mouth Disease Center are taking on amplified roles in the efforts to control foot-and-mouth disease in the countries of South America in 1969-1970.

The pressures of increased assistance in consultation, training, and research are already being felt. Loans have been made by the Inter-American Development Bank to Argentina, Chile and Paraguay for campaigns to control the disease. This is a major development and has of course given rise to new requests for assistance. Each loan agreement specifically spells out the role that the Center should take in participating in the campaigns.

As pointed out by Dr. Palacios in his report to the Committee, the most important problem confronting the Center's staff is the development of an epidemiological surveillance system throughout the countries. A reliable system established on base-line data is essential to the conduct of effective control programs for foot-and-mouth disease. Hand-in-hand with development of this system must go an intensive training program directed toward building an infrastructure of trained personnel to make

diagnoses, administer the campaigns and evaluate results. In epidemiology, particularly, there exists a great deficiency and need for administrators or persons with training in administration. Suggestions from the committee for increasing development of this system and strong recommendations for achieving this objective are requested.

Dr. Williams referred not only to continuing education and post-graduate training but to support of undergraduate study programs in those countries with the greater deficiencies of veterinarians. In the Inter-American Meeting on the Control of Foot-and-Mouth Disease and Zoonoses, held in Rio in May, 1969, Dr. Ivo Arzua Pereira, Minister of Agriculture of Brazil, specifically related to this deficiency: "Studies conducted in 18 Latin American countries, during 1967, revealed the existence of only 10,366 professionals with an annual increase of only 570."

Dr. Williams commented that this Scientific Advisory Committee had been invited to meet to advise the Organization on realistic and logical ways of conducting its programs of assistance.

He said: "We hope you will see fit to evaluate, criticize and make recommendations in a very frank and direct way. We know it will be constructive. We solicit your advice most sincerely."

"Your task is not easy and we gratefully appreciate your efforts."

Dr. Williams announced the resignation of Dr. Carlos Palacios, Director of the Center, and expressed the sincere gratitude of the Organization to Dr. Palacios for a job well done and for the significant contributions the Center has made under his leadership.

GENERAL

The Committee congratulated the Director and other staff of the Center for accomplishment gained during the year regarding the recommendations made by the Committee in the meeting of last year.

As a consequence of increases in the budget, some new personnel have been recruited and certain vacant positions filled. Additional laboratory and field equipment has been purchased.

The Committee recognizes the increased workload placed upon the Center due to new requests for assistance from the countries. Increased requests are anticipated as a result of the technical assistance plans of the loans by the Inter-American Development Bank to the countries to conduct campaigns for the control of FMD. Additional assistance provided in training places a greater burden on the field and laboratory staff of the Center.

The Committee therefore points out the necessity for additional support to adequately meet the new requests for assistance. The IDB should provide financial assistance to the Center in the form of a grant for improving quantity and quality of training.

1. The need for a new site remains as critical as ever, for the same reasons stated in the 1968 report as follows:

"Site of the Center's Laboratories. The present location of the Center is a drastic hindrance to the effective operation of the laboratory services. A transfer of these operations should be arranged as soon as possible to a site providing close contact with other scientific workers, disciplines and literature, and accessibility of the laboratory for the scientific and technical staff to increase research and service operations beyond normal working hours."

A year has now passed and during that time, we are pleased to note, a proposal has been made for additional space with the approval by the Ministry of Agriculture.

1.1 The Committee hopes that this first step will be quickly followed by the necessary implementation to:

1. Secure an appropriate site.
2. Initiate formal planning.
3. Assure its total funding through its inclusion in the loan request being forwarded to the IDB by the Brazilian Government.

The Committee recognizes that the proposition that the present site can be made suitable for the current program of research and control on FMD is unrealistic relative to efficient operation of the Center and urges that all possibilities for an appropriate location be explored for a site close to the metropolitan area of Rio de Janeiro.

2. The Committee notes that several new personnel were hired since the past meeting. However, because of the demands of the FMD campaigns in the various countries of South America the Committee urges that the Center staff be brought to full complement as soon as possible.

It is recommended that both academic and non-academic training opportunities for the staff of the Center and the personnel of the Organization working in FMD be made available as soon as possible.

3. The Committee notes with pleasure that its recommendations of last year concerning the short-term assignment of scientific staff to other laboratories for exchange of information and techniques is being followed and that some benefits have occurred as a result of this interchange of ideas. This course of action should be continued whenever possible.

4. The Committee recommends that in order to avoid delays in obtaining supplies and equipment, wider use of catalogues such as those issued by the General Services Administration and Department of Defense of the U.S. Government.

5. The Committee strongly recommends that PAHO request countries participating in Foot-and-Mouth Disease control programs to establish national laboratories for control of biological production. These laboratories should not be associated with actual production of vaccines and should be staffed by personnel specifically trained in all aspects of control of production of Foot-and-Mouth Disease vaccines regardless of kinds.

6. The Committee notes with pleasure that plans are being completed to establish a pilot plant for industrial production of FMD vaccines at the Center. The Committee urges that this project be given high priority in order to enable personnel of the Center to organize training courses for government and industry representatives in the production of safe and immunologically effective FMD vaccines.

7. Budget

The Committee strongly supports the increase in the Center's budget for 1971. In so recommending the Committee notes this represents nothing more than normal operational costs.

Especially pertinent to the budgetary considerations is the problem of financing the expanded responsibilities of the Center which it must assume in relation to the national programs being inaugurated through loans from the IDB. These are absolutely essential activities and cannot be met without additional budgetary support.

8. Control, Field Activities and Training

8.1 The Committee recognizes that an adequate veterinary medical service infrastructure is needed in several Latin American countries through which to carry out the effective prevention and control of FMD. The Center must continue to assist countries in the creation of the veterinary medical field services adequate to the accomplishment of the FMD program through courses for national program directors and other key personnel and by any other means which seem appropriate.

8.2 The Committee also feels that a scientific epidemiological basis for carrying out foot-and-mouth disease control is essential to the success of the program. Particularly desirable are relatively accurate baseline estimates of the incidence and prevalence of infection either prior to or in the early stages of the control program. This information is required in order to measure step-wise progress in control efforts.

This is particularly important because progress in disease control programs has often been most rapid in the initial stages of the program. The impetus given to disease control efforts by documentation of these early accomplishments has gone a long way in the past in sustaining public and legislative support for control programs, particularly for those programs of long duration.

Control Programs

The Committee recommends that during the course of the next year an effort be made to define several categories or campaign phases which will recognize step-wise progress in control in different areas (e.g. attack phase, control phase, consolidation or surveillance phase, disease-free phase). This technique has an important psychological value; it has been applied in human malaria and in animal brucellosis and tuberculosis control programs and could be of similar value in foot-and-mouth disease control.

8.2.1 In this regard, the Committee believes it is essential that progress of control activities in foot-and-mouth disease be measured in terms of reasonable and practically obtainable epidemiological parameters, such as estimates of incidence and prevalence, percentage of animals vaccinated (and quality of vaccine used) rather than in terms of doses of vaccines produced, number of vaccinations performed, or number of personnel employed in the field.

8.2.2 The Committee notes that progress has been made in the implementation of its earlier recommendations that a Pilot Regional Comparison Area (PRCA) be established for purposes of intensive field research and training. (See Annex II). In this PRCA, a special epidemiological team from the Center should experiment with methods for studying in depth selected samples of the livestock populations, which methods may be applied to different states or geographical areas.

8.3 Specific areas for continuing activities on behalf of the Center staff include:

8.3.1 Further development of a hemispheric surveillance program for foot-and-mouth disease (see below).

8.3.2 Assistance to countries in the evaluation of the progress of national control programs.

8.3.3 Coordination of national programs.

8.3.4 Laboratory services in a reference and advisory capacity to national laboratories and direct diagnostic services to countries now free of foot-and-mouth disease.

8.3.5 Assistance to countries in the identification of problem areas; in locating the sources of control problems; and in planning new directions of approach for the intensification of efforts in such problem areas.

8.4 Surveillance

As noted in last year's report, the Committee considers that a properly developed surveillance program for FMD in the hemisphere is urgently required. The Committee was informed that while some thought has been given to this matter by the Center's staff during the past year, it was not possible to carry out two of the recommendations made in last year's report because of pressure of other activities. These were visits by the Center's field services staff to the NCDC in Atlanta, Georgia or to WHO in Geneva, and the convening of an international group of consultants to define and recommend practical epidemiological parameters for an overall surveillance system. With respect to implementation of the latter, progress has already been achieved by the Center's staff, and it is now felt this may be accomplished if some members of the Committee devote an additional day at next year's meeting to explore in depth with the Center's staff different aspects of this problem.

Effective surveillance is based on what might be termed "hard" and "soft" data.

8.4.1 "Hard" data. These consist of laboratory-based procedures such as diagnosis, typing of strains, studies of carriers (see below) and serological epidemiology. Only the latter will be discussed here.

Although randomized serum collection from sheep and cattle might yield considerable information on the immunological status of animal population groups at different points of time, the value of such studies would be greatly increased by the simultaneous determination of the carrier status of cattle population. Such information could be useful both for retrospective analysis of epidemiological situations and for planning future control campaigns.

A careful epidemiological and statistical sampling design would have to be prepared before undertaking the collection of serums. The feasibility of such an undertaking, to be carried out possibly in the Pilot Area Scheme (see Annex II) should be studied.

8.4.2 "Soft" data. These refer to the determination of outbreaks and changes in incidence or prevalence of infection (see 8.2 above).

Problems arising in achieving full and accurate reporting of FMD outbreaks should be examined.

8.5 At present no adequate facility is available for training national staff in foot-and-mouth disease program management and administration. The Committee welcomes the plans made for the development of a field

research and training area by PAHO to which personnel from the host country and other countries can be sent for this type of training. We reiterate that provision should be made for the staff of the Center to actively participate in this training activity as instructors.

8.6 The Committee commends the Center's staff on their production of the first issue of a project monthly Epidemiological Bulletin in which the results of hemispheric surveillance activities will be promptly disseminated. Suggestions by Committee members for improvement of the excellent Bulletin include restriction of most of the more detailed tables to annexes in a special yearly or semi-annual issue; greater use of graphic forms of data presentation; and incorporation in the Bulletin of short narrative accounts of interesting epidemiological investigations, outbreak reports, instances of disease spread, control successes, etc.

8.7 The Committee notes that a proposal is now before the United Nations to establish a multi-disciplinary volunteer service corps (see Annex I). We support this proposal in principle and suggest that the possibility that young veterinary medical volunteers recruited under such auspices might be utilized in connection with certain animal disease control programs of South America be explored by the appropriate staff members of the Center.

It is recommended:

- 8.8.1 The training branch of the Center be expanded in personnel, facilities and equipment.
- 8.8.2 In order that the Committee can appreciate the effects of its recommendations upon the capabilities of the Center, based on the number of personnel and the workload of each and its relationship to the budget, it is proposed that a new organization chart as well as a functional chart be available to the Committee at the annual meeting.

9. Laboratory Services

9.1 Diagnosis and Typing

At present these very important investigations depend in large part on serological (C.F.) techniques, and the Committee considers that the effectiveness of this part of the Center's program could be enhanced by innovations in two directions. The first would require the availability of cattle testing facilities so that the K index technique along with comparative assays of SNT and CF could be evaluated for their obvious

practical implications in the sub-typing program. The second new recommendation would make possible short-term fellowship type of assignments of the senior staff of this section in some outstanding laboratory or laboratories to become familiar with modern immunological techniques which can be applied to routine and research activities of the Center.

9.2 Serum Assay

The Committee endorses the comments made under this heading last year and would hope that, as staff and facilities permit, progress will be made on those problems not yet tackled.

9.3 Carriers

The research work on this problem has given results of great importance in international trade. Regulatory measures for the control of movement of cattle can be established on a more reasonable basis and a relatively high degree of safety achieved but only in certain defined situations, one of which is a very low incidence of the disease in the country of origin of the animal. The possible use and interpretation of results of carrier detection techniques for such purposes should be the responsibility of the regulatory officials of the countries concerned.

The logical extension of this investigation into carriers could usefully be directed to the characteristics of the carrier virus in relation to virulence, pathogenicity, transmissibility, the importance of local (IGA) antibody, etc.

9.4 Cell Lines

The Committee recognizes the importance of the study of cell lines for the virus growth and assay. The basic nature of the work of selection of cell strains for these purposes would not warrant this to be a major program of the Center.

9.5 Inactivated Vaccines

9.5.1 Rabbit Vaccines

The Committee believes that the use of inactivated vaccine prepared from infected baby rabbit is being extended. There are no satisfactory protocols on the performance of such vaccines and such tests as have been made on the commercial product indicate that it is of very low potency. Since so little is known of this kind of vaccine, the Center should include rabbit vaccines in their program of vaccine testing.

9.5.2. Vaccine Potency Comparative Tests

It is important that the potency of FMD vaccines from differing geographic areas be compared. Comparative laboratory and field tests should be carried out on different vaccines. Field tests should be made under normal conditions of use in South America. The use of vaccines of the highest available potency may make possible a reduction of vaccination from three to two interventions annually. This reduction in turn might compensate for possible higher costs of more potent vaccines.

The Committee wishes to express its gratification at the ever-increasing quality of some of the vaccines now manufactured and used in South America and expresses the hope that this trend is continued and widened to the greatest extent possible.

9.5.3 The Committee is pleased to note the progress on inactivated vaccine research and reiterates its comments of last year. Research in this area calls for a continuing program to be pursued with energy. More attention should be given to the comparison of laboratory tests with protection tests in cattle.

9.6 Modified Live Vaccines

The Committee considers that it may be necessary to continue the experimental approach to the development of strains in an attempt to improve the preparations now in use in certain countries, but would recommend that more emphasis should be placed on cattle tests of strains attenuated by chemical mutagens. An effort should be made to employ the same strains in studies of attenuation by different methods, and so apply marker techniques to the various strains developed.

It is essential that the balance between the programs on live and inactivated vaccines should be regularly reviewed.

PAHO SCIENTIFIC ADVISORY COMMITTEE FOR
THE PAN AMERICAN ZOONOSES CENTER

Report to the Director

1969

Dr. Charles L. Williams, Jr., Deputy Director, PAHO, welcomed the Scientific Advisory Committee to Buenos Aires and the Pan American Zoonoses Center. Dr. Williams extended his gratitude to the Committee for their concentrated endeavors at the Foot-and-Mouth Disease Center in Rio de Janeiro and indicated that the task before them here in Buenos Aires was equally large and difficult. Dr. Williams pointed out that their endeavors are further compounded in reviewing the activities of the Zoonoses Center because of the diversity and number of diseases with which the Center must work.

Dr. Williams called their attention to the Recommendations for the Zoonoses, as indicated on page 29 of the Final Report of the Special Meeting of Ministers of Health of the Americas held here in Buenos Aires, 14-18 October, 1968. The first three general recommendations for the zoonoses clearly define the responsibilities and objectives of the Center in its programs of assistance for years to come:

1. That, in view of the social and economic impact of the zoonoses, the Governments should develop appropriate measures to combat them. National health services should include in their organization a department of veterinary public health that will maintain closely coordinated working relationships with the Ministry of Agriculture and its animal health services in order to provide for coordinated planning, control and research activities.
2. That countries should formulate plans of a permanent and continuing nature for the control of the major zoonoses and that, where necessary, they seek loan funds from the international lending agencies. In this planning and development process the countries are urged to make maximum use of the facilities and services of the Pan American Zoonoses Center, first in the planning and later in the training of personnel and in the development of techniques during the operational phases.
3. That, to coordinate activities against the zoonoses, countries should group together areas that are of like nature because of their geographic relationships,

similar ecology, and close relation in animal movements and establish a firm regional cooperation with a view to mutual protection against the spread of and future reinfection by those diseases.

The big question to answer is: How?

Dr. Williams requested their expert knowledge and experience in the evaluation of the programs of the Center and to make realistic forthright recommendations for the Organization to consider in future guidance for the Center. This Center is maturing to a status now where the Governments of the countries are developing an attitude of greater dependency and reliance upon its services. As this challenge increases, the Center must be capable of meeting it.

Comments of Dr. Miguel Albornoz

Representative of United Nations in Argentina

During the first session Dr. Miguel Albornoz, Resident Representative of the United Nations in Argentina, welcomed and thanked the Committee for their contribution to the scientific program of the Center, which, he indicated is one of the more important ones that the United Nations Development Program (UNDP) is developing in Argentina.

Dr. Albornoz referred to the wide economic impact of the research performed by the Center in the field of zoonoses. This is the consequence of the high level of scientific competence of the staff from whose efforts these results have universal significance. The investment by UNDP in this project is justified by these achievements.

Research is the key factor in the pre-investment part of development projects. The time is relevant for the development of the Center if we consider the Pearson report to Mr. McNamara (World Bank). This document basically indicates the need to unify the approach of the work of international organizations to better serve the governments. The development of pre-investment research is fundamental if we want to have sound and effective programs. The Rockefeller Report proposes that greater responsibility be given to the international organizations, so they can effectively collaborate in finding the solution to the scientific and economic gap among the countries in the world, one of the greatest problems of our times.

The UNDP specifically regards this Project as an effective one, and thinks that in the future it will go beyond the national scope and achieve regional significance. Dr. Albornoz said this will be possible with the cooperation of the Government of Argentina in alliance with other governments of the hemisphere.

Dr. Albornoz reassured the members of the Committee that he is maintaining close contact with PAHO/WHO concerning the rephrasing of the Project, and also suggested that we should look into the broad application of this knowledge for the benefit of the countries. He expressed his happiness over seeing the representative of FAO attending this meeting and emphasized the need for close relationship among all international agencies and a joint action for the benefit of the countries.

He indicated that through coordinated action closer contact has been maintained with the Government of Argentina in order to obtain better physical facilities for the Center. Consequently, he has received the firm promise of construction of a new building to be financed with a loan requested from the Inter-American Development Bank.

Dr. Schwabe, in responding to the words of Dr. Albornoz, expressed his satisfaction in the way the Center has been developing in collaboration with the system of the UNDP. He pointed out the significance of the zoonoses as a major problem suppressing health and economic development of the hemisphere. The future of the Center will extend beyond the programs in Argentina, achieving hemispheric significance. This Center contains unique facilities found nowhere else in the world for certain types of research, such as hydatidosis. Every effort should be pursued to provide it with adequate facilities necessary for the research to accomplish this task.

The Committee expressed their satisfaction with the progress made by the Center toward achieving the goals of the recommendations made last year, and particularly in attracting the outstanding scientists to participate in the programs. The prestige being developed by the Center's reputation has been instrumental in securing top men. The Committee extends its congratulations and best wishes to the Director and Staff for their continued success in searching for solutions to the major health problems of the Hemisphere.

The Committee considered the Final Report of the Special Meeting of Ministers of Health of the Americas held in Buenos Aires during 14-18 October, 1968, to be a major action of the Hemisphere in the programs to control the zoonoses.

1. Personnel

- 1.1. Permanent staff. Vacancies existing at present are expected to be filled by the end of 1969 or early 1970. There will, however, be further vacancies in 1970 as various staff members terminate their appointments. The Committee hopes that not only will these posts be filled but that expansion to allow appointment of a biostatistician and a training and publications officer will be authorized as a matter of urgency.

Assistance is also urgently required to aid in the editorial and disease surveillance fields. An editorial assistant, a surveillance clerk and a statistical assistant should be authorized as soon as possible.

It is essential to review the existing philosophy and procedures for assisting new scientific personnel and their families in adjusting to the country of their assignment. A successful adaptation would enable the Center to gain the most benefits from their talents, thereby avoiding an excessively rapid turn over of staff.

- 1.2. Consultants. The Center has been well served by its consultants, and the Committee recommends that full use of this procedure be maintained.

2. Rabies Program

The Committee wishes to acknowledge the recommendations on rabies presented by the Ministers of Health* in the above-mentioned meeting and advises the Center to assist these countries with all means possible to carry out implementation of these recommendations:

1. That, considering the importance of the rabies problem in both its effect on public health and its economic impact, the Governments should extend or initiate their rabies control programs in accord with modern methods and give them high priority in their national health programs.

2. That Governments should implement national programs for the control of rabies in which the following measures are included: mass vaccination covering a minimum of 70 per cent of the canine population; elimination of ownerless and control of stray dogs; and an energetic health education program. These programs should, if possible, be

*Special Meeting of the Ministers of Health of the Americas, Final Report, OPS Official Document No. 89, page 30, Buenos Aires (14-18 October 1968).

self-financed and provide for the participation of the agricultural and educational services and the municipal authorities. As a rule, they should receive material and economic support from the community.

3. That the countries should be assured of the production of antirabies vaccine of good quality and in sufficient quantity to provide for the development of the required intensive vaccination campaigns. The public health and animal health services should be more closely coordinated in order to combine their sources and efforts in the campaign against rabies.

4. That the Governments increase and improve services for the diagnosis of rabies in order to improve case reporting and to avoid the indiscriminate prophylaxis of humans. The Pan American Zoonoses Center, at the request of Governments, will collaborate in the training of a large number of professional personnel in this field and lend assistance in the diagnosis, production, and control of vaccines and in practical research.

- 2.1. Neuroparalytic accidents from rabies vaccines. The new rabies surveillance program now offers an increased opportunity to detect accidents following rabies vaccination in man. Attempts have been made to get detailed information, but limited efforts have been made to obtain expert neurological evaluation in individual cases. The Committee feels that this evaluation is important enough to be secured even if usually it is conducted retrospectively. There is a continuing need for direct investigation of these episodes and constant surveillance of vaccine production to help prevent them.
- 2.2. Vaccine production. The Center's staff should continue to give assistance to the countries concerning their problems in rabies vaccine production. Consultative visits to the individual laboratories and evaluation of potency of vaccines are services now being provided to the countries. Furthermore, the Center shall be conducting a training course on rabies vaccine production this month.
- 2.3. Rabies control programs. Although the Center has several research programs such as vaccine improvement and bat control which are pertinent, it is not in position to directly participate in local dog control programs. However, the Center's staff of consultants on rabies shall continue to be available to advise and help in the planning of such programs including the aspects involving public education, stray dog elimination, and dog vaccination.

- 2.4. Reduced vaccine dosage schedule. The Committee recognizes the interest of the Center's staff in determining if the highly potent Fuenzalida vaccine might be effective in post-exposure prophylaxis in man when used in a reduced number of doses. However, a question is raised concerning the Center's participation in such a study where the human subjects involved have actually been exposed to rabies.

The Committee feels that the statement made by the World Health Organization (WHO) Scientific Group on Rabies Research in their report to the Director General concerning this question is so pertinent to the discussion of this project that it is here quoted:

The present evidence drawn from experiments in animals with new vaccines of higher antigenicity seems to offer a good prospect in the possibility of reducing the dosage of the vaccines, the number and/or spacing of injections in the case of human treatments.

Some institutes have tentatively reduced the number of injections with presently available vaccines, starting the treatment with a limited dose from 3 to 7 daily injections followed by 2 or 3 booster injections after an interval of a few days. Serological results in post-exposure treatment in man have so far have been satisfactory.

However, the whole problem of possible reduction in the number of doses of vaccine should be considered to be still in the experimental stage. Before routine application to exposed humans, it is essential not only that antibody response studies are carried out but also that the immunogenic value of the reduced schedule be assessed by post-exposure experiments in animals. It is recognized that such experiments urgently require further development.

- 2.5. Dog carriers. This study has been terminated, and, in view of the low probability of meaningful results of the preliminary studies, the Committee agrees with this termination of activities.
- 2.6. Dog ecology project. The Committee notes this proposal and does not feel enthusiastic about its scientific justification. However, since this investigation would not involve the Center's space or personnel and would be supported by funds raised elsewhere by its sponsors, the Committee did not wish to evaluate it further.

- 2.7. Surveillance. The Committee compliments the staff on the measures taken through questionnaire forms, already accepted by Health and Agricultural authorities of the region, to improve knowledge on rabies incidence in man and animals and on adverse reactions to vaccination. This procedure of coordinating and stimulating national efforts should be vigorously pursued by the staff during visits to countries of the Hemisphere. Such efforts should be extended to other aspects of surveillance. Included should be methods for determining changes, and the rapid dissemination of such information concerning the rabies status of an area, e.g., the gradual extension of territories experiencing the disease, new introductions of disease into formerly free areas, and shifts with respect to reservoir animals.

Methods for achieving these goals should be explored, and should include serological surveys, when appropriate, and attempts at isolations of virus from suspected carrier animals. Also, information on national requirements for the movement of potential carriers should be assembled and circulated.

- 2.8. Ecological and virological studies of bat rabies. There has been significant progress achieved in this program culminating in the presently operative experimental bat control program. These studies have already supplied important information on the ecology of vampire bat species in northern Argentina, which has led to the control approach now being tested in the field. The Committee is enthusiastic in supporting the continuation of these efforts which offer the only practical vampire bat control technique available.

- 2.9. Evaluation of bovine vaccines (ERA vaccine). The past years' results of the limited tests on the immunizing capacity of the baby hamster kidney (BHK) passaged ERA virus were encouraging. A low mortality rate in the control group made improbable an absolute evaluation of the degree of protection afforded, but antibody response showed high immunogenicity. Somewhat disconcerting were the findings of virulence on intracerebral inoculation of calves.

Since the very high virus titers of this BHK-ERA virus strain make it an excellent candidate for an inexpensive source of ERA type vaccine, further studies are indicated. The Committee suggests that another cattle study examine in parallel the following:

- 1) Infectivity by plaquing in BHK.
- 2) Infectivity by IC inoculation of calves.
- 3) Infectivity by IC inoculation of mice.
- 4) Immunogenicity titer by antibody response in cattle.
- 5) Immunogenicity titer by intramuscular challenge in cattle.

This second experiment should not require as many animals, since the end-point of titrations can be bracketed on the basis of results in the first test. The same procedure should be carried out when feasible on the available commercial ERA vaccine grown in porcine kidney cultures.

- 2.10. Post-exposure treatment experiment in dogs. The Committee has considered the design of experiments in dogs in which reduced vaccine schedules in post-exposure treatment could be directly tested after street virus challenge. The Committee feels that this is a logical step before field trials in man.

Taking into consideration recently available, highly potent vaccines, the possibility of reduced number of doses is now feasible but must be tested in comparison to present regimens and also in relation to the effect of antiserum. The following protocol for a dog experiment is considered preliminary, and results from it will influence future experimental design.

Vaccines. SMB and Wistar vaccines to be used in a volume proportionate by weight to that used in man.

Antiserum. Homologous antiserum from immune dogs would be obtained from Dr. Keith Sikes.* A single dose will be injected in a volume proportionate to human dose by weight.

Challenge. A pre-titer determination of street virus obtained from Dr. Sikes should be conducted at the Center under conditions of the final test and in local animals.

Bleedings. All dogs should be bled on acquisition and following a 30-day quarantine period. Post-exposure bleedings at 4, 10, 15, 30, and 60 days are indicated.

Due to limitations of animal space, only one vaccine can be tested at a time. The following groups of 15 animals each are currently recommended:

- A - Vaccine on day 0, 1, 10
- B - Vaccine on day 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 30
- C -- Homologous serum only
- D - Control

*Rabies Investigation Unit, N.C.D.C., Atlanta, Ga.

2.11. Rabies diagnosis

- 2.11.1. Isolation of rabies virus in tissue cultures. The results obtained thus far in this study have been very interesting, since they indicate an increased sensitivity when compared to the mouse inoculation test. The Committee agrees that this project should be pursued further until sufficient cases are accumulated to give completely definitive data.
- 2.11.2. Corneal test in rabies diagnosis. Since the laboratory has achieved proficiency in the technique of the corneal test, it is felt that diagnostic field samples should be examined by this test and compared with the tissue culture isolation of virus from saliva. Both these tests have the advantage of giving a diagnosis of rabies in the living animal.
- 2.11.3. Coded samples submitted to diagnostic laboratories. The Committee commends the Center's staff of consultants on rabies for the way in which this recommendation has been carried out. Furthermore, the results are an indication of the success of previous training courses in the fluorescent antibody (FA) technique carried out by the staff of the Center. To assist the few laboratories still having difficulty in identifying the test samples, the Committee recommends that a staff member visit these diagnostic laboratories to investigate directly the source of the trouble.
- 2.12 Cooperative study with SELSA on bovine vaccines. The Committee feels that the nature of the material made available is such that results cannot be properly interpreted. Therefore the Committee recommends that this project be reviewed.

3. Hydatidosis program

The importance of hydatidosis in the western Hemisphere was stressed at the October 1968 meeting of the Ministers of Health of the Americas.* It is our pleasure to note, therefore, that excellent progress has been made during the past year in the areas of hydatidosis research. It is clear, in fact, that the staff is taking full advantage of the Center's unique facilities to undertake work of truly global significance on several aspects of hydatidosis.

* "Hydatidosis. We recommend to the Governments that they implement programs for the control of this disease which will include a continuing, intensive program of health education aimed principally at communities in rural areas, the sanitation and veterinary inspection of slaughterhouses, and the sanitary control of dogs. These programs should be coordinated at the highest level between the health, agricultural, and educational authorities as well as other public and private organizations." (Recommendations on Hydatidosis, p.31)

3.1. Treatment of dogs. Work completed during the year indicates that, under laboratory conditions, bunamidine hydrochloride is not superior to arecoline hydrobromide for the treatment of canine echinococcosis. It is considerably less toxic, however, and that fact alone recommends its use under certain circumstances.

3.1.1. It is felt by the Committee that preliminary work undertaken by the Center staff on the effects of bunamidine hydrochloride (with and with DMSO) upon the validity of Echinococcus granulosus eggs should be continued. This work is now possible because of the demonstrated ease of inducing primary hydatid infections in Mongolian birds, and the further demonstration that that method of evaluation of egg viability is clearly superior to the in vitro technique previously used by other investigators.

3.1.2. Consideration should also be given to the possibility of an additional drug trial which would compare the efficacy of another bunamidine salt, the hydroxynaphthoate, with that of arecoline hydrobromide.

3.1.3. It is also recommended that a preliminary evaluation be made in a few dogs of 4,4' diisothiocyanate diphenyl sulphone, another possibly useful drug.

3.2. Echinococcus infection in the dog. The newly developed method for counting protoscolices now makes it possible to infect dogs with known numbers of parasites. Studies in progress on the establishment and evolution in the dog's intestine of parasite populations of different initial levels should be continued. A preliminary statistical analysis of existing data will be made outside of the Center to determine whether these data would lend themselves to some type of life table design. These studies should ultimately yield vitally needed information on the population dynamics and longevity range of Echinococcus adults in the dogs' intestine.

3.3. Biology of Echinococcus eggs. This is also an important area of study. It is recommended that preliminary experiments on the resistance to heat of E. granulosus eggs provide the foundation for more elaborate experiments to determine precisely their thermal death point (i.e., accurate temperature-time relationships for the death of eggs).

3.4. Immunological Studies.

3.4.1. Purification of antigens. Important progress has been made in the purification of the parasitic antigens from E. granulosus hydatid cyst fluid. However, the lipoprotein fraction precipitated at pH5, ionic strength 0.005M, seems to correspond to only part of the parasitic antigens since positive reactions were obtained with no more

than 75 per cent of the sera of infected persons. On the other hand, a fraction easily eluted from DEA cellulose columns at pH6 also showed some serological activity and may correspond to other component(s) of the parasitic antigen complex (PAC). Studies should be continued in order to obtain a mixture of parasitic antigens which are able to react with a higher percentage of sera from infected humans or animals. Also, the optimal conditions for coating sheep RBC with the purified antigen should be carefully established, by comparing different antigenic preparations and different techniques of coating. With regard to the Casoni reaction, the lipoprotein fraction showed higher activity than the crude hydatid fluid antigen. A final conclusion about its specificity depends on observations that have to be completed.

3.4.2. Reaginic antibodies in the dog. This project was successfully conducted and should be completed by the study of specific heterocytotropic antibodies. The PCA test in the guinea pig may be a good substitute for the passive hemagglutination test and may have diagnostic value. Also, the reagini antibody of the dog should be further characterized with respect to its physico-chemical properties.

3.4.3. Immunological studies in sheep. The characterization of skin sensitizing antibodies in the sheep could not be accomplished because of the systemic reactions observed after the I.V. injection of antigen into the recipient animals. The anaphylactic nature of this reaction may be established by transferring the reaginic antibody to the skin of newborn sheep, as well as by the use of in vitro test leading to the specific liberation of chemical mediators such as histamine and serotonin.

Here again, the heterocytotropic antibodies should also be searched for, since they may replace the passive hemagglutination test and could be of diagnostic value.

It is recommended that comparative studies of the antigenic similarities and differences of E. granulosus and Taenia hydatigena cyst fluids be undertaken as an approach to the problem of the present lack of specificity of immunodiagnostic tests for use in sheep.

3.5. Epidemiological studies. The Committee is pleased to note that the Center's staff will soon be augmented by the addition of an epidemiologist experienced in the hydatidosis field. It is expected, therefore, that the program of epidemiological research will expand during the coming year.

3.5.1. Pilot control project in Neuquén. Because the government of Argentina has not yet initiated its proposed control program in Neuquén, it has not been possible for the Center's staff to undertake

previously suggested epidemiological studies in this pilot control area. It is hoped that this project will be activated. It could provide a unique opportunity for significant and practical field research of hydatidosis control under Latin American conditions.

- 3.5.2. Studies of infection foci. To provide better documentation of the economic and health importance of hydatidosis in South America, specifically in Argentina, as well as additional epidemiological information about this disease, it is recommended that the necessary epidemiological follow-up studies be undertaken by the epidemiologists on hydatid disease patients from Buenos Aires Province. Such information would assist in determining the probable sources of infection, the existence of transmission foci, and the existence of previously undisclosed human and animal infections.
- 3.5.3. Hemisphere surveillance. Present efforts by the staff to collect published and unpublished data on the prevalence in animals and the incidence of proved surgical cases in man of hydatid infection in the countries of this Hemisphere should continue. This effort should contribute to the development of an effective hemispheric surveillance system with preparation and distribution by the Center of a periodic surveillance document.
- 3.5.4. Hydatidosis in Colombia. It is recommended that cooperation be continued with Colombian authorities and the Tulane University International Center Medical Research and Training (ICMRT) in Cali on the definition, extent, and evolution of hydatidosis in Colombia. There are two aspects of this program which are of considerable interest. The one concerns the possible occurrence of E. oligarthrus in Colombia and the second, the possible dangers to Colombia of continuing introduction of both sheep and sheep dogs from several endemic hydatid disease areas.
- 3.5.5. Development of epidemiological survey tools and methodology applicable to South American conditions. Present efforts in this area are directed towards the development of suitable immuno-diagnostic tests for epidemiological surveys of levels of hydatid infection in dogs, sheep and man. This work is of great importance and should be continued. Further comment is made under 3.4 above.
- 3.5.5.1 It is apparent that progress in the development of an immuno-diagnostic test useful for survey of sheep will depend upon the construction in the Center building (or in another suitable site in the city of Buenos Aires) of a small facility for raising a few helminth-free (or at least tapeworm-free) lambs. The unavailability of known unsensitized sheep makes the existence of such a facility of utmost importance to the continuation of this work.

- 3.6 Training. The Committee notes that a training course on laboratory methods in hydatidosis will be held at the Center from 7-13 September 1970, followed by a WHO Inter-Regional Seminar on the Control of Echinococcosis (hydatidosis) from 14-20 September 1970.

4. Brucellosis program

- 4.1. Field Services in Brucellosis. The Committee was please to acknowledge the occurrence of coordination of brucellosis control and prevention activities between different countries. It recommended the need to continue and to strengthen, where resources permit, the dispatch of specialists from the Center to the programs in the countries when requests are received. The Committee pointed out the specific contribution of the Center's advisors in brucellosis to the national programs in Mexico in connection with experimentation into vaccines for goats and with the smooth-rough type dissociation problems encountered there. It also wishes to observe that personnel resources in brucellosis in the Center are stretched very thinly in this aspect, possibly to the detriment of the in-house Center research and development program. In accordance with the massive campaigns now being organized on brucellosis and coinciding with the recommendation of the Ministers of Health of the Americas* when they met in 1968, the countries will inevitably draw heavily on the Center for guidance, pointing up thereby the need to consider additional personnel.
- 4.2. The Center is contributing to, and should do more wherever possible to promote, national programs against brucellosis. The use of abattoir samples for swine brucellosis studies and the use of the card test in herds all suggest the need for the Center to keep surveillance over these programs and, moreover, to promote interest in the problem of goat brucellosis in Argentina.
- 4.3. Similarly, the Center has stimulated and should continue to assist in the formation of National Brucellosis Reference Centers which would aid medical as well as veterinary medical personnel in their brucellosis interests, such as diagnosis and preparation of reagents, in the development as well as supply of standard procedures and reagents.
- 4.3.1. These Reference Centers would assist in carrying out recommendations of the Ministers of Health of the Americas, and their development should be encouraged in all countries. In this regard, it is essential for the Center to continue to offer and to develop training courses in all aspects of brucellosis.

*Special Meeting of the Ministers of Health of the Americas, Final Report, OPS Official Document N° 89, pages 31 and 32, Buenos Aires (14-18 October 1968).

- 4.3.2. Specifically the Committee encourages the intention to offer national courses in Northern Argentina and in Brazil in 1970.
- 4.4. Although the Committee realizes that a small but highly creative brucellosis team can be over-extended because of its enthusiasm to provide information about brucellosis, it does reconfirm its previous view that an area in which animal and human disease occur simultaneously is an ideal epidemiological study area. Information gathered here would provide data on the economic and public health aspects of the disease of great value for that country. Such a plan for epidemiological studies needs adequate preparation and requires the services of animal specialists knowledgeable in reproduction rates, mortality of newborn, and husbandry procedures.
- 4.5. The laboratory services should continue as in the 1968 report. In accordance with the recommendations of the Ministers of Health of the Americas, already cited, this involves maintenance and distribution of strains for Brucella antigens and vaccine production; production and distribution of antigens; strain 19 vaccine quality control; and potency testing. In addition, brucella strains received from different countries would be typed and phages and specific sera distributed.
- 4.6. The studies on methods for standardization of brucella agglutinating agents, especially the suitability of these methods when applied to antigens that are to be used for testing goat and swine sera, should be continued as outlined in the project of standardization of the agglutination test. The Committee hopes that as a result of this work recommendations will be made for improving the standardization and application of the agglutination test to swine and goat sera.
- 4.7. With reference to the project of Studies on vaccine for the prevention of caprine brucellosis, the Committee took note of a serious fertility problem which might prevent close adherence to the original plan and recommended a delay of a year before time of challenge to allow acquisition of more information on mating characteristics of the goats and possibly to allow a study of caprine fertility.
- 4.7.1. The division of the existing small dose Rev. 1 study group into two groups would also allow for a booster dose to be given; alternatively, an additional group could be added next year and vaccinated with the small dose at that time. This would provide two small-dose groups, one having been vaccinated a year or more before challenge, the other having been vaccinated a few months prior to challenge.
- 4.8. The Committee reviewed the data on the project of Serological response of calves vaccinated at an early age and noted that it was proceeding on schedule, but felt that ultimately the calves with the different

vaccination schedules and consequent serological response would need to be challenged as a test of their immunity. The present data are in themselves of great interest and should be published. The animals should upon challenge contribute much information to the meaning of the serum response.

- 4.9. Wildlife reservoirs of brucellosis in Argentina. This project continues to be of interest. The Committee noted that the studies now involving negative findings from more than 500 armadillos seem to remove that animal from the list of important reservoirs despite their presence in an area of high bovine brucellosis endemicity.
- 4.9.1. Biological surveys must be entered into with great care in order to be aware of the potential research demands such surveys may engender. Such attention to limitations of currently utilized techniques may avoid important "false negative" findings. For example, new knowledge of unique reactions of certain globulins active as "antibodies" may require adaptation of the traditional procedures to work with the serum of the newly examined species.
- 4.10. The isolation of specific melitensis and suis phages in project Search for phages in Brucella cultures isolated in Latin America is of value as contributing a potentially important taxonomic reagent. The Committee recommends that these new phages be examined by electronic microscopic techniques as an aid to understanding some of their unique qualities. This can be accomplished with the cooperation of the technical facilities of the medical schools in Buenos Aires.
- 4.11. In the project Development of a rapid diagnostic test for ram epididymitis, the Committee found data on the gel-diffusion test which provided a test potentially of use equal to that of the more complicated complement-fixation test. Evaluation of the new test should be conducted under field conditions.
- 4.11.1. The Committee especially recommends that contact be made with other U.N. agencies for possible collaboration with the Center in this work. For example, the UN-supported studies on Patagonean sheep could provide material of great value in testing the efficacy of the new gel-precipitin reaction, as well as contributing valuable B. ovis cultures to the collection.
- 4.12. The Committee noted the problems in swine brucellosis control and encourages the cooperation between the Center and the Instituto Nacional Tecnología Agropecuaria (INTA) in evaluating the available vaccines. The investigation of different methods of challenge should be pursued, including introduction of B. suis into the uterus at the time of fertilization. It is considered important that a second

vaccine be included in the experiment, which is designed to provide a definitive evaluation of Dr. Cedro's vaccine. The Center should continue the search for effective immunization agents. This may later require maintenance of pigs in the Center's field station at Azul. The use of hamsters or other less widely used laboratory animals should be considered.

- 4.13. In the consideration of quality control of reagents distributed and along the lines suggested, the Committee encourages the attempt to control the immunogenicity of batches of Strain 19 vaccine in the project, The testing of B. abortus strain 19 vaccine.

4.13.1. The Committee recommended the acceptance of the plan whereby virulence of the challenge strain will be considered satisfactory when in the non-vaccinated guinea pig the geometric mean spleen/body weight ratio shall not be less than 0.3 per cent and the geometric mean titers in the agglutination test are not less than 600 International Units. Furthermore, a protection rate of 80 per cent against such a challenge strain in 1/15 of the cattle dose of strain 19 will be considered satisfactory in the view of the Committee. The Committee encourages this plan and anticipates reviewing the results achieved during the year.

- 4.14. General. Brucellosis continues to be a disease for which the Committee recommends that regular surveillance be established. The Committee continues to think as it did in 1968 that epidemiological analyses will be required for effective control in an area with consideration of its specific situation, e.g. transmission to humans via certain foods. This can best be initiated and developed through the formation of epidemiological teams in the various veterinary medical schools in different countries with assistance from the epidemiologists of the Center. The Committee again recommends that steps be taken to determine where such epidemiological teams could be formed and assisted by the Center, especially with reference to training in laboratory and epidemiological procedures.

- 4.15. Brucellosis Epidemiology.

4.15.1. The Committee noted the projection and planning activities of the Center in control and research programs on brucellosis. The Committee recommended that the Center assist countries in making their surveys of prevalence and in helping the countries to decide what kind of control programs the particular country can do.

4.15.2. The Committee recommended that conferences on brucellosis, perhaps combined with conferences on tuberculosis, be conducted by the Center, as early as possible, first for the high level administrative personnel and second for the technical personnel who must

carry out the programs. Such conferences will assist governments by providing the kinds of information needed for evaluating their own specific situation in relation to the disease. From the conference stage, a plan for a United Nations Development Program (UNDP) or Inter-American Development Bank (IDB) loan for the remaining strategy can be developed. This conforms with Recommendation No. 1 of the Zoonoses Section in the Report of the Meeting of Ministers of Health, August 1968, held at Buenos Aires. This may require a rearrangement of the Center's priorities for meetings already in the planning stage.

- 4.15.3. The Committee encouraged the Center to push forward with the standardization of brucellosis diagnostic antigens and sera and vaccines for use in production of reagents and their distribution, and this recommendation is in accord with Recommendation No. 2, Zoonoses, of the Report of the Ministers of Health, 1968.
- 4.16. The Committee encouraged the Center to assist each country in establishing a system supported by legislation for the quality control of brucellosis vaccines produced in national laboratories, and this is in conformity with Recommendation No. 3, Zoonoses, of the Report of the Ministers of Health, 1968.

5. Tuberculosis Program

The Committee is pleased that a consultant is coordinating the Center's activities in regard to tuberculosis.

- 5.1. We recognize that the international meeting on tuberculosis control could not be carried out during 1969 as recommended in last year's report. However, it is urged that this meeting be held as soon as possible in 1970. The purpose of the meeting would be to encourage national programs on bovine tuberculosis and to review the items identified in the Committee recommendations made in both the 1967 and 1968 reports, with special emphasis on the need for biostatistical analysis on prevalence and types of the disease before national programs are begun.

The purpose of the meeting would also be to review the Recommendations of the Special Meeting of the Ministers of Health of the Americas, Final Report, 14-18 October 1968*, to assess the magnitude

-
- *"1. That the Government implement programs to control and/or eradicate bovine tuberculosis in accord with the human and economic resources available.
2. That for the planning, execution, and future financing of these programs, use be made of the experience gained in countries which have developed control programs, as well as of the collaboration of the Pan American Health Organization through the Pan American Zoonoses Center.
3. That for the development of these programs special attention be given, among other things, to the education and training of personnel; the conduct of surveys to determine the prevalence of the disease; coordination of the activities of the public health and the animal health authorities; the use of approved and uniform tuberculin tests; the elimination of reactors; and economic incentives for producers, which are necessary to obtain their support in the development of these programs."

of the problem; protection of herds and parts of the country free of the disease; eradication of infection in herds and areas with low reactor rates so as to furnish sources of replacement; and control and/or elimination in areas with a high prevalence of disease.

- 5.2. The Center should explore the possibility of having a section in the national Veterinary Public Health Services that would work closely with the Ministers of Agriculture and its animal health services in order to provide for coordinated planning, control and research activities on tuberculosis control.
- 5.3. The Center should collaborate with countries in the formulation of their plans, and this should be on a continuing basis in regard to tuberculosis control. In addition to participation in the planning, they should continue to train personnel and to develop techniques during the operational phases of the tuberculosis control programs. Countries should be urged that, where necessary, they secure loans from the international lending agencies for tuberculosis control as recommended under the section of zoonoses of the final report of the Special Meeting of Ministers of Health of the Americas, 14-18 October 1968.*
- 5.4. In order to coordinate activities between countries on tuberculosis control, the Center should recommend that they group together where it is to their mutual benefit to establish uniform procedures to protect against the spread of tuberculosis among them, as recommended by the above-mentioned report.
- 5.5. It has been brought to the Committee's attention that some countries may be considering the use of isoniazide as a means of controlling the disease in infected herds of cattle. The Committee recommends caution of this use because such animals could continue to excrete tubercle bacilli and therefore would be carriers that would not react to tuberculin tests.
- 5.6. The Committee recognizes the need for standardization of tuberculosis biologic reagents and strongly recommends this procedure be pursued with expediency. Immediate consideration should be given to standardization of tuberculin. A pilot plant should be designed and developed within the Center to standardize biologic reagents and to provide training in this field so important to disease control in Latin America.

* "That countries should formulate plans of a permanent and continuing nature for the control of the major zoonoses and that, where necessary, they seek loan funds from the international lending agencies. In this planning and development process the countries are urged to make maximum use of the facilities and services of the Pan American Zoonoses Center, first in the planning and later in the training of personnel and in the development of techniques during the operational phases."

6. Food Hygiene Program

- 6.1. The number and frequency of food-borne infections and intoxications have increased markedly in recent years, causing major concern among health authorities.
- 6.2. There are many reasons to presume that the occurrence of food-borne diseases will continue to increase through rapid urbanization, modifications in food habits, modern transportation, and increase in international travel. Also, the mass processing and rapid distribution of foods, especially in international commerce, are all factors which might affect the incidence of food-borne diseases in Latin America.
- 6.3. The Committee expresses its pleasure with the efforts of the Center to promote studies in food microbiology and with the recruitment of a consultant in this field.
- 6.4. The aim of the Center's activities in this field should be to serve as the source of technical advice and training. Food hygiene includes problems of microbiology, technology, toxicology, preservation, and other features of food safety and quality in the chain of production and processing from the source to the consumer.
- 6.5. The technical aspects of food hygiene have been covered and are under continuous review by expert groups of WHO and FAO, and these groups and resultant publications should serve as guides to activities to be developed by the Center. Coordination of efforts should be made with other institutions and activities involving food hygiene in the South American Continent.
- 6.6. Since the overall problem of food hygiene is large in scope and involves important economic and public health considerations, it is hoped that adequate financial and personnel resources will be sought and made available to cope with the responsibilities involved.
- 6.7. It is realized that with only one technical officer at present on the Center's staff, a very limited amount of work can be undertaken, selected from the variety of technical and advisory responsibilities mentioned above. Priority at this stage should be given to microbiological aspects, to the establishment of microbiologically-oriented laboratory procedures and to defined investigations such as sources and means of reducing microbial contamination in abattoirs and in meat and milk-processing plants. Improvement of statistical information on food-borne outbreaks and their causes should be developed.
- 6.8. The Committee approves the research projects of the Center on Salmonella as described.

- 6.9. It is recommended that a consultant be appointed to provide knowledge on industrial food hygiene problems in South America.

7. Training

The Committee notes that the Center's training program continues to be one of its most important activities. Priority is being given to laboratory and other courses in areas of high demand and need such as rabies, brucellosis, and laboratory animal medicine. Several courses have been offered at the specific request of the governments.

Efforts are being made to evaluate the effectiveness of the Center's training. In particular the subsequent application of the trainee's new knowledge to his future work indicates that the majority of trainees and the official services of their countries are profiting from the training being offered.

The Committee urges that efforts to improve the present system of training and evaluation continue and reiterates the importance of continuing reassessment of priorities to be applied to future training activities.

8. Laboratory Animals

An attempt has been made to improve the production of laboratory animals, but no substantial progress was achieved in view of the limitation of physical facilities. The Committee reiterates, therefore, the recommendation for the improvement and increase in space for the expansion of laboratory animal colonies, particularly mice, as stated in the 1968 report.

9. Leptospirosis

The survey of leptospirosis in wildlife continues and at its present level does not represent a greater strain on the Center's resources than the results warrant. The distribution of reagents to countries helps relations between those countries and the Center, and is more valuable to the Center. The Committee recommends that this program should be maintained on its present basis.

10. Anthrax

The Committee recommended last year that in due course a surveillance program should be undertaken. This, however, depends on the availability of staff and facilities.

11. Epidemiology

The activities of the staff in this area have been directed almost entirely at studies on rabies, and there has been no action of note in relation to the other areas of activity of the Center. Training

courses in epidemiology have been recommended but could not take place because of budget limitations. It is hoped that once the staff of this section has reached full strength, the possibility of additional courses will be reconsidered.

The Committee strongly recommended the establishment of an additional cattle identification system and a reporting procedure through the national meat inspection system and personnel at the time of slaughter, in order to help in reporting prevalence of brucellosis, tuberculosis, and other animal diseases. The Committee recommends that the Center propose to countries that they establish a National Identification System of animals which would lead to improved reporting of morbidity and mortality in their countries.

12. Biological Reagents

The provision of a service of this kind to countries is a valuable part of the Center's activities. The Committee considers that the scheme as suggested by the consultant should be the goal towards which the Center should work. Its implementation should be phased to the development of the proper facilities and recruitment of staff.

13. Physical Facilities

The Center is rapidly acquiring an international reputation as a World Center for Zoonoses Research. This role - and the very important services rendered to the countries of the Western Hemisphere - cannot be maintained adequately in the present confined physical facilities.

For the immediate future, the needs might be met by construction of new pre-fabricated separate units on the grounds of the building in which the Center is now located.

14. General

Two recent developments are noted because of their potential importance as possible zoonoses problems. It is recognized that the already heavy workload of the Center does not permit specific attention to these developments at this time, but their significance should be kept in mind should further findings materialize during the course of the year.

1) Recent research has added considerably to the evidence of close serological relationships between some animal and human influenza strains. In order to clarify further the possible importance of animal influenza on the epidemiology of human influenza, isolations

of avian, equine and porcine influenza strains should be sought and sent for analysis to the World Influenza Center in London. Technical guidance on this problem is available from the Veterinary Public Health unit of WHO.

2) Several animal leukemias and sarcomas are now known to be caused by viruses (e.g., mouse, avian, cat) or other transmissible agents. These agents can cross species barriers under experimental conditions. It is important to keep in mind the possibility of human infection from animals with respect to such agents, and the important public health implications that would arise if evidence accrues linking animal neoplasms to human disease. Attention to this problem is being given in technically advanced countries, and this work should be followed closely by the Center's staff.

15. Biohazards Control

The Committee draws the Director's attention to a manual on biohazards and their control, prepared by the National Institutes of Health of the United States Public Health Service. The Committee suggests that these guidelines be followed whenever possible for the protection and training of personnel, and that the Director with the aid of his staff prepare an outline report for the next Committee meeting as regards any deficiencies existing in the Center's laboratories relative to Biohazards.

16. The Committee urgently recommends that the financing requested by the Center in Buenos Aires from UNDP be given the highest priority to ensure continuation of its current program at the planned level. If the Center fails to obtain appropriate support, zoonoses control in Latin America would be seriously affected. It is hoped, on the contrary, that appropriate financing will be provided not only to assure the continuation of the present program, but also to expand the activities of the Center and therefore increase the services rendered to countries throughout the entire Hemisphere.

ANNEX I

International Veterinary Service Corps

The concept of international voluntary service for medical, agricultural and other technically trained personnel has been accepted by young people throughout the world and has received the endorsement of many governments, international agencies and private foundations.

A plan for an international veterinary service corps was unanimously approved at the 1968 International Congress in Edinburgh of the International Veterinary Students Association. It is anticipated that some European countries will support limited activities in this area in the near future. In light of these developments and the fact that a proposal for establishment of a multi-disciplinary volunteer service corps is now before the appropriate bodies of the United Nations, this Committee encourages this development and suggests that the PAHO/FMD Center explore the possible use of young international veterinary volunteers in the development of animal disease control programs. Benefits may be gained with this group in the undertaking of special epidemiological investigations or surveillance activities which are basic to the inauguration of control programs and which national veterinary services of some countries might not be adequately staffed to perform. It is well realized by us that there would be many difficulties in the implementation of this use of international personnel in some countries, but the idealism and compassion of a sizeable proportion of young veterinary medical students and graduates which is documented for many countries should be recognized and encouraged and, if possible, drawn upon in the Pan American Foot-and-Mouth Disease Control Programs if requested by the country involved.

ANNEX II

Pilot Regional Comparison Area

Basic to the promotion and development of adequate and accurate animal disease reporting, especially FMD, is the amplification of veterinary animal health services within the countries of Latin America. To achieve this goal, scientific maturity of veterinary medical personnel can be accomplished only through education and experience. To provide training adequate to meet the responsibilities of the trainee, objectives dealing with the teaching process and objectives dealing with structure must first be determined. Performance criteria for evaluating the learning process must also be stated.

Relative to the objectives of the structure, the Committee recommends that a Pilot Regional Comparison Area be designed and developed. The significance of this Area to the training is to have available an area with animal populations, veterinary medical service personnel and cooperative local residents in which to permit the trainee to design, develop and administer an animal health program and disease reporting system.

Two areas suggested for the sites are:

- 1) Argentina
- 2) Rio Grande do Sul, Brazil.

The staff of the Pan American FMD Center and Pan American Zoonoses Center will be directing these programs with assistance from other staff members of VMS/PAHO.

The beginning program to be launched in the Pilot Regional Comparison Area is outlined in Annex II.A.

ANNEX II.A.

STUDY GROUP ON FORMULATION, ADMINISTRATION AND EVALUATION OF ANIMAL HEALTH PROJECTS

1. The Problem

The Governments of the Americas, aware of the great losses occasioned by animal diseases, have decided to strengthen health campaigns aimed at significantly reducing the adverse economic effects of such diseases. At the same time, the Inter-American Development Bank, at the request of the Governments, has decided to provide the necessary technical and financial aid. To this end it has already granted several loans and is in the process of studying others.

This growing interest on the part of the Governments and the IDB makes necessary the use of planning in conducting the campaign against animal disease. Planning, in turn, calls for the formulation of animal health programs covering increasingly larger geographic areas which include not just one, but many, of the Latin American nations. It will be necessary to develop extremely complex programs, sufficiently flexible to be applicable in such geographically, socially, and culturally dissimilar areas as the Argentine Pampa, the subtropical regions of the hemisphere and the Andean foothills. Moreover, these programs should be closely connected with, and represent an integral part of, the national development plans which the countries of Latin America are either preparing or implementing. Finally, they should effectively contribute to integration efforts being made at the regional and the Andean subregion levels.

Programs of this nature require well-trained, professional personnel during all of their phases - from planning, through implementation, to evaluation. They call for a knowledge of disciplines that are not included in the curricula of schools of veterinary medicine. Veterinarians of health and animal health services who will be responsible for the campaign against animal diseases will, therefore, have to possess the knowledge necessary to meet this challenge.

For these reasons, it is considered imperative to complement the training of veterinary medical officers with instruction in certain aspects of economic development planning, placing special emphasis on those relating to livestock health. Veterinarians will thus become active disseminators of the technical knowledge and ideas needed to help overcome the problems of underdevelopment in the countries of the Americas.

The basic objective of the present project is to propose a system of training for veterinary medical officers which will fit them for their new role. The system would consist in carefully selecting a limited number of veterinarians to receive basic training in several disciplines which are fundamental to the analysis of economic development. After this basic training, the veterinarians, in cooperation with one or two economists, would analyze and evaluate some of the animal health programs

conducted in the countries of the Region. Lastly, they would be asked to formulate a specific animal health program for a given geographic area.

A training program, as described, would produce, within a short period of time, the first group of professional planner-evaluators required for foot-and-mouth disease control. The experience obtained in this first teaching cycle would provide guidelines for future training, and would make possible the compilation of teaching materials for intensified theoretical and practical training in these subjects.

2. Project Objectives

- 2.1 To teach the modern concepts of economic and social development and the techniques of development planning.
- 2.2 To acquaint veterinary medical officers with up-to-date methods of planning and administering animal health programs, through theoretical and practical training.
- 2.3 To disseminate these techniques and facilitate an exchange of information and experience on these matters within the context of economic development at the health level.
- 2.4 To analyze existing animal health programs in the Americas, and on the basis of these studies, to draw up a system and methodology which will facilitate the improvement of the future training courses for specialists in the formulation, administration, and evaluation of animal health programs, particularly from the standpoint of economic justification.
- 2.5 To collect data and prepare the teaching material necessary for developing future training programs.

3. Participants

- 3.1 One course coordinator.
- 3.2 Ten participants, veterinary medical officers from the governmental services of various countries of the Americas, with sufficient ability and experience in animal health programs, and who are now engaged in, or will in the future engage in, planning and evaluation work in these services.
- 3.3 Experts from the Pan American Zoonoses and Foot-and-Mouth Disease Centers.
- 3.4 Consultants from the Latin American Institute for Economic and Social Planning (ILPES) and the Pan American Health Planning Program.

3.5 Additional consultants.

Members of the last three groups will participate on the dates and for the lengths of time to be established at a later date.

4. Duration and Site

4.1 Approximately nine months

4.2 Pan American Zoonoses Center.

4.3 Geographic demonstration areas. Among others, the following may be considered:

Brazil: Rio Grande do Sul, for foot-and-mouth disease.

Argentina: Santa Fe Province Center for brucellosis and tuberculosis.

Patagonia, for hydatidosis.

Northern provinces, for paralytic rabies.

Mesopotamian area, for ticks, etc.

Peru: Central sierra, for parasitic diseases.

It will be necessary to obtain authorization from the respective countries to employ their resources and to utilize the necessary information.

5. The work of the study group will be divided into four parts: the first and second will consist of classroom theory, the third of group work, and the fourth of team work.

5.1 First part: This phase will last eight weeks and will be devoted to teaching basic concepts of economic policy, public administration, development theory, etc., under the program given below. During the first four weeks, the following subjects will be taught:

5.1.1 National Accounting: Basic concepts of the formulation and utilization of national accounts. Methodology for establishing indices of economic development.

5.1.2 Economic Analysis: Basic concepts of economic theory: the main macroeconomic variables. Elements of microeconomics. Income distribution.

- 5.1.3 Theory and Sociology of Development: Political and institutional characteristics of the development process. The role of social groups. Economic development as a process of social change. Theory of social change in Latin America, its limitations and advantages.
- 5.1.4 Administration: General concepts. Principles of general administration. Theory of decision-making. Elements of public and health administration.
- 5.1.5 Statistics: Guidelines for reaching a certain operational level and for establishing efficient working relations between statisticians and economists. Analysis and interpretation of the more important indices.

During the subsequent four weeks, the following subjects will be taught.

- 5.1.6 Economic Policy: Outline of the process of political and social decision-making which leads to a definition of objectives and the selection of instruments used in economic policy, as well as their application.
- 5.1.7 Planning Theory and Practice: General planning. Instruments most commonly used in planning. Analysis and instruments of economic policy, especially in development financing.
- 5.1.8 Public Sector Planning: The role of the public sector. Indirect and direct activities. Financing and allocation of resources. Program budgeting. Health service planning.
- 5.1.9 Project Formulation and Evaluation: Various aspects relating to the formulation and evaluation of economic development projects conceived as concrete expressions of development plans.

5.2 Second Part (two weeks). This phase will include subjects specifically related to the agricultural and livestock sectors. At the end of this phase each participant will carry out an identification exercise in which he will relate the subjects studied to the situation existing in his own country.

5.2.1 There will be lectures on the following aspects:

- Economic and social problems of the Latin American rural community.

- Agrarian reform and planning of the agrarian sector.
- Economic and health problems of the Latin American livestock industry.
- Livestock programs and animal health planning.
- Livestock development and its importance to public health.

5.2.2 Identification exercise: Each participant will prepare a monograph relating the subjects mentioned above to the situation in his country.

5.3 Third Part (twelve weeks). In this phase, the participants will work as a group and will make a detailed analysis of existing animal health projects in their countries; the analysis will include a critical appraisal of these projects in relation to the objectives of national development (attention will be concentrated on foot-and-mouth disease projects).

In addition, the participants will broaden their knowledge of the theoretical concepts of project formulation and evaluation by applying these concepts to an analysis of animal health projects.

Special consideration will be given to the following points:

- Location of the project within the development planning process of the country.

- Project engineering:

- Technical aspects
- Epidemiology
- Institutional aspects
- Legal instruments
- Operational methods
- Utilization and training of personnel
- Education and communications
- Technical assistance
- Multinational aspects
- Economic justification
- Evaluation.

- Economic and financial feasibility: cost-benefit analysis.
- Project funding: internal and external financing.

- 5.4 Fourth Part (fourteen weeks). This phase will consist of exercises in formulating projects for particular geographic areas and specific fields of animal health. Teams of two or three participants will be formed for this purpose under the supervision of the coordinator. These teams will travel to predetermined areas where they will make a study of the situation, collect the necessary basic data, and formulate a project. These projects will be subsequently analyzed by the entire group with the participation of experienced planners.

All the material collected, as well as the experience gained, will be utilized as teaching elements in preparing future courses.

6. Required Resources

- 6.1 An economist specializing in economic development, with sufficient experience in teaching, as well as in the practice of his specialization, will be required to teach the subjects indicated in item 5.1. In addition to teaching the subjects indicated, he will act as course coordinator. In the future, this expert could act as consultant economist for these programs.

The teaching of the subjects mentioned in item 5.2 will require inviting specialized lecturers, who could be selected with assistance from ILPES. For the broader study of the theoretical concepts of project formulation indicated in item 5.3, the services of the coordinator will be utilized. The latter may be supported by a project analyst for a period of eight weeks.

7. Other Requirements.

- 7.1 Administrative services, including secretarial services, personnel and equipment for document reproduction, library facilities, and files.
- 7.2 Cooperation of the governmental services involved in the projects under study, including a means for gaining ready access to required data; and
- 7.3 Cooperation of the planning services and other public services engaged in project analysis.

8. Schedule of Activities

- 8.1 Appointment, contracting, and assumption of duties by the coordinator.

- 8.2 Selection and appointment of the technicians and consultants who will participate in the seminar.
- 8.3 Preparation of the work plan.
- 8.4 Selection of the participants.
- 8.5 Preliminary organization and establishment of the Study Group.
- 8.6 Conduct of the study.

ANNEX III

SUGGESTED ITEMS FOR FUTURE RESEARCH

For the Pan American Foot-and-Mouth Disease Center

1. Production of immunity in young stock

- Dosage of vaccine (N.S. Muntiu's work)
- Immunization schedule

This is suggested since the main problem in FMD in cattle-raising is the outbreak in young stock moved for fattening at 10-12 months. There appears to be great difficulty in protecting against the virus to which they are exposed when they reach the fattening area or in transit.

2. Investigation in detail of vaccine breakdowns

- Antigenic sub-type involved
- Possible differences in pathogenicity for different ages of stock

This is related to problem 1 above and would follow if immunization of young stock is shown to be adequate against laboratory challenge.

3. Make a start toward comparing Lucam's K value with mouse protection and serum neutralization in TC and on guinea pigs.

4. In some diseases, mainly respiratory, the role of local antibody is being explored, especially in relation to immunity. It is suggested that this be explored in relation to FMD.

5. Some attempt should be made to find virus mutants which could have the final assembly of virus particles blocked so that incomplete antigens might accumulate to quantities far beyond those at the end of a normal cycle. Temperature shift of mutants or application of certain metabolic inhibitors near the end of the cycle might be helpful.

For the Pan American Zoonoses Center

1. Examination of milk samples for tubercle bacilli should be pursued.

2. Tuberculin testing of cattle. A comparison of some different techniques using tuberculin in PPD and correlation of test results with post mortem findings.

3. Ribi vaccine to be used in tuberculosis control.

LIBRARY
PAN AMERICAN ENTOMOLOGICAL BUREAU
WASHINGTON, D.C.