CURRENT PAHO RESEARCH ACTIVITIES IN ARTHROPOD-BORNE VIRUS DISEASES

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Through the Office of Research Coordination, the Pan American Health Organization began inquiry in 1962 into its possible role in arthropod-borne virus research in Latin America. Drs. W.C. Reeves of the University of California and William F. Scherer, then with the University of Minnesota, acting as PAHO Consultants, were asked to survey research and research needs in arthropod-borne virus diseases in Latin America. The report of that effort during April and May 1962 was submitted to the PAHO/ACMR at its first meeting (RES 1/9).

Among the recommendations in report RES 1/9 was the development of a regional reference and training center in São Paulo, Brazil, in collaboration with the Instituto Adolfo Lutz and the School of Hygiene and Public Health of the University of São Paulo. Eight reasons were given for its establishment there, as follows:

1) São Paulo is centrally located in South America;
2) the Instituto Adolfo Lutz has an excellently equipped and housed virologic research unit and is sympathetic to increased research and service functions;
3) medical entomologic research and teaching in the School of Hygiene and Public Health are active;
4) there are facilities for microbiologic teaching in both the School of Hygiene and Public Health and in the Medical School;
5) there are good library facilities;

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6) there is a combined atmosphere of active research and academic programs in virology, entomology and vertebrate zoology;

7) almost all arboviruses currently known in South and Middle America have been recovered at least once in Brazil and thus can be worked with in that country with a minimum of restrictions on importations; and

8) field areas where arthropod-borne viruses are active are readily available within short distances of the city of São Paulo.

During the past year, PAHO has investigated this recommendation further and has found that the Instituto Adolfo Lutz is enthusiastically receptive to this proposal and is willing to allocate space, personnel and items of basic equipment to the Center. Currently, arrangements are being made to establish this Center in conjunction with the WHO Regional Reference Center for Arboviruses at the Communicable Disease Center, Atlanta, Georgia.

A second recommendation made last year concerned collaborative studies in the Amazon Basin to consolidate and gain knowledge of the distribution of arthropod-borne viruses in this area, and especially to facilitate the inevitable movements of human population that will occur in the next century into this area. As a first step toward accomplishing this objective, PAHO is organizing a meeting of arbovirus researchers from ten laboratories bordering the large river basins of Equatorial South America. A one-day meeting will be held in Rio de Janeiro during the Seventh International Congresses on Tropical Medicine and Malaria in September 1963, which will have as its purpose to define problems to be investigated, establish priorities and feasibility, to determine the willingness of laboratories in South America to participate singly or jointly in arbovirus research, and
to explore possible ways that PAHO might foster investigations in this field.

In conjunction with the above Congresses, PAHO is also organizing another more general meeting of arbovirus investigators for the purpose of crystallizing the problems presented by recent epidemics of arbovirus diseases in South America and to determine what can be done to accelerate research leading toward their prevention and control. Within the past few years there have been outbreaks of Venezuelan encephalitis in Panama, Colombia, and Venezuela, Eastern encephalitis in Panama, British Guiana, and Jamaica, yellow fever in Colombia, hemorrhagic fever in Bolivia and Argentina as well as St. Louis encephalitis in the United States. Items for discussion will include identifiable factors that contributed to the recent epidemics and epizootics in the Americas, problems encountered in investigations of these epidemics, questions to be answered in studies of an epidemic and the possible role that PAHO might play to assist in the investigations and control of epidemics and epizootics of arboviruses in the Americas.

Under a grant from the NIH/USPHS, the University of Minnesota and Cornell University Medical College in conjunction with the Mexican Government and PAHO, are carrying out a research training program concerning arthropod-borne viruses in Mexico. The objectives of the program are:

1) To study the interrelationships between arthropod-borne viruses pathogenic for man and migratory birds which are suspected as inter-continental disseminators of virus, and

2) to provide research training for pre-doctoral students and post-doctoral fellows in the field and laboratory aspects of the ecologies of these viruses and their associated avian, mammalian and arthropodal hosts in tropical and temperate zones.
Agreements between the Universities and PAHO and between PAHO and the Government of Mexico provide research training sites in tropical areas of Mexico. Cooperation with Mexican scientific institutions through the facilities of the PAHO currently involves the Instituto Nacional de Virología of Mexico and a co-program director from Cornell University Medical College who is in full-time residence in Mexico. A second six-week Graduate Field Research Course in Virology, Ornithology and Ecology will be given for graduate students from Cornell University and from Mexico during July-August 1963 in Mexico. Since the summer of 1961 and in collaboration with PAHO, the Government of Mexico and Mexican scientists, research on arthropod-borne viruses and related ornithology has been carried out in the field in Mexico and in laboratories of the Instituto Nacional de Virología, of the University of Minnesota and of Cornell University Medical College. Antibodies to St. Louis encephalitis virus in humans and to Eastern and Western encephalitis viruses in large domestic animals have been found along the tropical eastern coast of Mexico, near Veracruz. Also in that location, mosquitoes have yielded a virus in the Bunyamwera group. Thus this international cooperative research and training program endeavors a) to train new personnel who can bring together laboratory and field aspects of virology and zoology, b) to define existing and potential arthropod-borne virus health problems in Mexico, and c) to evaluate the role of migratory birds as inter-continental disseminators of viruses.
SUPPLEMENTARY REPORT ON
ACTIVITIES IN THE FIELD OF ARBOVIRUS DISEASES*

Since the last meeting of the PAHO Advisory Committee on Medical Research various types of arboviruses have been extremely active in two regions of the Continent: the Caribbean area and the pampas and chaco areas of South America.

Mention should be made of the following epidemics in the countries bordering the Caribbean:

(a) The encephalitis epidemic in the Gulf of Tampa, Florida, United States of America, which began in July 1962 and reached its peak in September. It was caused by the St. Louis virus and it is suspected that this virus was also the causal agent of the outbreak that occurred in the autumn of 1959 and 1961. The virus is endemic in this zone.

(b) The outbreak of equine encephalitis in the central region of Panama. Eastern equine encephalitis virus was isolated from the sick animals and serological surveys also incriminate this virus. On the other hand, the virus of Venezuelan equine encephalitis was isolated in the same region in the serum of several febrile patients, and the presence of St. Louis virus was confirmed in the blood of wild birds.

(c) The encephalitis epidemics in the state of Zulia in Venezuela and in the neighboring peninsula of Guajira in Colombia which,

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from October 1962 onwards, caused about 10,000 human cases (with a mortality rate of slightly under 1%) simultaneously with an equine epizootic with a high mortality. To date, only the etiological significance of the Venezuelan virus has been demonstrated in this epidemic. The National Institute of Health in Colombia, assisted by PAHO, isolated and identified 14 strains of human origin.

(d) The equine encephalitis epizootic in Jamaica which began in the early part of November 1962 causing deaths in 70 animals in a small area in the southeast of the island. In December, towards the end of the epizootic, there were also 11 human cases of which nine were fatal. A PAHO consultant cooperated with the health authorities of Jamaica in appraising the situation. The Eastern equine encephalitis virus, which had not before been found in this island, was identified as the etiological agent.

These epidemics are a clear indication of an increase in the transmission of viruses causing encephalitis in the Caribbean and also in the southeastern part of the United States. Three different arboviruses have been involved in their etiology. There was also an increase in the incidence of jungle yellow fever, the highest for five years, in Colombia; 28 of the 30 cases occurred in the southern part of the Magdalena River. PAHO assisted and helped to coordinate the recent trip that the Director of the WHO International Arbovirus Reference Center in Atlanta, Georgia, made through the Caribbean region in order to get in touch with research workers and to gain a direct knowledge of the ecology of the zone.
Epidemics of hemorrhagic fever in two areas in the southern part of South America also called for the cooperation of PAHO.

(a) From 1943 onwards an epidemic disease has been occurring predominantly in the autumn and winter in a well-defined area in the northeastern part of the province of Buenos Aires, Argentina. This disease is known as Argentinian hemorrhagic fever or "mal de los rastrojos". The disease mainly afflicts the migrant day laborers working in the maize harvest. Since 1958 the disease has assumed epidemic proportions every autumn with 6 to 20% mortality. In the same year the etiological agent was found to be an arbovirus (Junin virus) which has still to be classified in Casals' antigenic scheme. Microbiological, clinical and epidemiological investigations have clarified only a few aspects of the disease. There are indications that the small mammals that frequent maize fields are a source of the virus, which is probably transmitted by mites, but no effective means of control has as yet been found. In August and September 1962 a PAHO consultant visited the epidemic zone and the laboratories working on this problem and discussed with Argentine investigators and health authorities certain little known aspects of the ecology of the disease and made recommendations for further research.

(b) A clinically similar disease, also in epidemic form and also occurring in autumn and winter, occurred in the northeastern part of Bolivia (in the Beni department) in 1959. It is known
that there were 362 cases and 120 deaths between September 1959 and May 1962. Immediately after the epidemic in 1962, which was more intense than the earlier ones, the investigators of the National Institutes of Health, USPHS, made a survey of the affected area and found Junin virus antibodies in the serum of persons convalescing from the disease. In 1963, a cooperative program has been set up between the Bolivian Government and the National Institutes of Health, USPHS, with PAHO acting as the coordinating agency. As provided for in this program, studies on the etiology, epidemiology and ecology of hemorrhagic fever in Bolivia are actively progressing during the current epidemic season.

As pointed out in Dr. W.F. Scherer's report the problems which have arisen in the study of this and other arbovirus epidemics will be discussed at the meetings on arbovirus which PAHO is organizing in conjunction with the VII International Congresses on Tropical Medicine and Malaria in Rio de Janeiro, September 1963.

Proposal for the Establishment of an Arbovirus Reference Center in South America

In accordance with the recommendation made by this Advisory Committee at its meeting held in June 1962 the Office of Research Coordination is exploring the possibility of establishing a regional arbovirus reference and training center in São Paulo, Brazil, with the collaboration of the Adolfo Lutz Institute and the School of Hygiene and
Public Health of the University of São Paulo. These institutions have expressed their interest in establishing a laboratory which would be for reference functions, virological and entomological consultations, cooperation in field studies as well as training. It would serve the eight southern countries of South America (Brazil, Paraguay, Uruguay, Argentina, Chile, Bolivia, Peru, and Ecuador). It would act as a sub-center of the WHO Regional Reference Center for the Americas which is situated in the Communicable Disease Center, Atlanta, Georgia, U.S.A. This laboratory would function as a unit physically independent of the present arbovirus research laboratories at the Adolfo Lutz Institute. The laboratory has all the equipment, facilities, and most of the personnel required for meeting the above-mentioned responsibility.

Contributions to Information Exchange

PAHO has regularly contributed to the Information Exchange on Arthropod-borne Viruses and has provided information relating to its activities in this field.