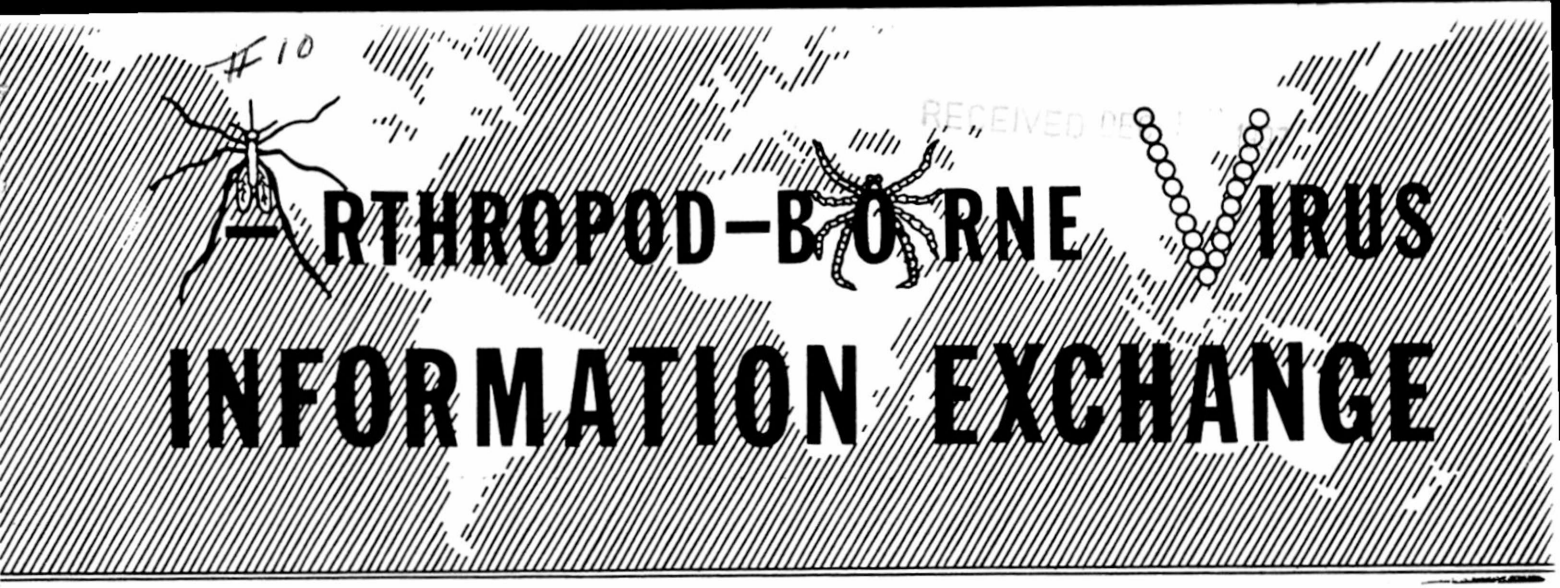

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December 1997

The Arbovirus Information Exchange is a newsletter prepared under the auspices of the Subcommittee on Information Exchange (Nick Karabatsos, Chairman), American Committee on Arthropod-borne Viruses. Printing and mailing costs of the Arbovirus Information Exchange are paid by tbe Division of Vector-Borne Infectious Diseases, Center for Infectious Diseases, Centers for Disease Control and Prevention, Fort Collins, Colorado,USA. The purpose of the Arbovirus Information Exchange is the timely trade of information. Recipients are those who study various aspects of arbovirology. The Arbovirus Information Exchange contains preliminary reports, summaries, observations, and comments submitted voluntarily by qualified agencies and individual investigators. The appearance in the Arbovirus Information Exchange of any information, data, opinions, or views does not constitute formal publication and should not be referred to in "Reference" sections of papers or included in lists of publications. The Arbovirus Information Exchange is not a "peer reviewed" publication; in fact, it is not a publication at all. Any reference to or quotation of any part of the Arbovirus Information Exchange must be authorized directly by the agency or person submitting the text. Reports need not be in manuscript style, the results do not have to be definitive, and you need not include tables (unless you want to). The intent is to communicate among ourselves and to let others know what we are doing.

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CARLOS SANMARTIN-BARBERI (1922-1996)

"I want my body buried directly in the land, without a coffin and just wrapped in a shroud. I want to rapidly become integrated back to prime and nutritious mother. I would like to blossom in the world of beautiful flowers that decorate it, to re-emerge in the pastures of the prairies, in all that world of hidden flora and fauna, always and forever active and fascinating. I have three wonderful sons and two beautiful grandchildren and I hope that they will keep a graceful memory of me. I feel my self perpetuated in them; and I trust that they will give birth to new generations that will keep a little something from what I was, in order not to disappear completely from this world."

This is a paragraph taken from a letter left by Dr. Carlos Sanmartin to his youngest brother Roberto, several months before he died. These words give a picture of the interesting personality of this Colombian scientist, who was born in Bogota on April 12, 1922 and died also in Bogota on December 6, 1996. In addition to his wife Clara and his three sons Jaime, Mauricio and Diego, he had three sisters and two brothers with whom he shared a special sense of humor in analyzing human behavior. Being a descendent of an illustrious Colombian family with well known medical doctors, he graduated from the Universidad Nacional de Colombia Medical School in 1948. After the year of obligatory social service as a rural doctor he was granted a fellowship at the London School of Tropical Medicine and Hygiene where he obtained a Diploma in 1950. His professional career was sealed by his innate faculties and his clear inclinations to Public Health, in particular to all those illnesses currently called "emerging diseases". After his return from England, he served in a number of important national and international positions.

From 1950-1953 he worked at the "Instituto Carlos Finlay" in Bogota; there his responsibilities included the preparation of the yellow fever vaccine that was distributed in Colombia and other countries in Latin America and Africa. At that time, in collaboration with Drs. Hernando Groot and Ernesto Osorno, he showed that the Venezuelan equine encephalitis (VEE) virus was capable of causing human epidemics under natural conditions, during an outbreak in Espinal, a municipality of the Tolima Department of Colombia. He then worked for two years with Dr. Max Theiler at The Rockefeller Foundation Virus Laboratories in New York and with Dr. Wilbur G. Downs at the Foundation's Trinidad Regional Virus Laboratory in Port of Spain. In 1955 he returned to Colombia as Professor of Virology and Preventive Medicine at the Universidad del Valle Medical School until 1973. During this period, he continued his collaboration with the Rockefeller Foundation and established the field station of Rio Raposo in the jungles of the Colombian Pacific Coast where he isolated a number of new arboviruses. He thoroughly described, for the first time in Colombia, an epizootic and epidemic of VEE virus that took place in the surroundings of Cali in 1967, showing the key role of horses in spreading this virus. With Dr. Harold Trapido, he also described Pichinde virus, the first arenavirus isolated in Colombia. He was Lecturer of the Slovak Academy of Sciences at Smolenice in 1966; and in 1972 he delivered the thirty-seventh Annual Charles Franklin Craig Lecture for the American Society of Tropical Medicine and Hygiene with the provocative title, "Epidemiological Experiences in Over-developed Sub-countries". In this lecture, Dr. Sanmartin criticized in his particular style the waste of premature introduction of high-technology, based on the purchase of very sophisticated and expensive equipment, never properly utilized, in those areas

of the world where the basic conditions of social and economic structures are still years behind.

Subsequently, he was a consultant in the epidemiology of viral diseases for the Pan American Health Organization (PAHO). Carlos spent three years at the "Centro Panamericano de Zoonosis" in Buenos Aires, Argentina until 1976 and then six years with PAHO in Caracas, Venezuela until 1982. During his appointment, he was an Honorary Member of the Conference of Public Health Laboratory Directors in Washington, DC. Finally he returned to his country as Director of the Colombian National Institute of Health, became part-time Professor of Tropical Medicine at the Universidad Nacional de Colombia and an Honorary Member of the Colombian National Academy of Medicine. He was a long-time member of the American Society of Tropical Medicine and Hygiene.

Using his own words, Carlos Sanmartin believed that this is a wonderful world to which he felt proud to have been part of because he enjoyed some of its wonderful things like Love, Music, Art, sincere friendship, and especially the grandiosity of the tropical forest. Carlos was my professor and friend; he had a captivating personality; he was a unique character and a great man whose death prompted sorrow in all of his family and among his selected friends.

Jorge Boshell, M.D.
Instituto Nacional de Salud
Santa Fe de Bogota, Colombia

Last year Charlie Calisher began a new feature in the Arbovirus Information Exchange - the commemoration - in which he decided to run one or two of the reports from old issues of the newsletter. I found these to be quite enjoyable to read and am trying to continue this feature. I've had fun browsing through the back issues of the Arbovirus Information Exchange while searching for reports to reprint, and especially liked reading the Introductory Notes from the Sub-Committee on Information Exchange from the early issues. These Introductory Notes provide a nice historical perspective on the ACAV and the Subcommittee itself, so I have selected these as the commemorative reports to place in the next two issues of the Arbovirus Information Exchange. The Introductory Notes from the first three issues are included here, and next June I will print the notes from issues 4 and 5. I think you will find them interesting to read.

I'd like to remind everyone that they are encouraged to submit a report - at least once every two years. Reports can consist of brief summaries or preliminary data.

I'd also like to thank people for submitting their reports electronically. In this issue, all but one of the reports were submitted either by e-mail or on a computer diskette. This has been working quite well, saves postage costs, and allows us to post the reports on our website. As a reminder, the home page for the Arbovirus Information Exchange can be found at the following address: http://www.utmb.edu/ctd/arbovirus.

Laura J. Chandler
Editor

INSTRUCTIONS FOR SUBMITTING REPORTS: **PLEASE** follow these instructions for submitting reports. We want to keep this mechanism timely and viable. Therefore, submit only recent news and summaries of your work. **PLEASE** limit the submission to 1 or a very few sheets (21.59 cm x 27.94 cm = 8.5 x 11 inches) plus a table or two; condense as much as you can (**single space** the text; double-spaced pages take twice as much space as single-spaced pages); **do not** staple pages together; **do not** number pages.

I prefer to receive reports electronically, in WordPerfect or Microsoft Word. Rich Text or ASCII text formats are also acceptable. Either Macintosh or DOS/Windows based documents are acceptable. (Be sure to indicate which format you have used). If you have access to e-mail, your reports may be sent to me at:

`lchandle@marlin.utmb.edu` *or* `laura.chandler@utmb.edu`

If submitting by e-mail, attach the report as a document to your e-mail message. If you like, you may also send your report on a computer disk. Printed reports and reports on computer disks may be mailed to me at the address below.

All submissions received electronically (either by e-mail or on a computer disk) will be posted on the website. Reports received only as printed documents (not submitted electronically or on a disk) will **not** be posted on the website. Please feel free to make any suggestions for improvements or changes on the website. If you have interesting hyperlinks, photographs or other materials you would like to see placed on our home page, feel free to let me know (by e-mail please) and we will add them to the site.

If sending reports by mail, please use this address:

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You may also send reports by FAX to: 409-747-2437

Previous Editors of the Arbovirus Information Exchange

Telford H. Work 1960-1972

Roy W. Chamberlain 1972-1981

W. Adrian Chappell 1981-1984

Barry R. Miller 1984-1989

Charles H. Calisher 1989-1996

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en coopération
ORSTOM
Dakar et Paris

CRORA report on the WEB

During January 1998 an interactive report from CRORA,Pasteur Institute of Dakar,will be installed on the WEB:
Pasteur Institute of Paris http://www.pasteur.fr./Bio/CRORA/
ORSTOM Paris http://www.orstom.fr./CRORA/
Pasteur Institute and ORSTOM are associated to collect data and to create this report using HTLM language.
This report involves all the data collected by Pasteur Institute and ORSTOM,since1962,about 5,551 isolated strains of 185 arboviruses or mixed arboviruses.
For each virus,all the observed hosts or vectors are given,with the number of collected strains in each country.
For each host,or vector,the number of collected strains of each virus in all the countries is given.A special listing is given for the viruses isolated from male mosquitoes.
For each country,especially Burkina-Faso,Central African Republic,Ivory Coast,Madagascar,Mali,Mauritania and Senegal,the list of all the isolated viruses is given,with a special mention for the most recent strains.
For all the 5,551 isolated and identified strains,listing give the exact place (latitude and longitude), date of collect and the host (or vector).In this listing,481 strains are connected with their bibliographical data.
For all the viruses,hosts or vectors,and countries,HTLM anchors give the opportunity to have an immediat access to the concerned subject.
These 5,551 viruses identification required about 6,000,000 mosquitoes identified, 150,000 ticks, 600,000 sand flies, 10,000 vertebrates and 5,000 humans to be sampled.
It means also 1,529 indirect immuno fluorescence, 966 fluorescences using monoclonal antibodies,1,815 neutralizations (suckling mice or continuous cells lines) and 3,996 complement fixations.
Twice a year,all these files will be completed with the last virological data from the CRORA or bibliographical ones.

Jean-Pierre DIGOUTTE
INSTITUT PASTEUR

François ADAM
ORSTOM

A SYSTEMATIC LIST OF ARBOVIRUSES IN EUROPE

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All arboviruses registered in the International Catalogue of Arboviruses (1) which have been demonstrated in Europe during the 20th century are reviewed here. In addition, several non-registered arboviruses (marked by an asterisk in the alphabetical list) have been included. The number of 'European' arboviruses, excluding synonymous viruses, stands at *c.* 50 at present (one-tenth of the 492 non-duplicate arthropod-borne viruses of the world registered as of December 1995). For details on history, properties, ecology, epidemiology and distribution maps of these viruses, see a recent monograph (2). The alphabetical list gives standard abbreviations of the viruses according to the Catalogue, common synonyms, and classification into the families, genera and antigenic groups.

Absettarov virus: see CEE virus
African horsesickness virus (AHS) - *Reoviridae: Orbivirus*
African swine fever virus (ASF) - unclassified
Arbia virus (ARB) - *Bunyaviridae: Phlebovirus*
Avalon virus (AVA) - *Bunyaviridae: Nairovirus,* Sakhalin group
Bahig virus (BAH) - *Bunyaviridae: Bunyavirus,* Tete group
Batai virus (BAT) - *Bunyaviridae: Bunyavirus,* Bunyamwera group
Batken virus: see Dhori virus
Bauline virus (BAU) - *Reoviridae: Orbivirus,* Kemerovo group
Bhanja virus (BHA) - *Bunyaviridae:* Bhanja group
Bluetongue virus (BLU) - *Reoviridae: Orbivirus*
Broadhaven virus (BRD): see Cape Wrath virus
Čalovo virus (CVO): see Batai virus
Cape Wrath virus (CW) - *Reoviridae: Orbivirus,* Kemerovo group
Central European encephalitis virus (CEE) - *Flaviviridae: Flavivirus*
Clo Mor virus (CM) - *Bunyaviridae: Nairovirus*, Sakhalin group
Corfou virus (CFU) - *Bunyaviridae: Phlebovirus*
Crimean-Congo hemorrhagic fever virus (CCHF) - *Bunyaviridae: Nairovirus*
Dengue virus (DEN) - *Flaviviridae: Flavivirus*
Dhori virus (DHO) - *Orthomyxoviridae: Acarivirus,* unassigned
Erve virus (ERVE) - *Bunyaviridae: Nairovirus,* Thiafora group
Eyach virus (EYA) - *Reoviridae: Coltivirus*
Grand Arbaud virus (GA) - *Bunyaviridae: Uukuvirus*
Hanzalová virus: see CEE virus
Hypr virus: see CEE virus
Ilesha virus: see BAT virus
Inkoo virus (INK) - *Bunyaviridae: Bunyavirus,* California group

***Kama virus** (KAM) - *Flaviviridae: Flavivirus*
Karelian Fever virus: see Sindbis virus
Kharagysh virus: see Tribeč virus
Kumlinge virus: see CEE virus
Lednice virus (LED) - *Bunyaviridae: Bunyavirus,* Turlock group
Lipovník virus: see Tribeč virus
Louping ill virus (LI) - *Flaviviridae: Flavivirus*
Matruh virus (MTR) - *Bunyaviridae: Bunyavirus,* Tete group
Meaban virus (MEA) - *Flaviviridae: Flavivirus*
Mircha virus: see Tribeč virus
Mykines virus (MYK) - *Reoviridae: Orbivirus,* Kemerovo group
Negishi virus: see louping ill virus
Ockelbo virus: see Sindbis virus
Okhotskiy virus (OKH) - *Reoviridae: Orbivirus*, Kemerovo group
Olyka virus: see Batai virus
Palma virus (PLM) - *Bunyaviridae:* Bhanja group
Paramushir virus: see Avalon virus
Ponteves virus (PTV) - *Bunyaviridae: Uukuvirus*
***Puffin Island virus** (PI) - *Bunyaviridae: Nairovirus*, Hughes group
Radi virus (RADI) - *Rhabdoviridae: Vesiculovirus*
Russian spring-summer encephalitis virus (RSSE) - *Flaviviridae: Flavivirus*
Sandfly fever Naples virus (SFN) - *Bunyaviridae: Phlebovirus*
Sandfly fever Sicilian virus (SFS) - *Bunyaviridae: Phlebovirus*
Sedlec virus (SED) - *Bunyaviridae:* unassigned
Sindbis virus (SIN) - *Togaviridae: Alphavirus*
Snowshoe hare virus (SSH) - *Bunyaviridae: Bunyavirus,* California group
Soldado virus (SOL) - *Bunyaviridae: Nairovirus,* Hughes group
***St. Abb's Head virus** (SAH) - *Bunyaviridae, Uukuvirus*
Ťahyňa virus (TAH) - *Bunyaviridae: Bunyavirus,* California group
Thogoto virus (THO) - *Orthomyxoviridae: Acarivirus,* Thogoto group
Tindholmur virus (TDM) - *Reoviridae: Orbivirus*, Kemerovo group
Toscana virus (TOS) - *Bunyaviridae: Phlebovirus*
Tribeč virus (TRB) - *Reoviridae: Orbivirus,* Kemerovo group
Tyuleniy virus (TYU) - *Flaviviridae: Flavivirus*
Uukuniemi virus (UUK) - *Bunyaviridae: Uukuvirus*
West Nile virus (WN) - *Flaviviridae: Flavivirus*
Wexford virus (WEX): see Cape Wrath virus
Yug Bogdanovac virus (YB) - *Rhabdoviridae: Vesiculovirus*
Zaliv Terpeniya (ZT) - *Bunyaviridae: Uukuvirus*

The arboviruses occurring in Europe belong to six RNA virus families (26 Bunyaviridae, 9 Flaviviridae, 9 Reoviridae, 2 Rhabdoviridae, 2 Orthomyxoviridae, 1 Togaviridae) while the only DNA virus (ASF) has remained unassigned to any family at present. Taxonomy and nomenclature is based on the latest ICTV report (3). It should be noted that binomial, Linnean nomenclature of viruses has not yet been generally adopted by the ICTV although it does work in all other areas of

life science. However, latinized names of viral families and genera have already been accepted. In the survey, 'prototype' is the strain on which the virus type (concept) has been established; it is usually the first isolate of the virus. 'Neotype' is the strain designated as nomenclatural type when the original material is missing. 'Topotype' might be given for particular countries, or as a latter strain from the original country (4).

TOGAVIRIDAE

Sindbis virus - *Alphavirus*
Type species of the genus *Alphavirus;* Western equine encephalitis (WEE) complex. Prototype: EgAr-339 (*Culex univittatus,* Egypt, 1952). European topotype: R-33 (*Acrocephalus scirpaceus*, Slovakia, 1971). Synonyms and subtypes: Babanki (Y-251), Kyzylagach (LEIV-65A), Ockelbo (Edsbyn 5/82) and Karelian fever (LEIV-9298) viruses - the latter two being identical to prototype SIN virus by CFT, HIT and polypeptide composition but distinguishable by PRNT. However, the overall divergence between Ockelbo and EgAr-339 strains is only 6% and 3% in the sequences of nucleotides and amino acids, respectively (5).

FLAVIVIRIDAE

West Nile virus - *Flavivirus*
Japanese encephalitis antigenic complex. Prototype: B-956 (man, Uganda, 1937). Neotype EgAr-101 (man, Egypt, 1950). European topotypes: Sambuc (man, France, 1964); Hp-94 (*Hyalomma marginatum,* S. Russia, 1963).

Dengue virus - *Flavivirus*
Four serotypes of dengue virus comprise a separate Dengue antigenic complex of flaviviruses. Prototype DEN-1: Sabin strain (man, Hawaii, 1944). Not yet isolated in Europe; it occurred in Greece, 1927-28.

Louping ill virus - *Flavivirus*
Tick-borne encephalitis (TBE) antigenic complex. Synonym: Negishi virus (6). Prototype: Moredun LI-31 (sheep, Scotland, 1929). Very closely related to CEE, RSSE and NEG viruses, in fact indistinguishable from them by conventional serology tests.

Central European encephalitis virus - Flavivirus
TBE antigenic complex. Synonyms: Absettarov virus; Hanzalová virus; Hypr virus; Kumlinge virus; Western or European TBE subtype; 'ricinus' TBE subtype. Probable subvarieties of CEE are Spanish sheep encephalitis (SSE), Turkish sheep encephalitis (TSE) and Greek goat encephalitis ('Vergina') viruses. CEE prototype: Stillerová (man, Bohemia, 1950). Neotype: Hypr (man, Moravia, 1953). European topotypes: Minsk-256 (*Ixodes ricinus*, Belarus, 1940), Kumlinge A-52 (*Ixodes ricinus*, Finland, 1959). A nomenclatural confusion around CEE has repeatedly been emphasized (7). CEE is very closely related to LI and RSSE viruses by CFT, IFA, VNT and cross-protection test; the differentiation only possible by unconventional techniques.

Russian spring-summer encephalitis virus - *Flavivirus*

TBE antigenic complex. Synonyms: Eastern TBE subtype; 'persulcatus' TBE subtype. Prototype: Sofyin (man, Far East, 1937). Antigenically very closely related to CEE and LI viruses, indistinguishable by conventional serology and protection tests.

Tyuleniy virus - *Flavivirus*
Tyuleniy antigenic complex. Prototype: LEIV-6C (*Ixodes uriae*, Far East, 1969). European topotype: 'Murman' (*I. uriae*, Kola peninsula, 1967). Related to the Australian Saumarez Reef virus by CFT, VNT and nucleotide sequence of the envelope gene, while less similar to RSSE, WN and Japanese encephalitis viruses by CFT and HIT.

Meaban virus - *Flavivirus*
Tyuleniy antigenic complex. Prototype: Brest/Ar/T707 (*Ornithodoros maritimus*, France, 1981). Close to the Australian Saumarez Reef virus by CFT, HIT and even VNT, while more distantly related to TYU and WN (unrelated by VNT), CEE, RSSE and other flaviviruses.

Kama virus - *Flavivirus*
A non-registered flavivirus, probably of the Tyuleniy antigenic complex. Prototype: LEIV-24077 (*Ixodes lividus*, European Russia, 1990).

BUNYAVIRIDAE

Batai virus - *Bunyavirus*
Bunyamwera antigenic group. Synonyms: Čalovo virus; Olyka virus; Chittoor virus; Ilesha virus. Prototype: AMM-2222 (*Culex gelidus,* Malaysia, 1955). European topotypes: Čalovo-184 (*Anopheles maculipennis*, Slovakia, 1960) and Olyka (*A. maculipennis*, W. Ukraine, 1973). Other topotypes: Chittoor IG-20217 (*Anopheles barbirostris*, India, 1957); Sar MS-50 (*Aedes curtipes*, Sarawak, 1962). Closely related to the African "Beliefe" (UGMP-6830, nonregistered) and Ilesha viruses.

Ťahyňa virus - *Bunyavirus*
California antigenic group, California encephalitis complex, a subtype of California encephalitis virus. Synonym: Lumbo virus. Prototype: Ť-92 (*Aedes caspius*, E. Slovakia, 1958). Closely related to California encephalitis virus, especially to La Crosse and SSH viruses; genetic reassortment with all possible combinations of the three RNA segments has been demonstrated among them and the reassortants can appear during a mixed infection of a vector mosquito.

Snowshoe hare virus - *Bunyavirus*
California antigenic group, California encephalitis complex, a variety of La Crosse virus. Prototype: 'Snowshoe hare original' (*Lepus americanus*, USA, 1959). Very closely related to La Crosse and TAH viruses; genetic reassortment has been demonstrated.

Inkoo virus - *Bunyavirus*
California antigenic group, California encephalitis complex, a subtype of California encephalitis virus. Prototype: KN-3641 (*Aedes communis/punctor*, Finland, 1964). Closely related to Jamestown Canyon, less similar to TAH and SSH viruses.

Bahig virus - *Bunyavirus*
Tete antigenic group. Prototype: EgB-90 (*Oriolus oriolus,* Egypt, 1966). European topotype: ISS.U.45 (*Fringilla montifringilla,* Italy, 1968). Related more to MTR by CFT and HIT (indistinguishable by CFT) than to Tete virus.

Matruh virus - *Bunyavirus*
Tete antigenic group. Prototype: EgAn 1047-61 (*Sylvia curruca*, Egypt, 1961). European topotype: ISS.U.60 (*Fringilla coelebs*, Italy, 1968). Related to BAH virus by CFT and HIT.

Lednice virus - *Bunyavirus*
Turlock antigenic group, the M'Poko antigenic complex. Prototype: 6118 (*Culex modestus*, Moravia, 1963). Antigenically very closely related to African Yaba-1 and M'Poko viruses; distinguishable by PRNT.

Sedlec virus - *Bunyavirus* (?)
An unassigned member of Bunyaviridae, possibly related to Turlock serogroup. Prototype: AV-172 (*Acrocephalus scirpaceus*, Moravia, 1984).

Arbia virus - *Phlebovirus*
Phlebotomus Fever antigenic group. Prototype: ISS.Phl.18 (*Phlebotomus perniciosus*, Italy, 1980). No cross reactions with TOS, SFN or SFS viruses in CFT. Close to Salehabad phlebovirus by CFT but not by VNT.

Corfou virus - *Phlebovirus*
Phlebotomus Fever antigenic group. Prototype: PaAr-814 (*Phlebotomus major*, Greece, 1981). Closely related to SFS virus by CFT, but distinct by PRNT.

Sandfly fever Naples virus - *Phlebovirus*
Phlebotomus Fever antigenic group. Prototype: 'Sabin-Naples' (man, Italy, 1944). Closely related to TOS and Teheran viruses, but not to SFS by CFT and HIT.

Sandfly fever Sicilian virus - *Phlebovirus*
Phlebotomus Fever antigenic group. Prototype: 'Sabin-Sicilian' (man, Sicily, 1943). Antigenically distinct from SFN and other phleboviruses by CFT and HIT.

Toscana virus - *Phlebovirus*
Phlebotomus Fever antigenic group. Prototype: ISS.Phl.3 (*Phlebotomus perniciosus*, Italy, 1971). Antigenically closely related to SFN virus by CFT and HIT but distinguishable by PRNT (SFN antiserum does not neutralize TOS virus).

Grand Arbaud virus - *Uukuvirus (Phlebovirus)*
Uukuniemi antigenic group. Prototype: Argas-2 *(Argas reflexus,* France, 1966). Related to UUK and PTV viruses by CFT.

Ponteves virus - *Uukuvirus (Phlebovirus)*

Uukuniemi antigenic group. Prototype: Larves-6 (*Argas reflexus*, France, 1966). Related to GA virus: one-way reaction in cross-CFT.

Uukuniemi virus - *Uukuvirus (Phlebovirus)*
Uukuniemi antigenic group. Synonyms: Poteplí virus; Sumakh virus. Prototype: S-23 (*Ixodes ricinus,* Finland, 1960). Topotypes: Poteplí PO-63 (*I. ricinus,* Bohemia, 1963), Sumakh (*Turdus merula*, Azerbaijan, 1968).

Zaliv Terpeniya - *Uukuvirus (Phlebovirus)*
Uukuniemi antigenic group. Prototype: LEIV-21C (*Ixodes uriae*, Far East, 1969). Distantly related to UUK virus by CFT.

St. Abb's Head virus - *Uukuvirus (Phlebovirus)*
Uukuniemi antigenic group. A non-registered virus that involves a number of closely related (SAH-like) strains. Prototype: M-349 (*Ixodes uriae,* Scotland, 1979).

Crimean-Congo haemorrhagic fever virus - *Nairovirus*
CHF-CON antigenic group. Synonyms: Crimean haemorrhagic fever virus; Congo virus. Prototype: Khodzha (man, Uzbekistan, 1967). African topotype: V-3011 (man, Zaire, 1956). European topotype: Drozdov (man, S. Russia, 1967).

Erve virus - *Nairovirus*
Thiafora antigenic group. Prototype: Brest/An-221 (*Crocidura russula,* France, 1982). Related to Thiafora virus by IFA and CFT. Possibly not an arbovirus but a true mammalian virus.

Soldado virus - *Nairovirus*
Hughes antigenic group. Prototype: TRVL-52214 (*Ornithodoros capensis/denmarki*, Trinidad, 1963). European topotypes: EgAr-3608 (*O.maritimus,* Wales, 1974) and Brest-Ar/T13 (*O. maritimus*, France, 1977). A remarkable antigenic heterogeneity of SOL isolates has been found by CFT; in fact, some European (French, Irish) isolates differ from the prototype strain more than eightfold in reciprocal titres. SOL is distantly related to Zirqa and Punta Salinas viruses of the serogroup by CFT and IFA.

Puffin Island virus - *Nairovirus*
Hughes antigenic group. Prototype: 9617 (*Ornithodoros maritimus,* Wales, 1974). A non-registered virus composed of strains closely related to SOL but distinguishable by IFA and VNT.

Avalon virus - *Nairovirus*
Sakhalin antigenic group. Synonym: Paramushir virus. Prototype: CanAr-173 (*Ixodes uriae,* Newfoundland, 1972). Topotype: LEIV-2268Ku (*I. signatus*, Far East, 1969). Distantly related to Sakhalin (SAK) virus by CFT.

Clo Mor virus - *Nairovirus*
Sakhalin antigenic group. Prototype: ScotAr-7 (*Ixodes uriae*, Scotland, 1973). Closely related to SAK virus (prototype LEIV-71c: *I. uriae,* Far East, 1970), the difference in titres being only

3-4 fold in cross-CFT. CM may be regarded as a subtype of Sakhalin virus.

Bhanja virus - *Bhanjavirus* (a suggested generic name)
Bhanja antigenic group. Prototype: IG-690 (*Haemaphysalis intermedia*, India, 1954). European topotype: ISS.IR.205 (*H. punctata*, Italy, 1967).

Palma virus - *Bhanjavirus* (a suggested generic name)
Bhanja antigenic group. Prototype: PoTi-4.92 (*Haemaphysalis punctata*, Portugal, 1992). Very closely related to prototype Bhanja virus by IFA, distinguishable by PRNT. PLM has probably not yet been compared with European BHA strains; at present it may be regarded as an Iberian variety (subtype) of Bhanja virus rather than as a new virus, because the mean cross-PRNT titre differences among European, Indian and African strains of BHA have also been found as great as 4-10 fold.

REOVIRIDAE

Eyach virus - *Coltivirus*
Colorado Tick Fever (CTF) antigenic group. Prototype: Eyach-38 (*Ixodes ricinus*, Germany, 1972). Closely related to CTF virus by CFT and VNT, but CTF virus is not neutralized with anti-EYA serum.

Tribeč virus - *Orbivirus*
Kemerovo antigenic group, the Kemerovo subgroup. Synonyms or subtypes: Lipovník virus; Koliba virus; Cvilín virus; Brezová virus; Kharagysh virus; Mircha virus. Prototype: Tribeč (*Ixodes ricinus,* W. Slovakia, 1963). Topotype: LIP-91 (*I. ricinus,* E. Slovakia, 1963). Closely related to the Siberian Kemerovo virus by CFT but distinguishable by VNT or RNA-RNA hybridization. Gene pools of the Kemerovo group orbiviruses have a great reassortment potential. Interestingly, rabbit syncytium virus that occurs in the USA is also closely related to TRB virus.

Okhotskiy virus - *Orbivirus*
Kemerovo antigenic group, the Great Island (GI) subgroup. Prototype: LEIV-70C (*Ixodes uriae,* Far East, 1970). Antigenically and genetically closely related to other GI subgroup viruses; probably identical with CW virus because it hybridizes to all 10 OKH genes. The GI complex viruses may represent a single viral gene pool, i.e. one species.

Cape Wrath virus - *Orbivirus*
Kemerovo antigenic group, the GI subgroup. Prototype: ScotAr-20 (CW-20: *Ixodes uriae*, Scotland, 1973). Antigenically and genetically closely related to GI, BAU, MYK, TDM, OKH, Nugget and Yaquina Head viruses. In fact, probably identical with (i.e., a synonym of) Okhotskiy virus because it hybridizes to all 10 OKH genes (8). Very similar or identical, non-registered viruses are Arbroath (ARB-1), Broadhaven (FT-363), Wexford (GS-80-9), Thormodseyjarklettur, Mill Door/79 and a number of other strains. Some of these viruses can be differentiated by PRNT, but they reassort readily at a high frequency. Only minor variability has also been found in the induced protein profiles among different CW and CW-like isolates.

Mykines virus - *Orbivirus*

Kemerovo antigenic group, the GI subgroup. Prototype: DenAr-12 (*Ixodes uriae,* Faeroe Islands, 1974). Antigenically and genetically related to TDM (distinguishable by CFT), CW, GI, BAU, Yaquina Head, OKH and other GI subgroup viruses.

Tindholmur virus - *Orbivirus*
Kemerovo antigenic group, the GI subgroup. Prototype: DenAr-2 (*Ixodes uriae*, Faeroe Islands, 1974). Antigenically and genetically related to MYK (distinguishable by CFT), CW, GI (closely), BAU, Yaquina Head, OKH and other GI subgroup viruses.

Bauline virus - *Orbivirus*
Kemerovo antigenic group, the GI subgroup. Prototype: CanAr-14 (*Ixodes uriae*, Canada, 1971). European topotype: FI-873 (*I. uriae,* Norway, 1974). The Norwegian isolates FI-873 and FI-962 have been found identical with prototype BAU virus by RNA-RNA hybridization. Antigenically closely related to other members of the GI or Kemerovo subgroups, and indistinguishable from GI virus (CanAr-41) by CFT; both viruses can be differentiated by VNT. Some BAU and GI isolates from Newfoundland have exhibited a remarkable variation in all 10 genome segments.

African horsesickness virus - *Orbivirus*
African Horsesickness antigenic group. There is no recognized prototype strain. A slight RNA homology with BLU virus, but not with *Reovirus*. Ten AHS antigenic types are distinguishable by VNT while not by CFT.

Bluetongue virus - *Orbivirus*
Bluetongue antigenic group. There is no recognized prototype strain. Distantly related to epizootic haemorrhagic disease of deer and Eubenangee viruses. Twenty-four antigenic types of BLU are recognized at present; VNT and HIT are serotype-specific while the serotypes are indistinguishable by the group-specific CFT. Genetic heterogeneity of some serotypes is relatively great, and 10 genome segments of different serotypes could interchange and reassort in the *Culicoides* vector or in a vertebrate host.

RHABDOVIRIDAE

Radi virus - *Vesiculovirus*
Vesicular stomatitis antigenic group. Prototype: ISS.Phl.166 (*Phlebotomus perfiliewi*, Italy, 1982). Related to YB virus by CFT.

Yug Bogdanovac virus - *Vesiculovirus*
Vesicular stomatitis antigenic group. Prototype: Yu-4/76 (*P. perfiliewi,* Serbia, 1976). Related to Radi virus by CFT.

ORTHOMYXOVIRIDAE

Dhori virus - *Acarivirus*
Unassigned to any serogroup. Synonyms: Astra virus, Batken virus (LEIV-306K: *Hyalomma marginatum,* Kirghizia, 1970). Prototype: IG-611313 (*Hyalomma dromedarii,* India, 1961).

European topotype: PoTi-461 (*H. marginatum,* Portugal, 1971). Nucleotide sequence data suggest that DHO is distantly related to influenza viruses but their envelope proteins differ significantly.

Thogoto virus - *Acarivirus*
Thogoto antigenic group. Prototype: Ken-IIA (mixed amblyomminid ticks, Kenya, 1960). African topotype: IbAr-2012 (*Boophilus* spp., Nigeria, 1964); European topotype: SiAr-126 (*Rhipicephalus bursa,* Sicily, 1969). Only 15-20% nucleotide homology with influenza orthomyxoviruses.

UNCLASSIFIED

African swine fever virus - *Porcivirus* (a suggested generic name)
The only DNA arbovirus occurring in Europe; formerly classified in the Iridoviridae, but later removed from that family. There are several antigenic types, but no recognized prototype strain.

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STUDY OF ARBOVIRUSES IN GUINEE REPUBLIC

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Soviet-Guinee Virological and Microbiological Laboratory has been open in Kindia, Guinee Republic at November 1978. The information on circulation of arboviruses in Guinee before 1978 was practically absent. During thirteen years until laboratory was closed at 1991 its main activity was directed on the study of ecology and distribution of arboviruses in this country. This work has been conducted by the number of Soviet and Guinee specialists (1). General results of theirs collective investigations are reflected in the present report.

Speciments for surveys were collected in all regions of Guinee. About 77.000 mosquitoes, 100.000 Ixodidae ticks, 2700 bats, 106 monkeys, 308 other mammals, 1500 wild birds and 927 blood samples collected from febrile patients have been processed during 1978-1989 using inoculation of newborne mice. As a result of this work 127 strains of 20 arboviruses were isolated: Chikungunya (1 strain), Dengue 2 (4), Saboya (7), Wesselsbron (1), Bunyamwera (4), M'Poko (5), Rift Valley Fever (6), CHF-Congo (9), Dugbe (22), Bhanja (6), Forecariah (1), Jos (26), Abadina (15), Kindia (2), ArK 6956 (1), Fomede (2), Blue-tongue (9), Mossuril (2), ArK 6909 (1) and Kolente (2). Serological identification many of these strains has been kindly performed in the Pasteur Institute, Dakar by J.P.Digoutte and some of these strainss in VARU, New Haven, USA by R.Shope. Forecariah (Bunyavirus-like,gr.Bhanja),Kindia and ArK 6959 (Orbivirus, gr.Palyam), Fomede (Orbivirus, gr.Chobar Gorge) and Kolente (Rhabdovirus) were estimated as a "new" viruses and ArK 6909 was identified as a original type of Lagos bat virus.

Table include the information on the sources of isolation of 127 strains. It is interesting to underline the facts of Chikungunya virus isolation from females of Amblyomma variegatum ticks; isolation of Saboya virus strains from the bat, bird, Amblyomma and Boophilus ticks; isolation of Bunyamwera strains from Amblyomma variegatum and blood of patient; first case of isolation of M'Poko virus strains from Culex cinereus mosquitoes. It is important to note the ecological association of Rift Valley fever virus with bat and isolation of Dugbe virus from the monkey's brain.

Two strains of Abadina virus were isolated from wild birds and one strain was isolated for the first time from febrile patient. Signs of her illness included high temperature, fever, cough, join pains and anorexia. Kindia virus was isolated from Am.variegatum as well as from mosquitoes genus Aedes. Two strains of Fomede virus were origitated from bats, 8 strains of Blue-tongue virus from Ixodidae ticks and one from the bird. Examination of lung samples of 197 small mammals by ELISA for HFRS antigen were negative while among the liver samples of 1712 these animals antigen of Lassa virus was detected in 15 cases (1,5%): 13 of Mastomys natalensis and 3 non-identified species.

It was found that larvae of Amblyomma variegatum ticks are capable to accept Abadina virus during theirs feeding on the infected white mice. The transstadial survival of Abadina virus from larvae to nymphs has been also demonstrated when these nymphs were fed on a susceptible mice. Two seronegative lambs, 3 and 5 month old, and two young goats, 4 and 5 month old, inoculated

with Abadina virus showed no clinical signs. The virus was isolated from blood each of these animals on days 2, 3, 4, 5 after inoculation respectively. The complement fixing antibodies were found through one or two weeks post infection and precipitating antibodies - after 3-6 weeks. These date showed that young sheep and goats in this age may participate in circulation of Abadina virus in nature.

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Table. Sources of isolation of arboviruses in Guinee

Alphavirus	
Chikungunya	Amblyomma (Theileriella) variegatum (1)
Flavivirus	
Dengue 2	Aedes (Stegomyia) gr.africatus (3) Aedes (Stegomyia) luteocephalus (1)
Saboya	Amblyomma (Theileriella) variegatum (3) Boophilus geigyi (1) Nycteris gambiensis (2) Lanius collaris (1)
Wesselsbrob	Aedes (Aedimorphus) sp. (1)
Bunyavirus	
Bunyamwera	Aedes (Diceromyia) furcifer (1) Amblyomma (Theileriella) variegatum (2) Human being (1)
M'Poko	Culex (Culiciomyia) cinereus (5)
Phlebotomus	
Rift Valley Fever	Lavia frons (2) Hipposideros caffer (3) Miotis sp. (1)
Nairavirus	
CHF-Congo	Rhipicephalus sanguineus sanguineus (4) Boophilus geigyi (3) Amblyomma (Theileriella) variegatum (2)
Dugbe	Amblyomma (Theileriella) variegatum (19) Amblyomma (Theileriella) pomposum (1) Boophilus geigyi (1) Cercopithecum (Erythrocebus) patas (1)
Bunyavirus-like	
Bhanja	Boophilus annulatus (2) Boophilus geigyi (2) Ixodidae ticks (non identified) (2)

Forecariah	Amblyomma (Theileriella) variegatum (1) Boophilus geigyi (1)
Jos	Amblyomma (Theileriella) variegatum (23) Amblyomma (Theileriella) pomposum (1) Boophilus geigyi (1) Rhipicephalus longus (1)
Orbivirus	
Abadina	Amblyomma (Theileriella) variegatum (11) Amblyomma (Theileriella) pompossum (1) Ploceus cucullatus (2) Human being (1)
Kindia	Aedes (Aedimorphus) sp. (1) Amblyomma (Theileriella) variegatum (1)
ArK 6956	Amblyomma (Theileriella) variegatum (1)
Fomede	Nycteris nana (2)
Blue-tongue	Amblyomma (Theileriella) variegatum (8) Ploceus cucullatus (1)
Rhabdovirus	
Mossuril	Aedes (Aedimorphus) sp. (1) Culex sp. sp. (1)
AnK 6909 (Lagos bat)	Nicteris gambiensis (1)
Kolente	Amblyomma (Theileriella) variegatum (1) Hipposideros sp. (1)

Arbovirus Surveillance in New Jersey, 1997

For 1997 the arbovirus survey ran from the first week of June into the month of October. During this period 566 mosquito pools were collected and tested for viruses in day old chicks. There were twenty four (24) pools positive for Highland J (HJ) virus. Eastern encephalitis (EE) virus was isolated from eleven (11) pools.

The collection area totals, species of mosquito, and time of collection for the HJ isolates are summarized in Table I. Activity began in late July and continued into October. All positive HJ isolates were from pools containing *Culiseta melanura* mosquitoes from five (5) sites.

Table II contains EE isolate data. Viral activity began in mid-September and continued through the second week of October. The virus was present in pools containing *Culiseta melanura* from three (3) geographical sites.

(Dr. Thomas Domenico, Marion Pierce, Bruce Wolf, Gordon Fratz, Joanne Angarone, Pat Bryant, Claudio Amari, Harry Dillon)

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Table I
1997
HJ Mosquito Pool Isolates
For Week Ending

Area Collected	Mosquito Species	7/25	8/8	8/15	8/22	8/29	9/5	9/12	9/19	9/26	10/3	10/10	10/17	Area Totals
Dennisville	*Cs.melanura*	1	1		1			1				1		5
Green Bank	*Cs.melanura*		1	2	3	1	2	1	1		1			12
Corbin City	*Cs.melanura*				1		1					1		3
Waterford	*Cs.melanura*					2						1		3
Centerton	*Cs.melanura*							1						1
Weekly Totals		1	2	2	5	3	3	3	1	0	1	3	0	24

Table II
1997
EE Mosquito Pool Isolates
For Week Ending

Area Collected	Mosquito Species	7/25	8/8	8/15	8/22	8/29	9/5	9/12	9/19	9/26	10/3	10/10	10/17	Area Totals
Dennisville	*Cs.melanura*							1						1
Green Bank	*Cs.melanura*										1			1
Centerton	*Cs.melanura*							1	3	2	1	2		9
Weekly Totals		0	0	0	0	0	0	2	3	2	2	2	0	11

A SERO-SURVEY AND A CASE-CONTROL STUDY OF HEMORRHAGIC FEVER WITH RENAL SYNDROME (HFRS) DURING AN OUTBREAK IN 1989 IN BOSNIA AND HERZEGOVINA

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Bosnia and Herzegovina (BH) is one of the most serious HFRS endemic regions in Europe. In the spring of 1967, an outbreak of HFRS occurred in Fojnica commune in BH with 144 HFRS patients (1). In 1989, we recorded a new big HFRS outbreak in Sarajevo region and the last one and probably the biggest during the war in 1995 (2). It was shown recently that Puumala and Dobrava viruses cause hemorrhagic fever with renal syndrome in BH (3).

Objective: During one of the greatest HFRS outbreak in 1989, in a collaboration with USAMRIID, we established a sero-survey and a case-control study of HFRS in Sarajevo region (BH). Our aim was to identify a rate of seropositives and risk factors for HFRS in Sarajevo endemic region. Now, after the war and great people's migration it is important to use such data in formulating prevention strategies and to develop hypotheses for future investigation.

Subjects and Methods: In 14 Sarajevo region communities we tested by ELISA test 2626 healthy residences (1% of population) for the presence of specific IgG to Hantaan (76-118) and Puumala (NE#223L) viruses. Thirty-eight case patients were matched with 280 age and sex related HFRS seronegative controls. A standard questionnaire was used to collect data during personal interviews with case-patients and controls.

Results: Of 2626 tested healthy residents in 66 (2,51%) we found specific IgG antibodies to Hantaan (37) or Puumala (29). Majority of them were workers in wood industry and housewives. Among the seropositives, 77% were in age groups of 20-39 and 50-60 and more years. Majority of older HFRS seropositive people were in Fojnica community which was the focus of the great HFRS outbreak in 1967. Case-control analysis identified that significant rate of patients lived in houses with only groundfloor ($p=0.002$), have food for human use in cow-sheds ($p=0.01$), had cows giving milk each day ($p<0.001$) and drunk uncooked milk ($p<0.001$), saw rodents ate their crop ($p=0.004$), planted a domestic crop ($p<0.005$), their cats entered the house ($p=0.006$), they visited forest daily ($p<0.001$), observed rodent contact with their food ($p<0.001$), ate in the restaurant at the working place (forest) ($p<0.001$), drunk water from the natural spring ($p=0.003$), saw rodents litter at the working place ($p<0.01$) and were in the mountains with the sheep ($p<0.01$).

Conclusions: We found at least that two hantaviruses, Hantaan like (probably Dobrava) and Puumala like continuously circulate in Sarajevo region. The findings of this study suggest that eliminating rodents from human environments is the basis of prevention (4). Reduction of human exposure to rodents, rodent excreta and contaminated particulates should decrease HFRS morbidity and mortality. It would be necessary to restore strong efforts to improve epidemiological conditions on the field and prevent new cases and new outbreak in the post-war period.

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Temporal fluctuations in species composition at a windmill habitat within a short grass prairie ecosystem

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Between 1995 and 1997, longitudinal studies of hantaviruses were carried out at a short grass prairie habitat in southeastern Colorado, near Rocky Ford. At a site surrounding an active windmill, high temperatures, the presence of a permanent water supply, and presence of predators, [coyotes (*Canis latrans*), prairie rattlesnakes (*Crotalus viridis viridis*), and many raptors, particularly red-tailed hawks (*Buteo jamaicensis*) and northern harriers (*Circus cyaneus*)] were associated with fluctuations of mammal populations, including the occurrence of a remarkable expansion of cotton rats (*Sigmodon hispidus*), as shown in Table 1. In all, 211 rodents were captured, including 49 deer mice (*Peromyscus maniculatus*) and 34 western harvest mice (*Reithrodontomys megalotis*). Elsewhere on this reserve 9% of western harvest mice and 1% of deer mice have antibody to Sin Nombre virus (SNV).

We determined whether males were scrotal and whether the vaginal orifice was open in females. For comparison we examined animals at two western slope sites (near Durango and near Grand Junction) during periods when we trapped at the southeastern Colorado site and at the western slope sites within three weeks of each other in the months September-March, 1995-97 (data not shown). At the windmill site 80-100% of males were scrotal and 83-86% of females had open vaginal orifices. At three other trapping sites (piñon-juniper, canyon, and canyon mouse habitats) near the windmill 7-53% of males were scrotal and 7-18% of females had open vaginal orifices. In contrast, at the western slope sites 0-10% of males were scrotal and all females had closed vaginal orifices during this seven month period.

At the windmill site only one rodent, a western harvest mouse, was found to be seropositive (IgG ELISA, probably to El Moro Canyon virus (ELMCV) when captured in March and April 1995. No decline in antibody prevalence could be associated with the expansion of the cotton rat population, although a greater proportion (2X) of young and subadult mice were trapped in the years when the cotton rat population was high.

This essential absence of evidence of infection with SNV or ELMCV in their natural rodent hosts at this site may have been due to rapid population turnover of susceptibles. This suggests that long-lived, persistently infected rodents are the principal reservoirs of hantaviruses and may provide a basis for further studies of interepidemic maintenance and transseasonality of hantaviruses in southeastern Colorado and perhaps in other areas of the southwestern U.S.

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Table 1. Rodents captured near a windmill, Piñon Canyon Maneuver Site, Las Animas County, Colorado, by species, frequency, and year of collection, 1995-1997.

	1995 (Σ TN[a]=404)			1996 (Σ TN=475)			1997 (Σ TN=312)		
			Recaptures			Recaptures			Recaptures
Species[b]	Freq.	%	(% of total)	Freq.	%	(% of total)	Freq.	%	(% of total)
D.o.	7	14.6	1 (7.7)	0	0	0	3	5.9	0
M.m.	8	16.7	2 (15.4)	0	0	0	0	0	0
N.m.	1	2.1	0 (0)	0	0	0	0	0	0
O.l.	2	4.2	1 (7.7)	5	4.5	1 (2.2)	6	11.8	5 (17.2)
P.m.	13	27.1	5 (38.5)	26	23.2	16 (35.6)	10	19.6	8 (27.6)
P.l.	8	16.7	2 (15.4)	12	10.7	5 (11.1)	0	0	0
R.m.	8	16.7	2 (15.4)	15	13.4	3 (6.7)	11	21.6	4 (13.8)
S.h.	1	2.1	0 (0)	54	48.2	20 (44.4)	21	41.2	12 (41.4)
TOTAL	48	100.2	13 (100.1)	112	100	45 (100)	51	100.1	29 (100)

[a] Σ TN signifies total number of trap nights

[b] D.o.= Dipodomys ordii, M.m.= Mus musculus; N.m.= Neotoma mexicana; O.o.= Onychomys leucogaster; P.m.= Peromyscus maniculatus; P.l.= Peromyscus leucopus; R.m.= Reithrodontomys megalotis; S.h.= Sigmodon hispidus

EVALUATION ON THE EFFICACY OF VACCINES AGAINST HFRS AND STUDY ON THEIR ANTIBODY DEPENDENT IMMUNIZATION ENHANCEMENT AND IMMUNOLOGICAL STRATEGY

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The purpose of this report was to observe the safety, serological efficacy, short-term and long-term epidemiological efficacy character of three different kinds of inactivated vaccines against HFRS (Type I vaccines prepared from tissue culture of Mongolian gerbils kidney, supplied by Institute of Biological Products, Shanghai and Tianyuan Company; type I vaccines purified from mouse brains supplied by Institute of Biological Products, Lanzhou; type II vaccines prepared from tissue culture of hamster kidney, supplied by Institute of Products, Changchun) that were produced from 1993 to1994 in China. Immunofluorecent antibody assay was used in testing specific IgG antibody and Micro-CPE method was used in testing the titer of neutralizing antibody. The results showed that the three kinds of vaccines were all safe. The moderate and severe side effects of them were 0.56%,0.03%,3.26%and 1.57% respectively.14 days after three doses of injection, before reinforced ,14 days and 1 year after reinforced, the rates of seroconversion of neutralizing antibody by the Micro-CPE method were 78.36%,12.33%, 80.56% and 54.84% for hamster kidney vaccines; 57.81%,10.79%,70.71% and 35.94%for Shanghai Mongolian gerbils kidney vaccines;70.00%,50.00%,91.18% and unknown(not yet completed) for Tianyuan Mongolian gerbils kidney vaccines; 51.09%, 11.11%, 54.32% and 45.00% for mouse brains vaccines. The rates of seroconversion of immunofluorecent antibody by IFA method were 65.73%,35.90%,85.00% and 68.33%for hamster kidney vaccines;93.69%,17.76%, 89.04% and 60.38% for Shanghai Mongolian gerbils kidney vaccines ;83.33%, 12.90%, 64.52% and unknown(not yet completed)for Tianyuan Mongolian gerbils kidney vaccines; 84.27%, 12.50%, 81.25% and 0%for mouse brains vaccines. According to the short-term (1-20 year after primary immunization) and middle-term (2 years after primary immunization) observation, these three kinds of vaccines were effective, and their protection rates in population were 97.81%,88.73% for hamster kidney vaccines; 94.08%, 91.72% for Shanghai Mongolian gerbils kidney vaccines; 100.00%,100.00% for Tianyuan Mongolian gerbils kidney vaccines; 88.45%,100.00% for mouse brains vaccines. There was no significant difference in clinical manifestation between the inoculated and un-inoculated people after another infection. After the epidemic peak, the inoculated individual didn't show any clinical symptom while had seroconversion or increase of antibody titer which could be defined as second infection. Till now, we haven't found any antibody dependent immunization enhancement phenomenon among the inoculated population. According to the short-term and middle-term (1 or2 years after primary immunization) observation, these three kinds of vaccines were all epidemiologically effective. We also offered some suggestions on the immunological strategy.

ISOLATION AND CLASSIFICATION OF HANTAVIRUS STRAINS FROM HOST ANIMALS CAPTURED IN NIDI OF HFRS IN CHINA

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The purpose of this research was to isolate and classify of hantavirus strains from host animals captured in nidi of HFRS in Ningxia and Beijing in China. Hantavirus strains were isolated by using infant Meriones unguiculatus and Vero-E6 cells from lung tissues of A.agrarius captured in Ningxia and R.norvegicus captured in Beijing. The isolates of hantavirus were compared with known serotypes of hantavirus by indirect immunofluorescent antibody test with monoclonal antibodies, genus-specific reverse transcription- polymerase chain reaction (RT-PCR) followed by restriction endonuclease fragment length polymorphism analysis and serotype-specific RT-PCR. 330 base pair regions of the medium(M)genome segment of hantavirus isolates were amplified by RT-PCR, clone
d and sequenced .The results showed that Hantavirus strains from Ningxia were HTN viruses and those from Beijing belonged to the SEO serotype. The comparison of 330 base pair regions of the M genome segment of isolates from Ningxia to those of other HTN virus isolates revealed 79.4% to 82.4% homology, and displayed 57.6% to 71.5% homology when compared with other serotypes of hantavirus. On the other hand ,the comparison of strains from Beijing to SEO virus isolates revealed 93.9% to 96.4% homology and displayed 61.5% to 75.8% homology when compared with other serotypes of hantavirus. It's the first time that SEO viruses were detected in host animals in Beijing and HTN viruses were isolated from Ningxia. These provided scientific basis for the further study and control of HFRS in these districts. It also suggested that hantavirus strains of Ningxia were from a new subtype of HTN virus. There might be more subtypes of HTN virus in China.

COLORADO 1997 HANTAVIRUS SUMMARY

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In 1997, two confirmed cases of hantavirus pulmonary syndrome (HPS) occurred in Colorado residents. One patient is a resident of Weld county; one is a resident of Routt county. Both patients survived.

The first case involved a male truck driver in his late twenties who lived south of Greeley, CO. The date of onset was 2/16/97 and symptoms included renal failure and pulmonary complications. The virus obtained from the patient was typed as Sin Nombre Virus (SNV).

The patient had an extensive travel history prior to onset and the precise exposure site was unknown. However, a rodent survey was conducted at his home on 3/4-5/97. Of 167 trap nights, nine (9) captures were made. All were identified as *Mu musculus*. None of the collected rodents were found to be seropositive.

The second case involved a 42-year-old female who lived on a cattle ranch Routt county southwest of Steamboat Springs, CO., but had lived in Yuma county prior to her illness where she and her husband wintered their cattle. Yuma is located approximately 250 miles due east of Routt county. She returned to her home in Routt county on April 19, and became ill on 5/1/97.

Because both the Routt and Yuma sites were considered possible exposure sites, both were surveyed on 5/13/97 and 5/14/97. The Routt county survey team consisted of Dr. Charles Calisher, Colorado State University Arthropod Borne and Infectious Disease Laboratory (CSU-AIDL) and Charles Ireland, CDC Southwest Field Activities. The Yuma county survey team consisted of Tim Doyle, CDC Southwest Field Activities, Butch Warner, Northeast Colorado Health Department, and Dale Tanda, Colorado Department of Public Health and Environment. This investigation is a good example of interagency cooperation to complete a project that could not have been completed by a single agency.

The Routt county survey resulted in the capture of twelve (12) rodents (7 *P. maniculatus*) from a total of 489 trap nights. One (1) deer mouse was found seropositive for SNV.

The Wray survey resulted in the capture of one hundred twenty-one (121) rodents from which eighty-nine (89) were processed from a total of 456 trap nights. Twenty-nine (29) rodents were found seropositive for a seropositivity rate of 32.58% (29.73% for *P. maniculatus*).

It should be noted that the Yuma county site consisted of two (2) trap sites separated by approximately five (5) miles. The "home" site where the patient lived and slept and the "feedlot" site where the patient worked during their three (3) month stay in Yuma county. Portions of the latter site appear to be located just over the state line in Nebraska.

Rodent specimens were forwarded to Dr. Brian Hjelle at the University of New Mexico (UNM) for DNA sequencing. Dr. Hjelle's lab was able to match "two (2) sets of two (2) identical sequences" from rodents captured at the Yuma county feed lot site.

No DNA sequences were obtained from the Routt county site. Subsequently, a resurvey of the Routt county site was conducted on 9/2/97-9/4/97 and resulted in forty-eight (48) rodent captures (291 trap nights), five (5) of which were found seropositive. Results of DNA sequencing are pending.

Based on exposure history, trap success, *P. maniculatus* seropositivity, and DNA sequencing, the patient was most likely exposed in Yuma county.

CDPHE continues to: 1) provide serologic testing for antibody for SNV for patients suspected of having HPS, 2) provide information and advice about HPS prevention, and 3) investigate confirmed cases of HPS and share that information with CDC. CDC maintains a national HPS registry of all U.S. cases.

EVIDENCE FOR SUPPRESSION OF CYTOTOXIC T CELL RESPONSE IN MICE BY VENEZUELAN EQUINE ENCEPHALITIS VIRUS

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Venezuelan equine encephalitis (VEE) virus (*Alphavirus* genus; family *Togaviridae*) causes numerous epidemics with fatality rates of 38-83% in equines. Although the disease is generally milder in humans, fatality rates as high as 1% have been attributed to VEE virus infection in some epidemics (Groot, 1972). Initial VEE vaccines consisted of formaldehyde-inactivated preparations of virulent virus which were not infectious for laboratory animals, although 4% of humans vaccinated with the preparation developed VEE illness (Berge *et al.*, 1961). Subsequently a live attenuated VEE vaccine (TC-83) was developed by serial passage of the virulent Trinidad donkey (TRD) virus in tissue culture (Berge *et al.*, 1961). This vaccine induces long lasting neutralisation and haemagglutination inhibition (HI) antibodies in humans and equines (Kinney *et al.*, 1988). However, reactogenicity to the attenuated vaccine includes systemic febrile illness in 30-40% of vaccinated humans, thus making it unsuitable for wide scale human use. Studies using recombinant vaccinia virus (VV) expressing the structural proteins of VEE indicate that this recombinant virus may be suitable for use as a vaccine for equines and humans at risk of mosquito-transmitted VEE disease but not for laboratory workers at risk of accidental exposure to aerosol infection with VEE virus (Kinney *et al.*, 1988).

The role of T cell effectors in development of immunity to alphavirus infection has not been investigated in detail. Previous studies suggest that cytotoxic T cells (CTLs) are only produced in specific experimental situations and may not be required for recovery, even following central nervous system infections (Hirsch & Griffin, 1979; Hirsch *et al.*, 1979; Griffin & Johnson, 1977). Studies with TC-83 virus and VV/VEE recombinant virus showed that CD4+ T helper cells were the predominant cell type present after virus-specific

lymphoblastogenesis, and that CD4+ activation was also associated with elevated levels of interleukin-2 (IL-2) (Mathews *et al.*, 1994).

In order to determine if CTL are important in the clearance of VEE virus infection, preliminary studies have been undertaken in six different mouse haplotypes (Table 1). No lymphocyte cultures derived from individual mice inoculated with VEE virus by the various immunisation schedules i.e. via the intraperitoneal (IP), subcutaneous (SC) or intravenous (IV) routes were able to lyse target cells *in vitro*. Furthermore, the addition of adjuvant failed to stimulate a CTL response. Despite this, neutralising antibody titres (obtained from serum on the day of sacrifice) ranged from 1/4-1/256, with highest titres observed in C3H/Ca mice inoculated SC. These results imply that VEE virus may suppress CTL activity. Profound suppression of CMI responses has been observed in humans infected with either immunodeficiency virus or measles virus (Karp *et al.*, 1996; Hirsch & Curran, 1996), it remains to be determined whether or not all alphaviruses can suppress CMI responses. Experiments are underway to determine whether or not complement opsonization of pathogens leads to suppression of CMI through the inhibition of IL-12 production as is thought to be the case for these other viruses i.e. does VEE virus mimic these other viruses?

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EFFECTS OF BREFELDIN A ON THE REPLICATION OF MAYARO VIRUS

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Brefeldin A (BFA) is a fungal antibiotic that has profound effects on the secretory pathway in mammalians cells. It not only inhibits secretion but also causes massive morphological changes. In the presence of this substance the Golgi apparatus disaggregates and many enzymes are redistributed to the endoplasmic reticulum. Remarkably, these changes are fully reversed when the drug is removed. The glycoproteins of enveloped viruses are synthesized, processed and transported inside cells. While the intracellular transport and expression of viral glycoproteins on the cell surface are essential for many biological functions. The details of this transport pathway are proorly understood. BFA interferes with the maturation of viral glycoproteins and suppresses the formation of infectious enveloped virus particles. Monolayers of Vero and *A. albopictus* cells (C6/36) cells were infected or mock infected in the presence of different concentrations of BFA. Cells were radiolabelled with ^{35}S-methionine and the proteins analysed by SDS-PAGE. Our results show that BFA significantly blocks the production of infectious particles in both cell cultures. Experiments with *A. albopictus* cells showed that BFA apparently does not affect the synthesis of virus proteins. In Vero cells, however, BFA induces a drastic modification on the protein synthesis. Analysis of virus-specific proteins by immunoprecipitation suggests that BFA treatment results in modification of virus glycoprotein synthesis. In Vero cells the addition of BFA, at early stags of infection, blocks the synthesis of late proteins. The presence of BFA at later stages however has no effect on Mayaro virus proteins. Our results indicate that BFA interferes with the replication of Mayaro virus in different ways, probably by blocking the processing of virus glycoproteins as well as virus RNA replication.

The Effect of Laboratory Passage on the La Crosse Virus M Segment

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La Crosse virus (LAC), a member of the family Bunyaviridae, California serogroup. Members of the family Bunyaviridae have a tripartite, negative sense RNA genome. The large (L) RNA segment codes for the polymerase, the middle sized (M) RNA segment codes for the envelope glycoproteins (G1 and G2) and a nonstructural protein NSm, and the small (S) RNA segment codes for the nucleocapsid (N) protein and a nonstructural protein NSs.

Several isolates of LAC virus have been sequenced (Grady et al., 1987; Huang et al., 1995, 1997). However, all of the sequence data were obtained from LAC isolates that had been passed at least once in cell culture or suckling mice. In 1995, Huang et al. published the complete nucleotide sequence of the M segment of two LAC isolates from human fatalities which occurred in 1960 and 1978. The virus isolated from the 1960 brain was passaged three times in suckling mice (SM) and once in BHK cells. The 1978 virus was passaged twice in SM and once in BHK cells. A total of 20 nucleotide changes was seen, with seven amino acid changes (Huang et al., 1995). In our laboratory, we have CNS specimens from the two fatal cases of LAC encephalitis which occurred in 1960 and 1978. A 425 bp fragment of the LAC M segment was RT-PCR amplified directly from both these specimens. The nucleotide sequences obtained from these unpassaged LAC RNA specimens were compared to nucleotide sequences obtained from low passage laboratory isolates by Huang et al. (1995).

When the sequence for the passaged 1960 M segment was compared to the nucleotide sequence obtained from the unpassaged viral RNA from the 1960 case, there were two nucleotide differences. One substitution resulted in an amino acid change at position 618 converting a tryptophan residue to an arginine. The other nucleotide change was conservative.

The viral RNA from the 1978 brain tissues had three nucleotide differences when compared to the 1978 sequence of the M segment from the passaged virus. One of the substitutions resulted in an amino acid change from aspartic acid (unpassaged 1978 viral RNA) to asparagine (passaged 1978 virus). The other two nucleotide changes did not effect the amino acid sequence.

When the nucleotide sequences of the 1960 and 1978 LAC RNA amplified directly from the brain tissues were compared, only two nucleotide changes were seen in this region of the M segment. Both changes conserved the amino acid sequence.

These data provide evidence that this area of the LAC genome is well conserved over a period of 18 years. The mechanism for this genetic stability is hard to explain given the high error rate of RNA polymerases and the fact that one would not expect the G1 glycoprotein to be highly conserved since it is exposed to the vertebrate immune system. However, similar results were obtained when the glycoprotein genes of Ebola Zaire isolates were analyzed (Sanchez et al., 1996). We plan to sequence a larger area of the G1 protein gene as well as a portion of the G2 protein gene to further investigate these findings.

It was also surprising to find both nucleotide and amino acid substitutions when low passage viruses were compared to viral RNA amplified directly from the brain. It is unlikely that these substitutions were introduced in the process of amplifying the viral RNA from the brain because only a small fragment of the genome was amplified and three clones were sequenced to obtain the data. Therefore, it appears that these mutations may have been caused by a low number of passages in the laboratory. If so, these data are have important implications for the use of even low passage virus in phylogenetic studies.

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LA CROSSE AND SNOWSHOE HARE VIRUS SUPERINFECTION AND REASSORTMENT

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La Crosse virus (LAC) is an arbovirus belonging to the family Bunyaviridae, genus Bunyavirus. It has a negative sense, tripartite RNA genome in which the large (L) segment encodes the polymerase, the middle sized (M) segment encodes two glycoproteins, G1 and G2, and a nonstructural protein, and the small (S) segment encodes the nucleocapsid protein and a nonstructural protein. The M segment is responsible for important phenotypic characteristics including neuroinvasiveness, neurovirulence, and mosquito infectivity and transmission.

Ae. triseriatus mosquitoes (the natural vector of LAC virus) were transovarially infected with prototype LAC and orally challenged on snowshoe hare virus (SSH) (a virus closely related to LAC). Mosquitoes were confirmed to be transovarially infected with LAC by FA. RT-PCR was used to identify mosquitoes that were superinfected with SSH. The primers used were described by Urquidi and Bishop (Journal of General Virology, 1992, 73, 2255-2265) and can distinguish LAC segments from SSH segments. Mosquitoes were considered to be superinfected if they tested positive for both LAC and SSH S segments by RT-PCR. Superinfected mosquitoes were plaque-assayed and plaques were genotyped using the primers designed by Urquidi and Bishop.

19.5% of the mosquitoes tested were positive for superinfection (17 out of 87 mosquitoes tested). Mosquitoes determined to be superinfected were plaque assayed and 24 plaques per mosquito were genotyped by RT-PCR. Of the viruses genotyped, 91.9% were LAC parental genotype (159/173), 1.7% were SSH parental genotype (3/173), 2.3% had reassortant genotypes (4/173), and 4.0% had diploid genotypes (7/173). The S segment was the most common diploid segment (71%). Two of the reassortant viruses were genotyped as SSH L segment and LAC M and S segment. One reassortant virus was LAC for the L and M segments and SSH for the S segment. The remaining reassortant was LAC for the L and S segments and SSH for the M segment.

These data indicate that *Ae. triseriatus* mosquitoes that are transovarially infected with LAC can become superinfected with SSH at a fairly high rate (19.5%). In addition, segment reassortment can occur in dually infected mosquitoes, thereby enhancing the evolutionary potential of California serogroup viruses in nature.

DOT-ELISA WITH CALIFORNIA SEROGROUP (BUNYAVIRIDAE, BUNYAVIRUS).

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Dot enzyme immunoassay on membrane filters (Dot-ELISA) is a simple, rapid serological test for detection of antigens and antibodies. Previous investigations obtained in this laboratory showed high sensitivity and specificity Dot-ELISA for rapid detection of VEE and vaccinia viruses (1,2). At the present work, this test was employed for the California serogroup. Tahyna, Inkoo and Snowsshoe Hare (SSH) viruses are widly distributed in Russia and cause numerous febrile diseases in humans. Clinical manifestations are similiar. Three types of virus antigens were used in Dot-ELISA: 10% suspention of infected s.m.brain, sucrous-aceton treated s.m.brain and supernatant fluid from infected chick embryo cells culture. Control antigens were prepared from noninfected materials. The best results were obtained with the sorbtion of antigens on acetatecellulose membrane in PBS pH 5,0 as compared to PBS pH 7,4 or borate buffer pH 9,0. All three viruses cross-reacted to some extent but could be distinguished. Dot-ELISA was imploid also for the detection of viruses in Aedes aegypti mosquitoes experementaly infected with Tahyna, Inkoo and SSH viruses. In appropriate time infected and control mosquitoes were pooled (10 moquitoes in a sample). After centrifugation at 2000 rpm 10 min these probes were tested in Dot-ELISA in comparision with conventional ELISA. Table shows that Dot-ELISA turned to be less sensitive than conventional ELISA. But taking in to consideration rapidness and simplicity of Dot-ELISA it may be recommended for pilot survey.

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Table. Detection of Tahyna, Inkoo and SSH virises in experementaly infected mosquitoes *Aedes aegypti*.

Virus	Infection titres in TCD 50/ml	Titres of antigens (reciprocal dilutions)		Sensitivity TCD 50/ml	
		Dot-ELISA	Conv.ELISA	Dot-ELISA	Conv.ELISA
Inkoo	1:1000000	16	800	60000	1200
Tahyna	1:100000	16	1600	6000	63
SSH	1:1000000	16	800	60000	1200

A case of immune thrombocytopenic purpura and dengue*

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This report describes a patient with chronic immune thrombocytopenic purpura (ITP) who developed a primary dengue infection with hemorrhagic manifestations. A 35-year old man presented in September 1993 with fever, purpuric rash, numerous petequiaes and equimosis in the legs. ITP had been diagnosed 5 years earlier and had responded to treatment based on prednisone and subsequent splenectomy. Platelets count had remained about 150,000/mm3. Laboratory studies revealed hematocrit 55% and platelet count had fallen to 11,000/mm3. Partial thromboplastin time was 32/25 sec. and prothrombin time 11/13 sec. Hemagglutination Inhibition test for dengue antibodies revealed a primary infection. Five days after the onset, treatment based on hydrocortisone was initiated. Platelets count rised to 156,000/mm3 by day fourth after the beginning of the treatment.

The use of corticosteroids in the treatment of DHF and DSS has been controversial. The case presented in this report was diagnosed as dengue with hemorrhagic manifestations. Viral infections frequently are associated with reduction of platelet count by day 7th to 10th after the onset of disease. In the case presented here low values in platelet count were the result of the basal illness (ITP). The dramatic fall in the platelet count detected by day fourth, could be the result of the dengue infection. Hydrocortisone treatment increased platelets count. The use of corticoids should be considered when patients are at risk of having hemorrhagic manifestations.

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MULTIPLE GENETIC TYPES OF ST. LOUIS ENCEPHALITIS VIRUS CIRCULATING IN HARRIS COUNTY, TEXAS

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St. Louis encephalitis (SLE) virus circulates in Houston (Harris County) Texas endemically. The Harris County Mosquito Control District conducts active surveillance for SLE activity in bird and mosquito (*Culex quinquefasciatus*) populations. While the virus is isolated from this area during most years, in occasional years, no activity is seen, and no virus is isolated from mosquito pools. The mechanism(s) of endemic persistence during this time, as well as overwintering, are not known. Several hypotheses exist, including reintroduction of virus by migrating birds, or persistent infection of mosquito vectors or vertebrate hosts.

We are currently investigating the epidemiology of SLE in Harris County by studying the molecular characteristics of the viruses that circulate in the area. We are using molecular techniques to identify the genetic types of viruses over an extended period of time. We have available for study all of the SLE isolates that have been made in Harris County since 1986. By identifying and using molecular markers of the viruses, we hope to determine whether the virus that circulates in Houston and Harris County is maintained persistently in the area, or disappears and is reintroduced.

Two molecular approaches are being used. RNA from the original Vero cell passage of each mosquito pool is extracted, and viral RNA amplified using RT-PCR. A 750-bp portion of the envelope (E) gene is being used in these studies. Following PCR, the single-stranded conformation polymorphism (SSCP) technique (Black et al., 1995) is used initially to screen virus isolates for genetic variation. Genotypes are identified and selected viruses from each genotype are sequenced. The SSCP approach allows us to rapidly screen large numbers of samples for genetic variation, avoiding the expense and extra unnecessary work of sequencing each isolate.

In 1990, 36 isolates of SLE virus were made. Preliminary genetic analysis using SSCP demonstrates that heterogeneity does exist among the isolates (Figure 1). SSCP genotypes were assigned based on the pattern of migration in the gel. Six genotypes could be distinguished among the 18 isolates seen on this gel. We are currently analyzing the remaining isolates from this year. SSCP analyses will be followed by sequencing one of each SSCP genotype to determine the extent of sequence variation.

Interestingly, the genotypes correlate quite well with geographic location of the trap sites where the mosquitoes were collected (Table 1; Figure 2). Two general areas (inside the inner loop and outside the inner loop) are assigned. The inner loop is subdivided into four quadrants. The SW quadrant contains one genotype, type A (Table 1). The NW and NE quadrants, including central Houston, contain genotypes B, D and E. Genotype C is seen only in Baytown, which is located in Harris County, but across the Houston ship channel from the city itself. Genotype F is only

found outside of the inner loop and between I-45 and US59. Thus it appears that even within a relatively small geographic area, there are discrete foci of transmission of the virus. It is possible that mosquitoes and/or the vertebrate hosts of the virus do not travel between these areas. These areas are relatively well-defined due to the interstate highways which run through Houston.

These results indicate that genetic variation among SLE viruses circulating in Harris County (Houston) does exist, and that virus may be circulating in microniches within the city. Study of viral isolates from the same trapping areas in consecutive years will reveal whether these genotypes remain in the area or disappear, with subsequent introduction of new viruses. These studies also demonstrate that molecular markers of a virus population can be used as tools to study the epidemiological aspects of a vector-virus cycle.

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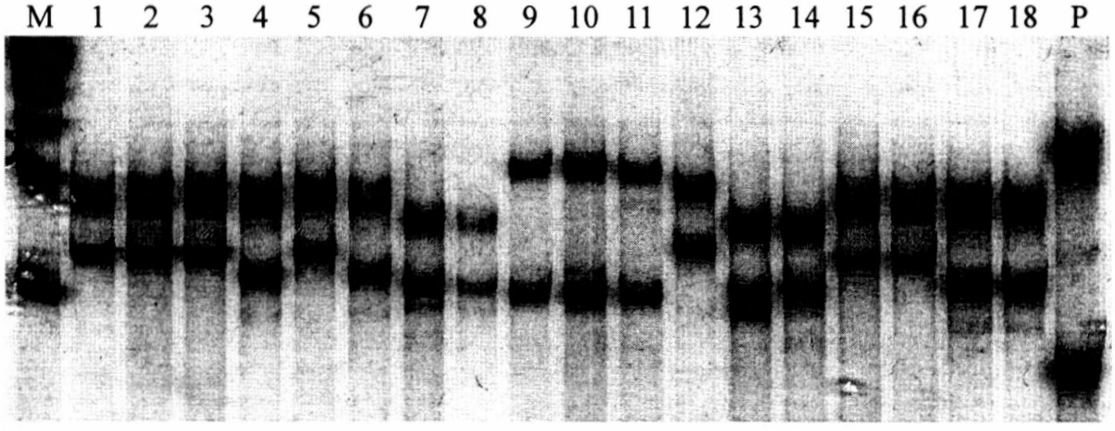
Figure 1. SSCP analysis of 18 isolates of SLE virus from 1990.



Genotype	B	B	B	F	B	F	C	C	E	E	E	D	C	C	B	B	A	A
Trap Site #	21	21	42	112	22	103	324	322	93	93	81	31	325	323	93	93	63	67

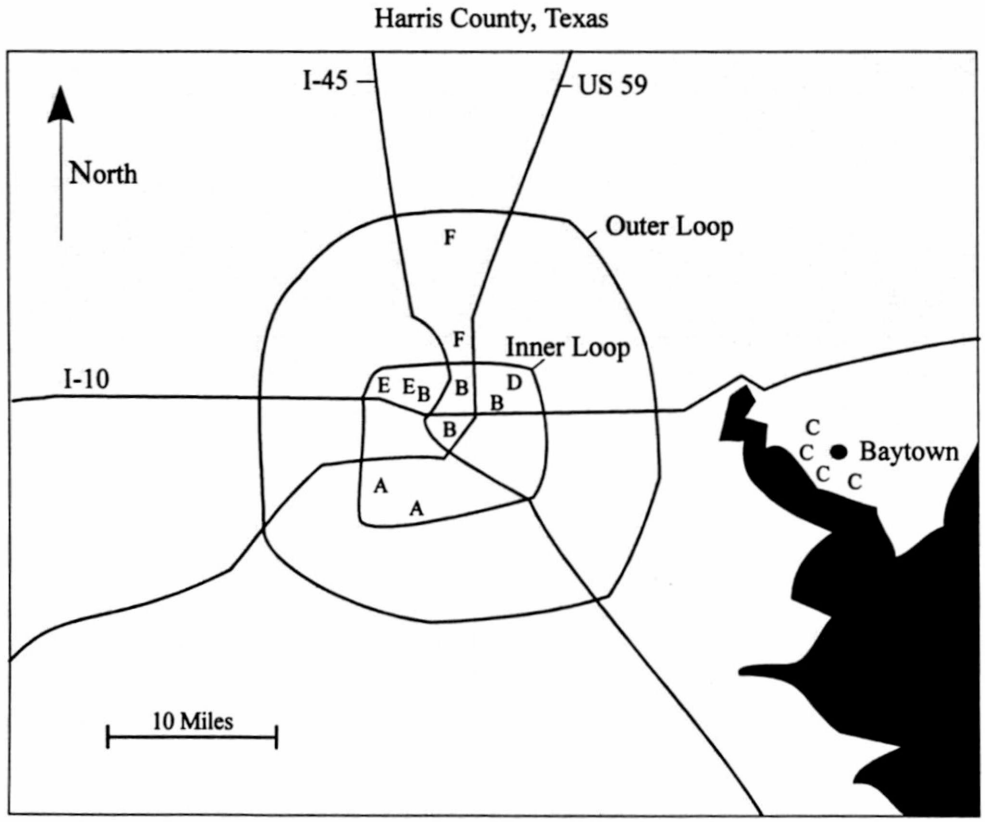
Figure Legend.
Top row: M: molecular weight markers. No. 1-18, Harris County isolates. P: SLE, Parton (prototype) strain from St. Louis, MO. **Bottom row**: Genotype: genotypes were assigned letters A-E based on pattern of migration in gel. The Parton strain was not assigned a genotype.
Trap Site #: Numbers correspond to the Harris County Mosquito Control District trap locations. (See Table 1 for locations of trap sites).

Table 1.

SSCP Genotype	Trap Site #	Trap Site Location (General Area) [1]
A	63, 67	SW quadrant inside the inner loop[2] of Houson
B	21,22 42 93	NE quadrant inside inner loop of Houston Central Houston (downtown area) NW quadrant inside the inner loop
C	322, 323, 324, 325	Baytown (eastern Harris County, across the Houston ship channel), outside the outer loop
D	31	NE quadrant inside the inner loop
E	81, 93	NW quadrant inside the inner loop
F	103, 112	north (outside) of the inner loop

[1]Refer to Figure 2 for approximate locations.
[2]The "inner loop" is loop I-610. The "outer loop" is highway 8.

Figure 2. Map of Harris County, showing location where each genotype of virus was isolated.



INTRODUCTORY NOTES FROM THE SUB-COMMITTEE ON INFORMATION EXCHANGE

This first newsletter on American Arthropod-borne Virus Research inaugurates one service charged to the Sub-committee on Information Exchange, organized under authority of Section Five of the 1959 Gould House Conference on Arthropod-borne Virus Investigations. It is not as comprehensive nor does it contain as great a variety as would be possible or useful under the intent of those who originally suggested or favored such a publication. On the other hand, it contains primarily information summaries of annual and other official reports, contributed specifically for this newsletter by a large percentage of investigators invited to do so. It brings together in one place key information about a wide variety of projects and accomplishments of American-sponsored, financed, or associated arthropod-borne virus research, covered by extensive reports which have been received. It indicates existence and content of these reports, which are listed subsequently in this newsletter, should readers wish to consult certain of such sources in detail.

Contributions by foreign investigators and review of arbor virus work of rapidly increasing foreign laboratory and field activities is absent, being clearly beyond the responsibility and authority of the American group as organized so far. There is also lacking much in the way of reports on current or new field investigations or laboratory techniques. These and other shortcomings, in contrast to the material of interest and value which does appear, may stand out sufficiently to stimulate contributions of the indicated sort for the next issue.

It appears now that the scope, interest, and value of the comprehensive coverage of annual report and project summaries received during the first quarter following the year of reported accomplishment is sufficient to provide the main substance of one issue of the newsletter each year; the other one or two published in fall and/or winter would deal more with current news on field studies, interim developments, and occurrences of immediate epidemiological interest.

As concluded in the initial letter of solicitation for contributions sent last December, the content, size, style, and utility of the newsletter is up to those who contribute to and receive it. This charter group of investigators and agencies as now constituted is listed at the end of this issue.

Concurrent with the debut of the newsletter, the first part of the punch card Catalogue of Arthropod-borne Viruses is issued. Containing records of more than 49 strains, many of them new and unpublished, the catalogue enters the field as a preliminary effort to bring together in one place the latest salient information on a rapidly growing number of arthropod-borne viruses in a form that can keep a variety of globally scattered investigators up to date, with a minimum of duplication of work and without prejudicing later formal publication of the comprehensive detail required of new virus strain reports.

Here again this pilot endeavor has necessarily been confined primarily to American effort in its initial stages. But it is obvious that to

be of greatest value and utility it must be extended to international use and participation.

If the material results in the way of newsletter and catalogue are worthy of the objectives set forth by the Gould House Conference and efforts of the Sub-committee, then the participants, contributors, and recipients must next give consideration to improvement and expansion of these instruments through extension to and more active participation by a globally representative group.

The catalogue is obviously incomplete at this stage, nor is it ever expected to be really complete at any point in time, since it is an instrument designed to keep abreast of isolation and characterization of new arbor viruses and to accumulate more knowledge about those already recognized. Now that the design, punch card system, coding, and reproduction methods have been worked out, it is expected that each month will bring issue of new cards representing not only newly reported viruses but also additional information for standard strains until this section of the catalogue is complete.

Finally, all that the Sub-committee on Information Exchange has implemented so far as been in response to the tasks assigned to it by the Gould House Conference. While workable instruments such as the newsletter and punch card catalogue have been devised, they do not necessarily represent any final form. Corrections and suggestions for improvement are hereby solicited.

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INTRODUCTORY NOTES FROM THE SUB-COMMITTEE ON INFORMATION EXCHANGE

The reception of the first issue of the Arthropod-borne Virus Information Exchange newsletter was enthusiastic and has prompted issue of this second number on the previously suggested schedule of three times a year - April, September and January. As originally planned, the April issue will be devoted primarily to annual report summaries, while the other two issues will contain progress reports or mention of projects planned or being implemented.

The Catalogue of Arthropod-borne Viruses, an obviously more sizeable undertaking, at least until all published viruses are represented, was also well received. Being a much more complex presentation and an attempt to prove suitable to a wide variety of arthropod-borne virus investigators for utilization in many ways, it was initially designed to be reproduced photographically for two primary reasons. First, it would present the data submitted by investigators exactly as they compiled it; second, change of editions of cards for any particular virus, within range of the information called for under the punch card key, could easily be accomplished.

At the outset it was recognized that the Catalogue would be of changing value according to the information each consultant required. For this reason the format devised contained a great deal of information which might not be of use to a worker in the confines of a laboratory, while those working at distances in the field might find their sole source of information about a number of viruses easily accessible on the catalogue cards and easily located by the punch card system.

Most of the comments on the Catalogue were commendatory and encouraging. A number of suggestions have been received for improvement. As promised with issue of the first pages, the Sub-committee is combining these suggestions into a revised form which will be submitted for review in October. Any suggestions from others not yet heard from will be welcome. Another set of cards for additional strains is now in production and should be distributed within a few weeks.

Finally, it must be remembered that the Sub-committee on Information Exchange has been established with a view to compiling and issuing a newsletter and for production and maintenance of an Arthropod-borne Virus Catalogue. Beyond editorial selection and correction of obvious discrepancies and errors, the Sub-committee is not final judge or jury to pass on technical content which, at times, may be debatable and therefore highly stimulating in the search for facts.

The value of both the newsletter and the Catalogue, therefore, reflect the thought and intensity of interest of the participants. Both have been gratifying to the Sub-committee and with continued participation of similar quality,

these contributions to exchange of significant information among arthropod-born virus investigators will continue apace.

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INTRODUCTORY NOTES FROM THE SUB-COMMITTEE ON INFORMATION EXCHANGE

MEETING OF WHO STUDY GROUP ON ARTHROPOD-BORNE VIRUSES

By invitation of the WHO, a "Study Group on Arthropod-borne Viruses" met in Geneva, Switzerland, September 5-10, 1960. This group was comprised of nine members, two consultants, four members of the WHO secretariat and one observer. The members of the group represented or rather were engaged in work on arthropod-borne viruses in eight different countries, namely Colombia, Czechoslovakia, India, New Zealand, Uganda, United Kingdom, United States, and USSR.

The meeting was called "to assist in implementing" recommendations for a cooperative international program of investigation of the arthropod-borne viruses proposed at an informal meeting in Lisbon in September 1958 and approved and formalized by a WHO Scientific Group on Virus Research which met two months later in Geneva.

The preliminary report of this Study Group has now been issued and the final report will soon be printed and ready for distribution. This report with annexes covers more than 60 pages and since it may be obtained from the WHO only the main subjects considered are given here: 1) Procedures for determining the presence, prevalence and importance of arthropod-borne viruses in unexplored or incompletely studied areas; 2) Grouping and classification; 3) Importance of arthropod-borne viruses in human and/or veterinary disease; 4) Ecological aspects of the problem; 5) Reference laboratories; 6) Current and potential information exchange procedures; 7) Control measures; and 8) Implementation of the recommendations of the Study Group.

It will be recalled that following the recommendations of the WHO Scientific Group on Virus Research which met in November 1958, the WHO was not in a position to implement these recommendations and an American Group, sometimes referred to as the Gould House Group, was assembled by the Rockefeller Foundation to consider activating some of these recommendations among American investigators with the hope that the experience thus gained might be useful in eventual internationalization under the auspices of the WHO. It is gratifying to report that the activities of this American group, particularly as concerned the establishment of a reference laboratory, efforts to investigate methods of preparation of diagnostic reagents for distribution, and the activities of the sub-committee on Exchange of Information, involving the issuing of a newsletter and the assembling of a virus registry or catalog were presented and approved by this Study Group.

It was recommended, for example, that in addition to a central reference laboratory, regional laboratories be established and a system of collaboration and exchange of material be developed; and that the newsletter as well as the catalog be internationalized. However, as the WHO is not in a position at this time to assume responsibility for either the newsletter or the catalog it was

advised that for the present both remain in the hands of the American group and that international collaboration and distribution be arranged directly or through foreign correspondents.

The integration of the activities of the American group into an international program under the auspices of or in collaboration with WHO will be discussed at the next meeting of the American group when a WHO representative will be present. This meeting is to take place during the second week in April.

The final paragraphs of the Study Group report on the "implementation of the recommendations" are of sufficient interest to reproduce:

"It is recognized that in order to conduct progressive development and implementation of the recommendations of this Study Group, a continuous means of consultation must be maintained. The development of this programme should be planned and financially supported on a long-term basis and should provide for the active participation of recognized experts in this field acting as consultants and as members of an advisory group specially devoted to problems of arthropod-borne diseases. Meetings of research workers should be arranged periodically to review progress achieved, exchange information and propose promising lines of activities.

"This can best be done by an organization such as WHO which would ensure the international co-ordination necessary for steady progress in the type of programme recommended in this report."

Richard M. Taylor, M.D., Chairman

THIRD ISSUE OF THE NEWSLETTER

Beyond acceptance of the newsletter as a valuable means for exchange of scientific information by the WHO Study Group on Arthropod-borne Viruses and the recommendation that it be expanded to international participation, the present issue shows increased interest and value by the participants themselves. There is a larger number of contributions ranging from those which report amazing achievements to some of permanent worth as reference material, unavailable from any other single source. The contents also reflect careful thought and consideration of space by being brief summaries of the essence of considerable accomplishments.

It is the largest issue so far and exceeds in size our original anticipation. If and when the newsletter is internationalized, it appears necessary to consider more than two issues a year. This means additional work which is willingly accepted because it reflects success of an effort to solve the real problem of rapid exchange of specialized scientific information on a global basis. It also reflects the vitality of research effort in this field which is an appreciation of its challenges, importance and opportunity for future scientific achievement.

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Al McGuire: (when he heard that a fat man had lost 20 lb.): "That's like a deck chair blowing off the Titanic."

Frank Layden, on one of his lackadaisical players: "His sweat is so rare it could cure cancer."

A farmer took a piece of bad earth and made things flourish thereon. Proud of his accomplishments, he asked his minister to come by and see what he had done. The minister was impressed. "That's the tallest corn I have ever seen. I've never seen anything as big as those melons. Praise the Lord." He went on that way about every crop, praising the Lord for it all. Finally, the farmer couldn't take it any more. "Reverend", he said, "I wish you could have seen this place when the Lord was doing it by himself."

Jeannette Smith: "People who love words are perfectly nice people, sanguine and frequently civilized, mostly gallant in the face of crimes against God, nature and the American language."

Mrs. Henry Adams: "Henry James chews more than he bites off."

Chief Seattle, Suquamish Tribe, 1788-1866: "Whatever happens to the beasts soon happens to man. All things are connected."

Leila Barber: "Men are each unique before marriage, all the same after."

Anonymous: "Life is an experiment without a control."

Mahatma Ghandi: "Whatever you do will be insignificant, but it is important that you do it."

George Raveling, Washington State basketball coach: "I know the Virginia players are smart because you need a 1500 SAT to get in. I have to drop bread crumbs to get our players to and from class."

Nicholas Burns (U.S. State Department): "Roger Clemens is a traitor... For a measly few million bucks he went over to the opposition, and we don't like it."

Kurt Waldheim: "I did what was necessary to survive the day, the system, the war - no more, no less."

Thomas Jefferson: "There is a natural aristocracy among men, the basis of which is ability and honor."

Cecil De Loach (Owner and Winemaker, De Loach Vineyards): "Hey, I'm a smart guy. I'm a normal guy. I figured if it tasted good to me, it should taste good to other normal guys. All I know is dandy grapes make dandy wine. The secret is, there is no secret. Wine is something you drink and enjoy. Don't make such a big deal out of it."

Louis Pasteur: "Wine can be considered with good reason to be the most healthful and hygienic of all beverages."

Anonymous: "Some of his decisions were accurate. A stopped watch is right twice a day."

Ian McEwan: "By concentrating on what is good in people, by appealing to their idealism and their sense of justice, and by asking themselves to put their faith in the future, socialists put themselves at a severe disadvantage."

Thomas B. Reed: "One of the greatest delusions in the world is the hope that the evils of this world can be cured by legislation."

Anatole France: "The law, in its majestic equality, forbids rich and poor alike to sleep under bridges, beg in the streets, or steal bread."

Meg Greenfield: "Ninety percent of politics is deciding whom to blame."

Gordon Lightfoot: "I've been on the town, washing the bullshit down."

Act of British Parliament (1670): "[Be it resolved] that all women, of whatever age, rank, profession, or degree; whether virgin maids or widows; that shall after the passing of this Act, impose upon and betray into matrimony any of His Majesty's male subjects, by scents, paints, cosmetics, washes, artificial teeth, false hair, Spanish wool, iron stays, hoops, high-heeled shoes, or bolstered hips, shall incur the penalty of the laws now in force against witchcraft, sorcery, and such like misdemeanors, and that the marriage, upon conviction, shall stand null and void."

Gabe Paul: "The great thing about baseball is that there is a crisis every day."

Anonymous: "God put us here to accomplish something in our lifetimes. I am so far behind now, I'll never be able to die."

Douglas Jerrold: "Religion's in the heart, not in the knees."

Anonymous: "Friends help you move. Real friends help you move bodies."

Bob Golic: "They tell us for months that their swimsuit issue is coming, but then they put Marge Schott on the cover and they give us no warning at all."

W.S. Gilber: "It isn't so much what's on the table that matters as what's on the chairs."

Karl Marx: "The philosophers have only interpreted the world. The point, however, is to change it."

The Talmud: "It is beyond our power to explain either the prosperity of the wicked or the afflictions of the righteous."

Elbert Hubbard: "There is something that is much more scarce, something finer far, something rarer than ability. It is the ability to recognize ability."