

The symposium on "Applications of Molecular and Related Technology to Vector-borne Diseases," chaired by Rex E. Thomas, presented the state of the art with RNA and DNA probes. B. R. Miller reviewed their application to viral archeology and molecular pathogenesis. Rex Thomas talked about the use in the diagnoses of plague in fleas. Both papers indicate there will be a drastic change in our approach to diagnosing infected arthropods in the future and there will be a remarkable reduction in the use of experimental animals in the process. Dr. Larry Hilburn et al., from the USDA-Kerrville, Texas, presented an unusually interesting paper for SOVE members concerned with genetics of North American *Boophilus* ticks and their control.

The symposium and the estimation of the vectorial capacity developed and moderated by W. K. Reisen was outstanding. An excellent job was done in defining vector-capacity and vector-potential.

Without question the trip up the aerial tram to dinner at the "Top of the Mountain" was an interesting and novel experience for most of us. The scenery was magnificent. We could have started a little earlier, but then the meetings are not just for fun!

The symposium on the "Malaria Outbreak in California" was interesting. It was well presented and gave very good details as to why and how. It would seem that the "cardboard condominiums" were an important factor of the epidemiology of this outbreak. It is interesting at this time that a new species of *Anopheles hermsi* is being described by Ralph Barr, University of California, Los Angeles and co-workers and will appear in the Mosquito Systematics in the near future. This new species was previously misidentified as *Anopheles freeborni* which is the dominant malaria vector in northern California. Apparently, *An. hermsi* was responsible for most of the malaria transmission in the San Diego County area.

The symposium on "Population Regulation on Mosquito Larvae in Relation to Disease Transmission," moderated by Norbert Becker of the University of Heidelberg, West Germany, was well done and highly informative. Durland Fish's remarks concerning *Aedes triseriatus* in a study he carried out in the northeastern U.S. was a very simplified model and made for clear-cut decisions. The presentation on "Cyclopoid copepoda for *Aedes* control," by G. G. Martin was unique. It looks as though these may have possibilities for commercial production and ought to be effective.

Norbert Becker indicated that they had excellent control of mosquitoes in Europe and in Asia with *Bacillus thuringiensis israelensis*. They had a good but shorter experience with *Bacillus sphaericus*. One of the novel things was that they were able to put *Bti* in large drinking water storage containers for mosquito control in southeast Asia with no ill effects on the population.

The presentation by C. H. Calisher, "When is a Bullet not a Bullet," was a highly informative paper about the Rhabdoviridae. Also, he was getting back at Chet Moore for not liking his previous title. Wayne Crans' presentation on the "Saltmarsh Wading Birds in the Epidemiology of EEE," centered on their development of techniques for capture and working with these animals."

The symposium, moderated by Bruce Francy, had some very interesting results. It would appear that there is a very low transmission occurring among passerine birds insofar as SLE virus is concerned during the winter months in Orange County.

The symposium on "Lyme Disease in California," was extremely well-attended and we were very fortunate to have Dr. P. E. Lavoie, from San Francisco to participate. The treatment of this disease, once diagnosed, is a very complicated one and Dr. Lavoie's treatment departs from that used by most other M.D.'s in that he prescribes intravenous penicillin over a much longer period of time than other physicians. All of the other papers, especially those on the distribution of *Ixodes pacificus* in California were of interest to local workers. Bob Lane's, (University of California, Berkeley) work with the Western Fence Lizard was an interesting departure from the usual host studies.

Durland Fish, New York Medical College, presented a good review, "The Epidemiology of Lyme Disease in the Northeastern U.S." The epidemiology of Lyme disease in the northeast is rather different from that in the Pacific Northwest; therefore, it was a good contrast.

The review of *Aedes albopictus* in the United States by Chet Moore indicated that it had disappeared from a few locations, had not extended its range in any significant fashion over that of the previous year, and the techniques for processing shipments of tires overseas has perhaps contributed largely to stabilizing the situation.

The last paper on the "African Clawed Frog," by J. C. Hitchcock, was a delightful, refreshing conclusion to a meeting. We ought to have him prepare a closing presentation every once in a while for it was tremendous. Surely it sent everyone away in a very happy mood.

#### 1989 Annual Conference Oklahoma

The 1989 Annual Conference will be held at the University of Oklahoma, Norman, Oklahoma, November 13-15, 1989. Since most of the members will be arriving on the weekend, Sunday, November 12, this will allow savings on airfare and ease the problem of room accommodations at the University. Further pertinent details of the Oklahoma meeting will appear in a later Newsletter issue.

#### EUROPEAN REGION

##### European Region Meets at Cambridge

The annual conference of the Society for Vector Ecology, European Region, was held at Pembroke College, University of Cambridge, Cambridge, England, 30 August to 2 September 1988. Cambridge was an interesting choice for the meeting. It is an ancient city and Roman ruins still stand there. The origin of the University dates from 1209 nearly 300 years before the discovery of America, when some dissenting scholars left Oxford University for the city of Cambridge. The University today is made up of 29 colleges, all within Cambridge City with a population of 90,000. Each college is an independent self-governing corporation under the coordinating role of the University.



*Some of the participants pictured at Pembroke College.*

John Goose, Ph.D., the conference organizer, prepared an informative, balanced program of papers and topics of current vector interest. Two field trips were included in the program. Pembroke College provided excellent facilities for dining, banquet, refreshments, and sleeping accommodations in student dormitories. The Pembroke College setting and relaxed atmosphere enhanced the enjoyment of the vector ecology conference.

There were some 67 participants including 5 members from the United States (R. Fontaine, C. Mitchell, R. Dodwell, H. B. Munns, and B. Federici). In all, 16 nationalities were represented at the meeting. The program offered a variety of vector ecology topics of significance to current vector control problems of deep concern to most countries internationally. The conference included abstracts of papers presented by each of the 30 speakers. Copies of these abstracts are attached as Supplement I to the Newsletter.

Michael Service, Ph.D., will retire as European Regional Director. He was the first director of the Region and held the post for four years. He was instrumental in organizing the Region from the beginning and largely through his efforts, developed it into a viable, active branch of the Society with a strong membership. In a recent balloting of European members, Norbert Becker, Ph.D., Heidelberg, West Germany, was elected Director.

Presently, Mike Service heads the medical entomology program at the Liverpool School of Tropical Medicine. The School was founded in 1898 and in fact is the oldest school of tropical medicine in the world. In the last academic year, the

school had 263 post-graduate students and currently there are 30 Ph.D. students. Over the past three years, students from 57 countries including the United States attended.

The Liverpool School is one of a few institutions in the world today that is helping to meet an urgent need for well-trained and qualified graduates in medical entomology and vector disease control. Its importance cannot be overstated in view of the decreasing availability of medical entomologists in the face of a rising global problem of vector diseases. In large part this can be attributed to a lack of entomological expertise in vector disease control programs in most countries in tropical and subtropical regions.

#### **John Goose has Palpitations**

Dr. John Goose, organizer of the European Region Annual Conference, experienced some anxious moments just before meeting registration at Pembroke College, Cambridge, where the meeting was scheduled. In the scenario below, his feeling of despair and helplessness are revealed when he is informed by the college registration porter two hours before arrival of registrants that the college had no record of a meeting of vector ecologists!

**Scene:** The Porter's Lodge, Pembroke College, approximately 3:00 P.M., Monday, 29 August.

**J. Goose:** Hello, I've come to set up the registration desk for the Vector Ecologists' Meeting.

**Porter:** Sorry, what did you say?

**J. Goose:** The Society of Vector Ecologists. We are having a meeting here this week.

**Porter:** (Looking through book) I can't see anyone of your name in this book I'm afraid.

**J. Goose:** No, the booking wouldn't be in my name. It will be under Society of Vector Ecology.

**Porter:** (After a long pause and much searching of the book) I'm really very sorry Sir, I can't find any mention of this. Are you sure you've come to the right college?

**NOW THIS IS THE STUFF OF NIGHTMARES.** Having spent nearly a year, on and off, arranging the annual meeting of the European Region of the Society for Vector Ecology, a conversation like this two hours before visitors from all over the world start arriving would surely bring palpitations to the calmest of organizers.

Of course we found the right page in the book and by the end of the day, June, my assistant and I had welcomed and registered some 60 to 70 people from a dozen or more countries.

#### **Zoonoses Congress Meets in Czechoslovakia**

Concurrently, with the SOVE European Regional Conference in Cambridge, England, a Zoonoses Congress was held jointly with the VI Joint Meeting of the European Leptospira Workers at Brno, Czechoslovakia, 29 August to 1 September 1988. The Congress was held under sponsorship of the World Health Organization.

Durland Fish, Ph.D., Director, Medical Entomology Laboratory, New York Medical College, attended the Congress and submitted the following interesting report for publication in the SOVE Newsletter.

The meeting was attended by over 300 scientists. Most were European with 200 from Czechoslovakia alone, but also represented were Japan, India, Australia, and the United States. Invitational, submitted, and poster presentations totalled slightly less than 300. Papers were delivered in English and Czech or Slovak with simultaneous translation.

Topics in the plenary session covered ecology (Rosicky, CSSR) and surveillance (Kmety, CSSR) of zoonoses, oral rabies immunization of wildlife (Selimov, USSR), Lyme borreliosis (Johnson, USA), and zoonosis epidemiology (Matyas, CSSR). Submitted papers were mixed among zoonoses affecting livestock and those affecting humans. Papers on vector-borne zoonoses included arboviruses, tularemia, Q fever, and Lyme borreliosis. Other major topics were leptospirosis, rabies, salmonellosis, toxoplasmosis, brucellosis, and listeriosis.

A series of sessions on Lyme borreliosis consisted of 23 papers and 5 posters. Lyme disease now appears to be the most prevalent vector-borne disease in the temperate world. Specific reports were from Prague where 258 cases were reported in 1987 (Markvart), 150 cases from Trieste, Italy (Cinco), and 361 cases

from northern Yugoslavia (Strle). But, several workers from eastern Europe unofficially speculated that the actual number of human cases in many countries is in the thousands. Spirochete isolations in Europe have been made only from *Ixodes ricinus* and *Ixodes persulcatus*. Reported infection rates in *I. ricinus* were 13 percent in Stockholm, Sweden, 17 percent from near Bratislava, Czechoslovakia (Kmety), and 20 percent in southern West Germany (Wilske). Transovarial infection rates were reported to be less than 1 percent.

The Europeans have an advantage in their efforts to study Lyme disease epidemiology because of their long experience with tick-borne encephalitis. Not only do they know more about the ecology of the vectors, but TBE foci are predictive of where they also will find Lyme disease. I was much impressed with a beautifully detailed map of *I. ricinus* distribution and density in the Bohemia region of western Czechoslovakia.

The highlight of the conference for me was the very last session entitled Zoonoses-General Aspects. The program was dominated by the Russians whom I had hoped would provide a state of the art synopsis of the Pavlovsky doctrine on the natural nidity of transmissible diseases.

The first paper by Cherkasskiy (USSR) entitled "A theoretical substantiation of surveillance and control of zoonoses" was delivered in Russian with no transcript provided for the translators. I saw little connection between the five handwritten systems diagrams projected during the presentation. Daier (USSR) spoke on "Zooanthroposes in conditions of anthropogen pressing." He divided the more than 100 zoonoses affecting man into two groups: totally "natural" and independent of man and those that have no connection with natural systems (but would they then be zoonoses?). The former are more stable, but the latter are more important. In this second category he included Q fever and leptospirosis. He emphasized problems associated with the large livestock producing cooperatives in Russia where these and other diseases are apparently serious health problems among workers.

Chernukha (USSR) spoke next on "Problems of zoonosis infections under conditions of anthropogenic transformation of the environment." But he also presented in Russian with no translation and only one slide. The next paper (Khana, India) was cancelled and the one after that (Papadopoulos, Greece) was presented the previous day because the speaker had to leave.

Adamovich (USSR) presented a seemingly interesting paper on "The landscape ecology conception of zoonoses." This is the first quantitative approach I have seen to Pavlovsky's theories. Unfortunately, there was again no translation except for the reading of the abstract (which everyone already had). One of his slides implied that he was able to predict seropositivity in humans with plant community structure, but I could not figure out what zoonosis he was discussing or if it was theoretical.

A paper by Anuz (Poland) entitled "Human zoonoses in Poland in the years 1980-1987" again stumped the translators with a Polish/Czech presentation which resulted in long periods of silence over the earphones.

Despite some problems with this last session, the

conference was a great success. Recommendations to be submitted to WHO include more inter-disciplinary research on zoonoses and more international cooperation for surveillance, among others. The Czechs were impressive with the quantity and quality of their presentations. The eastern Europeans in general seem superior in their ability to cope with outbreaks of zoonoses and to study their causes. This experience will be to their advantage in their attempts to control Lyme borreliosis.

## LATIN AMERICAN REGION

### Vector Control Activity Intensifying

Robert Tonn, SOVE correspondent for the Latin American Region, submitted an informal letter highlighting some current vector disease and control activities underway in Latin America. His report follows:

My information is drawn mostly from Andy Arata of the Vector Biology and Control Project, as they seem to be the most active in Latin America. Larry Lacey, Paul Reiter, and Mike Nathan will be giving a training course in Barbados for the Peace Corps volunteers working for *Aedes* control in the Caribbean. It should be an excellent course with Mike actually having been involved with *Ae. aegypti* eradication with Marco Giglioli. In an earlier letter, I mentioned a WHO/PAHO/VBC meeting in Guatemala to stimulate the interest of countries in testing for mosquito resistance to insecticides. Last July, the same group held a follow-up workshop in Guatemala for two weeks. Mexico, Guatemala, Honduras, Costa Rica, Nicaragua, and Panama sent participants to the workshop. Each brought working papers on the status of resistance in their country. It was heartening to see something like this underway in Central America, Mexico, and Panama as they do have serious mosquito resistance problems plaguing their malaria programmes.

Sam Breeland, retired CDC Medical Entomologist, was involved with an environmental assessment related to a five year extension of United States aid for the malaria programme in Honduras. The programme includes improved larval control through environmental management and testing of biological control agents.

Vector Biology and Control project of USAID/Washington, D.C. collaborated with the joint WHO/FAO UNEP Panel of Experts on Environmental Management for Vector Control (PEEM) to test cost effectiveness of vector control in El Salvador. The PEEM has similar studies planned for Ethiopia and India. Andy Arata told me that during the first six months of 1988, El Salvador had only 3,800 cases of malaria. This is down from 12,300 in 1987, 24,000 in 1984, and 95,000 in 1981. El Salvador is using limited residual spraying but does use focal spraying on case detection and environmental management in estuaries. Small source reduction projects using local labor are being supported. Along with good vector control, El Salvador maintains, a passive case detection and drug treatment activity.

The malaria activity in Mexico has been gradually moving toward more emphasis on research. For a number of years, Mexico has maintained a malaria research center in Tapachula, Mexico. The Center was originally staffed with both PAHO and

Mexican scientists. Although PAHO still has an important input, the Mexican scientists are the Center's driving force. It has been a center that has opened its doors to other investigators with research in new techniques to identify sporozoites in mosquitoes, identification of biocontrol agents against *Anopheles*, and microecological studies of their aquatic habitats. Scientists from NASA, University of California at Davis and Stanford, Uniformed Services Medical Center, and the University of Texas at Houston have been collaborating with the Center to determine the feasibility of a study using remote sensing and radar to identify major Anopheline breeding sites. This study is utilizing the techniques and information from a study done by NASA and Dr. Washino's group at the University of California, Davis. The study will be interesting to follow and whether successful or not, it should greatly add to our knowledge on biology and ecology of the two principal malaria vectors in the Tapachula area as well as help develop the public health potential of information collected by NASA.

The other encouraging story is in Belize (British Honduras) where USAID has a program titled, "Increased Productivity Through Better Health." Two components of the program include malaria control and *Aedes aegypti* control. The consultants involved with the work have been Glenn Stokes and Vishnu-Priya Sneller for *Aedes aegypti* control and Edgar Smith and Robert Turner for malaria. They have had an excellent training component utilizing PAHO training in Panama, El Salvador, Mexico, and Guatemala, plus the USAID training leading to fellowships to the Wedge Training Center and New Orleans. Consequently, in a comparatively short time, a competent national vector control team has been developed. The Program Corporation and Medical Care Development, Inc. have been doing creditable work in health education, local training, and communications as well as seeking meaningful ways to develop community participation.

### Dengue Fever a Persistent International Vector Disease Problem

Previous newsletters on dengue fevers in the Caribbean and Latin American region reported widespread occurrence of the disease in nearly all countries. According to the Centers for Disease Control Laboratory, Dengue Branch, San Juan Puerto Rico, cases of dengue fever have increased progressively for the past five years reaching a total of 128,430 reported in 1987. However, public health agencies know that dengue is grossly underreported and that actual cases are far greater. For example, Brazilian health authorities estimated that over one million dengue cases occurred in their country in 1986-1987, but only a fraction of this number was officially reported to the Pan American Health Organization which maintains health statistics for Latin America. Of interest to the health agencies in the U.S., where *Aedes albopictus* has been introduced, is that dengue transmission has yet to be confirmed in those areas of Brazil where *Ae. albopictus* is present.

The CDC, Dengue Branch participated in the investigation of an epidemic of dengue in Guayaquil, Ecuador in 1988. The number of cases was conservatively estimated at 422,000. Also participating concurrently was a delegation of vector specialists