

amassed by the governor serving Charles III of Spain to secure California, chose not merely to occupy the territory militarily, but to build religious and civil institutions that would provide for the long-term, self-sustained development of the population. The four-point San Blas plan foresaw:

- Establishment of military footholds at San Diego and Monterey.

- Construction of a network of missions, located along an overland route which became known as the *El Camino Real* (King's Highway) one day's walking distance apart. These missions were to serve as the centers of education for the Indians, in religion as well as music, geometry, astronomy, agronomy, and masonry. From these centers, the Indians learned how to build aqueducts, irrigate and cultivate crops, and domesticate animals. Some of the aqueducts are still in operation, and at some mission sites, artifacts such as violins, large song books for use by choirs, and telescopes are on display.

- Building of *presidios*, or fortifications, in order to sustain a permanent claim to the territory.

- Realization of the ultimate objective: the creation of a just and noble civil order, enlightened by the moral, religious, scientific, and technological principles emanating from the mission. This was to take the form of *pueblos*, or cities, with institutions of civil government and learning built around a plaza, or civic center. It was envisioned that such cities would ensure the sustained development of the people, including the optimal cultivation of the natural resources at their disposal, through continued emphasis on progress in scientific and technological knowledge.

Although he died before the vision was fully realized, and, ultimately, only two pueblos were established—in Los Angeles and Santa Clara—as a direct result of the plan, Father Serra salvaged the territory which includes today not only the most populous and prosperous state in the United States, but also vast regions of the North American continent that the Russians were actively coveting at the time of his intervention.

The same people who argue in the name of “cultural relativism” that famine and disease-ridden conditions in the Third World are justified as “the way such cultures do things,” have claimed that Father Serra's efforts abused the California Indians. This was refuted by an exhaustive investigation in the 1940s involving interviews with descendants of hundreds of Indians who were converted and educated by Serra. There was not a single account of a family history that recalled abuse. On the contrary, the histories recalled precious experiences of charity and mutual respect. Moreover, Father Serra, despite his poor health, traveled at one point to Mexico City to plead for more support in his efforts, and his pilgrimage included the proposal of a 32-point “Indian Bill of Rights” for protection of the Indians against exploitation, called the *Representación*, which Viceroy Bucareli adopted as state policy on March 13, 1773.

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## Public Health

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# Asian tiger mosquito threatens U.S. cities

by Debra Hanania Freeman

April traditionally marks the beginning of spring and the blooming of cherry blossoms in the nation's capital. Unfortunately, this April also marks the opening of the first full season in America of a breed of super-mosquito that began appearing in major urban centers late last summer. And, as that occurs, alarm is building rapidly among the scientists and public health planners faced with the task of trying to stop them.

Researchers involved in the study of this mosquito, *Aedes albopictus* or “Asian tiger,” say that it poses the worst mosquito-borne disease threat to American cities of all time. In an unusually candid public statement, George Craig, an *albopictus* expert and president of the American Mosquito Control Association, admitted, “In my 35 years in medical entomology, this is potentially the worst threat to public health I've seen.”

Dr. Chester G. Moore, a Centers for Disease Control research entomologist in Fort Collins, Colorado, not only agrees, but in a significant break with past CDC policy, has publicly decried the Reagan administration's failure to mount a federal effort to fight this threat. In a recent interview, he stated, “We have tended to handle real public health problems—such as AIDS—by fighting fires once they flare up rather than preventing the flare-up. It's hard to convince the policymakers you need the money. They say it may not be cost effective. But, these are political decisions, not scientific ones.”

Moore continued that if fires are what the policymakers require, fires are what they will get. The Asian tiger mosquito is in the United States to stay. “We will never get rid of it,” Moore said.

Why does this mosquito evoke such alarm?

### A disease carrier

Asian tiger mosquitoes are exceptionally efficient carriers of viral diseases including dengue virus. Newly arrived in Brazil, the Asian tiger ignited an epidemic of dengue fever that afflicted an estimated 350,000 people in Rio de Janeiro in 1986, an increase from just 6 in 1985.

Dengue, also known as "breakbone fever," causes severe headaches and joint, muscle, and eye pain. "It's like somebody has his fingers behind your eyes and he's trying to pull them out," said Moore, who one contracted the disease while traveling in the Caribbean. Although dengue itself is not usually fatal, survivors who contract the virus a second time frequently come down with dengue hemorrhagic fever, which causes skin eruptions and severe bleeding from the gums, intestines, and internal organs. It is fatal to about 15% of its victims. Except for foreign travelers, dengue has been virtually unknown in the United States for decades. However, the tiger mosquito threatens to change all that.

In 1986, thirty-three cases of dengue were reported to the CDC, up from eight the year before. Fourteen of the cases were in Texas, the first state where the mosquito appeared. In Baltimore, Maryland, where tiger mosquitoes were first found in August 1987, an unprecedented seven cases of dengue have already been found.

There are other threats from the tiger mosquito. Scientists worry that the tiger mosquito is much more efficient than the native tree hole mosquito at transmitting LaCrosse encephalitis, a disease already endemic to the Great Lakes states.

LaCrosse encephalitis is a viral inflammation of the brain with normally mild flulike symptoms in adults. But in children, it frequently causes severe headaches, paralysis, seizures, permanent brain damage, and I.Q. loss.

There is also evidence to suggest that the tiger mosquito, under certain conditions, transmits AIDS.

## How the mosquito spreads

Asian tiger mosquitoes are said to have arrived in the United States in 1985 in a shipment of used tires sent to Houston from Japan. (There are, however, other theories as to how the mosquito got here.) The mosquitoes, which breed readily wherever there is at least a quarter-inch of water, quickly spread throughout the area, from Houston to New Orleans. By August 1987, tiger mosquitoes were spotted breeding as far north as Chicago, up and down the east coast, and in pockets throughout the Midwest and South. It is already a major problem in Texas and Louisiana.

The tiger tends to breed close to buildings rather than in the woods, it breeds in sun and shade and is resistant to all but the very coldest of temperatures. It bites day and night. It is an aggressive biter, and it is persistent. According to Moore, "The female will follow a person. If the person gets in a car, the female will get in with them."

It also has the unusual ability to transmit disease not only through its saliva, when it bites, but through its eggs, making its offspring infectious without having to bite an infected person first. Because the mosquito tends to resist all commonly used insecticides, eradication is vexing.

In a recent article in the *Chicago Tribune*, Craig recounted a chilling story:

"When we found *albopictus* in Evansville, Indiana, they

sprayed insecticides into the tire piles [where the mosquitoes were found breeding] for 11 days. There was so much insecticide that it had crystallized on the ground and would crunch under your feet as you walked. On the 12th day, they stopped spraying and just watched as the mosquitoes flew out of those tires."

Moore, of CDC, says the costs of eradicating the Asian tiger mosquito with insecticides would be "mind boggling." He insists the only control strategy is source reduction—getting rid of every possible container where they might breed. That means, he says, shredding all old tires, cleaning up all trash, eliminating any container that might allow still water to collect.

But in today's rapidly decaying urban centers, that would require the kind of effort that the current administration has been totally unwilling to even consider, and which state governments simply cannot afford.

## The case of Norfolk, Virginia

In fact, in most American cities, whatever previously existed in the way of even traditional mosquito control and eradication programs is in the process of being dismantled. The case of Norfolk, Virginia is exemplary.

Norfolk houses several large naval facilities, is on the Atlantic coast, and is just north of the Great Dismal Swamp. Well before the advent of the tiger mosquito, this area has always suffered severe mosquito infestation. As a result, Norfolk has one of the most aggressive mosquito control programs in the nation.

In the early days, these programs were designed and implemented by the U. S. military. More recently, mosquito control has been run by the municipal government with 55% of the allocated funds coming from the state government in Richmond.

Today, this area faces an immediate additional threat of tiger mosquito infestation (eggs were discovered throughout the area late last summer). Local officials have called for significant funding increases to stem this threat, while at the same time warning of potential outbreaks of encephalitis and dengue fever if early control measures were to be unsuccessful.

The state government, under the leadership of Gov. Gerald Baliles, has responded by cutting *all* funds for mosquito eradication and control out of the new budget, placing the entire burden on the municipalities affected.

Proposals by scientists to employ new technologies utilizing advanced scientific principles from an area variously known as "optical biophysics" or "bioelectromagnetics" (see *Science & Technology*) to control the pesticide-resistant Asian Tiger have, similarly, fallen on deaf ears. So, with no funds allocated, and no plan on the drawing board likely to stop them, the first crop of Asian tiger mosquitoes born in American cities this season are, at this very moment, hatching, laying new eggs, and biting.