resistance appears related to genes on the mosquito's second chromosome, with possible help from a few genes on chromosome three.

And just last year, Alison C. Morris, Paul Eggleston and Julian M. Crampton of the Liverpool (England) School of Tropical Medicine reported the first successful introduction of a bacterial gene into *Aedes aegypti,* a species that has developed widespread resistance to pesticides.

With the technique for inserting bacterial genes into *Aedes aegypti* now well established, the Liverpool researchers say they look forward to experimental insertions of various mosquito genes. "Such work should ultimately lead to an understanding and control of the molecular mechanisms involved in the transmission of pathogens by their insect vectors," they write in the January 1989 MEDICAL AND VETERINARY ENTOMOLOGY.

Large-scale disease control through engineered insects remains "far down the road," says Beaty. Other approaches, including safer pesticides and new drugs, will no doubt play important roles along the way. But in light of growing pesticide resistance among insect populations, environmental concerns about large-scale drainage of ecologically sensitive wetlands where mosquitoes breed, and the bleak prospects for rapid development of vaccines against such scourges as malaria and dengue, researchers say gene-altered mosquitoes start to look pretty good.

NIAID's Gwadz calls the replacement of entire insect populations a "very long-range goal" that will probably work best in specific circumstances, such as areas where targeted insect populations remain somewhat isolated or where an infestation is relatively new.

The genetic approach has some ecological advantages over a strategy of wiping out entire insect populations, Beaty adds. "Whenever you knock out something with pesticides, you create an ecological vacuum and something else moves in," he says. With improvements in genetic engineering techniques, "we may be able to enhance populations that are not good transmitters," without removing a significant piece of the ecological puzzle.

But any genetic traits scientists choose to enhance will have to work very efficiently in the altered mosquitoes. Gwadz notes that in Africa, mosquitoes typically inject 2,000 times more malaria-causing protozoans into humans than are needed to transmit the disease. Thus, even mosquitoes genetically engineered for a 99 percent reduction in their transmission efficiency would have little effect on the spread of malaria there, he says.

T. Litwak

On the brighter side, while scientists today know of only a few mechanisms by which insects become poor carriers of pathogens, other sources of vector incompetence — perhaps extremely efficient ones — probably await discovery, Gwadz asserts.

It will take time to understand these various biological mechanisms and to sort out the underlying genetics. Toward that end, entomologists and molecular biologists express excitement about a $1.1 million program initiated this year by the Chicago-based MacArthur Foundation. The money is earmarked to forge a marriage between modern genetics and vector biology at five U.S. research centers.

Researchers note that a thorough understanding of even one good mechanism of vector incompetence could lead to wholesale reductions in the number of people suffering from mosquito-borne diseases. "However it happens," says Gwadz, "if the mosquito can't transmit the disease, then that's okay." □

Letters continued from p.67

and if such studies confirm these findings, it would appear that prudent public policy intended to address the educational disparity between poor and nonpoor children should include efforts to assure access to SBP for all low-income children."

Gill suggests children who tend to be absent and tardy also tend not to participate in SBP or to perform well in school, but there was no difference in absence and tardiness rates between SBP participants and nonparticipants in the year prior to SBP implementation.

Alan Meyers, Michael Weitzman
Boston University School of Medicine
Amy Sampson, Beatrice Rogers
Tufts University School of Nutrition
Boston, Mass.

Tasaday: Forked tongue?

It was misleading — ambiguous if not erroneous — to say in your report on the Tasaday that "the strange case . . . grows stranger still with new evidence presented at the annual meeting of the American Anthropological Association" ("Tasaday controversy grows more curious," SN: 11/25/89, p.343).

In fact, all new primary evidence at the meeting (chiefly genealogical and linguistic) supported the argument that the Tasaday were an authentic and distinct group of cave-dwelling food-gatherers who had resided in the Mindanao rain forest for at least several generations when researchers first contacted them in 1971.

There are disagreements on aspects of the Tasaday, but the "clash" you cite between linguists is not over whether Tasaday language is authentic but over when it split from a root language and to what degree it is uniquely Tasaday. All linguists who have done field work with the Tasaday say their speech is related to but distinct from that of neighboring peoples. In other words, the Tasaday are real, not phonies, which was the major question raised before the meeting.

In affirming Tasaday authenticity, four researchers who presented new data joined the 11 other anthropologists who have done field studies with the Tasaday. None of the anthropologists you quoted as saying the Tasaday are impostors have ever met the people, visited their habitat or gathered primary evidence. If *that* is what your report meant by a "strange case," then I hasten to agree.

John Nance
Portland, Ore.

Like cancer, AIDS and corruption, the Tasaday controversy refuses to die. The hoaxers, careless researchers and vested interests do not allow it. There are bucks to earn, reputations to protect, celebrity statuses to cultivate. The truth — well, it can wait.

Our paper argues that the Tasaday speak a distinct language and not a dialect of any Manobo language. Our analysis of Tasaday and representative Manobo languages reveals that Tasaday shares only 26 of its 100 basic vocabulary items with Cotabato, the Manobo language with which it was claimed to share 90 percent of its fundamental vocabulary at the meeting of the American Anthropological Association. A cognate sharing of 26 percent is very low, considering that the cutoff figure for dialects is about 70 percent.

We found that several aspects of Cotabato syntactic rules were violated in the Tasaday speech of 1972, including sentence formation, pronominalization, time reference and focus affixation patterns. Nor was there in several instances a consistency of patterning of the syntactic aberrations. To say the Tasaday speech taped and transcribed by C. Molony in 1972 is a dialect of Cotabato is to say the following sentences represent one dialect of English: "I is going yesterday I house"/"I will go yesterday mine house"/"I went my house yesterday"/"House yesterday."

A possible explanation could be that the Tasaday in the early '70s were not speaking their own language but were trying to learn and speak another, perhaps a language of prestige to them, spoken by an individual or group with superior technology which they wished to acquire.

Tasaday bilingualism — and the ignorance on the part of the Tasaday and their interpreters of what the linguists were truly after in 1971 and 1972 — partly accounts for the kind of linguistic data collected at the time. Thus, a huge chunk of those linguistic data is not Tasaday but Cotabato Manobo or a dialect of Cotabato such as Blit — the language spoken by Dafal, the man who reportedly introduced the Tasaday to trapping and hunting technology, and to Manuel Elizalde Jr., who introduced them to the outside world.

As the issues clarify themselves, it becomes clearer that the hoax is the hoax.

Araceli C. Hidalgo, Cesar A. Hidalgo
Linguists
University of Malaya
Kuala Lumpur, Malaya