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This Week

Research Notes

Articles

Cover: Orange, yellow and green strands represent three protein portions that together make the "globular domain" atop a hemagglutinin spike (blue) on the surface of a human influenza virus, as viewed from above. Minor mutations within these protein strands have periodically endowed this virus with novel, immune-avoiding abilities or lethal virulence. Scientists say such viral mutability – in conjunction with uncontrolled human population expansion and global ecological instability – presents the specter of new viral epidemics against which we may have frighteningly few defenses. (Computer image: University of California, San Francisco)

Departments

Letters

Neanderthal underachievers

Bruce Bower incorrectly describes us as arguing that Neanderthals did not possess the "intellectual capacity for symbolic thought or logic" ("Talk of Ages," SN: 7/8/89, p.24). This is a common misreading of our article, stemming from a failure to distinguish between the capacity for a behavior and its adoption as a significant part of human adaptation.

In fact, there is good evidence that Neanderthals had symbolic *capacities* equivalent to ours. Neanderthals were apparently responsible for the Chatelperronian, an Upper Paleolithic industry with good evidence of symbolic behavior. However, the use of symbols appears to have played at best a very minor role before the Upper Paleolithic – just as farming was not practiced for tens of millennia after the necessary intellectual capacity had developed. Thus, adaptive dependence upon language seems to have appeared long after the necessary neurological changes.

This implies that biological and behavioral evolution were mosiac in nature – a fact that should surprise no one but that does have major implications for the character and significance of the debate about the origins of "modern" humans and "modern" behavior.

Philip G. Chase
Harold L. Dibble
University of Pennsylvania
Philadelphia, Pa.

Schooled in sadness?

It is interesting that "clinical depression is pretty rare before about age 7" and that "a bout of major depression lasts an average of seven to nine months" ("Growing Up Sad," SN: 8/5/89, p.90). This suggests there might be a correlation between childhood depression and compulsory school attendance.

As director of a statewide organization assisting home schoolers, I am contacted by dozens of parents every year who tell the same story. Sometime after their children started grade school, these parents noticed that the children began to "lose their spark." Many tell of children who just were not developmentally ready for the academics and who seemed to be living under a constant threat of failure and fear of public humiliation. Others tell of children who were bored and miserable having to sit passively in wooden desks all day, memorizing information with little relevance to their daily lives. They all tell of children who felt helpless and unhappy but were unable to change things. The children were too small and too vulnerable to stand up to the teachers, the class bullies, their parents and the laws that forced them to go to school day after day. The result was depression, anxiety, social withdrawal, low self-esteem and school phobia.

The parents always tell me that improvement was dramatic when they took their children out of school to educate them at

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and rational."

Unfortunately, new diseases occur most frequently in crowded, poverty-stricken, tropical lands – the areas where people are least prepared to identify and analyze viral trends, says epidemiologist Donald A. Henderson, dean of the Johns Hopkins University School of Hygiene and Public Health in Baltimore.

Moreover, says Robert E. Shope, a viral epidemiologist at the Yale University School of Medicine, tropical-disease programs and specialists are dwindling in number worldwide. In 1973, citing budgetary constraints, the National Institutes of Health closed the last of its laboratories for tropical virology. More recently, an important tropical-virus laboratory in Hawaii shut down. Now, Shope says, the U.S. military plans to close its tropical-disease lab in Kuala Lumpur, Malaysia, even though it has served as an "excellent listening post for new diseases."

Given current social and ecological trends, virologists say, this hardly seems the time to cut back on such programs. Rather, Shope and others recommend constructing sophisticated, on-site laboratories in key tropical areas and creating a global "red alert" reporting system among hospitals in high-risk areas. Shope suggests supplementing local labs with mobile units staffed by microbiologists, epidemiologists and entomologists who could investigate diseases on call.

Such a network could be surprisingly economical, says Henderson. For as little as $150 million a year, he calculates, a global consortium could finance 15 tropical medical centers and 10 U.S. research facilities, leaving $25 million for selected projects in epidemic areas.

There's little time to lose, warns historian McNeill. An expanding human population subject to urban overcrowding now provides an unprecedented opportunity for aspiring viruses. "If you look at the world from the point of view of a vigorous virus, or even a bacterium today, there's a magnificent feeding ground out there, with billions and billions of human bodies where 25 or 27 years ago there was half that."

He recalls what happened in the 1950s when a virus newly introduced to control the rabbit population went out of control in Australia. Ultimately, the rabbits evolved an ability to coexist with the virus, but not before 80 percent of them had fallen to the epidemic. "This seems to me a very exact model of what might happen to human populations exposed to a new and very lethal virus in the world today," McNeill says.

Moreover, "the idea that the medical profession could stand as an effective obstacle to the propagation of such an infection seems to me optimistic, to say the least." If our experience with previous outbreaks is any indication, McNeill says, "the doctors would be the first to go." □

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home. They describe how their children became cheerful, enthusiastic learners. But most of them say it takes a long time to heal completely, and that some scars remain.

This is biased and anecdotal evidence. But it would be very interesting to see some controlled investigations in this direction. That so many children are "growing up sad" is too tragic for us to leave any leaf unturned.

Elizabeth C. Hamill
Director
Northern California Homeschool Association
Berkeley, Calif.

Power conversion 'urgent'

"Where Acids Reign" (SN: 7/22/89, p.56) is the first report I have seen detailing the mechanism by which tree dieback occurs. Nitrogen compounds (interestingly, including ammonia) precipitate the sequence of events that weakens trees and eventually leads to forest loss.

The article indicates that the major U.S. sources of atmospheric nitrogen compounds are motor vehicles, fossil-fueled power plants and industrial furnaces. Thus it becomes particularly urgent that we follow the French example and convert to nuclear power as rapidly as is consistent with safe and prudent construction.

In addition, another look might be taken at the automotive pollution control tradeoff between higher-temperature burning that produces more nitrogen oxide and less carbon monoxide or lower-temperature burning that produces less nitrogen oxide and more carbon monoxide.

Further, a question arises as to whether pH or nitrogen compounds are the key parameter causing forest loss. Perhaps the resources spent to further decrease particulate matter and sulfur dioxide should be diverted to reduce nitrogen oxides and ammonia.

Lloyd McAulay
New York, N.Y.

Unconventional cay

Your report on the discovery of a Maya site on Ambergris Cay suggests there may be other sites on other coral islands of Belize ("Late Maya Culture Gets an Island Lift," SN: 7/8/89, p.20). This suggestion proceeds from a faulty premise. Ambergris Cay is not a typical coral island. It is my understanding that Ambergris is an island only by virtue of Spanish civil engineering: For military purposes during the colonial period, the Spanish excavated the channel that now separates Ambergris from the Yucatán. When the Maya lived on Ambergris, it was the southern tip of the Yucatán, not an island.

Jan Konigsberg
Helena, Mont.

Ambergris is indeed atypical, says Elizabeth Graham of the Royal Ontario Museum in Toronto, because it is connected to Yucatán by a narrow spit of land. Nonetheless, she asserts, modern-day residents of Belize travel to Ambergris in boats rather than by land, and the Maya probably did not use the sandy channel for transportation. Graham knows of no solid evidence that the Spanish created the cay. Furthermore, she says she and her co-workers have now uncovered evidence of Maya occupation on nearby cays. – B. Bower