RANDOM SAMPLES

edited by CONSTANCE HOLDEN

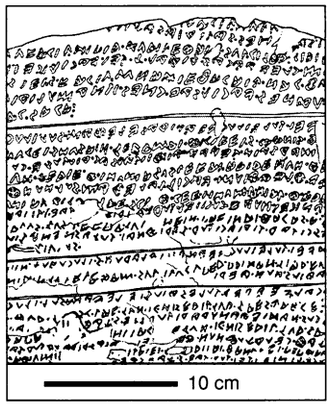
Why Neurons Won't Regenerate

Until 15 years ago, most neurobiologists thought neurons in the brain and spinal cord were incapable of regeneration. Then came the discovery of local factors that stimulate or inhibit axon growth, which encouraged researchers to suspect that, given the right nurturing, severed nerve fibers could re-establish lost connections.

But nobody's been able to get those fibers to regrow in large quantities in either animals or in laboratory dishes, despite the addition of stimulatory factors and the removal of inhibitors. Now researchers at the Massachusetts Institute of Technology (MIT) think they know why: The genes that cause elongation of axons shut down at a certain point in their development. "The significant thing was not the environment they were growing in," says one of the researchers, neurobiologist Gerald E. Schneider. Rather, he theorizes, the growth is controlled primarily by an "intrinsic program."

Reporting in the 1 August issue of the *Proceedings of the National Academy of Sciences*, Schneider, with Dong Feng Chen and Sonal Jhaveri, relates that they arrived at their finding using "explant" culture—putting hamster retinal cells in a laboratory dish next to tissue from the midbrain tectum, an area that retinal axons readily innervate in developing hamsters. Using tissues of varying ages, they determined that while embryonic retinal axons would link up with tectum cells from animals of any age, very few axons from animals more than 2 days old would make the connection.

Neurobiologist Samuel David at Montreal General Hospital, who helped demonstrate that neutralizing inhibitory factors make some axon elongation possible, says the results are interesting, but "there are some crucial experiments that still need to be done." He suggests that environmental factors may still be regulating the intrinsic program. Neurobiologist Kenneth L. Moya of the National Scientific Research Center in Orsay, France, who studies gene expression in developing nervous systems, is more convinced by the MIT results. He says they present "a good jumping-off point" for research on how to manipulate the genetic as well as environmental factors in nerve regeneration.



Tablet talk. Portion of the *Tabula Capuana*.

Etruscan Tablet Interpreted

The Etruscans, who ruled ancient Italy before the Romans, have remained shrouded in mystery, largely because their language has defied translation. It hasn't helped that the Etruscans left few extensive texts for archaeologists to pore over.

Last month, however, a team of Etruscan scholars triumphantly revealed the meaning of the *Tabula Capuana*, a terracotta tablet from 470 B.C. and the second longest Etruscan text in existence. The tablet, an annotated religious calender, tells of a land-hungry people whose quest for territory put them at odds with neighboring Greeks, and who divided their years not into 12 months, but 10. "This is a very important result," says Giovannangelo Camporeale, an etruscologist at the University of Florence.

The calender itself is particularly interesting, says Mauro Cristofani, head of the National Research Council's Institute for Etruscan Archaeology in Rome and leader of the team who deciphered the tablet. It bolsters traditional belief that in the 700s B.C. under Rome's legendary founder, Romulus, the Romans used a calender with 10 months based on lunar phases and a winter period that was not counted. It is well known that the Romans used 10 months until about 450 B.C., when they added January and February, but this firms up the earlier historical record.

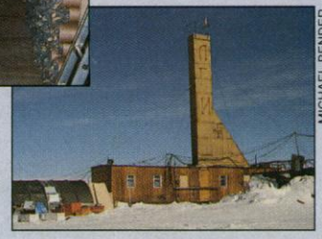
The tablet also records that the Etruscans had an even greater appetite for territory than previously thought. Their settlements centered on Tuscany, from where they invaded Latium, Campania, the Po valley, and the region around Salerno in the 7th and 6th centuries B.C. The tablet, says Cristofani's colleague Maristella Pandolfini, reveals that in the 5th century the Etruscans "made much more extensive incursions than previously believed," invading coastal regions west of Naples then inhabited by the Greeks.

Antarctic Drillers Strike New Depths

Research into Antarctica's frozen history has reached new depths—3000 meters and counting. Ice-core drillers at Russia's Vostok Station struck the milestone last month and extracted the Earth's oldest ice core yet.

Michael Bender, a geochemist at the University of Rhode Island who studies the Vostok samples for clues about changes in the Antarctic climate, called reaching 3000 meters "symbolic," and said "drilling at Vostok has gone significantly beyond the depths at which previous data have been published."

By studying concentrations of carbon dioxide and methane trapped in the ice, scientists have already gained data supporting the theory that increases in natural greenhouse gases, which are more concentrated during periods of thaw, preceded the melting of glacial ice after the penultimate ice age 140,000 years ago (*Science*, 29 June 1990, p. 1607). With the new data, says Bender, they will be able to add another 50,000 to 60,000 years to the ice record, taking researchers back to the ice age before that. At 3000 meters the ice is estimated to be 300,000 years old, older than even deeper ice samples taken in Greenland, because the Antarctic ice layers are thinner due to less snowfall.



INSET: CONNIE WEYHENMEYER/SCRIPPS INST. OF OCEANOGRAPHY

MICHAEL BENDER

Cold world. Drilling headquarters in Antarctica. *(Inset)* Ice core.

Despite the winter weather—it was minus 70°C when the Vostok drillers hit 3000 meters—the drilling continues at the rate of 1 to 2 meters a day. They should soon surpass the longest core—3054 meters drilled at Greenland—and eventually they hope to get almost to the bottom of the ice layer, which is estimated to be 3700 meters thick.

Leakey Beaten by Kenyan Mob

Paleoanthropologist Richard Leakey, who in recent months has been devoting most of his energies to politics, was beaten last week by an angry crowd as he was seeking to visit an imprisoned political dissident.

The attack took place in Nakuru, a town 160 kilometers from Nairobi. Leakey, now the secretary-general of a new Kenyan political party, Safina, says he was waiting in the parking lot for permission to enter the prison when a mob wielding leather whips,

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rocks, and wooden clubs attacked him, his colleagues, and several journalists. Kenyan police stood by during the attack, according to other observers. Leakey escaped his attackers after running (on his artificial legs) to his Land Rover and driving away, but not before crowds had smashed all the vehicle's windows.

Leakey, formerly a member of the governing party Kanu, resigned from the directorship of the Kenya Wildlife Service last year after losing the backing of Kenya's president Daniel arap Moi. Moi has been actively denouncing Leakey since last May, when he joined with several Kenyan business people and politicians to form an opposition party (*Science*, 12 May, p. 791) to counter what they say is a corrupt dictatorship. The attack demonstrates just "how oppressive this regime is," says Leakey, who adds that it has only strengthened his political commitment.

Leakey, who lost both legs in a plane crash 2 years ago, seems to be made of stern stuff. Immediately following the attack, which left nine deep welts in his back, he returned to Nairobi for a prearranged meeting with a photographer from the *National Geographic*.

NYU Primate Lab Changes Hands

Despite clamorous opposition from animal rights organizations, the New York University (NYU) Medical Center last week turned over its 225-chimp primate research facility in upstate New York to a New Mexico–based foundation that has recently been charged with several violations of federal animal welfare standards.

The transfer of the NYU facility, known as the Laboratory for Experimental Medicine and Surgery in Primates (LEMSIP), means that the new owner, the Frederick Coulston Foundation in Alamagordo, will now oversee research on more than 700 chimpanzees, over half of the chimps used for laboratory research in the United States. Chimps are primarily used for vaccine research.

Last month, the U.S. Department of Agriculture (USDA) filed a complaint against the Coulston Foundation alleging violations of the Animal Welfare Act. Among the charges is that three chimps died in 1993 when temperatures in one of the foundation's primate housing units soared to over 50°C. "We are responding to all the USDA charges and will be in full compliance by September 15," says the foundation's head, Frederick Coulston.

But animal welfare advocates including chimp researcher Jane Goodall have pleaded with NYU officials to postpone the transfer until the foundation has demonstrated that compliance. NYU, however, is responding to other pressures: It's been ordered by USDA to increase the size of dozens of the LEMSIP chimp cages to meet federal standards. And rather than take on this expense—expected to top $1 million—NYU chose to give away its facility.

Roaring on the Pacific Rim

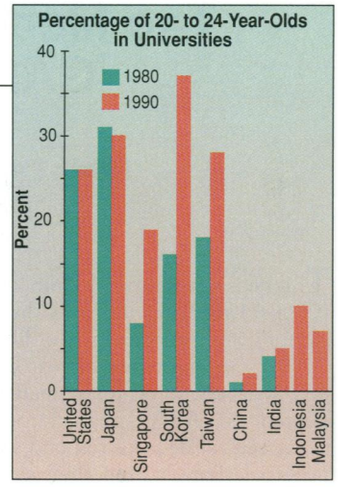
Who's going to be the next Asian "tiger"? Malaysia, predicts a new analysis published by the U.S. National Science Foundation (NSF). In a report on "Asia's New High-Tech Competitors," NSF says Malaysia is getting set to leap the gap between the NIEs (newly industrialized economies) of Hong Kong, Singapore, South Korea, and Taiwan, and the EAEs (emerging Asian economies)—Malaysia, China, India, and Indonesia.

The report, authored by Lawrence M. Rausch, ranks the eight tigers and would-be tigers on various criteria, including patent trends, high-tech trade with the United States, openness to foreign investment, and technological infrastructure. All the NIEs and EAEs put together are still dwarfed by Japan. But among the EAEs Malaysia looks particularly promising by a number of indicators: It is "purchasing increasing amounts of advanced technology products and continues to attract large amounts of foreign investment—much of it in the form of new high-tech manufacturing facilities." And it sells the United States $2.3 billion worth of computers and electronics a year (the figure for India, in contrast, is only $15 million).

At the bottom of the heap, says the report, are China and Indonesia. Although they are buying more U.S. high-tech products and know-how, they're not demonstrating either the resources or the commitment "that would project technological competitiveness in the near future."

The report contains one observation on the scientific job situation that may gladden the hearts of underemployed U.S. scientists and engineers: Not only are Asian students who come to the United States likely to be drawn back home by new opportunities, but, the author predicts, "the increased competition for [scientific] talent [in Asia] will likely affect the ability of the United States to retain top [native] talent."

*Available from NSF. Phone: 703-306-1130. E-mail: pubs@nsf.gov



Growing talent. Changes between 1980 and 1990 are particularly dramatic in today's tigers—Singapore, South Korea, and Taiwan (Hong Kong not shown).

New Member of Dino Family

Paleontologists excavating a site among vineyards in southern France last month announced a rare find: an almost complete skeleton of a hitherto unknown Cretaceous-era dinosaur equipped with unusual bony plates. The creature, estimated to be 70 million to 75 million years old, is a member of a midsized species of the plant-eating sauropods.

"It is about 15 meters long, walked on four legs, and has the long neck and tail typical of sauropods," says Jean Le Loeuff of the Musée des Dinosaures at Esperaza, France, one of the team excavating the site, a former river bed in the Aude Valley. "But the most unusual feature is the bony dermal plates." The new species belongs to the family of sauropods called titanosaurs, and although other species with bony plates have been found in the southern hemisphere, this is the first to have been found in the north. The researchers, who have a paper in press at *Comptes Rendus de l'Academie des Sciences*, have christened it *Ampelosaurus atacis*—dinosaur of the vineyard.

The French team is now puzzling out how the plates were arranged and what purpose they served. Although some carry spurs up to 20 centimeters long, "we don't think they were for protection from predators because of the large size of these dinosaurs," Le Loeuff says. They may have just lent support to the vertebral column, say the researchers.

Scientists hope *Ampelosaurus* will help build a better global picture of the distribution and diversity of titanosaura and their relation to other sauropods. "Sauropod evolution has only been considered from the American point of view so far," says Le Loeuff. Angela Milner of the Natural History Museum in London observes that "the completeness of the remains could ... help tie together some of the other European dinosaur fragments," making it possible to make more precise identifications of material, including nonplated titanosaurs, already excavated. And *Ampelosaurus* may even have some relatives close by: Although most sites of this age in Europe contain only marine organisms, the Aude Valley site appears to be studded with dinosaur fossils.