

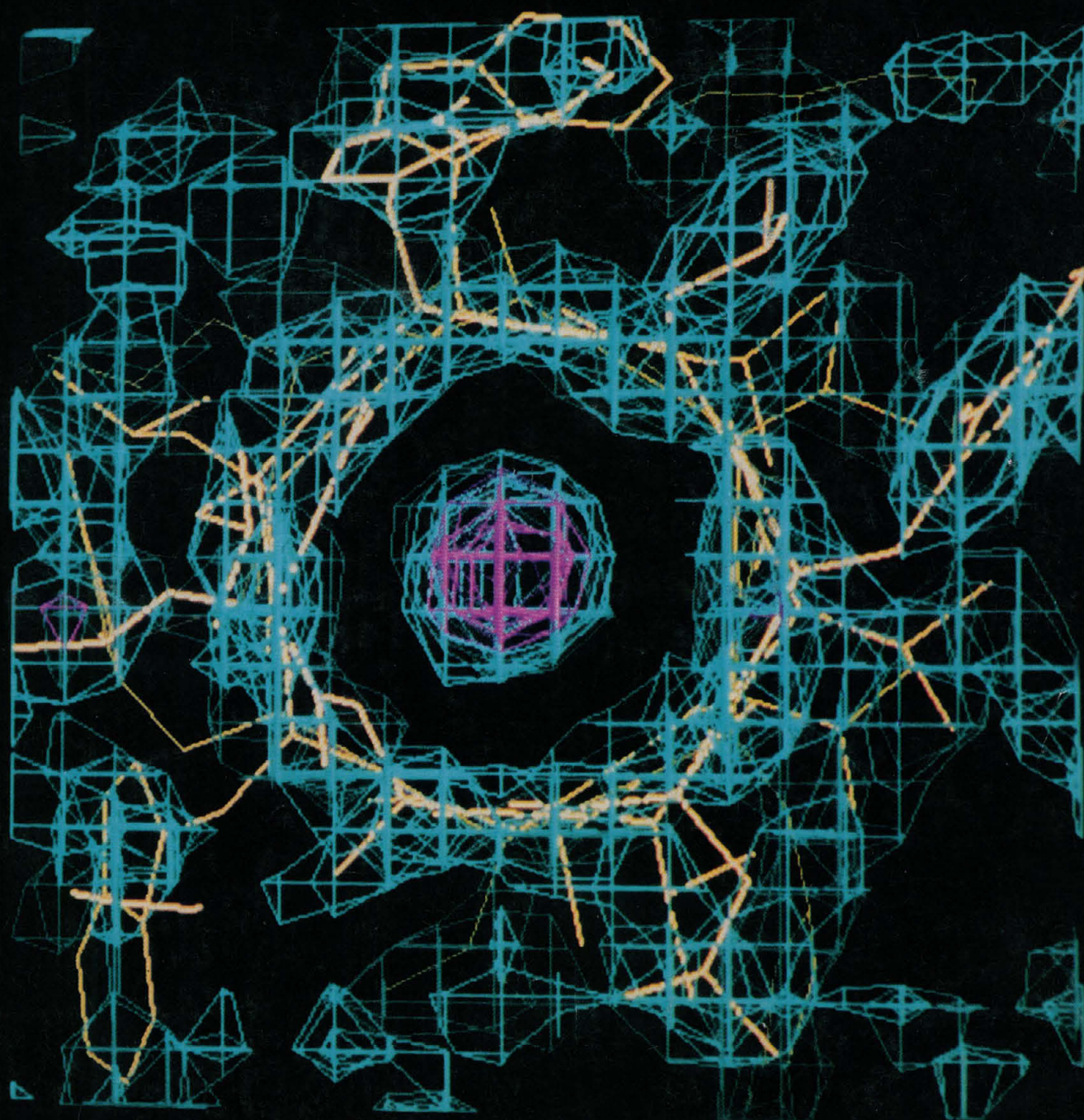
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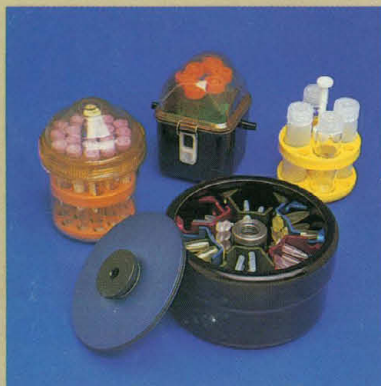
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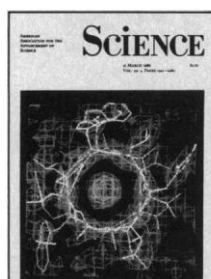
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COVER The gramicidin pore. The molecular structure (yellow) of the gramicidin pore is superimposed on a section of the electron density map derived from gramicidin/cesium crystals. The higher density contours (magenta) correspond to the ion ligands (cesiums and chlorides) located in the center of the pore. The lower density (blue) contours are from the polypeptide chains. See page 182. [B. A. Wallace and K. Ravikumar, Rensselaer Polytechnic Institute, Troy, NY 12180-3590]

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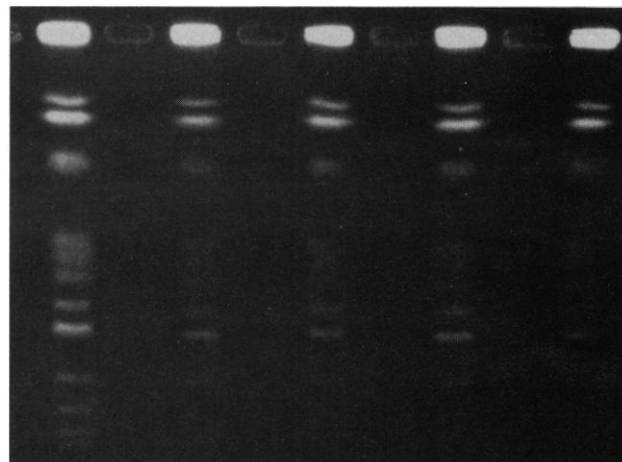
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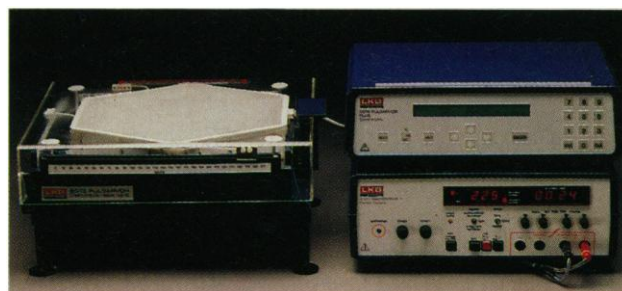
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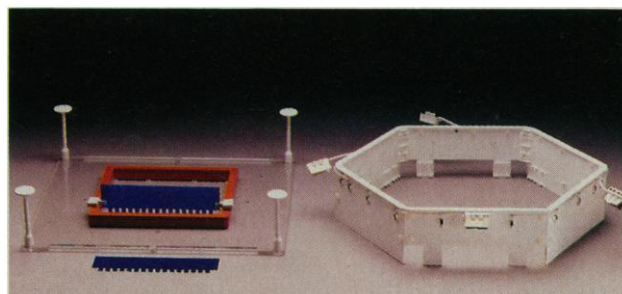
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This Week in SCIENCE

Ocean actions and animal roads

THE formation of food webs in the ocean near reefs, islands, and headlands is greatly affected by local fronts; these fronts are boundaries between two different water masses and are generated by interaction of local currents with local topography (page 177). Wolanski and Hamner explain how fronts, formed for example by boundary mixing or the interaction of warm lagoon waters with colder shelf waters, affect the distribution of organisms and particulates throughout the water column. Rather than dispersing floating eggs, larvae, and plankton as do currents in the open sea, locally formed eddies and jets redistribute sediments and sweep together floating particulate materials, concentrating them. Zoocurrents or "animal roads" form, and these concentrations of plankton and other animals help to define the boundaries, direction, and size of local flows. The physical phenomena operating around ocean topographic features concentrate organisms that are low on the food chain and therefore also the larger animals—fishes, whales, and sea birds—that eat the food sources assembled there.

El Niño predictions

WARMING trends in the southern Pacific Ocean—El Niño events—have had devastating effects on animals and plants in the sea and on land and may be linked to changing mid-latitude weather patterns. Since the destructive El Niño of 1982 and 1983, efforts have intensified for finding ways of forecasting future El Niño events. The most recent El Niño occurred in 1986 and 1987, and its buildup and some of its features were predicted fairly successfully by three different numerical models (page 192). One, a statistical model, considered how atmospheric patterns evolve; the second was based on the response of the tropical Pacific Ocean to wind stress; and the third simulated the evolution of an El Niño by coupling atmosphere and

ocean data. Barnett *et al.* point out that all three models apparently owe their successes to a fundamental reliance on tropical wind data: atmospheric circulation patterns, which affect sea level pressure and sea surface temperature, vary on a large scale and with low frequency and provide a reliable signal that an El Niño event is on the way.

Earthquake record in tree rings

THERE does not appear to be enough regularity in the recurrence interval of great earthquakes in the Mojave segment of the San Andreas fault for accurate prediction of when the next large earthquake there will occur (page 196). Jacoby *et al.* report that tree ring data in cores and stumps of Jeffrey pines, white firs, and incense cedars growing near the fault zone provide evidence of a major trauma to trees along the fault in the winter of 1812–1813. On 12 December 1812, the San Juan Capistrano earthquake occurred; its source was previously thought to be a coastal fault but now appears attributable to a major rupture (magnitude >7) of the San Andreas fault. Nine trees growing within 20 meters of the fault suffered severe trauma: all had greatly suppressed growth for years, two lost their crowns, and four took about 50 years to fully recover. The fault slippage probably severed major roots of these trees, impeding for decades food and water uptake. Radiocarbon data and historic information indicate that the segment's previous great earthquake had occurred about 330 years earlier; only 44 years later, in 1857, another large earthquake was felt. Thus, if future large ruptures of the fault are to be forecast, a better understanding of how stress builds up and is released will be needed.

New retroviral protein

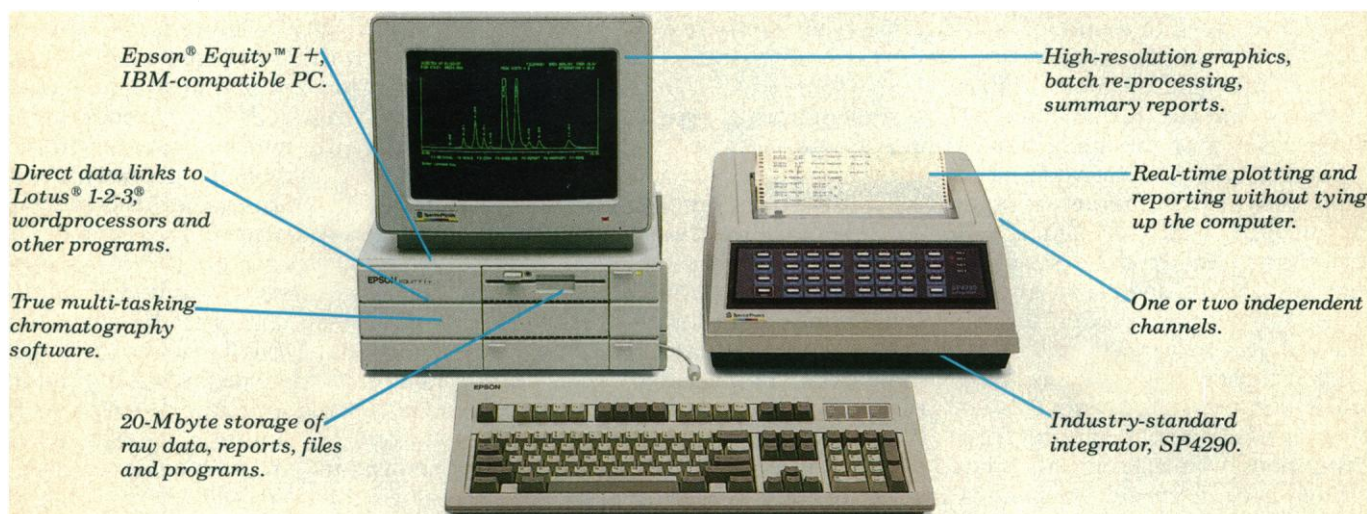
A new retroviral protein has been identified; produced by a gene tentatively named *sid*, the protein is found in amounts equivalent to

those of some of the protein products of the *gag* gene (page 199). Henderson *et al.* purified and sequenced Sid from a virus that causes immunodeficiency disease in macaques. The amino acid sequence of the protein closely corresponds to the predicted sequence for the product of the X-ORF genetic region. X-ORF is found in the genomes of a number of related simian viruses and in the type 2 human immunodeficiency virus (HIV-2); it is not found in HIV-1, the human immunodeficiency virus most commonly associated with AIDS. With antibodies, Sid-like proteins were detected in a number of simian viruses and in HIV-2, but not in HIV-1. Diagnostic antibodies, nucleic acid probes, and other reagents based on Sid and X-ORF may thus be important in further distinguishing among the immunodeficiency viruses. Although the function of Sid is not known, its strong binding to single-stranded nucleic acids in vitro suggests that it may be an RNA-binding protein.

Protein source for Alzheimer's plaques

IN Alzheimer's disease, pathologic lesions called plaques form in the brain and appear to interfere with normal brain functioning. These plaques have amyloid β protein and inorganic aluminosilicate at their core, and this is surrounded by a disorganized mass of fibrous nervous tissue. The source of the amyloid β protein may now have been identified: the protein resembles heparan sulfate proteoglycans (HSPG) (page 223). These HSPGs, which are cell-surface and extracellular-matrix molecules, are the most common proteoglycans in the nervous system. Schubert *et al.* show that the amyloid β protein precursor and the core protein of HSPG have strong sequence homologies, react with the same antibodies, and yield some of the same digestion products. During normal turnover, cells internalize and degrade HSPGs, and the pieces are then released; the core proteins of plaques are possibly incompletely degraded HSPG molecules.

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Influencing Congress: Ten Commandments

At the 1988 New Orleans meeting of the American Physical Society, William Brinkman of AT&T Bell Labs, Harold Hanson of the House Science, Space and Technology Committee, and I gave talks on the funding of physics in the 1990s. Our talks were different in style and approach, but there was one main message that each of us stressed. The divisiveness resulting from one subfield of physics attacking others was hurting the cause of support for physics as a whole, and, for that matter, was hurting the case for the support of science and technology overall. We all emphasized the need to make the case for support of science to both the executive and legislative branches of government, but with some caveats and guidelines. Hanson offered "Ten Commandments for Academics Who Want to Influence Congress." These useful guidelines are presented below for those who might need them.

Thou shalt know thy congressman: get to know the congressman or senator from your district or state on a personal basis. Get close enough to him that he knows your name and who you are and what organization, laboratory, or school you are with.

Thou shalt know about thy congressman: get to know about him so that you don't commit a faux pas that will damage your basic cause. For example, don't rail against pork-barrel politics when you are there trying to bring home a little bacon of your own. It is not likely that the congressman will share all of your political views. However, the only voting record that counts, at the time, is the one he will make on the issue you are pressing.

Thou shalt not limit visitations to crisis situations: make sure that some of the visits are just attitude-enhancing efforts. Visit often for a "hi" and a handshake. The influence you have will fall off inversely as some high power of the length of time between visits.

Thou shalt know the congressman's staff people: all congressmen need help in dealing with a vast plethora of problems. It is the congressman's staff that supply that help. Educating the staff may be as significant as educating the congressman, and staffers can usually give you more time that the congressman can.

Thou shalt have a focused and concise message: the congressman has even less disposable time than you do, so don't overburden him with detail and don't protract the session. There may be no points to be gained by finishing on schedule, but there are definitely points to be lost by not finishing in the time you've been allotted.

Thou shalt not commit effrontery toward someone else's project: be positive about your own shtick, and do not attack another program gratuitously. Congressmen will have to make choices, but they don't appreciate academic intellectuals urging them to scuttle programs to which they are committed.

Thou shalt visit the congressman in his district: when he's not in Washington politicking, he's in his district politicking, and there are ways of showing him at home that there are real votes involved. Also consider volunteering a few hours of your time (or a relative's time) for envelope-stuffing and making phone calls.

Thou shalt get to know who the key congressmen are: know who they are in terms of major committee assignments and make informed liaisons with other scientists who are in the districts served by these key congressmen.

Thou shalt accept a turn-down or set-back graciously: recognize that when the congressman votes contrary to your urging, it won't be because he is ignorant or uninformed. Perhaps his philosophical priorities are different from yours, and, of course, it may be that political considerations dictate a certain vote.

Thou shalt not do thy lobbying like a lobbyist: your competitors for the congressman's attention and vote are professionals with beaucoup bucks at their disposal. Therefore you should forget about inviting him to lunch—or any other blandishments. Just know your facts. Be as straight as you know how to be in making your case, and don't underestimate what the congressman may already know about your problem.

—ALVIN W. TRIVELPIECE

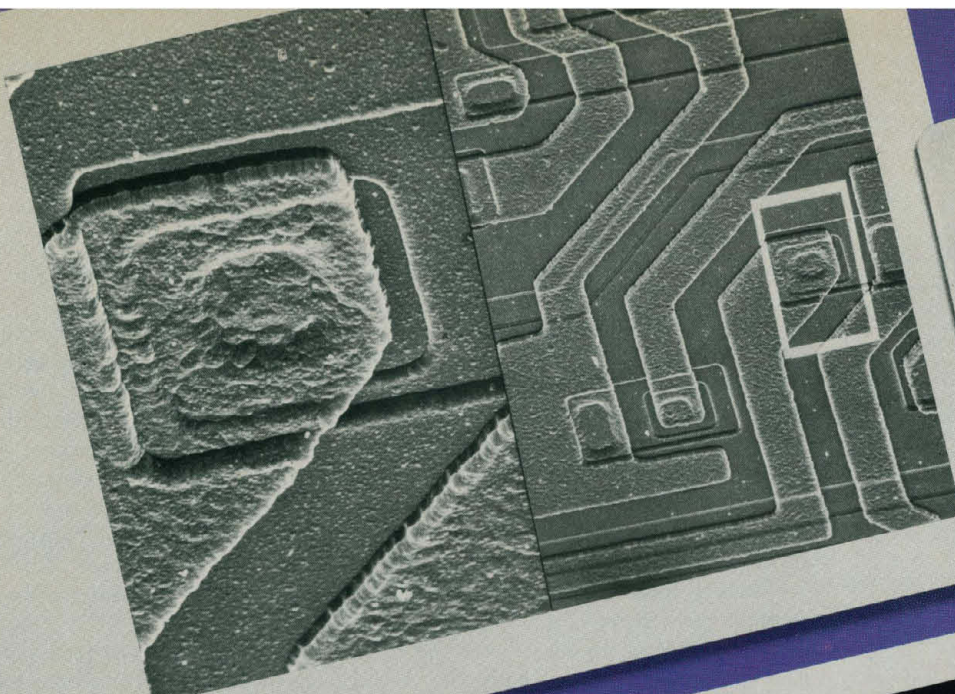


Fig. 1

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Fig. 2

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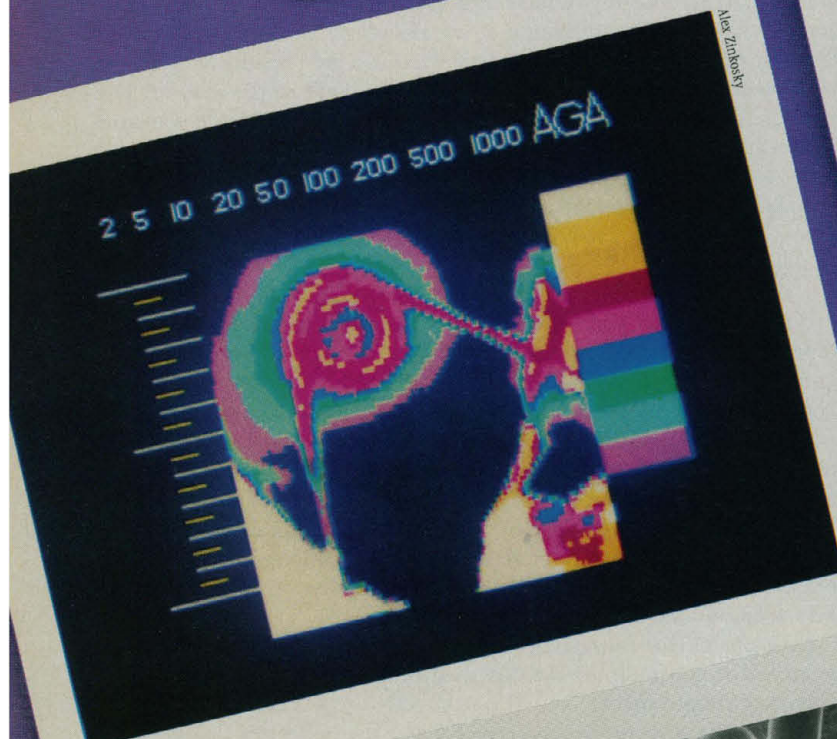


Fig. 3

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Fig. 4

Fig. 5



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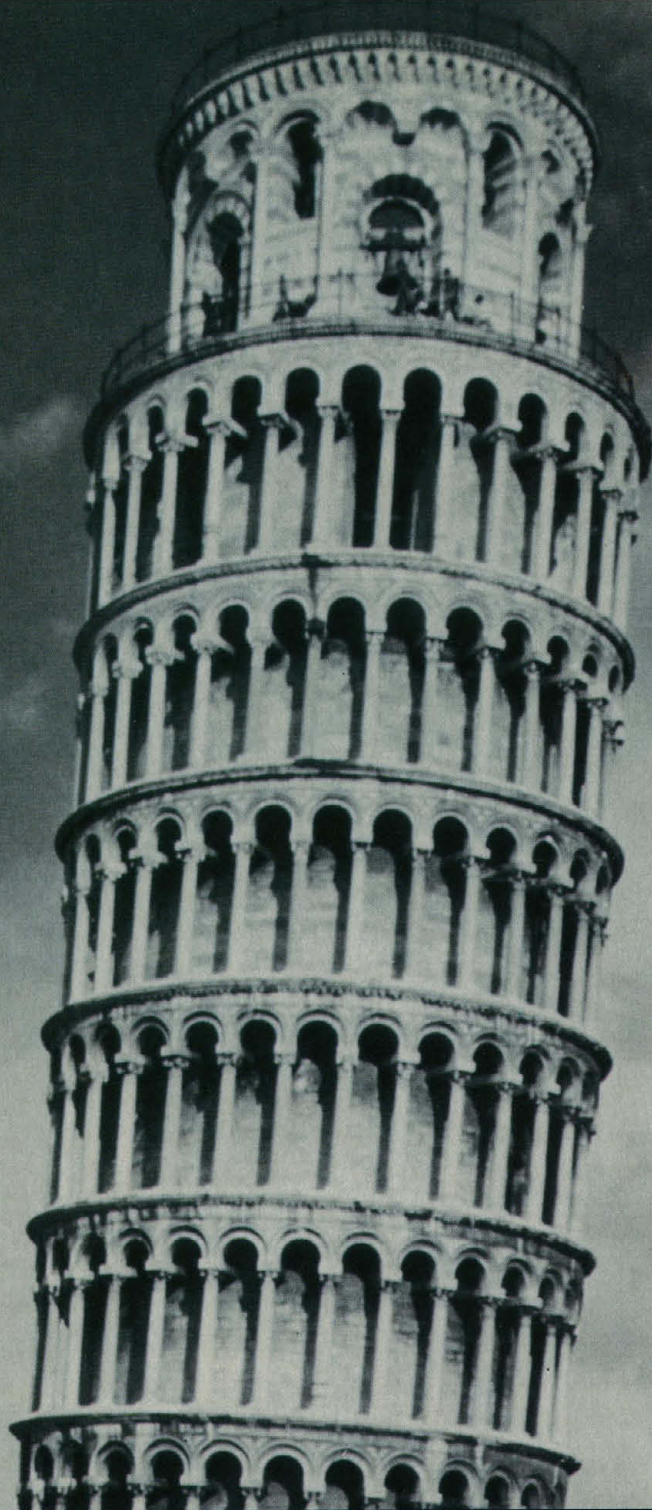
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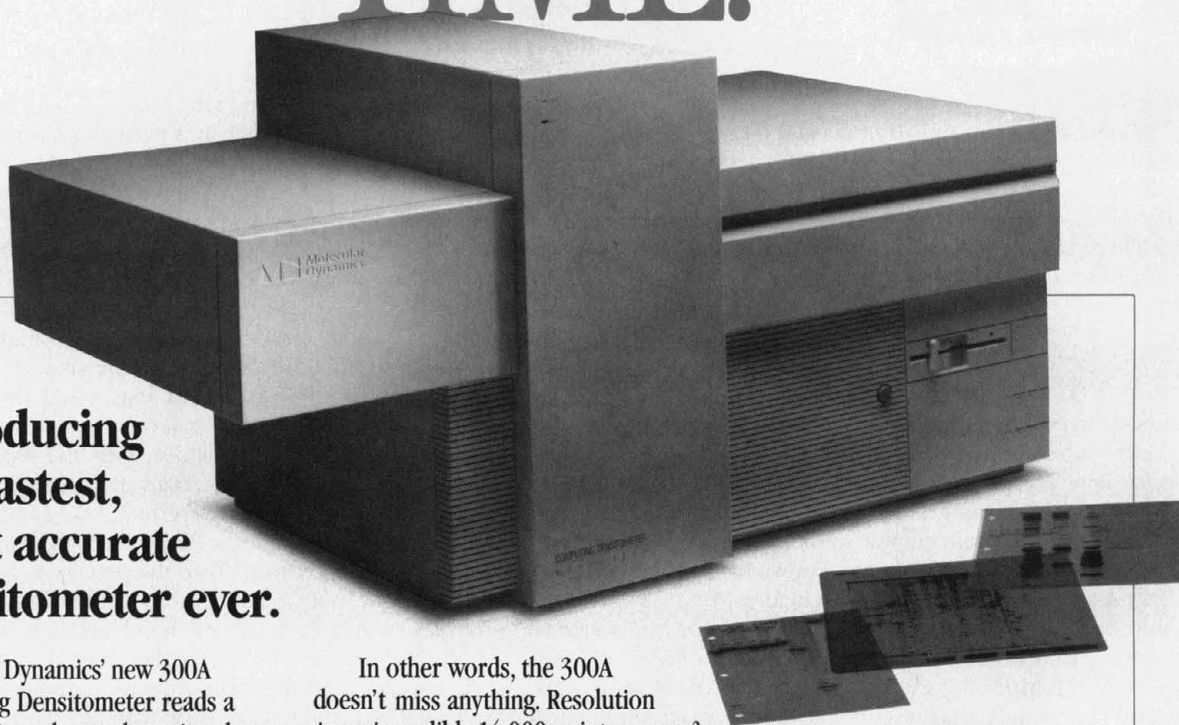
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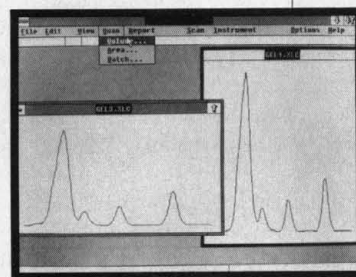
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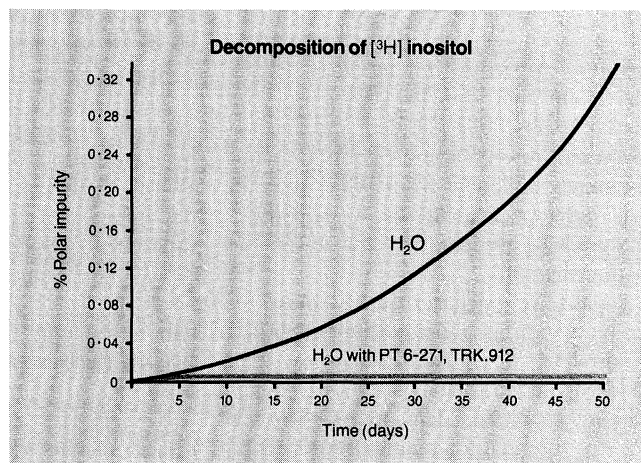
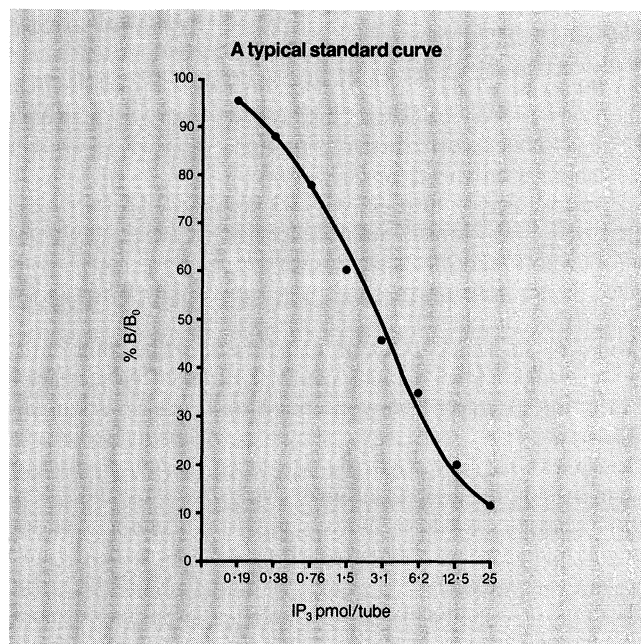
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(Continued from page 147)

Hunter-Gatherers and Humane Living

Thanks for Roger Lewin's interesting piece (Research News, 27 May, p. 1146) on Lee and DeVore's *Man the Hunter* (1) 20 years later. As organizer of the conference on which the book is based, I need to add a question.

The changing !Kung Bushmen indeed continue to provide important evidence of human behavior before the onset of "peasantry" 10,000 years ago. Perusal of *Man the Hunter* will show that among the peoples who survived peasantry and urbanization the North American Indians provide us with evidence incomparably richer than that of other continents. Everywhere else hunters-gatherers were squeezed out of favorable environments, while in North America the very extent and variety of virgin environments made it possible for the Indian peoples to resist domination by large peasant societies and to provide incomparable evidence of what we might have learned from their rich experience in humane living.

Since the brilliant success of our latest stages of evolution into a few competing hierarchical nation-states with lethal power might rather be an evolutionary trap, the question is whether we might still escape

from it by applying what we might learn from the few surviving hunting-gathering peoples!

SOL TAX

Department of Anthropology,
University of Chicago,
1126 East 59 Street,
Chicago, IL 60637

REFERENCES

1. R. B. Lee and I. DeVore, Eds., *Man the Hunter* (Aldine, Chicago, IL, 1968).

DOD Lab Quality

As president of the Association of Engineers and Scientists, American Federation of Government Employees, Local 3176, at the U.S. Army's Materials Technology Laboratory in Watertown, Massachusetts, I wish to take exception to Daniel Charles' remarks regarding our facility in his article "Report asks upgrade of military R&D labs" (News & Comment, 25 Mar., p. 1484). The U.S. Army's Materials Technology Laboratory does *not* have a "bad reputation," as Charles states. It does have a fine collection of dedicated engineers and scientists working hard to fulfill their mission of providing advanced materials for the U.S. Army. This

work has resulted in many significant contributions in the areas of lightweight equipment, armor, antiarmor penetrators, and numerous other aspects of materials science and engineering. The Materials Technology Laboratory's problem is the same as that of other Department of Defense laboratories, that is, the lack of competitive salaries that would allow us to attract and retain more of the outstanding scientists and engineers that are available. Massachusetts is an extremely competitive region for scientists and engineers.

RAYMOND E. HINXMAN III

Association of Engineers and Scientists,
American Federation of Government Employees,
Local 3176, c/o U.S. Army Materials
Technology Laboratory,
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Erratum: The bibliographic listing that appeared at the head of the book review entitled "The militarization of physics" (15 Apr., p. 341) should have read *Historical Studies in the Physical and Biological Sciences*, vol. 18, part 1. The work in question is also known by the informal title "Cooperation or Cooptation? Science and the Military."

Erratum: The address given for Small Talk/V, Digital, Inc., in reference 2 of the software review "PC software for artificial intelligence applications" by Helmut Epp *et al.* (6 May, p. 824) was incorrect. It should have been 9841 Airport Boulevard, Los Angeles, CA 90045.

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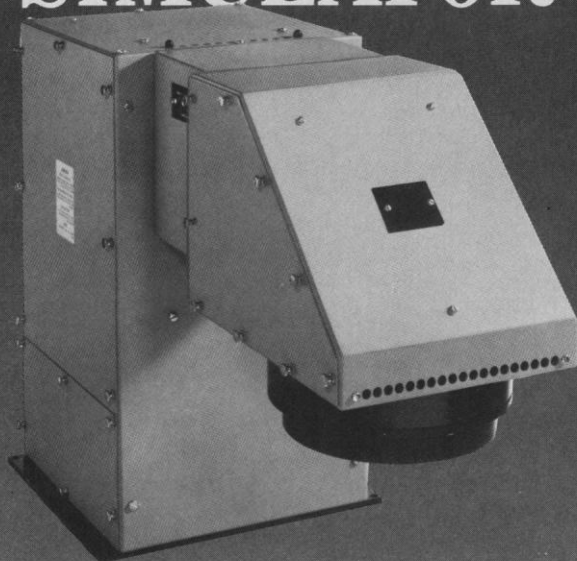
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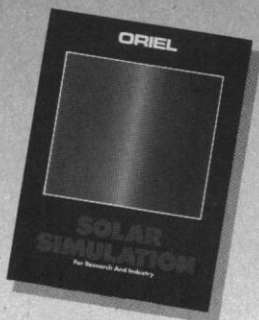
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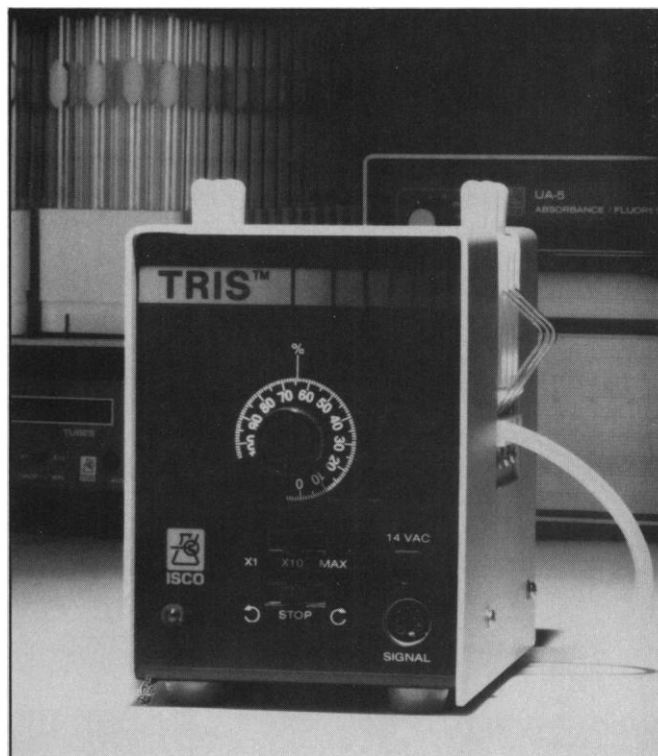
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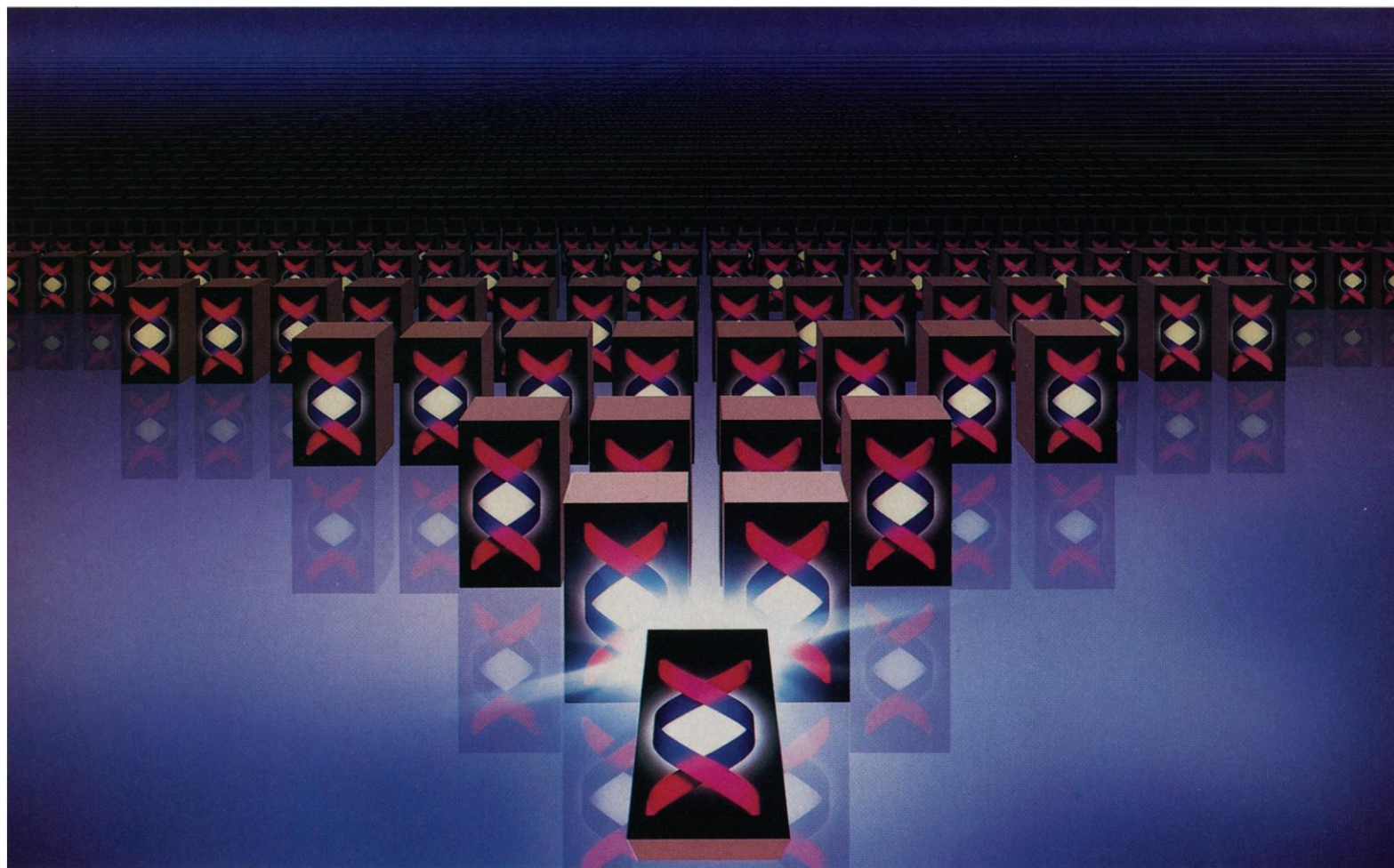
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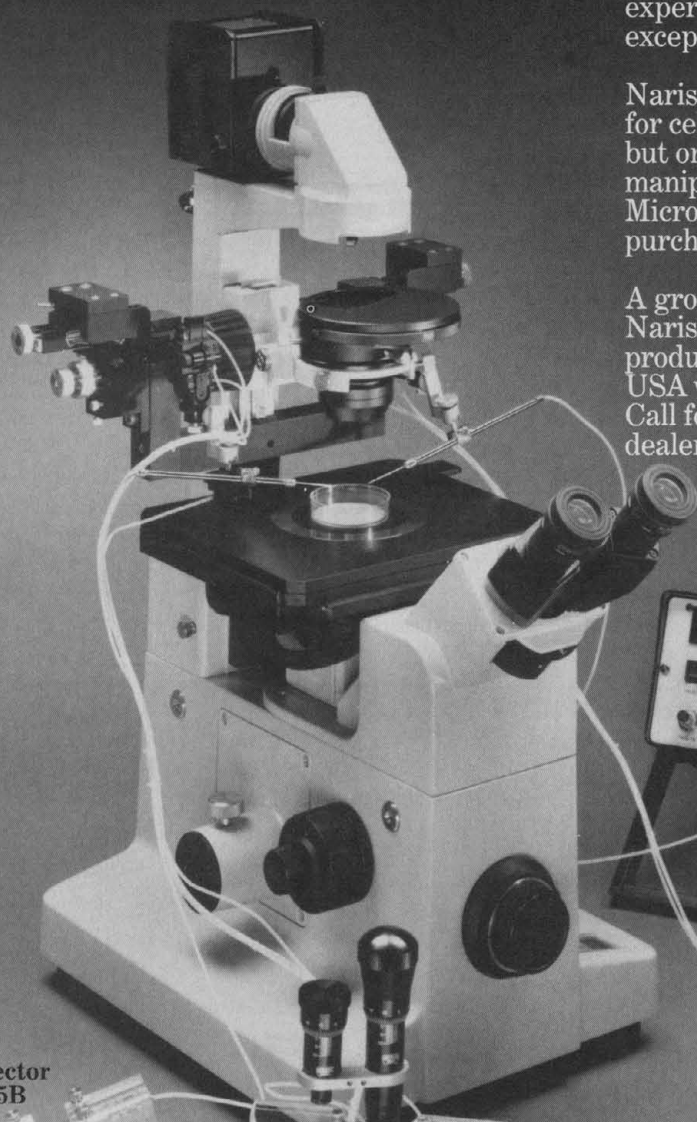
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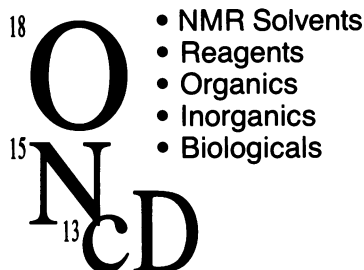
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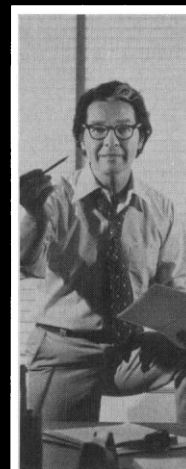
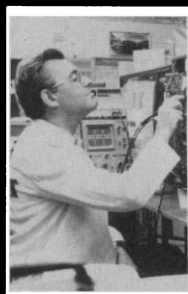
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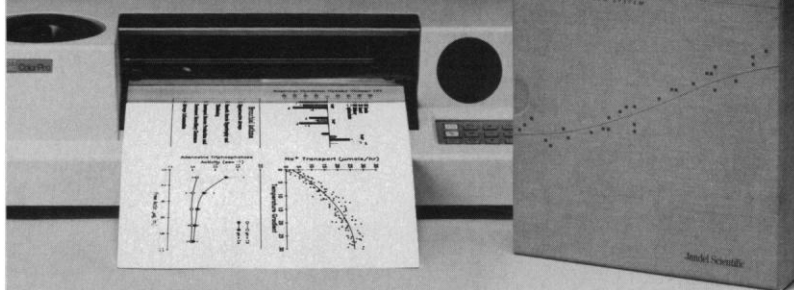
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