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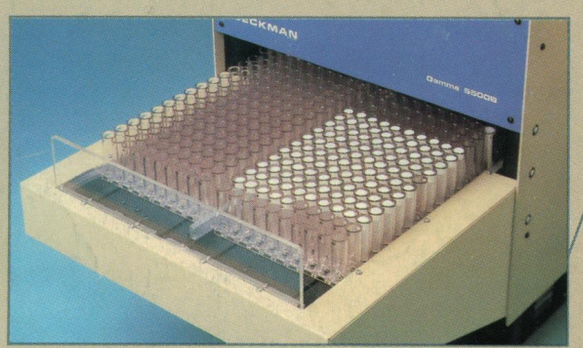

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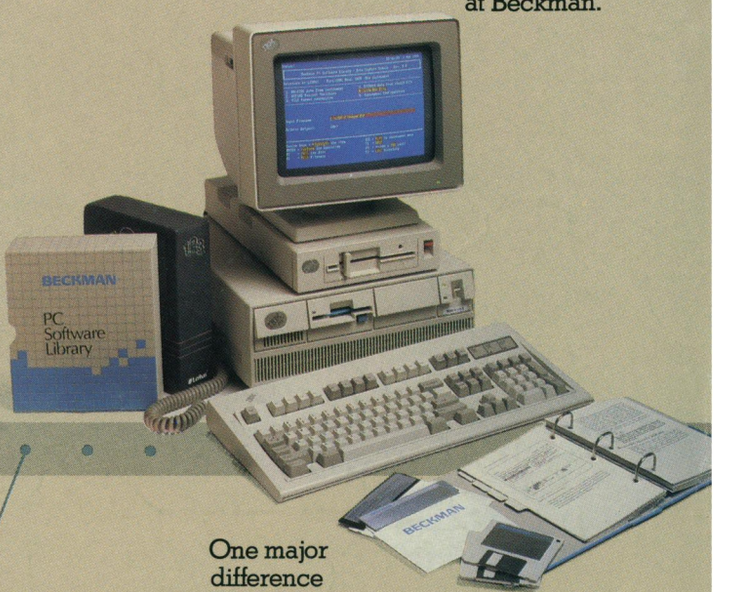

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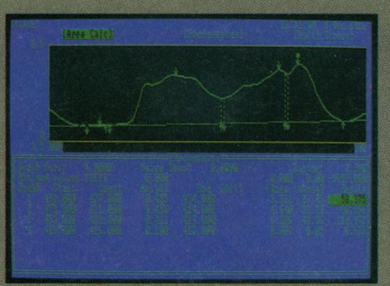

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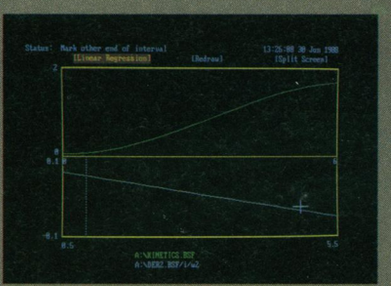

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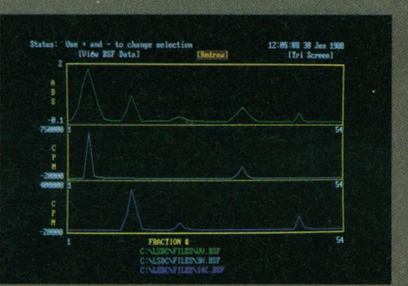

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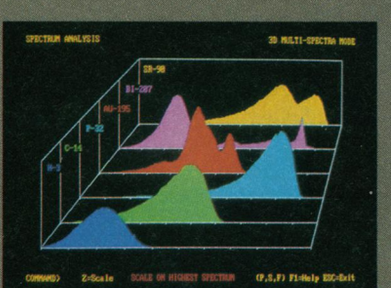

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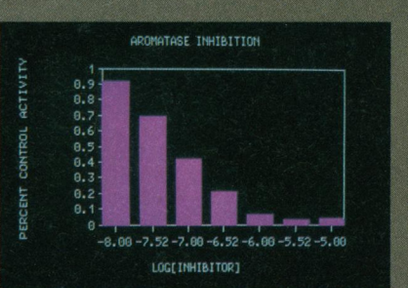

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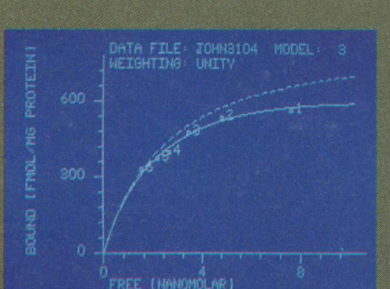

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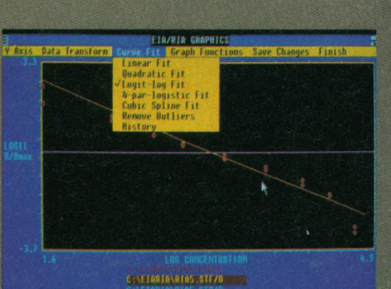

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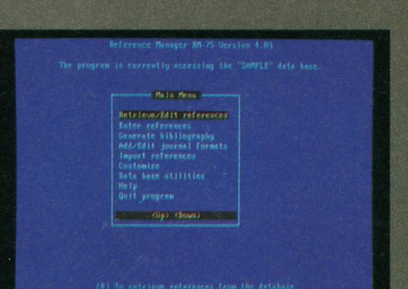

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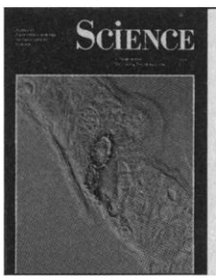

COVER Staining of the polar distribution of a viral envelope glycoprotein in a midgut columnar epithelial cell. Paraffin sections of the caterpillar, *Trichoplusia ni*, infected with a baculovirus were immunostained with a monoclonal antibody reactive with the glycoprotein, a peroxidase conjugate and diaminobenzidine as color substrate. See page 1728. [Photomicrograph by B. Andrew Keddie using a Zeiss Axiophot with differential interference contrast optics]

Reports

Technical Comments

Book Reviews

Author Index to Volume 243 is found on pages I–X.
Information for Contributors is found on XI–XII.

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Leucine zippers

A proposal was made last summer that a "structural motif" called a leucine zipper might be a common feature of certain DNA binding proteins. According to the model, two proteins could zip together if each had an array of leucines stacked up like the teeth of a zipper. The dimers would have a special site to which a defined DNA sequence could bind, and this binding could influence gene expression. Three research articles in this issue present experimental evidence in support of the zipper model (pages 1681, 1689, and 1695). In the studies of Landschulz *et al.*, the liver nuclear protein C/EBP was studied; in the studies of Turner and Tjian and Gentz *et al.*, interacting proteins encoded by two proto-oncogenes (*fos* and *jun*) and homodimers of the *jun* product were evaluated. DNA binding regions in these systems are homologous. When amino acids in the zippers were mutagenized, dimers did not form; when those in the DNA binding regions were mutagenized, binding of dimer to DNA did not take place. These studies establish a role for leucine zippers in bringing about dimerization and a role for dimerization in creating DNA binding sites.

Tasmanian Aboriginals

RECENT excavations at two rockshelters in south central Tasmania show that humans had colonized the highlands 30,000 or more years ago (page 1706). Previous estimates had placed the Aboriginals on this island some 8,000 years later. Intermittent occupation of a small limestone cave ended about 11,000 years ago and of a larger sandstone shelter ended about 2,500 years ago. Each shelter contained informative artifacts, raw materials, and animal remains. Cosgrove discusses how the highland hunter-gatherers lived and compares their styles of life with those of other Pleistocene Aboriginals in Tasmania and in mainland Australia. Tasmania was connected to the mainland by the Bassian Land Bridge several times between 55,000 and 10,000 years ago; it was probably during the longest stretch—from 37,000 to 29,000 years ago—that the people who came to occupy the highland caves migrated southward from the mainland.

Dinosaur egg

IN 1987 a large egg was found in an Upper Jurassic formation in Utah's Cleveland-Lloyd Dinosaur Quarry, from which more than 12,000 dinosaur bones have also been recovered (page 1711). The egg was broken, but the two parts of the shell remained connected; in one part there appears (by computerized axial tomographic scans) to be an early-stage embryo. The egg has an inside shell of calcite with a distinctive pore structure and a second outer shell about half as thick. In modern reptiles, certain stresses, illnesses, and environmental conditions can delay egg-laying, and, while the egg is retained in the oviduct, a second "pathologic" shell, like the one on the dinosaur egg, may be added. The double shelling of the egg, the absence of a nearby nest of eggs, the egg's fine preservation, and the inverted curvature of the shell (suggesting that the egg broke while it was still somewhat pliable) have led Hirsch *et al.* to propose that some trauma (which killed the mother) interfered with the laying of this egg, that the second shell was added to the egg, that the egg then cracked in the oviduct and was buried along with the mother, and that sometime later the egg was preserved in sediments. This egg dates from about 150 million years ago and adds information to a 75-million-year gap that has existed in the dinosaur record.

Alcohol and neurons

THE manifestations of intoxication are several: first, reaction times are delayed and fine motor skills impaired; then, motor coordination and mental abilities deteriorate; finally, the central nervous system is depressed and states of stupor or comas may result. Studies by Lovinger *et al.* indicate that some of these changes may be brought about by the interactions of alcohol with those brain neurons that have glutamate receptors—glutamate is a major excitatory neurotransmitter in the central nervous system—that can be activated by the drug NMDA (page 1721). Concentrations of alcohol that produce intoxication in vivo inhibited ion currents in these neurons in vitro. Ethanol reduced current amplitudes in a dose-dependent fashion, and the inhibition of currents by different alcohols was directly related to how potent each alcohol is in producing intoxication. The suppressive effects of alcohol on NMDA-responsive neurons fit with the notion that these neurons participate in normal cognition, behavior, and other neural phenomena. The possibility is raised that intoxication might be preventable if interactions of alcohol and these NMDA-responsive neurons could be disrupted.

AZT and variant AIDS viruses

THE only licensed drug that has been effective to date in reducing symptoms and prolonging life for patients with AIDS or AIDS-related complex is AZT. The drug was approved for use in 1987 and is believed to suppress viral replication to some extent. A comparison of the drug sensitivities of AIDS virus isolates from patients who were and were not being treated with AZT was made by Larder *et al.* (page 1731). In individuals who had been taking AZT for 6 to 30 months, variant viruses arose that were less sensitive to the drug in an in vitro assay. How pathogenic and infectious the variant viruses are in comparison to drug-sensitive strains is not yet known. The reduced drug sensitivities have so far not presaged any changes in patients' clinical profiles (such as worsening symptoms) or reappearence of viral antigens in blood. At present, therefore, no changes have been recommended in treatment protocols. These variants were discussed by Marx in the 24 March issue of *Science* (page 1551).

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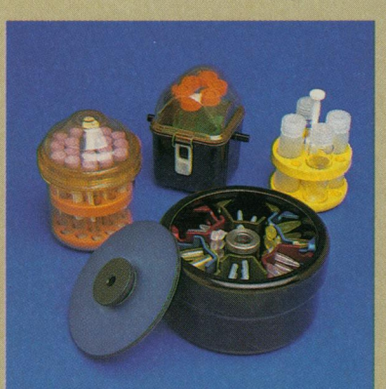

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SCIENCE

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Congressional Fellowships for Science

Representative Doug Walgren (D–PA) has teamed with Senator John Glenn (D–OH) to push for passage of legislation that could be a significant step toward ameliorating this country's deteriorating position and future prospects. Under terms of the legislation, every year one female and one male high school graduate in each congressional district would receive a scholarship paying a maximum of $5000 a year for 4 years to study science, mathematics, or engineering. The proposed legislation calls for an initial appropriation of only $5.5 million, and in terms of needs, the number of students who will be helped is small. However, as a symbolic gesture with possible follow-on consequences, enactment of the legislation could make a large difference.

Walgren has stated, "Because of their broad geographical distribution [the] fellowships would serve as a highly visible stimulus and source of role models for high school students.... The awarding of these fellowships—perhaps during National Science and Technology Week—would remind members of Congress and the public of the importance of science to our national goals."

The legislation would place responsibility on the National Science Foundation to administer the program. Some of the mechanisms to be employed would give the program great visibility. For example, "The Director shall notify all public and private secondary schools and all institutions of higher education in the United States annually of the availability of scholarships under this Act."

The legislation further specifies that the National Science Foundation "shall establish for each congressional district, or, to the extent a contiguous group of congressional districts reflects a geographic region similar in demographics, geography, and economic status and activity, for each such group of congressional districts, a broad-based committee of educators, scientists, mathematicians, and engineers who shall submit to the Director [NSF] nominations of one male and one female from each congressional district for scholarships under this Act." Such committees would identify a host of excellent candidates worthy of support. The attendant activity and publicity would be likely to stimulate substantial additional financial support from industry, foundations, alumni, local communities, and the states. Were the program to be markedly successful, it might serve the function of a pilot plant for later expanded federal support.

Another provision of the legislation could lead to improvement of relations between the Congress and scientists, mathematicians, and engineers. The Act includes: "The Director shall notify each Member of Congress in writing of selections made from such Member's district at least one week before public announcement of such selections is made." Given adequate notice, the various congressmen would have highly valued photo opportunities and a chance to share in a happy public event. They and their staffs would become better acquainted with the scientists, mathematicians, and engineers of their districts, who in turn would become better informed about some of the concerns of congressmen.

In pushing for the legislation, Walgren has been joined by a bipartisan group of 27 members of the House Science, Space and Technology Committee, including Chairman Robert A. Roe (D–NJ). He has received strong support from the scientific community in testimony presented 9 March by Richard C. Atkinson, president of AAAS, Thomas F. Malone, president of Sigma Xi, and Lynn Arthur Steen, chairman of the Council of Scientific Society Presidents.

In his testimony, Atkinson implicitly reminded the Congress that the problems we face in education for science and technology are broader than those addressed in the Walgren proposal. He pointed to a "leaky pipeline" which conveys to the doctorate only a tiny fraction of students with the potential for it when in the tenth grade. In addition, he noted that by 1995 about 30% of the engineering faculties will have retired and have to be replaced. But in 1987, only 42% of U.S.–granted Ph.D.'s in engineering were awarded to U.S. citizens.

Obviously, the new legislation addresses only part of the educational problems, but it is an imaginative proposal that should enjoy broad support. Critics should exercise self-restraint in seeking this or that modification. That would only lead to delays or outright failure of enactment.—PHILIP H. ABELSON

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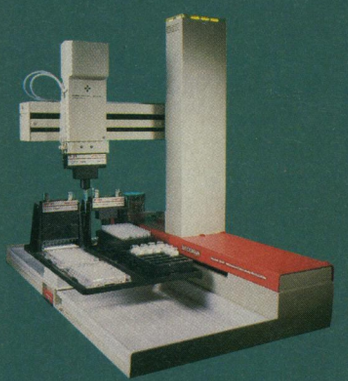

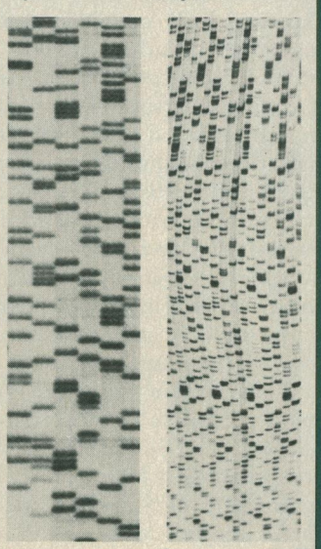

Figure 1. Autoradiogram of sequence analyses accomplished on the Biomek 1000 using GemSeq K/RT double-stranded DNA sequencing system and Riboprobe Gemini pGEM-3 vector, containing an insert of a known cDNA.

Figure 2. Autoradiogram of sequence analyses using M13mp18. Lanes 1-9 were performed manually, lanes 10-18 were performed on the Biomek 1000.

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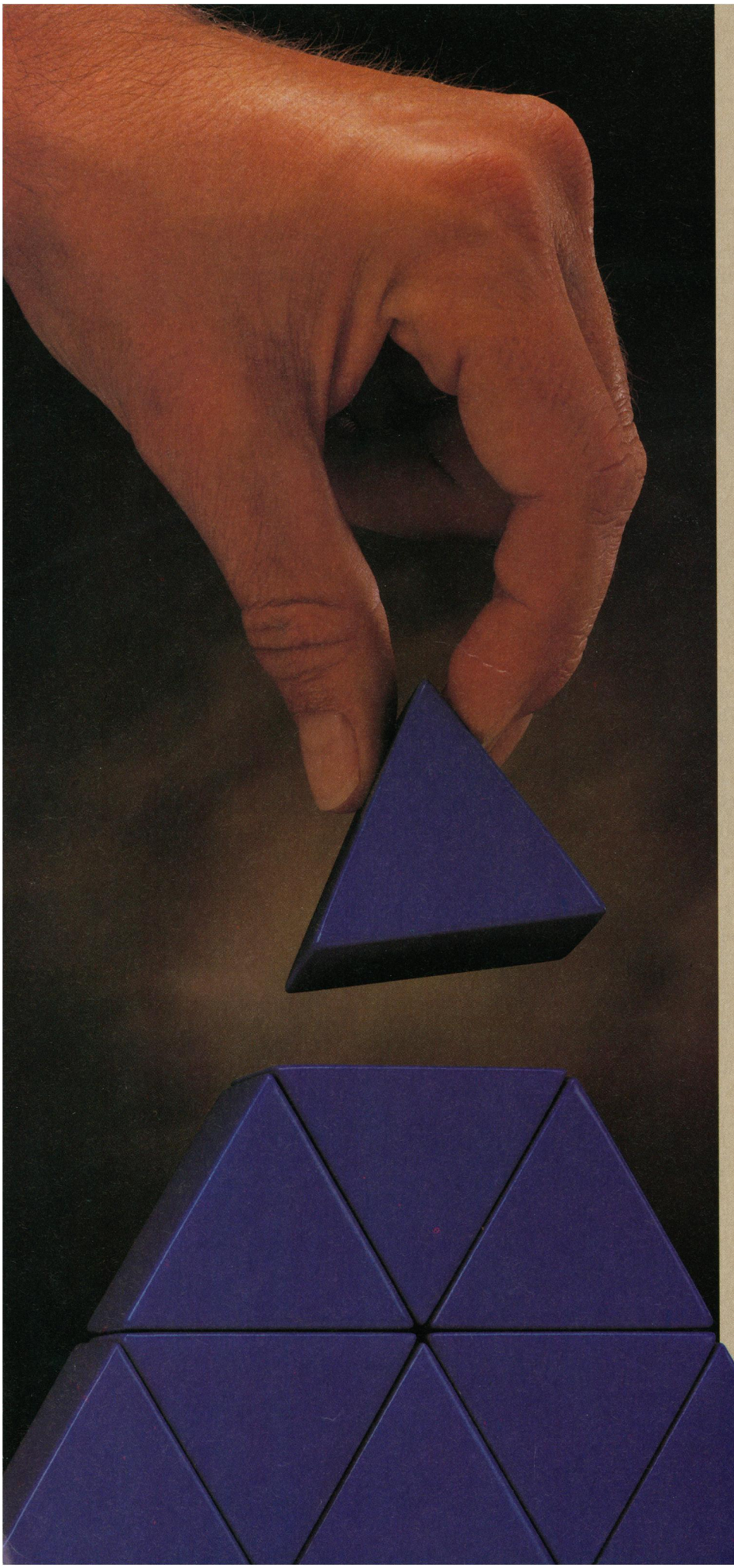

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Letters. Letters are selected for their pertinence to material published in *Science* or because they discuss problems of general interest to scientists. Letters pertaining to material published in *Science* may correct errors; provide support or agreement; or offer different points of view, clarifications, or additional information. Personal remarks about another author are inappropriate. Letters may be reviewed by outside consultants. Letters selected for publication are intended to reflect the range of opinions received. The author of the paper in question is usually given an opportunity to reply.

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Typing. Use double-spacing throughout the text, tables, figure legends, and references and notes and leave margins of at least 2.5 centimeters. Put your name on each page and number the pages starting with the title page.

Titles. Titles should be short, specific, and amenable to indexing. For general articles the maximum length is 80 characters and spaces; for research articles and reports the maximum is 100 characters.

Summaries or abstracts. These should include a sentence or two explaining to the general reader why the research was undertaken and why the results should be viewed as important. The abstract should convey the main point of the paper and outline the results or conclusions.

Text. A brief introduction should indicate the broad significance of the paper. The whole text should be intelligible to readers in different disciplines. Technical terms should be defined. All tables and figures should be cited in the text in numerical order.

Symbols and abbreviations. Define all symbols, abbreviations, and acronyms.

Units of measure. Use metric units. If measurements were made in English units, give metric equivalents.

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Unpublished observations. Reference to unpublished data should be given a number in the text and placed, in correct sequence, in the references and notes.

Acknowledgments. Gather all acknowledgments into a brief statement at the end of the references and notes.

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Animal welfare. Authors using experimental animals must state that their care was in accordance with institutional guidelines. For animals subjected to invasive procedures, the anesthetic, analgesic, and tranquilizing agents used, as well as the amounts and frequency of administration, must be stated.

Figures. For each figure submit three high-quality glossy prints or original drawings of sufficient size to permit relettering but not larger than 22 by 28 centimeters (8½ by 11 inches). On the back of every figure write the first author's name and the figure number and indicate the correct orientation. *Manuscripts with oversized figures will be returned to the author without review.* Photocopies of figures are not acceptable; transparencies, slides, or negatives cannot be used because they cannot be sent to reviewers.

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Uncertainties and reproducibility. Evidence that the results are reproducible and the conditions under which this reproducibility (replication) was obtained should be explicitly stated. The effect of limitations in experimental conditions on generalizability of results should be discussed. Uncertainties should be stated in terms of variation expected in independent repetitions of the experiments; they should include an allowance for possible systematic error arising from inadequacies in the assumed model and other known sources of possible bias. Probabilities from statistical tests of significance should be subordinated to the reporting of results and associated uncertainties.

Printing and Publication

Proofs and reprints. One set of galley proofs is sent to the authors. An order blank for reprints accompanies the proofs.

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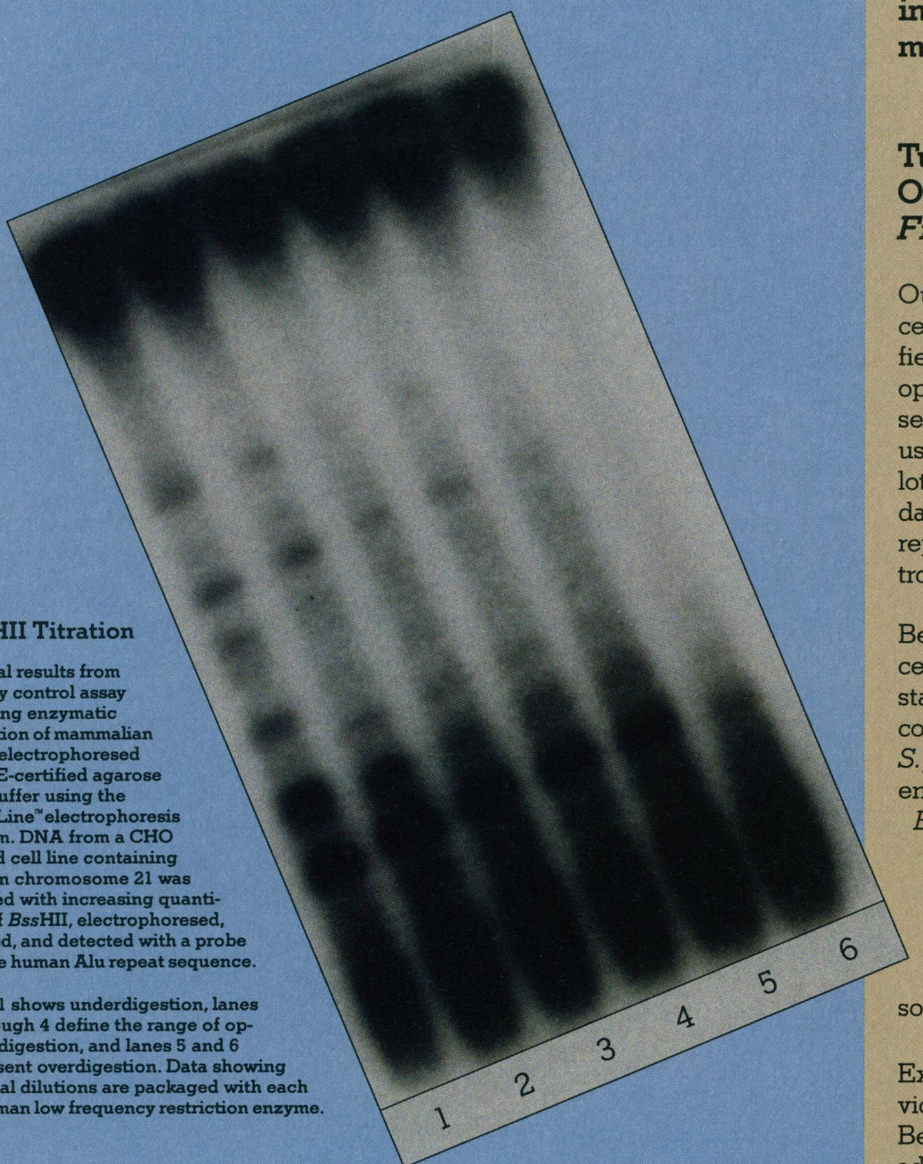

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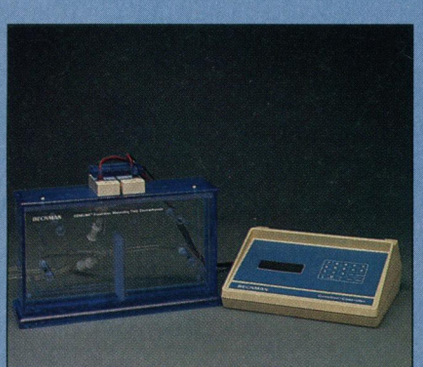

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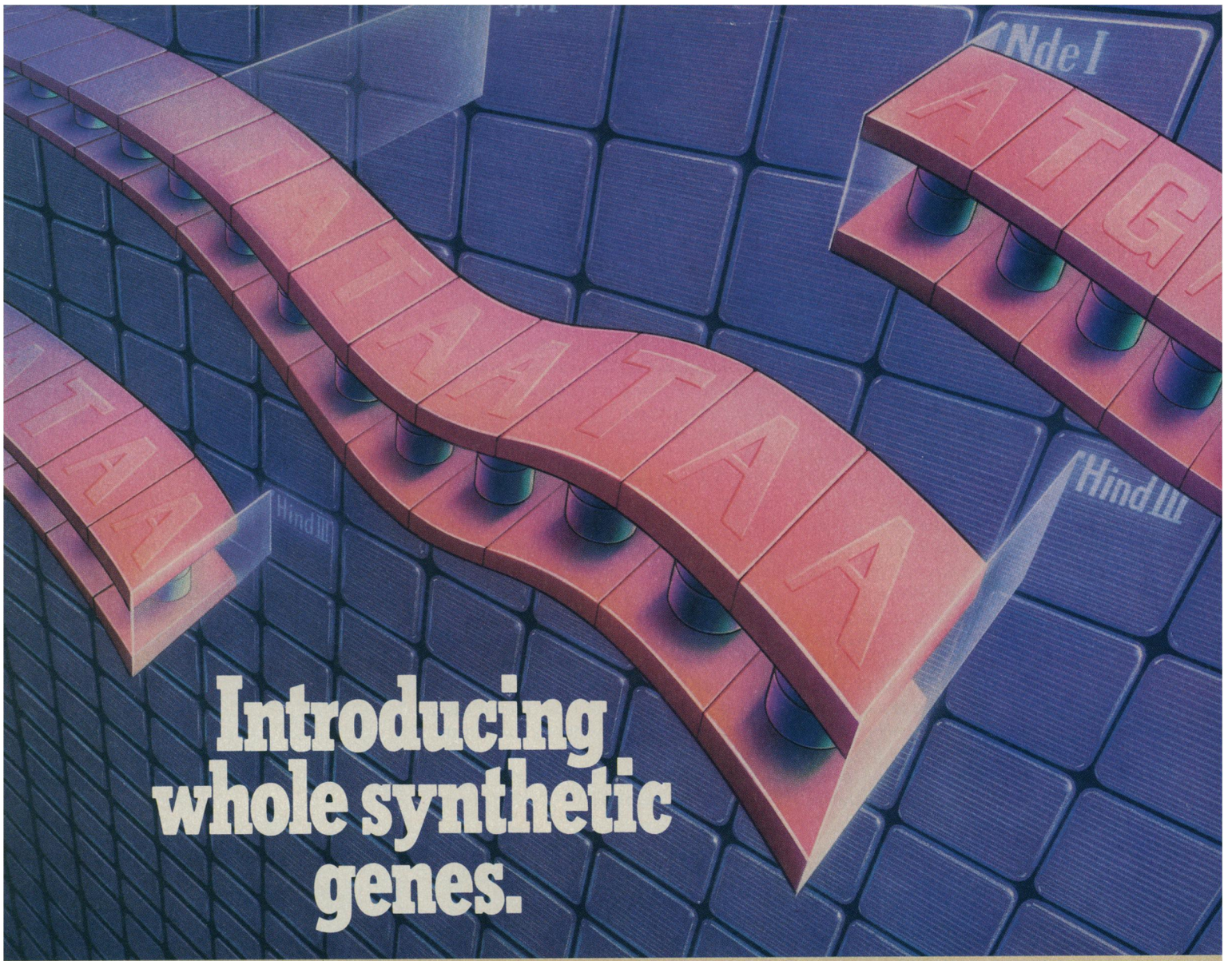

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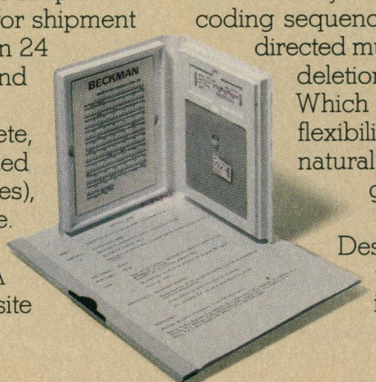

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