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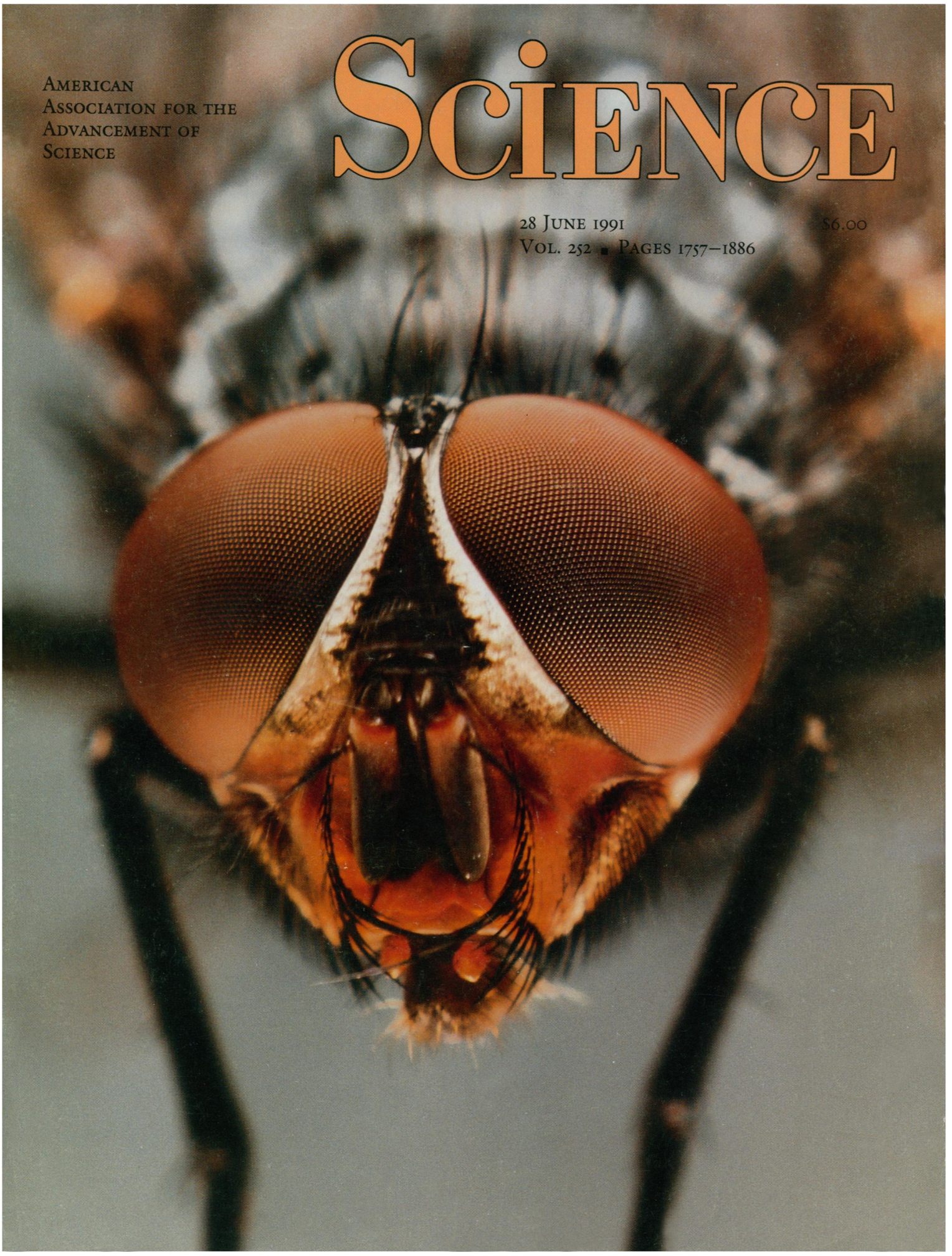

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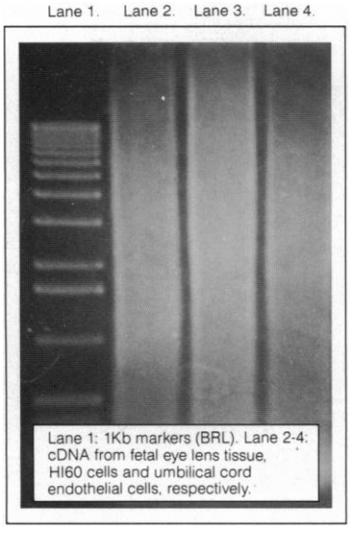

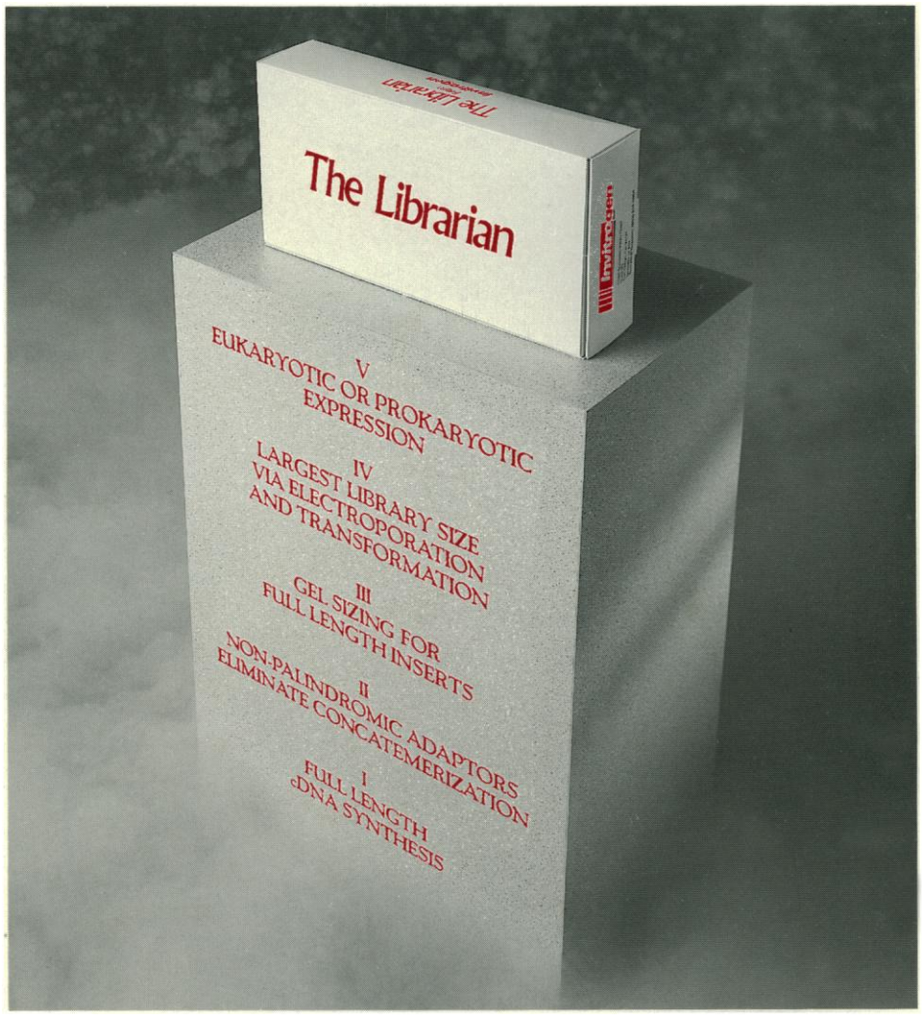

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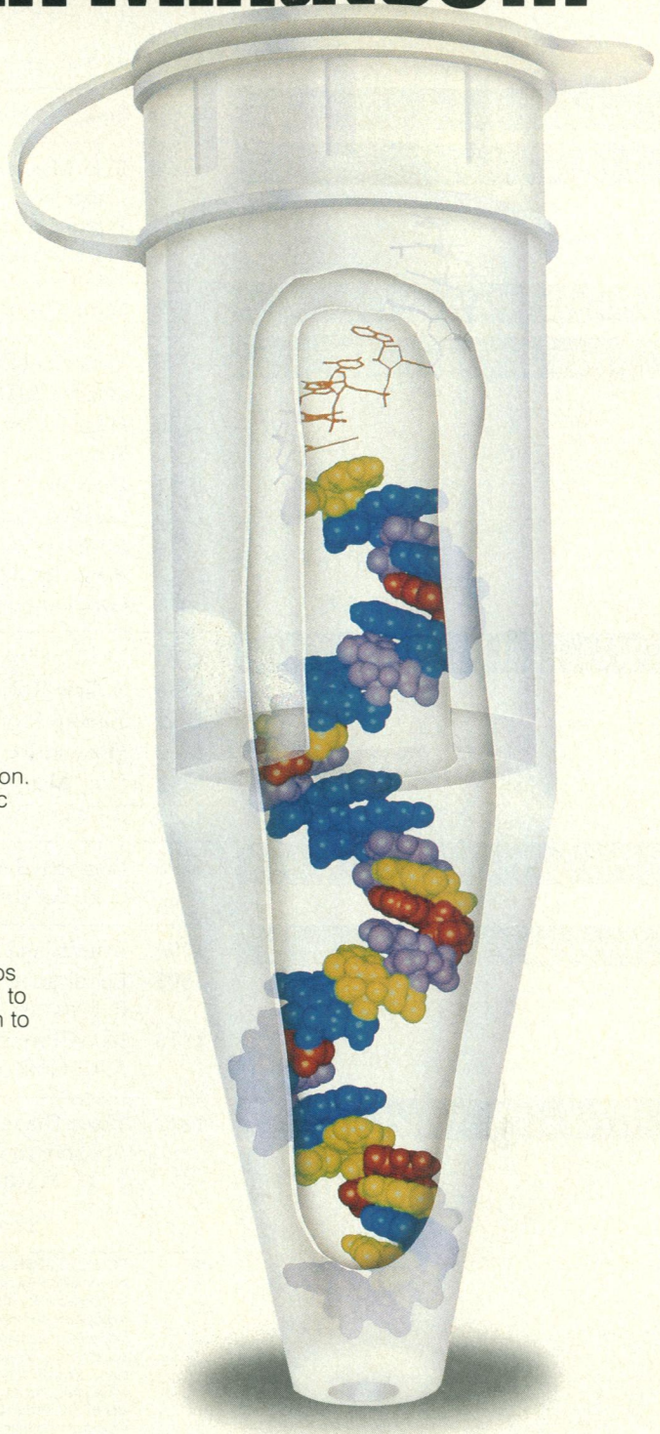

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**patent pending.* *mRNA model courtesy of* BIOSYM

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COVER The head of the blowfly *Calliphora erythrocephala* with its large compound eyes. Each eye contains about 5000 ommatidia, which provide the fly with all its information about the visual world. Because it is highly regular and easily accessible for electrophysiology, the fly visual system is widely used in the study of the fundamental aspects of neural information processing. See page 1854. [Photograph by H. L. Leertouwer]

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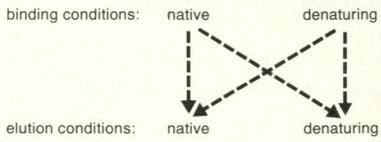

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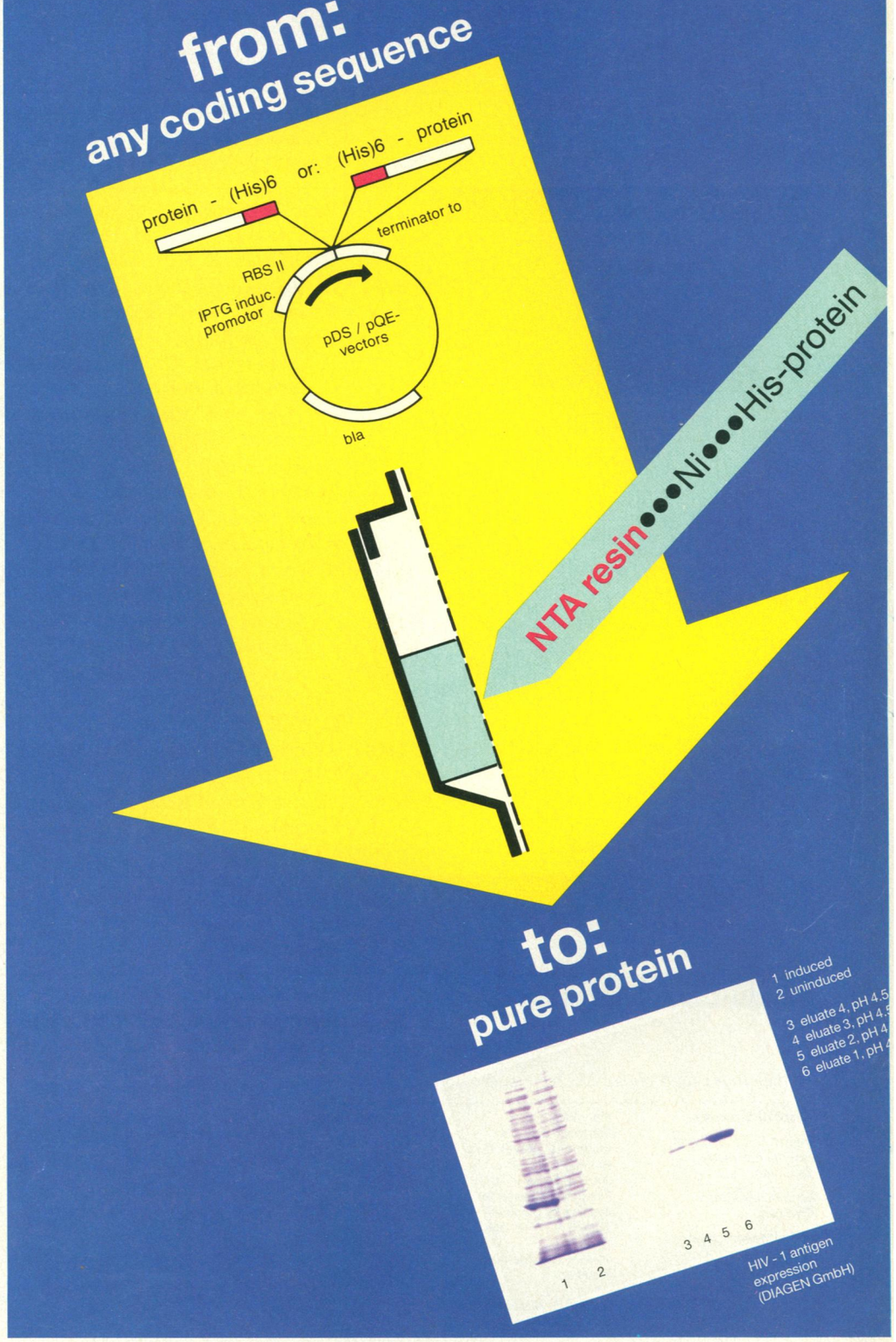

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This Week in
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Economics of HIV testing

In July 1992 the Americans with Disabilities Act will take effect, and preemployment medical screening of any kind will be severely limited. In the meantime, many companies require job candidates to be screened for certain medical conditions; recently tests to detect infection with the AIDS virus HIV have become available. In 17 states no laws currently exist to prohibit the use of HIV test results for denying jobs to candidate employees. Bloom and Glied assess the economic costs and benefits of HIV tests in the workplace and conclude that for most firms it is not cost-effective either to test prospective employees or to periodically retest employees for HIV (page 1798). HIV testing incurs large direct and indirect costs on companies (some of the latter are quite subtle, such as whether a policy of testing will deter qualified individuals from applying to that company) and only a fraction of all firms—large ones in high-risk areas of the country that offer good benefit packages—would realize economic benefits from testing. The authors also discuss social costs and benefits of HIV tests, which are quite separate from the company costs and benefits.

Primary role for secondary structure

There are three isoforms (related forms) of the chicken protein β-tropomyosin. Skeletal muscle contains one of these forms; smooth muscle and all other tissues contain the other forms of the protein. All three are produced from the same gene through a process called alternative splicing: in skeletal muscle cells a segment of the gene called exon 6B is used, whereas in other tissue exon 6A is incorporated into the pre-messenger molecule. What determines how the splicing will occur? In vitro studies by Clouet d'Orval *et al.* show that secondary structural features of the RNA transcript near the exon 6 insertion site affect the accessibility of the site: in muscle cells only muscle-specific exon 6B can be incorporated and incorporation of alternative exons is blocked; in other tissue, the reverse is true (page 1823). Libri *et al.* illustrate the same phenomenon with an in vivo system (page 1842). Exactly how big a part secondary structure plays in tissue-specific splicing is not yet clear; secondary structure probably acts in concert with trans-acting factors and exon competition to promote different forms of gene splicing.

Superconductor under pressure

The superconductivity of alkali-doped buckyballs—K_3C_{60}—is pressure-dependent: the onset temperature for superconductivity gets higher as the pressure used in the preparation of the compound is decreased (page 1829). Bulk superconductivity in K_3C_{60} was monitored by measurements of the fractional diamagnetic shielding of sample materials. Samples prepared under atmospheric conditions showed a transition temperature of 19.3 K; in other samples the transition temperature was observed to drop as pressure was increased, and a low transition temperature of less than 8 K was recorded at the highest pressure, 21.2 kilobars. Sparn *et al.* discuss similarities and differences in the behaviors of K_3C_{60} and other superconducting materials, noting that current hypotheses for the mechanism of superconductivity may not be adequate to explain the strong negative pressure dependence of this new material.

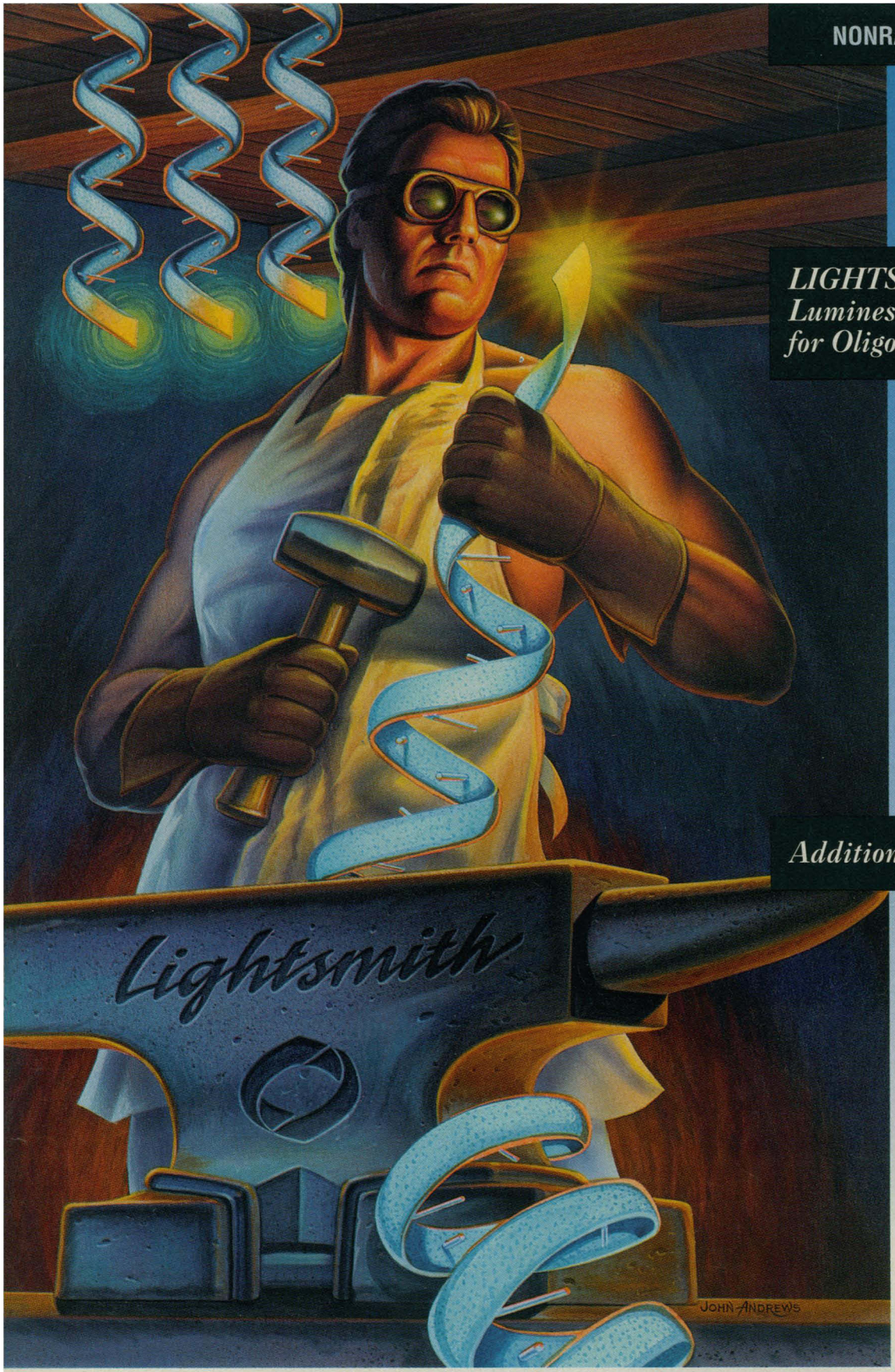
Potential trypanosome drug

An analog of myristic acid, called O-11 because oxygen is substituted for the number 11 methylene group of the molecule, has proved to be toxic to African trypanosomes in vitro (page 1851). This suggests that the analog might have a future role as a chemotherapeutic agent against these parasites, which are responsible for the lethal disease African sleeping sickness. Myristates are the only fatty acids present in the trypanosome's membrane anchor that holds the variant surface glycoprotein in the membrane; without this glycoprotein the parasite would not be able to survive long in the host's bloodstream. Trypanosomes are dependent on their hosts for myristate because they cannot synthesize myristates de novo and may be able to produce only tiny amounts from precursors. Studies by Doering *et al.* show that trypanosomes that have incorporated the analog instead of myristic acid into their anchors die. Related studies have shown that the analog is not toxic to mammalian cells and should not, therefore, induce toxic side effects in a mammalian host.

Brain reorganization after deafferentation

How much "rewiring" can go on in the brain after neuronal connections have been severed? Brains of infants are known to be quite plastic, but neuronal connections in brains of adults were thought to be capable of only marginal reorganization. However, Pons *et al.* discovered that in macaque monkeys years after limb nerves had been cut at their entry point into the spinal cord (a process that leads to peripheral deafferentation) the zone of the brain that originally had responded to the limb area was now responding to sensory stimulation of the face (page 1857). The area that was newly responsive to face stimulation was more than 10 millimeters beyond the original face-responsive zone; this extent of reorganization is an order of magnitude greater than had been observed previously. The next step is to determine how reorganization is brought about and whether the mechanisms involved might be exploited for rerouting inputs to undamaged zones of the brain to restore function after strokes or similar pathologic brain lesions. Palca discusses these experiments on the "Silver Spring monkeys" further on page 1789.

■ RUTH LEVY GUYER



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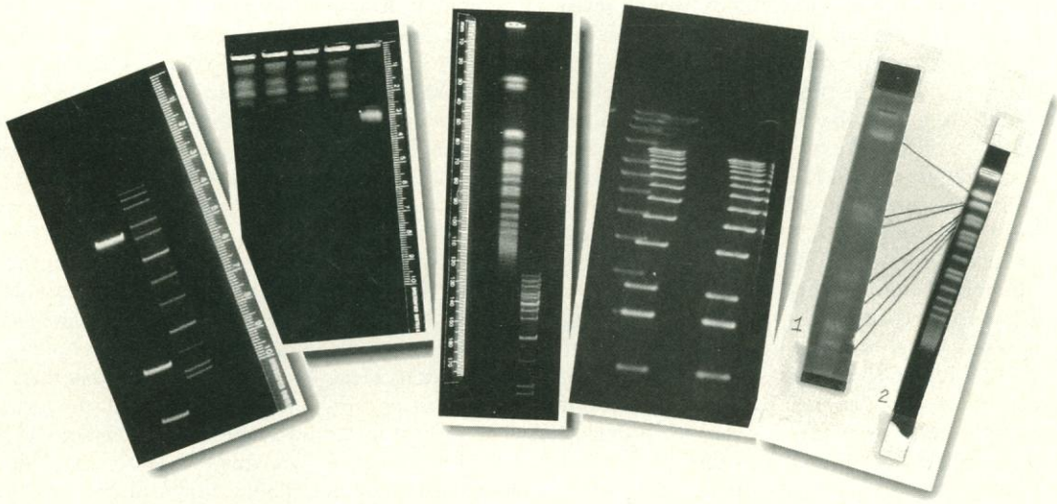
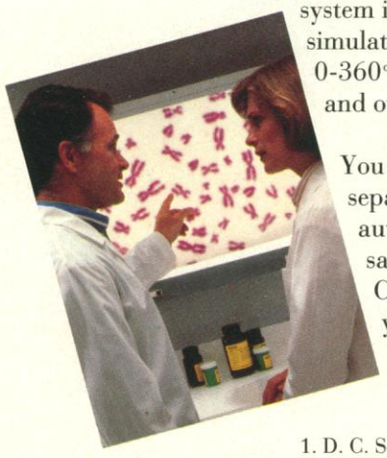


Left to right: Asymmetric voltage FIGE, 5-50 kb; *S. pombe* 24 hrs, 106° angle; 8kb - 2.2 mb;2-D separation of linear and supercoiled DNA; 8 state high resolution separation of *S. cerevisiae*.



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1. D. C. Schwartz and C. R. Cantor. *Cell*, **67** (1984).
2. Programmed Autonomously Controlled Electrodes. See S. M. Clark, E. Lai, B. W. Birren and L. Hood. *Science*, **241**, 1203 (1988).

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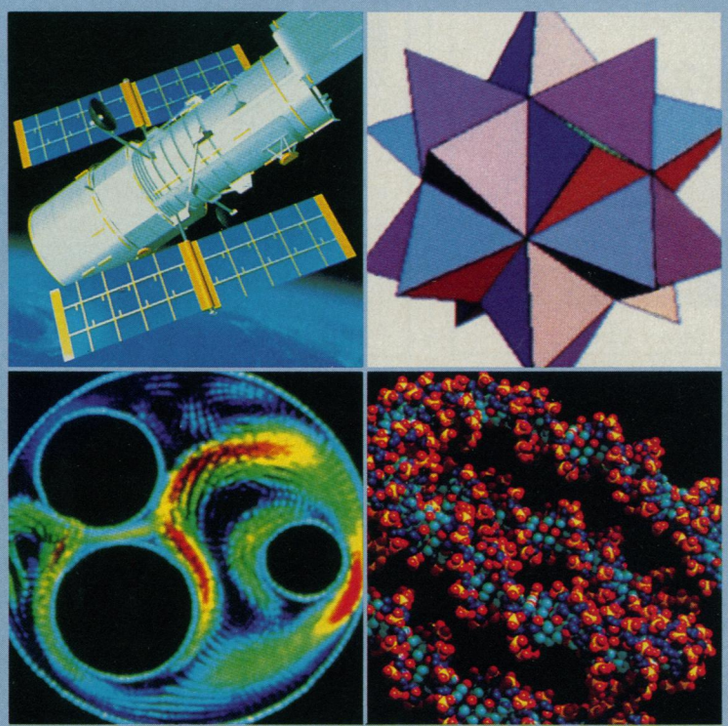

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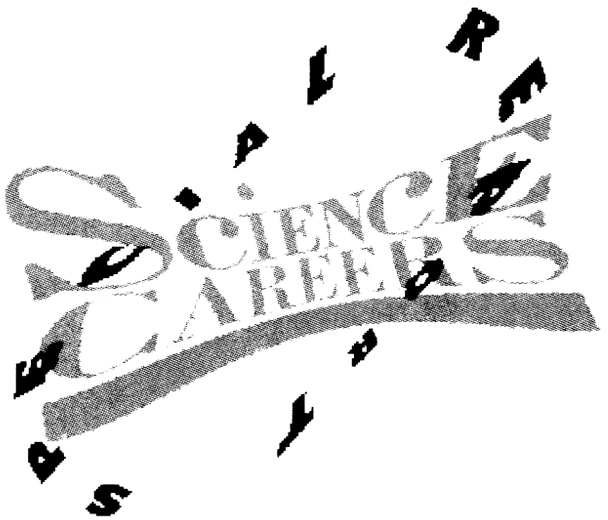

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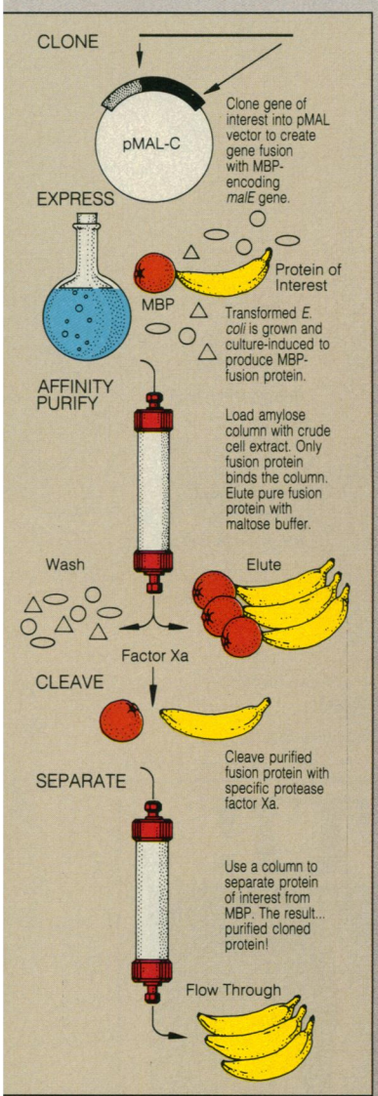

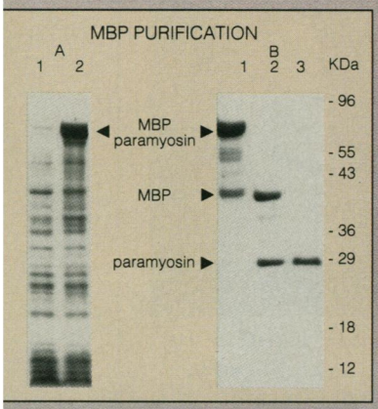

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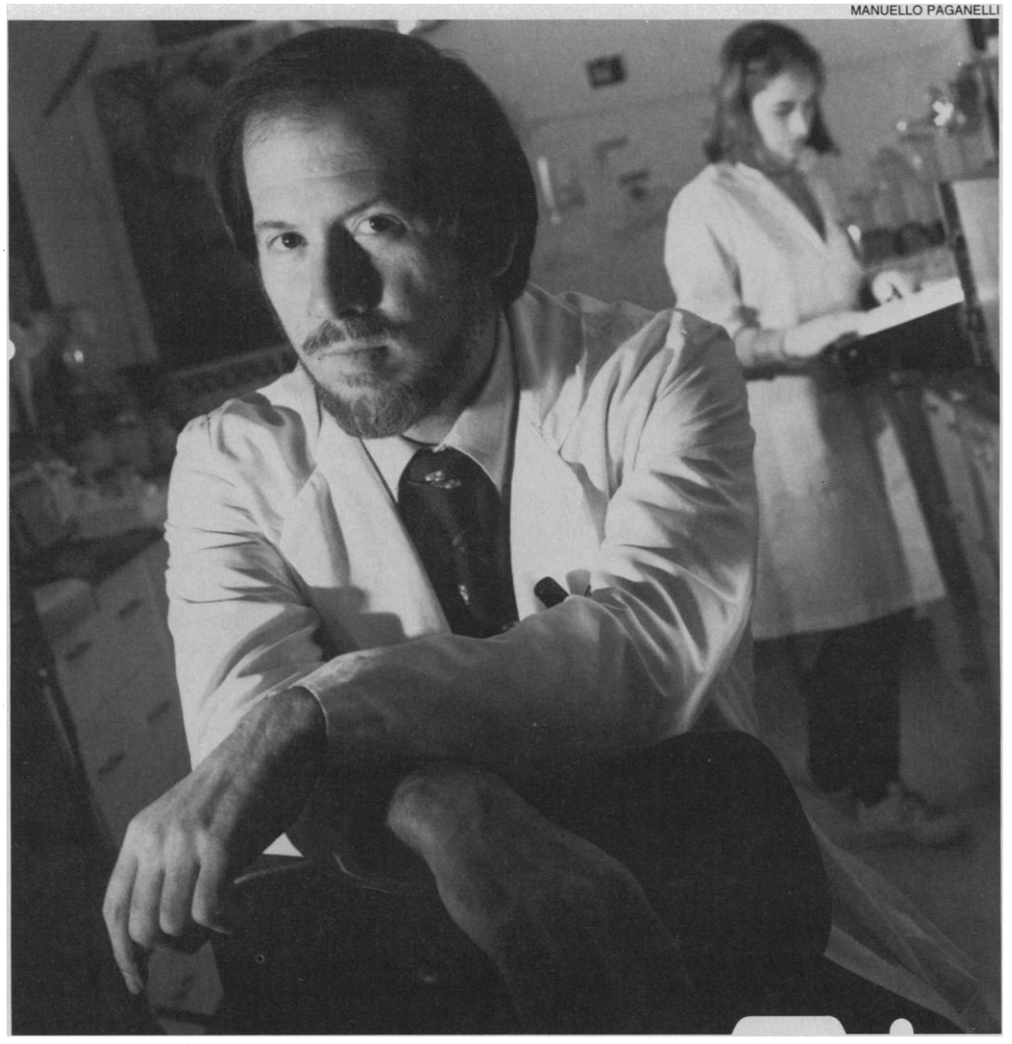

For more than ten years Bert Vogelstein has been pursuing the genetic basis of cancer. With his publications in Science *identifying several tumor suppressor genes, Vogelstein dramatically furthered our understanding of colorectal cancer and its pathogenesis.*

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* Identification of a Chromosome 18q gene that is altered in colorectal cancer (E.R. Fearon, *et al.*, *Science*, 247; pp. 49-56). For a full report from ISI see *Science Watch*, December 1990.