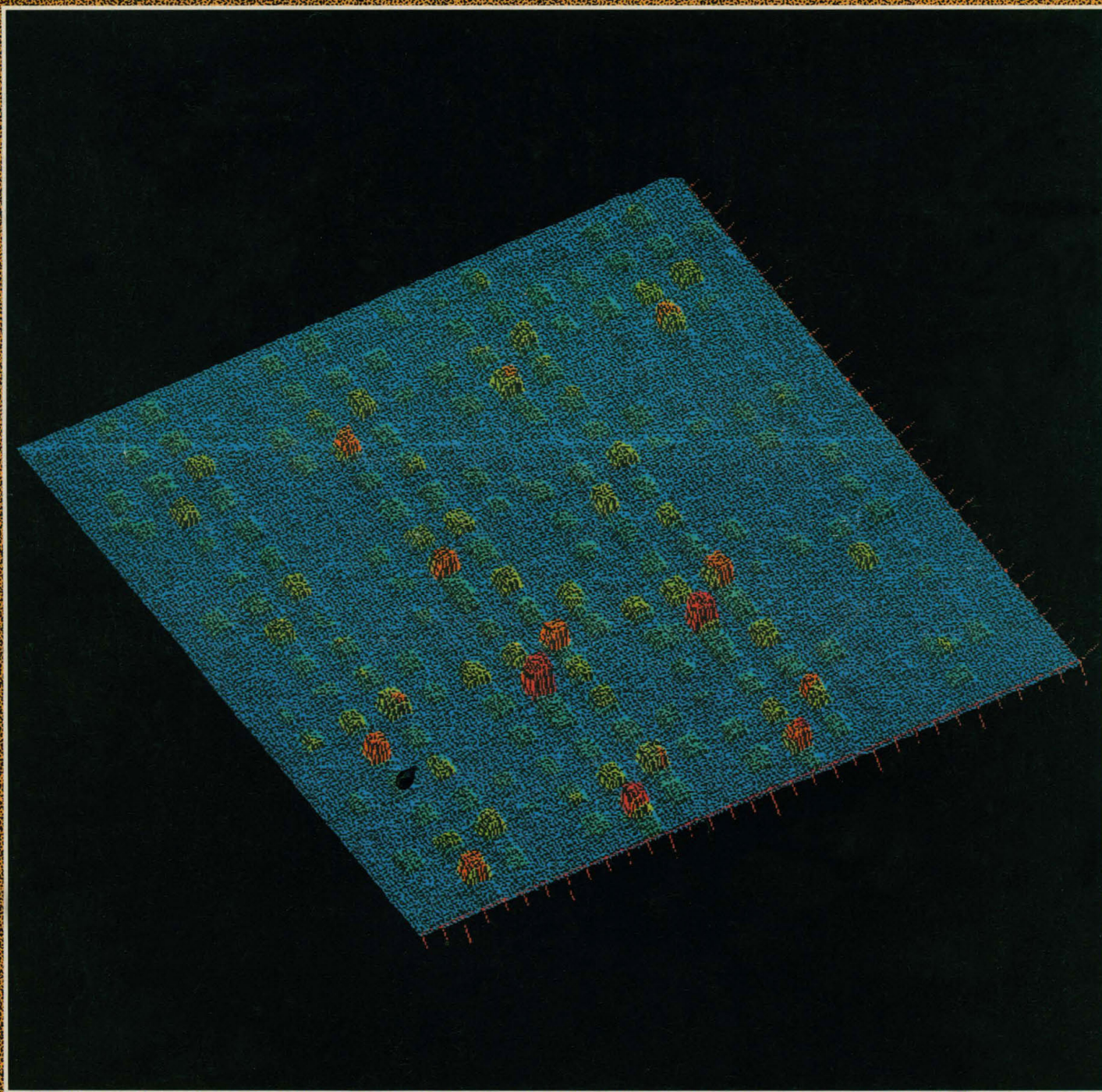


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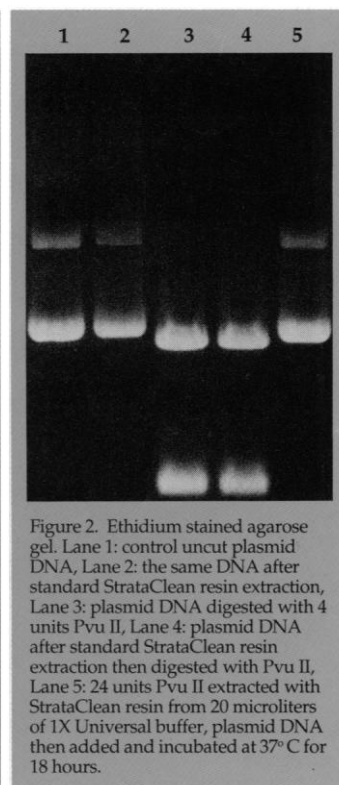
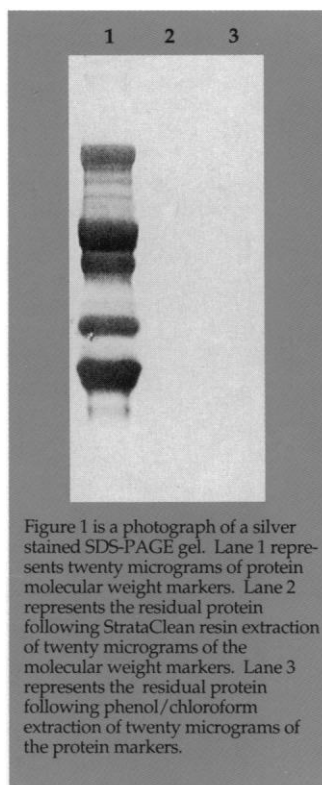
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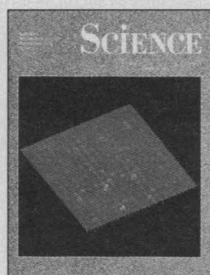
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This Week in SCIENCE

2060 Chiron

WHEN 2060 Chiron was discovered in 1977 it was classified as an asteroid. By the late 1980s, it was observed to brighten rapidly and to have a faint dust coma. Thus it had begun acting and looking like a comet. Two papers this week present new information about this largest known comet, one that is estimated to be an order of magnitude larger than other known comets. Spectrophotometric observations made in 1990 by Bus *et al.* indicate that CN gas is associated with Chiron (page 774). Radiometric observations obtained by the Infrared Astronomical Satellite and older ground-based observations made in 1983 suggest that Chiron may be twice as large as was previously thought and much darker (Sykes and Walker on page 777). The studies point to a role for gravity in gas outflow from Chiron, favor sublimation of CO₂ ice as the driving force for recent outbursts of CN from parent HCN molecules, and make the case for geometry playing an important part in the comet's changing behavior. Continuing observation of Chiron may lead to a plausible explanation for how Chiron formed in the outer solar system.

New NMR procedure

A new nuclear magnetic resonance (NMR) technique—rotational resonance magnetization exchange—has been developed for measuring distances between two nuclei of a homonuclear spin pair (such as ¹³C-¹³C or ³¹P-³¹P) in a protein (page 783). Structural studies of membrane constituents and other large proteins that cannot be studied with conventional diffraction and solution NMR techniques are possible with this method. Spin dynamics and the exchange of magnetization are analyzed for two atoms spinning at rotational resonance; the distance between the nuclei of the spin pair is then determined. Creuzet *et al.* illustrate the technique with model compounds and the protein bacteri-

orhodopsin. The latter is a large molecule that functions as a light-driven proton pump in the outer membrane of *Halobacterium halobium*. Experiments on ¹³C-labeled bacteriorhodopsin established unambiguously that the chromophore retinal is in a 6-*s-trans* configuration (rather than a *cis* configuration) in this protein. Such structural information should contribute to a better understanding of conformation changes that affect function in this and other membrane proteins.

Adhesion molecule in atherosclerosis

ONE of the early changes in blood vessels that might presage the development of atherosclerosis is the appearance of adhesion molecules on the surface of vessel endothelial linings (page 788). As atherosclerosis progresses various cells, lipids, and matrix materials accumulate in the inner layers of large arteries, and the vessels eventually lose their elasticity and resilience. In two rabbit models of atherosclerosis—one involving a genetically predisposed strain of rabbits and the other involving rabbits whose disease is inducible by diet—Cybulsky and Gimbrone found that the expression of the adhesion molecule occurred at sites where atherosclerotic lesions were developing. Mononuclear but not polymorphonuclear leukocytes adhered to the adhesion molecules in vitro. Sequence analysis showed that the rabbit molecule was similar to a well-characterized human adhesion molecule. Should the human equivalent be expressed in association with atherosclerotic lesions, it might qualify as a much-needed marker with which disease initiation and progression and possibly therapies could be monitored.

Element assimilation

IN marine food webs, copepods (which are zooplankton) assimilate a variety of elements from the diatoms (which are phytoplankton) that

they ingest. Laboratory experiments with radiolabeled diatoms indicate that the efficiency with which assimilation occurs can range from 0.9% to 97.1% for different elements (page 794). These figures directly reflect how the various elements are partitioned in different compartments of the diatom: specifically, those that are in the cytoplasm of the diatom are readily assimilated whereas those bound up in the cell walls and membranes are not. A greater proportion of total cellular protein was found in the cytoplasm of senescent diatoms than in the cytoplasm of diatoms that were rapidly growing. Therefore, copepods would be expected to assimilate more protein and protein-associated elements by ingesting senescent cells than by ingesting an equal number of rapidly growing cells. Reinfelder and Fisher suggest that these differences in assimilation efficiency in turn may affect the residence times, partitioning, and recycling of a variety of elements in ocean surface waters.

Role for protooncogene product

THE cell surface receptor for the hepatocyte growth factor (HGF) is identical to a product of a protooncogene (page 802). The *c-met* protooncogene product was known to be expressed in many different tissues, but HGF is the first ligand that has been found for it. The *c-met* protein has α and β subunits; the β subunit consists of extracellular, transmembrane, and tyrosine kinase domains and tyrosine phosphorylation sites. Studies by Bottaro *et al.* show that HGF interacts with the *c-met* β subunit. HGF is thought to be important in liver regeneration and in stimulating the proliferation of a variety of cell types in a number of organs. The interaction of ligand and receptor may be an early step in mitogenic triggering by HGF. With both receptor and ligand now identified, a better assessment can be made of the roles of these two and their interactions in normal and transformed cells.

■ RUTH LEVY GUYER

A Major Breakthrough in mRNA and DNA Extraction



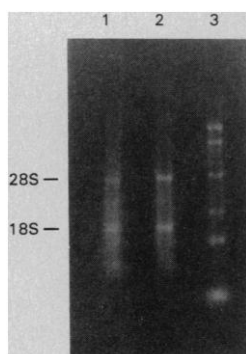
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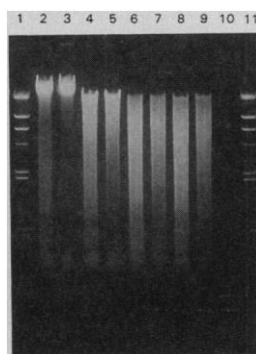
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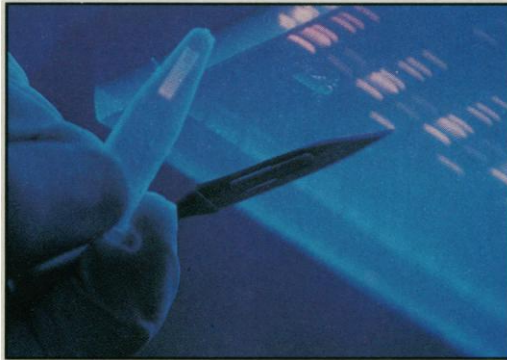
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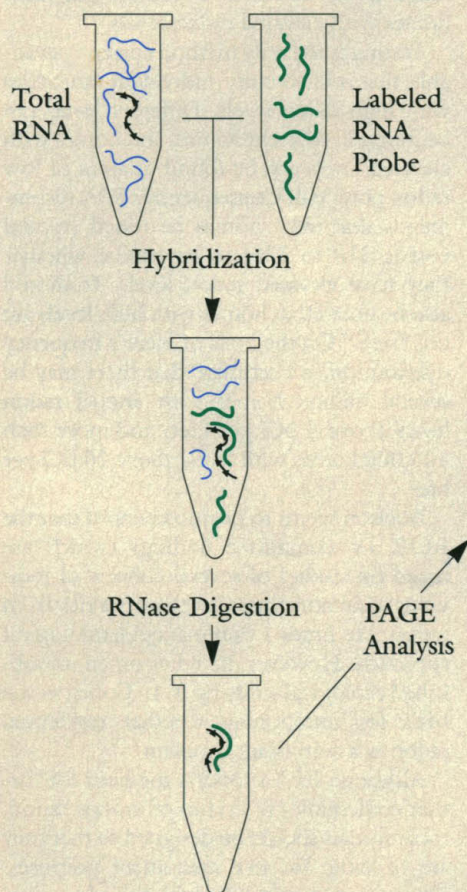
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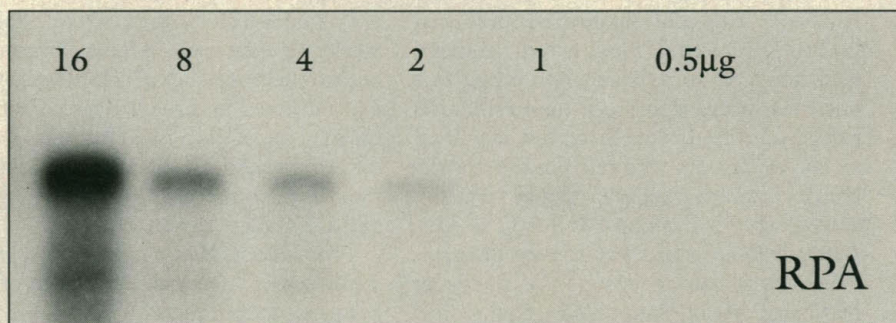
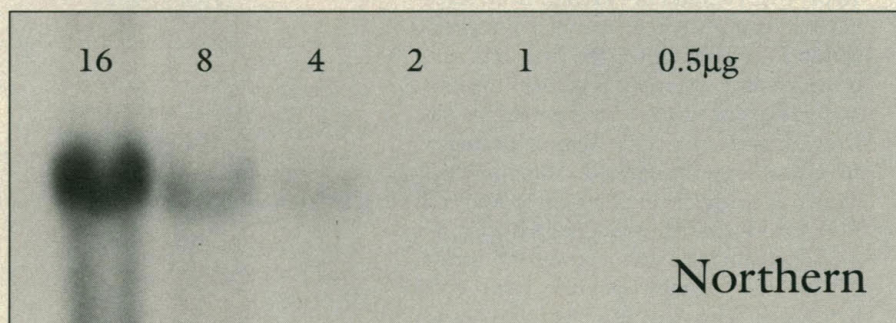
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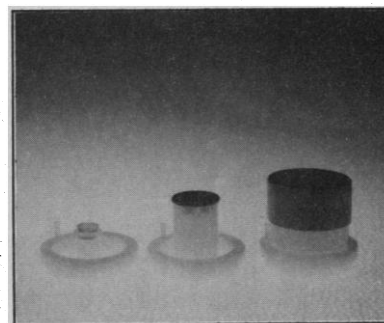
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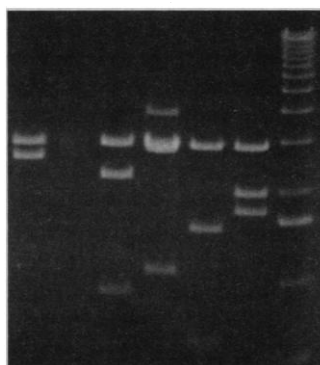
mRNA* SAMPLE	LIBRARY SIZE (CHEMICAL)	LIBRARY SIZE (ELECTROPORATION)
Fetal Eye Lens	2.3×10^5	3.5×10^6
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*Libraries were constructed from cDNA shown in cDNA synthesis gel entitled: Full length cDNA.



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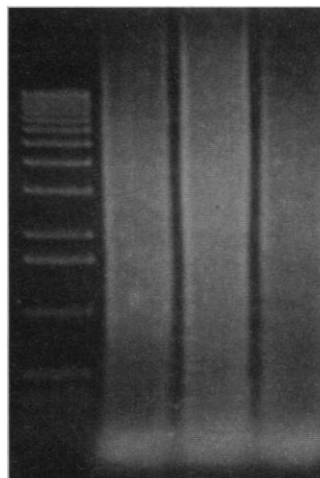
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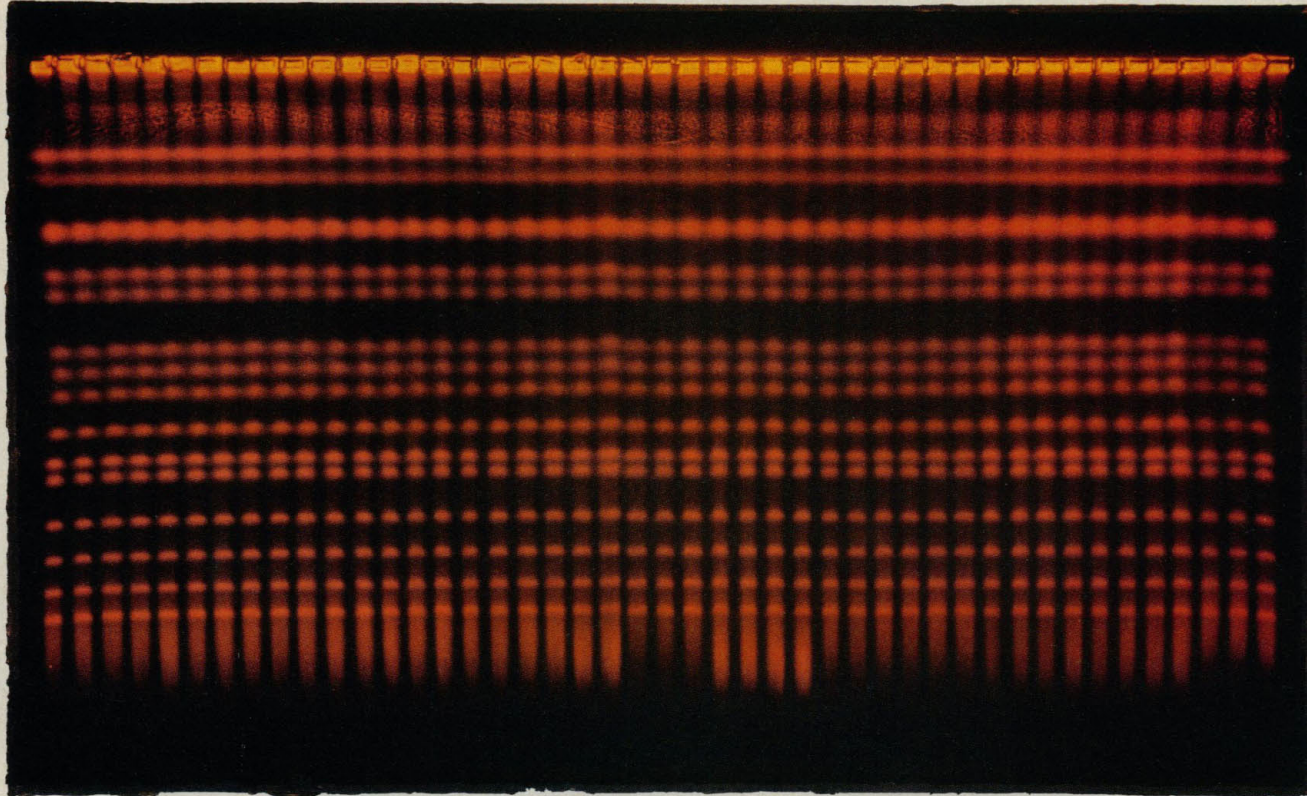


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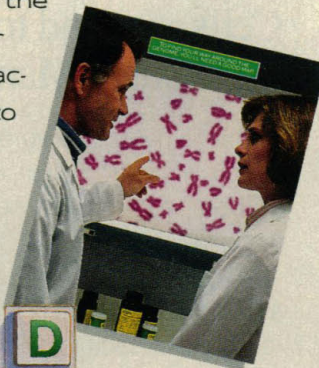
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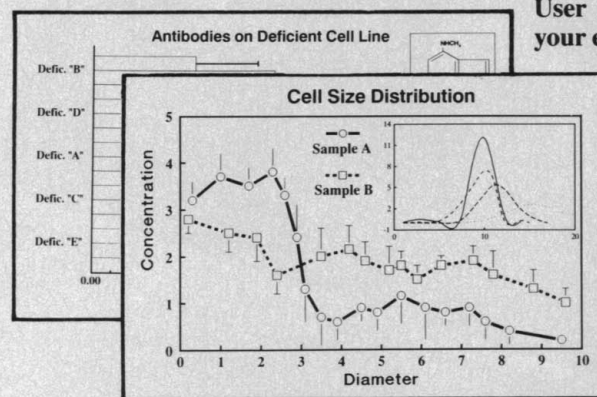
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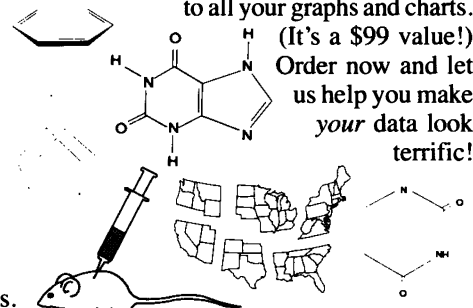
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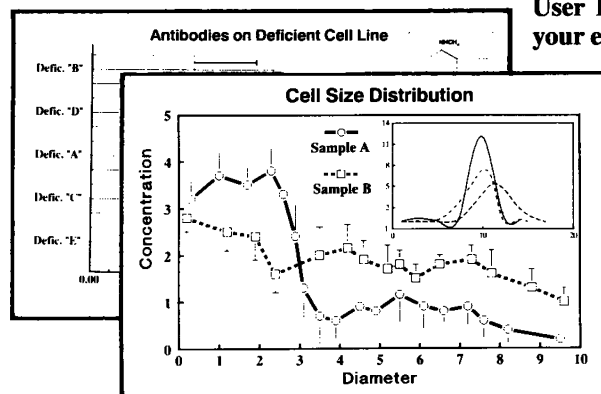
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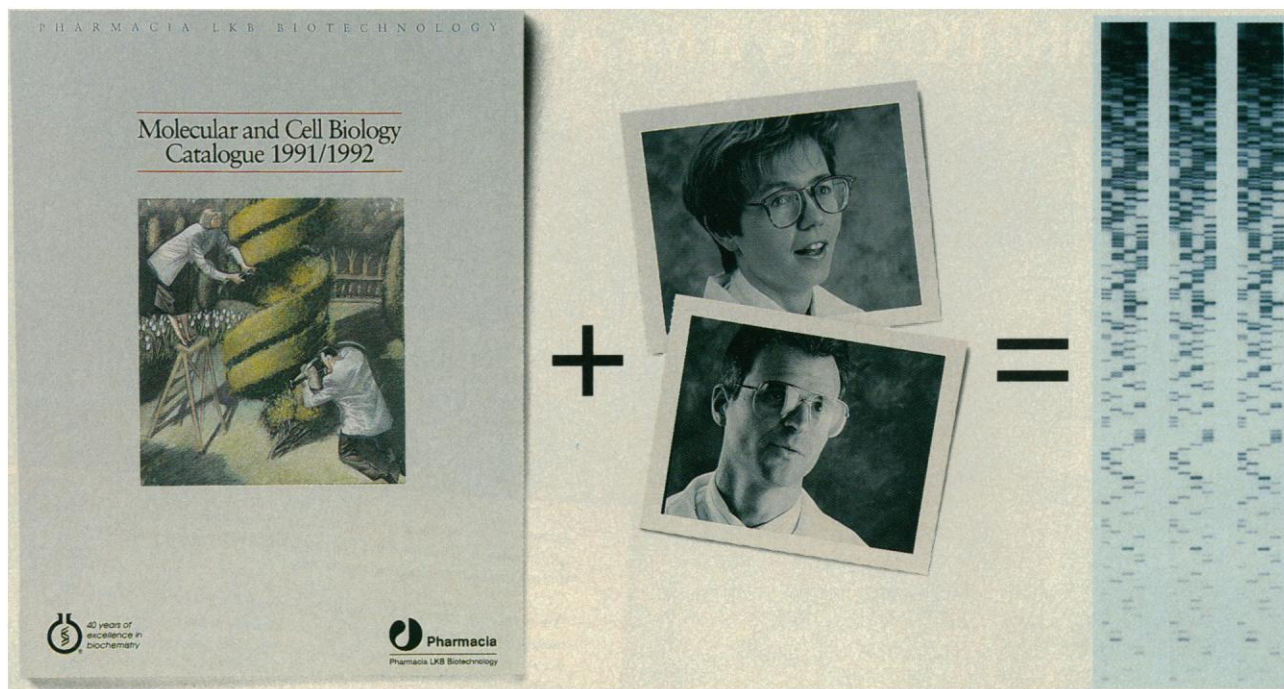
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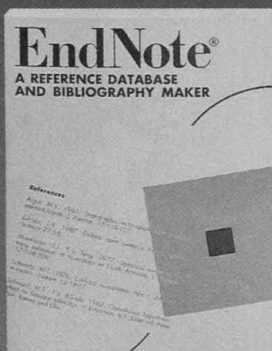
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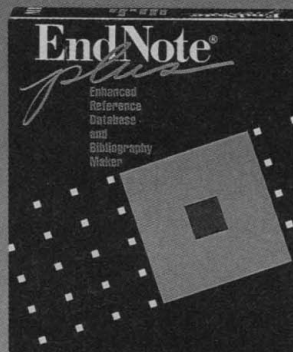
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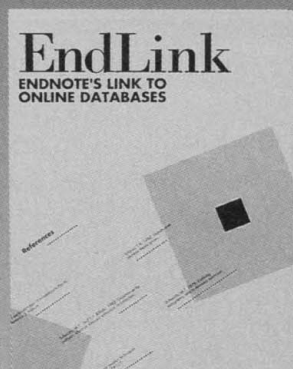
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References

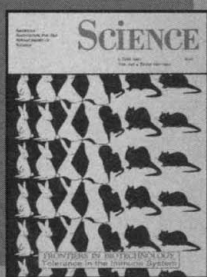
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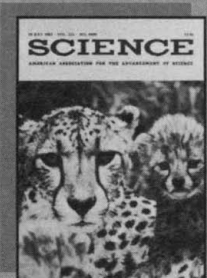
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