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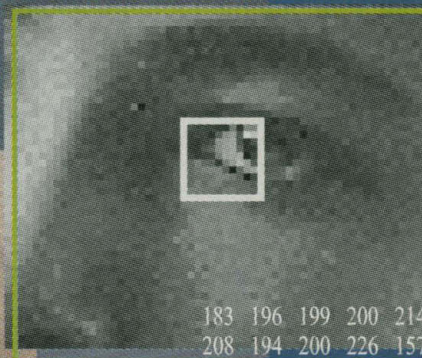
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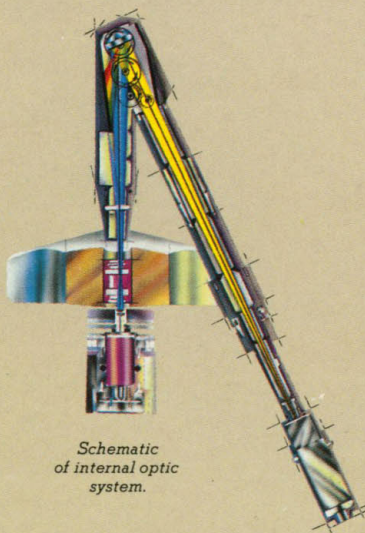
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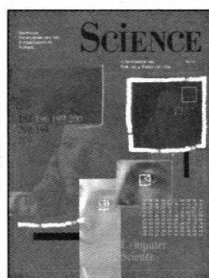
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COVER Conversion of images into digital form is one aspect of computer vision. Once digitized, an image can be processed, manipulated, and interpreted. The matrix of numbers is the numerical representation of the light and dark regions within the square border around the woman's eye. The articles in this issue survey developments in computer vision, robotics, parallel processing, and natural language processing. See editorial, page 1189, and articles, pages 1227 to 1254. [Cover by Julie Cherry; digital image of Sarah Bernhardt courtesy of Azriel Rosenfeld]

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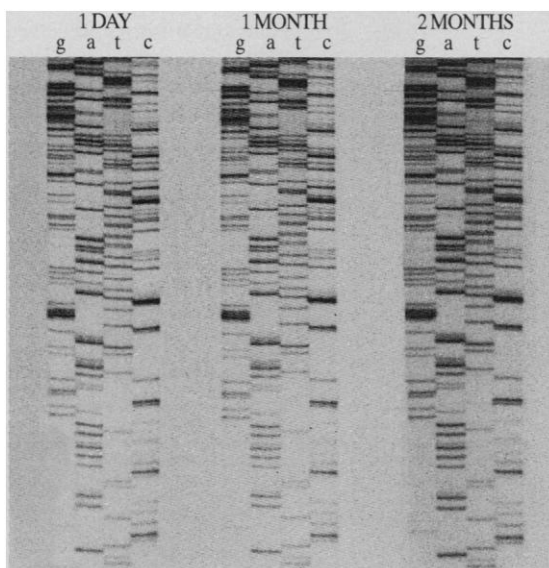
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This Week in SCIENCE

Computing RNA shapes

Experimentation is one way to learn about the three-dimensional structure of a macromolecule; computer modeling is another. Major *et al.* have taken the latter approach, using a combination of symbolic and numerical techniques, to produce atomic-level models of features of RNA (page 1255). Structures were predicted for several interesting regions of transfer RNA—the anticodon loop, the T-loop, and a pseudoknot. The task of predicting structure was considered a constraint satisfaction problem; structures that violate known constraints (such as the pairing of two uracils) would not be allowed. Structural data are plugged into appropriate algorithms to generate relatively simple models for the organization of the nucleotides; these models could then be refined with computational methods that consider such factors as which structures best minimize bond energy. Comparisons of the predicted structures with crystallographic data indicated that reasonable models could be produced with these methods. Other advances in the field of computer science are described in four articles (pages 1227 to 1254), a news story (page 1209), and the editorial (page 1189) in this special issue.

Climate record from the Southern Hemisphere

Global climate change—is it occurring and if so why?—is a controversial topic. Many pieces have been missing from the climate puzzle, such as long-term records of climate trends from the Southern Hemisphere. One such record is now available (page 1266). Tree-ring data have been obtained for a 1000-year period—the years from 900 to 1988—from a huon pine forest in western Tasmania. This chronology, a proxy of Austral summer temperatures, indicates that the 20th century has been an unusual one. The recent consistent warming in Tasmania since 1965 is anomalous; so was the cold period at the turn

of the century, when a dramatic reorganization of ocean-atmosphere circulation in the Southern Hemisphere may have occurred. Cook *et al.* note that these data are consistent with but do not prove the hypothesis that anthropogenic factors and greenhouse gases may be affecting or driving the current warming trend.

Sorting of messenger RNA

Microfilaments are protein-rich structures that are known to assist in the movement of vesicles and organelles within cells. Another role has now been discovered for them: they participate in the transport and anchoring of messenger RNA molecules (page 1275). In chicken embryo fibroblasts, messenger RNA molecules that direct the synthesis of the protein actin typically concentrate at the cells' ruffling edges. Sundell and Singer found that this pattern was sustained only when microfilament function was unimpaired. Drugs that blocked the actions of microfilaments impeded both localization and anchoring of the messenger molecules. These two stages of messenger localization appeared to be affected by different microfilaments. Other cellular filament systems, microtubules and intermediate filaments, were also monitored, but they were not observed to participate in the sorting of the messenger molecules. Sorting is vital to cell functioning, because it is one step toward ensuring that proteins will be made where they are needed in the cell.

Cloning of IL-8 receptors

One of the well-studied activities of interleukin-8 (IL-8), a cytokine that is made by many types of cells, is the promotion of inflammatory responses: IL-8 attracts neutrophils and other cells of the immune system to sites of injury and then it activates them. Clues to how it works can come from knowledge of both its

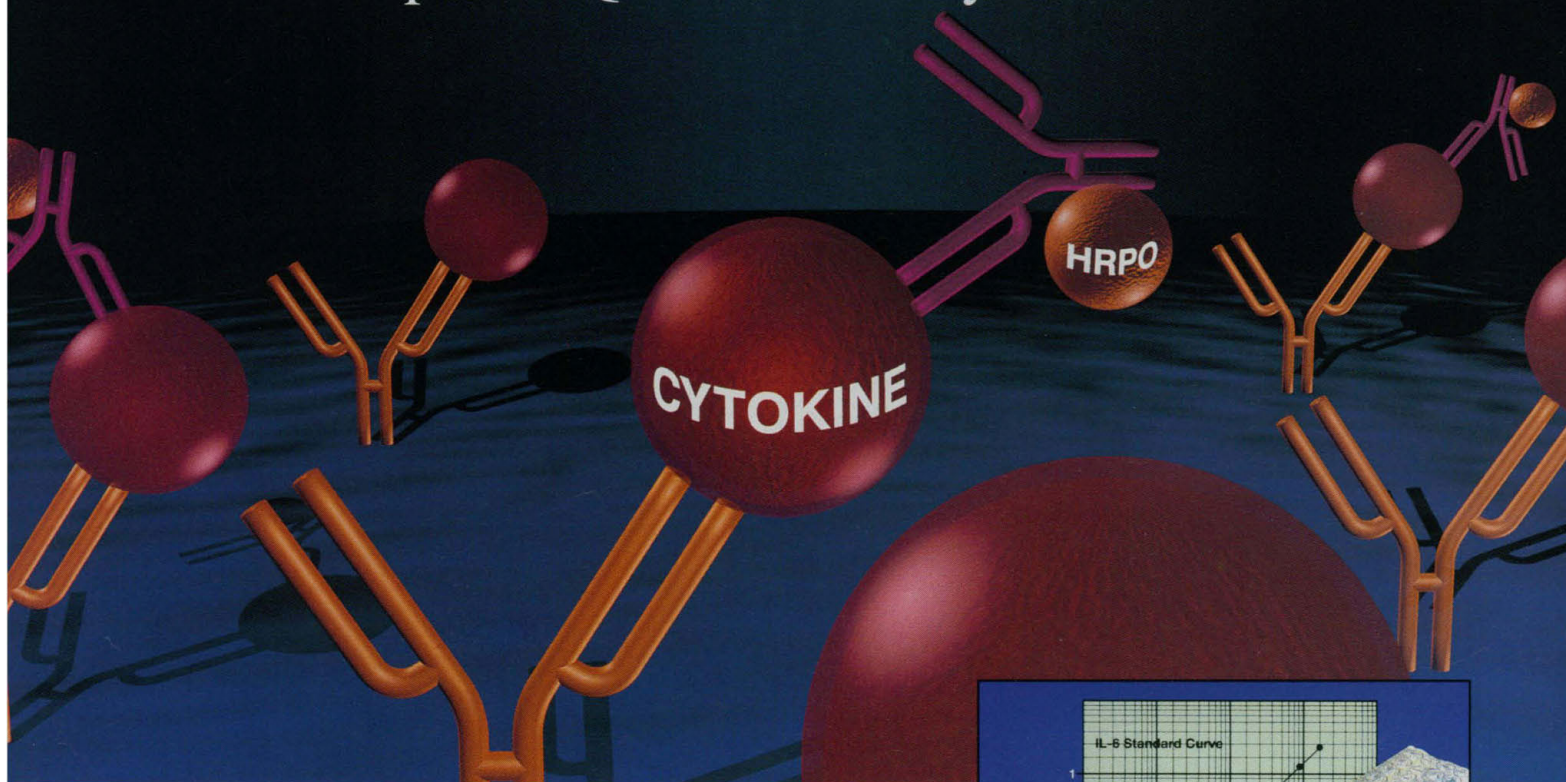
structure and the structure of cellular receptors to which it binds. Two reports this week describe the cloning of complementary DNA molecules that encode IL-8 receptors. Holmes *et al.* cloned a high-affinity receptor for IL-8 (page 1278); Murphy *et al.* cloned a low-affinity receptor (page 1280); both were cloned from human neutrophilic cells. Cells made to express the cloned material bound IL-8 and showed increases in intracellular calcium, a characteristic early response to this substance. The deduced amino acid sequences for the two receptors were 77% identical. This suggests that there may be a family of receptors that bind IL-8 and that these two receptors are members of that family.

Viral persistence in neurons

Neurons cannot be replaced. Therefore, from the perspective of the neuron, it may be better to be infected by a virus and be impaired functionally than to be destroyed by host killer cells—called CTLs—that, though directed toward the invading virus, wipe out the neuron as well. When virus-specific CTLs are injected into brains of animals in the persistent stage of infection (when viruses reside in neurons), there is no apparent effect (page 1283). However, when CTLs are injected during the acute stage of disease—when other cells of the nervous system cells are infected—immunopathologic injury occurs and animals die. Joly *et al.* tested the hypothesis that what accounts for the unusual resistance of neurons to immune destruction is that they lack surface MHC class I molecules. Class I molecules are found on many types of cells; they form complexes with peptides of invading viruses, and the complexes become targets for CTL attacks. In vitro, neuronal cells proved incapable of synthesizing messenger RNA molecules for one of the chains of the class I molecules; thus they could not produce the class I protein or display it on their surfaces. ■ RUTH LEVY GUYER

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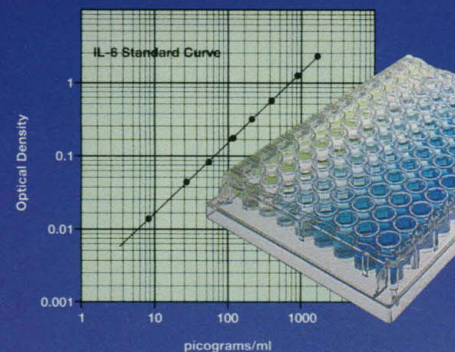
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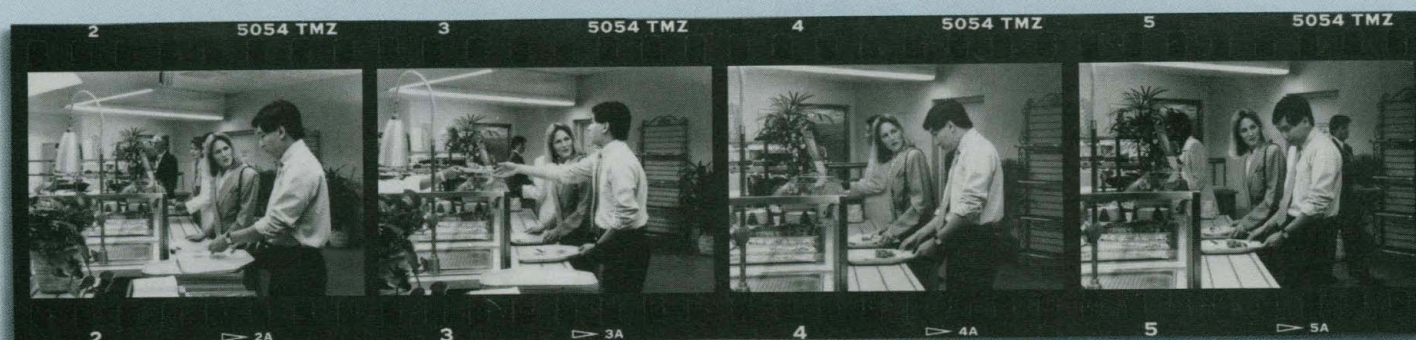


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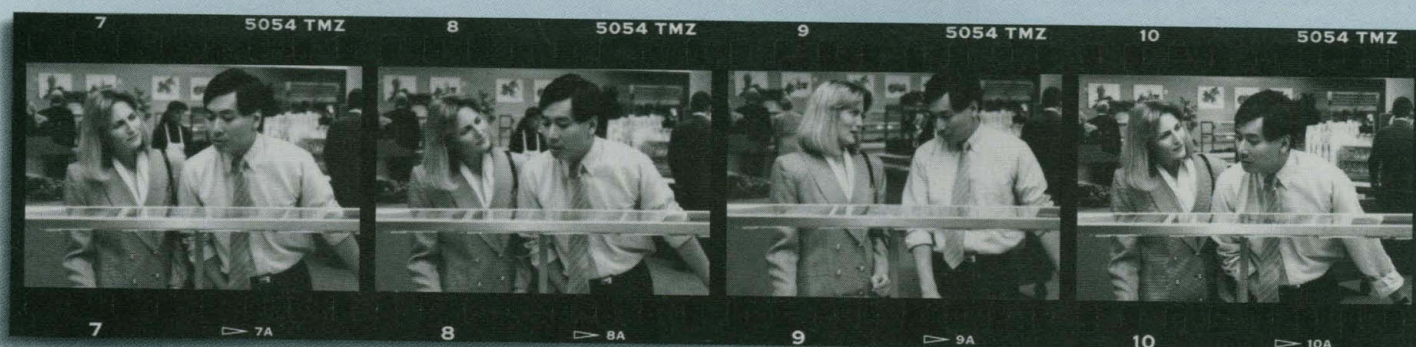
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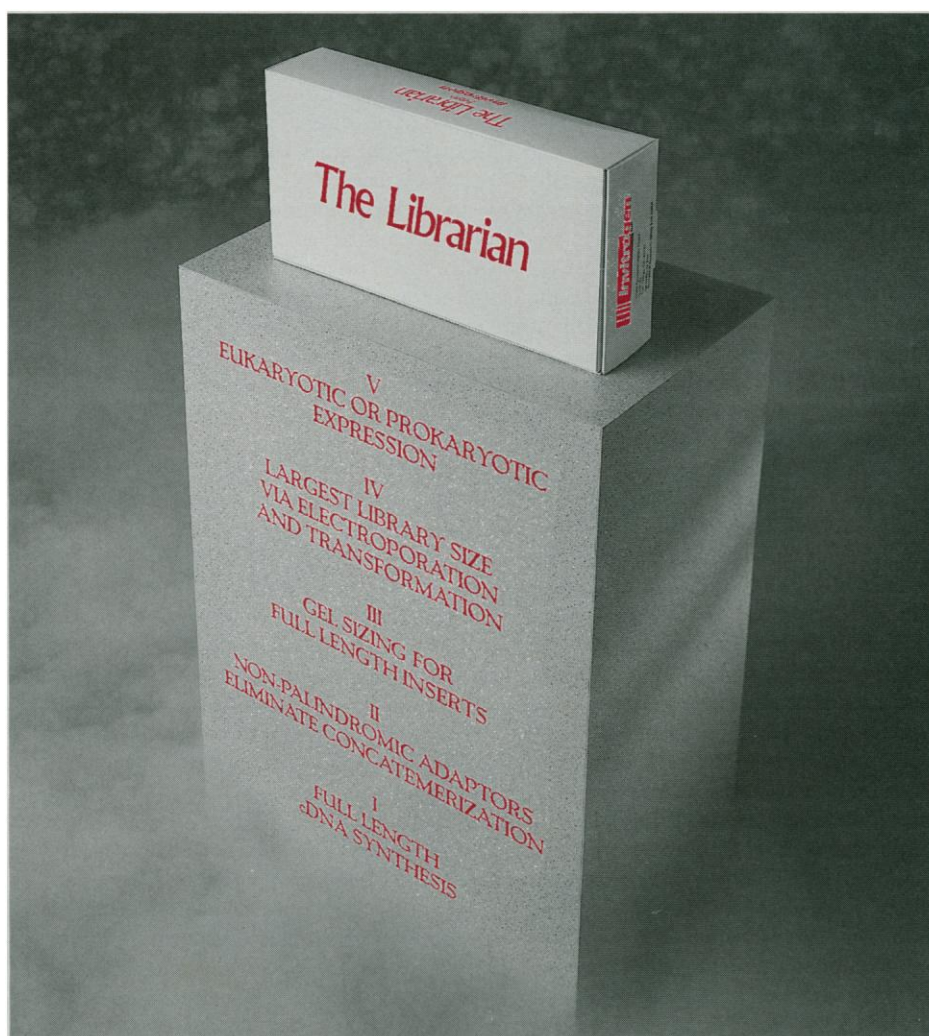
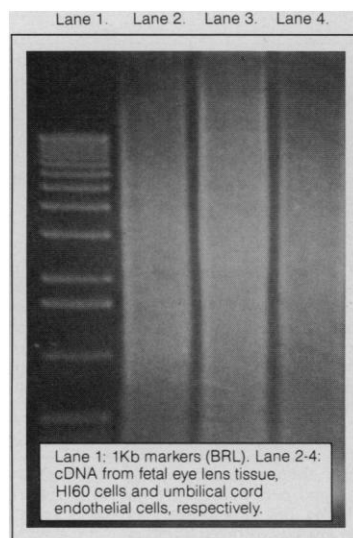
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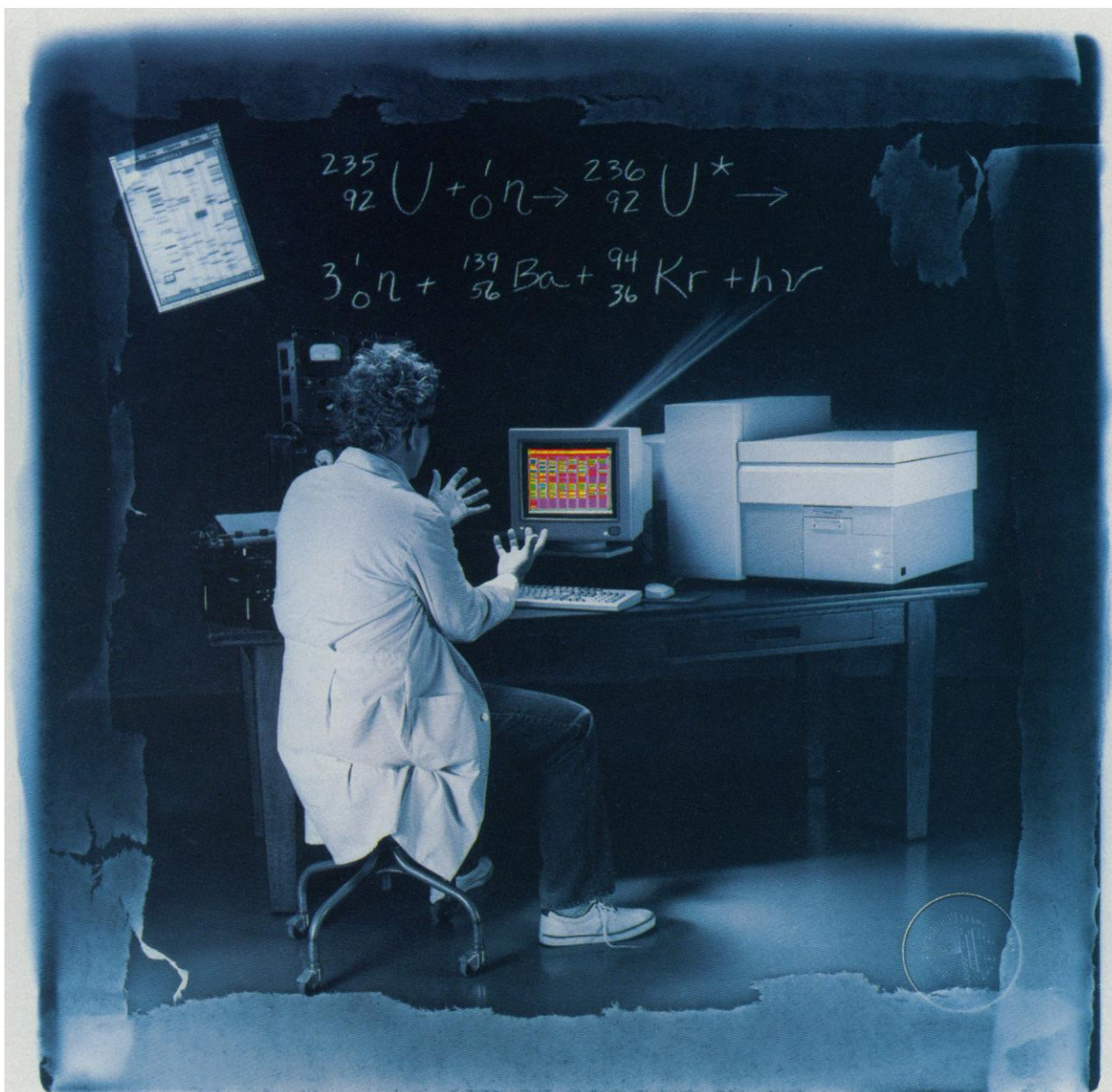
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The person who is generally recognized as the most productive technologist in Procter & Gamble history is Victor Mills. An engineer's engineer, his technology achievements during a career lasting from 1926 to 1961 were truly remarkable. They included pioneering work on continuous hydrolyzer processes; controlled crystallization processes which remain state-of-the-art today; continuous hydrogenation processes; cake mix milling processes which dramatically improved the quality and acceptance of prepared baking mixes; spray drying processes; and airtight canister packaging. Many products, especially in the food and paper areas, owe their success largely to his creative contributions. He is



the holder of 25 patents. He developed processes which improved consumer products to make life better for innumerable millions of people worldwide.

In May, 1990 Procter & Gamble announced the formation of The Victor Mills Society to honor those very special technologists in the Company who, through their technology innovations, have made sustaining and important business contributions throughout their careers.

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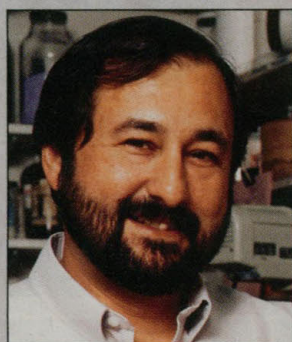
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ment to which other technologists can aspire. P&G salutes the charter members of The Victor Mills Society, along with every member of the Company's research and development team. Their efforts, their dedication and their accomplishments are a source of pride to P&G, and to the technological community overall.

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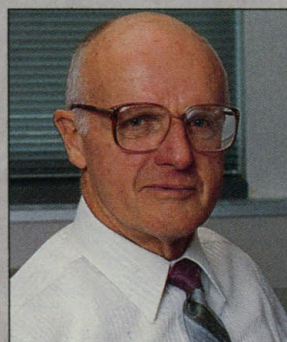
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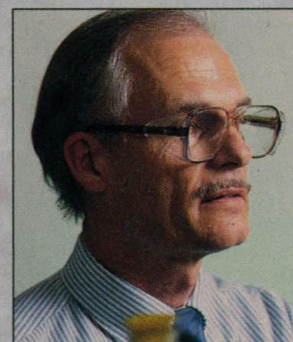
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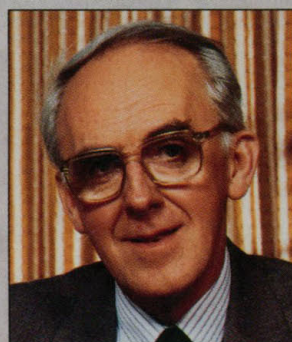
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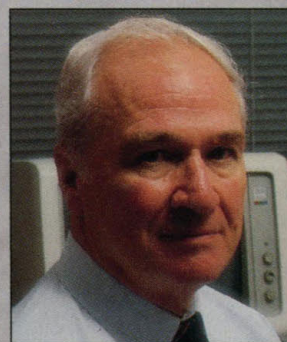
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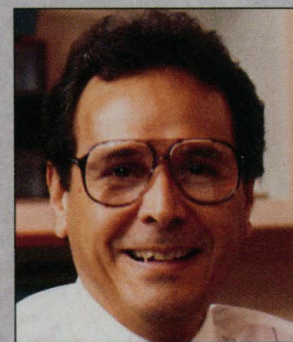
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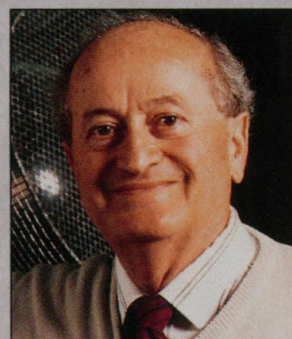
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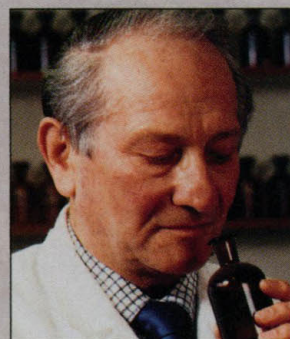
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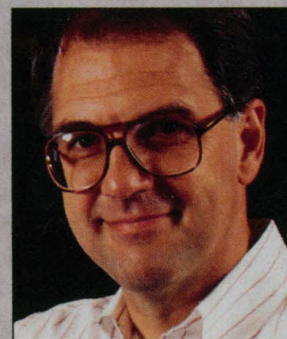
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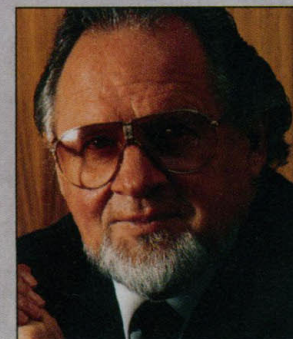
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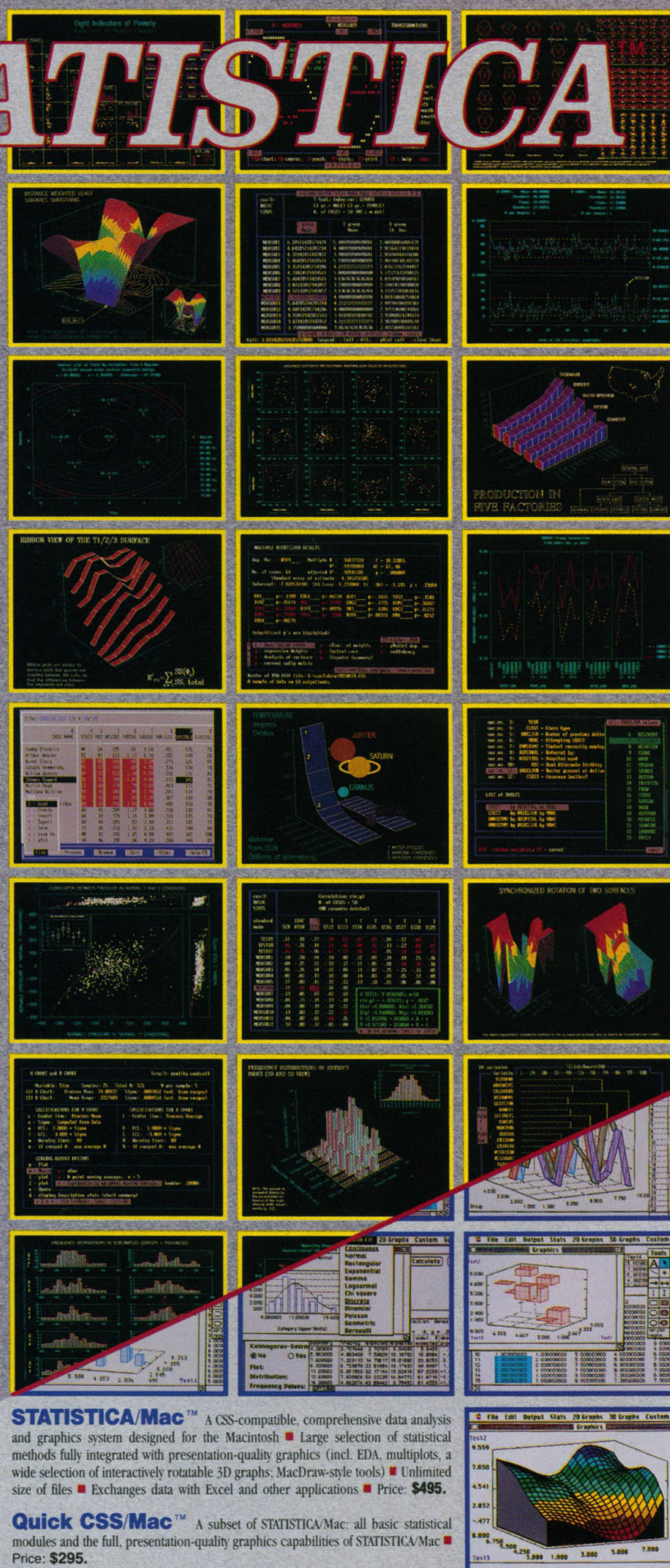
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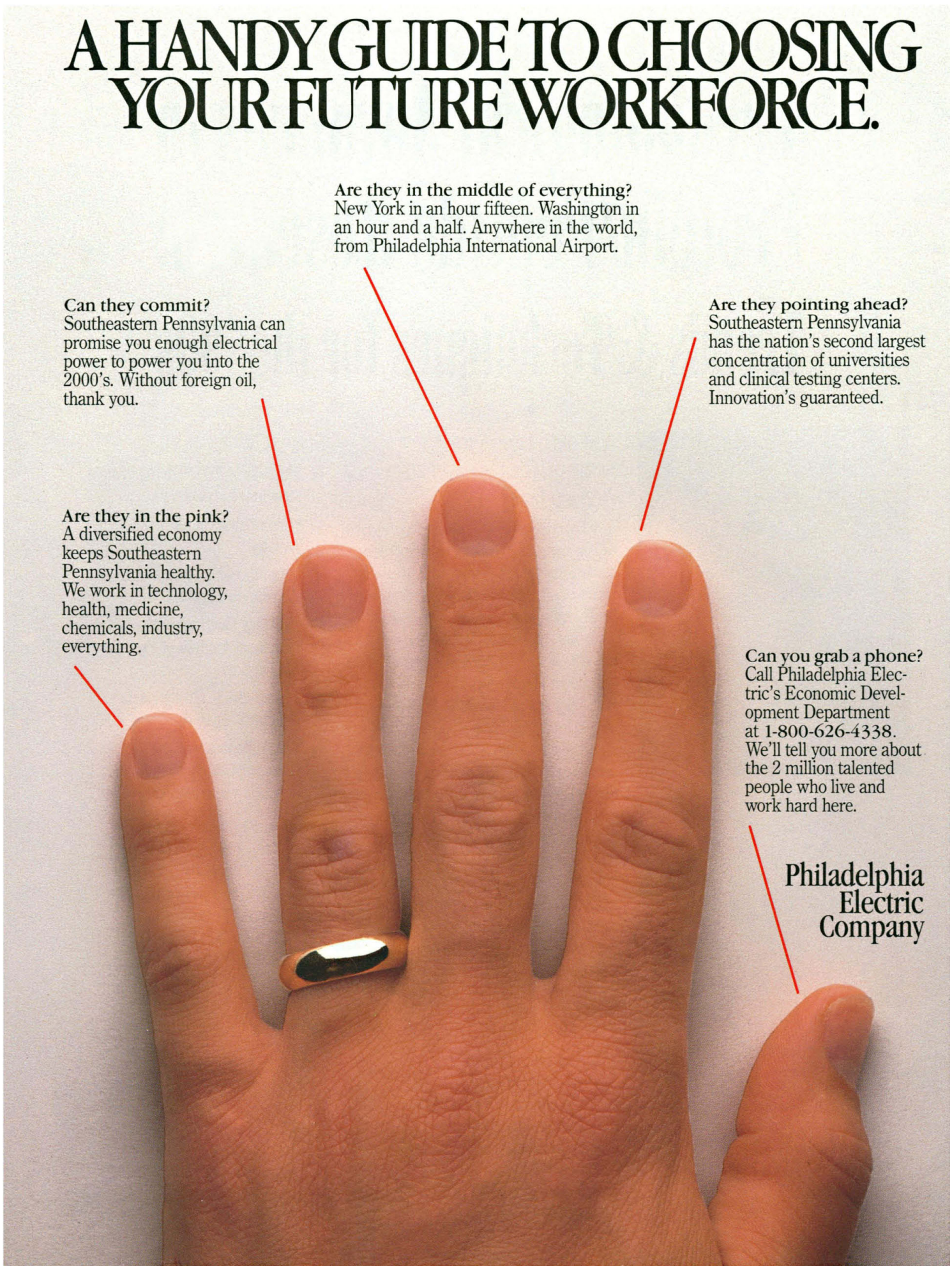
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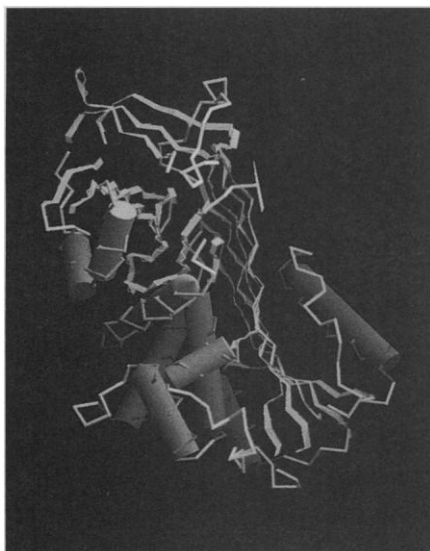
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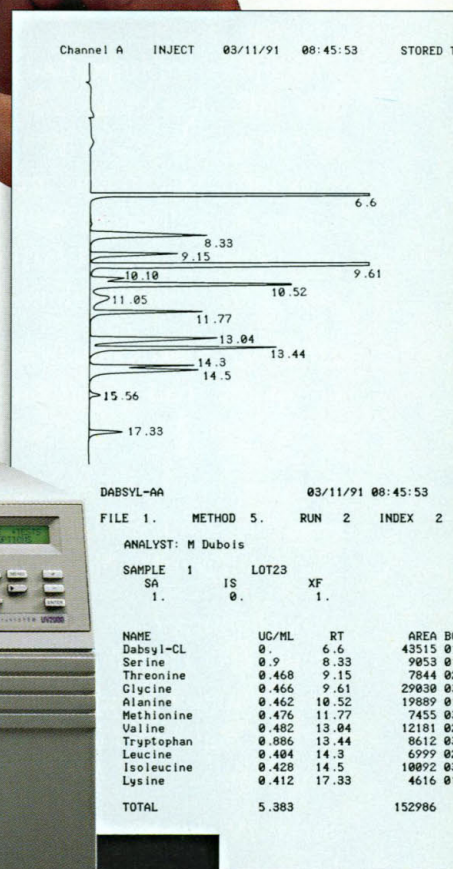
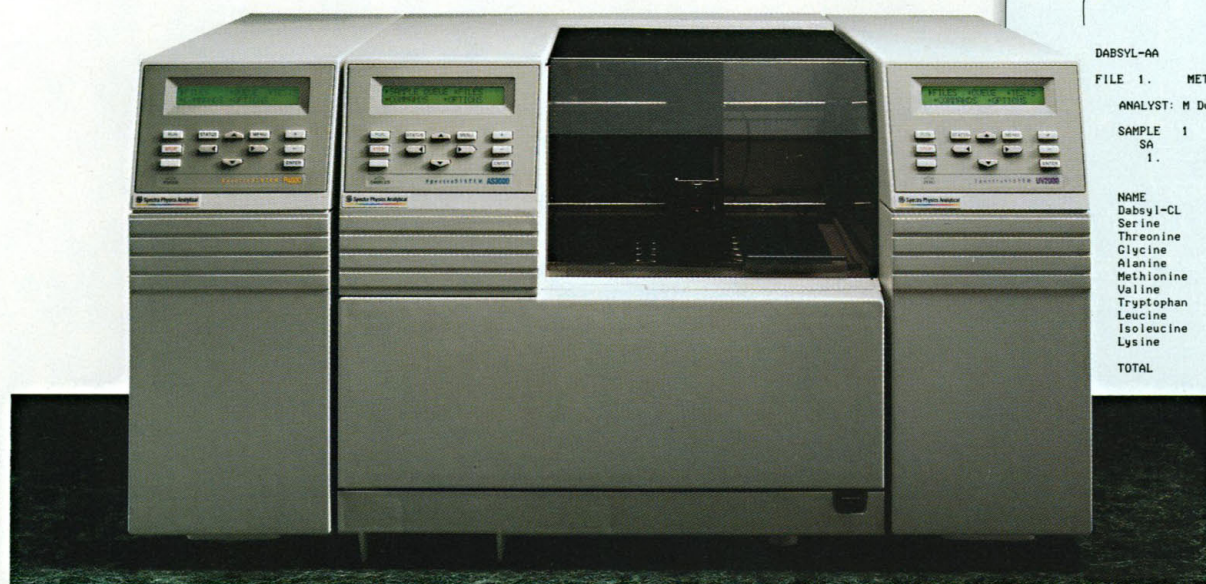
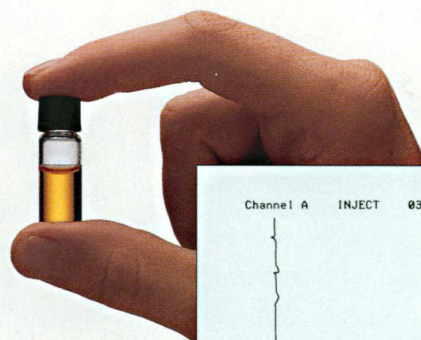
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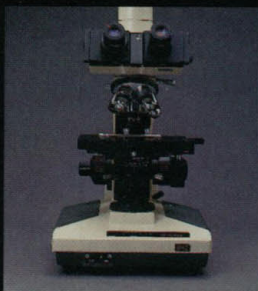
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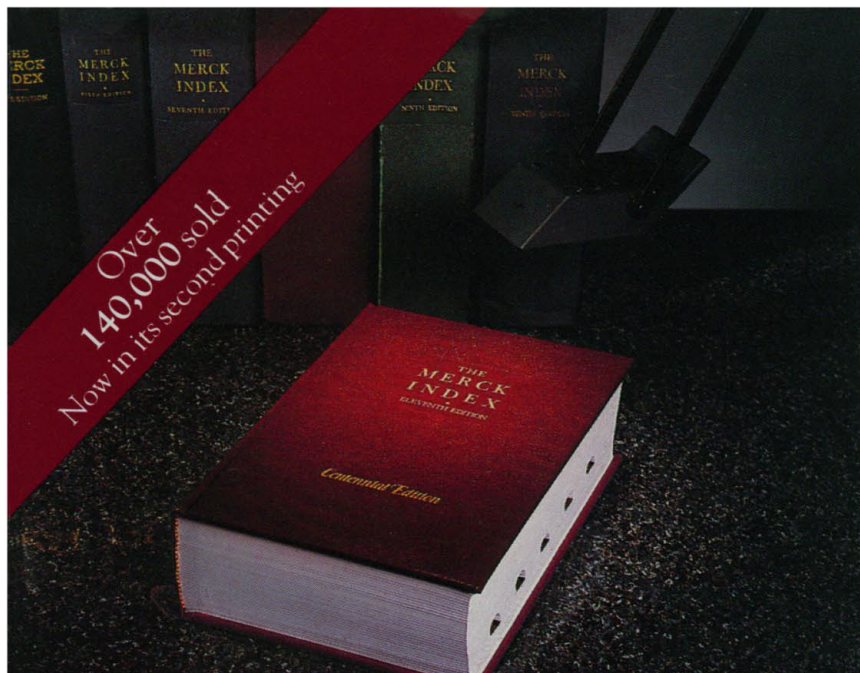
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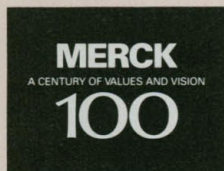
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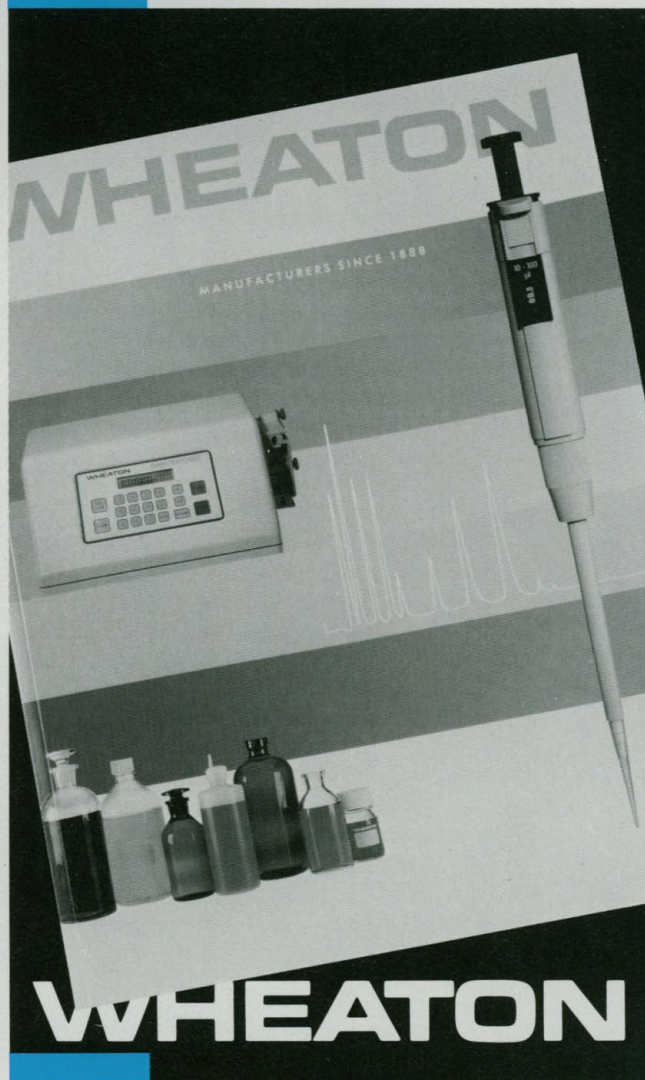
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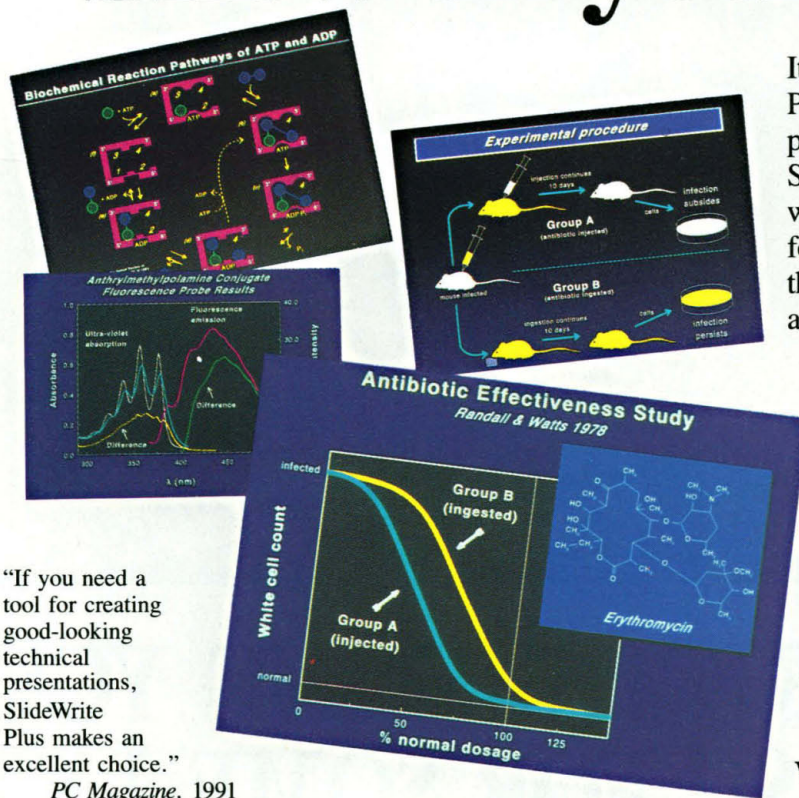
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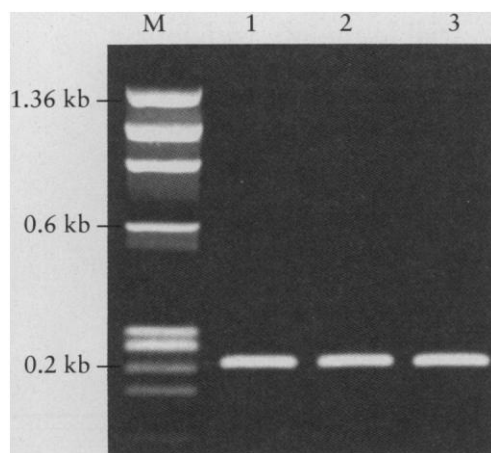


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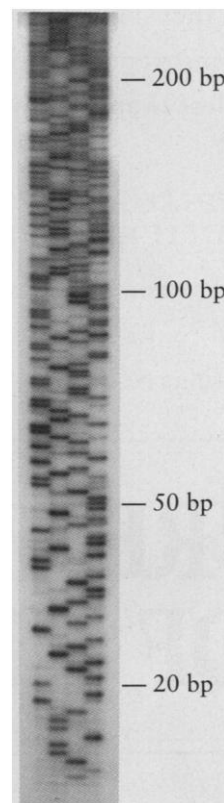
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