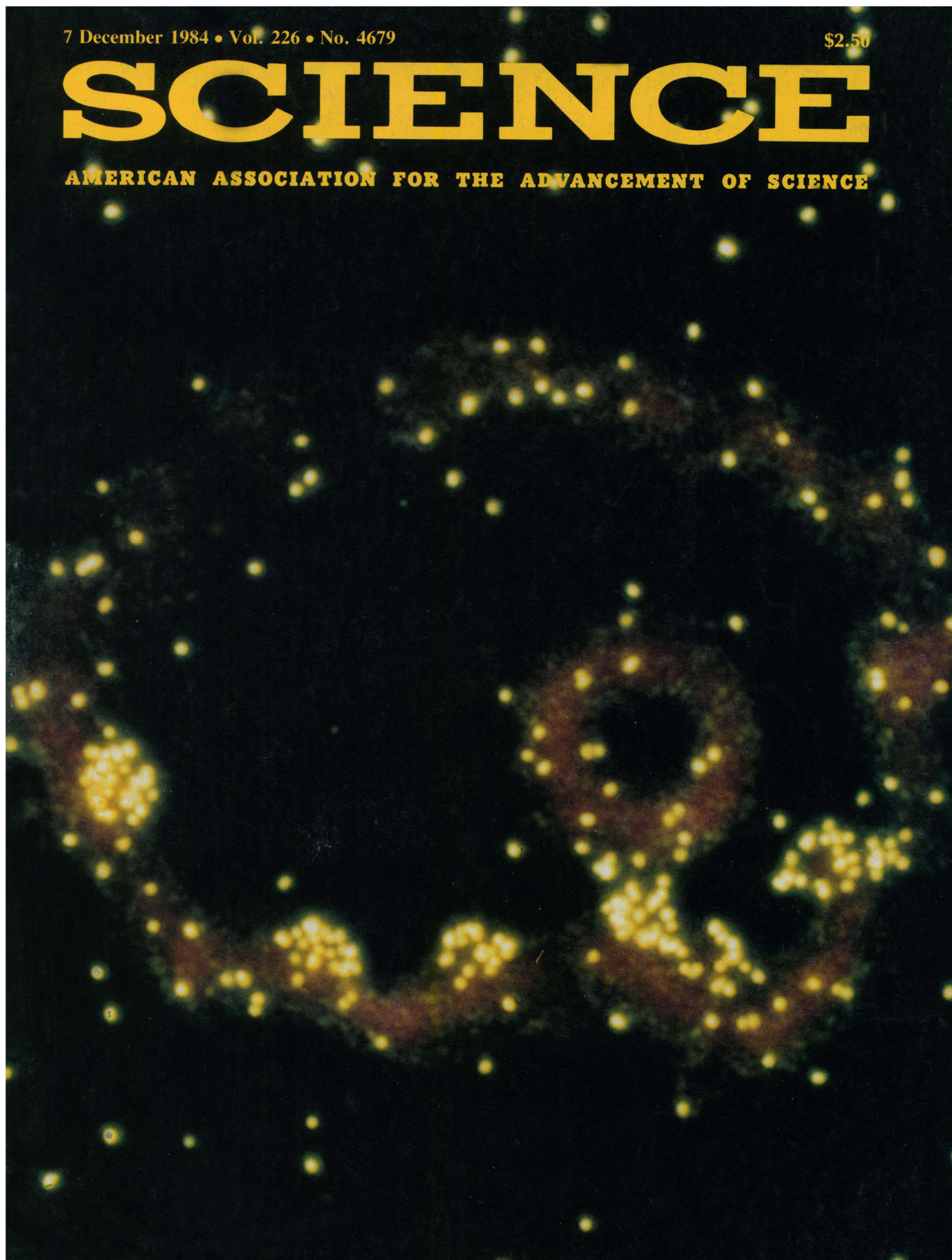


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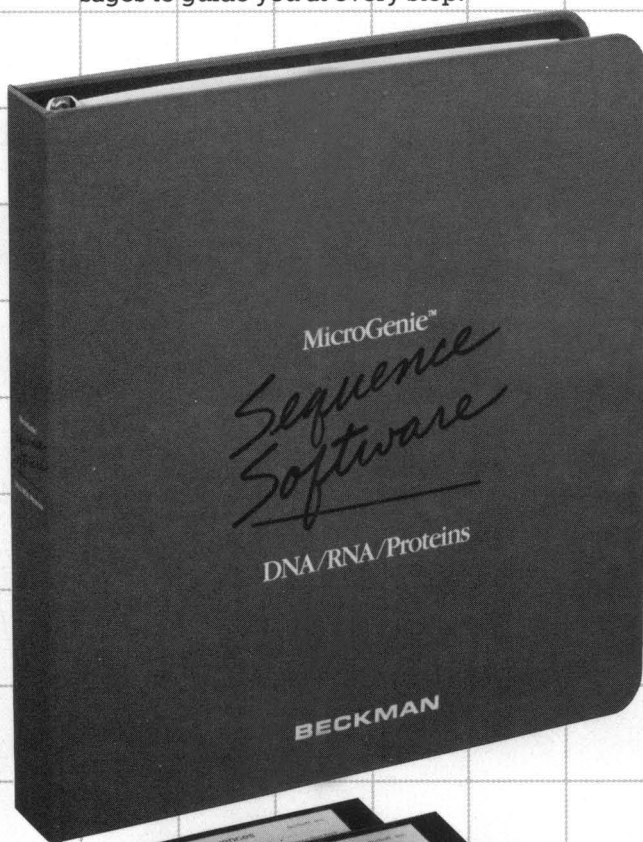
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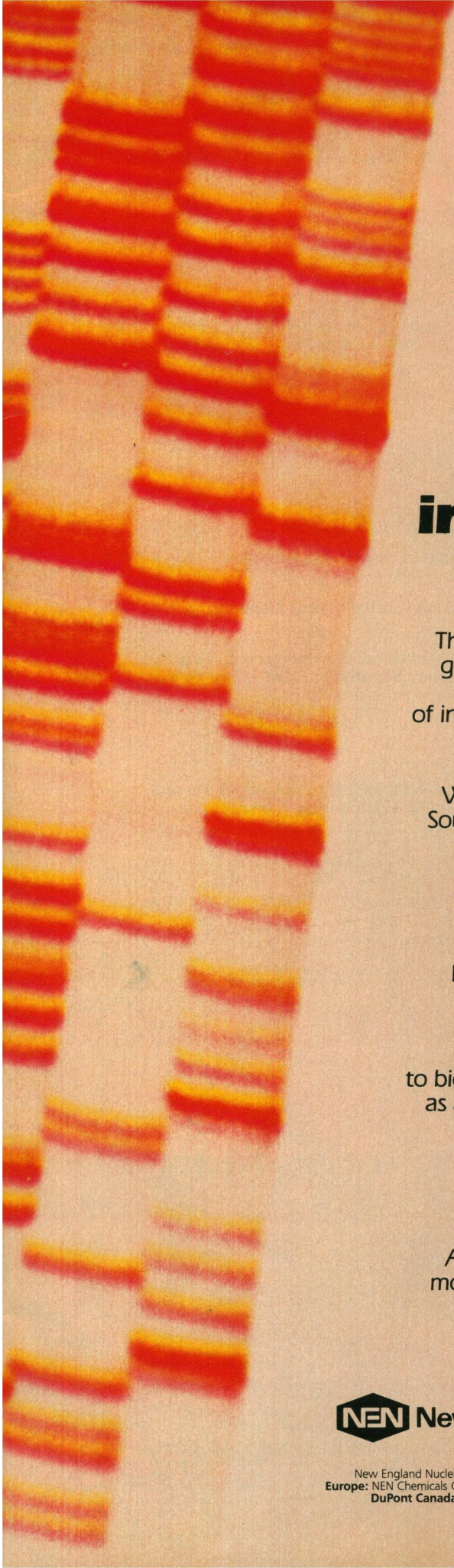


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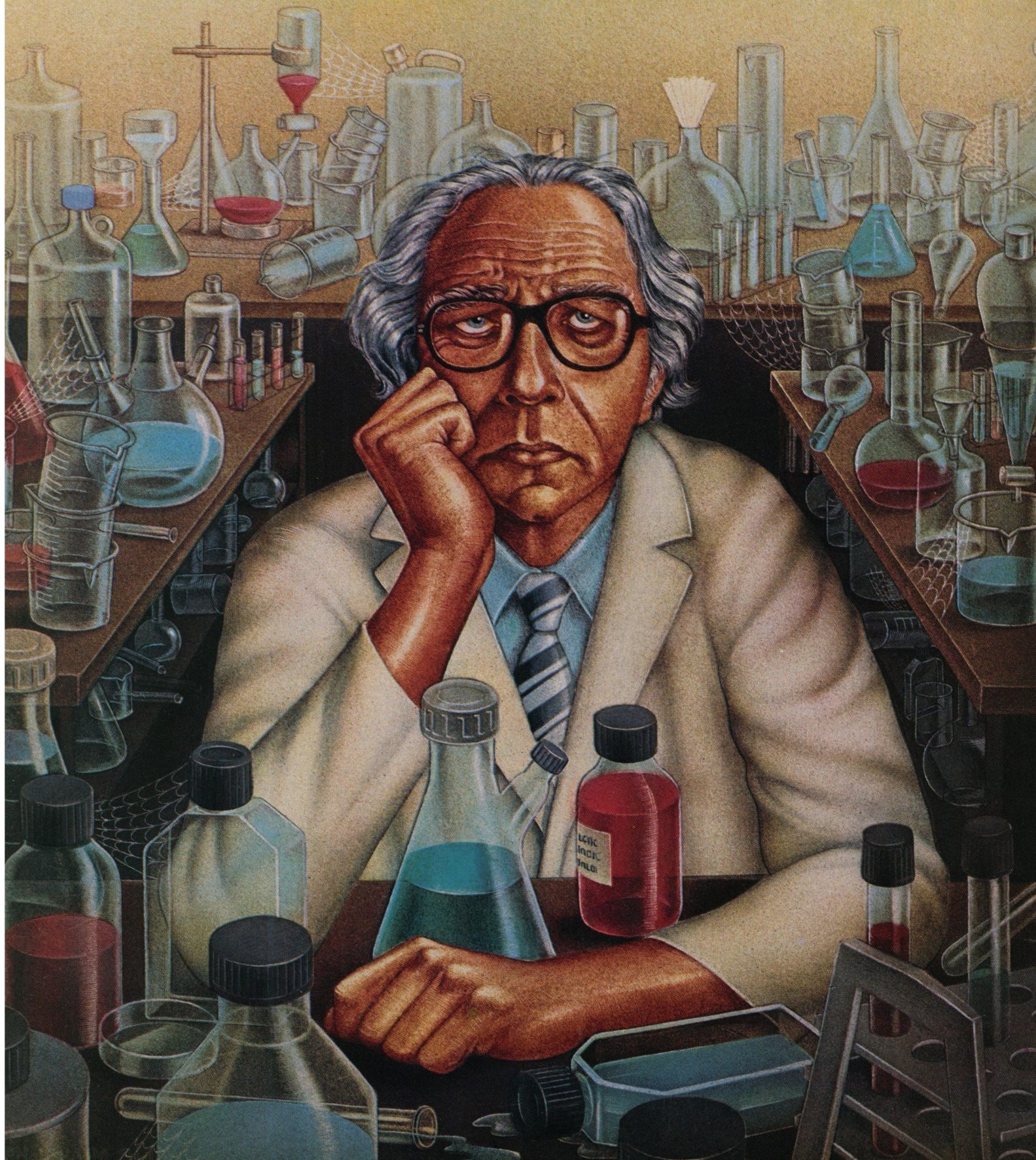
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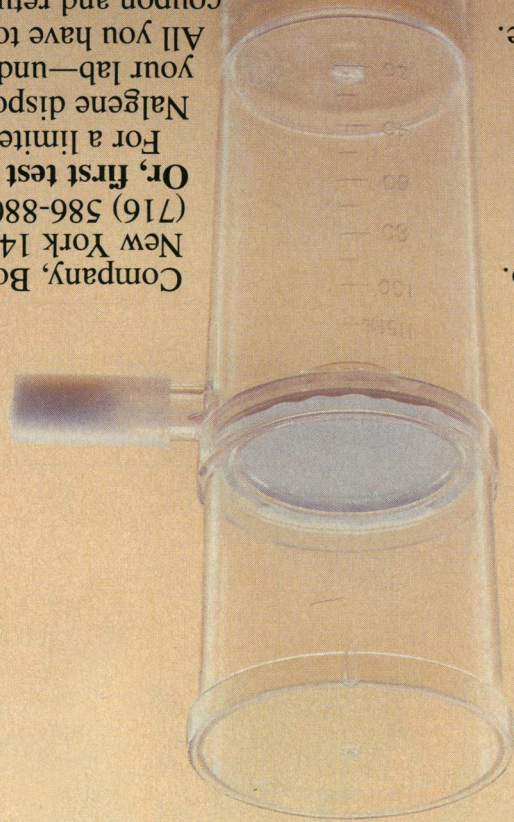
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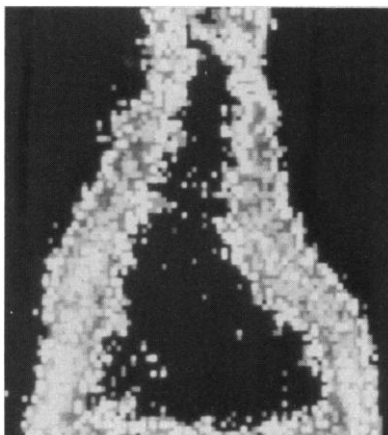
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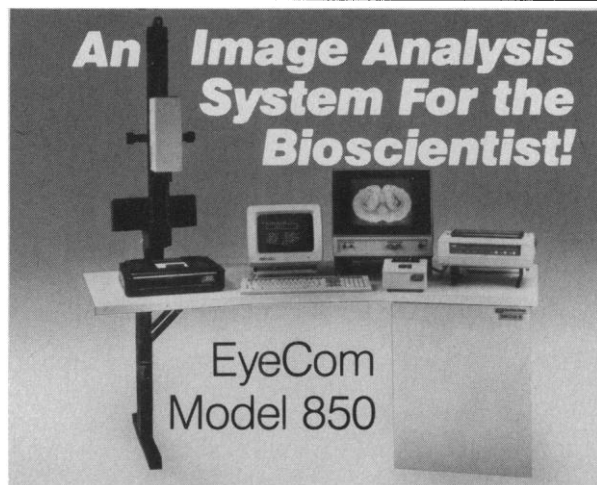
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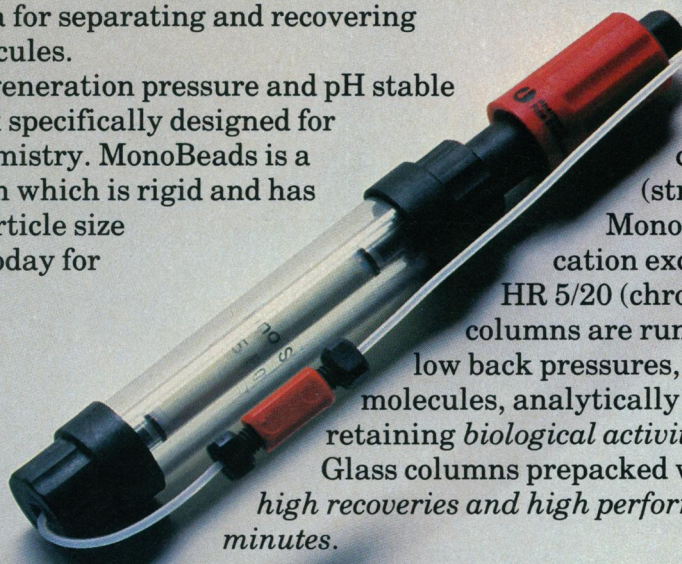
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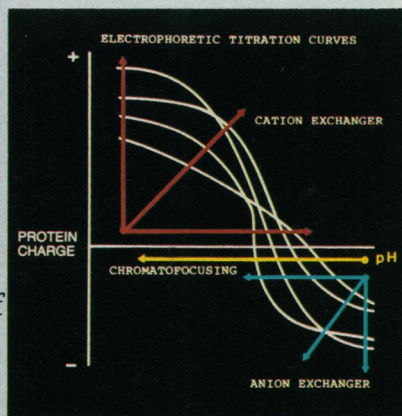


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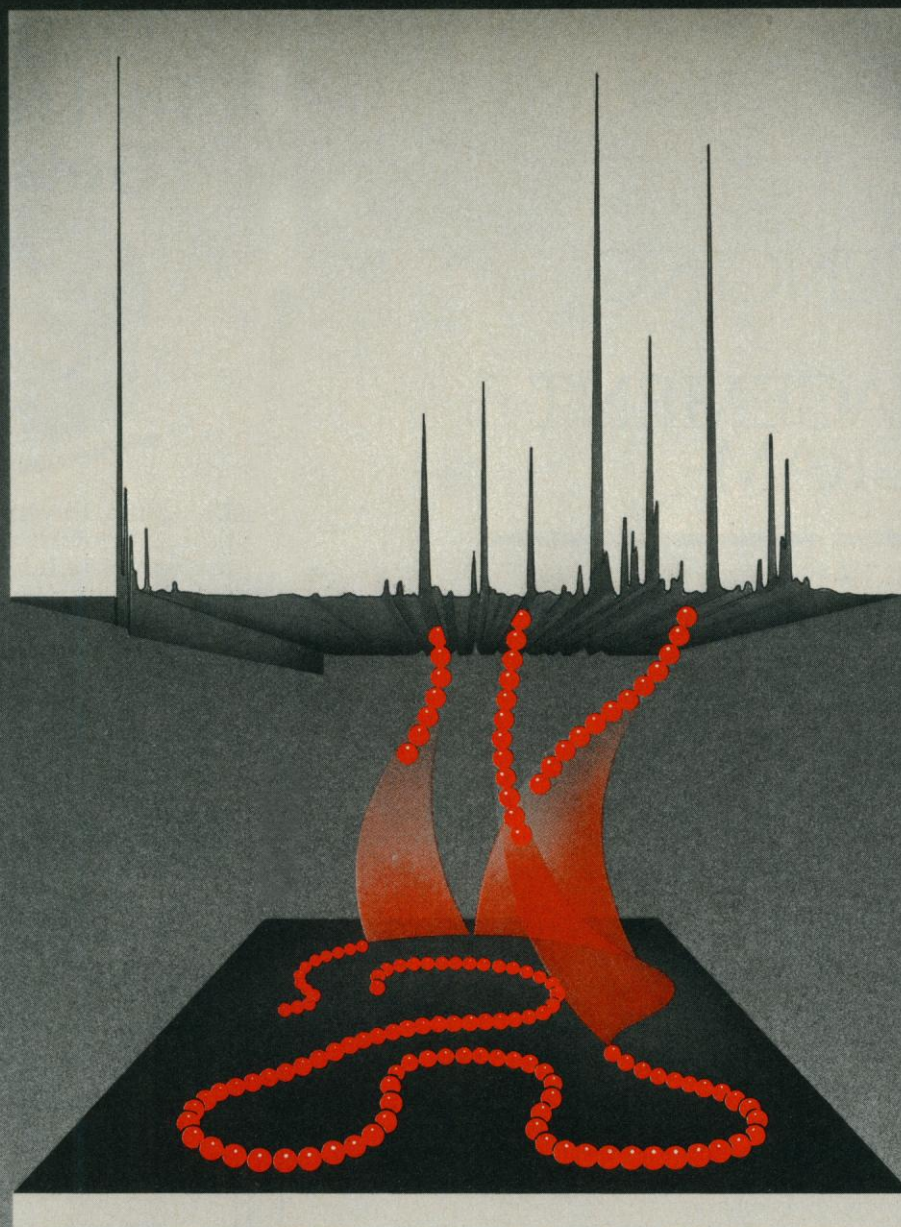
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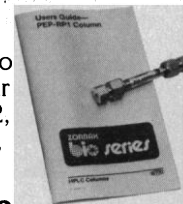
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              126 203          325 390 403          515 592
1  -----
      <-----PDX4----->
      >-----PDX3----->
      >-----PDX5'----->
      <-----PDX8'----->
>-----PDX21-----<-----PDX7-----<
      <-----PDX16----->
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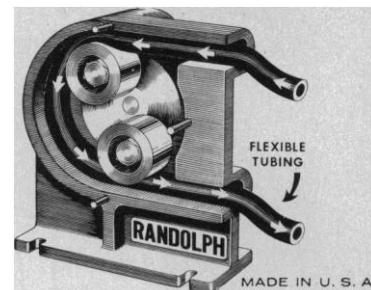
Name	Base	Sequence
33'	213	CGGGCCTCT? GCGGGATATA GTCCATTGGG ACTAGCATCG
58'	1	CGGGATATC GTCCATGCGG ACTAGCATCG CCCAGATGGG AATCGATTAC
42'	51	CGGGCCTCTT GCGGGATA GTCCATTGGG AC?AGMAQCG CCCAGATGGG AATCGPTTAC
6'	24	T3TCGG ACTAGCATCG CCCAGATGGG AATCGATTAC
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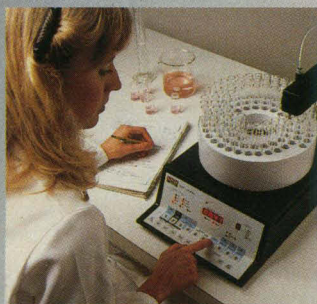
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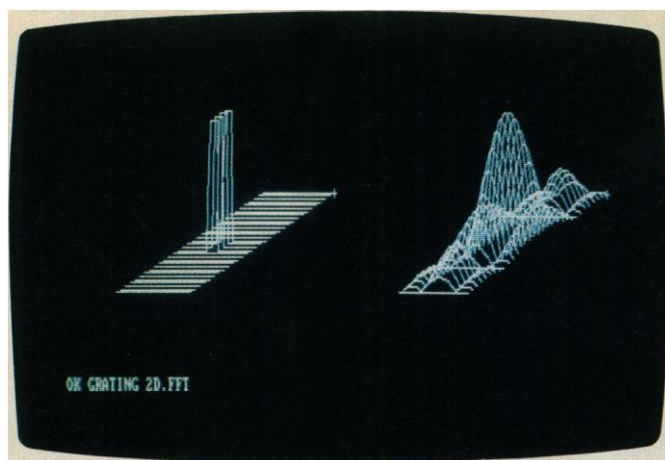


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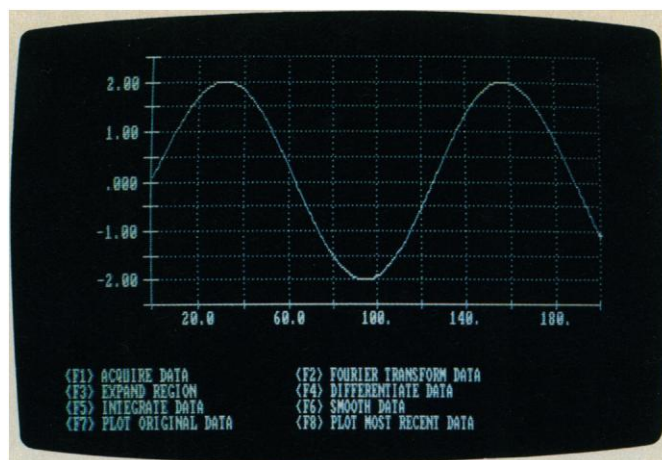
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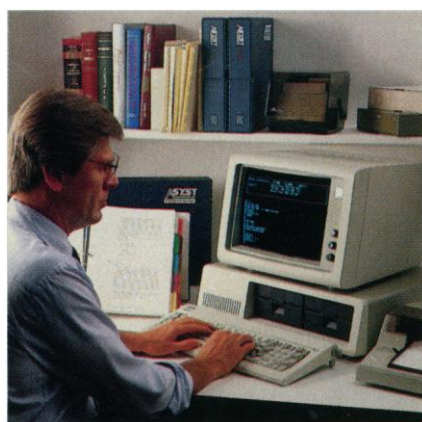
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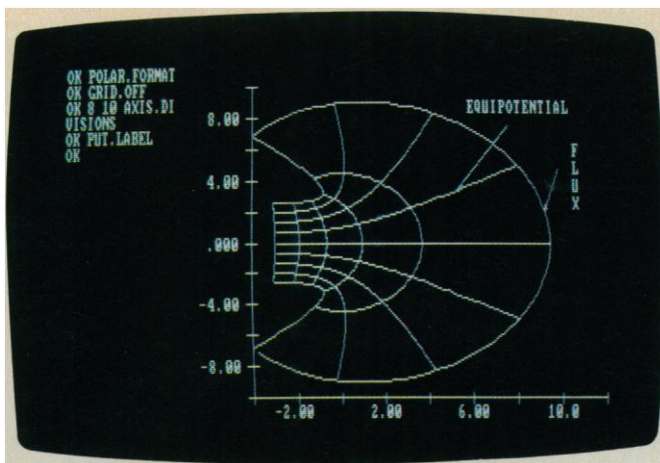
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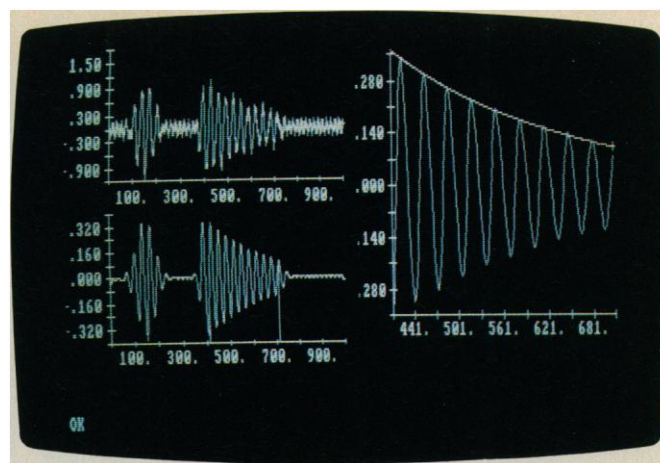
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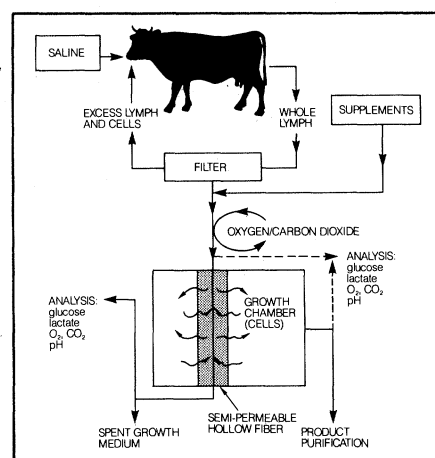
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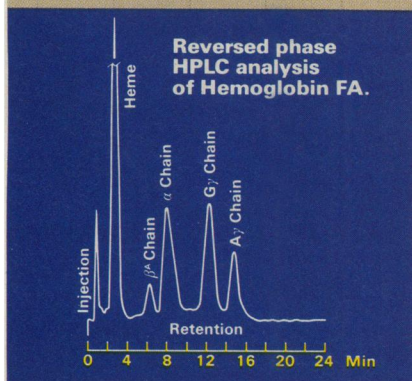
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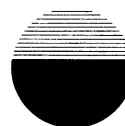
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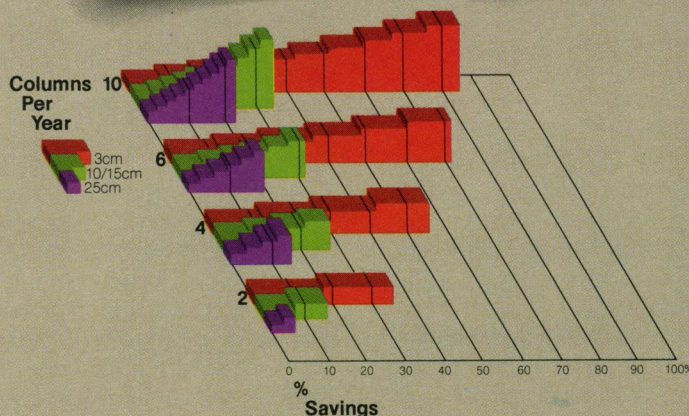
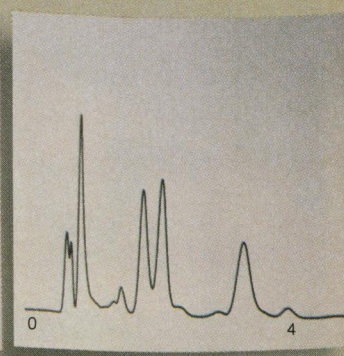
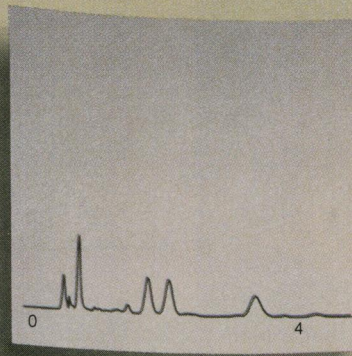
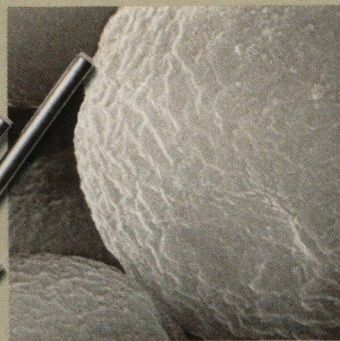
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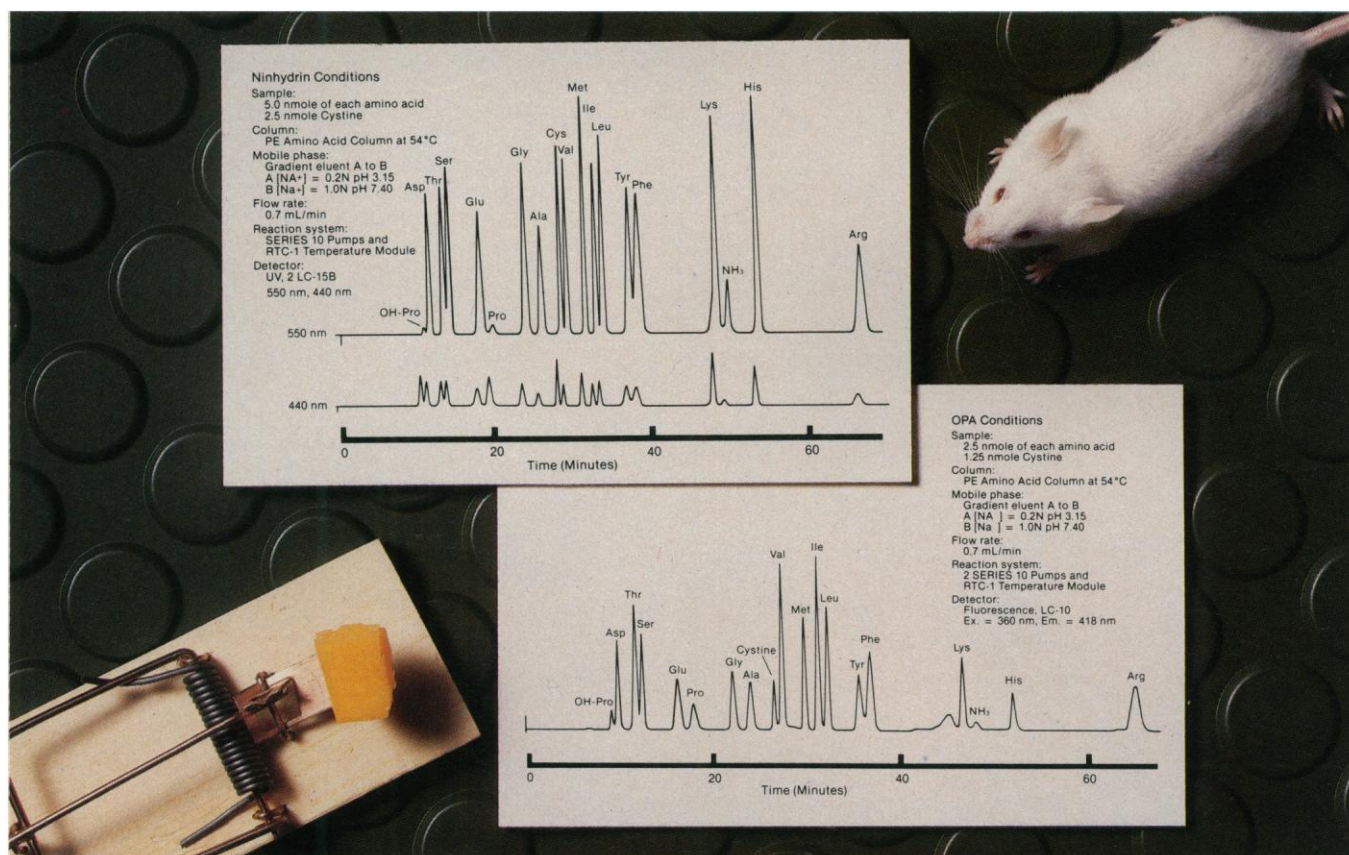
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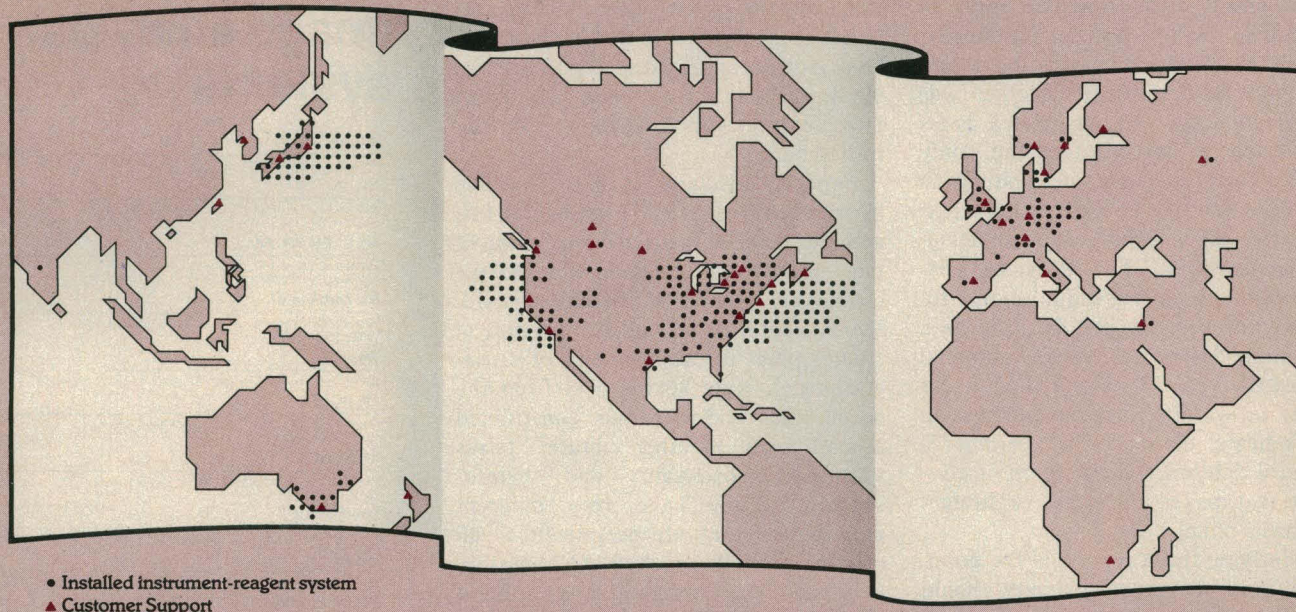
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LETTERS

Values, Research Questions, and the News Media

The recent report by B. A. Gladue, R. Green, and R. E. Hellman (28 Sept., p. 1496) of different neuroendocrine responses in heterosexual men, homosexual men, and heterosexual women was immediate news. An Associated Press (AP) dispatch stressed that the study found "clear evidence of a biological difference between homosexual and heterosexual men . . . that may have developed before birth." The AP quoted Gladue as cautioning that the hormonal response pattern could not be used as a "screening device" to identify potential homosexuals (1). Elsewhere Gladue was quoted as warning that the findings do not indicate there is "a correctable chemical difference in the brain or elsewhere that makes a man gay or straight [emphasis mine]" (2).

Underlying these reports is the popular ideology that homosexuality should be screened out, corrected, or prevented. While researchers studying politically charged topics such as sexual orientation cannot be held responsible for journalists' reactions, we can shape those reactions by carefully framing research questions and explicitly stating alternative explanations of data. Gladue *et al.* may have attempted this, but their report contains subtle value assumptions nonetheless.

By locating their research within the context of pursuing "a biological explanation of homosexuality" and characterizing their findings as inviting "the idea that there may be physiological developmental components in the sexual orientation of some homosexual men," Gladue *et al.* reveal two important assumptions. First, they imply that heterosexuality needs no explanation. Critics of "heterosexual bias" in scientific research point out that trying to explain homosexuality (rather than sexual orientation in general) presumes that heterosexuality is somehow more natural and desirable (3).

Second, focusing exclusively on a biological approach obscures an important alternative interpretation of the data. Gladue and his colleagues scrupulously avoid the conclusion that a particular neuroendocrine response pattern shapes subsequent sexual orientation, but comment that "our findings are not inconsistent with such an interpretation." Other possibilities are not detailed, including that psychological variables may have strongly influenced physiological responses. Because subjects were adults selected on the basis of exclusive homo-

sexual or heterosexual behavior patterns, their biological responses may have been more a consequence of their professed sexual orientation than antecedent to it. Since the role of psychological factors in physiological processes (for example, psychogenic illnesses and placebo effects) is not well understood, laypersons reading press reports of the study might not have been led to this interpretation without guidance from the researchers.

Explicit consideration of all plausible hypotheses is especially important in this area because the relative contribution of biological and cultural factors to what we call sexual orientation remains obscure. Recent anthropological and historical studies point to the necessity of distinguishing discrete sexual acts from the social roles and identities constructed around them. In other cultures, terms such as "homosexuality" and "heterosexuality" may have very different meanings, if they are meaningful at all (4). Studies in this society of "homosexuals" and "heterosexuals" tap cultural identities, individual preferences, and specific behaviors. Which of these can be explained with biological data remains unclear.

As long as the status of homosexual persons in the United States remains a politically charged topic, the very framing of a scientific research question on sexual orientation will elicit value-laden coverage from the news media. Researchers studying human sexuality, therefore, should take care to avoid reinforcing popular prejudice against lesbians and gay men.

GREGORY M. HEREK

Department of Psychology,
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References and Notes

1. San Francisco *Chronicle*, 21 September 1984, p. 1; Seattle *Times*, 21 September 1984, p. A13.
2. J. Brody, *New York Times*, 21 September 1984, p. A16.
3. S. Morin, *Am. Psychol.* **32**, 629 (1977).
4. G. M. Herek, *J. Homosexual.* **10**, 2 (1984).

Some readers, generally uninformed about our research, may (on the basis of a few press reports and without a careful reading of our scientific report) draw erroneous conclusions about the scientific scope of our research and our motives and values. Herek's letter, in which he tends to highlight some facts and ignore others, exemplifies this problem.

We do not agree with Herek's characterization of the research as looking for the "explanation" of homosexuality and ignoring that of heterosexuality. Two of our three study groups were heterosexual, and each of the groups we studied

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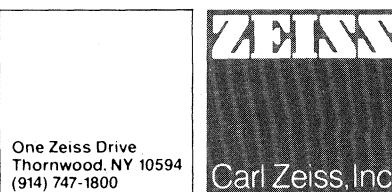
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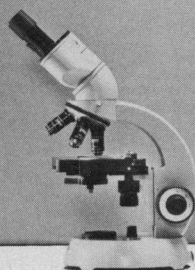
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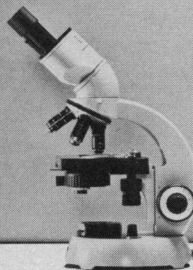


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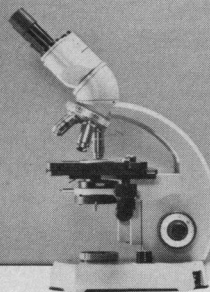


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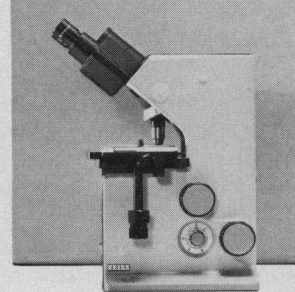


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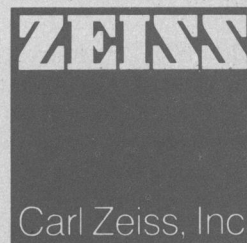
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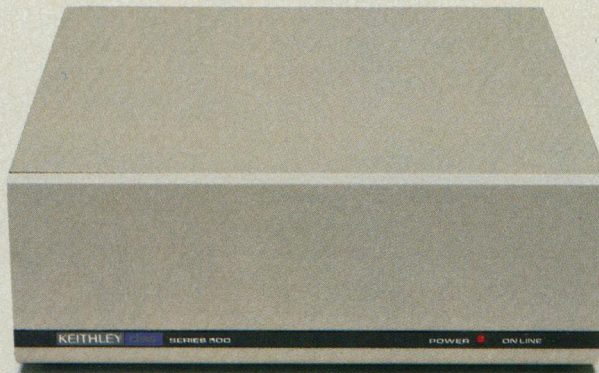
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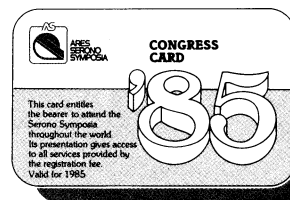
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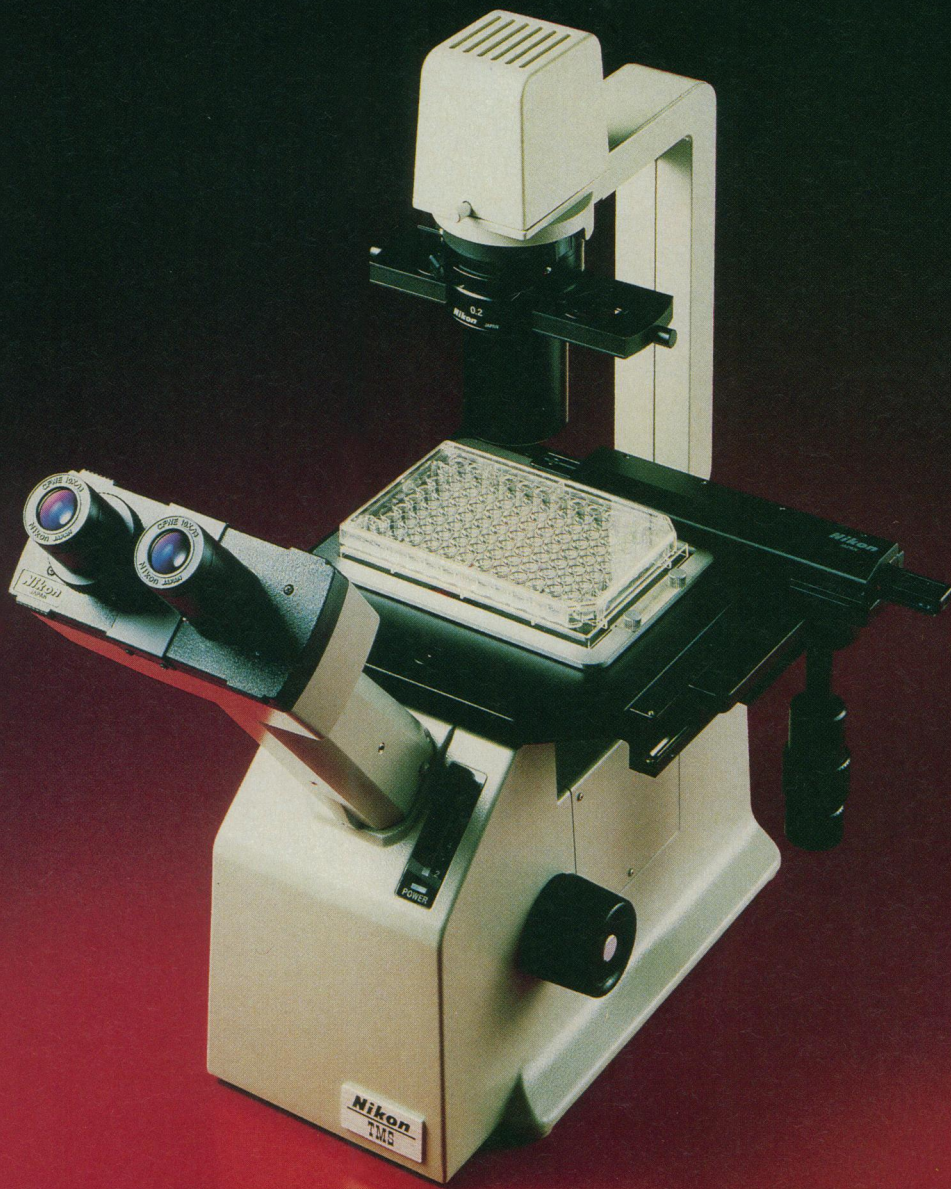
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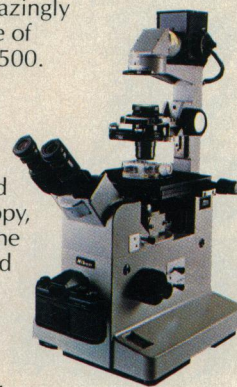


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Science in Perspective

On three occasions in the fall of 1984, and on two continents, scientists and scholars are assembling to pay centennial tribute to the vision of George Sarton (1884–1956). Sarton's life was devoted to an idea—that the history of science should be an organized field of learning, central to our culture. Attention to Sarton salutes a faithful pioneer. It also does more. It underlines the bubbling energy of the history of science in our day, and its growing importance for teaching, research, and policy.

The scientific enterprise has increased greatly in size, complexity, and diversity in the decades since Hiroshima. Change is the norm in areas as varied as the financing of science, policy for science, instrumentation, the links of technology and science, the education of scientists, and the public understanding of science. This listing is fragmentary, but underlines the need for perspective. We need to see science steadily and see it whole. And here history helps us, whether we are scientists, scholars, or policy-makers.

A partial inventory of institutes, projects, and publications suggests the multiplicity of roles that the history of science can perform. Scientific and technical societies have taken an important lead. The Center for History of Physics which the American Institute of Physics organized in 1965 has been followed by upwards of a dozen history centers for subjects from chemistry (American Chemical Society and American Institute of Chemical Engineers, together), through information processing (American Federation of Information Processing Societies), to microbiology (American Society for Microbiology). These centers encourage teamwork in conducting oral histories, in subduing the vast archival resources of 20th-century science, and in preparing exhibits and other materials to educate the citizen and the student. Teamwork also characterizes research on subjects from the early years of Los Alamos to the development of the laser, and from the creation of polymer science and technology in the 1920's and 1930's to the story of the (still unfinished) space telescope. More familiar in style are the American teams which are editing the papers of Joseph Henry, of Thomas Edison, of Charles Darwin, and of Albert Einstein.

Industrial companies have not been slow to perceive the significance of history for public understanding and for corporate culture alike. General Electric has had a (prizewinning) historian of science on its staff for almost a decade. Du Pont is sponsoring a major analysis of its patterns of research and development, and the Rohm and Haas Company is marking its first 75 years with a scholarly history. Perhaps the most striking testimony to the desire for perspective comes from the more popular press. The November issue of *Science* 84 is devoted to "20 Discoveries That Changed the World," while in October the *New Yorker* began its serialization of "Annals of Eugenics" by Daniel J. Kevles, a noted historian of science.

This swelling tide of documentation, scholarship, and popular writing has been matched by the development of new intellectual concepts, new teaching contexts, and new professional forums. Thomas S. Kuhn's "paradigms" and "normal science" have eroded forever the credibility of older stereotypes. In pedagogy, the technologically oriented universities stand out, as witness Virginia Tech's Center for the Study of Science in Society, RPI's commitment to Science and Technology Studies, and Stanford's focus on Values, Technology, Science and Society. A resurgent History of Science Society has seen a membership increase of 50 percent in the past 5 years and HSS has been joined by such vigorous siblings as the Society for History of Technology and the Society for Social Studies of Science.

George Sarton's vision has its reward in today's flourishing community of historians of science. The challenge is to nourish and extend these humanities of science, as the pace of scientific and technological change quickens. Only then will we all—scientist and citizen alike—be able to see science in perspective.—ARNOLD THACKRAY, *Department of History and Sociology of Science, University of Pennsylvania, Philadelphia 19104*

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