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\*Mardis, E.R., Roe, B.A. Automated methods for single-stranded DNA isolation and dideoxynucleotide DNA sequencing reactions on a robotic workstation. *BioTechniques* 7, 840-850 (1989)

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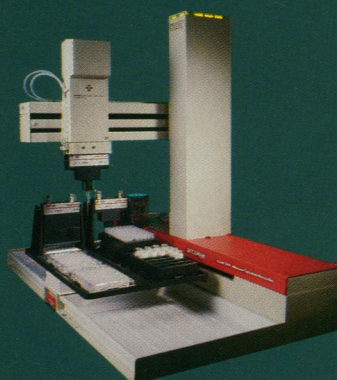


Figure 1



Figure 2

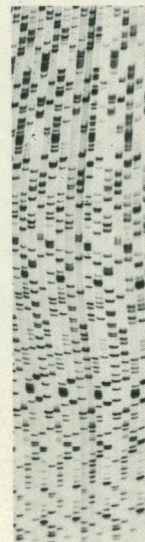
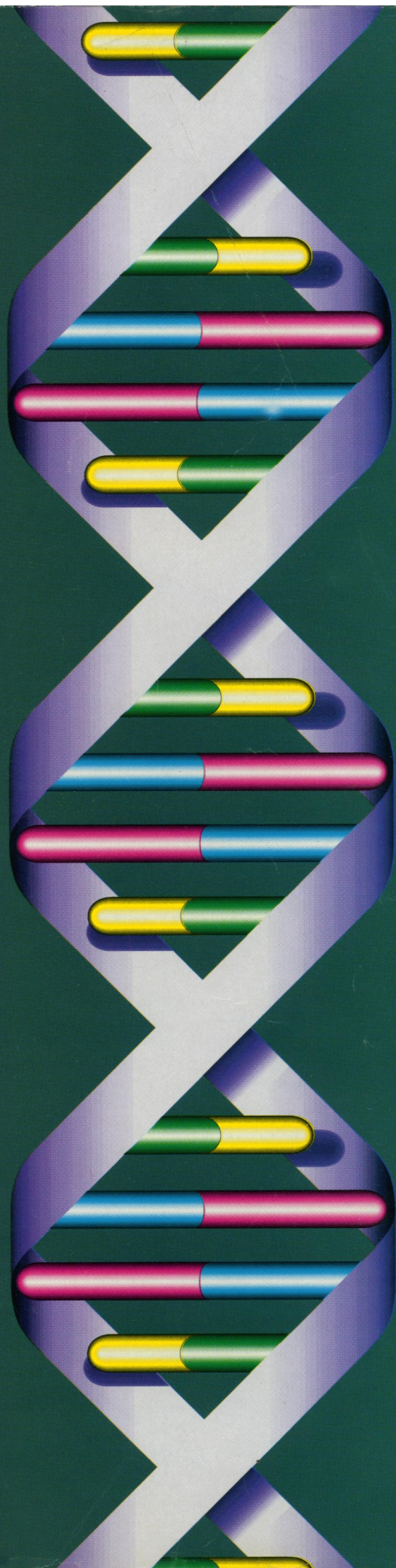


Figure 1. Autoradiogram of sequence analyses accomplished on the Biomek 1000 using GemSeq K/RT double-stranded DNA sequencing system and Riboprobe Gemini pGEM-3 vector, containing an insert of a known cDNA.

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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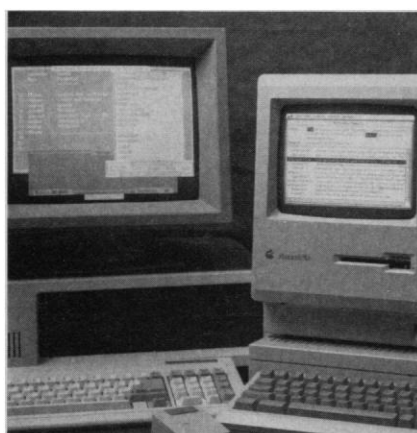
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**COVER** The dorid nudibranch *Hexabranchus flaveomarginatus* deposits its brightly colored egg masses as fluted ribbons on rocky substrates in underwater lava tubes. Their beautiful appearance coupled with their ability to avoid predation prompted research on the chemical constituents that are responsible for the survival of the eggs. These constituents were discovered to be macrolides that have antifungal activity. See page 173. [Photograph by Scott Johnson]

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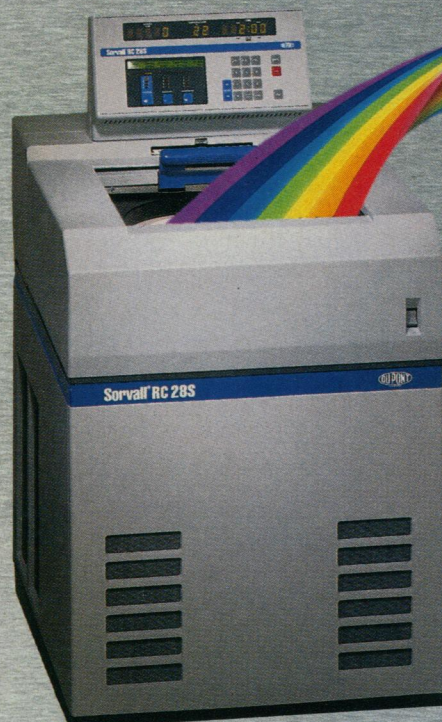
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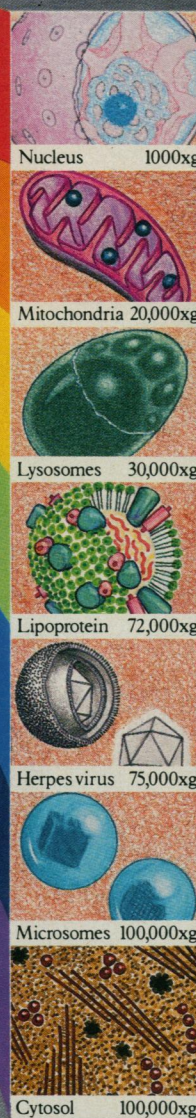
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## This Week in SCIENCE

### Hubble in space

THE launch date for the space shuttle Discovery is late April; the shuttle's payload includes the \$1.5-billion Hubble Space Telescope. Since the mid-1970s plans have been in the works for this telescope, which, in an orbit hundreds of miles above the earth, is set to scan the universe for some 15 years. The Space Telescope will be making many targeted observations, but it will also dwell for long periods on random fields that contain no previously identified objects of special interest. Bahcall *et al.* have made a number of predictions, using ground-based telescopic observations and simulations, about what the Space Telescope will find during its first year of operation (page 178). New data on shapes, sizes, contents, and brightness distributions of already identified faint galaxies are expected; new stars and faint quasars should be discovered and their colors and types identified. Whether brown dwarfs—faint stars not massive enough for nuclear fusion—can account for the universe's "missing mass" should also be determinable.

### Genes of behavior

TWIN, relative, and adoptee studies in humans and selection and inbreeding experiments in animals have shown that few behaviors are controlled by single genes; instead, behaviors are often affected by several genes that in some, but not all, cases may be additive (page 183). In addition, behavior is also a reflection of nongenetic factors. Thus, although the nature-versus-nurture debate may be moot because both affect behavior, the weight that each exerts over behavior remains an important and interesting issue. Behavioral studies have addressed IQ, learning disabilities, and other aspects of cognition, features of personality such as neuroticism and extroversion, and schizophrenia, affective disorders, and other psychiatric diseases. Plomin is optimistic that some tools of molecular biology may be adequate for locating genetic "needles in haystacks" but

stresses that others (such as linkage analyses) will not. Identifying genes that affect behavior will be crucial both for understanding "normal" features of behavior and for dealing with dysfunctional ones.

### Forest losses

RAIN forest in Madagascar is disappearing, and the island may never be properly reforested. Most of Madagascar's deforestation has occurred where population density is the highest and where the topography is the flattest. The pattern has been tracked with aerial photographs of vegetation taken in 1950 and with Landsat images from the 1970s and 1980s (page 212). By 1985, only half the rain forest that was present in 1950 was still in existence. Most of the forest was cleared to provide food and fuel for the 11.6 million people who live on the island; there is little commercial timbering. Thus, stopping deforestation requires new solutions to filling the subsistence needs of the local people. Madagascar has rich plant and animal population diversity (there are, for example, an estimated 8000 indigenous plant species); therefore, loss of rain forest is a major threat to species diversity, and many extinctions have already occurred. Green and Sussman point out that the decades of Landsat images available for much of the earth can provide valuable baseline and follow-up information about deforestation in other regions of the world as well.

### Ants, plants, and beetles

IN Costa Rican rain forests, *Piper* plants are typically inhabited by ants (*Pheidole bicornis*); the ants hollow out stems and leaves, making for themselves a series of living chambers inside the plant (page 215). The relationship is mutually beneficial: the ants supply nutrients—grass and gases—to the plants and keep other herbivores and vines at bay; the plants, in response to the presence of ants, produce "food bodies" (cells engorged with lipid and

protein) to nourish the ants. In the Carara Biological Reserve Letourneau has discovered unusual *Piper* plants that lack ants but still make food bodies; the ant-free plants are inhabited by the larvae of beetles (*Phyllobaenus*), which are common natural predators of adult ants and their brood. The beetle larvae had broken the "code" by which ants induce food body production and had induced the food bodies directly. Unlike ants, the beetles did not protect plants from other herbivores, and damage appeared excessive. Although other examples are known in which a parasite preys on a mutualist pair, this is different because the parasite does not use mimicry to achieve its ends.

### Maternal-fetal compatibility

FETUSES, like grafted organs and tissues, are not "self" but foreign, yet normally gestation goes on unperturbed and the fetus in utero is not rejected by its host. A number of hypotheses have been put forward to explain this phenomenon—the fetus may not express foreign antigens, the maternal immune response to foreignness may be suppressed—but the basis for fetal survival remains a puzzle. One antigen that might be involved in the maternal-fetal interaction is a class I histocompatibility antigen called HLA-G (page 220). This antigen was found on placental cells (called trophoblasts) and on tumor cells of trophoblast origin. HLA-G was expressed in the first trimester and became less prominent by the third trimester. The HLA-G antigens in all samples studied were identical, suggesting that HLA-G is not, like other HLA antigens, polymorphic; therefore, there would be no immunologic basis for rejecting tissues that expressed this antigen. Kovats *et al.* propose several functional roles for HLA-G in the developing fetus. Identification of this unusual HLA antigen provides a target protein (and gene) for evaluating and understanding why pregnancy succeeds and why in some instances (certain types of infertility) it may fail.

■ RUTH LEVY GUYER



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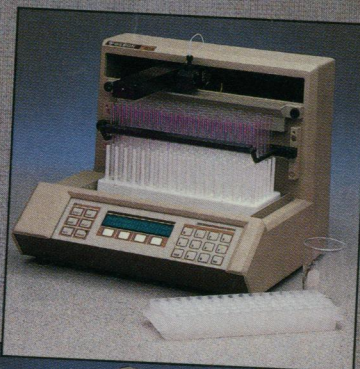
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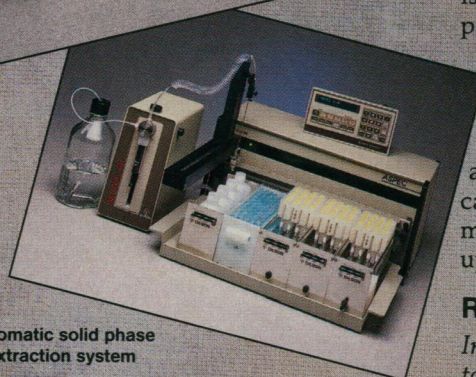
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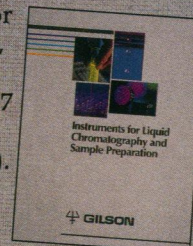
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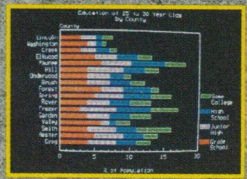
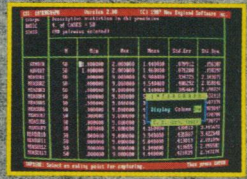
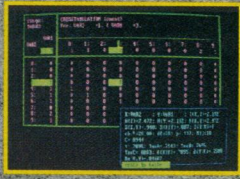
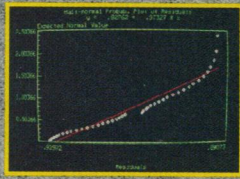
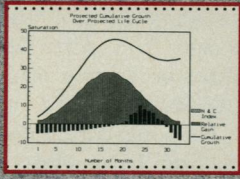
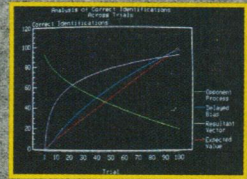
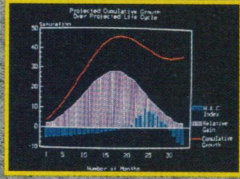
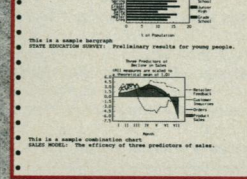
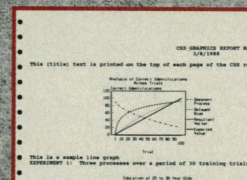
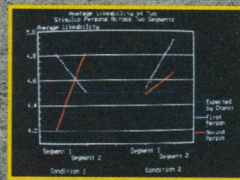
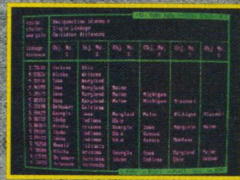
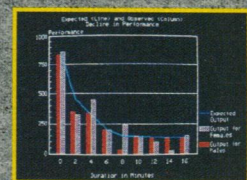
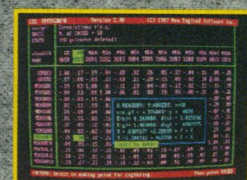
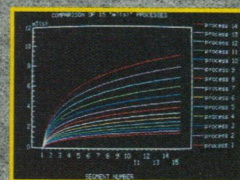
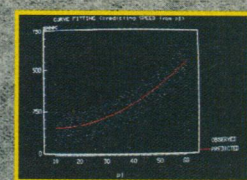
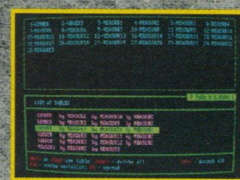
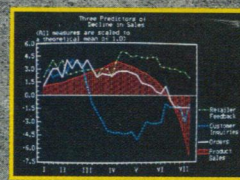


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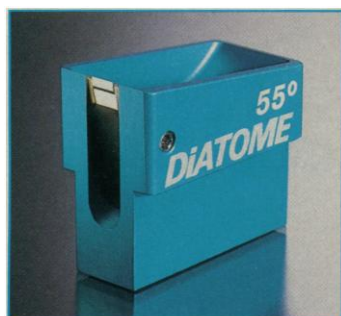
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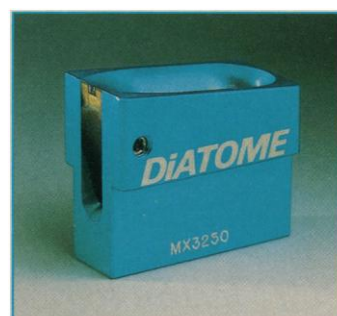
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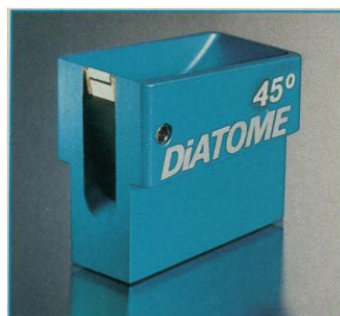
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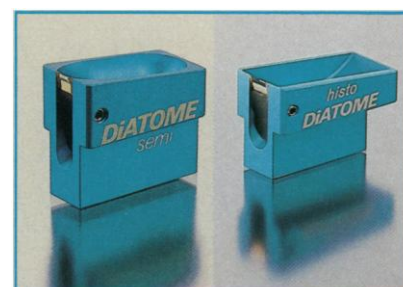
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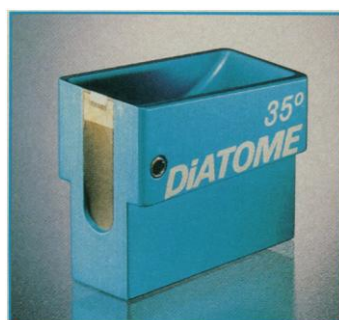
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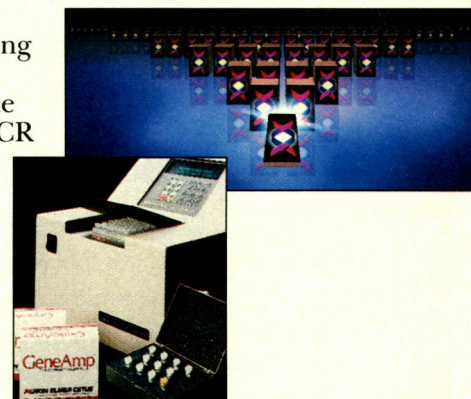
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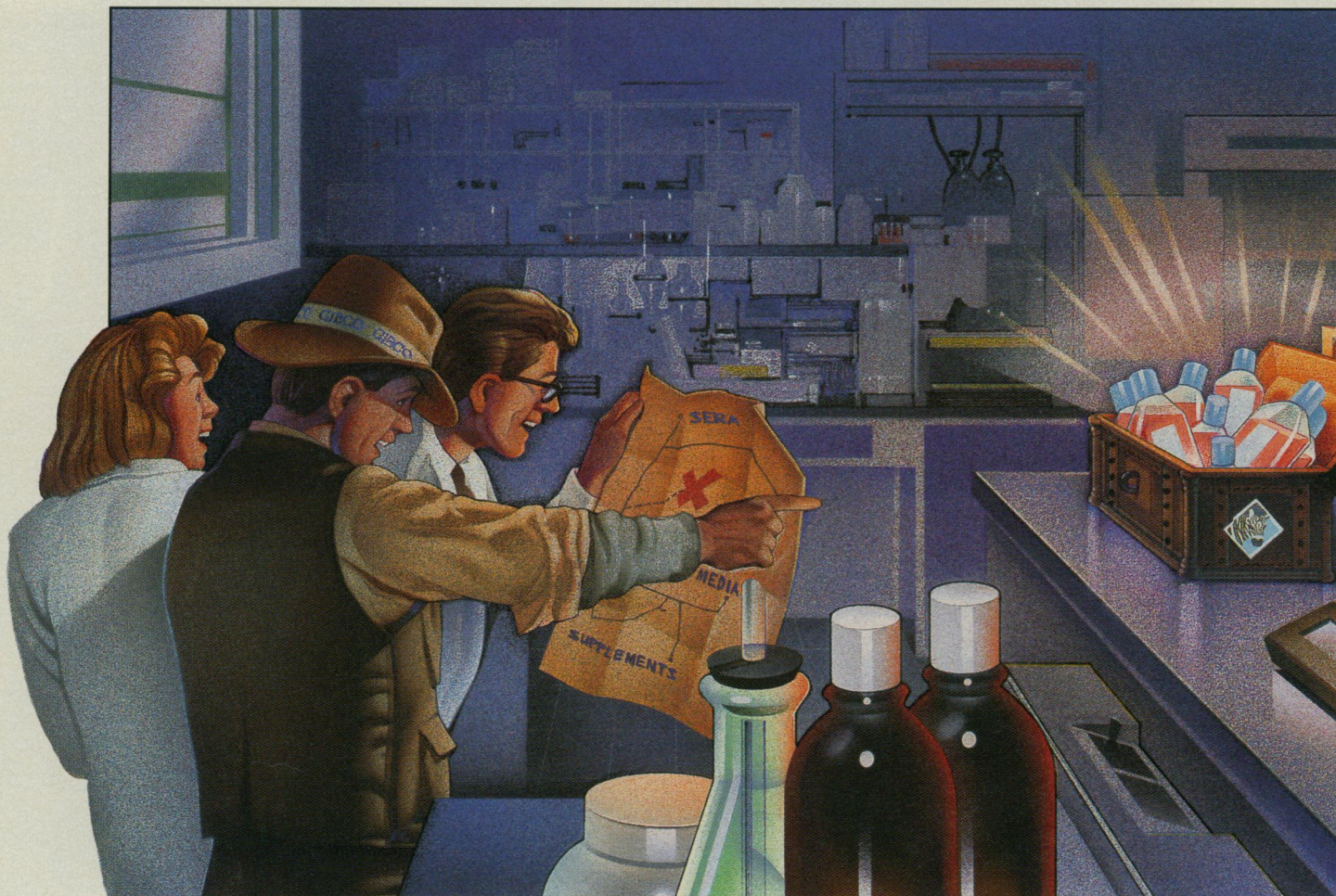
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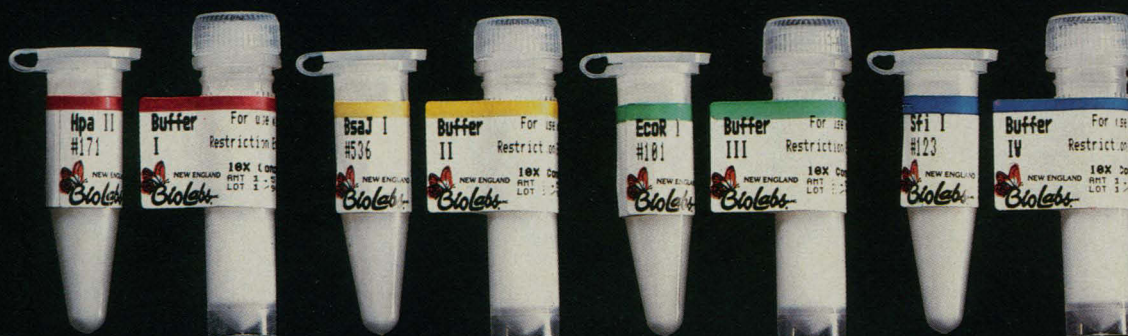
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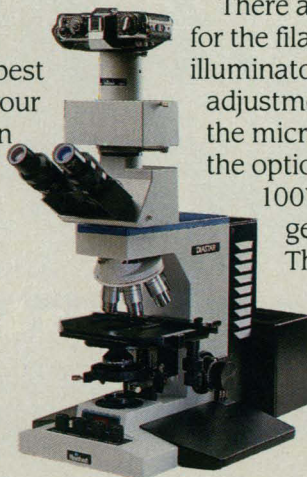


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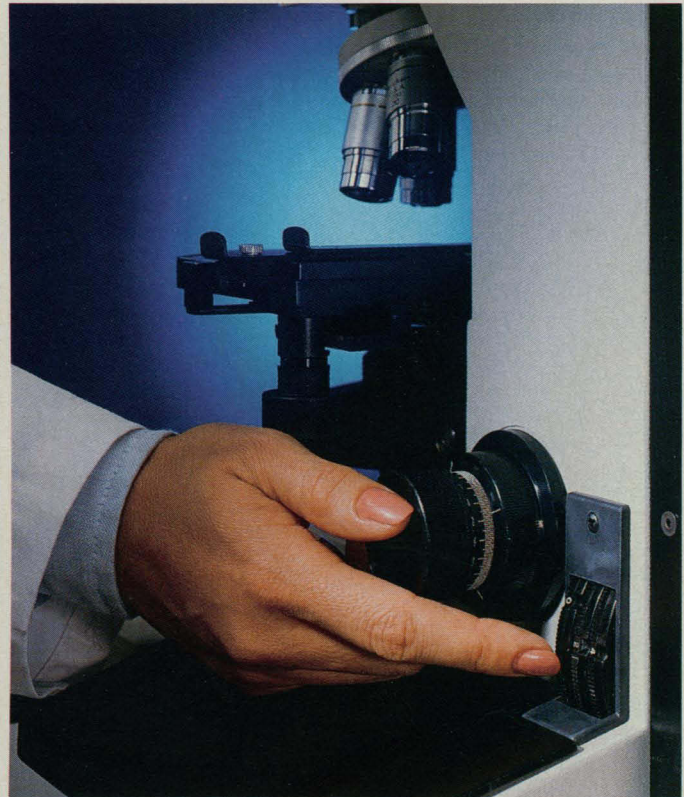
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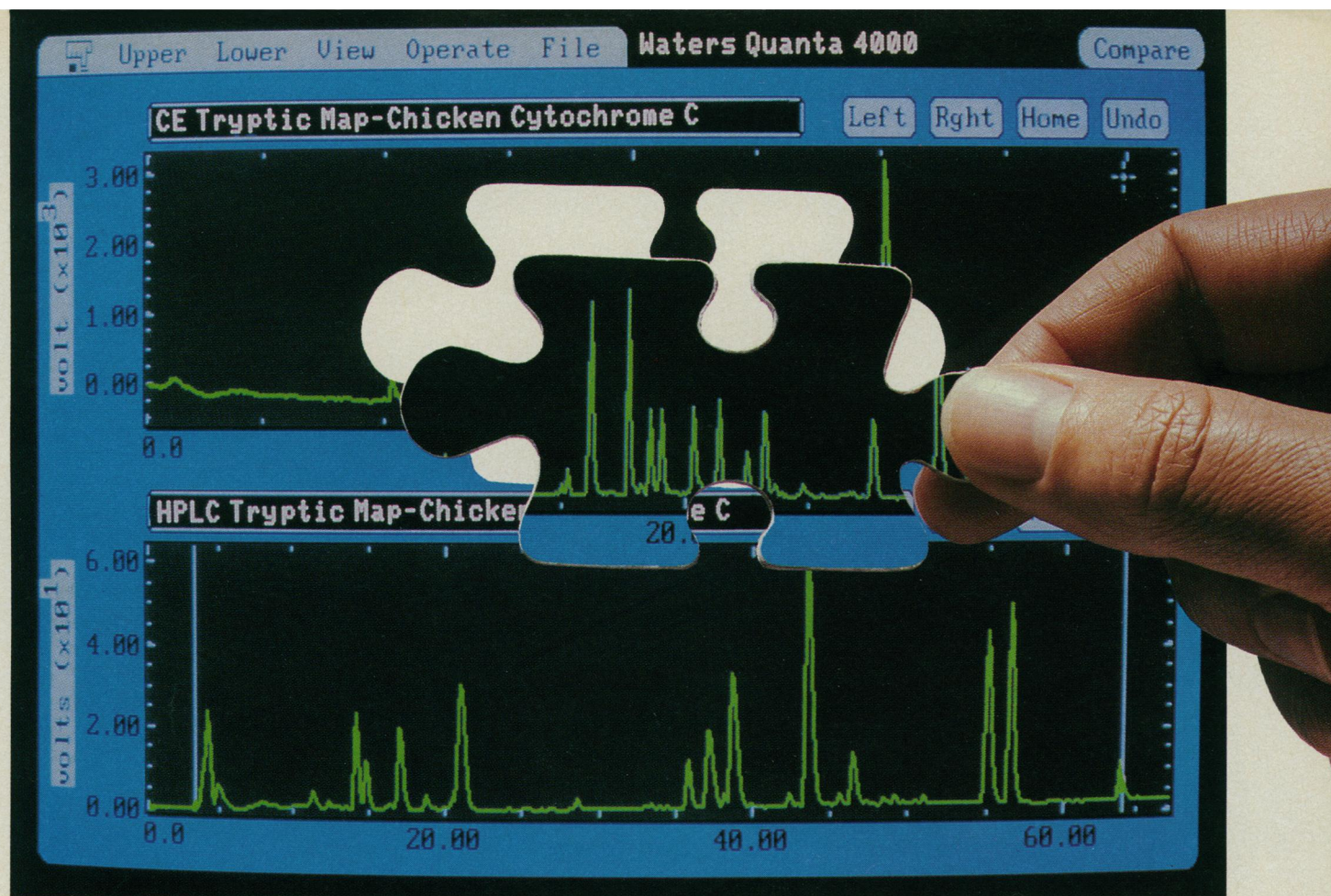
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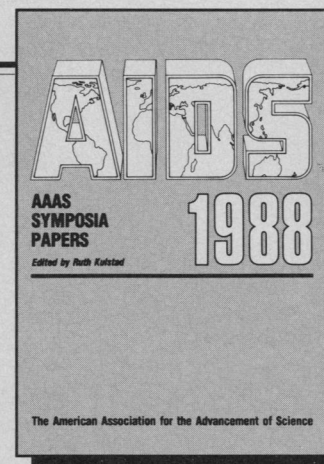
patterns of HIV-1 incubation, infectiousness, and transmission; and approaches to demographic impact modeling.

Section two discusses the social consequences of AIDS as they relate to gender, intravenous drug users, and public policy, and it examines the dilemmas that AIDS presents to the medical community.

The third section focuses on the AIDS prevention strategies currently employed around the world.

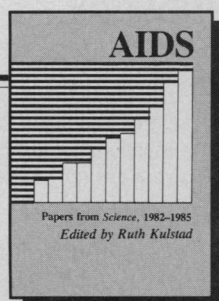
Section four considers the economic, political, ethical and legal issues surrounding the epidemic.

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**AIDS 1988** is a timely, authoritative source of information on the growing body of AIDS research being conducted around the world. It is essential for medical, biological, social, and behavioral scientists, and for everyone who is professionally or personally concerned about the AIDS epidemic.

1988; 478 pp.; softcover  
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*Edited by Ruth Kulstad*

This collection includes frequently cited research papers and news reports on AIDS that were published in *Science* between August 1982 and September 1985.

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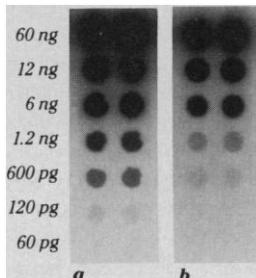
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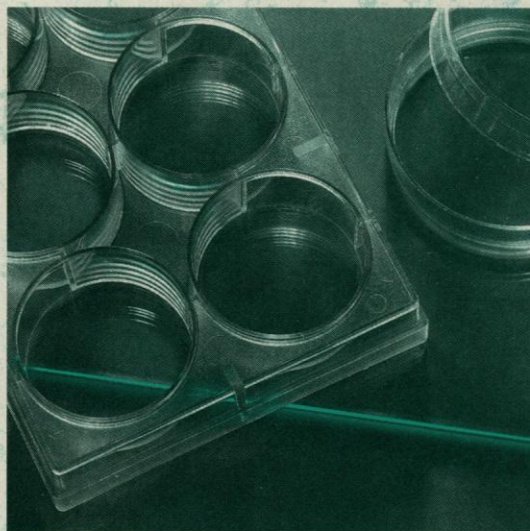
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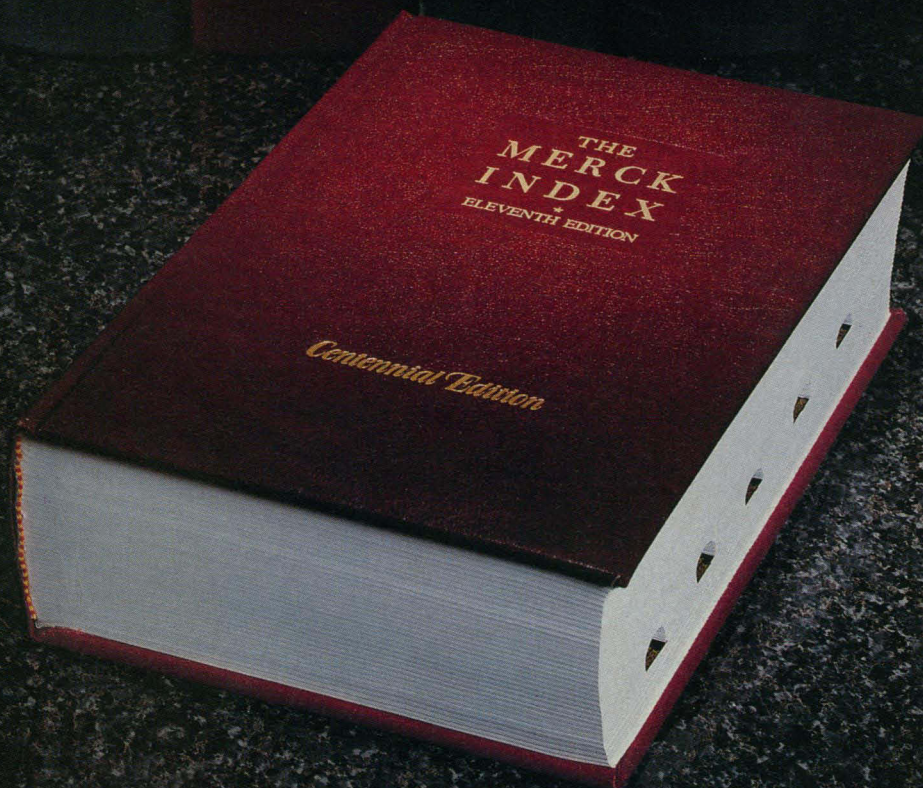
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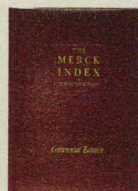


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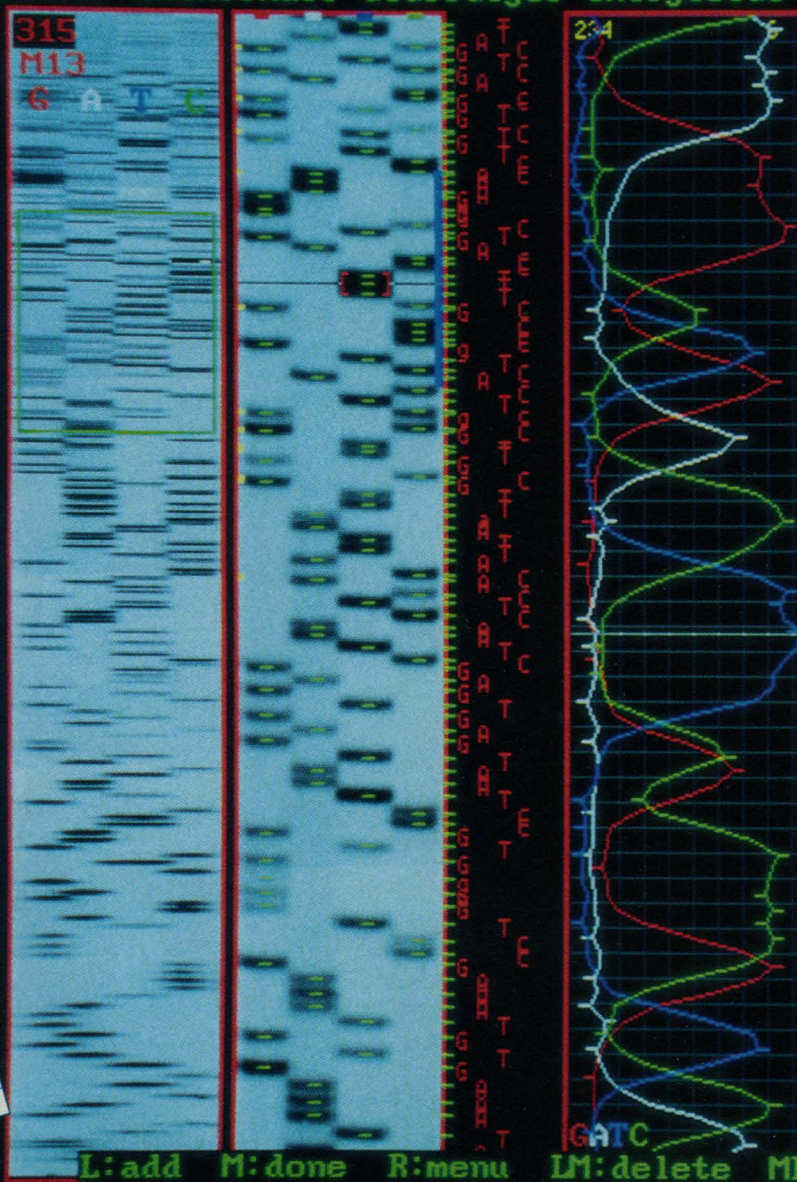
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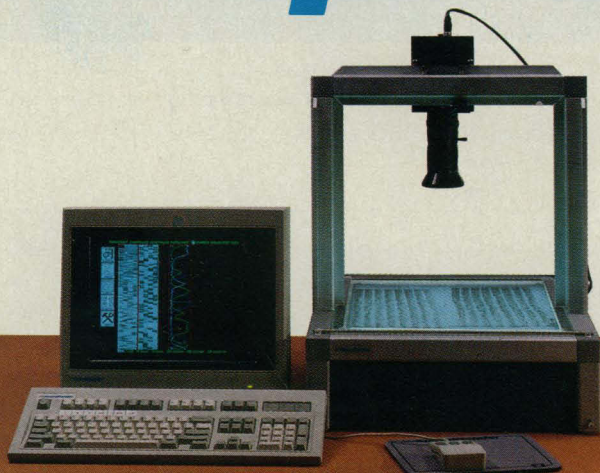
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- Applications of Gene Probes for the Detection of Pathogenic Microorganisms in Water and Wastewater Environments
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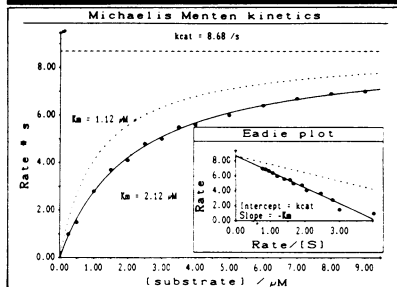
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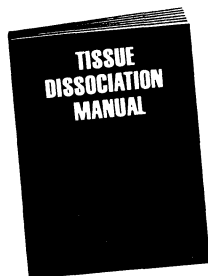
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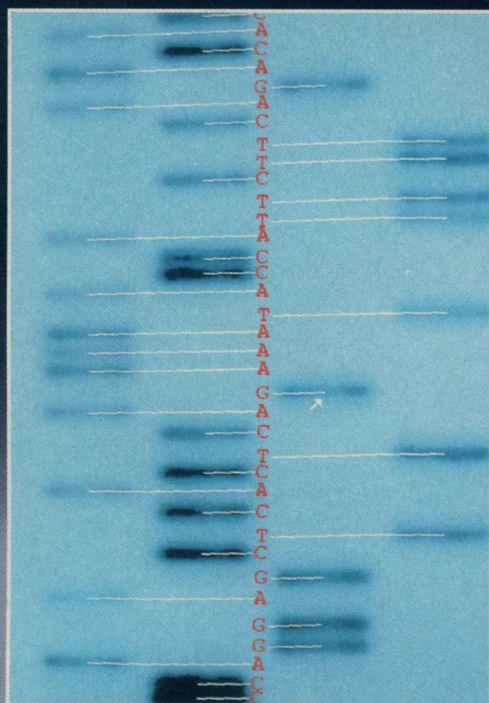


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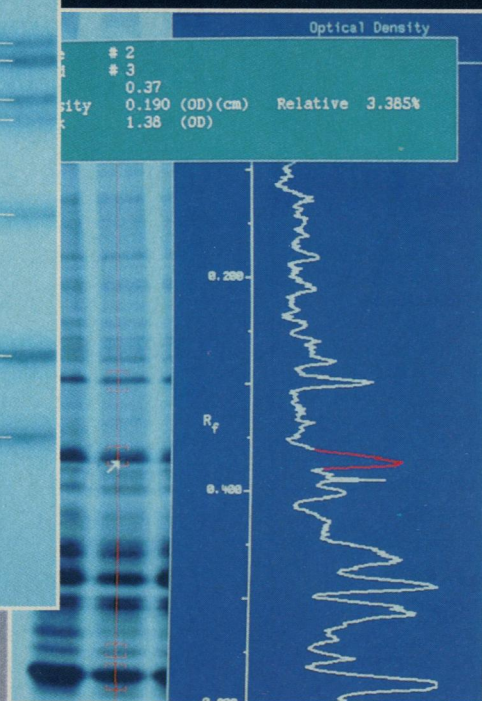
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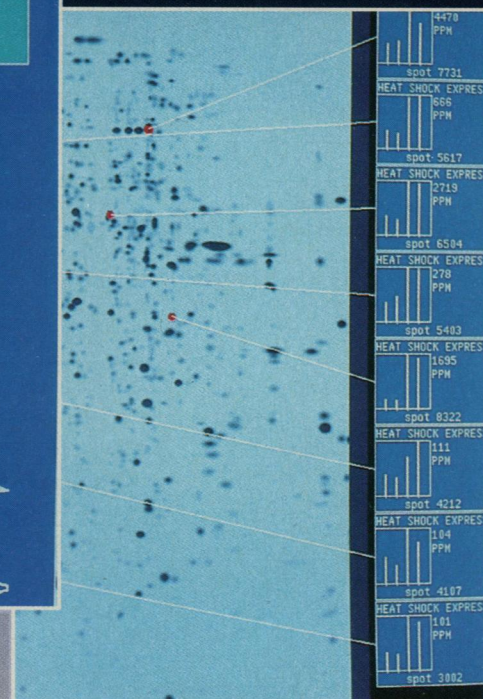
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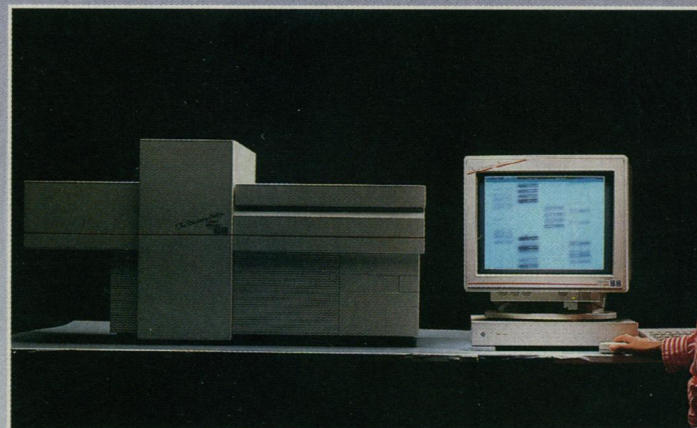
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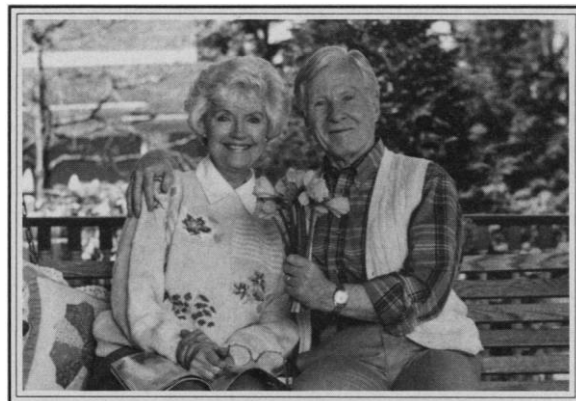
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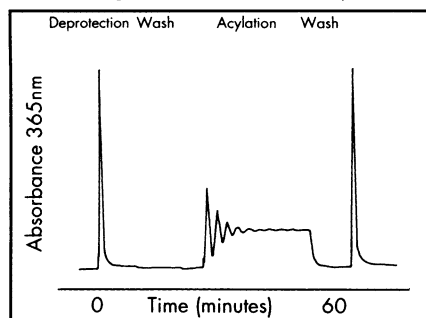
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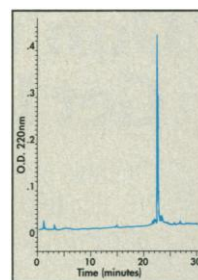
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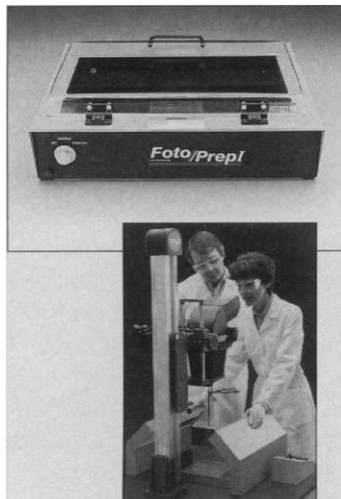
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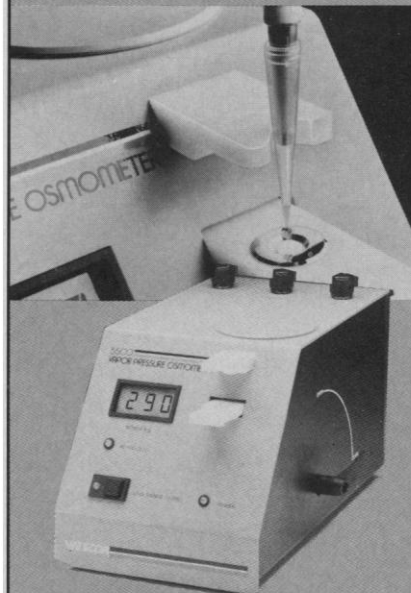
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