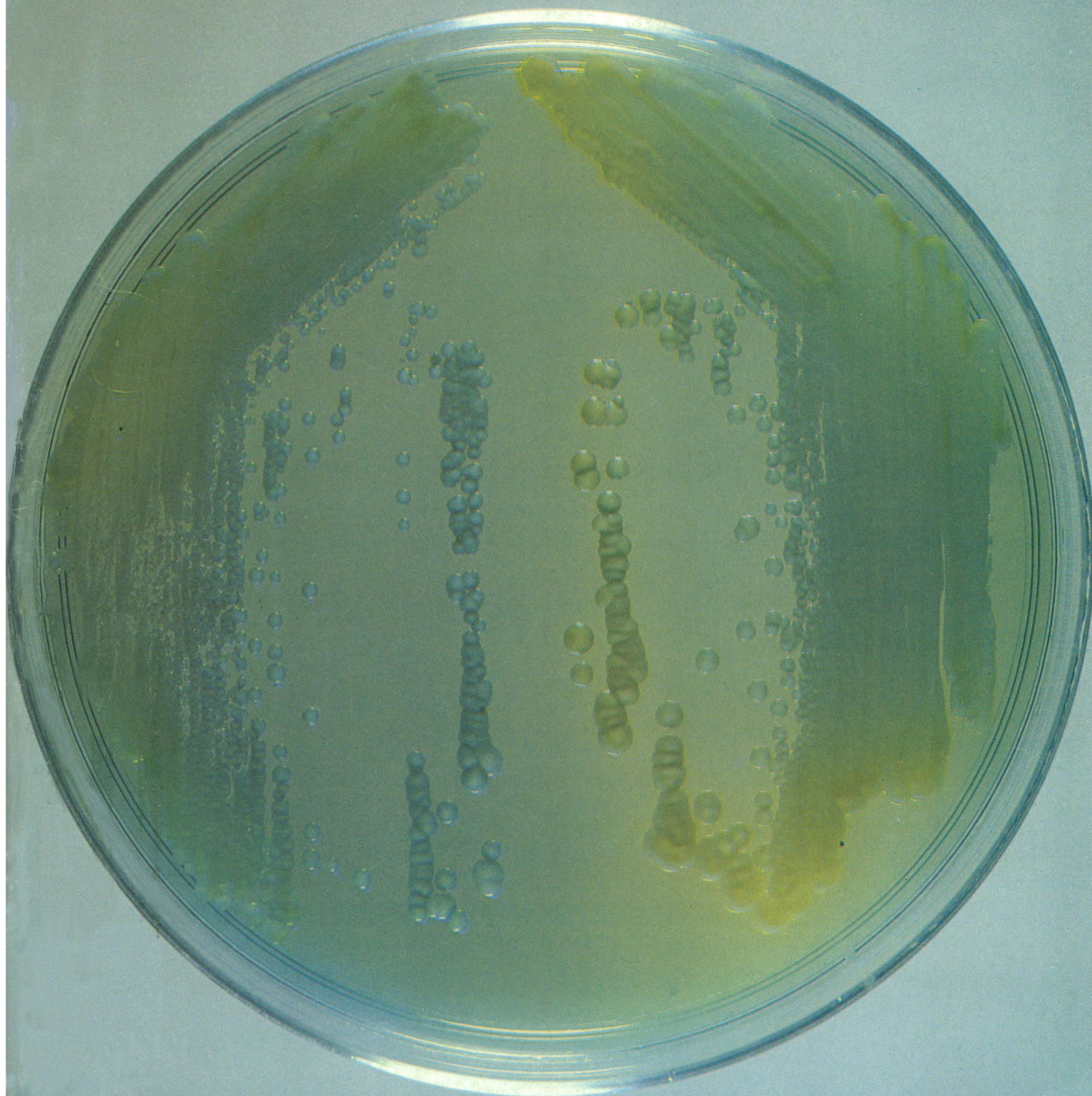


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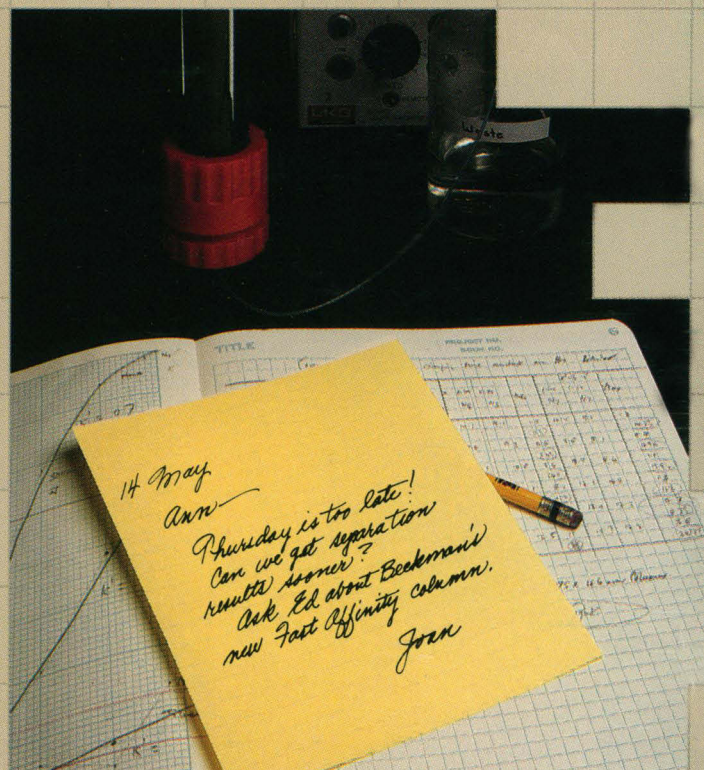
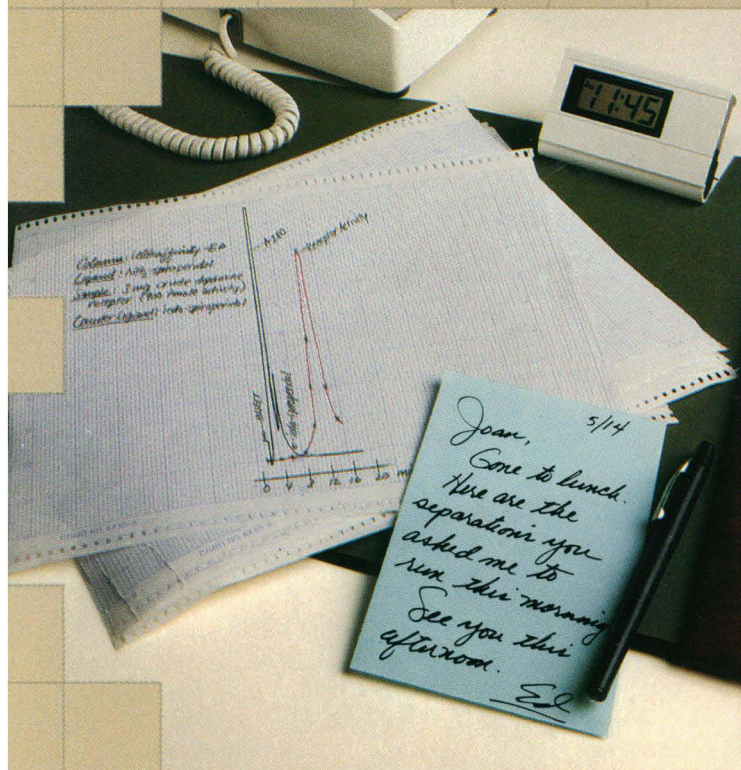
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COVER

Autoregulation of yeast copperthionein gene. Yeast cells were grown on a bromthymol blue galactose indicator plate on which positive cells are yellow and negative cells are white. Both strains contain an episomal fusion gene in which yeast copperthionein regulatory sequences drive the expression of bacterial galactokinase. The cells to the left contain multiple copies of the chromosomal structural gene for copperthionein and are galactose-negative. The cells to the right lack an intact copperthionein gene and are galactose-positive due to increased basal transcription of the fusion gene. See page 685. [Dean H. Hamer, National Institutes of Health, Bethesda, Maryland 20205]

Assembling the immunoglobulin genes

Genes for immunoglobulins are constructed from pieces of DNA scattered on the chromosome. Genetic mechanisms that might contribute to the assembly of the gene for one region of the immunoglobulin molecule (the V-J portion responsible for binding to antigens) have been analyzed in a model system (page 677). The genes for the V and J regions are made contiguous by a site-specific recombination process, and secondary genetic mechanisms may have a role in the nature of the final gene product. The genetic processes for V-J assembly may prove to be generally applicable for other antigen receptors and for other portions of the immunoglobulin molecule.

Fossil record of soft-bodied organisms

The fossil remains of a group of soft-bodied organisms that lived 400 million years ago have been discovered at a site near Milwaukee, Wisconsin (page 715). Scientists rarely get a chance to see such a collection, and it is thought that some unusual features of the local environment contributed to the preservation of these soft structures. The range of organisms represented in the collection gives an indication of the diversity of biologic forms that lived in Paleozoic times. Compound eyes were found in wormlike and arthropod specimens, and several kinds of appendages were seen on arthropods. One unusual limb suggests an adaptation for seizing prey. Such structures had previously been reported only on organisms that lived 40 million years later. A toothlike formation, probably from a conodont organism, may be only the second such specimen ever described. Although some organisms cannot yet be classified, after further analysis they may help explain gaps in the taxonomic record of Paleozoic organisms. This discovery provides new data for a 100-million-year period from which little information has been available.

Herpes simplex vaccine

Herpes simplex viruses (HSV) cause tremendous suffering. They initially infect the eyes, the lips, or, in the most well-publicized example, the genitalia; they then can travel along nerves and remain latent in the nervous system. Intermittently, they may be reactivated to cause new herpes lesions. A genetically engineered vaccine has now been prepared which successfully protects mice from lethal HSV infections and also seems to be effective in preventing the establishment of latent infections (page 737). The vaccine uses a modified vaccinia virus into which herpes DNA, coding for a herpes glycoprotein, was inserted. Under the control of a strong promoter gene of vaccinia, the HSV glycoprotein was produced and displayed on the vaccinia surface, where it proved to be immunogenic. Vaccinia was chosen for

the vaccine because it is known to be a stable virus for immunization. It was the agent used for vaccination against smallpox, a disease that has now been eradicated worldwide. Because vaccinia can accommodate large amounts of foreign DNA, it may be used in the future as the carrier in a polyvalent vaccine containing immunogenic materials from many pathogens.

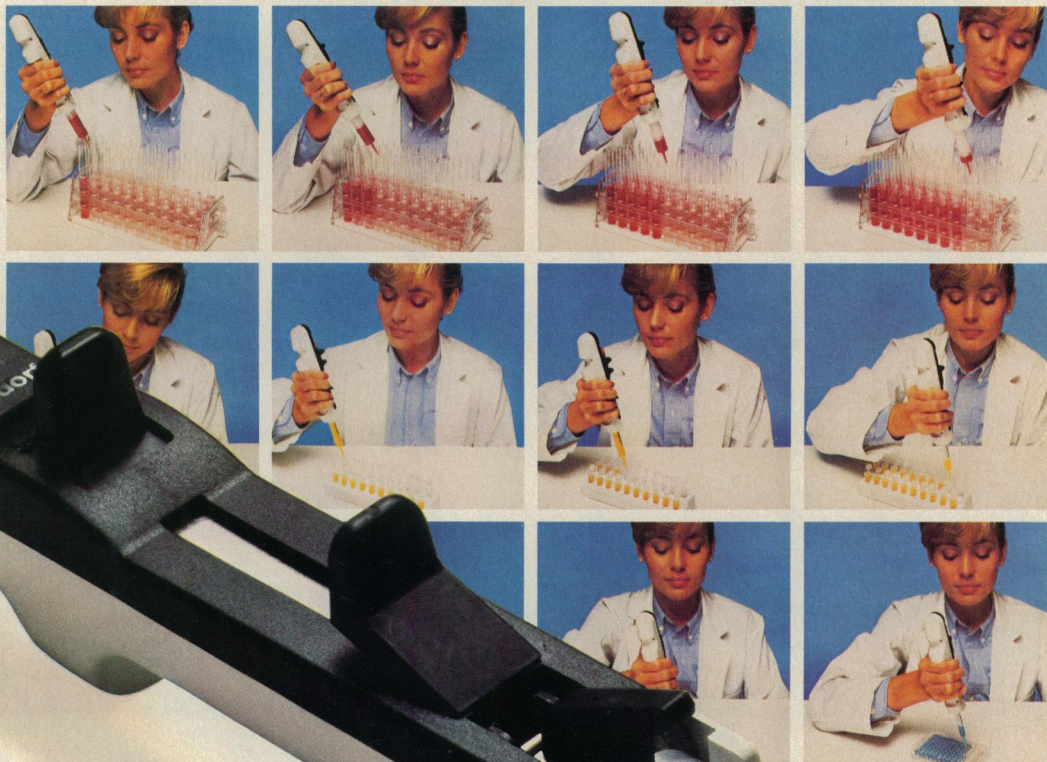
Golgi apparatus in live cells

A new technique has been developed for labeling the Golgi apparatus, permitting, at last, a study of its dynamics in the live cell (page 745). The Golgi apparatus, a netlike, membranous structure, was first seen inside cells that had been fixed and stained for light microscopic study almost 100 years ago and was later studied in detail in dried cells in the electron microscope. Since similar structures were never detectable in living cells, a slim possibility lingered that the Golgi apparatus was only an artifact. The label, a fluorescent lipid complex, tags membranous components of the cell as its lipid component is metabolized. The experimental conditions were adjusted for preferential accumulation of the label in the Golgi apparatus. With the fluorescent label, structural changes of the Golgi previously seen in cells that had been prepared for microscopy during successive stages of cell division were shown to be the same in live cells. The functions of the Golgi apparatus in assembling and transporting different kinds of molecules in the cell have been known for some time. With the fluorescent label, it may now be possible to correlate these functions with structural changes in this important cellular apparatus.

Borna virus and psychiatric disorders

Borna disease has been killing horses and sheep in Germany and Switzerland for 150 years. It is a form of encephalitis in which spasms, paralysis, and either excitability or apathy develop; sometimes it is called "crazy disease." The Borna virus from the brains of sick animals can, when injected into many kinds of experimental animals, cause neurologic and behavioral changes. Could this virus account for behavioral abnormalities in humans? Serum samples from almost 1000 psychiatric patients in the United States and Germany and from appropriate controls were tested for antibody to the Borna virus; evidence of exposure to Borna or a related virus was found in 16 patients (page 755). The clinical diagnosis common to those 16 patients was depression, and usually the depression was cyclical. The possible association of the Borna virus with human psychiatric disorders will undoubtedly stimulate research on the characterization of the virus, the identification of antibodies that can react with it, and the morphologic effects of the virus on the brain and on other parts of the nervous system.

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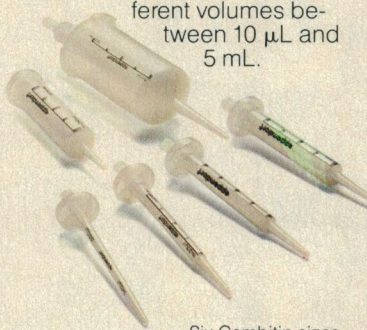
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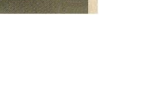
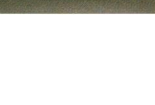
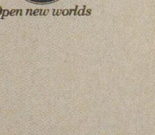
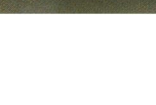
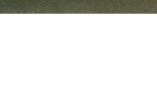
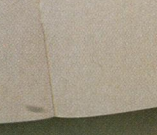
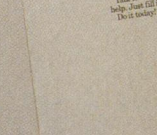
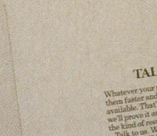
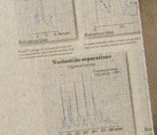
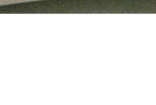
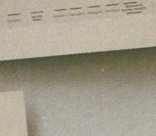
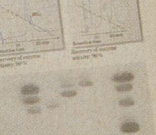
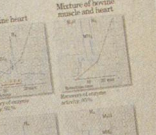
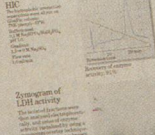
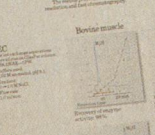
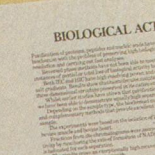
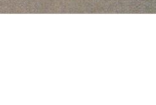
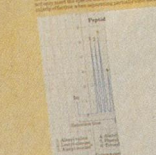
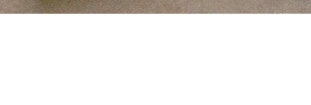
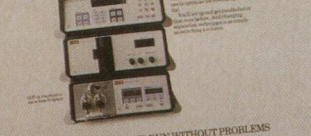
High resolution. The ULTROCHROM GTI system is designed for high flow rates and large sample volumes, making it ideal for preparative work. It offers high resolution and high sample recovery, making it suitable for analytical and preparative work.

High speed. The ULTROCHROM GTI system is designed for high flow rates and large sample volumes, making it ideal for preparative work. It offers high resolution and high sample recovery, making it suitable for analytical and preparative work.

Exhaustive. The ULTROCHROM GTI system is designed for high flow rates and large sample volumes, making it ideal for preparative work. It offers high resolution and high sample recovery, making it suitable for analytical and preparative work.

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HPLC



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INTEGRATED PURIFICATION

The purification of proteins from biological samples is a complex task. The ULTROCHROM GTi system provides a complete solution for the purification of proteins from a wide range of samples.

Analysis of sample complexity



Completely integrated purification

The ULTROCHROM GTi system provides a complete solution for the purification of proteins from a wide range of samples.

Analysis of sample complexity

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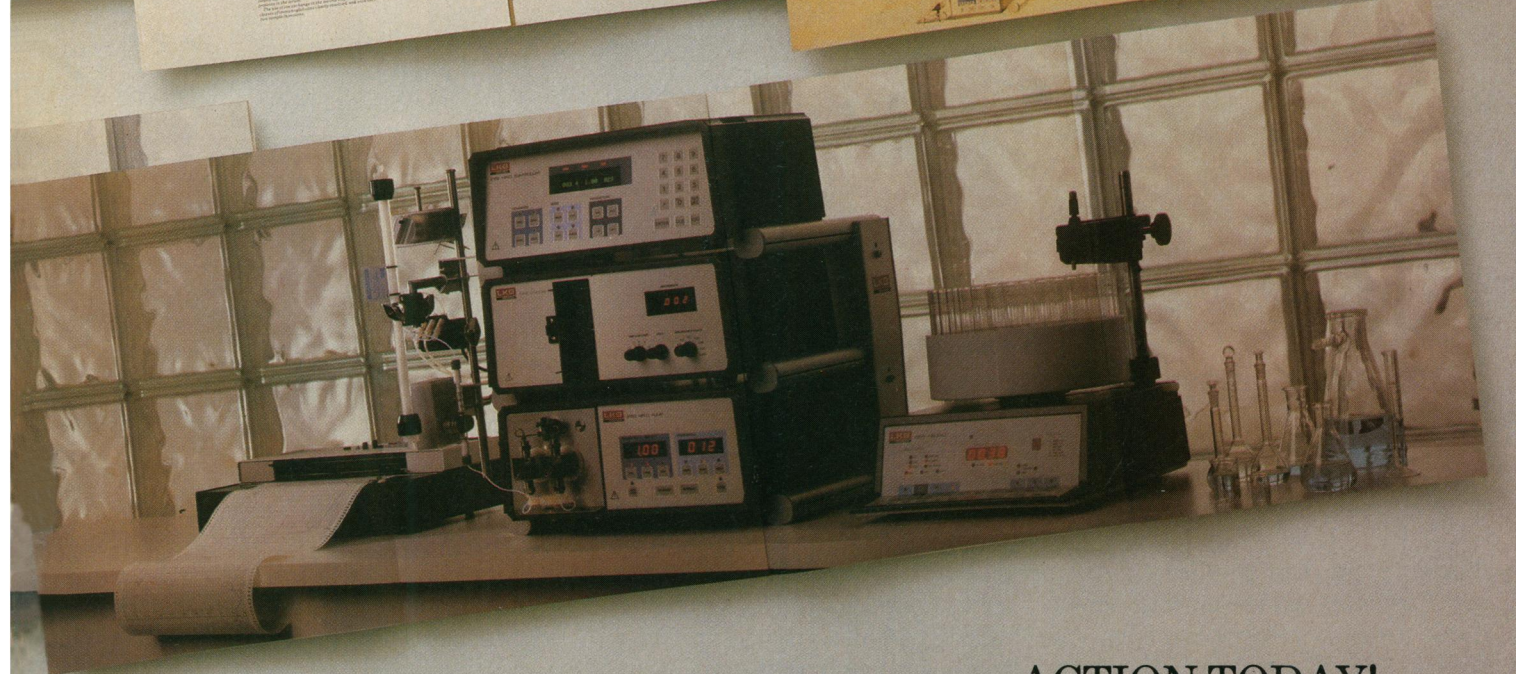
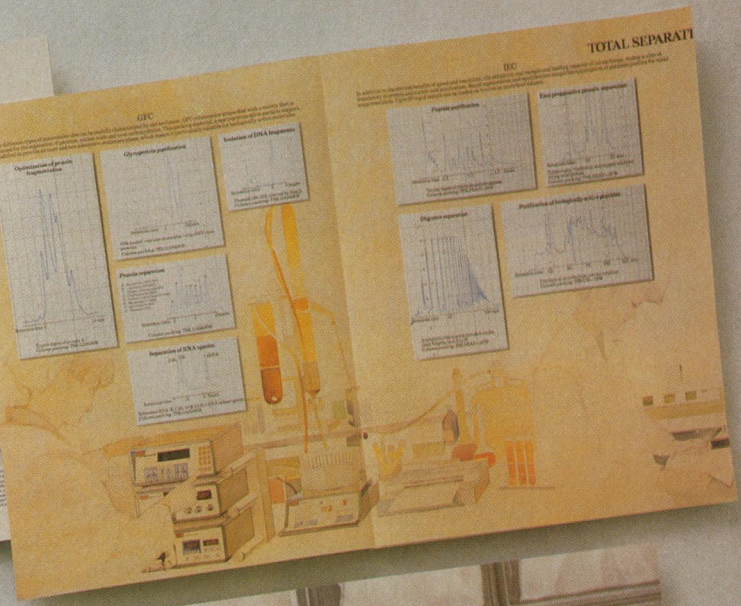
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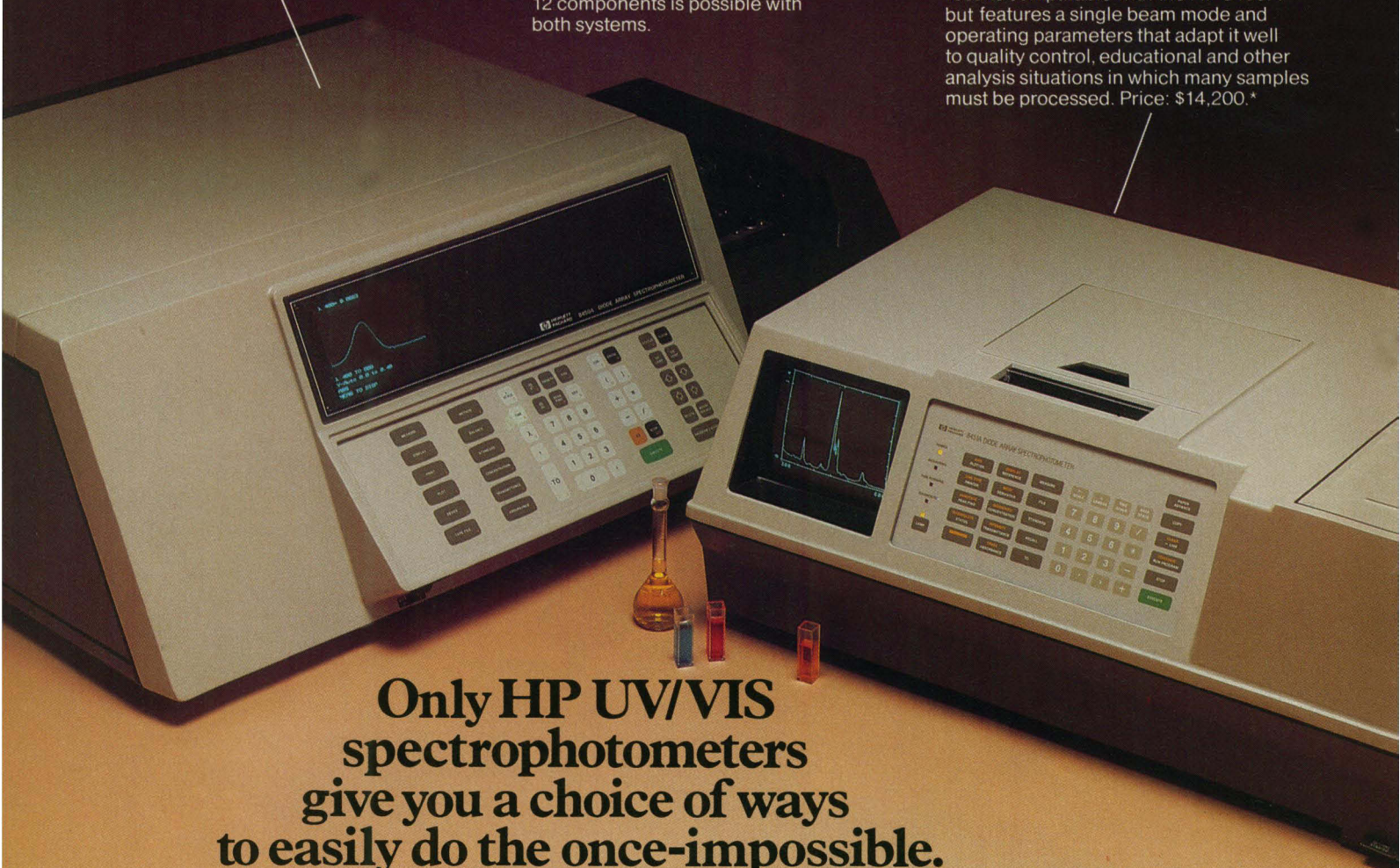
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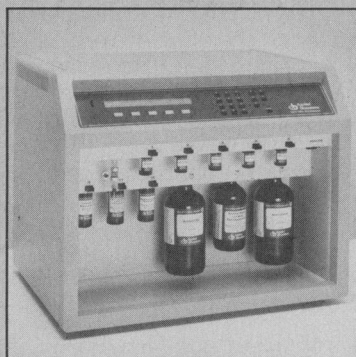
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BIOSYSTEMS UPDATE

Introducing the high performance, low cost, fully automated DNA Synthesizer.

The new Model 381A DNA Synthesizer optimizes the efficient phosphoramidite chemistry to reliably and economically produce high quality oligonucleotides.



Automatic rinsing and priming of reagent lines when new chemicals are added, menu-driven software and stable, prepackaged reagents make the 381A easy to use.

Results and Affordability

The new Model 381A produces high purity, defined-sequence oligonucleotides quickly and economically. It delivers routine coupling yields of 98–100% and the capability to synthesize oligonucleotides with more than 100 bases.

The 381A is a *complete* instrument-reagent system with the proven chemistry and precision design that have made Applied Biosystems the world leader in synthesis technology. Affordably priced, the 381A brings every researcher the speed and reproducibility of automated DNA synthesis with the convenience of an in-lab instrument.

Advanced Capabilities

The 381A can produce 50 to 100-mers providing greater flexibility in gene synthesis strategy by minimizing the number of purifications and ligations. With the efficient phosphoramidite chemistry, probes and primers can often be used without purification. Specific primers for Sanger dideoxy sequencing can be ready for use in less than 18 hours.

Production of mixed probes can be ac-

complished without any premixing of bases, and the addition of unusual bases can be completely automated. Small amounts of probes and primers or up to 10 mg of DNA for physical studies can be made economically and automatically with no hardware modifications.

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The 381A can be operated with the standard synthesis cycle or used to develop and store new chemistry methodologies incorporating existing or user-defined functions. Users can optimize cycles for up to five different nucleotides or derivatives. Integral battery with automatic re-start preserves synthesis parameters and user-designed cycles when power is interrupted.

Immediate Delivery

Compare and you'll agree: The 381A is a remarkable performance/price value. Your local Applied Biosystems representative has all the information for immediate purchase and shipment. Contact us at one of the offices listed below or circle reader service number 139.



The Ventilated Animal Rack:

Some day soon most research animals, personnel, and research programs will be protected this way.*

What is a "Ventilated Animal Rack"?

It is a portable, totally enclosed animal rack with four separate, independent, isolated-from-each-other chambers. Low velocity air enters each chamber, makes a single pass over the cages, and is exhausted by negative pressure directly to the main exhaust system. This special rack (VR-1) most effectively isolates the animals from the animal room... and the research personnel from the animals.

What are the benefits to the animals?

There are many. Cross-contamination is substantially decreased because air from an infected animal goes to the exhaust system with an absolute minimal exposure of the other animals. Animal stress is also significantly reduced: the enclosed environment is quiet; drafts and thermal and humidity fluctuations are greatly minimized; and animals can be easily observed without inducing stress. The success of this environment is attested to by the fact that the total number of animals born to a species that breeds poorly (DBA/2J mice) is increased and the percent survival is also appreciably higher. Additional evidence: judging by acceleration of weight gain, newly arrived animals housed in this system become acclimated more rapidly. Further evidence? Even multiple species can be successfully housed in the same rack.

What are the benefits to the research workers?

Since the air in the rack is exhausted into the main exhaust system and does *not* re-enter the animal room itself, research workers are effectively isolated from animal dander or other allergens, odor, pheromones, microorganisms, and food and bedding dust. Even with the doors of the unit open, the direction of air flow tends to be *from* the room and *into* the unit which helps to contain contaminated air *within* the unit. Result: virtual elimination of allergic reactions and generally, a cleaner, safer, odor-free work environment for the research people.

What are the benefits to research programs?

Because this system greatly reduces the chance of cross-contamination, and because it provides a much less stressful environment generally (e.g., it tends to reduce the amount of animal handling required), the chances of jeopardizing expensive research programs are substantially minimized.

Are there other benefits?

The air velocity is variable and is separately adjustable for *each* shelf. The system offers a choice of bottle watering or a specially designed upfeed serpentine automatic watering configuration that eliminates stagnant water, permits flushing during the day, and significantly minimizes contamination. This rack also permits excellent space utilization since multiple species can be safely housed in the same room. Cleaning is easy; VR-1 can be handled by most standard rack washers. The unit is quiet. And, in summary, it is a most effective isolation system *that can actually divide a room into multiple separate, isolated environments.*

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Lab Products now offers the widest selection of systems for environmental protection: five Stay-Clean™ laminar flow systems; Isosystem™ housing system consisting of a disposable filter cap, cage cover, and plastic cage; Enviro-Gard™ filter system with permanent filter bonnets; and See-Through™ suspended cage systems with a special filtering system. We are now likely to have at hand solutions to virtually all of your environmental problems.

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Why wait for "some day soon"... write or call Lab Products, Inc., 255 West Spring Valley Avenue, Maywood, N.J. 07607 or complete the coupon. (phone 201/843-4600)

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I would appreciate:

- ☐ Additional information on your VR-1 Ventilated Animal Rack.
- ☐ Information on your *other* environmental control products.
- ☐ Your 68-page catalog of animal housing and care systems and accessories.
- ☐ Seeing your local representative—Please call and set up an appointment:

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Name _____

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Organization _____

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*Many of these systems are already installed in major research institutions... and conversion to these ventilated animal racks is accelerating.



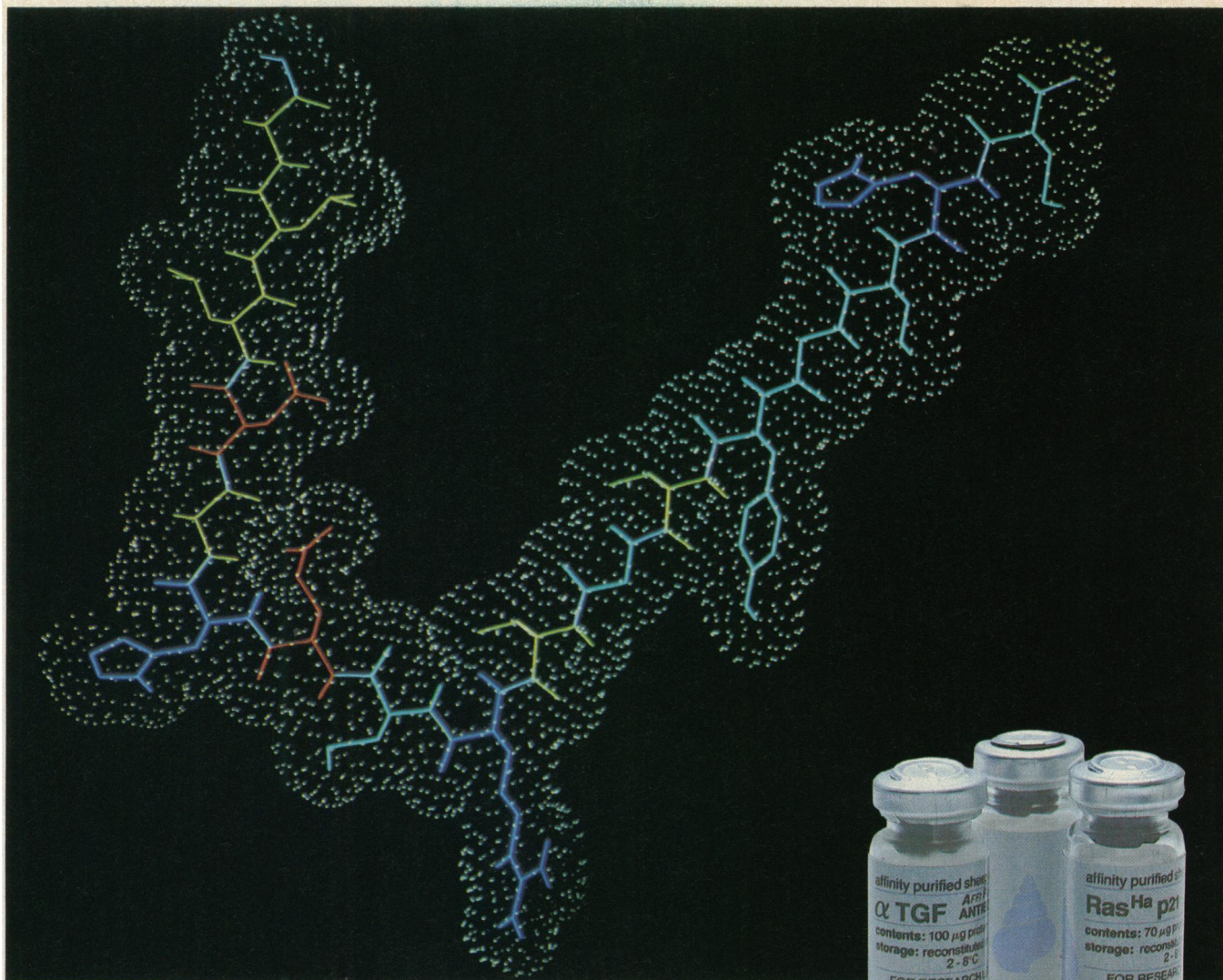
The VR-1 is the subject of one or more pending patents.

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NEW ANTIBODIES FROM TRITON BIOSCIENCES



Affinity-Purified Antibodies to Oncogene Proteins and Transforming Growth Factors.

To facilitate studies in the field of oncogene research and transforming growth factors, Triton Biosciences Inc. is now offering:

- ☐ **Ras^{Ha} p21** AFFI-PURE™ ANTIBODY
- ☐ **Ras^{Ki}/Ha p21** AFFI-PURE™ ANTIBODY
- ☐ **Fes p85** AFFI-PURE™ ANTIBODY
- ☐ **αTGF** AFFI-PURE™ ANTIBODY
- ☐ **Src p60** AFFI-PURE™ ANTIBODY

Each antibody is generated against a synthetic peptide corresponding to an amino acid sequence in the native protein. These antibodies are purified by affinity chromatography, thus reducing nonspecific reactions for clearer, faster results. Western blot and immunoprecipitation analyses are used to verify their reactivity and specificity.

Applications include: providing semi-quantitative data on oncogene and αTGF expression; localizing oncogene proteins and αTGF in cells using immunofluorescence; purifying antigens by antibody affinity

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Triton Biosciences Inc., a wholly-owned subsidiary of Shell Oil Company, is dedicated to developing products for the human health care field, with special emphasis on cancer.

Our product development program is aggressively committed to providing a continuing source of biological reagents of the highest quality.

For additional information, contact Triton Biosciences Inc., 6900 Fannin, Dept. 270, Houston, Texas 77030. Tel. (713) 796-1227.

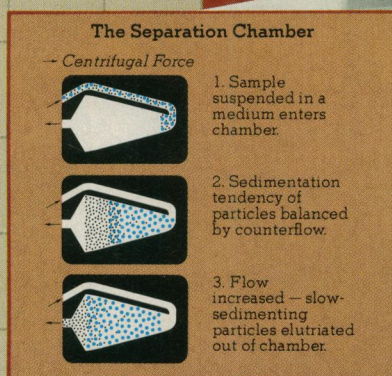
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ELUTRIATION:

*The gentle,
rapid way to
separate living
cells*



For high yield harvesting of whole, living cells, hundreds of researchers use the Beckman elutriation system.

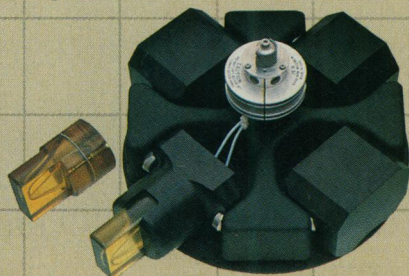
With centrifugal elutriation there's minimal cell loss. Recovery rates close to 100% are possible. Often in less than an hour.

Separation is by gentle washing action, so cells retain their

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Cell concentration is high with the Beckman system. Typically 10^{10} to 10^{12} cells can be separated according to size, and synchronously dividing cells can be obtained for cancer research and drug inhibition studies.

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Now there's a larger volume elutriator rotor for J-6 centrifuges. The new JE-10X Rotor with 40-ml separation chamber. It saves you time by processing nearly ten times more cells than the JE-6B Rotor.

Centrifugal elutriation. It's fast and gentle. And rapidly becoming the preferred method for living cell separations. For complete details and a bibliography of over 250 references, ask your Beckman representative or write: Beckman Instruments, Inc., Spinco Division, P.O. Box 10200, Palo Alto, CA 94304.

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Over 25 years ago, Eppendorf revolutionized liquid handling procedures by introducing the first mechanical-action pipette. Since then, we've developed a full line of high-quality instruments that include fixed-volume pipettes, continuously adjustable pipettes, and our new technologically advanced Ultra Micro series. From micro to macro samples, from routine quality control to pure research, there's an Eppendorf pipette for you.

New "Ultra Micro" Pipettes. Now, 0.5 μL is available as part of a series of newly designed, technologically advanced air-displacement pipettes that provide superior performance compared to conventional models. Easy-to-replace disposable tips eliminate carryover and are more convenient to use than positive-displacement systems. Five models available, including a continuously adjustable Digital Pipette, ranging from 0.5 to 10 μL .

Digital Pipettes™. Continuously adjustable, with direct digital display of the set volume to assure precise, reproducible results every time. The "click-set" ratchet mechanism locks your choice in place, practically eliminating accidental changes. Four models ranging from 0.5 to 1000 μL , with increments of 0.1 or 1.0 μL .

Maxipettor™. One pipette replaces conventional transfer and serological pipettes. Continuously adjustable setting lets you change volumes from 1 to 10 mL. Digital display of selected volume to 0.01 mL assures exact results; disposable tips maximize safety and accuracy by eliminating carryover. Two types of tips—air displacement (Maxitip "L") and positive displacement (Maxitip "P")—are available, in sterile and nonsterile packaging.

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New "Ultra Micro" Tips
in autoclavable tray

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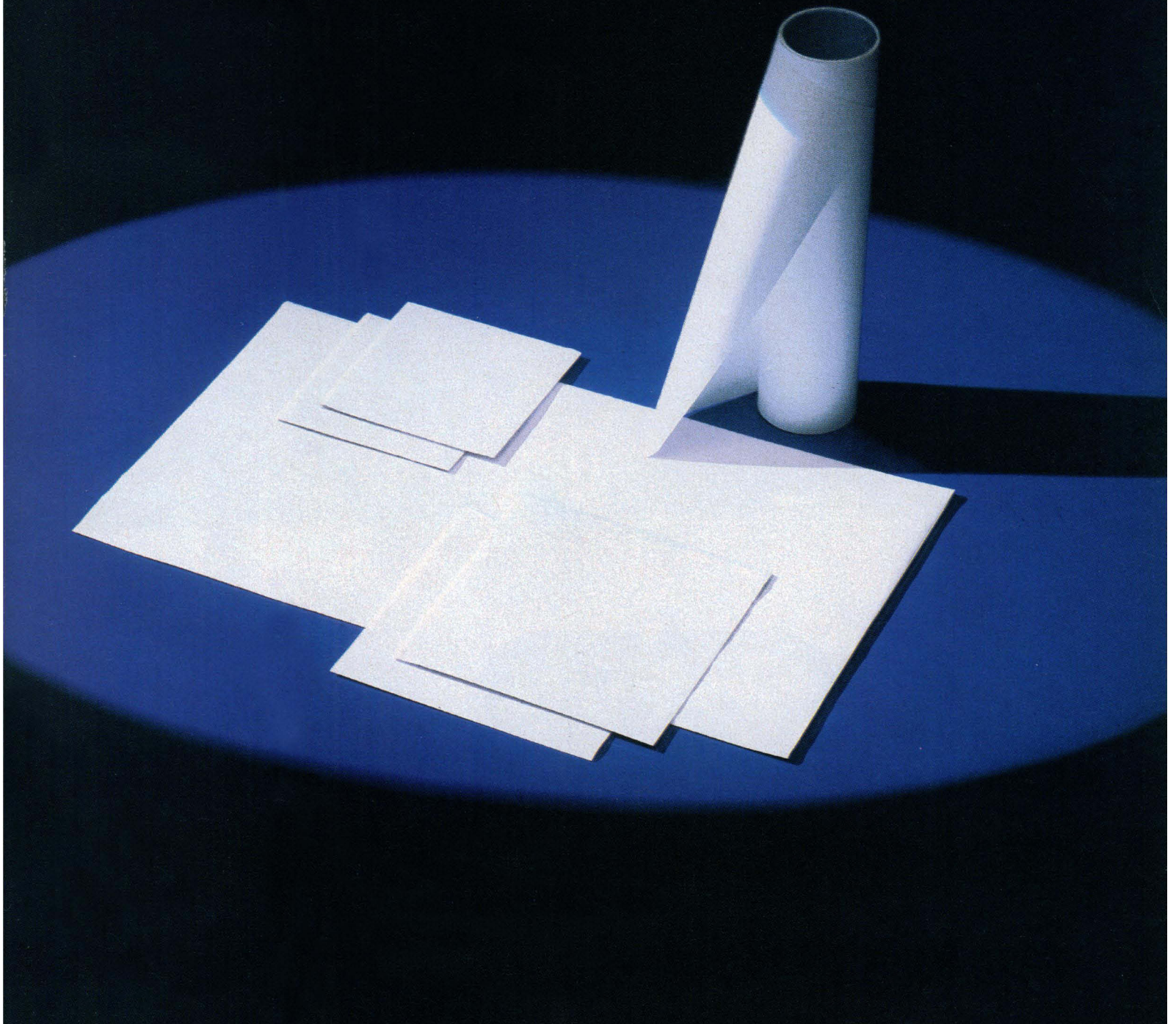
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No wonder new NYTRAN is in the spotlight. It outperforms every other nylon transfer membrane available today. NYTRAN is nylon-66 modified with a positive charge, giving you these unique advantages:

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NYTRAN is available in 0.1, 0.2, 0.45 and 0.65 μm pore sizes, in both standard and custom dimensions. It is naturally hydrophilic, and lot-to-lot consistency is excellent. Now there's new NYTRAN to complement S&S NC™ nitrocellulose. That makes Schleicher & Schuell the only company to give you the two leading transfer membranes.

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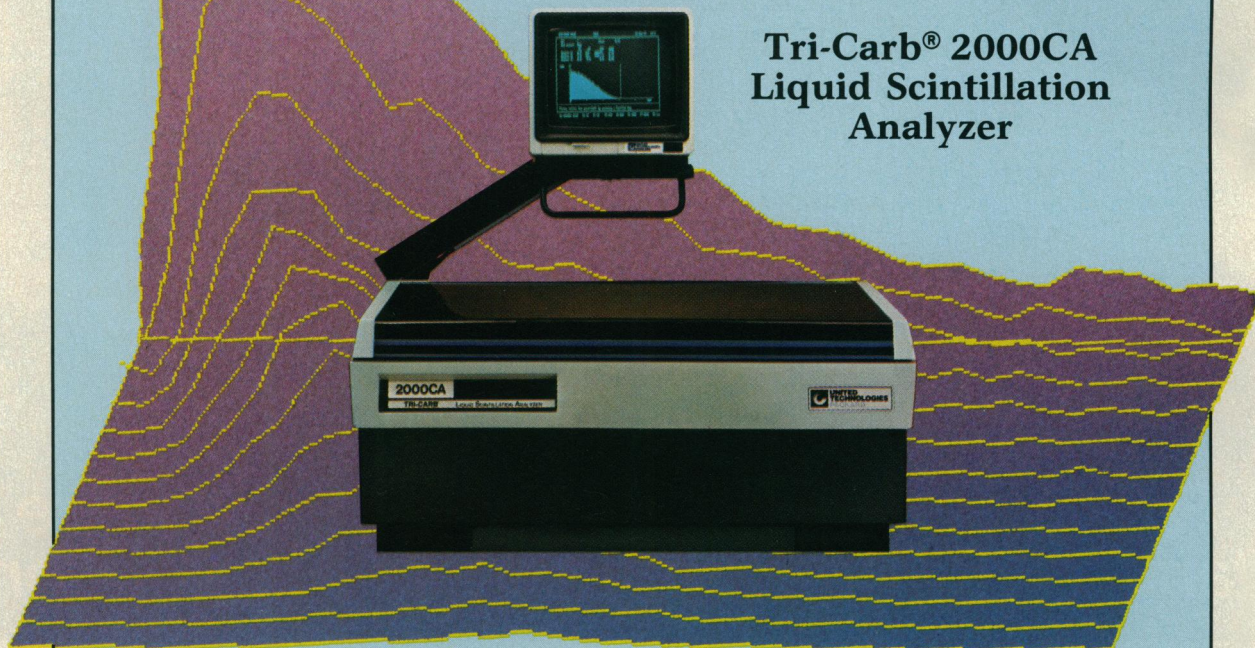
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LETTERS

"Nuclear Winter" Calculations

The description by Turco *et al.* of the possible global consequences of multiple nuclear explosions" (23 Dec 1983, p. 1283), represents an important attempt to quantify the effects of a nuclear war on global climate. In common with other preliminary studies (1), the numerical model simulations of Turco *et al.* suggest that heating of the earth's surface by solar radiation might be drastically reduced by the dust raised in high-yield nuclear blasts and by smoke from city and forest fires ignited by the blasts. However, in view of uncertainties in important inputs to the models and in many of the physical processes involved, as well as inadequacies in the models themselves, the predictions of a nuclear winter must be viewed as a possible, rather than the definite, outcome of a nuclear war. While this caveat has generally been made in scientific articles on the subject, and has been reemphasized in an excellent report by the National Academy of Sciences (2), it is often neglected in communications with the general public.

To further underscore the tentative nature of the nuclear winter predictions, I list below some of the scientific uncertainties associated with the numerical model calculations (3).

1) The amounts of material that would burn are not well quantified (for example, How widespread will forest fires be in winter?).

2) There are large uncertainties about the quantities of smoke particles that would be emitted into the atmosphere from various types of fires. On the basis of limited field data available (4), it appears that Turco *et al.* may have overestimated these emissions.

3) Clouds generally form above large fires, and these clouds often produce rain. This provides a mechanism for the prompt removal of some of the smoke particles, which would further reduce the effective (widespread) emissions of smoke.

4) The radiative properties of smoke particles are not well known. In view of the complex nature of smokes, these properties need to be established by field studies of the plumes from large fires.

5) Widespread smoke will change the radiative properties of clouds. Possible effects include enhanced absorption of terrestrial (long-wave) radiation by smoke particles when they are covered with water, decreases in the average size of cloud droplets (5), and decreases in

the ice content of clouds (6). In view of the profound effects that clouds have on the radiative balance of the earth, these effects should be included in numerical simulations of the effects of smoke particles on atmospheric temperatures.

While some of these effects would tend to diminish the predicted decreases in temperature at the earth's surface, others would tend to enhance the lowering in surface temperatures. Clearly, at this juncture, there are too many uncertainties and simplifications in the numerical simulations of the effects on climate of a nuclear war to place much reliance on their predictions. Reduction of these uncertainties will require dedicated research efforts to better quantify the amounts and nature of the smoke particles from various types of fires, the rates of removal of smoke particles from the atmosphere (particularly prompt removal), and the radiative properties of smokes and clouds affected by smoke, as well as to improve numerical models of global climate. The importance and urgency of the problem dictates that these research tasks be given top priority.

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7. I thank L. F. Radke, D. A. Hegg, C. Leovy, and S. Warren for helpful discussions.

Diagnostic Ultrasound

Our initial report on increased frequency of sister chromatid exchanges (SCE's) after in vitro exposure of human lymphocytes to pulsed diagnostic level ultrasound (1) has been confirmed and extended in publications from five laboratories in the United States and elsewhere (2-4). The increase has now been detected after continuous wave insonation and after in vivo exposure (4). The

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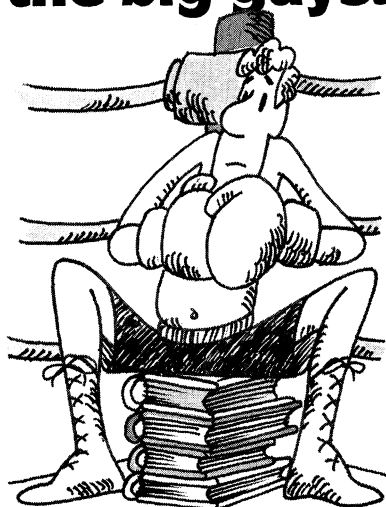
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frequency of SCE's increased with acoustic power in a critical range (3).

Free radicals are generated in aqueous solutions by pulsed ultrasound (5); their products have also been identified in the DNA thymidine of animal cells exposed to continuous wave insonation (6). The bioeffects of ultrasound responsible for the increased SCE frequency and some of the other findings described in more than 700 publications since 1950 (7) may well be the result of free radical release.

The failure of Ciaravino *et al.* to confirm our results (15 Mar., p. 1349) might be accounted for by many factors. Among these are the high degree of inter-observer variation in their SCE scoring, their high SCE baseline values, and the fact that their critical acoustical power range was not verified and was not systematically varied. These and other variables may account for the failure of some laboratories to reproduce results of others, leading to the confusion in this field.

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The following points are pertinent to Bases' letter.

1) Interobserver variation in SCE scores is expected and is the reason why controls were included. The SCE rate in our experiments did not increase above control values for any of the three independent scorers.

2) SCE baseline values vary considerably from laboratory to laboratory; for example, they were 3.28 for Kakati *et al.* (1), 16.3 for Lambert *et al.* (2), and 27.33 for Dutrillaux *et al.* (3). Our SCE baseline values were well within this range.

3) The dosimetry for our experiments was accomplished by Paul Goodwin, staff physicist at Albert Einstein College of Medicine, who also was involved in making dosimetric determinations for Liebeskind *et al.* (4). The intent of our experiments (5) was to duplicate exactly the experimental conditions of the Liebeskind *et al.* study (4) with a well-defined, nonvarying field from a specific diagnostic ultrasound device. Our earlier

attempts to verify their results with our equipment had been unsuccessful (6).

4) The Albert Einstein group declined to score the slides that we made on their premises with their equipment.

5) Bases suggested that we undertake "independent double-blind scoring by recognized experts . . ." of our slides (7). The coded slides were sent to William Morgan (at the University of California Medical Center, San Francisco); his evaluation agreed with ours.

6) Bases then suggested (8) that we send the slides to David Jacobson-Kram (George Washington University) for evaluation. His scoring agreed with ours.

7) The results of Martin *et al.* (9) are negative [χ^2 tests . . . were not significant. . .] (9, p. 993), as are the results of most of the studies in this area (10).

8) Makino *et al.* (11) used a Bransonic 12 cell disrupter that produces a continuous sound wave at a frequency of 20 kilohertz; their study thus has little relevance to diagnostic ultrasound.

MORTON W. MILLER
VICTOR CIARAVINO

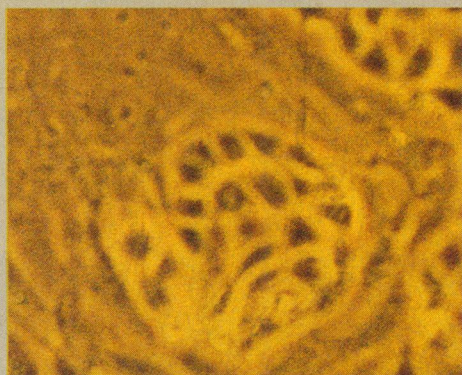
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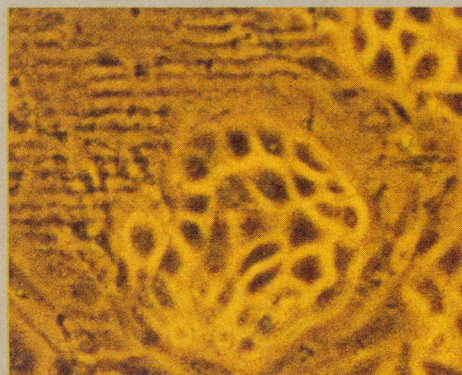
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Murine Retroviral Vectors and Human Gene Therapy

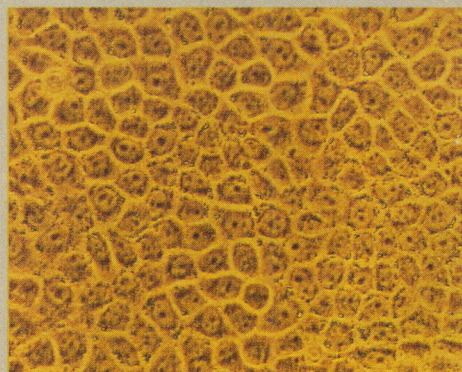
In his excellent and timely article, "Prospects for human gene therapy" (26 Oct. 1984, p. 401), W. F. Anderson discusses some of the possible difficulties surrounding the envisaged future use of retroviral vectors in attempts to correct human genetic defects. Such vectors unfortunately appear to have a strong propensity for deleting or rearranging their own sequences. One way in which such structural alterations might arise is through recombination events with homologous endogenous viruses already present in the cellular genome. In addition to the possible loss of vector-born



1. Co-culture of human diploid fibroblasts and Madin Darby Canine Kidney (MDCK) cells treated with fluorescein labelled monoclonal antibodies to MDCK cells.¹

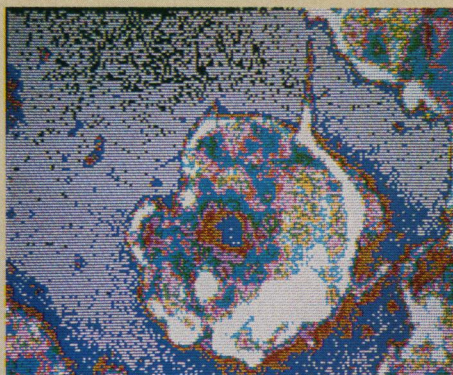


3. Same as Figure 1. Selective irradiation of non-fluorescently labelled cells with a high intensity laser beam.

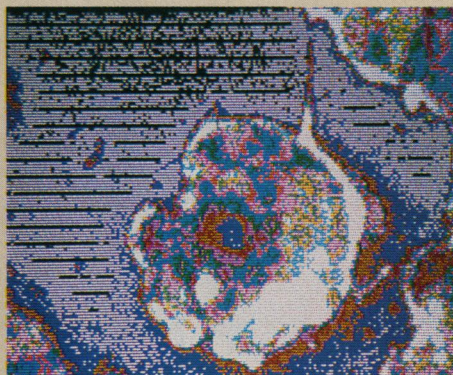


5. Growth of MDCK cells several days after exposing fibroblasts to laser irradiation.

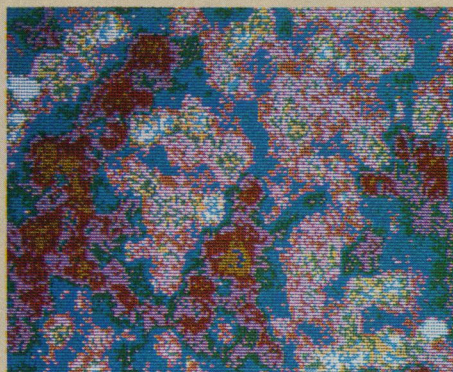
¹Courtesy of Dr. William Smith, Michigan State University.



2. Computer-generated pseudo-color fluorescent image of labelled cells.



4. Same as Figure 2. Lines indicate the path of the laser beam, selectively leaving the MDCK cells untouched.



6. Same as Figure 5. Fluorescent image of MDCK cells after retreatment with monoclonal antibody.

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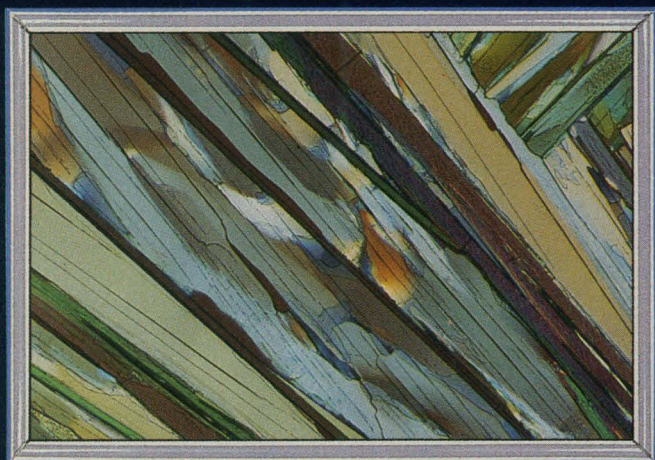
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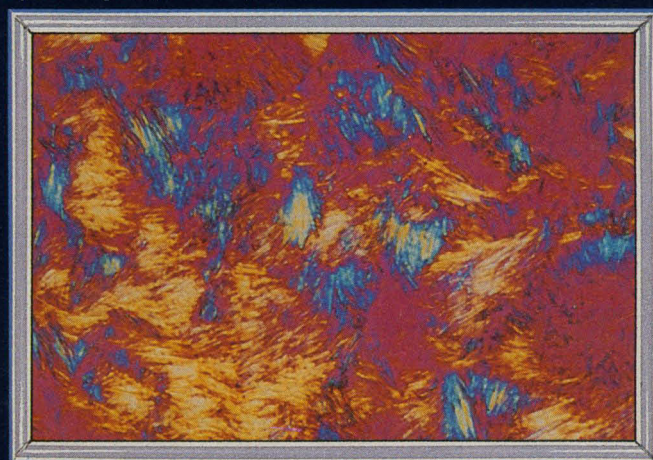
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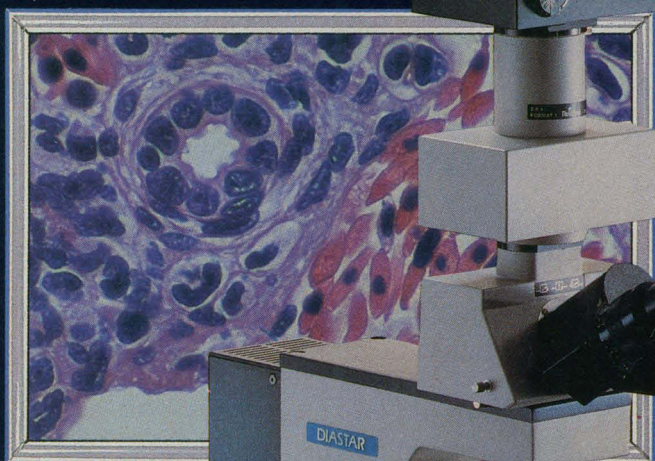
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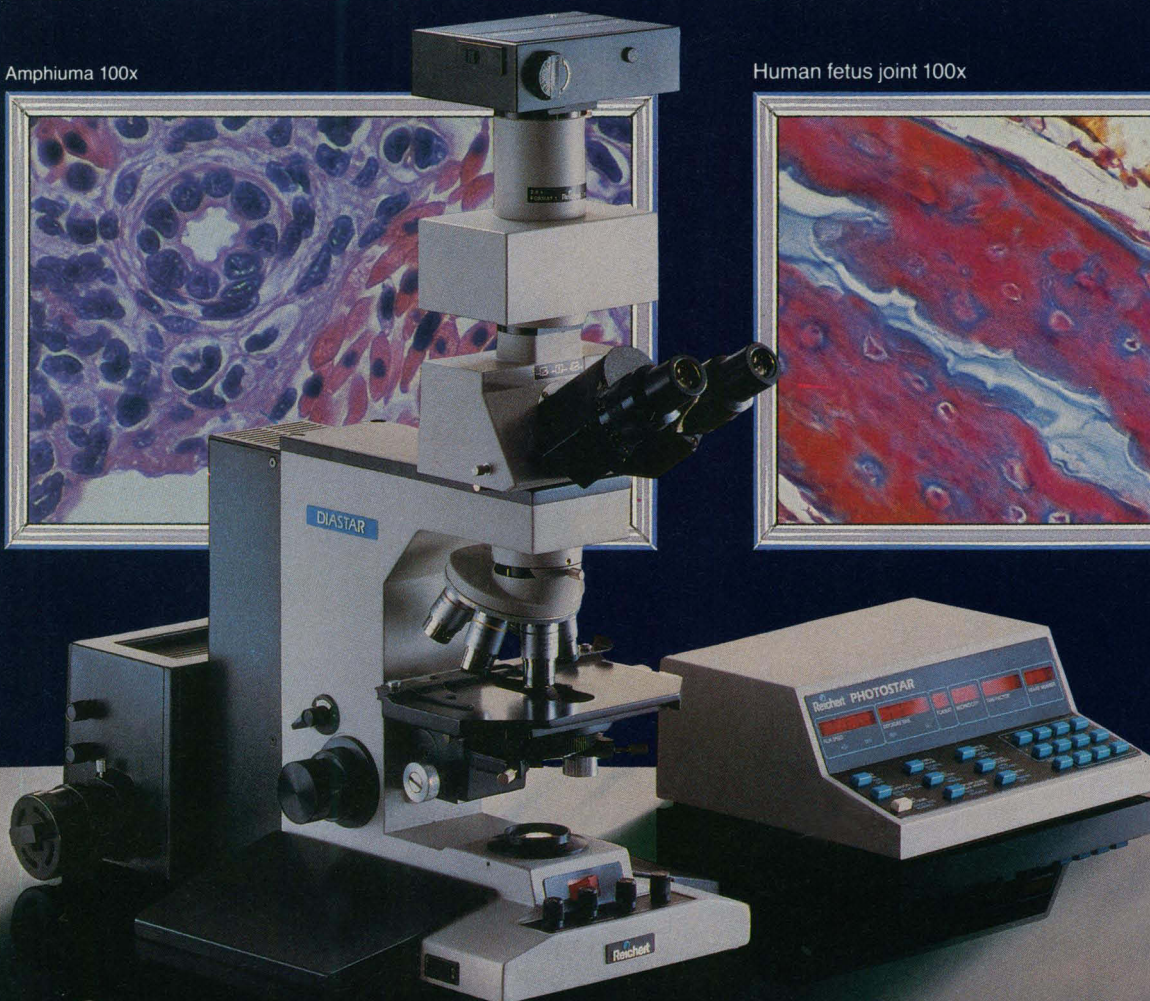
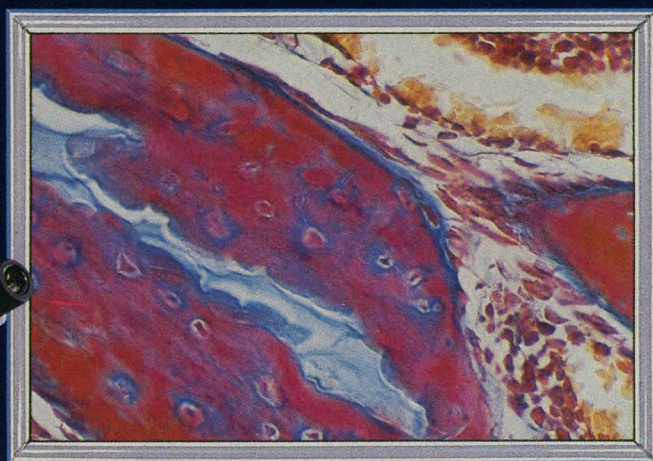
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sequences, such events could lead to the potentially harmful production of packageable infectious recombinant virus. Since avoidance of any homology with endogenous retroviruses is thus desirable, Anderson suggests using mouse retroviral vectors as a delivery system. However, quite apart from the putative inherent instability of recombinant retroviruses, this proposal is probably insufficient to overcome the recombination problem. This is because sequences with homology to mouse mammary tumor virus (1), Moloney murine sarcoma virus (2), Abelson murine leukemia virus (3), and Moloney murine leukemia virus (4) have recently been found in the human genome. Indeed, sequences containing murine retrovirus long terminal repeats (LTR's) have been employed in the screening of human genomic libraries (5).

There would appear to be two alternative means of circumventing this problem which would eventually enable murine vectors to be used in human gene therapy. Every such attempt would have to be preceded by a search for vector-homologous sequences in the patient's genome by Southern blotting. If sequences homologous to murine retroviral vectors currently in use are indeed found to be common in human genomes, as suggested by the work of Repaske *et al.* (4), alternative vectors derived from more distantly related species would have to be considered. Clearly, considerable attention will have to be directed toward the construction and experimental trial of appropriate retroviral vectors in order to optimize any future gene delivery system for use in humans.

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David Cooper raises a legitimate concern regarding possible recombination between murine leukemia virus (MuLV)-based viral vectors and endogenous retroviral sequences present in the human genome. In fact, recombination between a deletion mutant of Moloney MuLV and homologous sequences in mouse DNA involving a 400-base-pair segment that was 78 percent homologous

has recently been demonstrated (1). To evaluate possible recombination between MuLV's and human endogenous retroviral sequences, mouse cells have been cotransfected with defined *gag* and *pol* deletion mutants of Moloney MuLV (2) and cloned *gag* and *pol* segments of endogenous human retroviral DNA's. In no case could recombination be demonstrated. Although the deduced amino acid sequences comprising the *gag* and *pol* regions of endogenous human retroviral sequences are evolutionarily related to comparable segments of MuLV's (3), the extent of polynucleotide sequence identity may be too low for homologous recombination. For example, the *gag* and *pol* regions of human endogenous MuLV sequences are only 35 percent and 44 percent, respectively, related to analogous segments of MuLV. Furthermore, nucleotide sequencing of several different human endogenous retroviral clones (4) has indicated the presence of point mutations, inappropriate terminator codons, and deletions of various sizes, any one of which could render recombinants that might be generated replication defective.

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4. R. Repaske *et al.*, *J. Virol.*, in press.

Erratum: The name of M. Wallroth was omitted as the fourth author of the report "A simple and general method for transferring genes into plants" by R. B. Horsch *et al.* (8 Mar., p. 1229).

Erratum: In the legend for figure 2 of the report "Plasmodium falciparum malaria: Band 3 as a possible receptor during invasion of human erythrocytes" by V. C. N. Okoye and V. Bennett (11 Jan., p. 169), a reference for the use of metrizamide to purify schizonts was inadvertently omitted after the fifth sentence. It should have read, "Following the method of C. S. Pavia *et al.* [*Am. J. Trop. Med. Hyg.* **32**, 675 (1983)], as modified by Lyons."

Erratum: In figure 1 of the report "How bees remember flower shapes" by J. L. Gould (22 Mar., p. 1492), the results shown for the 24-element patterns (K₁ and K₂) should have been $P > 0.05$.

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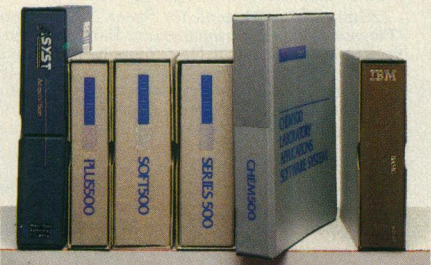
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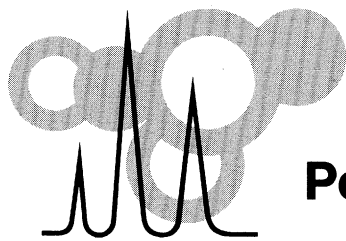
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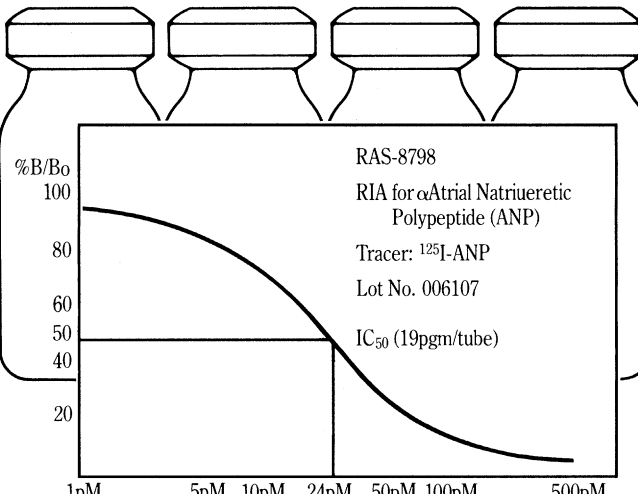
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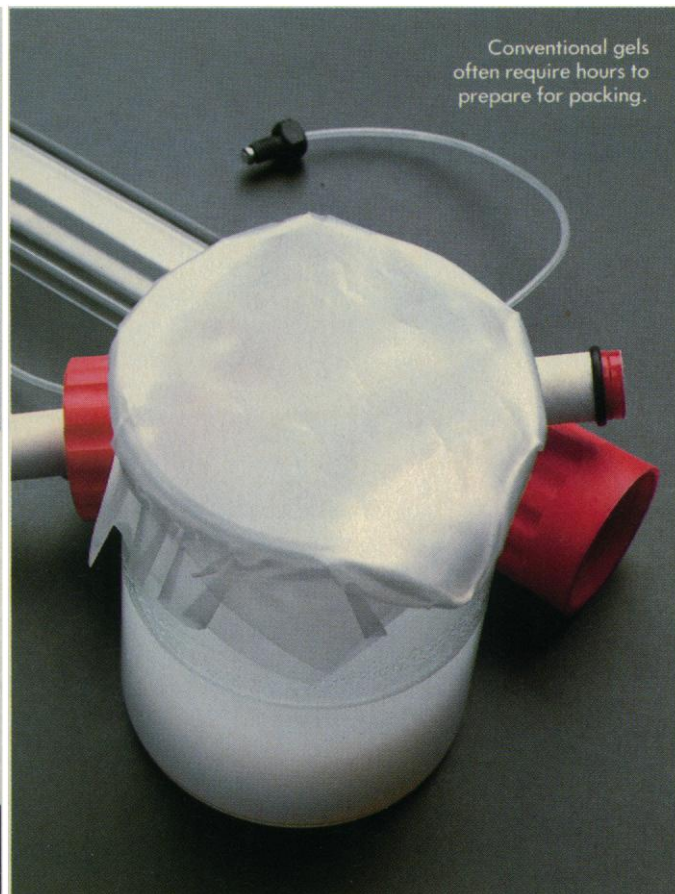
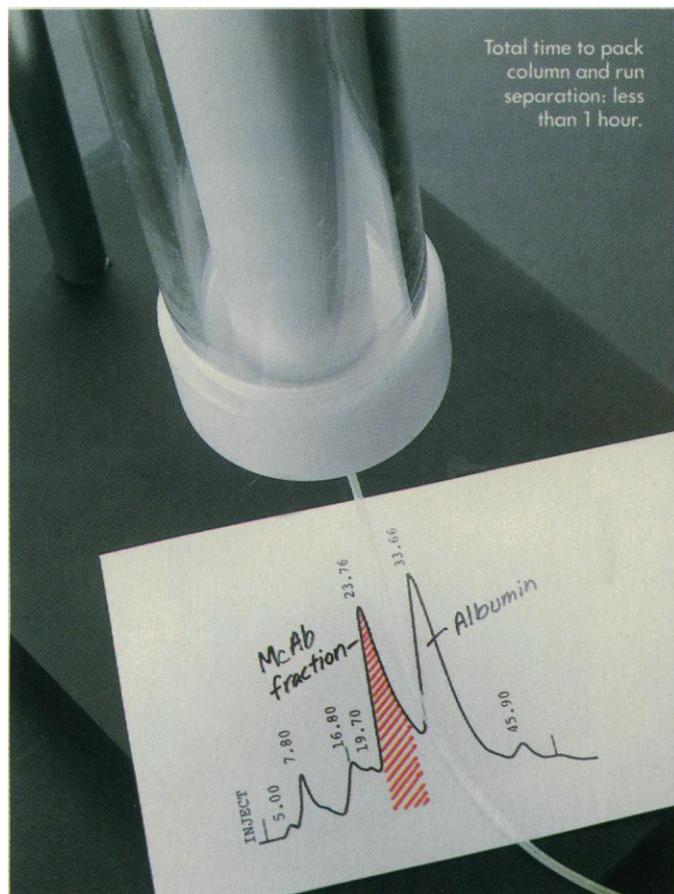
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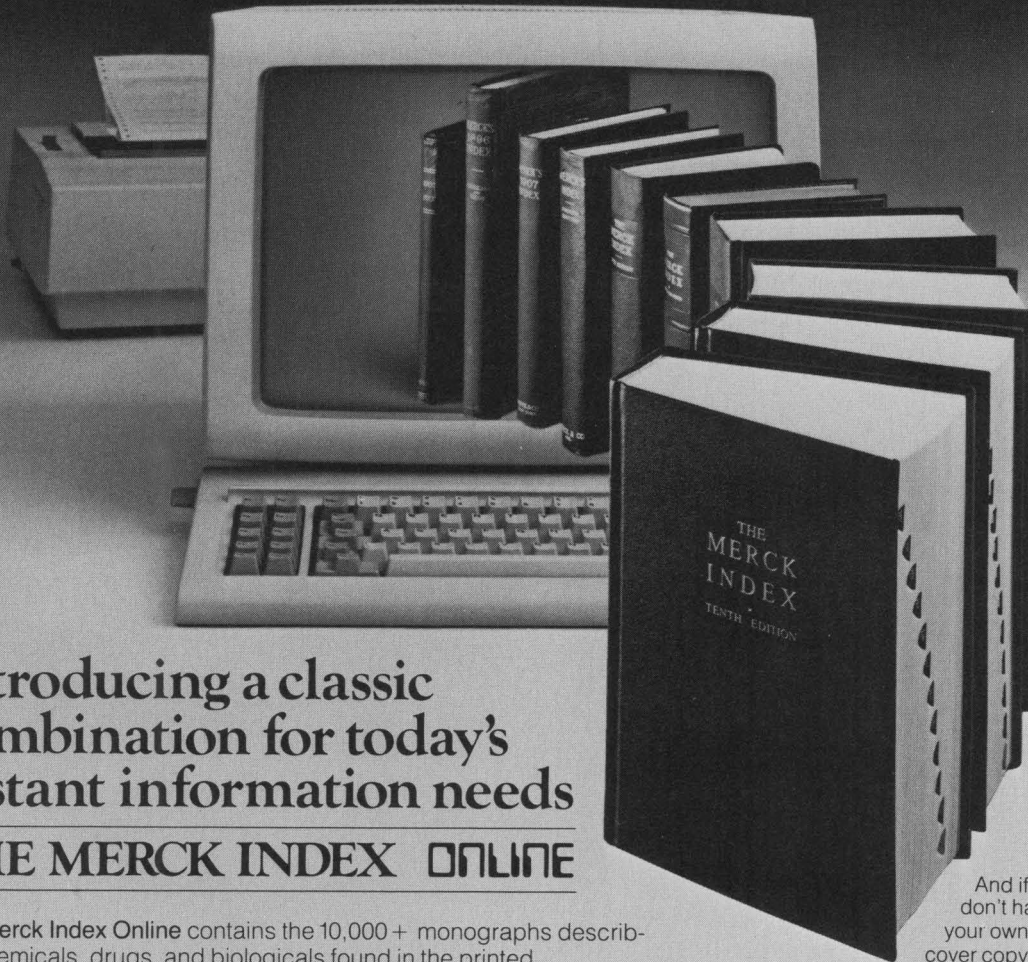
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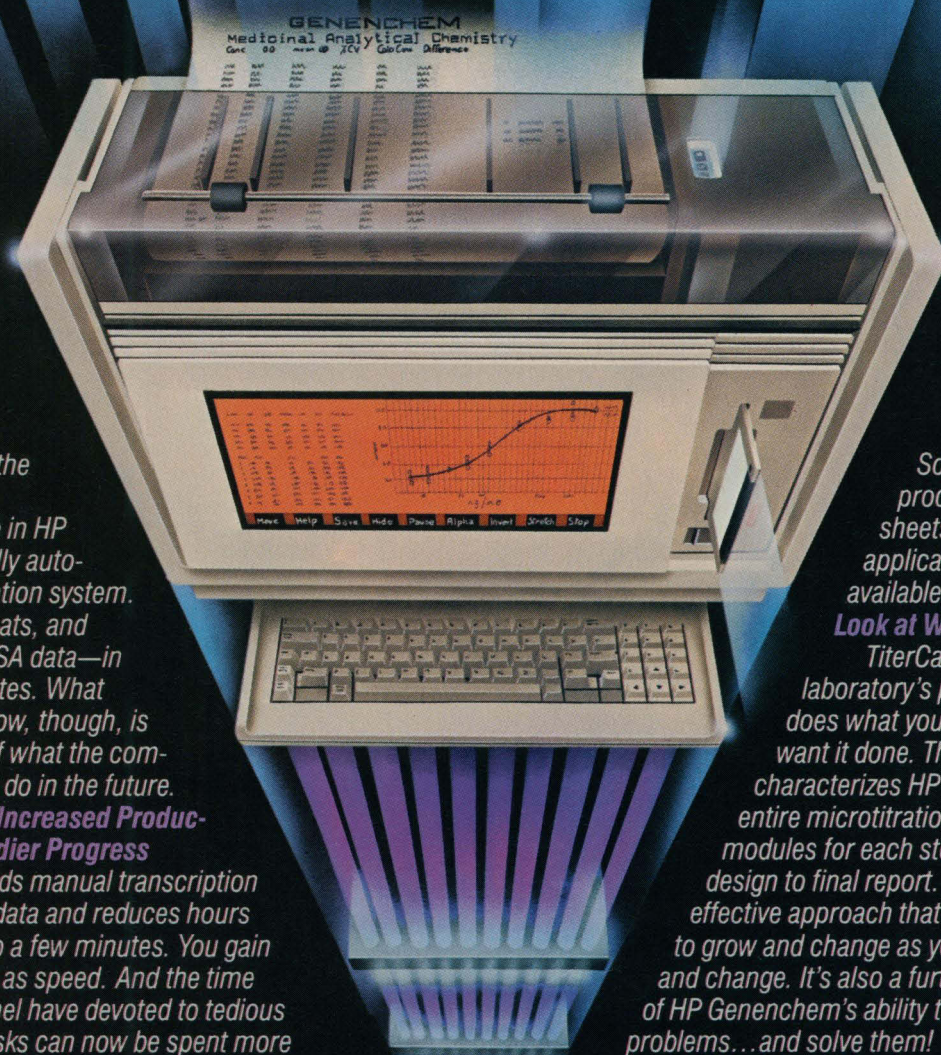
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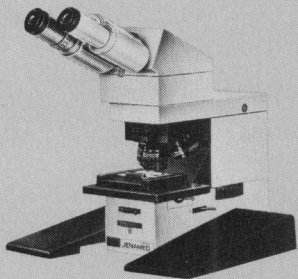
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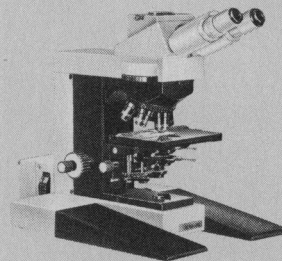
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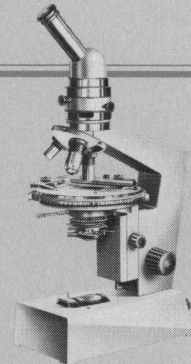
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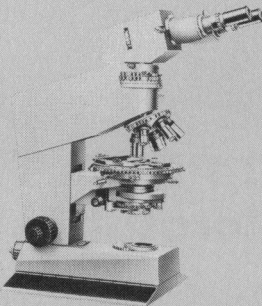
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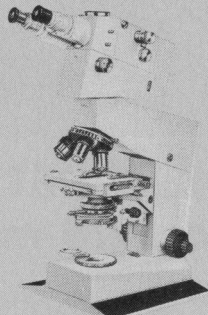
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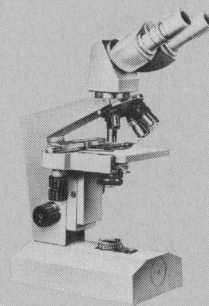
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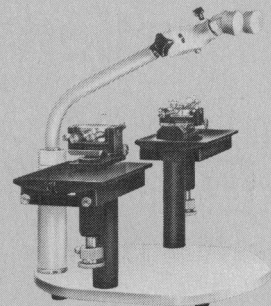
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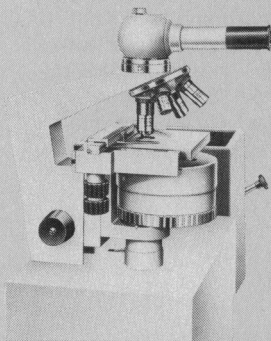
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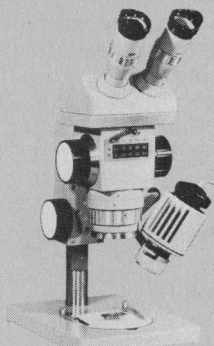
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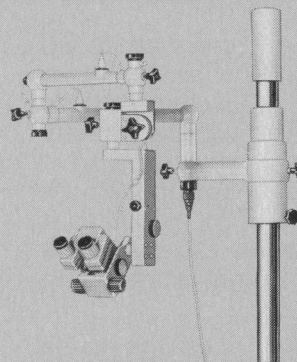
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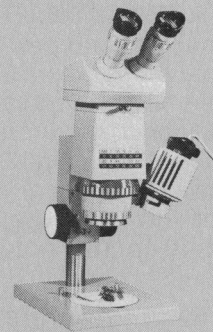
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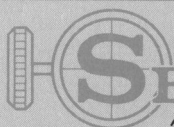


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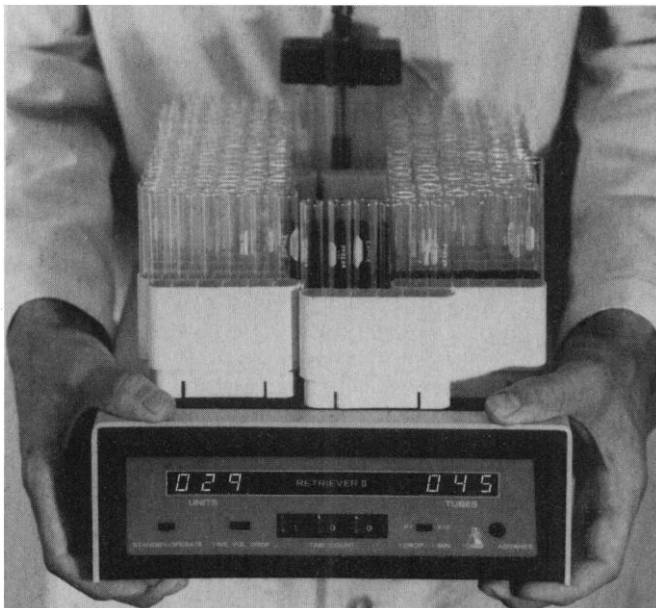
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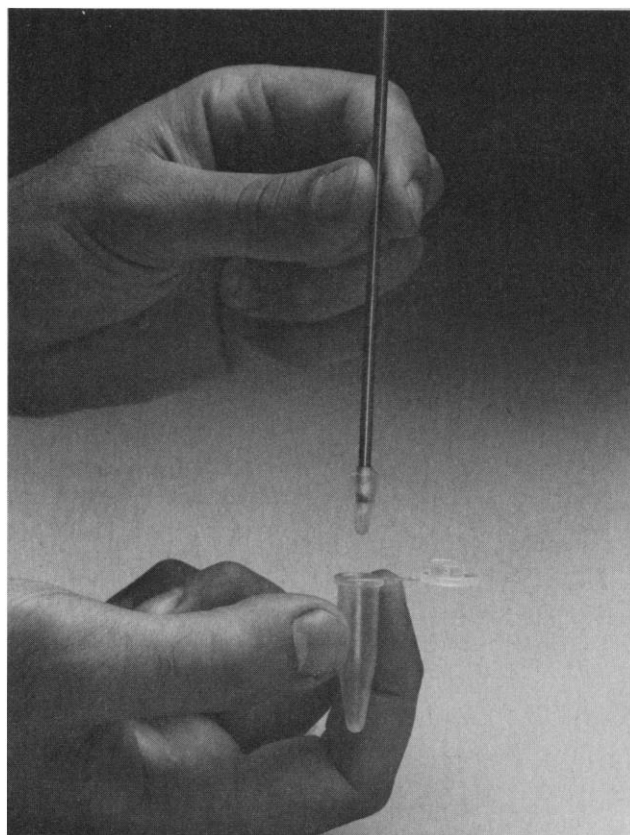
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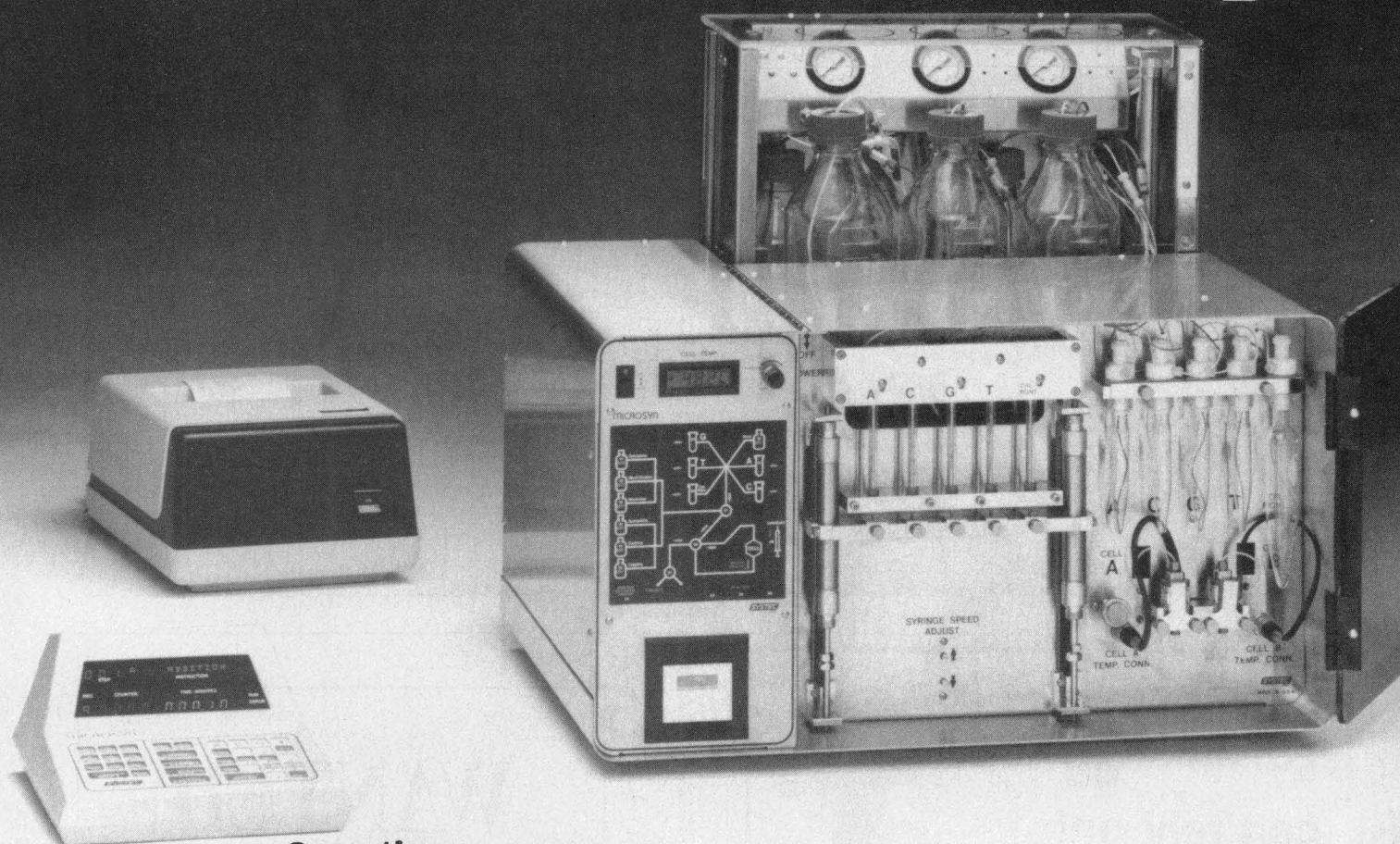


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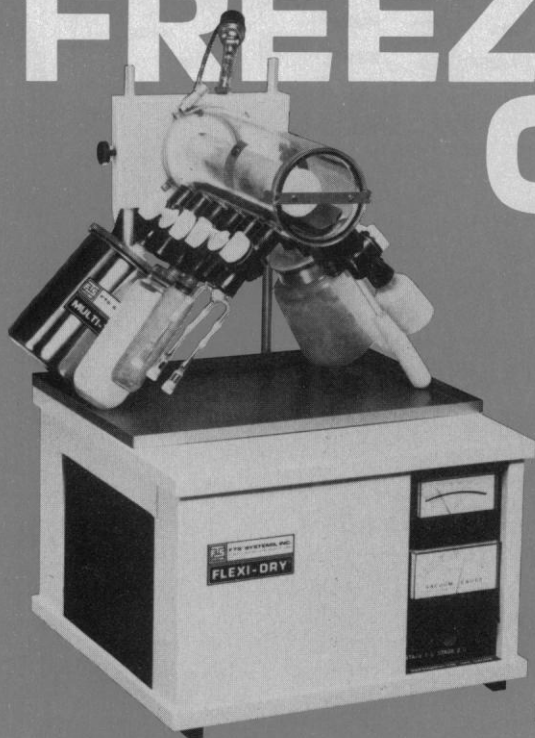
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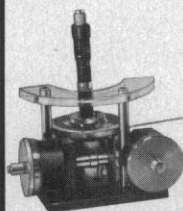
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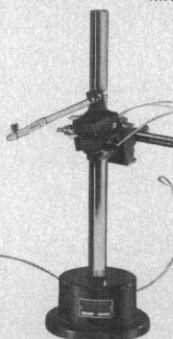
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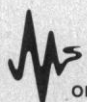
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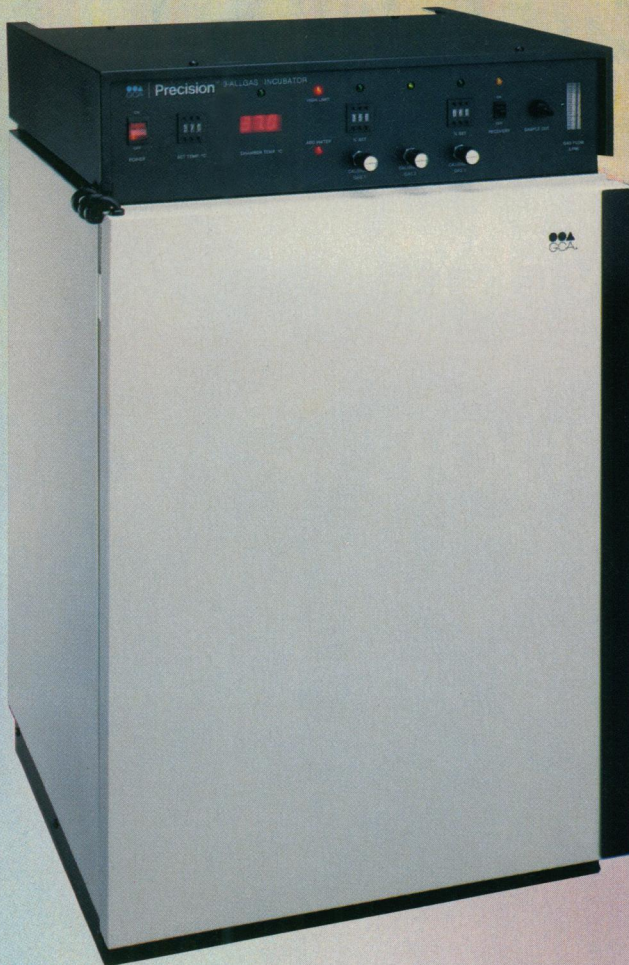
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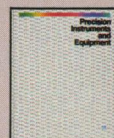


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A New Feature in *Science*

Modern scientists are accused of being specialists. This is a bum rap; it is also true. It is a bum rap when it implies that Newton knew all of science in his day whereas modern scientists are merely nuclear physicists, steroid chemists, or oil economists. The truth is that each of these specialties alone encompasses far more knowledge than did all of science in Newton's day. The range of facts, theories, and technologies that modern scientists must know is usually very broad, even within what outsiders might consider a specialty. Individual scientists may appear to be narrow because of the ever increasing accumulation of knowledge. Actually they know more, but it is a smaller fraction of total knowledge.

Scientists become increasingly isolated because of the jargon used in each specialty. New terms are introduced to describe concepts unknown in Newton's day. The replicons, cistrans, and liposomes of the biologist are foreign phrases to the physicist. The quarks, bosons, and GUT of the physicists are an undeciphered code to the economist. Yet there is both a desire and a need for different disciplines to understand each other. One institution that can contribute to a translating service is a multidisciplinary journal like *Science*. The question is how. We already publish important findings from many disciplines in the same journal. But just as we see that a giraffe tends to fall in love with another giraffe, we suspect that chemists love to read chemistry, archeologists archeology, and so forth. Moreover, adventurous readers who venture outside their areas of expertise soon run into the language barrier. The arcane terminology of a different field is denounced, whereas the jargon in one's own field is defended as the only way to express complicated concepts succinctly.

We have therefore decided to contribute to interdisciplinary communication by starting a new feature, "This Week in *Science*." On this new page, Ruth Guyer will summarize four to eight papers that appear in the current issue of the magazine. The purpose of these brief summaries is to allow the mathematician to understand the purpose and basic content of an article in medicine or a sociologist to understand an article in solid-state physics. We are deliberately picking papers to illustrate diverse developments, not to confer honors on a select few. Any scientist knows that what is immediately trendy may turn out in the light of history to be less important than some unheralded work that was far ahead of its time. In addition, a magazine like *Science* operates in loco parentis—all its authors are valued and cherished. Any article or report that survives our reviewing process is deemed to be of widespread interest. However, it would be physically impossible to give a special accounting of every paper in our weekly issue. We will select only a few so that the page can be read quickly. Over the long run, the subjects will cover a wide spectrum of disciplines even though the selections from one issue will be limited. Thus, over time, the reader of this page should get a good sense of the trends and accomplishments in other fields. This service complements the role played by our Research News and News and Comment writers in reporting the developments in various fields of research. The difference is that the new summaries will be briefer and even less specialist-oriented. An advantage is that those whose curiosity for more is aroused can read the original paper in the same magazine.

Wisdom is sometimes characterized as the ability to learn a little bit about a lot of subjects and a lot about one. We hope that the Renaissance women and men who read our journal will enjoy this new feature.

—DANIEL E. KOSHLAND, JR.

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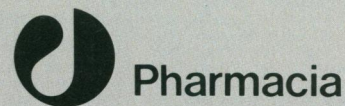
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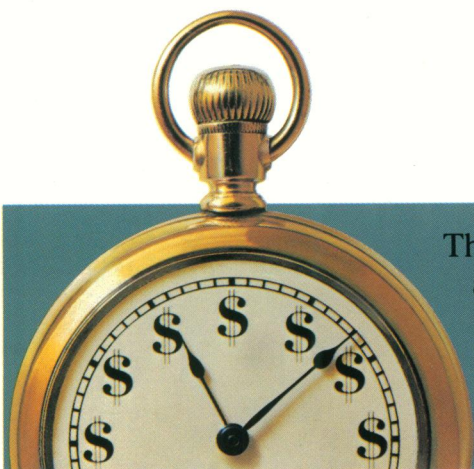
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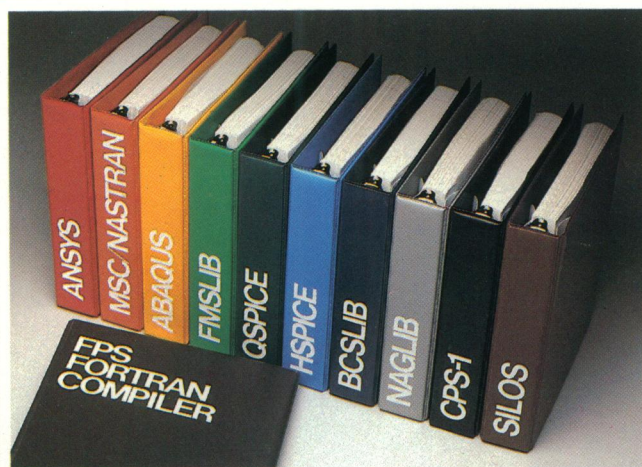
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Main memory capacity	4.5 MWords	15 MWords	7.25 MWords
Maximum disk storage capacity	16 Gbytes	3 Gbytes	3 Gbytes
Precision	15 decimal digits	15 decimal digits	15 decimal digits
Vector registers	4 x 2K	124 x 2K (max.)	4 x 2K
Scalar registers	64	184 (max.)	64
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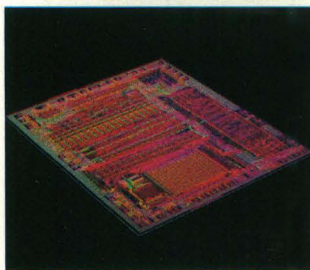
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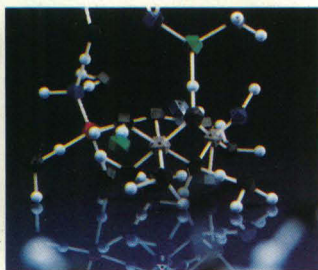
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Peak MOPS	190	1705	165
Peak MIPS (Multi-instruction parcels)	19	5.5	5.5
Typical MFLOPS, LINPACK Benchmark	9.9	20.0	6.0
Whetstones (64-bit)	20,100	5800	5800
1000x1000 matrix multiply, seconds	53	10	66
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We are particularly interested in symposia dealing with the latest developments in science and technology, and the implications of these developments for society.

All symposium proposals are subject to review. If the information submitted is inadequate for reviewing, the proposal will be returned. Endorsement (sponsorship) by a AAAS Section Committee expedites the review process. It is therefore in the interest of the proposer to send a *copy* of the proposal to the appropriate Section Secretary (see table of contents page of

Science for names) for endorsement at the same time the *original* is sent to the AAAS Meetings Office.

Speakers should *not* be confirmed at this time; however, sufficient information about probable speakers and their topics should be provided to allow for evaluation of the proposal. Please note that AAAS does not pay honoraria to speakers.

Some Deadlines

October: You will be notified about acceptance, conditional acceptance, or non-acceptance of your proposal. Further information will be provided at that time.

November: Preliminary programs with confirmed speakers are due.

January: Final program copy, suitable for publication, is due.

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Affiliation _____

Topic _____

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Topic _____

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