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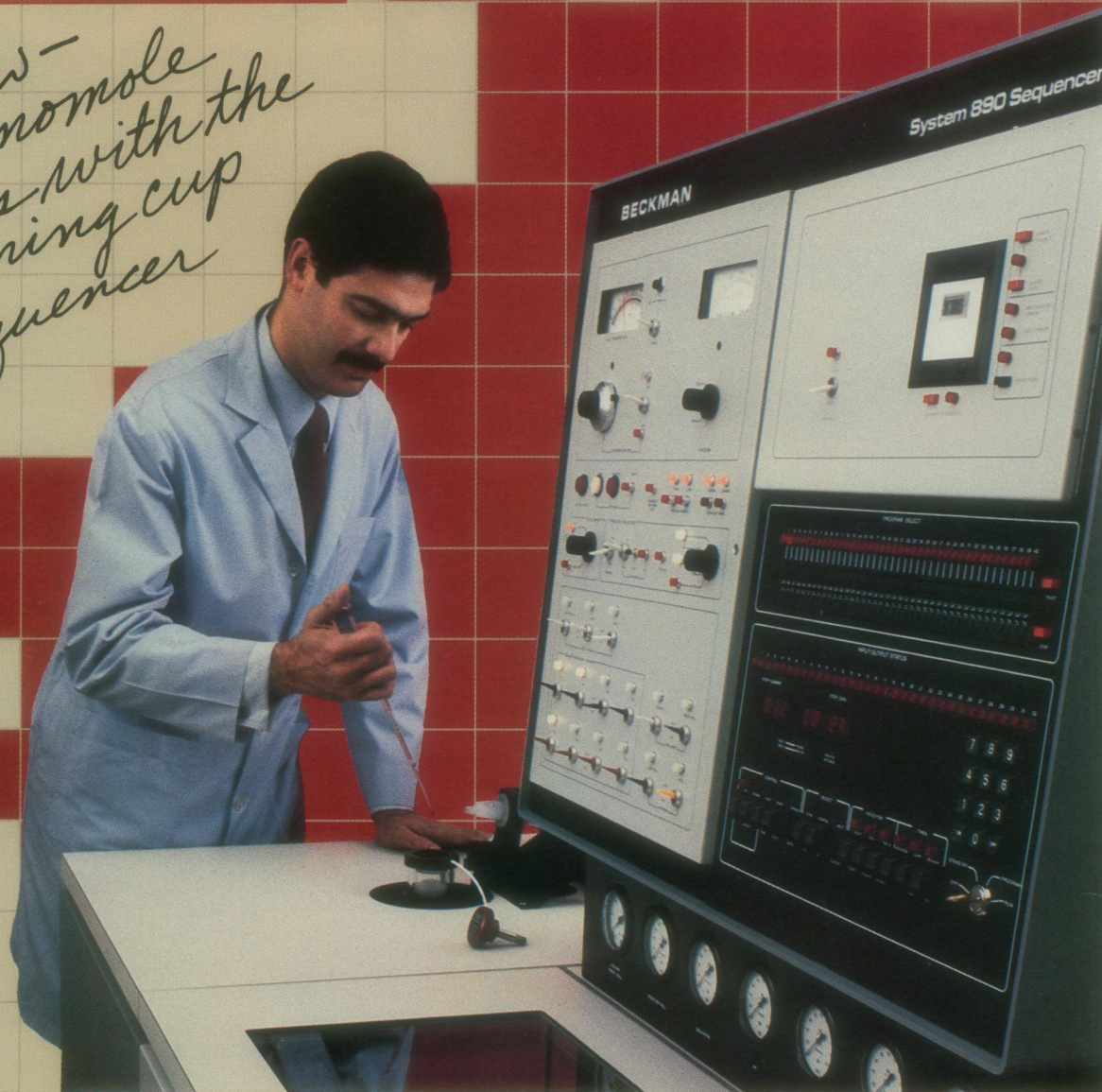
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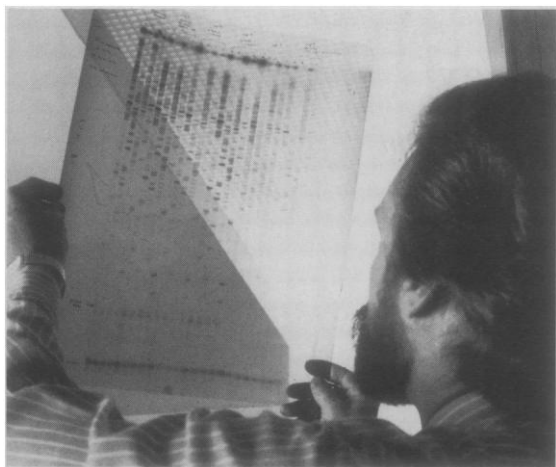
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Biotechnology

Edited by Philip H. Abelson

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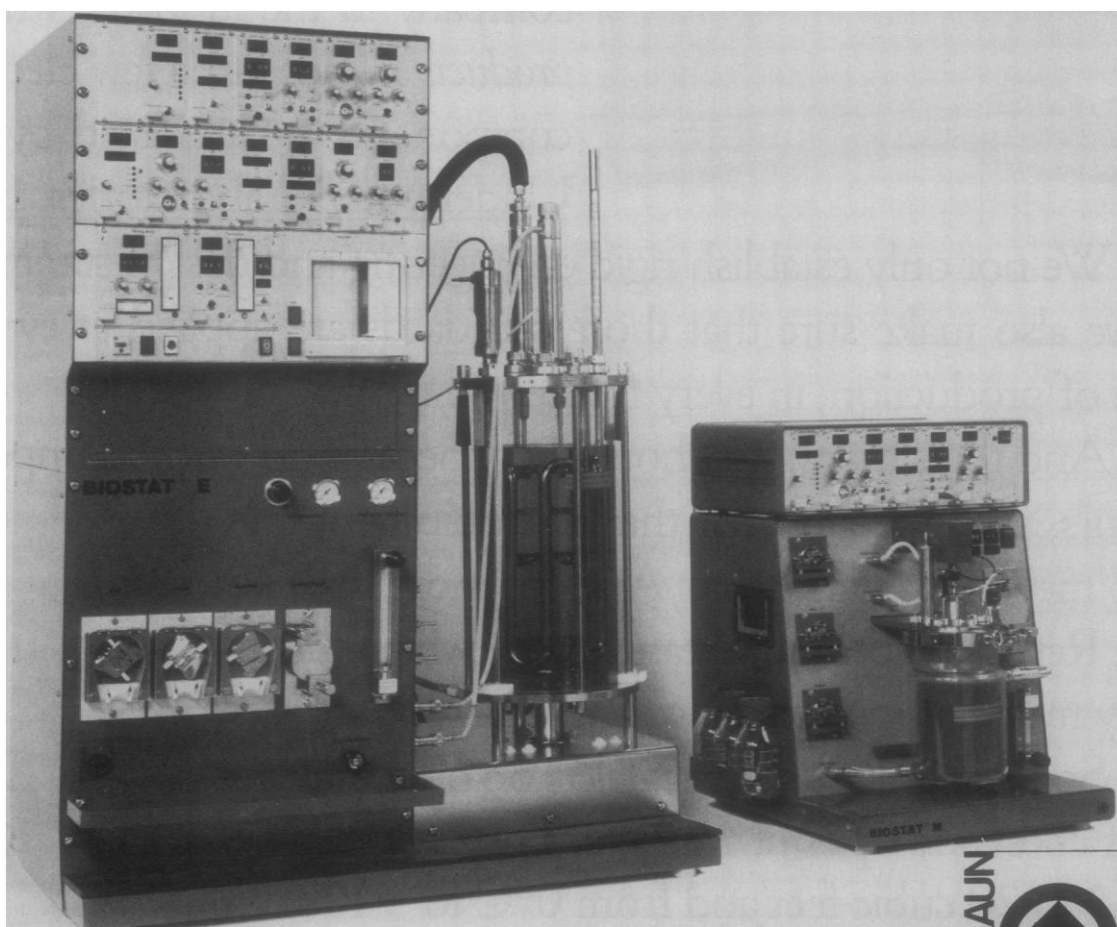
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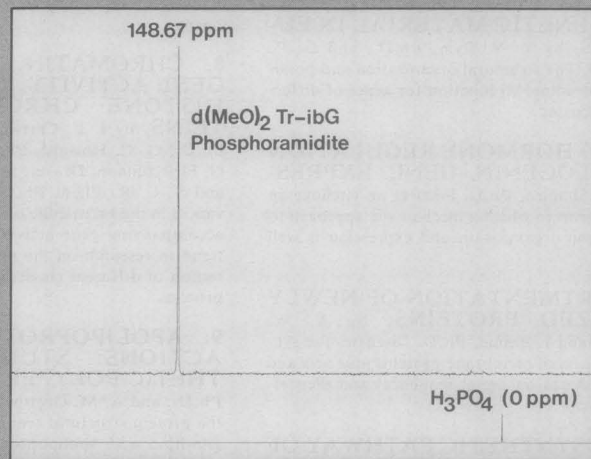
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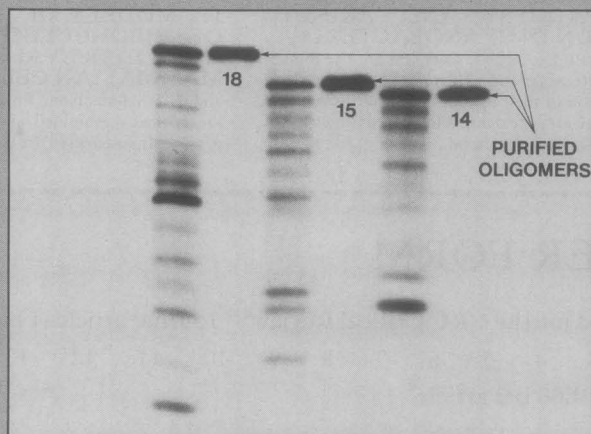
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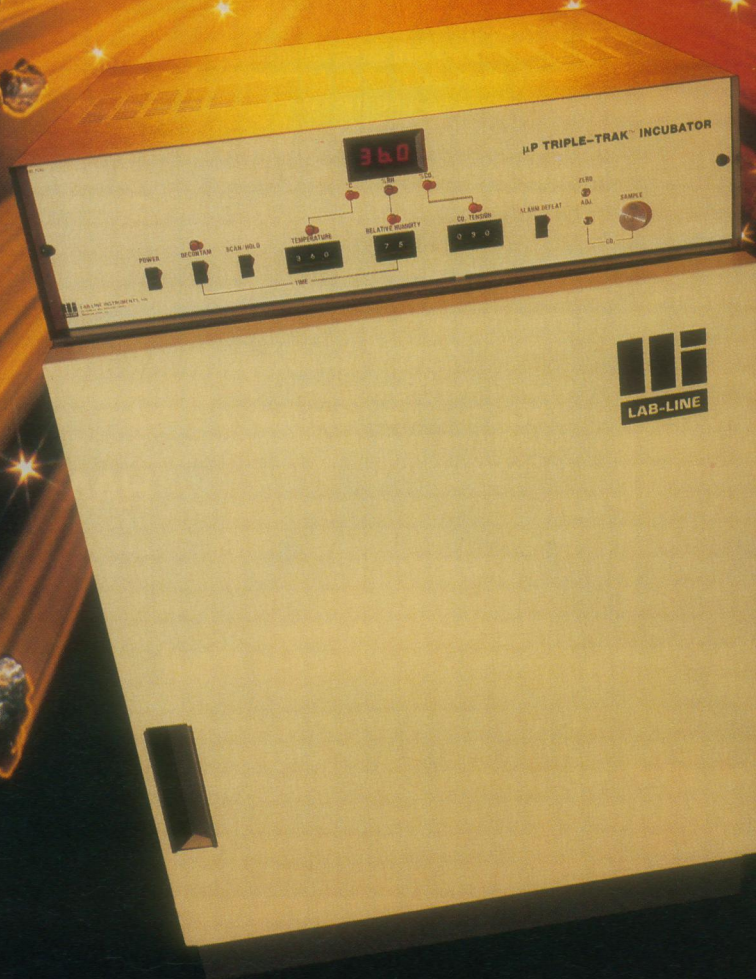
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The exclusive interlocking design of the UVA Agarose Cell and the UVT Transilluminator eliminates UV leakage so there's no need for cumbersome goggles. And because the cover of the UVA cell is opaque to UV wavelengths, the researcher can view the progress of the experiment without hazard at any time during the run.

VERSATILE CELL CONFIGURATION

The UVA cell is a compact design that conserves costly reagents—gels are 2 to 10 mm thick with 100 x 150 mm dimensions. The cover window is especially coated and vented to prevent fogging and allow easy viewing and photography. Overall, the cell and illuminator together are small and light enough to be stored easily in the lab.

WITH REGULATED POWER SUPPLY

Complete the UVA/UVT electrophoresis system with a Haake Buchler 3-1500 Power Supply. It's fully and precisely regulated in three modes—constant power to 200 watts, constant voltage to 1000 volts and constant current to 200 milliamps. Digital read-out allows easy monitoring and repeatability.

START READING EASIER

Give your research the benefit of brighter, easier to read results. To get complete details on the UVA cell, UVT illuminator and 3-1500 Power Supply, contact your local authorized distributor or Haake Buchler for the office nearest you. And ask about the complete line of Haake Buchler Laboratory Standard Instruments.

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ABBOTT DIAGNOSTICS: WHERE WHERE IDEAS BECOME REAL...

A TECHNOLOGY DRIVEN COMPANY — DRIVEN TO LEADERSHIP

Imagination. Freedom. Intelligence. Strong financial backing. The key aspects of a technology driven organization that is driving towards a variety of new products for the medical care field in 1983 and beyond.

Abbott Diagnostics Division has accelerated its efforts to lead the medical diagnostics industry with products that solve problems ... with products that answer needs.

Here is a scientific research environment that is unparalleled. An environment that has state-of-the-art equipment ... state-of-the-art technology ... and state-of-the-art thinking. This is an environment that enjoys the full, unrestricted backing of a \$2.5 billion corporation. It's also an environment that delivers. With imagination. And with outstanding results.

THESE NEW PRODUCTS SET THE PACE — A PACE WE INTEND TO KEEP

One look at the Abbott Diagnostics Division of 1983 tells you where we're going.

Successful new product introductions of the past five years include breakthroughs in immunoassays, as



well as new systems for drug and disease monitoring.

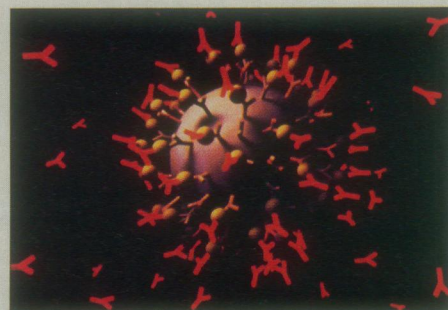
In the immunoassay field, Abbott Diagnostics has historically been a leader for reagents that diagnose hepatitis, rubella and many other diseases. Our traditional strength in Radio-immunoassay development has now been greatly enhanced through advances in life sciences and electronics technologies leading to enzyme and fluoro immunoassay systems.

Our recently introduced TDX System brings increased simplicity and sophistication to therapeutic drug monitoring by using microprocessor controlled fluorescence polarization techniques. And Abbott's CEA (carcinoembryonic antigen) reagent kits help physicians around the world monitor the effects of therapy on cancer patients. New ideas. New technologies. New products. For Abbott Diagnostics, technology means leadership.

ABBOTT PROFESSIONALS HAVE THEIR OWN IDEAS ABOUT GROWTH

Abbott Diagnostics centers its advanced R&D activities around interdisciplinary teams of scientists who bring together technical expertise, imagination and creativity. At Abbott there is a firm commitment to the free expression and exploration of ideas. We encourage you to think. And we reward smart thinking with recognition, advancement and the opportunity to see your ideas become meaningful products.

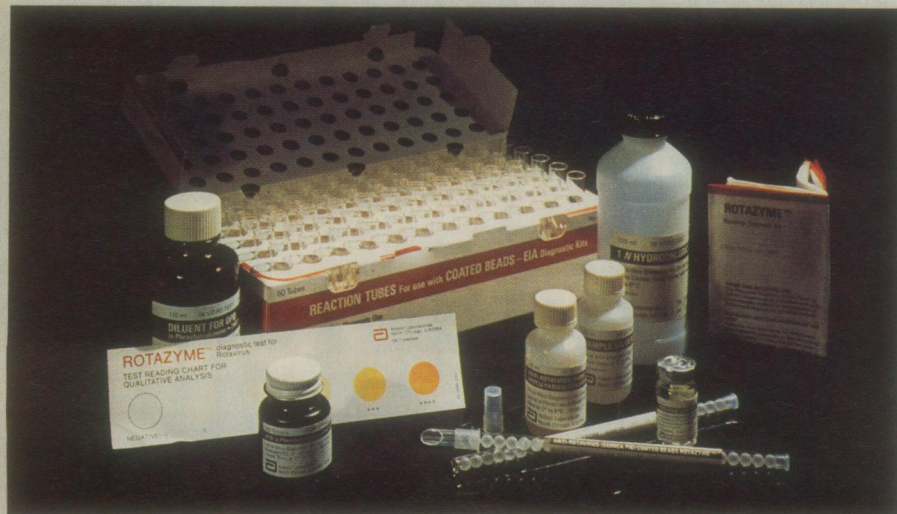
If you seek an environment that offers financial strength, tremendous professional support, and true technological leadership, consider Abbott Diagnostics Division.



Immunoassay

OPENINGS IN 1983 — SUCCESS CREATES NEW GROWTH

The following list of positions represents some of the openings that will be available during 1983 at Abbott Diagnostics. If you do not see yourself in this list, please do not hesitate to contact us. We always welcome the opportunity to talk with talented professionals.



ABBOTT
ABBOTT PARK ILL. 60064
"HEALTH CARE WORLDWIDE"

TECHNOLOGY TAKES FORM... WHERE GROWTH CONTINUES...

BIOCHEMIST — IMMUNOASSAY DEVELOPMENT

Utilizing an innovative systems approach, this position involves the purification and characterization of protein and carbohydrate antigens. Qualified candidates will have a Ph.D. in Biochemistry or related discipline, and 2-3 years of post-doctoral experience in immunoassay development with an emphasis on immunochemical reaction characteristics at surfaces and interfaces.

BIOCHEMIST — IMMUNODIAGNOSTICS/CLINICAL CHEMISTRY

Selected candidate will pursue independent research with a focus on the development of new diagnostic test kits. A Ph.D. in Biochemistry or related area plus some previous research experience required. Knowledge of medical diagnostics, organic chemistry, immunochemistry and hybridoma technology desirable.

BIOCHEMIST — SYNTHETIC POLYMER RESEARCH

Applicants will have a Ph.D. in Biochemistry, Chemistry or equivalent, and previous research experience in the areas of Physical Biochemistry, Analytical Chemistry or Organic Chemistry. Background in an industrial environment with project management experience is required. This position performs original research involving electrolytes, enzymology and immunology in synthetic polymer membranes.

BIOCHEMIST/ BIO-ORGANIC CHEMIST

This position involves assay development for new instrumentation and requires an individual with a Ph.D. or an MS degree plus extensive industry experience. All applicants should have a minimum of 2 years experience in assay development, enzyme stabilization or organic chemistry (not synthesis), and a knowledge of enzymology, blood chemistries, and chromophores.

PH.D. — BIOCHEMISTRY/IMMUNOCHEMISTRY/ MOLECULAR BIOLOGY

This position involves developing novel approaches in the area of monoclonal antibody immunoassays. The qualified candidate will have a Ph.D., post-doctoral experience preferred. A strong knowledge of biochemical and immunochemical laboratory procedures is essential, with experience in immunodiagnostic or monoclonal antibodies considered helpful.

ANALYTICAL BIOCHEMIST

The selected candidate will have both a Ph.D. in Biochemistry and an MS in Analytical Chemistry, coupled with a background in HPLC, spectroscopy and microprocessor technology. Responsibilities include developing instrumentation and chemistry systems.

PH.D. — BIOCHEMISTRY/IMMUNOCHEMISTRY

The qualified candidate will be an innovative individual with a Ph.D. and a strong background in immunochemistry. This position involves investigating new approaches and ideas in immunodiagnostic technology using monoclonal antibodies and synthetic peptides. Operating within an independent environment, the qualified candidate will have the opportunity to utilize their creative talents to the fullest extent in developing new ways of approaching diagnostics.

CLINICAL CHEMIST

This position is ideal for the professional interested in new product development. Candidates will have an advanced degree in Biochemistry, Bio-Analytical Chemistry or Physical Chemistry, Ph.D. preferred, and at least 2 years of industrial and/or laboratory experience in enzymology, organic synthesis, protein chemistry, and reagent development. Knowledge of medical instrumentation and systems development desirable.

PH.D. MOLECULAR BIOLOGY

The qualified candidate will possess a Ph.D. in the biological sciences with at least 3 years postdoctorate experience and the ability to clone peptidic hormones. Experience with reverse transcriptase and familiarity with brain peptides is preferred.

RESEARCH SCIENTISTS — IMMUNOASSAY DEVELOPMENT AND INSTRUMENTATION RESEARCH

The outstanding candidates who qualify will engage in research and development on state-of-the-art immunoassay reagents and instrumentation. Advanced degrees in biochemistry/immunochemistry for immunoassay development, and biomedical or electrical engineering for instrumentation research is required. Up to 5 years relevant postgraduate experience in RIA, EIA, or FIA development is desirable.

TECHNICAL SUPPORT SPECIALIST

This position involves troubleshooting technical problems, upgrading product performance through the implementation of new technology, and improving processes for efficiency yield and cost reduction, while interacting with all operations areas. The qualified candidate will possess a Ph.D. or equivalent in Biochemistry, Clinical Chemistry or related disciplines with 2-5 years experience in immunoassay technology.

MICROFABRICATION ENGINEER

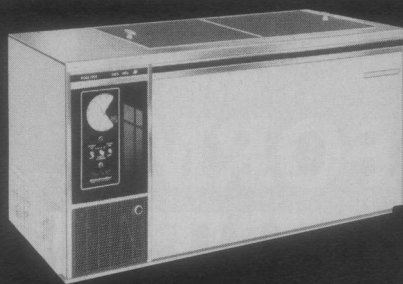
We seek a professional acutely familiar with all phases of microfabrication. This position involves both processing and product development. Thorough knowledge of semiconductor processing procedures is required. A degree in Physics or Electrical Engineering required, with a strong background in material properties and processing preferred.

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Abbott Diagnostics Division is located at our Corporate headquarters in an attractive suburban area on the Lake Michigan shoreline, 30 miles north of Chicago. For consideration, please complete the following and send, preferably with your most recent resume, to: Sue Hart-Wadley/Corporate Placement, Abbott Laboratories, Abbott Park, IL 60064.

Name _____
Address _____
City _____ State _____ Zip _____
Phone # (Work) _____ (Home) _____
Education Level _____
Recent Experience _____
Career Interests _____

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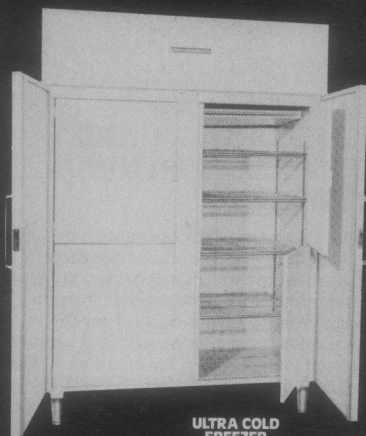
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PHARMACY REFRIGERATOR



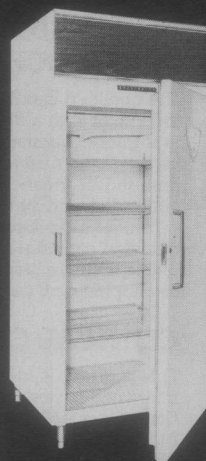
BLOOD PLASMA FREEZER



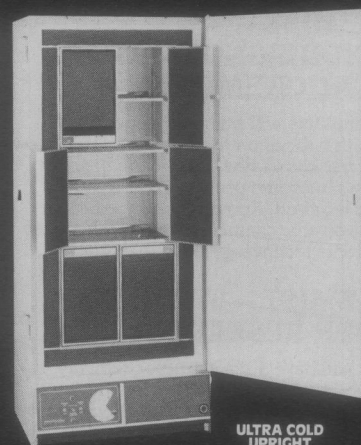
ULTRA COLD FREEZER



BLOOD BANK REFRIGERATOR

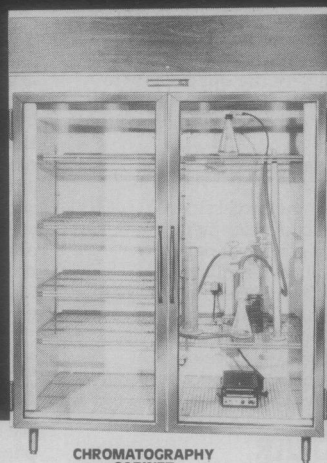
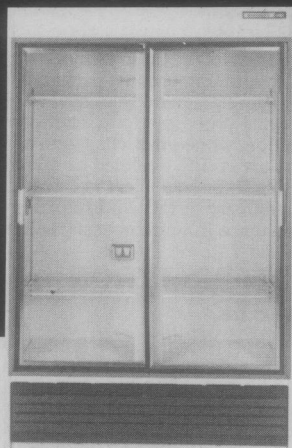


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CHROMATOGRAPHY CABINET

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Fact. State-of-the-art starts at Kelvinator. Every Kelvinator refrigeration unit is backed by 65 years of continuing cold storage research and development. Giving you the most technologically advanced system available. And state-of-the-art doesn't stop with superlative design.

Fact. Kelvinator quality means proven dependability. State-of-the-art lives in

craftsmanship and quality of materials as well. Ingenuity made us the industry leader, and performance keeps us there.

Fact. There's a Kelvinator unit to meet your specific cold storage requirements. Ultra Cold. Chromatography. Flammable Material Storage. Blood Storage. Laboratory Refrigerators. All intelligently designed with each individual application in mind. Nearly 50 models to choose from in various sizes, designs and

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VWR presents:

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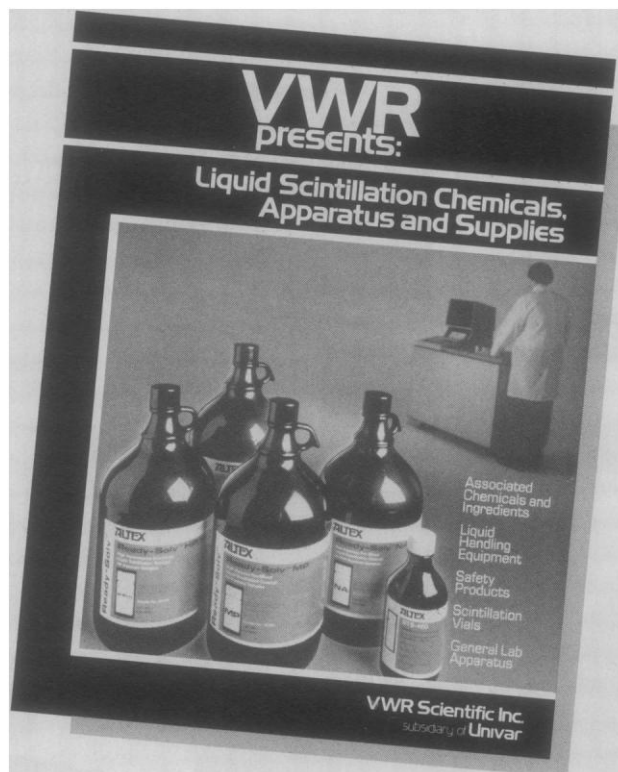
This unique publication features the entire Altex line of aqueous and non-aqueous cocktails. You will find all-purpose cocktails, as well as cocktails made for specific applications. It also contains the industry's most complete listing of L.S. related apparatus and supply items. Everything from applicators to vortex mixers plus detailed listings of cocktails, scintillation vials and chemicals.

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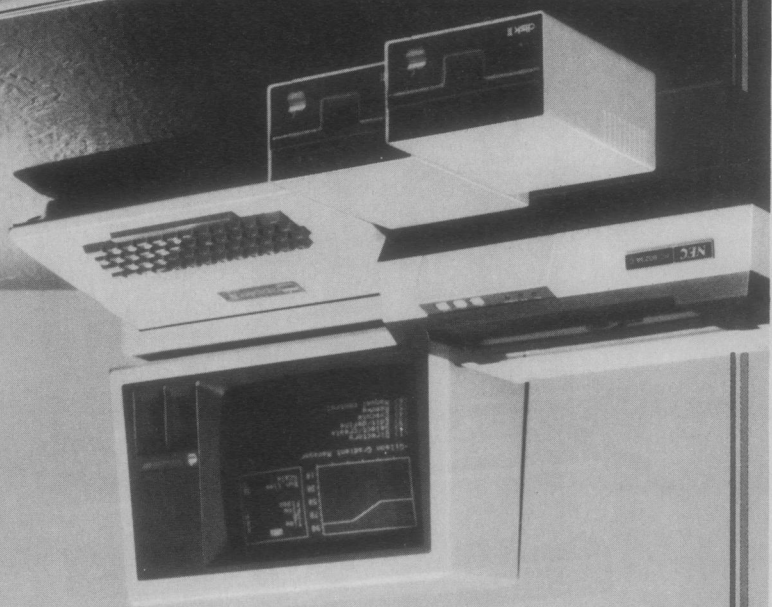
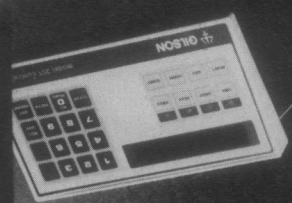
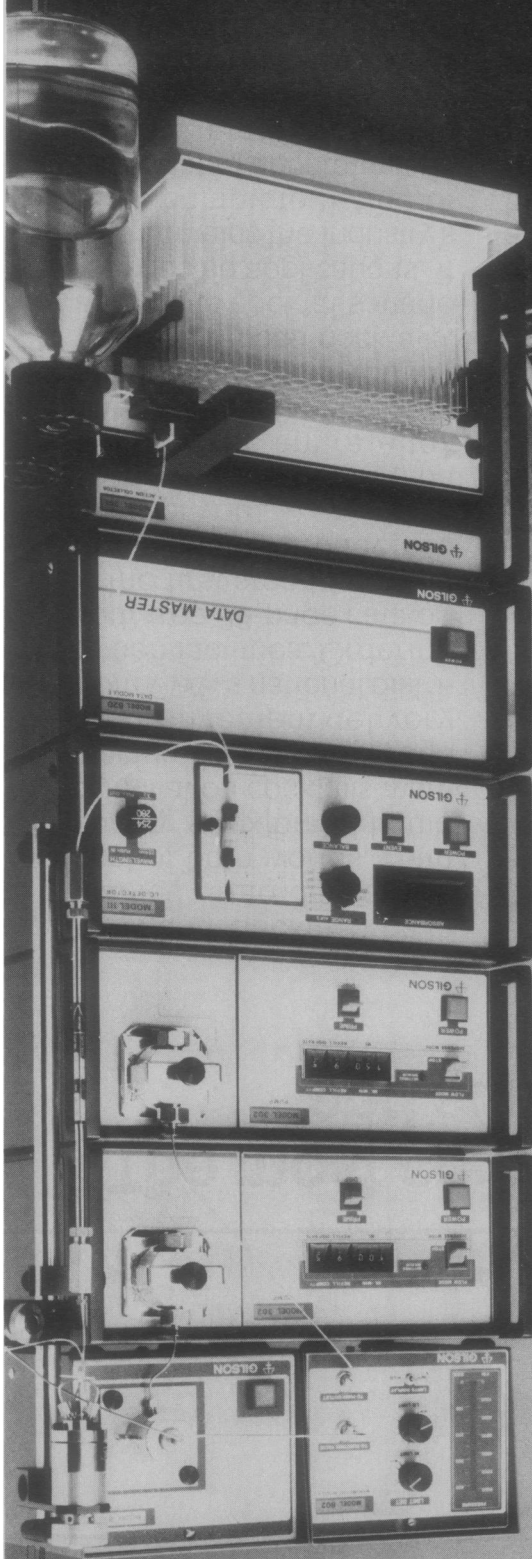
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Modularity makes it work. Our add-on approach lets you match the right system to your application. And expansion through hardware and software additions will enhance your system's capabilities without costly duplication. Let Gilson modularity work for you. Contact us for complete information.



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Presenting the AO Histostat Tissue Embedding Center -- a compact, integrated three-in-one work station that makes tissue embedding faster, easier and less expensive.

The AO Embedding Center features a paraffin bath with a 2.5 litre reservoir and illuminated manual dispenser, a heated plate with forceps warmer and overflow drawer, and a 11" x 15" cold plate to accelerate specimen solidification. An optional built-in vacuum infiltrator is also available.

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EASIER

The AO Embedding Center has a stable, solid 32" x 17" work surface, assuring maximum utilization of space. Everything is within easy reach. The low height reduces fatigue during long sessions when the work load is heavy. And, because the nylon coated work surface is one-piece -- with no cracks or open spaces -- cleanup is fast with less hassle.

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The manufacturing cost effectiveness of building a one-piece unit allows us to offer the AO Embedding Center at a price up to 30% less than competitive component systems. Savings like this enable you to get the system you need now instead of waiting to assemble a system piece by piece.

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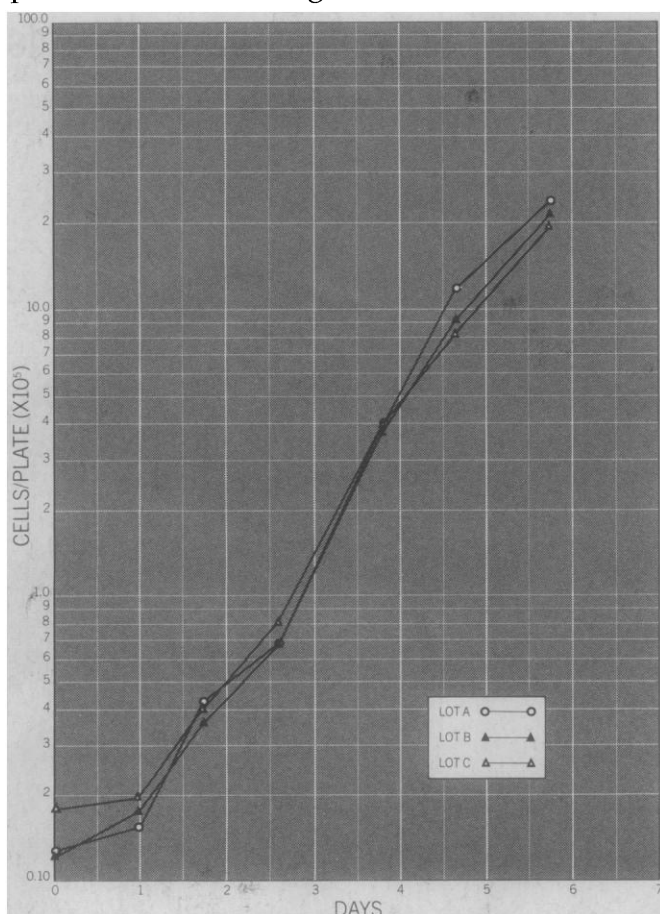


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NU-SERUM*: A LOT DIFFERENT
BECAUSE THE LOTS STAY THE SAME.

Nu-Serum™ medium supplement contains growth, attachment and transport factors, hormones, serum and essential nutrients to promote uniform cell growth.



Uniform growth promotability demonstrated by BHK-21 cells grown in three different lots of Nu-Serum™

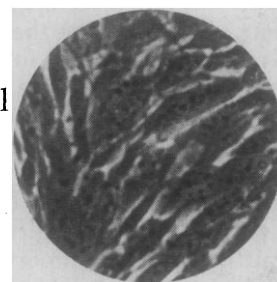
*Patent pending. Nu-Serum is a trademark of Collaborative Research, Inc. for its brand of medium supplement.

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BHK-21 cells grown in 10% Nu-Serum™

NU-SERUM™ OFFERS
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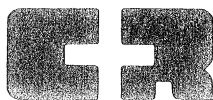
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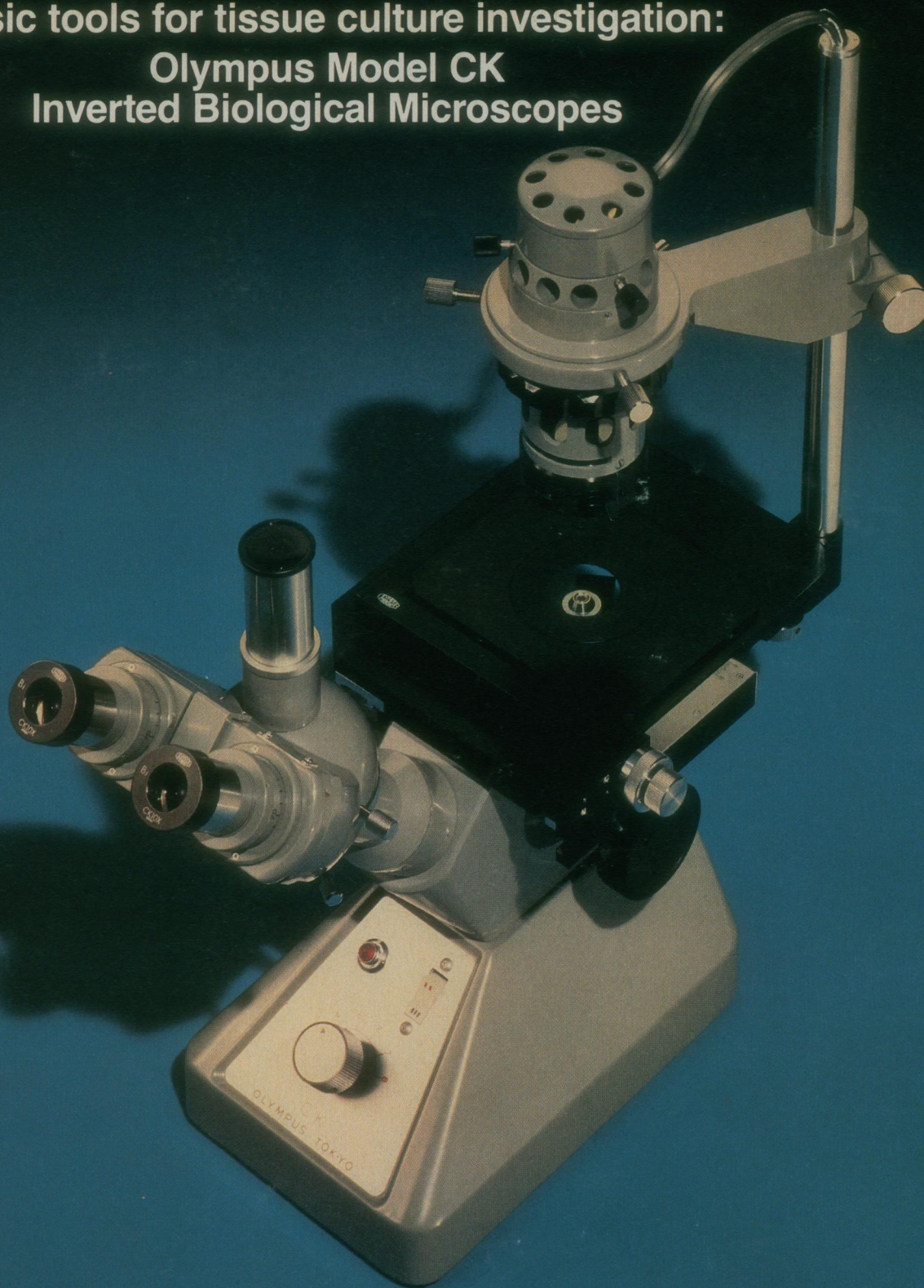
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The CK microscopes were conceived as the primary instruments for in vitro examination, without superfluous features so that it is reasonably priced. But without sacrificing capability, such as phase contrast.

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OLYMPUS
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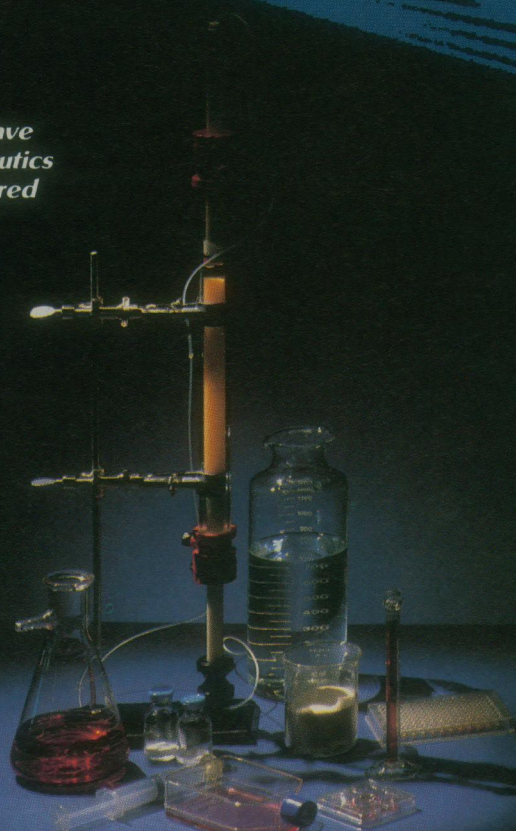
Bovine Albumins – quality, full line, versatile, reliable, at a competitive price.

Armour Pharmaceutical scientists pioneered the development of blood fractionation technology. We have been a major fractionator of human plasma for therapeutics since 1943, and since the late 1940's have manufactured Bovine Albumin for biochemical and diagnostic applications.

We have almost a century of experience as a producer of high quality biochemicals – but we are more than just a biochemical manufacturer – we are a pharmaceutical company.

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and metabolic research.*



Armour Pharmaceutical Company

Biochemicals – a commitment to the '80s

Bovine Albumins – a wide variety of products from 30 years of blood fractionation technology.

Although Armour Pharmaceutical has a long-standing tradition in the development of Bovine Albumins, we are not bound by tradition; our attitude is one of innovation – we have not only pioneered in Albumin developments, but have become the most active in applying versatility for new uses.

An example of, and a statement about, some of our Albumins . . .

COHN FRACTION V BOVINE ALBUMIN POWDER

"Fraction V" has become a generic label for a variety of Bovine Albumin products with different basic characteristics. Originally, the designation "Fraction V" referred to the fifth precipitate obtained in a cold ethanol fractionation process developed by Dr. E.J. Cohn at Harvard University during the Second World War. Armour collaborated in that project. Most therapeutic human blood fractions are still produced by the Cohn Cold Ethanol Process. Armour Bovine Albumin Fraction V continues that tradition.

Armour Fraction V Albumin has two important characteristics:

- 1 - Prepared under non-denaturing conditions
- 2 - Native fatty acid profile reflecting residual endogenous lipids.

Because Armour Fraction V is prepared under non-denaturing conditions – is never heated – no exogenous short chain fatty acid stabilizer is ever added. Bovine Albumin products manufactured by selective thermal denaturation processes usually have fatty acid profiles dominated by residual exogenous stabilizers.

For some applications, the special preparation of Bovine Albumin under non-denaturing conditions with a native fatty acid profile is important. For others, it is not.

Armour Fraction V is prepared under non-denaturing conditions by the traditional Cohn Cold Ethanol Process using the same strict quality controls applied to human plasma fractions for therapeutic use.

BOVINE ALBUMIN POWDER

Bovine Albumin Powder is more highly purified than our traditional Cohn Cold Ethanol Process Fraction V Powder, but manufactured by a lower cost process to give a quality product at a reasonable price. Armour's large scale processing capability permits competitive pricing despite the high cost of rigorous quality control associated with pharmaceutical operations. Because Bovine Albumin Powder is a heated product, it contains 1-2 mg fatty acid/g protein, about 2/3 of which is octanoic.

CRG-7 (Bovine Albumin, Clinical Reagent Grade)

A fatty acid free Bovine Albumin powder for the most discriminating research and diagnostic applications, manufactured by a process specifically designed to give consistently low levels of residual metabolites and enzymes.

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Rehavid S-30, S.F. is a 30% Bovine Albumin solution processed to optimize its characteristics as a serological diluent. It also has been processed to reduce residual octanoic (caprylic) acid to avoid false reactions in the rare incidence of patients with anticaprylate antibodies.

OTHER BOVINE ALBUMIN PRODUCTS:

Crystallized Bovine Albumin (CBA)

Bovine Albumin Powder Type H-7

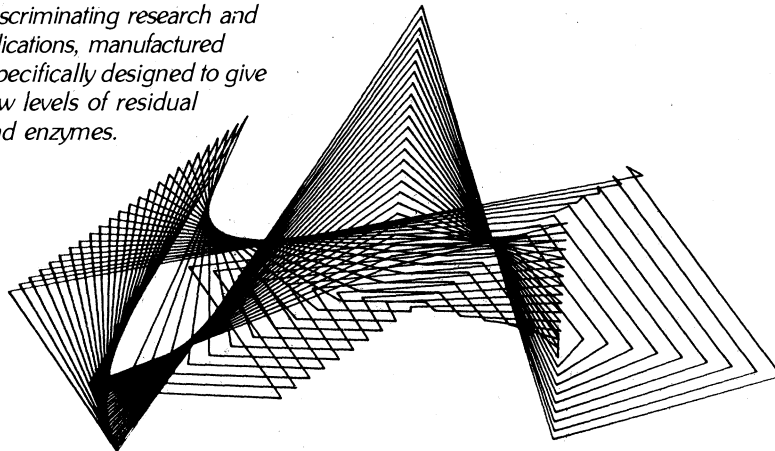
Rehavid® S-30 (standard)

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Leptalb® 7 (for Leptospira growth)

**PLM™ 5 (prepared Leptospira Medium
5X concentration)**

For an interchange of technical information on Bovine Albumins, call 1-800-435-1852 (in Illinois 1-312-726-6851) or write: Technical Service Manager, Biochemicals, Armour Pharmaceutical Company, P.O. Box 511, Kankakee, IL 60901.



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Biochemicals – a commitment to the '80s

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AVAILABLE MARCH, 1983

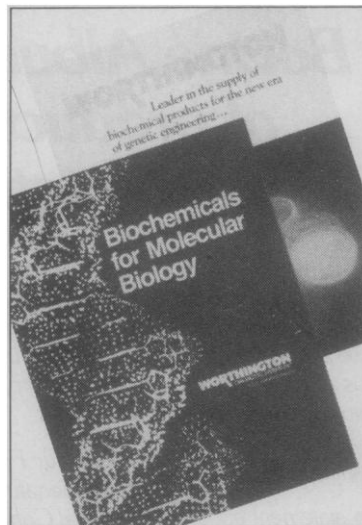
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Homogenizer,
you can
homogenize
samples
under 1 ml**

**...homogenize
anaerobically**

**...and
without
cross
contamination.**



When it comes to breaking down and homogenizing virtually any type of tissue, small organs, bones, muscle, cartilage, or even an entire mouse, the Brinkmann Homogenizer is in a class by itself.

Consider its power. A 600W motor develops up to 30,000 rpm (1200W on PT-45 model, with up to 20,000 rpm) to assure complete homogenization of most samples within 30 to 60 seconds (other instruments may require 15 minutes or more).

Consider the wide choice of generators, all made entirely of stainless steel. It includes a Microprobe Generator small enough to fit into a standard cuvette (for samples as small as 1 ml or less), Anaerobic Generators for aerosol-free homogenization, a Mechanical Seal Generator to

minimize contamination and cleaning problems, even an in-line bench-top unit that homogenizes without admitting air.

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ANNOUNCING FASEB SUMMER RESEARCH CONFERENCES FOR 1983

The Federation of American Societies for Experimental Biology will again present a series of Summer Research Conferences designed to meet the demand of experimental biologists for *intimate and detailed analysis* of current research in areas of intense scientific interest. The conferences, held weekly at the Vermont Academy in Saxtons River, Vermont, will be limited to an attendance of 150 persons and will be by invitation upon application. A conference fee of \$230 per person covers one week's room, board and registration. For additional information, a complete program and application form, please see the February issue of *FEDERATION PROCEEDINGS*, Volume 42, Number 2.

PROGRAM

SECRETION (June 12-17)

Chairman: Ronald Rubin, Medical College of Virginia

Vice-chairman: Jerry Gardner, National Institutes of Health

Intracellular Processing & Transport of Secretory Material. J. Jamieson, G. Grodsky, G. Scheele, J. Habener; **Receptor-Response Mechanisms – Ionic Events.** N. Kirshner, I. Atwater, P. Baker, P. Conn, I. Schulz, O. Petersen, J. Meldolesi; **Biochemical Events.** D. Lagunoff, F. Crews, J. Putney, M. Gershengorn; **Intracellular Control – Interactions of Cellular Mediators.** J. Gardner, H. Korchak, R. Sha'afi, P. Churchill, C. Wollheim; **Microfilaments & Microtubules.** P. Hall, S. Howell, J. Bennet, J. Trifaro; **Calmodulin-Phosphorylation Mechanisms.** A. Means, U. Schabart, M. Feinstein, J. Williams, R. DeLorenzo, R. Steinhardt; **Exocytosis & Membrane Recycling.** W. Douglas, F. Cohn, H. Plattner, P. Cullis, H. Pollard.

NEURAL CONTROL OF RESPIRATION (June 19-24)

Chairman: Donald Frazier, University of Kentucky

Vice-chairman: Walter St. John, Dartmouth Medical School

Adult Control: Respiratory Rhythmicity. W. St. John; **Afferent Mechanisms – Mechanoreceptors.** F. Zechman, G. Sant'Ambrogio, R. Shannon, S. Muza; **Chemoreceptors.** R. Fitzgerald, E. Nattie; **Efferent Mechanisms.** D. Bartlett; **Suprapontile Mechanisms.** R. Harper; **Historical Perspective on Respiratory Control.** D. Frazier, F. Kao; **Ventilatory Control in the Infant.** B. Thach, D. Shannon, J. Morola.

NEUROTRANSMITTERS (June 26-July 1)

Chairman: Stanley Parsons, University of California, SB

Vice-chairman: Harvey Pollard, National Institutes of Health

Transport in Cell, Granules & Synaptic Vesicles. G. Rudnick, S. Parsons, S. Schuldiner, D. Njus, M. Levine, E. Deliberto, H. Winkler, B. Kanner, A. Ramu, D. Apps; **Presynaptic Regulation of Synthesis & Secretion.** A. Goldberg, B. Collier, J. Cooper, P. Carroll, G. Gibson, O. Zinder, B. Livett, G. Pilar, B. Howard, D. Kuhn, J. Suszkiw, D. Michaelson, D. Jenden; **Cell Biology of Secretion.** W. Wu, A. Boyne, V. Chan-Palay, R. Ornberg, G. Pappas, D. Aunis, K. Morita, J. Trifaro, D. Foxhall, C. Creutz, H. Pollard, J. Scott, R. Klausner; **Synthesis, Composition & Assembly of Secretory Vesicles.** V. Whittaker, T. Joh, O. Viveros, W. Lovenberg, K. Kelner; **Presynaptic Toxins.** I. Hanin, L. Kohn, B. McClure, D. Anderson.

MICRONUTRIENTS: TRACE ELEMENTS, STATUS OF Cu, Zn, Fe & Se (July 3-8)

Chairman: Boyd O'Dell, University of Missouri

Vice-chairman: Edward Harris, Texas A&M University

Trace Elements: Nutritional Status & Bioavailability. Cu. E. Harris, D. Danks, J. Prohaska; Se. O. Levander, R. Burk, H. Ganther, P. Whanger; Zn. A. Prasad, J. Apgar, P. Fraker, P. Reeves; **Physiological Assessment of Zn & Cu Bioavailability.** N. Solomons, H. Anderson, J. Erdman, R. Cousins; **Extrinsic Labels in Assessment of Bioavailability.** V. Young, J. Turnlund, R. Schwartz; **Interactions That Affect Bioavailability.** M. Fox, H. Sandstead, R. Chaney, G. Cherian; **Future Research: Problems & Potential.** W. Mertz; **Fe Bioavailability.** J. Cook, C. Bodwell, G. Bates.

SOMATIC CELL GENETICS (July 10-15)

Chairman: Richard Davidson, University of Illinois at the Medical Center

Vice-chairman: Lawrence Chasin, Columbia University

Gene Transfer Vectors. R. Mulligan, P. Howley, M. Capecchi, M. Botchan; **Genetic Mapping, Molecular & Chromosomal.** L. Chasin, T. Caskey, R. Demars, T. Shows; **Oncogenes.** R. Weinberg, M. Cole, G. van de Woude, I. Verma; **Gene Amplification.** R. Schimke, J. Hamlin, J. Biedler, R. Kaufman; **Epigenetic Phenomena.** R. Davidson, L. Shapiro, B. Migeon, R. Ivarie; **Non-Vertebrate Systems.** A. Chovnick, G. Rubin, J. Schel, S. Dellaport; **Expression of Transferred Genes.** T. Maniatis, K. Yamamoto, C. Weissman, W. Schaffner; **Immune System Genes.** M. Scharff, C. Croce, L. Hood, S. Tonegawa; **Gene Transfer into Embryos.** F. Ruddle, R. Jaenisch, R. Palmiter, B. Mintz.

DEVELOPMENTAL NEUROBIOLOGY (July 17-22)

Chairman: Paul Patterson, Harvard Medical School

Vice-chairman: Nicholas Spitzer, University of California, SD

Growth Cones & Migration. D. Bray, K. Pfenninger, J-P. Thiery; **Axon Guidance & Regeneration.** D. Bentley, L. Landmesser, M. Willard, S. Kater, M. Gurney, J. Freeman, U. Rutishauser; **Neuronal Death.** R. Horvitz, R. Oppenheim, K. Herrup, N. Thoenen; **Growth & Differentiation.** E. Johnson, D. Berg, L. Reichardt; **Lineages.** N. LeDouarin, S. Landis, I. Black, M. Raff; **Specificity.** E. Frank, J. McMahan, J. Sanes, S. Easter, J. Schmidt, R. Hunt; **CNS Specificity.** M. Stryker, N. Daw, F. Nootebohm.

MECHANISMS OF CARCINOGENESIS (July 24-29)

Chairman: Douglas Lowy, National Institutes of Health

Vice-chairman: Paul Neiman, Fred Hutchinson Cancer Center

Viral Transforming Genes & Cellular Homologs. J. Bishop, H. Hanafusa, J. Parsons, R. Eisenman, D. Galloway; **Stages of Cellular Transformation.** I. Weinstein, V. Ling, N. Colburn, T. Slaga; **Cellular Controls.** H. Weintraub, R. Fuchs, I. Pastan, A. Poland; **Transforming Genes & Differentiation.** T. Graf, N. Rosenberg, I. Verma, M. Hoffman; **Gene Transfer.** H. Temin, M. Capecchi, M-F. Law; **Tumor Induction by Leukemia Viruses.** P. Neiman, W. Hayward, H. Varmus, R. Gallo; **Chromosome Structure.** R. Schimke, J. Spira, E. Eicher, J. Rowley; **Proteins Related to Transformation.** T. Hunter, E. Chang, G. Todaro, D. Livingston; **Tumor Oncogenes.** R. Weinberg, G. Cooper, M. Wigler, M. Barbacid.

AUTOIMMUNITY (July 31-August 5)

Chairman: C. Garrison Fathman, Stanford University Medical School

Vice-chairman: Alfred Steinberg, National Institutes of Health

Mechanisms of Immune Response. C. Fathman, R. Hodes, E. Unanue, C. Pierce; **Mediators of Inflammation.** B. Winttroub, K. Singer, L. Diás; **Experimental Models of Arthritis.** D. Trentham; **Spontaneous Murine Autoimmune Disorders.** N. Talal; **Human Autoimmunity Disease.** F. Steinberg; **Models of Immunotherapy.** H. McDevitt, J. Kapp, M. Greene, S. Strober; **Models of End-organ Specific Autoimmune Disorders.** J. Lindstrom, L. Steinman, N. Rose.

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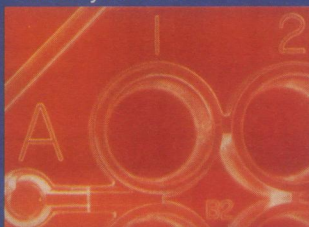
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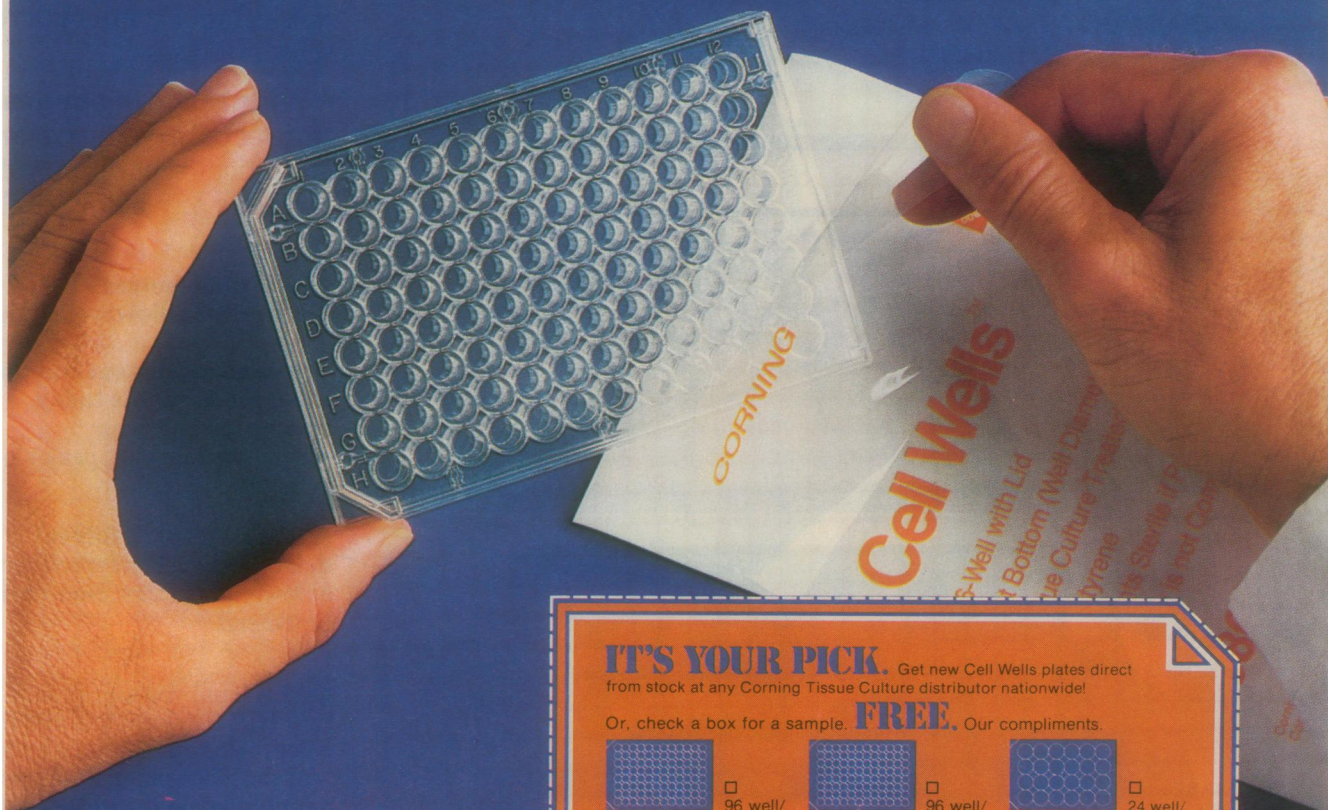
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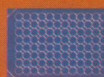
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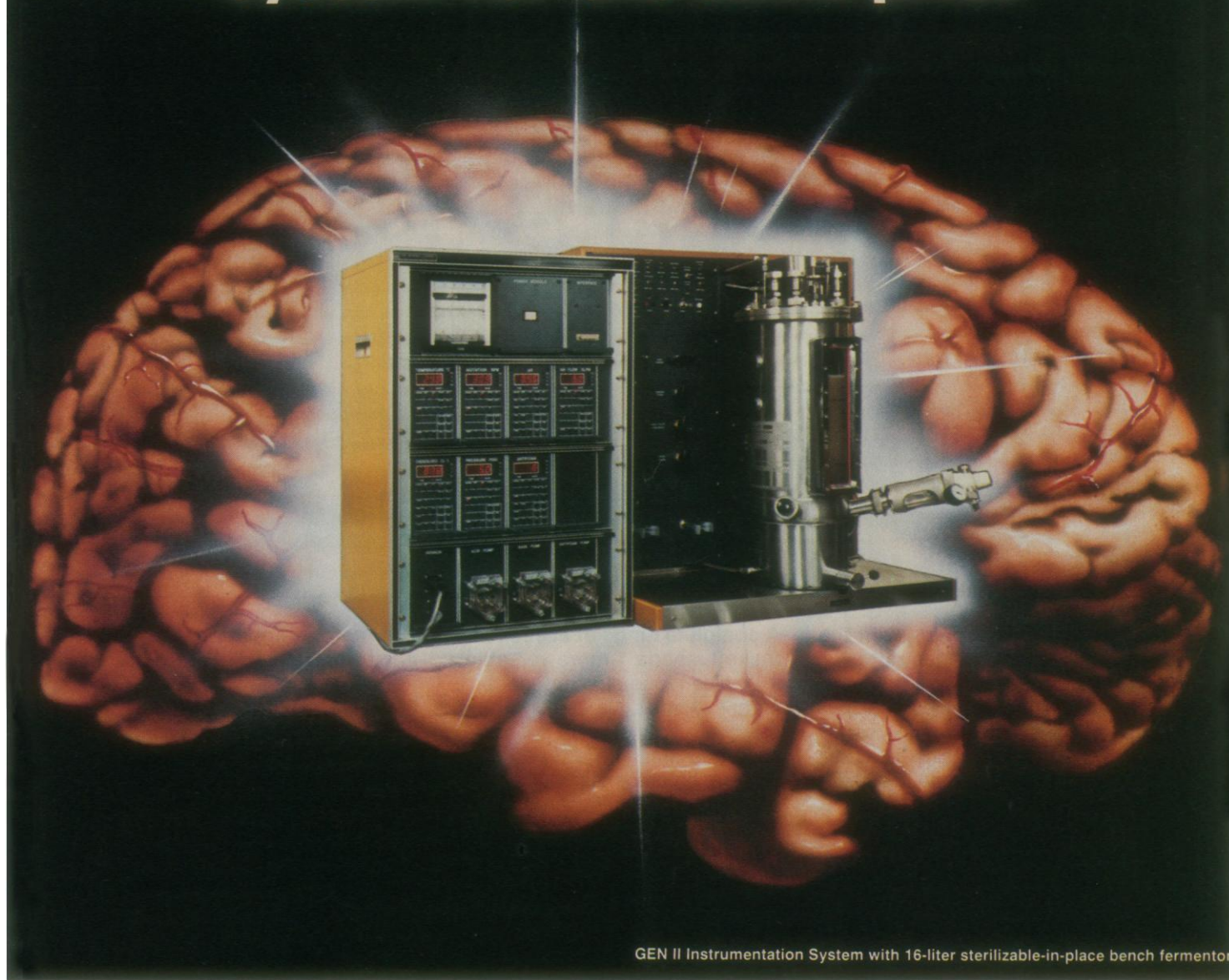
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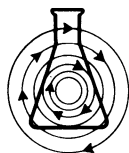
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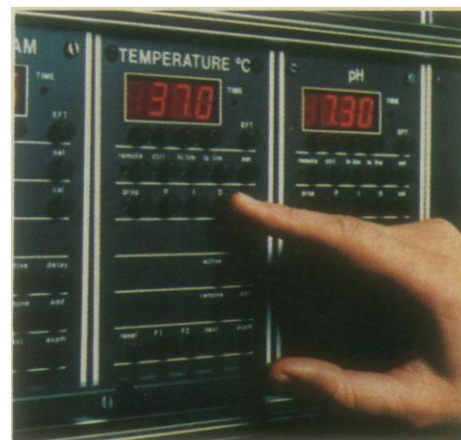
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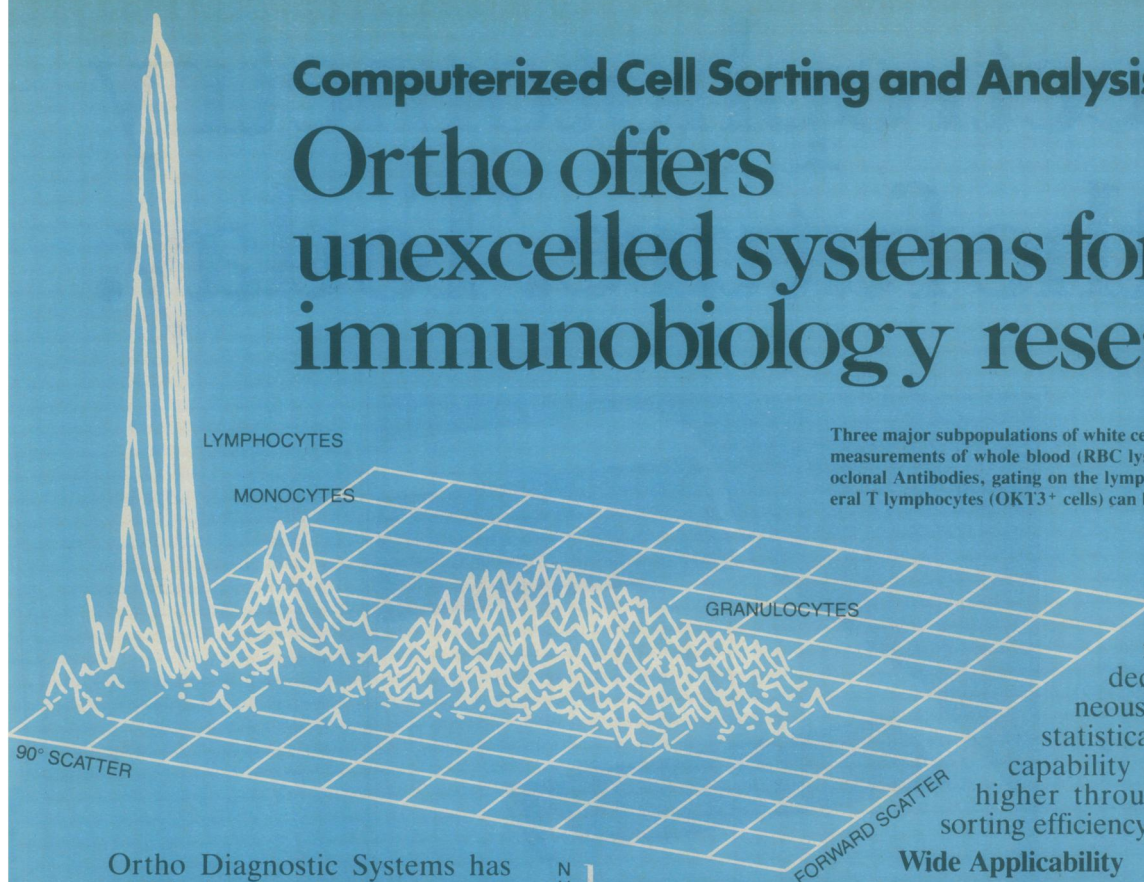
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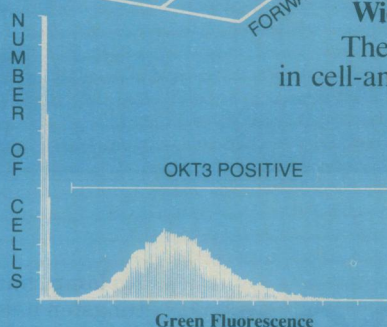
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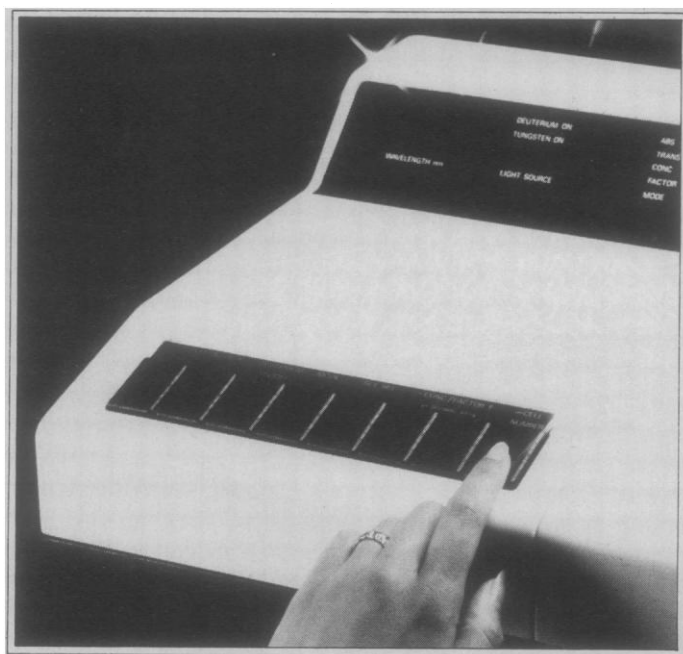
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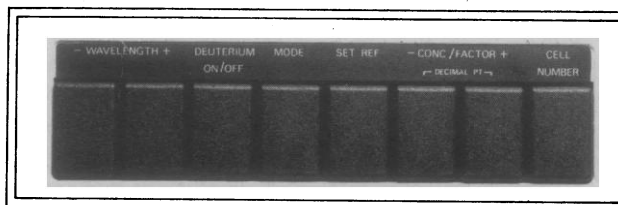
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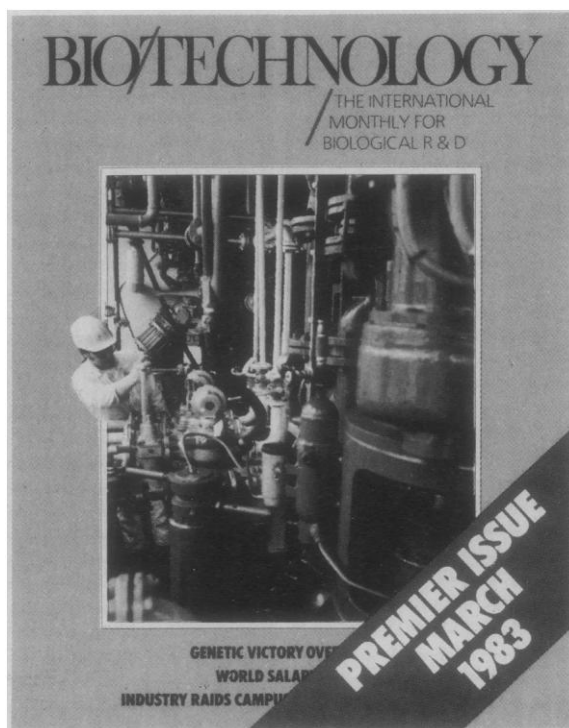
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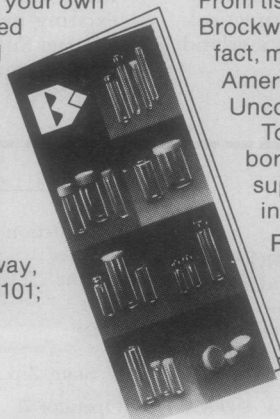
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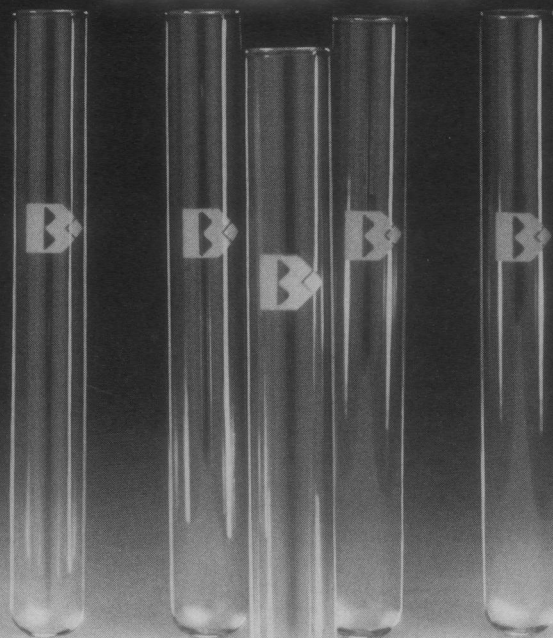
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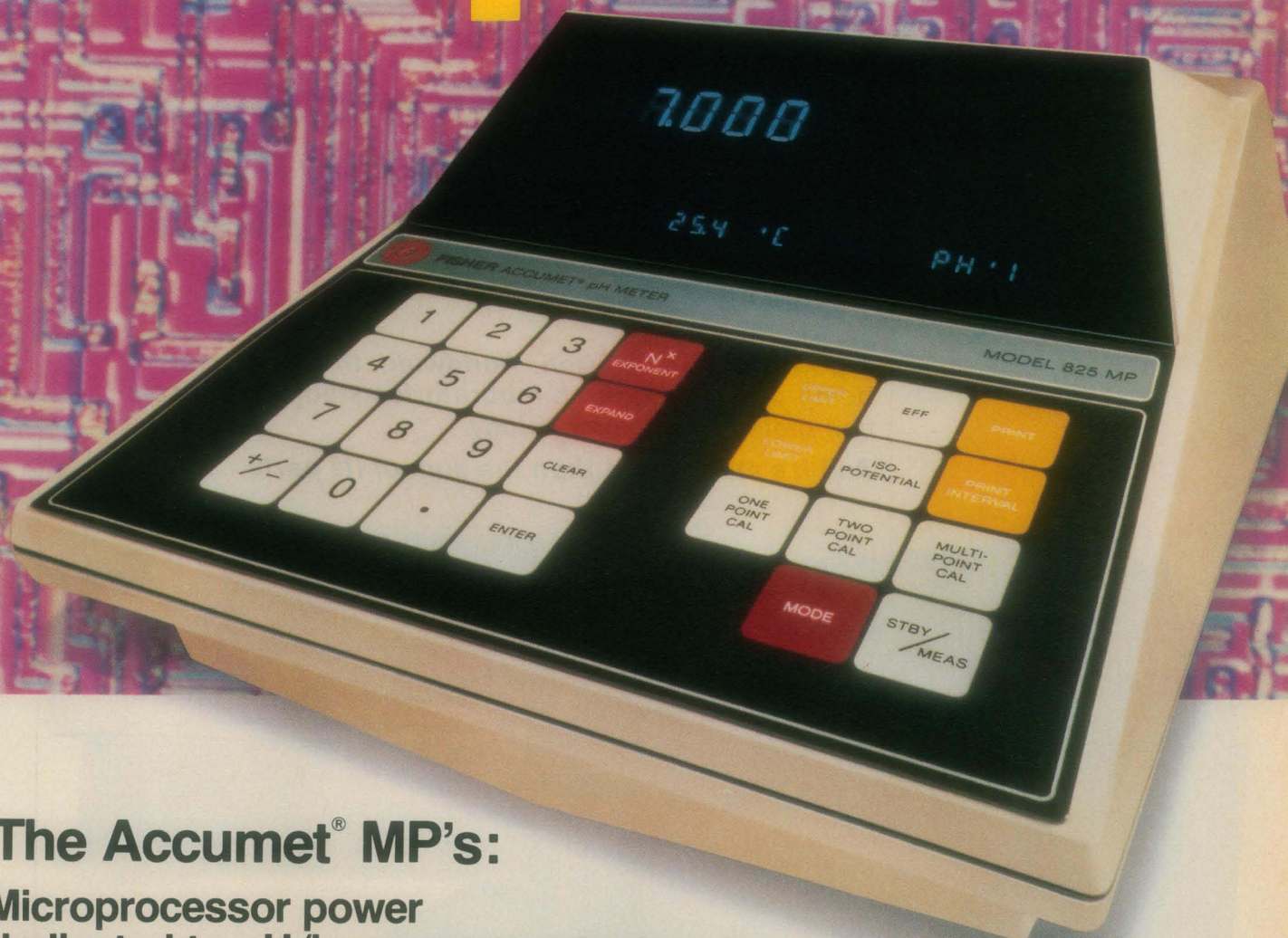
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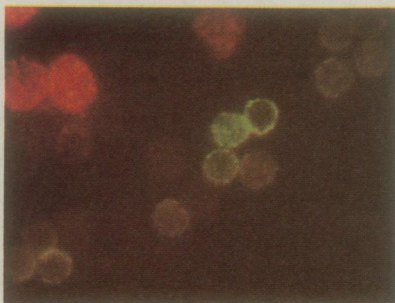
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power of our system

1 Monoclonal reagents from Becton Dickinson

have the purity, intensity and stability demanded by microscopists and flow system users for reproducible results. They constitute the broadest panel of monoclonal antibodies available for the enumeration of human leucocyte subpopulations including T cells, T cell subsets, B cells, granulocytes and monocytes.

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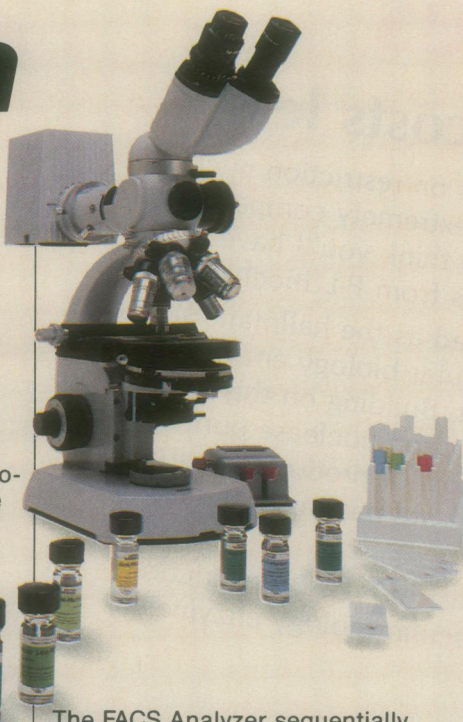
Two color immunofluorescence staining of monocytes and T cells in normal human peripheral blood. Monocytes labeled with Anti-Leu-M1 (red), T cells labeled with Anti-Leu-4 (green). Photo courtesy of John Kearney, PhD., University of Alabama in Birmingham.

2 The FACS™ Analyzer

takes full advantage of monoclonal antibody technology.

It's a benchtop flow cytometer that automatically identifies fluorescent labeled cells and cell components according to user specified criteria.

Two Z-80 microprocessors give the FACS Analyzer a complete range of keyboard activated options for high-speed analysis of subpopulations of cells.



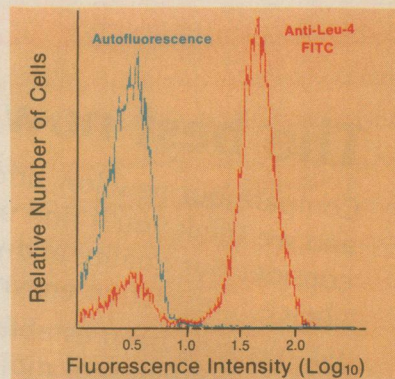
The FACS Analyzer sequentially analyzes samples as small as 25 microliters at rates of up to 1000 cells per second. Simultaneous measurements are made of cell volume and two fluorescence signals on each cell, which means you get accurate multiparameter characterization of subpopulations of cells in about one-tenth the time it takes with a fluorescence microscope.

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And since the FACS Analyzer excites fluorescent molecules by means of a mercury-arc lamp, there are no laser-associated costs and complications.



FACS™ Analyzer two color immunofluorescence analysis of T cell subsets in normal human peripheral blood. Cells are directly labeled with Anti-Leu-4 FITC (green) and Anti-Leu-3a Phycoerythrin (red).



FACS™ Analyzer histogram of T cells in normal human peripheral blood directly labeled with Anti-Leu-4 FITC, (Pan T).

3 Becton Dickinson immunofluorescence systems

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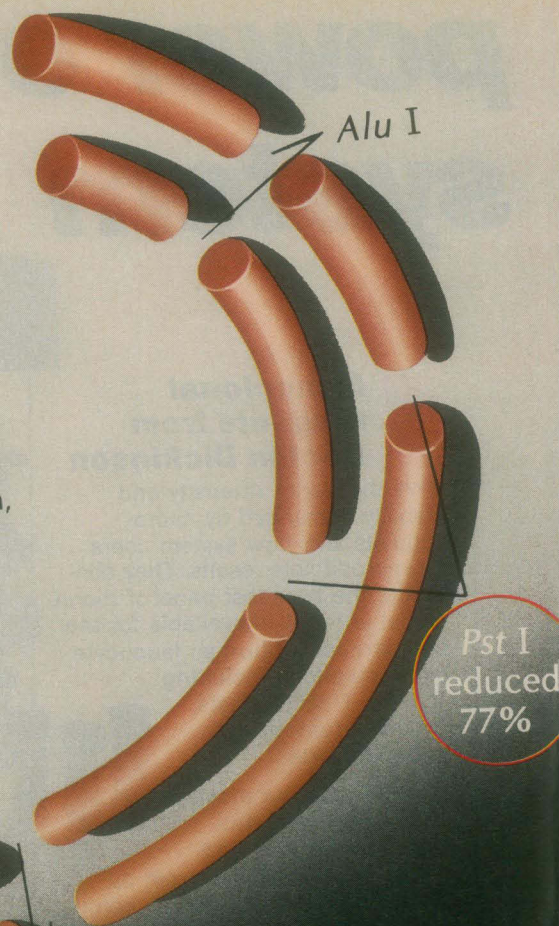
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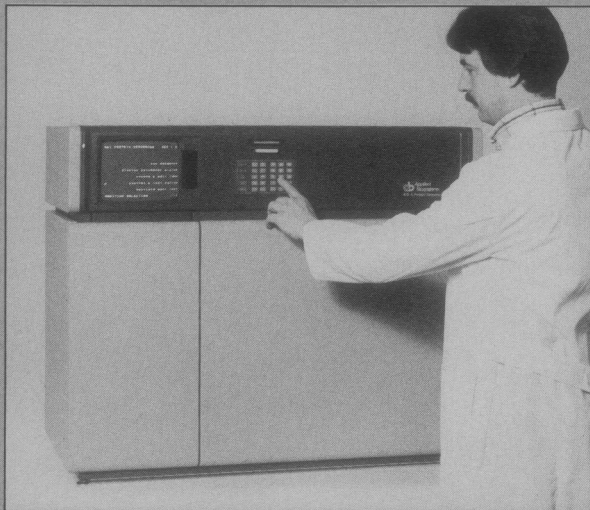
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BIOSYSTEMS UPDATE

New Protein Sequencer Provides Picomole Sensitivity

The Applied Biosystems Model 470A Gas-Phase Protein Sequencer sets a new standard of sensitivity, reliability, and ease of operation in the automatic sequencing of peptides and



The new Model 470A sequencer has been designed for reliable operation—there are no moving parts in the sample chamber, and no mechanical adjustments are required.

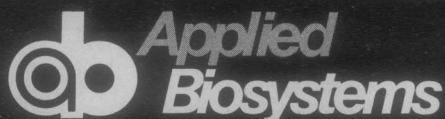
proteins. The gas-phase coupling base and cleavage acid minimize sample loss during Edman degradation and allow easy cleanup of the reaction chamber after each cycle. Miniaturized valves and lines also allow for small solvent volumes, making the system ideal for peptides as well as proteins.

More than 25 of these sequencers are operating at customer sites worldwide, and the number is growing rapidly. The table summarizes some of the data reported by users and illustrates the levels of sensitivity achievable with the Model 470A.

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| SAMPLE TYPE | SAMPLE SIZE (picomoles) | NUMBER OF AMINO ACIDS | RESIDUES IDENTIFIED |
|----------------------------|----------------------------|--------------------------|------------------------|
| Calliphora Polypeptide | 150 | 36 | 36 |
| Sperm Whale Myoglobin | 100 | 153 | 34 |
| Tissue Protein | 200 | — | 30 |
| Colony Stimulating Factor | 50 | — | 27 |
| Erythropoietin | 15 | — | 32 |
| CNBr Fragment Flavoprotein | 30 | — | 31 |
| Neuropeptide (Synthetic) | 50 | 13 | 13 |
| Neuropeptide (Native) | 1500 ^{1,2} | 44 | 40 |
| Mouse IgA (Heavy Chain) | 25 | — | 21 |
| Bacterial Enzyme | 150 | ~1150 | 20 |
| RNA Polymerase Factor | 600 | ~350 | 34 |
| Plant Enzyme | 350 | ~220 | 24 |

1. Guillemin, et al. *Science*, 218 pp. 585–587 (1982). 2. Esch, et al. *Journal of Biol. Chem.* (1983) In Press.



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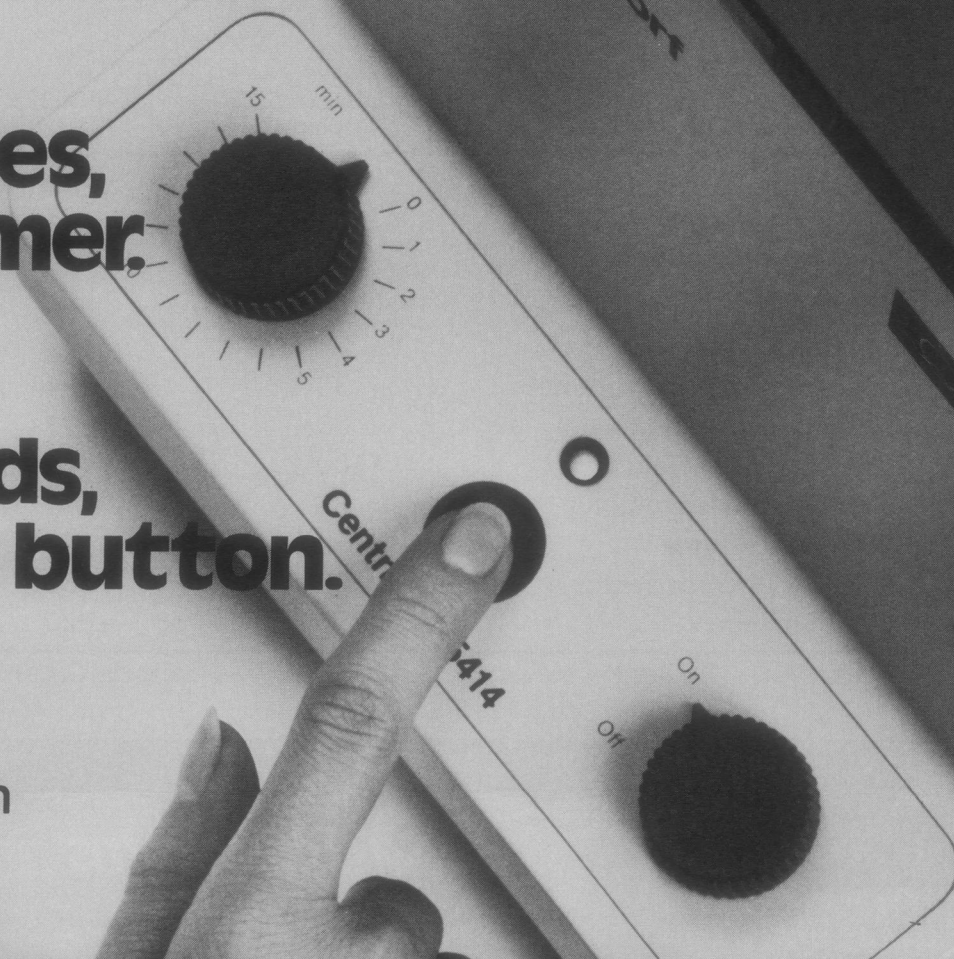
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set the timer.**

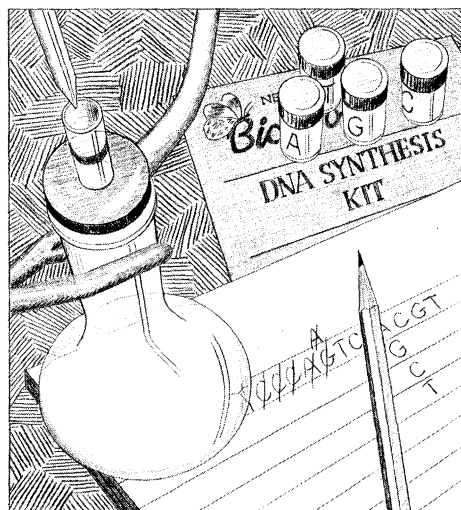
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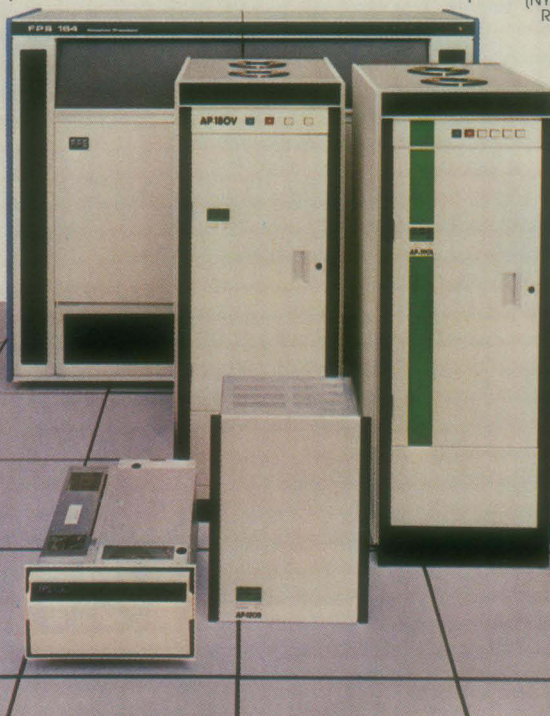
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The VR-1 is the subject of one or more pending patents.

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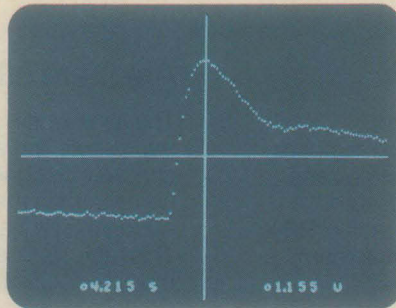


Fig. 2—Expansion of selected area for detailed analysis (up to X 256)

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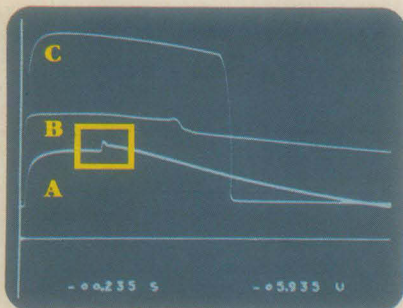


Fig. 1—Tetanic response in avian embryonic muscle after 15 days (A), 17 days (B), and 19 days (C) *in ovo*.

Figure 1 shows tetanic responses from an embryonic chicken muscle after 15, 17 and 19 days *in ovo*. These responses were captured and stored on a Nicolet digital oscilloscope then recombined on the screen for comparison. The high resolution and expansion capabilities allow detailed examination of small changes as shown in Figure 2. Cursor-interactive coordinate display eliminates the need to estimate amplitude or latency values of a waveform feature. Stored waveforms can be displayed or plotted in XY or YT format, transferred to internal disk memory for permanent storage or output to other computing devices via industry standard interfaces.

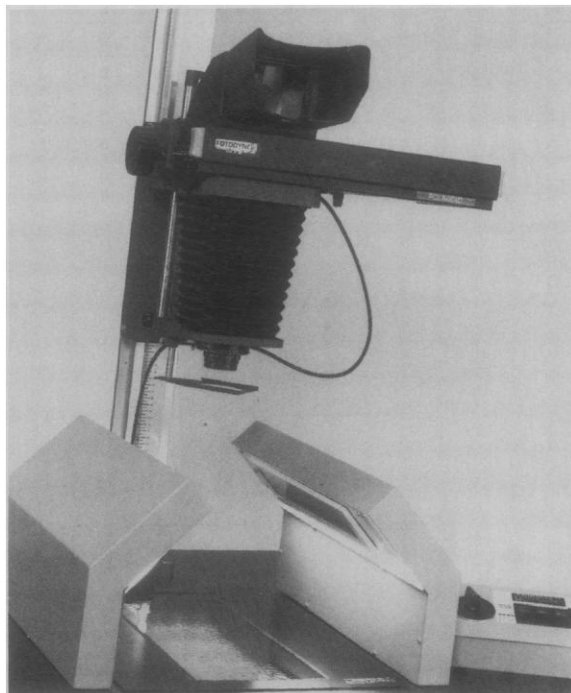


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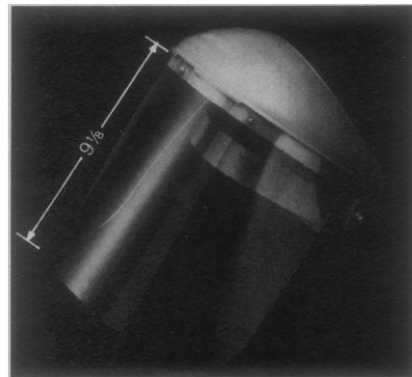
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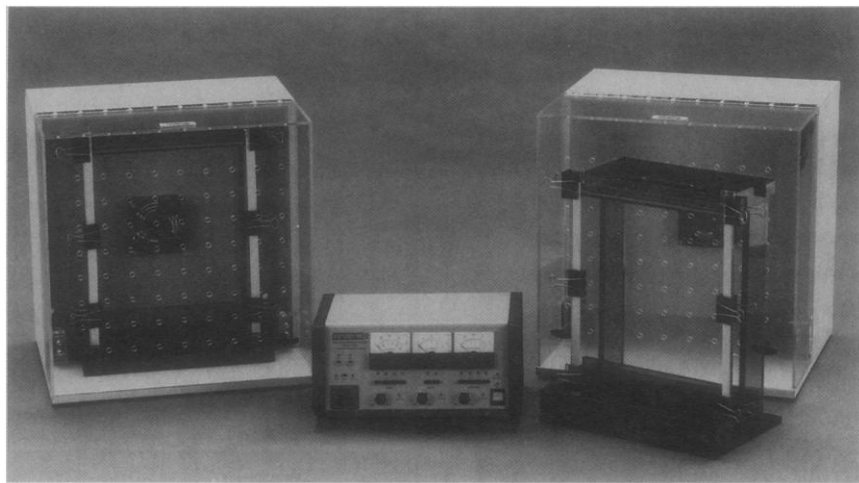
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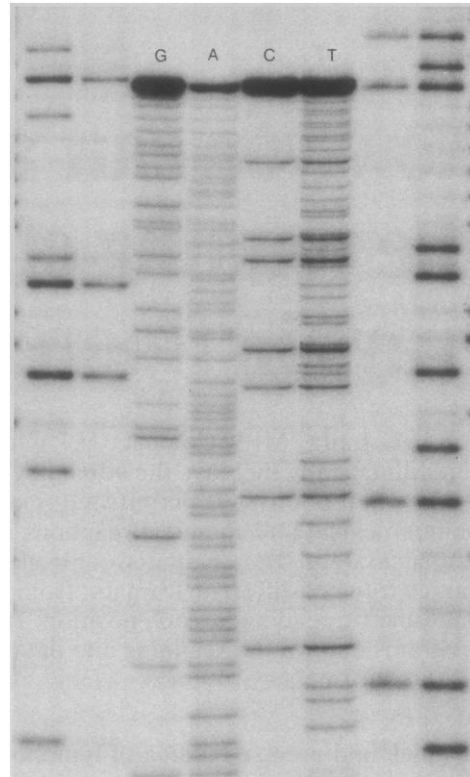
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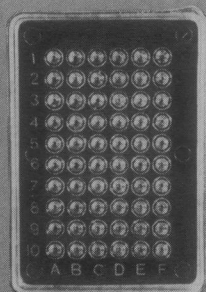
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Fig. 1 Photometrically determined charts of lymphocytotoxicity test.

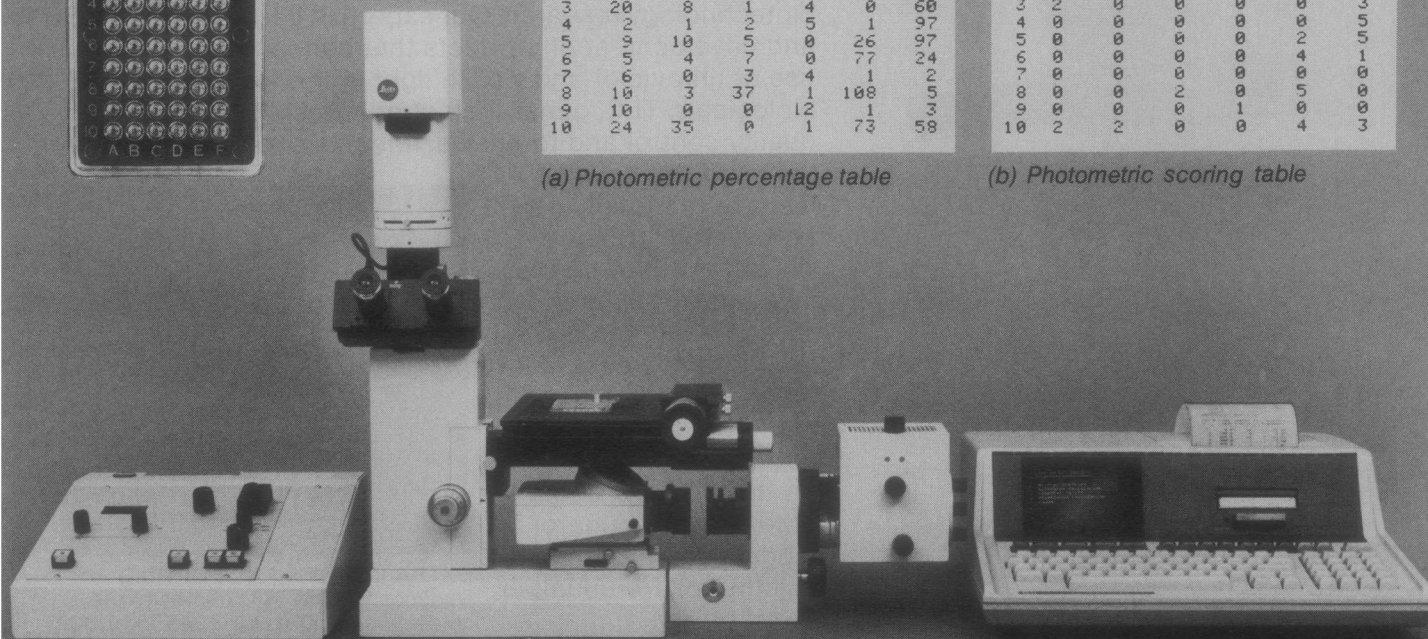


| | A | B | C | D | E | F |
|----|----|-----|-----|----|-----|----|
| 1 | 47 | 101 | 103 | 3 | 0 | 85 |
| 2 | 57 | 67 | 106 | 1 | 0 | 97 |
| 3 | 20 | 8 | 1 | 4 | 0 | 60 |
| 4 | 2 | 1 | 2 | 5 | 1 | 97 |
| 5 | 9 | 10 | 5 | 0 | 26 | 97 |
| 6 | 5 | 4 | 7 | 0 | 77 | 24 |
| 7 | 6 | 0 | 3 | 4 | 1 | 2 |
| 8 | 10 | 3 | 37 | 1 | 108 | 5 |
| 9 | 10 | 0 | 0 | 12 | 1 | 3 |
| 10 | 24 | 35 | 0 | 1 | 73 | 58 |

(a) Photometric percentage table

| | A | B | C | D | E | F |
|----|---|---|---|---|---|---|
| 1 | 3 | 5 | 5 | 0 | 0 | 5 |
| 2 | 3 | 4 | 5 | 0 | 0 | 5 |
| 3 | 2 | 0 | 0 | 0 | 0 | 5 |
| 4 | 0 | 0 | 0 | 0 | 0 | 5 |
| 5 | 0 | 0 | 0 | 0 | 2 | 5 |
| 6 | 0 | 0 | 0 | 0 | 4 | 1 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | 0 | 0 | 2 | 0 | 5 | 0 |
| 9 | 0 | 0 | 0 | 1 | 0 | 0 |
| 10 | 2 | 2 | 0 | 0 | 4 | 3 |

(b) Photometric scoring table



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Patient data:
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A-2 DEFICIENCY
391-50-3411

Parameters
Voltage 750
Time T 1
Sensitivity 1
Meas diaphragm round

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Y/P:paper)

| | A | B | C | D | E | F |
|----|-----|-----|-----|-----|-----|-----|
| 1 | 4 | 56 | 379 | 22 | 341 | 17 |
| 2 | 770 | 52 | 21 | 357 | 157 | 159 |
| 3 | 73 | 46 | 144 | 21 | 18 | 382 |
| 4 | 149 | 64 | 152 | 383 | 16 | 142 |
| 5 | 153 | 290 | 18 | 159 | 55 | 16 |
| 6 | 59 | 395 | 16 | 375 | 375 | 4 |
| 7 | 17 | 147 | 327 | 58 | 62 | 16 |
| 8 | 158 | 17 | 165 | 153 | 146 | 56 |
| 9 | 153 | 54 | 58 | 153 | 19 | 58 |
| 10 | 59 | 17 | 17 | 148 | 54 | 149 |

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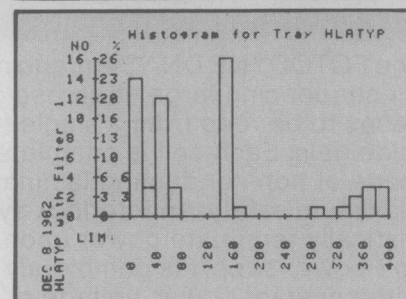


Fig. 2 Statistical analysis of data via a histogram.

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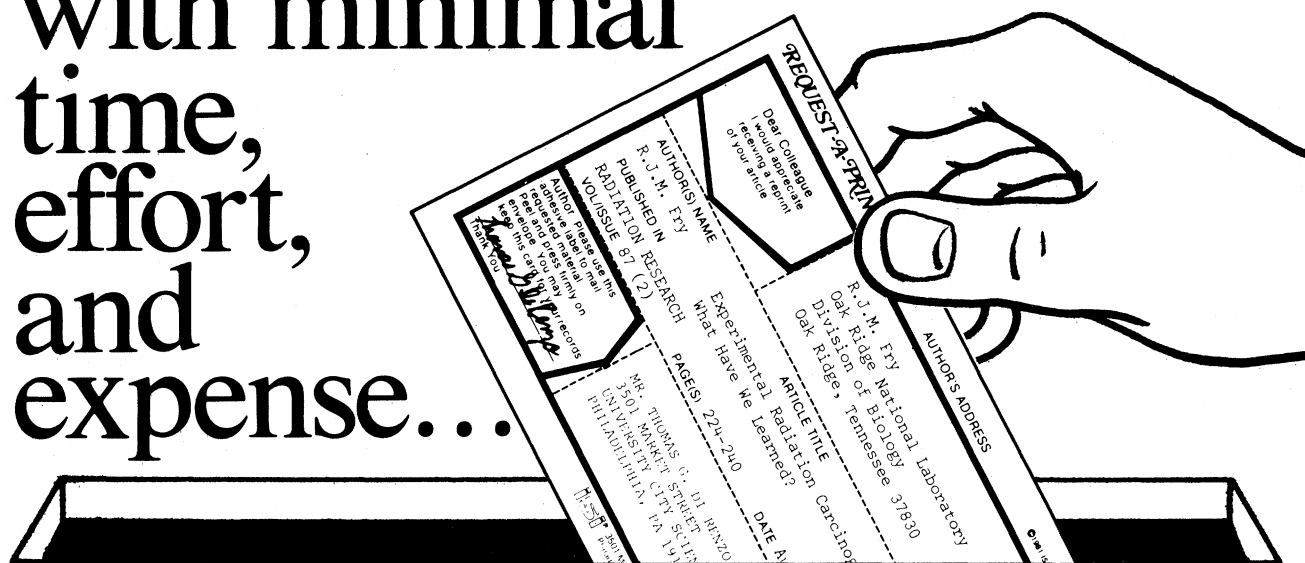
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SCIENCE/SCOPE

The first two satellites to be launched from NASA's space shuttle were placed in orbit for about one-third the cost of a conventional launch, thus saving their owners millions of dollars. This particular model of communications satellite, designed by Hughes Aircraft Company, is relatively inexpensive to launch because it sits upright and snugly folded in special cradles in the cargo bay. This feature saves money because launch costs are based on how much room a satellite takes up and how much it weighs. The cradle contains spring mechanisms that eject the satellite from the bay, after which rocket motors propel it into geostationary orbit. The drum-shaped spacecraft stands 9 feet tall when compacted. But when it reaches orbit, a telescoping solar panel deploys and the antenna unfolds, bringing the satellite's overall height to more than 21 feet.

A compact liquid-crystal light valve is designed to serve as a real-time light modulator for many optical data-processing and projection uses. The Hughes light valve uses liquid-crystal and thin-film technology to combine high input-light sensitivity and high image resolution with low voltage and power requirements. Uses include: graphics projection systems for large-screen displays, high-resolution vision for industrial robots, radar and sonar signal-processing, identification of moving objects, high-resolution spectral analysis of wide-band signals, and hybrid optical-digital processing systems.

Hughes spends about \$8 million a year in support of colleges and universities, including help to alleviate the shortage of engineering faculty and modern laboratory equipment. For example, Hughes hires faculty consultants part-time during the school year and full-time in the summer. The program establishes a continuous technical interaction and supplements the pay of faculty members. Also, Hughes donates textbooks, software packages, and a wide variety of used equipment -- including electronic instrumentation and components.

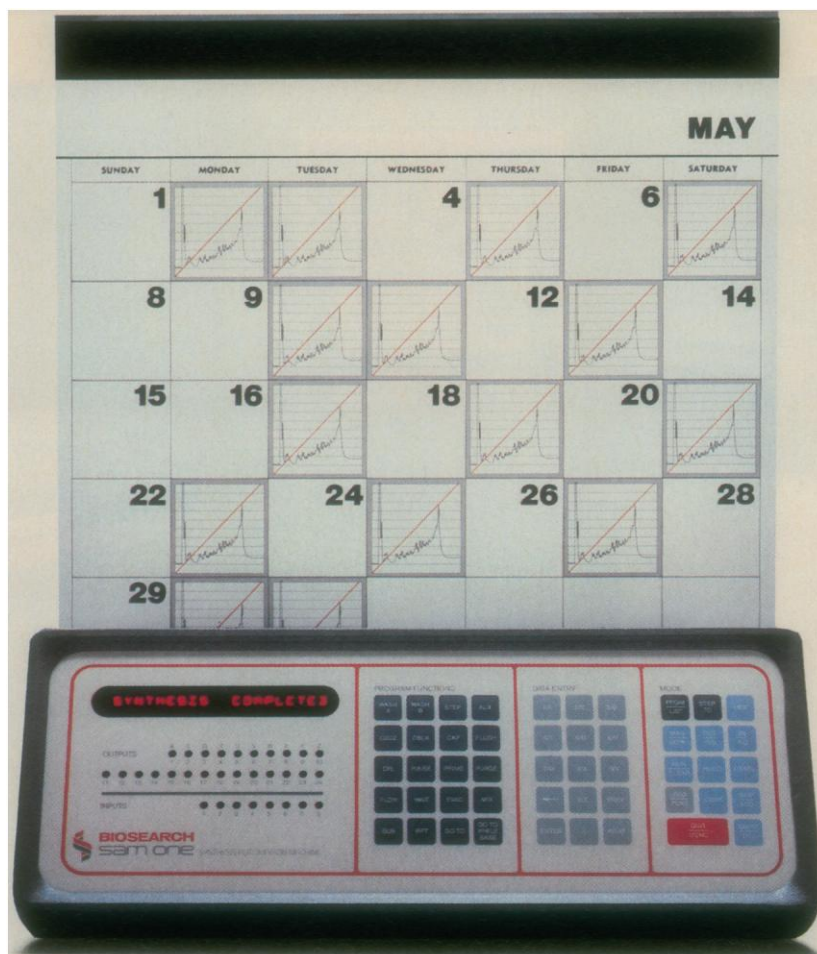
The Smithsonian Institution is installing a new security system to monitor many facilities continuously. The Hughes system includes burglar alarms, fire-sensing devices, voice communications channels, and closed-circuit TV. It will let Smithsonian personnel control entrances and exits, and watch over areas open to visitors. A computer will collect and display information on TV monitors and printers at a central control station. Hughes previously installed a facilities management system at the Smithsonian's National Air and Space Museum. That system provides a wide range of exhibit monitor and control functions.

Hughes is seeking engineers to develop advanced systems and components for many different weather and communications satellites, plus the Galileo Jupiter Probe. Immediate openings exist in applications software development, data processing, digital subsystems test, microwave/RF circuit design, power supply design, digital communications, signal processing, spacecraft antenna design, system integration test and evaluation, and TELCO interconnection. Send your resume to Ray Bevacqua, Hughes Space & Communications Group, Dept. SE, Bldg. S/41, M.S. A300, P.O. Box 92191, Los Angeles, CA 90009. Equal opportunity employer.

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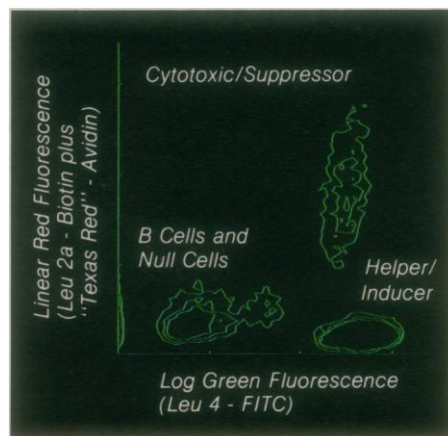
The preparative chromatogram shown above illustrates a crude 18-mer nucleotide (5'-AAGGATAGCCTTTAAATC-3') synthesized by SAM using the phosphate-triester synthesis method.



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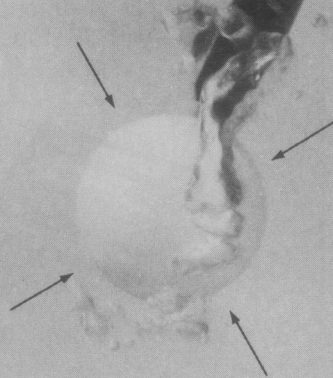
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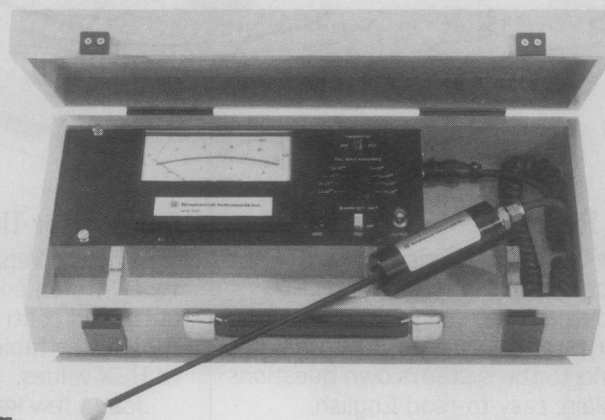
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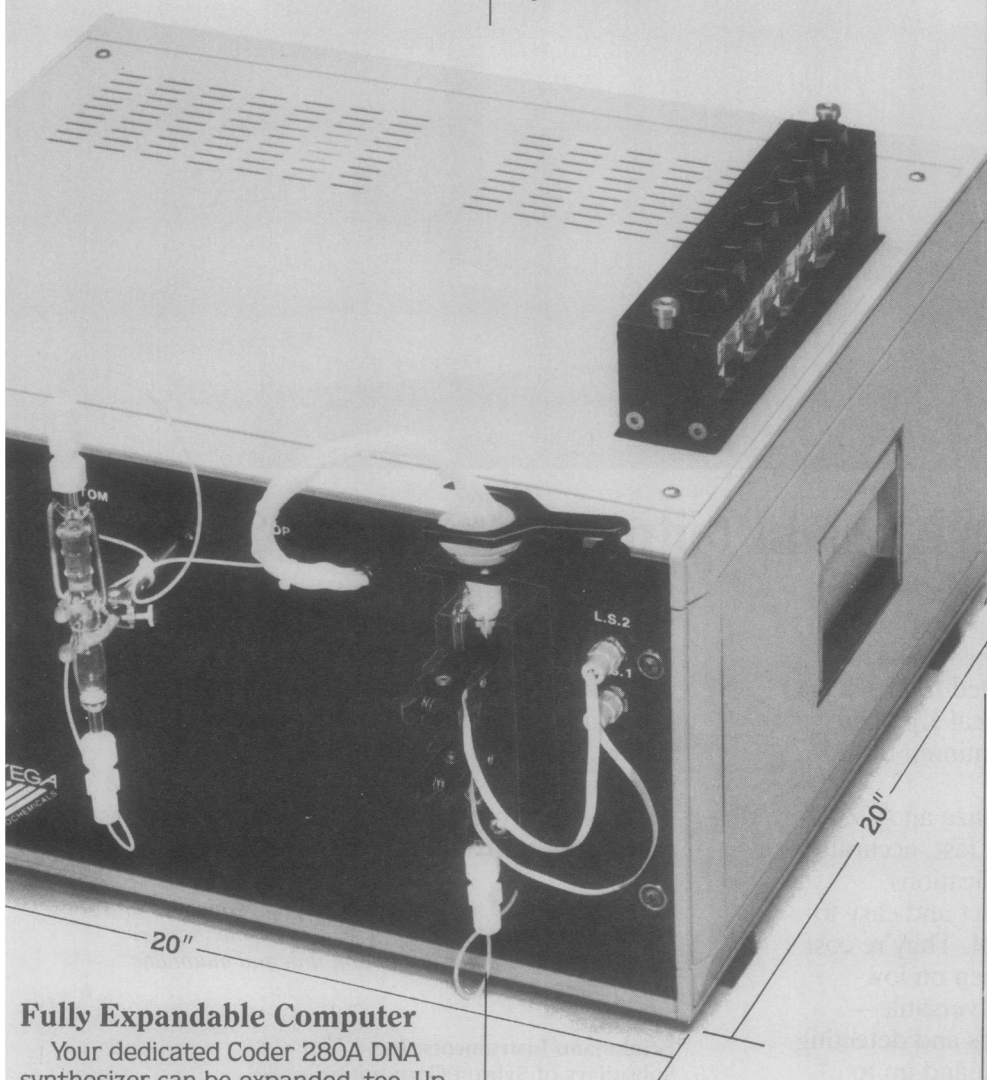
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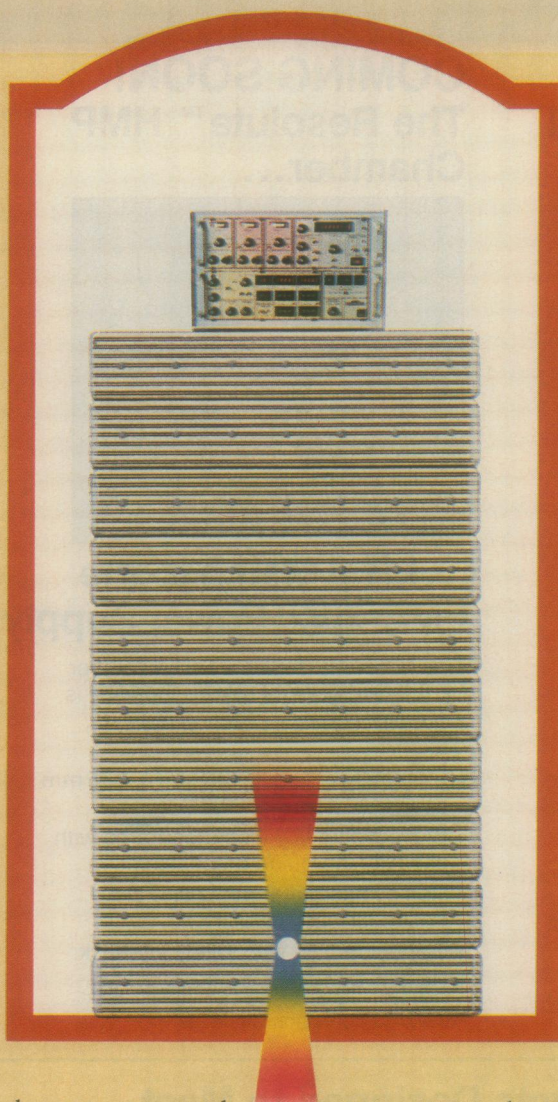
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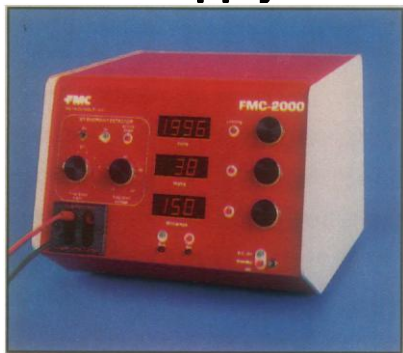
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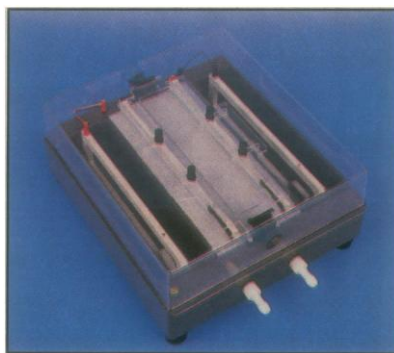
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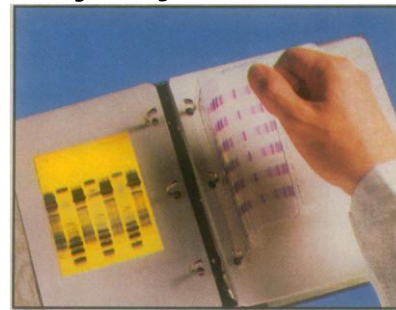
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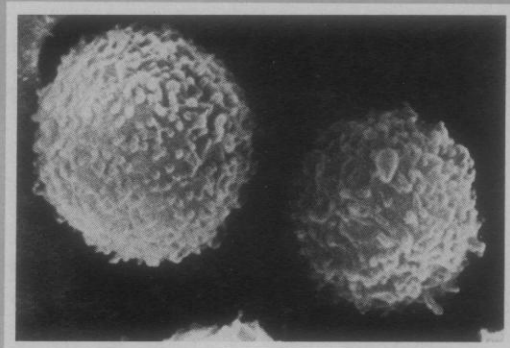


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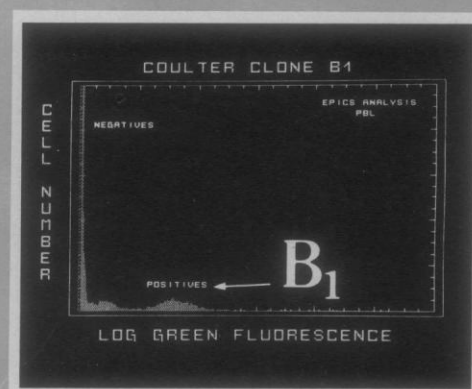
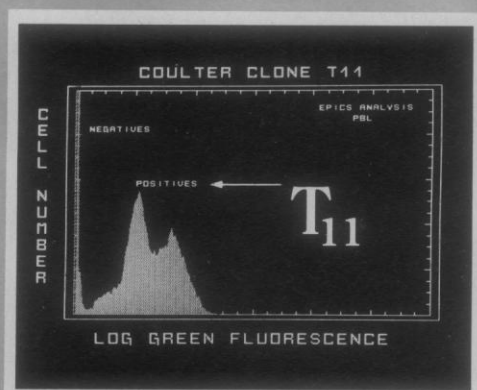
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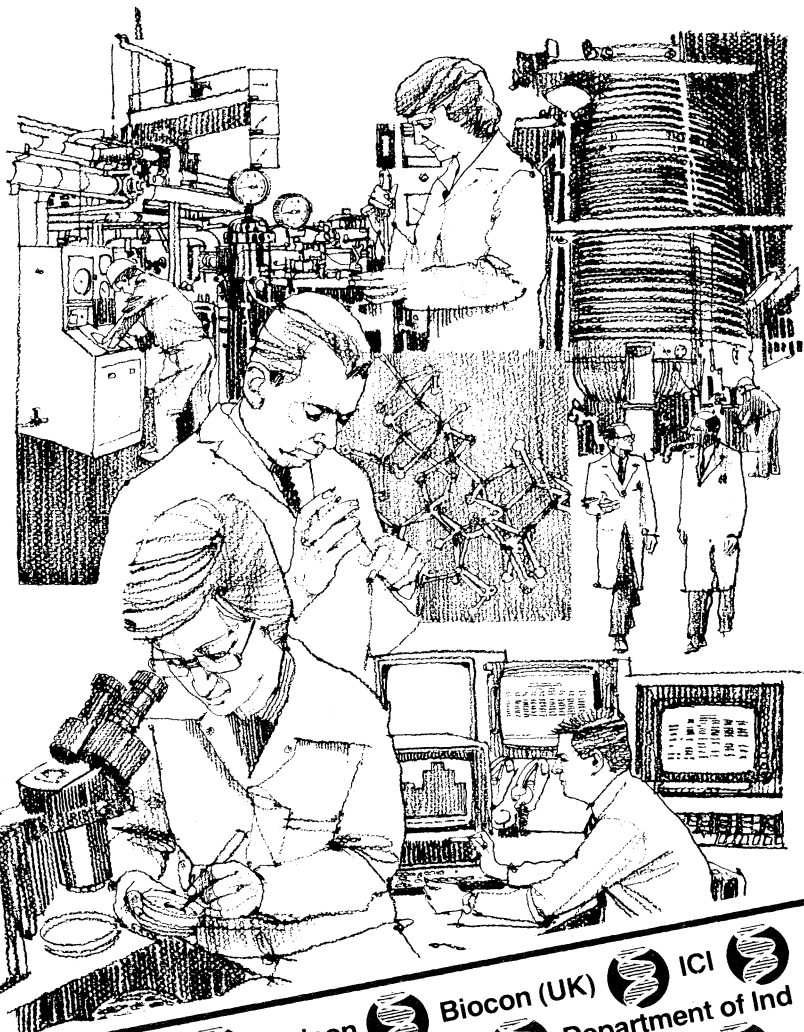
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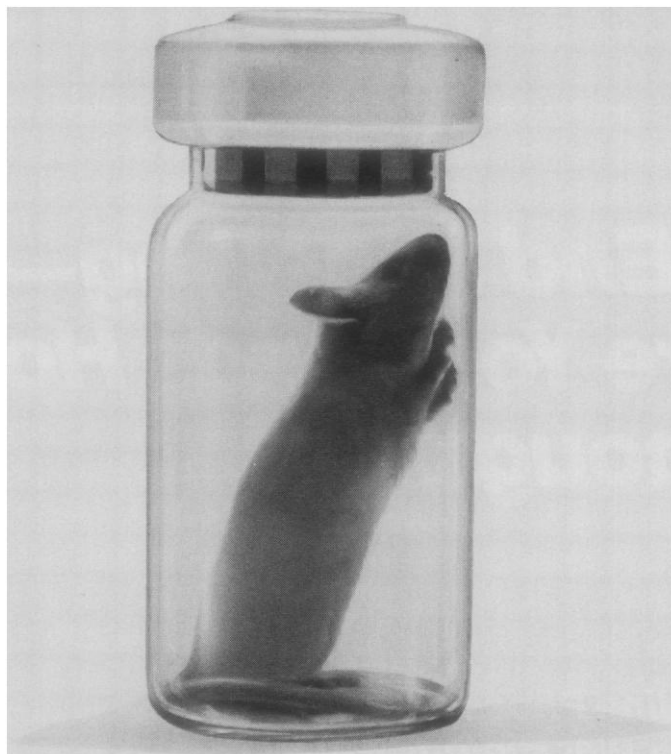
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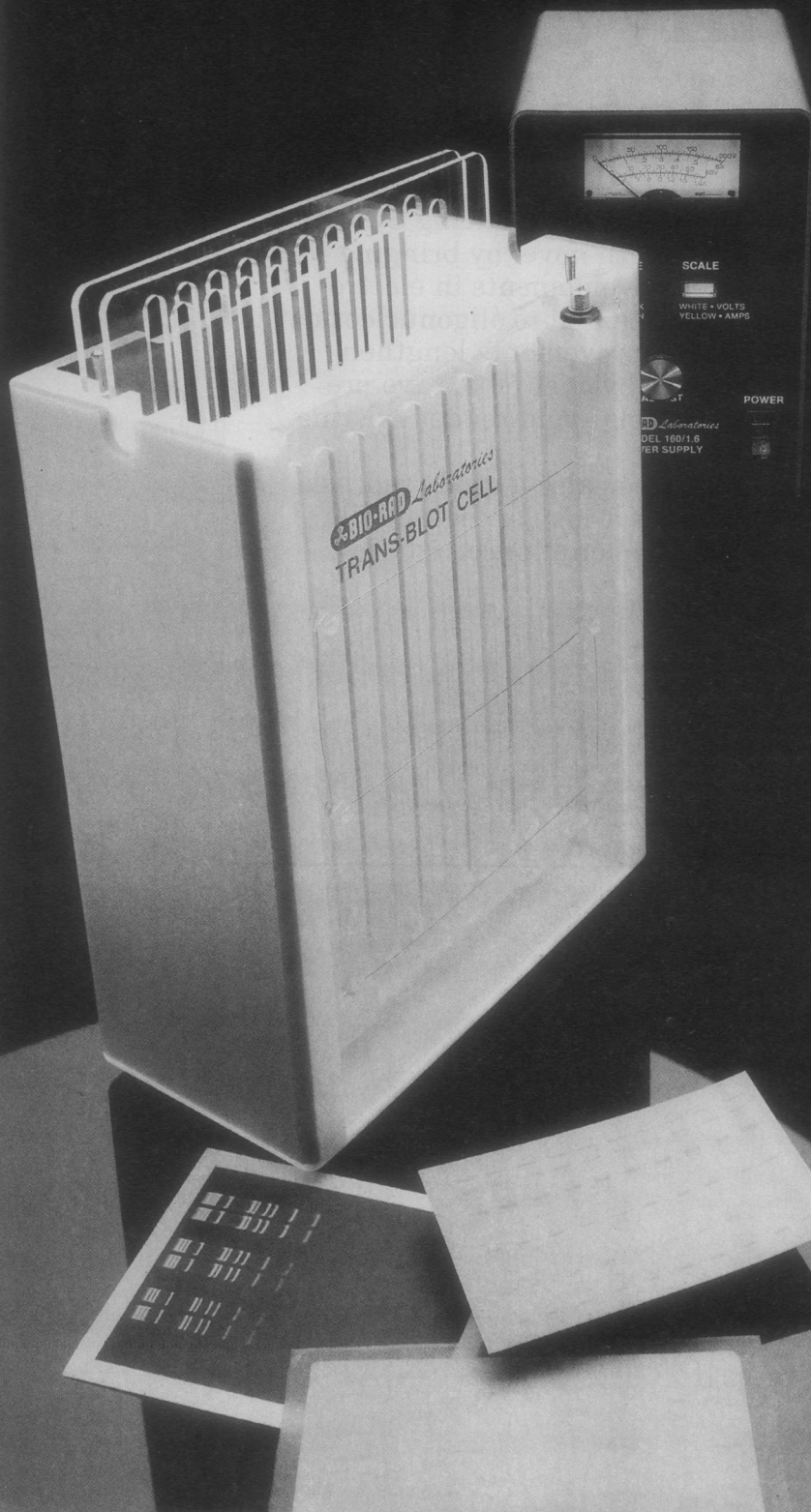
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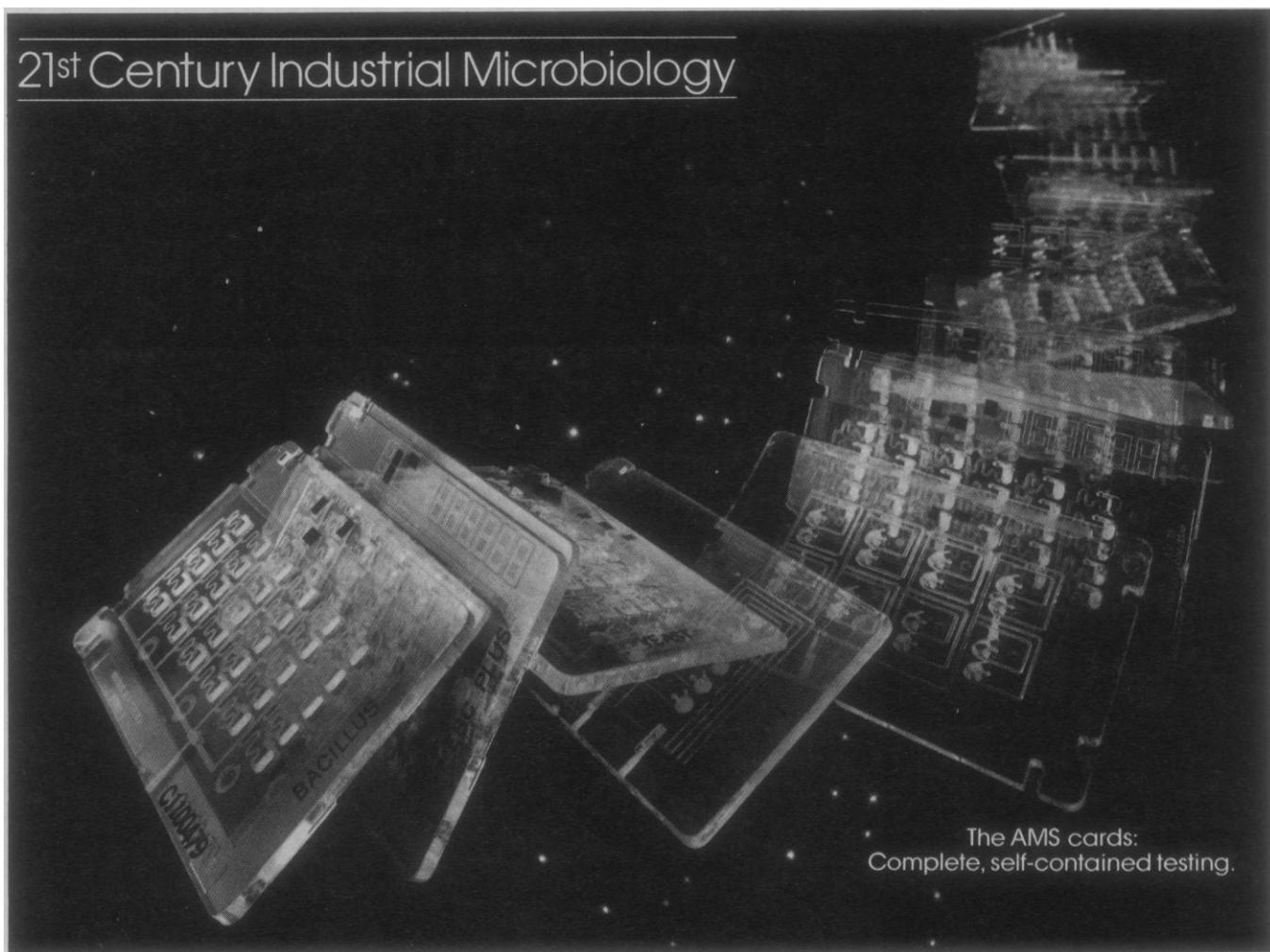
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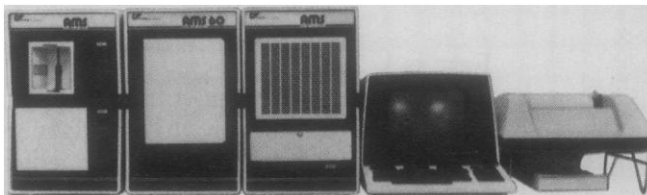
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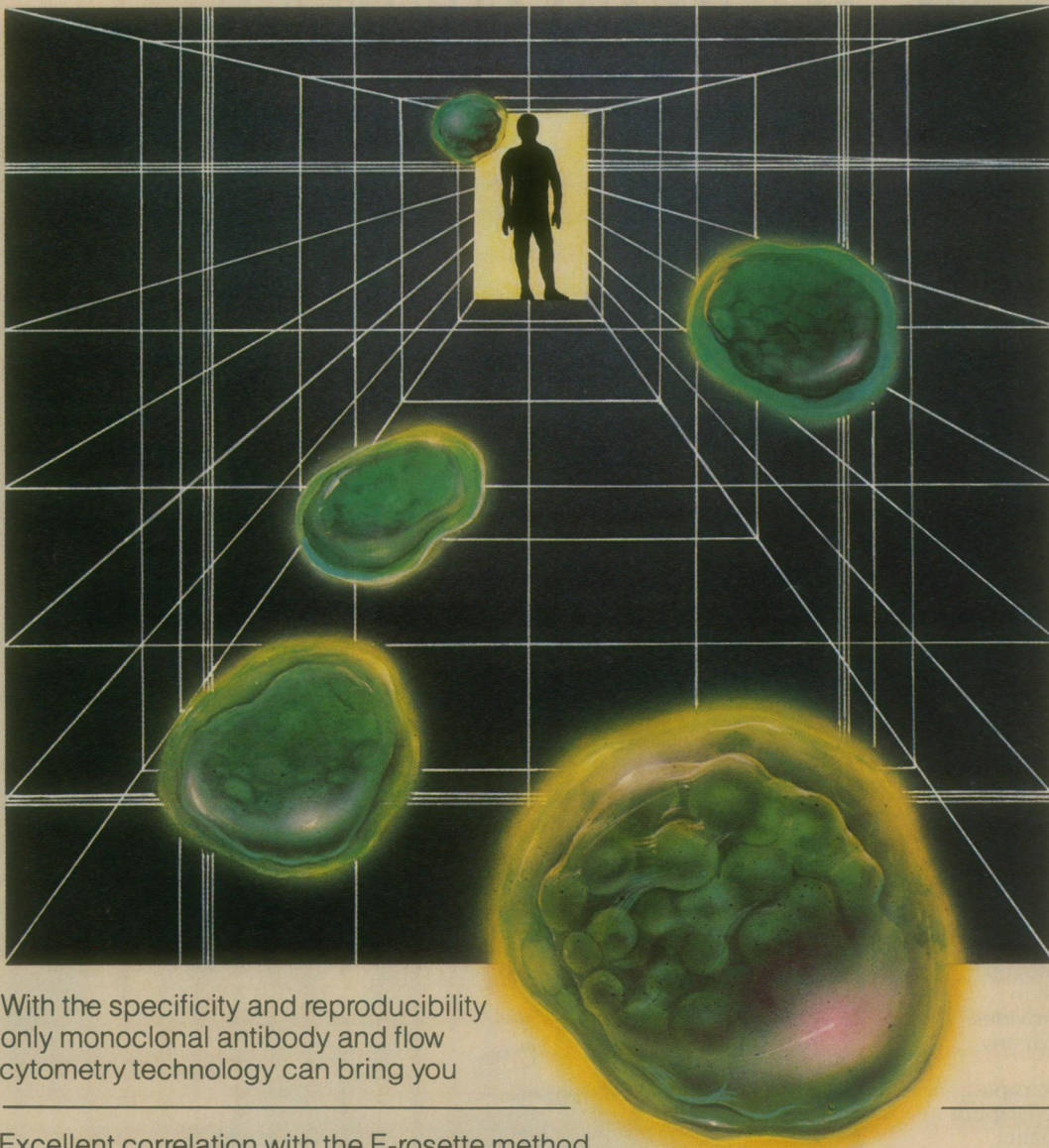
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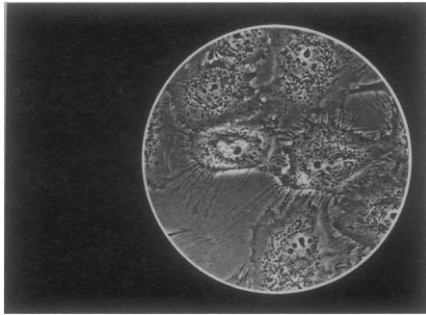
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New Biotechnology Companies

We are now in a period of especially rapid progress in applied biology. Important useful advances have already occurred employing recombinant DNA and hybridomas. Synthetic human insulin is being sold commercially and other major pharmaceuticals for human or domestic animal care are being tested. Antibodies produced by hybridomas have been approved for diagnostic use. Prospects are excellent that viral diseases soon will be conquered by use of interferon or vaccines.

Key ingredients in the dynamism of applied biology are more than 150 small companies, many of them new. Most of them were formed several years ago at the time of the great excitement over the then untapped potentials of recombinant DNA and hybridomas. Some of the companies have already gone bankrupt and others will disappear. A few months ago most observers guessed that there would be a further great mortality of other companies. But prospects of survival have improved.

Genentech is generally considered to be the leading new company. It is a south San Francisco firm that has pioneered in the creation of about a dozen protein products by recombinant DNA techniques. Employees number about 350, of whom 70 have Ph.D.'s. The budget for research and development is \$21 million. This is small in comparison with the budgets of larger companies, some of which spend ten or more times as much. Yet, in its creation of new major products, Genentech has a record that no other company in the pharmaceutical business has matched in recent years. In part this success is due to the fact that Genentech was early in applying recombinant DNA to create new products. In part success has arisen from its judicious choice of projects to tackle. But probably most important have been the company's policies with respect to personnel, which enable it to attract and retain high-quality people. The best features of an academic environment, including encouragement of publication, are retained. Scientists have equity positions in the company.

Other smaller companies have also succeeded in establishing their own special enclaves in which loyalty and creativity are fostered. In ordinary circumstances at universities, in government, or in industry, a scientist typically manifests only a small fraction of his or her potential. This is due to distractions, multiple responsibilities, interruptions, personality clashes, conflicts with management, and less than complete motivation. An organization that can foster a culture that brings out the best in its people can outdistance its rivals. A number of the new companies are succeeding in doing so. Their rate of progress is now comparable to that of Genentech.

Synthesizing a new product on a laboratory scale is only a short step toward marketing a profitable product. The process must be scaled up, costly clinical tests performed, clearance obtained from the Food and Drug Administration, and then the product must be successfully marketed. These steps require 4 years or more and ten or more millions of dollars. But there are other ways to obtain a faster financial payoff from new techniques or knowledge. There are diagnostic aids, specialty chemicals, and items for animal care. Many of these items are small in volume but high-priced. There are fees for contract research and potential royalties from patents. The successful small companies are carefully selecting viable and limited ecological niches in which they can survive and grow.

The big pharmaceutical, chemical, petroleum, and other industrial firms are intrigued by the potential of biotechnology. They believe that their financial strength, production skills, legal capabilities, and marketing know-how will later prove essential. Many of them are slowly building up their internal research competence. But, in the meantime, the small companies will be moving ahead rapidly to exploit the potentialities of the knowledge base and to extend it. They will be important engines of progress, crucial in establishing and maintaining a fast tempo for the biological revolution and its applications.—PHILIP H. ABELSON

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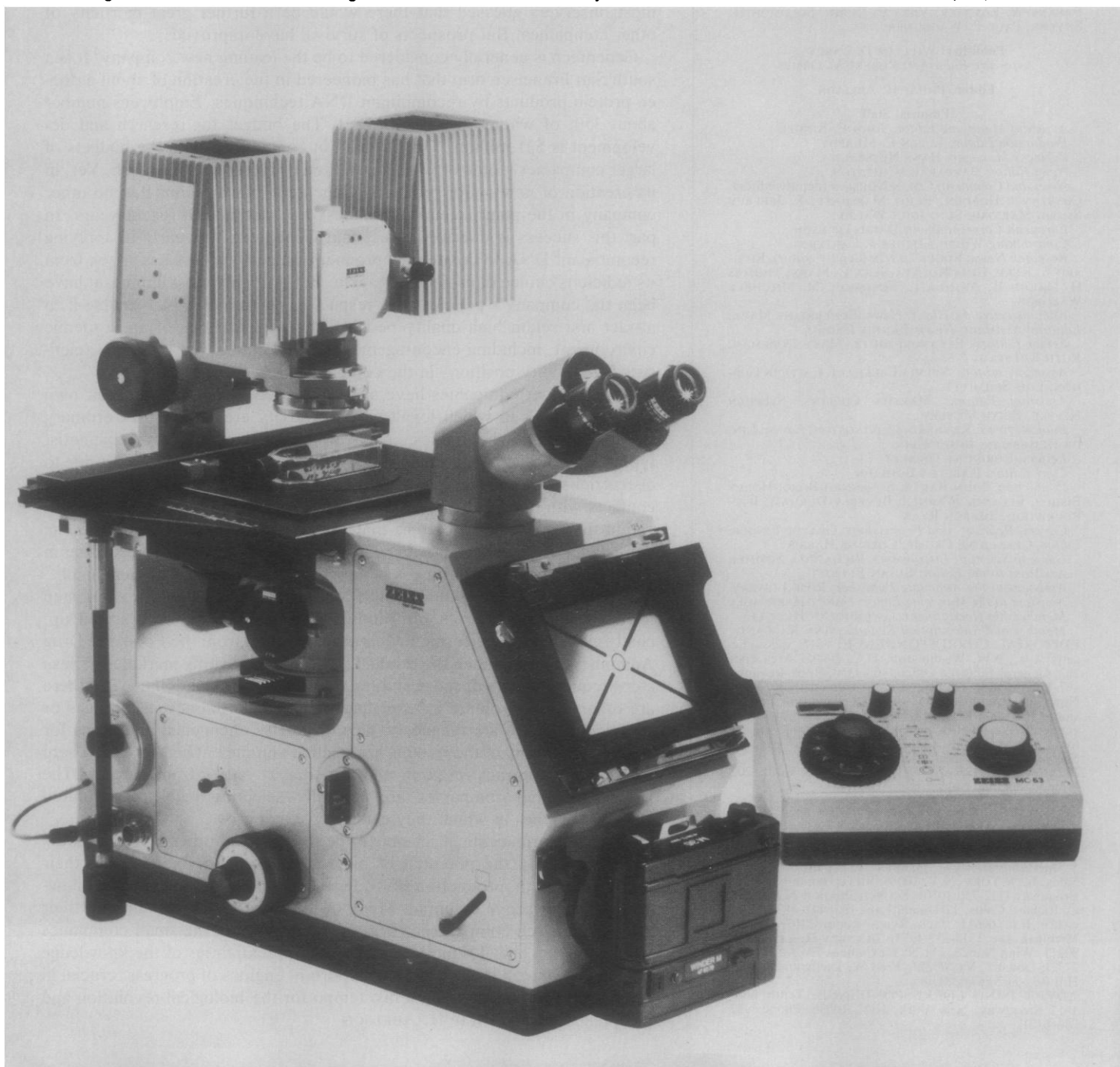
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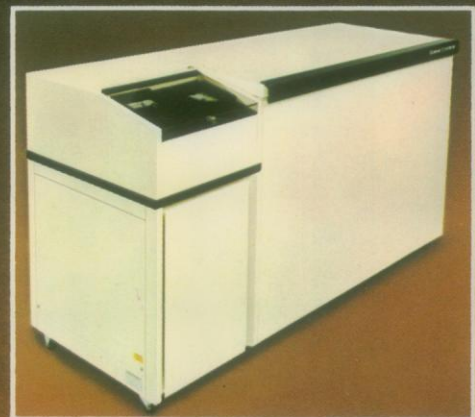


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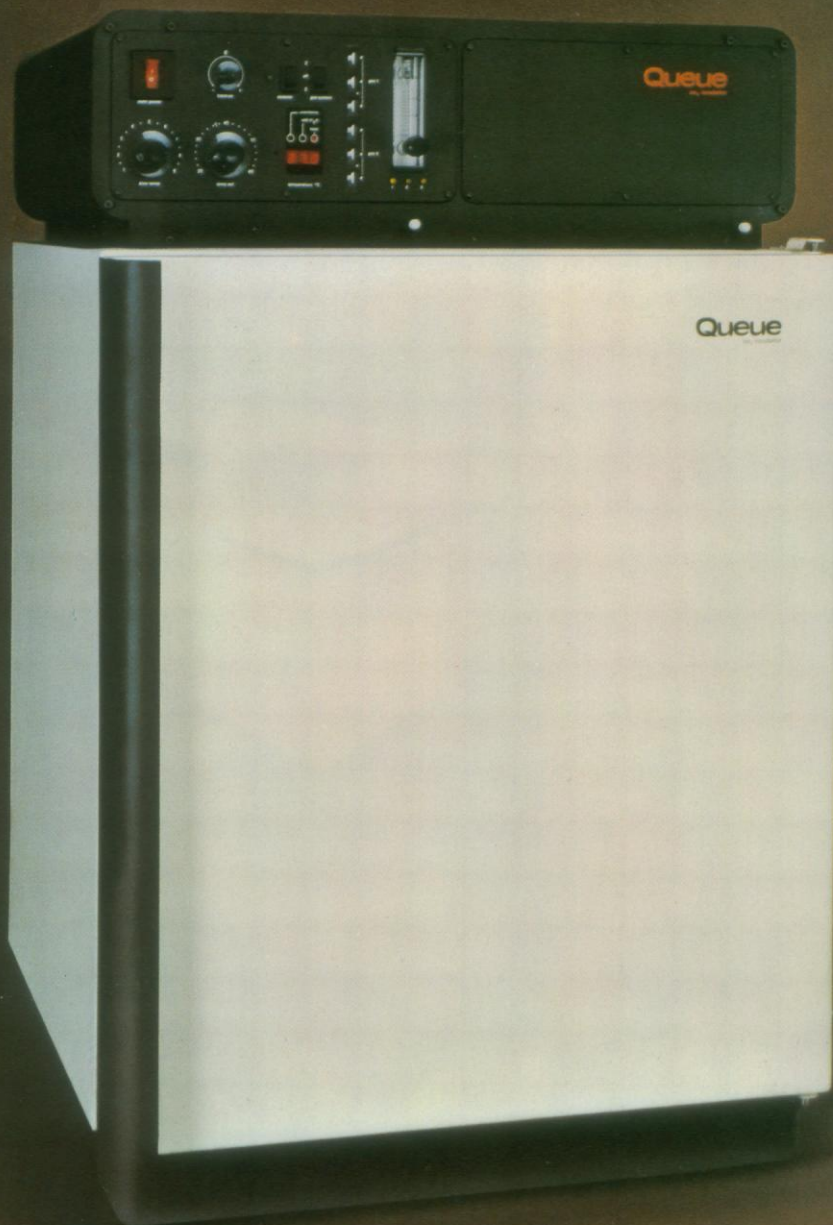
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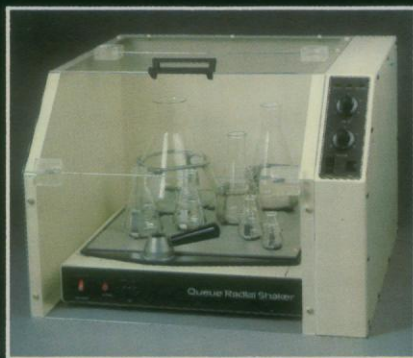
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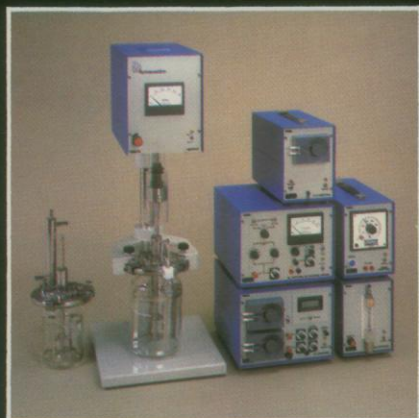


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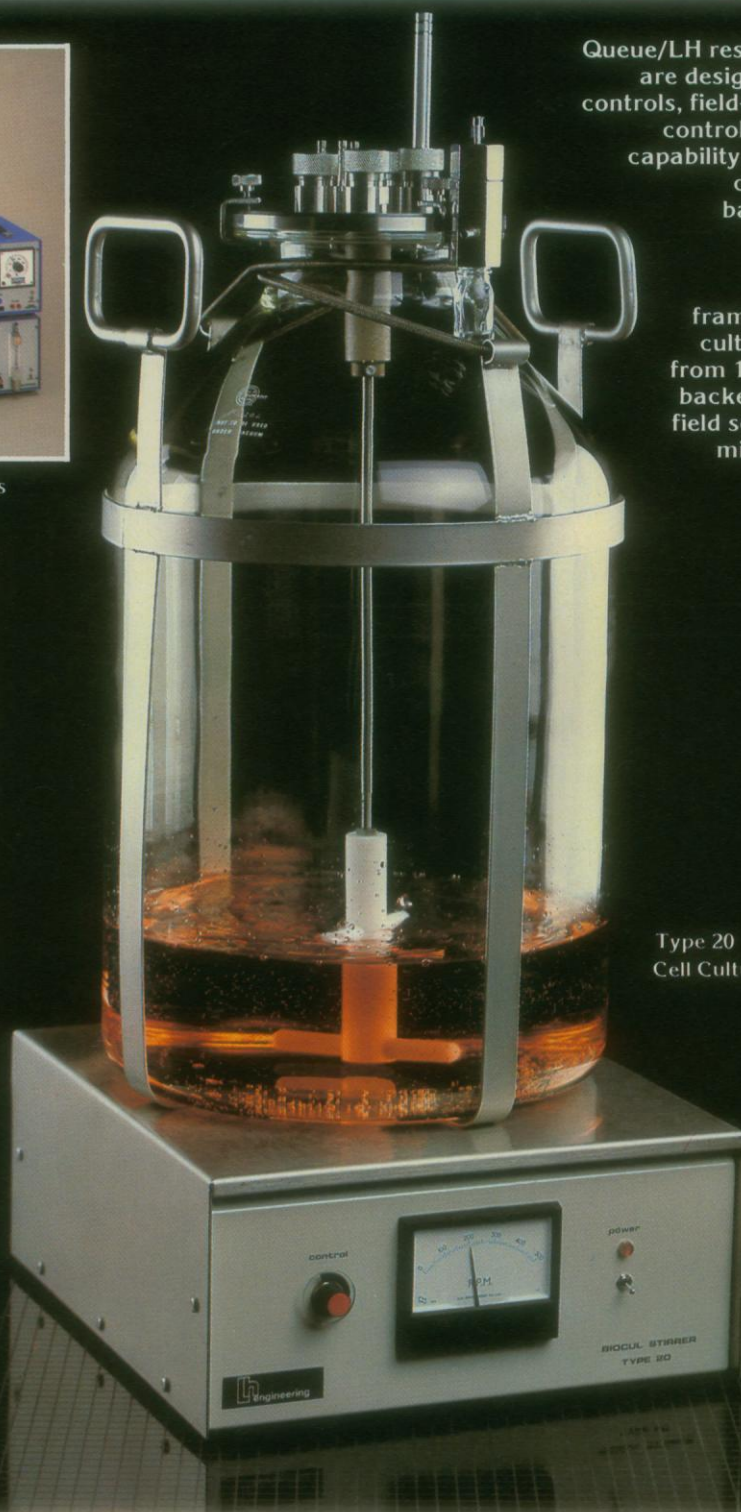
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