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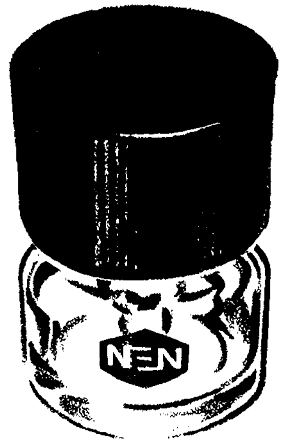
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23 April 1982

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SCIENCE

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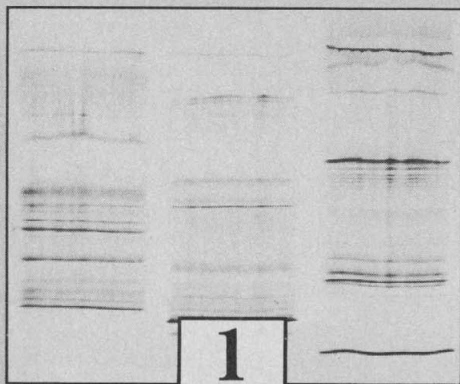
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

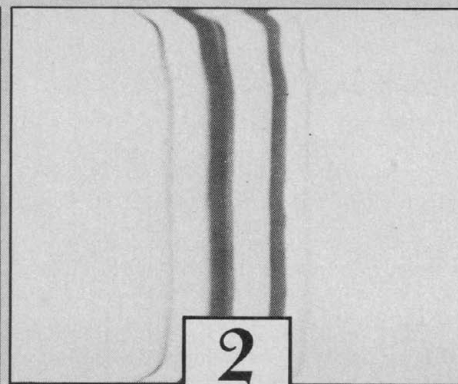
COVER

Bowerbird (*Amblyornis flavifrons*) recently rediscovered in a remote part of New Guinea. To attract females, males build a stick tower on a rimmed moss platform, decorate it with fruit of three different colors, and extend toward the female a blue fruit set against the golden crest. See page 431. [Painting by William Cooper, *The Birds of Paradise and Bower Birds*, William T. Cooper and Joseph M. Forshaw. First published in Sydney, Australia, by William Collins Publishers, 1977; first U.S. edition by David R. Godine, Publisher, Boston, Massachusetts, 1979]

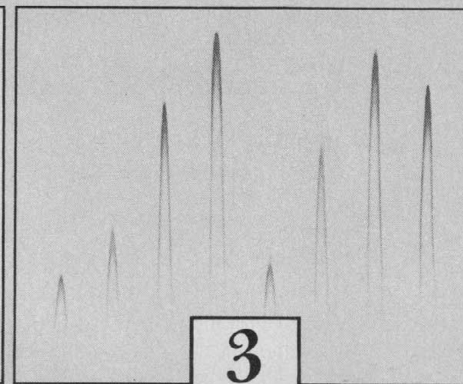
Six reasons to buy a Multiphor



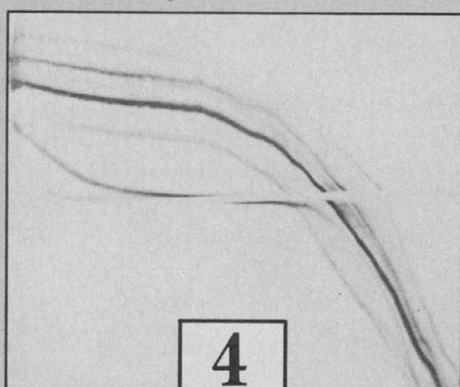
Obtain superior electrofocusing results for a fraction of the cost and time of running older systems. High performance electrofocusing lets you analyze well over 600 samples per bottle of Ampholine with improved resolution due to the elimination of thermal gradients in the gel.



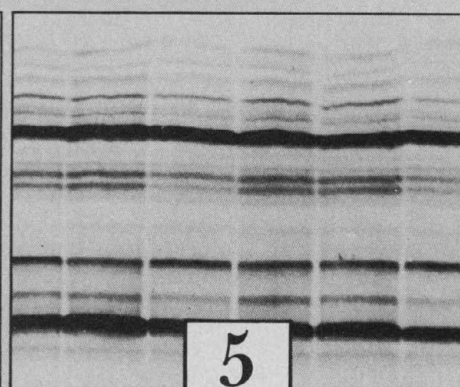
Choose between two preparative techniques. Purify up to gram quantities of even crude samples with preparative electrofocusing. Alternatively, try preparative isotachophoresis with its stacking principle to get good resolution at much lower cost.



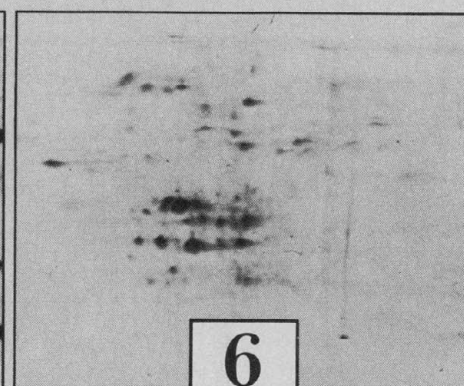
Quantitate proteins by Laurell rockets or run any popular immunoelectrophoretic technique. The new Mini Electrophoresis Kit costs only half the price of the original kits yet gives you everything you need to get started with agarose and immunoelectrophoresis.



Produce titration curves of your sample mixtures to gain information about stability, heterogeneity, interactions, pI, and the best pH for purification. Simultaneously display the electrophoretic mobility versus pH of every component in a single experiment with the new Titration Curve Kit.



Determine the molecular weights of native proteins with high resolution using ultrathin-layer gradient gel electrophoresis and our new miniature gradient former. Or perform conventional SDS and polyacrylamide gel electrophoresis with the original SDS/PAGE Kit.



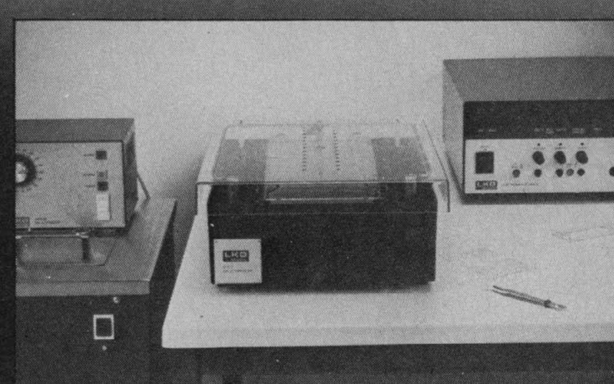
Map complex protein and peptide mixtures with two-dimensional electrophoresis. Combine high performance electrofocusing in the first dimension with ultrathin-layer gradient gel electrophoresis in the second, using the latest procedure developed by Görg et.al. and the new 2-D and Gradient Gel Kit.

Results 5 and 6, courtesy of Dr. Angelika Görg, Technische Univ. München

When you want the versatility to perform a wide variety of electrophoretic techniques, you need the Multiphor System. Now with an expanded range of capabilities, the Multiphor provides unparalleled flexibility, superior design and complete technical support.

Chosen by more researchers throughout the world than any other, the Multiphor System offers unbeatable value for money.

Isn't it time to update your present Multiphor or to consider adding a second system this year? Contact your local representative today and discover how little it costs to gain a lot of versatility.



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a glassware processing system more efficient, economical, faster than ordinary washers.

The Heinicke anti-contaminant washer, with its patented moving-jet impingement, and no recycled pollution feature has set new standards for laboratory glassware cleanliness.

Now Heinicke has systematized the washing process to minimize time, energy, breakage, and detergent. An important aspect to this system: Individual baskets are distributed to different places in the lab. As each technician fills his basket with used glassware it is removed for washing and replaced by an empty basket. It is much faster and easier to handle baskets than individual glassware.

The Model HW-200 and W6-12 can accommodate from two to six baskets at a time, and the HW-100 is available for single basket applications.

HW-200

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FREE. Washing system analysis.

Write and tell us your glassware washing needs. We will send you a detailed analysis of how the washing system can work for you.

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If you should ever have an equipment breakdown, a Heinicke Minute Man will be on his way to you in 48 hours. Dial toll-free 800-327-9783.

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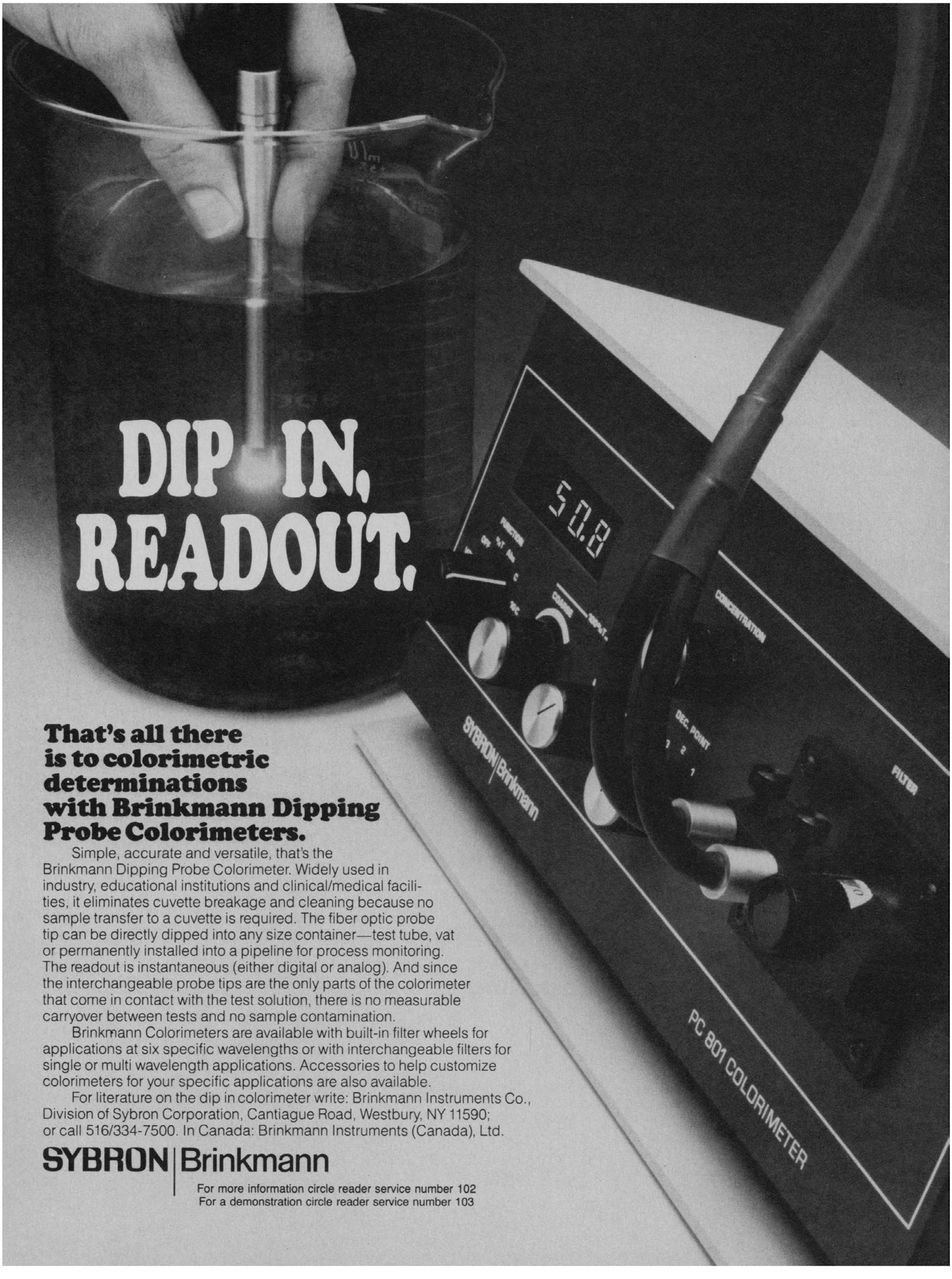
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NEW MODEL 2ML2
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New
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Delivery System.

Orthomune*
monoclonal antibodies in only two years generated more than 200 published papers

In a way, this is a tribute to Köhler and Milstein. Because they're the ones who gave us the idea. But the scientists and engineers at Ortho deserve credit, too, for making it happen.

It started, of course, with monoclonal antibodies. Six years ago, when George Köhler and Cesar Milstein showed the world how hybridomas could be made to produce antibodies against specific immunogens, there was no way to predict exactly which questions the new technology would answer.

OKT*: WELL-CHARACTERIZED MONOCLONAL ANTIBODIES†

The questions we had at Ortho were immunological ones. Our researchers were particularly interested in human lymphocytes. We developed a series of monoclonal antibodies directed against purified human T cells and called them the OKT panel.

Then the real work began. Because clear-cut results can come only from well-characterized reagents, scientists at Ortho put a lot of emphasis on defining the specificity of each clone. Input also came from scientists outside Ortho who worked with the OKT reagents. And as more has been published about the reagents, they've become more and more useful.

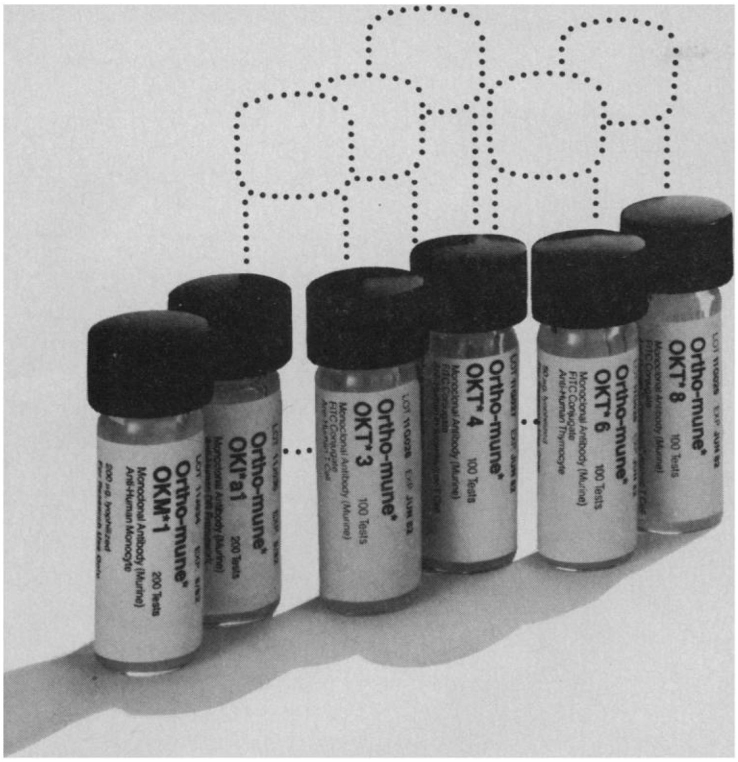
New potential applications came to mind. It began to look like the OKT reagents could standardize T lymphocyte subset analysis. Some immune deficiency disease states turned out to be associated with abnormal ratios of T cell subsets. Research oncologists have now begun using the OKT reagents to characterize proliferative lymphocytic disease states, and they have been used to study immune responses to renal transplantation.

MONOCYTES AND Ia-POSITIVE CELLS

We continued to develop more monoclonal antibodies. The new ones could differentiate monocytes and Ia-positive cell subsets. More applications were developed—sorting human peripheral blood cells, elimination of cell populations by complement lysis, studies on cytotoxicity and histochemical staining of tissue sections.

*Trademark

†For research use only.
Not to be used for diagnostic procedures.



FITC-CONJUGATED ANTI-HUMAN T CELL REAGENTS

We know how busy you are. Our new fluorescein- conjugated OKT monoclonal antibodies should help. They reduce staining procedures to one time-saving step. And more new monoclonal antibodies and fluorescent reagents are being developed and characterized at Ortho.

THE LEADING EDGE

Applications for the Ortho-mune products are following quickly on the heels of research developments. Research oncologists, rheumatologists and immunologists in and out of Ortho are using the System to take a closer look at leukemia, rheumatoid arthritis, multiple sclerosis, myasthenia gravis and response to infections. We've become more than just producers of monoclonal antibodies. We have a commitment to development of integrated systems for analysis of the human immune system. Ortho Immunology Systems is a name that seems to cover it.

Ortho brings you innovative technology—reagents and instruments developed by research immunologists for immunology research.

We'll be pleased to talk with you about setting up a system for lymphocyte subset analysis in your own laboratory. Call us at (800) 526-3875. In New Jersey, call (201) 524-1365.

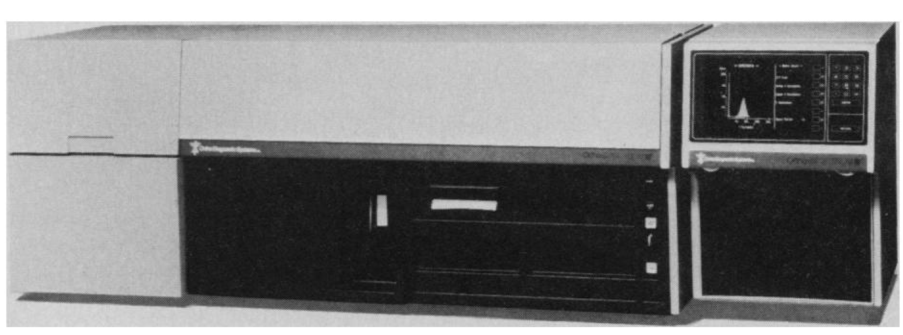
Ortho Diagnostic Systems Inc.

CELL SORTING AND ANALYSIS: CYTOFLUOROGRAF®

We created the Cytofluorograf to meet the growing demands for laser based cell analysis and sorting. Then we combined it with the Model 2150 computer system to provide the flexibility needed for ever-changing research demands in immunobiology, chromosome analysis and molecular genetics. That's the kind of innovation that makes the Cytofluorograf a leader in flow cytometry.

ORTHO SPECTRUM III*

If you are involved in large volume clinical research projects, you may need high speed analysis of whole blood, without the inconvenience of time-consuming sample preparation.
That's what the Ortho Spectrum III does. Integrating Ortho-mune‡ monoclonal antibody technology and laser flow cytometry, this flexible microcomputer-based system can be programmed for accurate cell differentiation on the basis of size and immunofluorescence.



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‡Formerly Orthoclone*

Ortho Immunology Systems: at the leading edge in human immunology research

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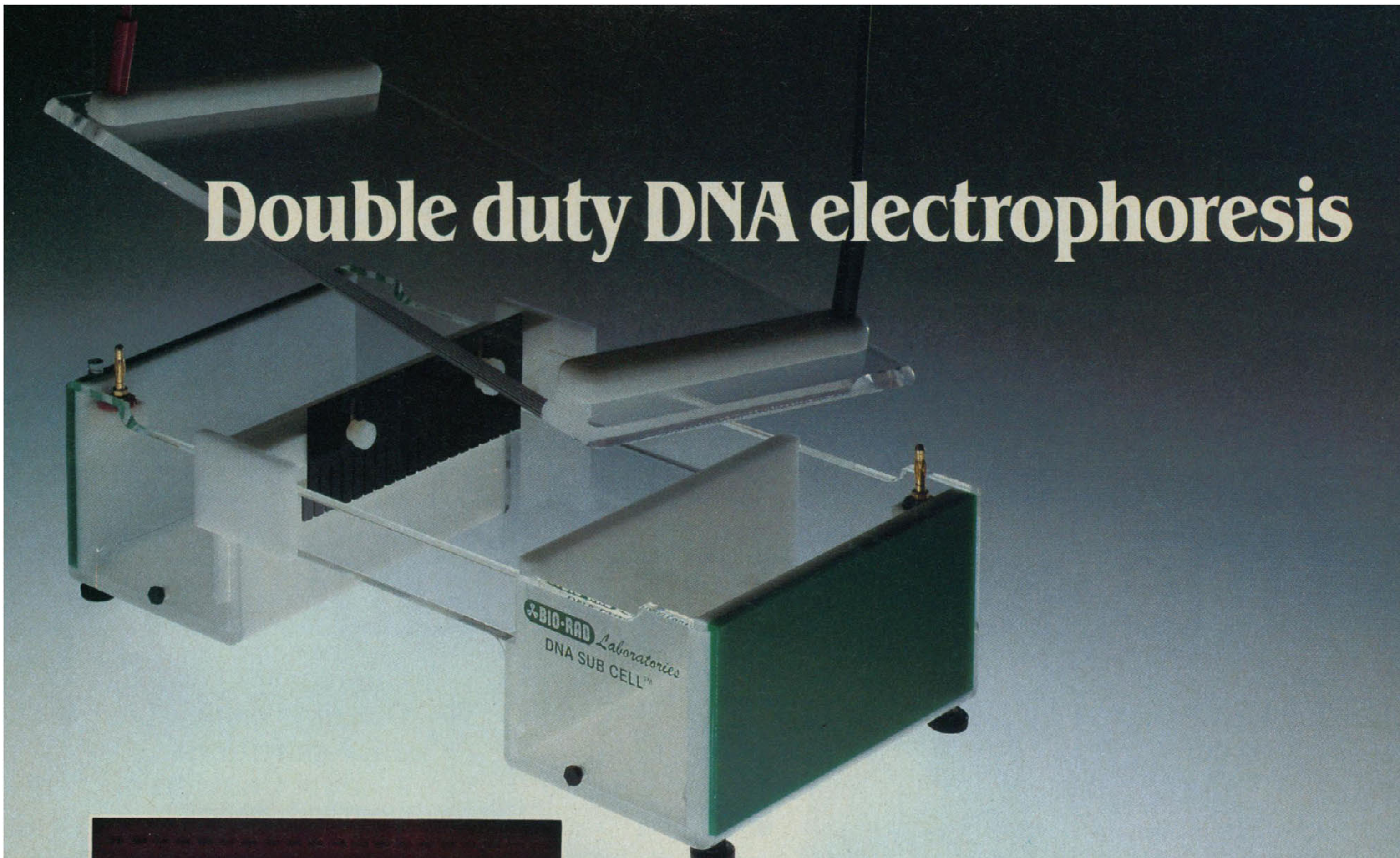
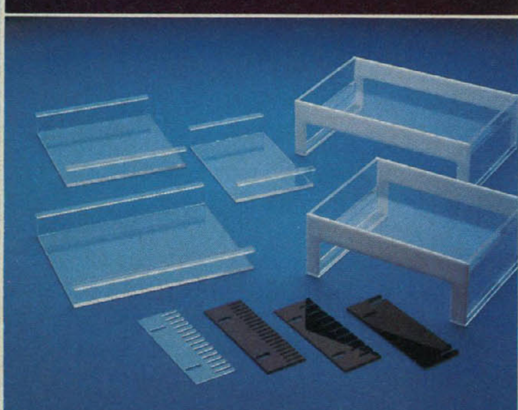
Double duty DNA electrophoresis





One cell, two modes: Sub or bridge.

The new Sub-Cell™ is designed primarily for Submarine electrophoresis. But it does Agarose Bridge electrophoresis just as well.

The Sub-Cell features a set of interchangeable, ultraviolet transparent gel trays in 4 different lengths. Gels to 25 cm can be run using these convenient trays, or you can cast directly on the cell. As many as 20 samples per gel can be separated.

To provide even more versatility, Bio-Rad offers a comb holder system that lets you cast gels on your own plates and trays, including microscope slides. There's also a selection of sample well combs in different lengths and thicknesses...a unique preparatory comb with two outside teeth for running standards...and precut Southern, Northern and electro-blotting papers.

Even the power supply is versatile. It's the Bio-Rad variable voltage Model 160/1.6 that doubles as a power supply for the Bio-Rad Gene Machine and as a high-amp source for the Bio-Rad Trans-Blot™ cell.

The only thing that isn't flexible about the Sub-Cell is its construction. The Sub-Cell is made out of heavy-duty plastic that prevents warp and sag. It has a four-point leveling system and a smooth soft-contact lid that closes without disturbing samples.

And the price?

Low. Especially when you consider the savings in time, materials and lab space.

Find out more. Contact Bio-Rad for details.

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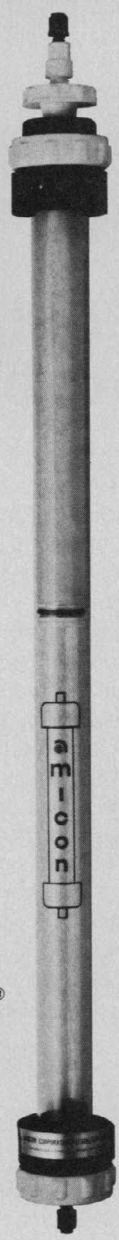
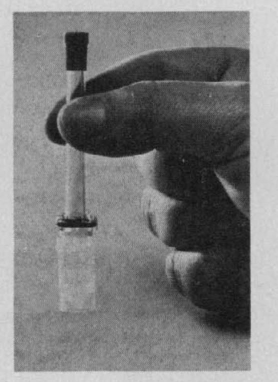
Here's the latest from Amicon, the leader in life science products.





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By redesigning our most popular stirred cell models, we've made them more convenient than ever before. Now you can get easier membrane loading, simpler sample loading and recovery, quicker and more efficient stirring, and even improved base stability. The world's best is now four ways better!

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Our complete line of standard and customized chromatography columns.

No one offers you a more extensive line of standard chromatography columns than Amicon – not even Pharmacia. And with our new column manufacturing subsidiary, we can now custom-build analytical and preparative columns to meet virtually any requirement.

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Our new disposable micropartition system, Centrifree.™

Centrifree is the first really efficient method for separating free from protein-bound microsolute. Based on the equilibrium nature of ultrafiltration, you can accurately partition microvolumes (0.15 to 1.0 ml) of serum or other biological fluids, *without dilution*. Protein-free ultrafiltrate is obtained in a single 5- to 10-minute centrifugation step.

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Our state-of-the-art PBA gels for purification of glycosylated biomolecules.

Amicon has developed the first commercially available PBA (phenyl boronate agarose) gels. Convenient and cost-effective, these Mātrex™ gels are available in three controlled ligand concentrations – each one optimized for particular applications. PBA gels are ideal for the group-selective purification of glycoproteins, nucleic acids, complex carbohydrates, and other diol-containing biomolecules.

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For more information on these innovative Amicon products for the life scientist, simply circle the appropriate reader service card and mail.

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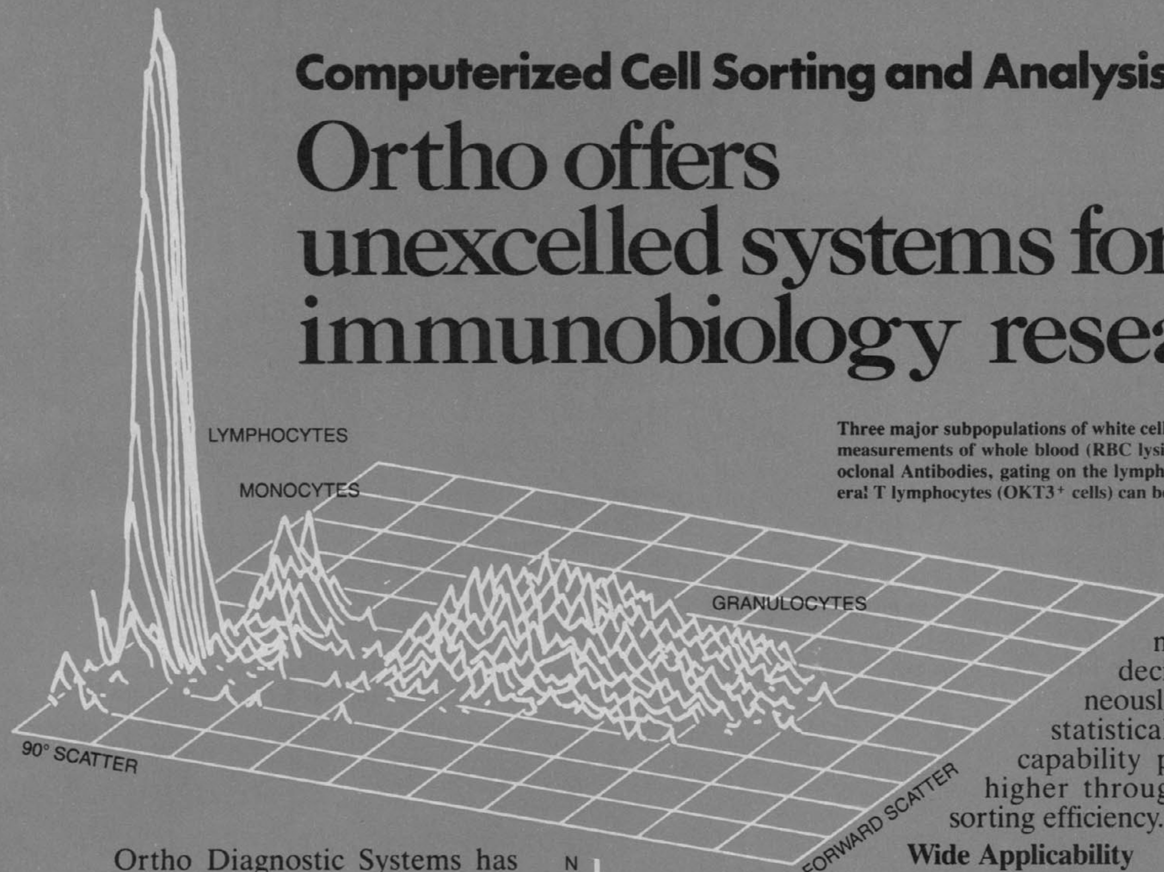
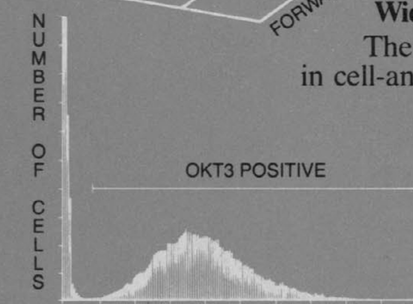
Computerized Cell Sorting and Analysis from Ortho

Ortho offers unexcelled systems for immunobiology researchers



Three major subpopulations of white cells by forward and 90° light scatter measurements of whole blood (RBC lysis only). Using Ortho-mune Monoclonal Antibodies, gating on the lymphocyte population, human peripheral T lymphocytes (OKT3⁺ cells) can be quantitated and/or sorted.



Ortho Diagnostic Systems has established a firm leadership position in cell sorting and analysis instrumentation—in fact, acceptance of Ortho systems by the scientific community has been so great that these instruments now are considered the standard of performance in the field.

Versatile Instrumentation

The Ortho Cytofluorograf* Flow Cytometer is an example of that leadership and commitment to research. As the only flow cytometer to offer a choice of five lasers, (including two installed as standard), the Cytofluorograf provides exceptional applications flexibility.

Flexibility is enhanced further by a modular design which allows the system to be upgraded as research needs change. Performance too is outstanding with analysis rates of up to 10,000 cells per second. And only Cytofluorograf offers direct measurement of seven optical parameters including axial light loss, a valuable technique that allows the use of non-fluorescent stains.

The new 2150 Computer and software can acquire up to 16 histograms and simultaneously display any four of these, all in real-time, allowing the operator complete control over all aspects of the experiment. Because 2150 has two independent microprocessors, it can perform rapid multiparameter sort decisions while simultaneously providing complete statistical data analysis. This capability provides significantly higher throughput and increased sorting efficiency.

Wide Applicability

The system has proved extremely valuable in cell-antigen and tumor studies. It can also be employed for research into cell sizing, DNA and chromosome analysis and many aspects of cell kinetics and microbiology. The exceptional versatility of the system allows it to keep pace with the researcher's interests, never to limit them.

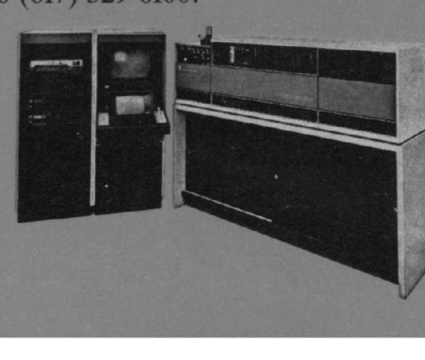
Total Professional Support

Ortho's interest in cellular biology extends beyond producing instrumentation. For example, Ortho has developed Ortho-mune* monoclonal antibodies, the first panel (for research use only) of murine monoclonal antibodies reactive with human T lymphocytes. The company maintains well-equipped applications and training laboratories to develop new techniques and to provide consultative services for customers.

The results of these investigations and others are published in Protocols so that other researchers may share the results. Free copies are available by contacting Ortho.

Ask about the Cytofluorograf Flow Cytometer, 2150 and the complete range of Ortho services. Contact Ortho Diagnostic Systems Inc., Research Instruments Division, 410 University Avenue, Westwood, MA 02090 (617) 329-6100.

Ortho Diagnostic Systems Inc.



* T.M. of Ortho Diagnostic Systems, Inc.

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INSERM CONFERENCES INSERM CONFERENCES INSERM CONFERENCES INSERM CONFERENCES INSERM CONFERENCES INSE

The French Institute of Health and Medical Research (Institut National de la Santé et de la Recherche Médicale) is organizing a series of meetings on advanced research topics in various biomedical fields. The meetings which started five years ago, are known as the INSERM CONFERENCES.

The aims of the conferences are :
– to foster the exchange of ideas, to evaluate new methods and new lines of investigation ;
– to bring together scientists, mostly from European countries, working in universities and public or private research institutions. The meetings will be held under the direct responsability of a chairman and several co-chairmen.

The INSERM CONFERENCES have the following special features :
– only highly topical subjects are dealt with ;
– if possible, the data presented should not have been the subject of any earlier complete publication, a condition which therefore excludes general reviews ;
– the Conferences do not publish proceedings or any other material, even in a summarized form.

The chairman of each INSERM Conference will invite 15 to 20 scientists to give a report in line with the above conditions. The number of contributions will be limited to three of four per session and, at the discretion of the chairman, at least one third of the time will be given over to discussion and brief informal communications.

In addition to the invited speakers, at least fifty participants will attend the meeting, and efforts will be made to select young scientists. Experienced research workers from fields other than those relating to the Conference will also be welcome to attend. Participants will be chosen in such a way as to enable those engaged in all types of scientific research to establish personal contacts, exchange information and find new ways of working together.

PRACTICAL ARRANGEMENTS

The INSERM CONFERENCES 1982 will be held at the Domaine de Seillac, near Blois (180 km from Paris), during the months of September and October (full address : Domaine de Seillac, 41150 Seillac, France). Each conference will last three and a half days, from Sunday evening (departure from Paris) to Thursday afternoon. Working sessions will be held from 9 a.m. to 12.30 p.m. and from 5.30 p.m. to 8 p.m. On free afternoons, participants will have a wide choice of leisure activities at the Domaine de Seillac and in the surrounding area (Tennis, Table-tennis, bicycling, visit to the Castles of the Loire).

REGISTRATION FEE

Participants whose applications are accepted but who are not invited speakers, will be asked to pay their registration fee and board (1400 FF).

Scientists wishing to attend this conference have to submit this application form BEFORE JUNE 4th to INSERM Conferences, 101, rue de Tolbiac - 75654 PARIS CEDEX 13, France - Telephone : 584-14-41 - extension 210.

APPLICATION FORM

CONFERENCE ON : . . . .
(Name-Date)

NAME, TITLE and POSITION :. . . . .

. . . .

INSTITUTION (with address and **phone number**) : . . . .

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See overleaf...

PRELIMINARY PROGRAM FOR 1982

MOLECULAR AND CELLULAR MECHANISM OF SECRETION OF PEPTIDE HORMONES - October 3-7, 1982

Pierre CORVOL, Chairman ; François ROUGEON and Andrée TIXIER-VIDAL, co-chairmen

The list of speakers will include :

G. BLOBEL	(New York)	L. JAN	(Marnes-la-Coquette)
M. CHRETIEN	(Montréal)	J. MARTIAL	(Liège)
P. COHEN	(Paris)	W.J. RUTTER	(San Francisco)
S. N. COHEN	(Stanford)	D. SABATINI	(New York)
C. DE DUVE	(Bruxelles)	I. SCHECHTER	(Rehovot)
B. DUFY	(Bordeaux)	M. SCHWARTZ	(Paris)
W.W. DOUGLAS	(New Haven)	P. SEEBURG	(San Francisco)
B. EIPPER	(Denver)	J. SHINE	(Canberra)
M.G. FARQUHAR	(New Haven)	D.F. STEINER	(Chicago)
H. GAINER	(Bethesda)	A. TASHJIAN	(Boston)
J.F. HABENER	(Boston)	C. TOUGARD	(Paris)
E. HERBERT	(Eugene)		

PRELIMINARY PROGRAM FOR 1982

MOLECULAR BIOLOGY OF THE HEMOSTATIC, IMMUNE AND INFLAMMATORY PATHWAYS - October 24-28, 1982
Thomas EDGINGTON, Chairman ; Dominique MEYER, co-chairman

The list of speakers will include :

H. BAUMGARTNER	(Bâle)
J. BENVENISTE	(Clamart)
B. BOUMA	(Utrecht)
J. CAEN	(Paris)
C. COCHRANE	(La Jolla)
D. COLLEN	(Louvain)
M. COLOMB	(Grenoble)
R. COLVIN	(Boston)
E. DAVIE	(Seattle)
R. FAUVE	(Paris)
M. GIMBRONE	(Boston)
S. GORDON	(Oxford)
O. GOTZE	(Göttingen)
C. HEMKER	(Maastricht)
P. HENSON	(Denver)
P. LACHMANN	(Cambridge)
M.J. LARRIEU	(Le Kremlin-Bicêtre)
Y. LEGRAND	(Paris)
P. MAJERUS	(Saint-Louis)
K. MANN	(Rochester)
G. MARGUERIE	(Le Kremlin-Bicêtre)
H. MULLER-EBERHARDT	(La Jolla)
J. NIEMETZ	(New York)
A. NURDEN	(Paris)
R. PORTER (Oxford)	(Oxford)
U. SELIGSOHN	(Tel Aviv)
R. SNYDERMAN	(Durham)
J. STENFLO	(Malmö)
G. TOBELEM	(Paris)

PRELIMINARY PROGRAM FOR 1982

THE REPLICON - 20 YEARS AFTER - September 19-23, 1982
François CUZIN, Chairman ; Moshe YANIV and Masamichi KOHIYAMA, co-chairmen

The list of speakers will include :

B. ALBERTS	(San Francisco)	Y. HIROTA	(Sizuoka-Ken)
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7th R&D Colloquium Washington, 23 & 24 June 1982
Advance Registration Form

Wednesday & Thursday, 23 & 24 June, at The Shoreham Hotel, 2500 Calvert St., N.W., Washington, D.C.

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☐ $125 Full Registration (sessions, three meals, R&D: FY 83 Report, and Proceedings)
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Program, badge, meal tickets, and R&D: FY 83 Report will be mailed 12 June. Registrations received after 12 June will be held at the AAAS Registration Desk at The Shoreham Hotel. Reports from previous years (order below) will be sent as soon as possible. Proceedings of '82 Colloquium will be sent as soon as available.

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THE LEADING EDGE

#2 in a series of reports on new technology from Xerox

Few inventions have proved more versatile than the laser.

It has been used as a super signal lamp for space communications. It has found a role in exotic metal-working applications, and the incredible precision that it offers has made new kinds of brain and eye surgery possible.

A system for playing TV shows from phonograph-like disks uses a laser to "read" the recorded program material.

Lasers are used in various forms of measurement and information handling systems. For example, one version of the bar-code reader used in supermarkets employs a laser scanner.

The Hologon Laser Scanner is one of the latest developments in practical applications of laser technology. It was invented by Xerox optical physicist Dr. Charles Kramer who wrote this article.

Lasers In Electronic Printing

At Xerox we use lasers in electronic printing systems that are based on xerography. Instead of making copies of existing documents, such printers create documents, drawing on information stored in a computer. In such a system, signals from the computer pulse the laser beam as it scans across a light-sensitive drum or belt that serves as the "camera film" in xerography. The image recorded in this way is then developed and transferred to paper as in a copier.

Laser electronic printers offer the quality of offset printing with significant versatility compared with conventional computer printers. There is virtually no meaningful limit to format or to type style or size. Pictorial or other graphic material can be printed as easily as text. Arabic, Greek or Russian alphabets—even Oriental ideograms—are within its capabilities, provided appropriate programming is fed into the printing system.

Equally significant is the fact that, with electronic printing, documents originated in one location can be printed simultaneously at a number of different locations.

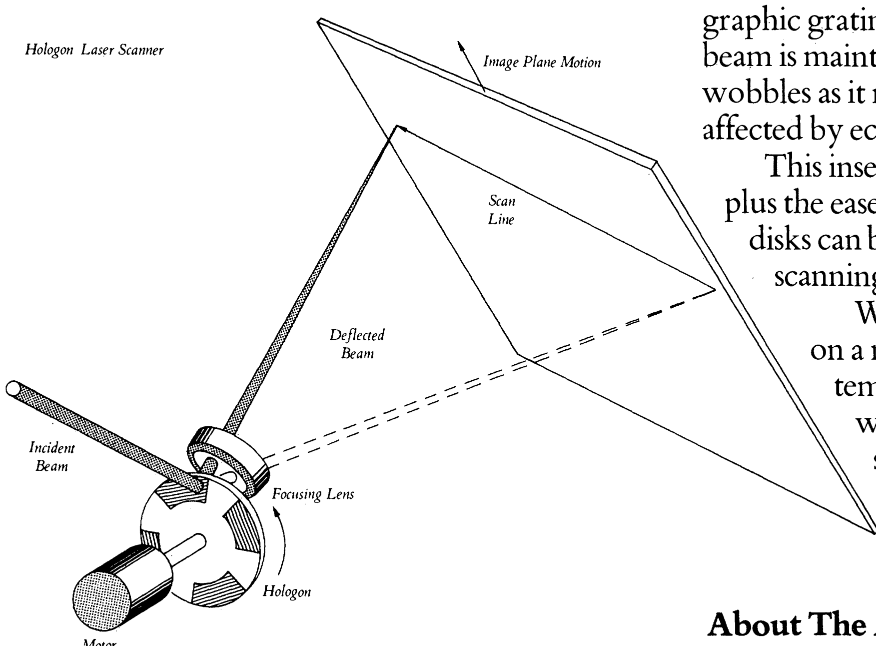
Xerox currently offers three such systems. The 9700 electronic printing system turns out almost two pages per second and has almost unlimited flexibility when it is used with the Xerox Integrated Composition System program. The 5700 electronic printing system is up to 40 times faster than conventional word-processing printers, which it can replace, and it can also be used for electronic mail and remote computer printing. A similar printer is offered as part of the Xerox 8000 network system. Designed for lower-volume applications, it is twelve times faster than a conventional word-processing printer.

In these printers, the scanning action of the laser beam is created by a relatively complex optical system that is based on a rotating, polygonal prism. Extremely high precision is required in such a system. This complexity and precision make such a laser scanner relatively expensive.

The Hologon Laser Scanner

To simplify laser scanners and reduce their cost, we considered holography to perform the functions of costly lenses and prisms.

Holographic recordings, best known for their reproduction of three-dimensional images, take the form of gratings—corrugated or ridged patterns on a transparent medium, having a spacing of approximately twenty millionths of an inch. In pictorial holograms, these gratings contain the recorded cross section of the wavefront of light



that had been reflected from the pictorial subject. When coherent light—usually from a laser—is transmitted through such a hologram, a true three-dimensional image of the subject is reproduced.

However, the holographic gratings used in a Hologon scanning system do not contain pictorial information. Only the optical diffraction properties of the gratings are utilized.

The Hologon System is one of several holographic approaches to scanning. But the others tend to scan in an arc-like pattern which is unsuitable for electronic printing, which requires a straight-line scan, much like the raster pattern used in television to create an image. The Hologon approach gets around this problem through a novel configuration.

In a Hologon, a series of holographic gratings are formed around the circumference of a transparent disk. A laser shines through these gratings as the disk rotates. The gratings diffract the laser light, and the rotating action causes it to scan across the surface on which it is focused, as shown in the accompanying diagram. Focusing is done by a simple, inexpensive lens.

The laser beam in this system is aimed so that it forms a nominal 45° angle to the Hologon's surface as it enters a grating and a 45° angle as it emerges from the grating. In other words, it is diffracted through a right angle by the gratings. This angling results in a straight-line scan.

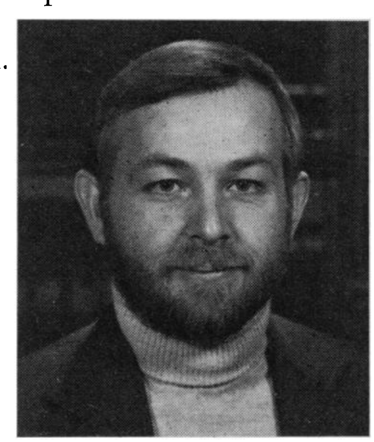
Because of the optical properties of the holographic gratings, the 90° diffraction angle of the beam is maintained even if the Hologon surface wobbles as it rotates. The beam angle is equally unaffected by eccentricities in the rotating disk.

This insensitivity to mechanical variation, plus the ease and low cost with which Hologon disks can be produced, make a Hologon laser scanning system relatively inexpensive.

Work is currently underway at Xerox on a new generation of laser printing systems utilizing the Hologon laser scanner with all its attendant benefits. This should enable Xerox to make the advantages of electronic printing more widely available than ever before.

About The Author

Dr. Charles Kramer is the inventor of the Hologon Laser Scanner. He is an optical physicist specializing in electro-optical reading and printing devices at the Xerox Joseph C. Wilson Center for Technology in Rochester, New York.



He holds a Bachelor's degree and a Master's degree in Physics from Fairleigh Dickinson University and a Master's degree and Ph.D in Optics from the University of Rochester.

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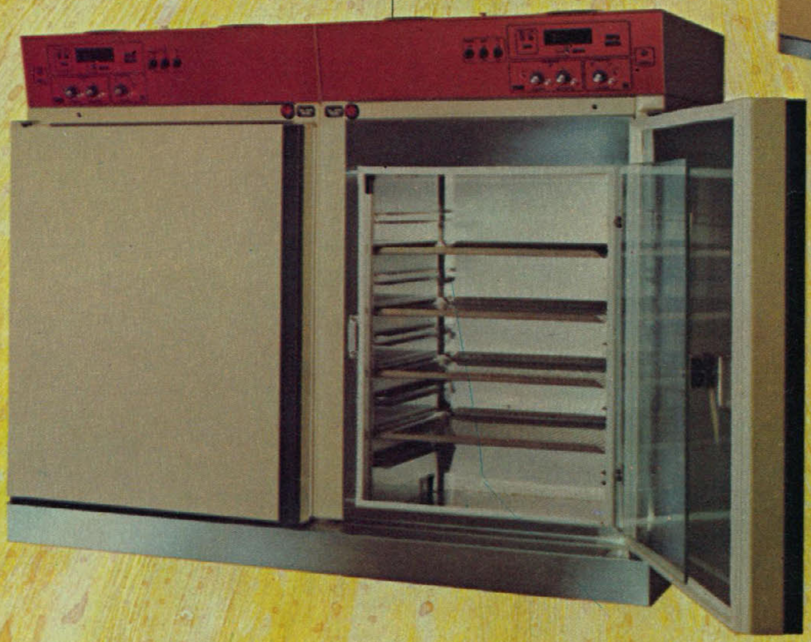

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23 April 1982, Volume 216, Number 4544 SCIENCE

The Government, Secrecy, and University Research

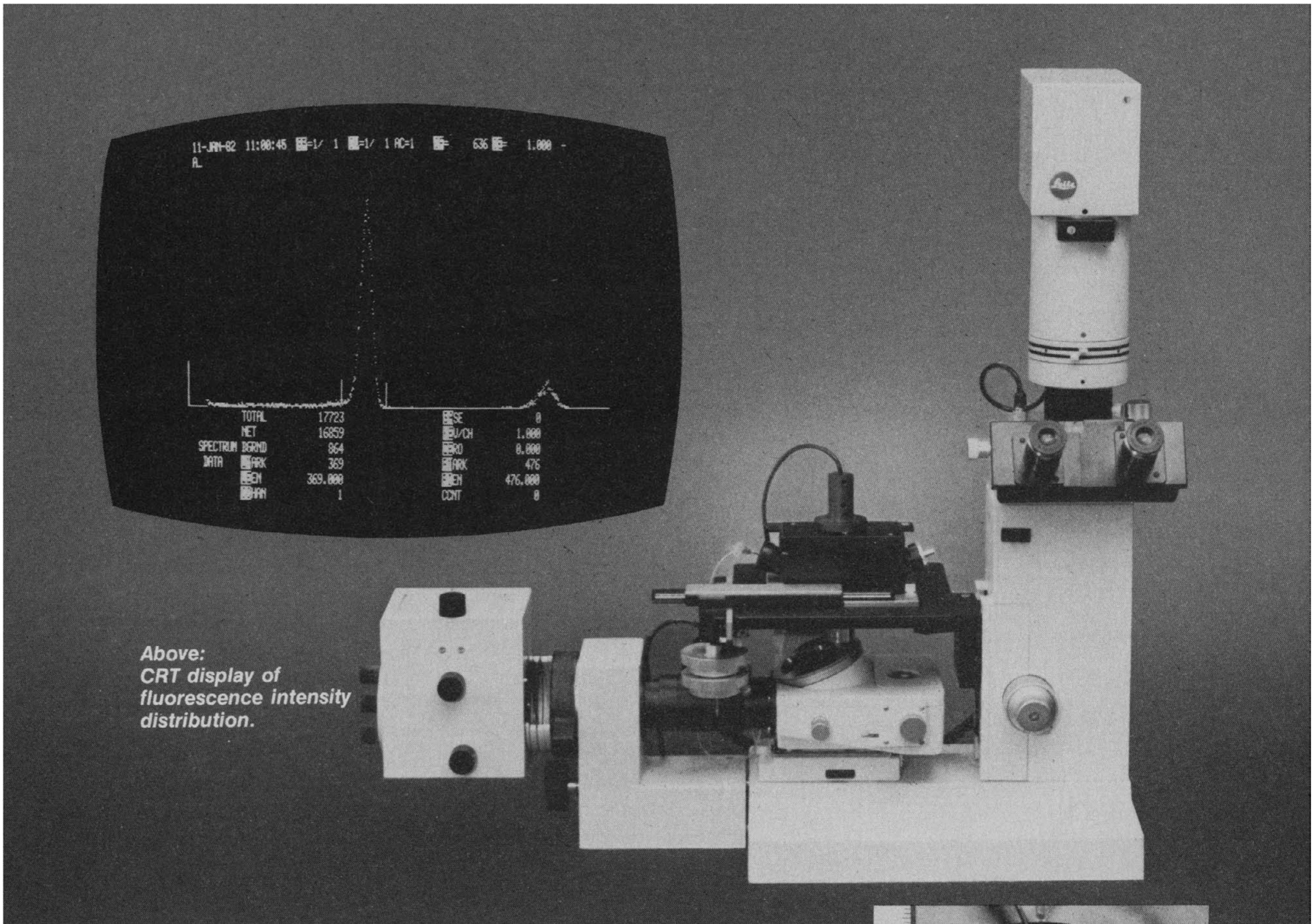
Fundamental science in the United States is a successful venture, but a peculiar one. Its success is attested by the dramatic increase in scientific awards won by Americans and by the contributions it makes to our technological productivity. Its peculiarity lies in the organizational arrangements for its sustenance. It is an activity pursued in one culture, supported out of another: more than two-thirds of the nations's fundamental science is done in the research universities, with the government sponsoring nearly all of it. Given the contrast in style and values between the two cultures, it is hardly surprising that this patronage arrangement sometimes generates quarrels. The current one is a debate over the government's efforts to regulate scholarly activities related to critical technologies.

The problem is that the Communist bloc nations have obtained and then copied U.S. innovations in military technology. The solution proposed by the Administration—based on the hypothesis that these leaks partly involved academic exchanges—is that universities restrict the access of foreign students and visitors to, and dissemination of research results in, certain fields of study. These restrictions are sought by applying to fundamental research regulations originally intended for devices or industrial processes.

The universities have countered that if unpatrolled academic visits and the participation of foreign students in research programs contribute to technology leakage, they do so minimally, and that interdicting academic exchange would therefore yield trivial benefits to national security. We have also emphasized the potential damage to the scientific enterprise from government efforts to restrict its openness—especially when these coincide with efforts of private sponsors to expand secrecy for proprietary reasons. It surely will be difficult to resist the latter if we are forced to accept the former.

There is, fortunately, encouraging progress to report. The Department of Defense has created a forum with the universities to examine research restrictions, among other things. The National Academy of Sciences will be studying the matter as well. The Department of State and the Department of Commerce are responsible for the regulations under which the current restrictions have been mandated. The State Department has revised its instructions on the handling of Soviet visitors, so that their academic hosts will not be required to shield them from exposure to particular unclassified projects. That department, which is responsible for the International Traffic in Arms Regulations, has also adopted an appropriately narrow view of their scope. We are informed that the regulations will apply only to technical data significantly and directly related to specific items on the Munitions List—the limitation set out by the United States Court of Appeals for the Ninth Circuit in *U.S.* v. *Edler Industries*.

These are promising signs of change, and they should be encouraged; there are other ways to meet our national security objective. If a Soviet scientist is viewed with such alarm that universities must be asked to police his visit, then the Department of State can apply visa controls. And if a technology has such military value that exposure in an open environment presents clear risks to national security, the government can classify the technology—thereby permitting the universities to decide in advance whether they can accept the restrictions that come along with the work. But to apply a burdensome set of regulations to a venture that has gained such great strength through its openness will cost the nation more than it can be worth.—DONALD KENNEDY, *President, Stanford University, Stanford, California 94305*



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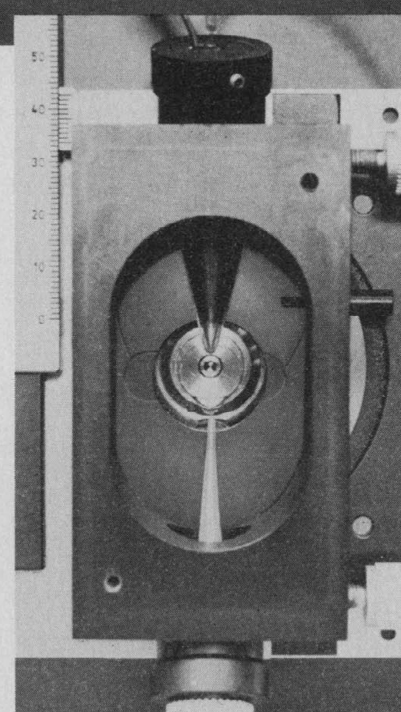

View looking into flow chamber

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