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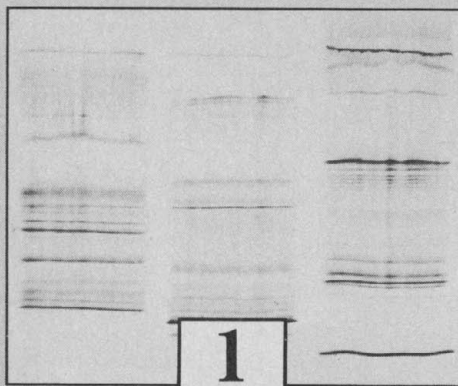
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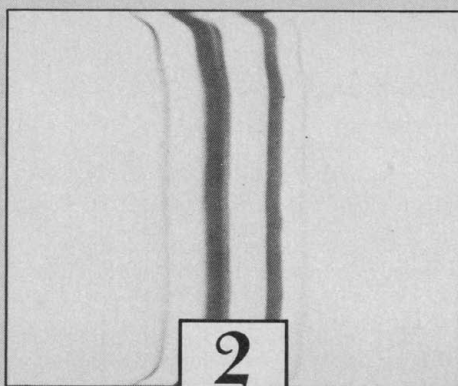
Bowerbird (*Amblyornis flavifrons*) recently rediscovered in a remote part of New Guinea. To attract females, males build a stick tower on a rimmed moss platform, decorate it with fruit of three different colors, and extend toward the female a blue fruit set against the golden crest. See page 431. [Painting 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]

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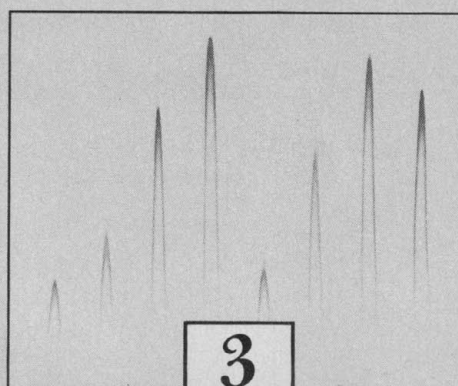
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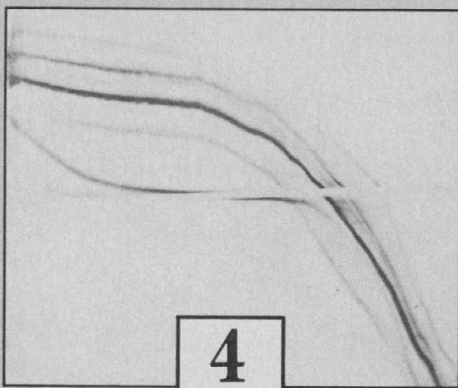
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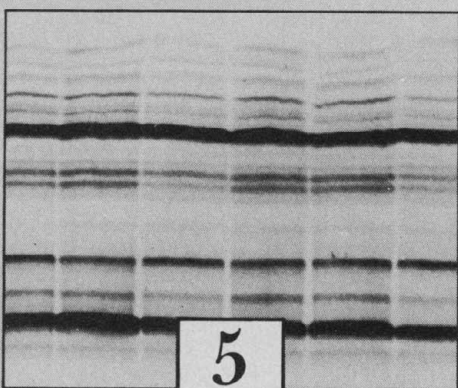
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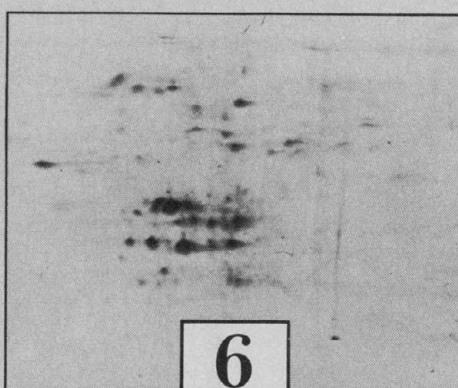
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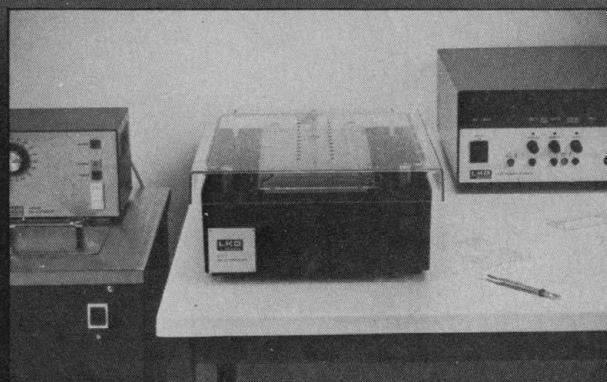
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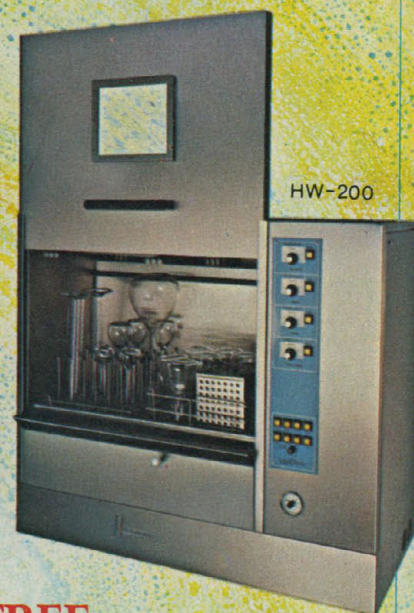
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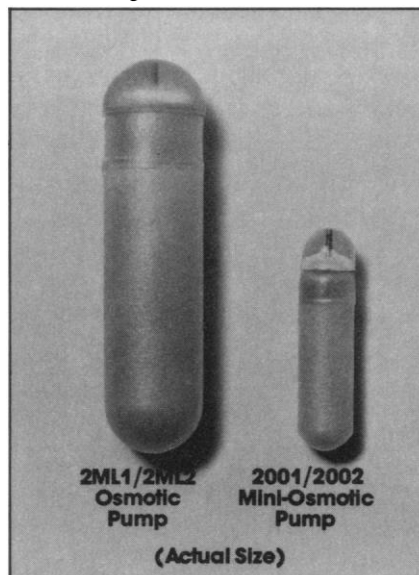
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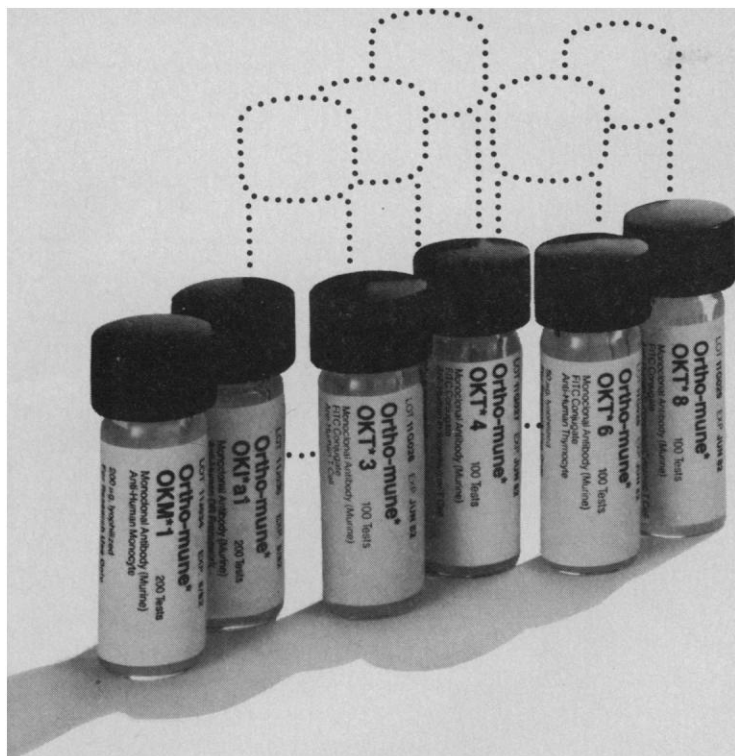
MONOCYTES AND Ia-POSITIVE CELLS

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.

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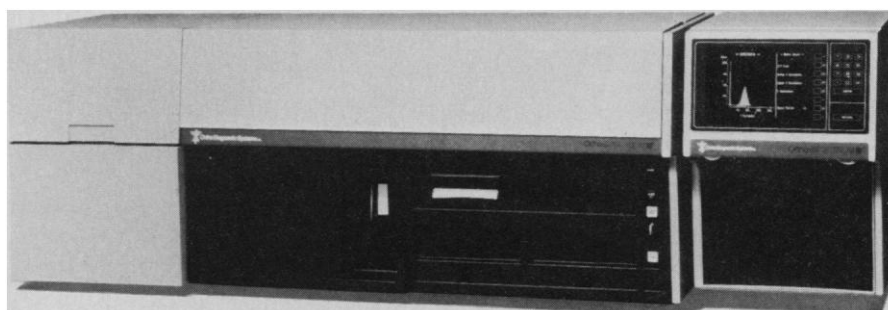
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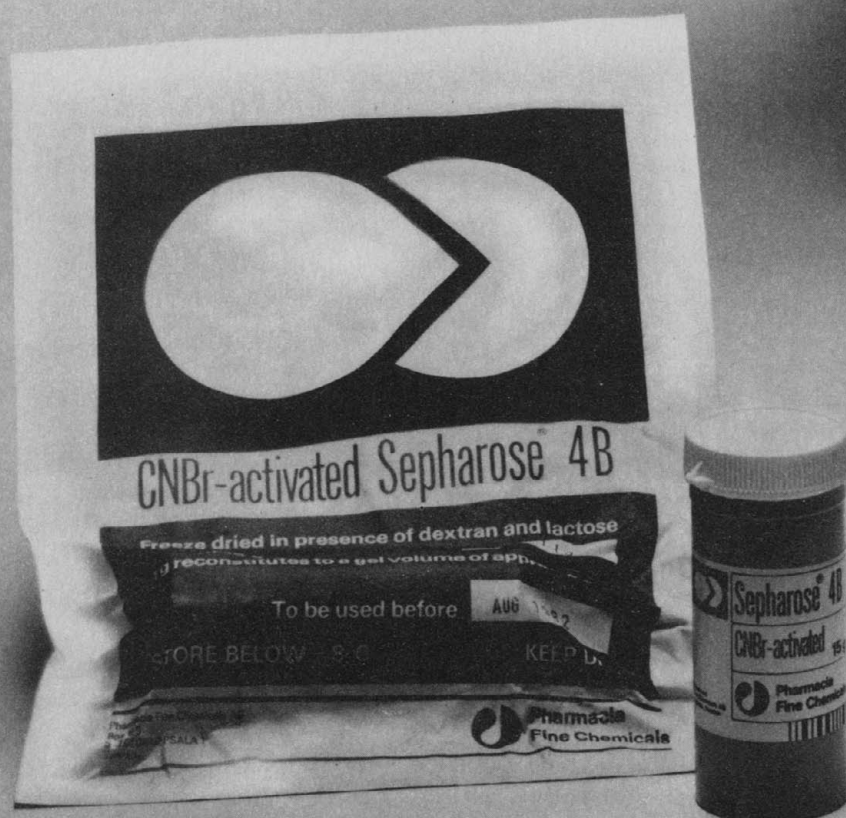
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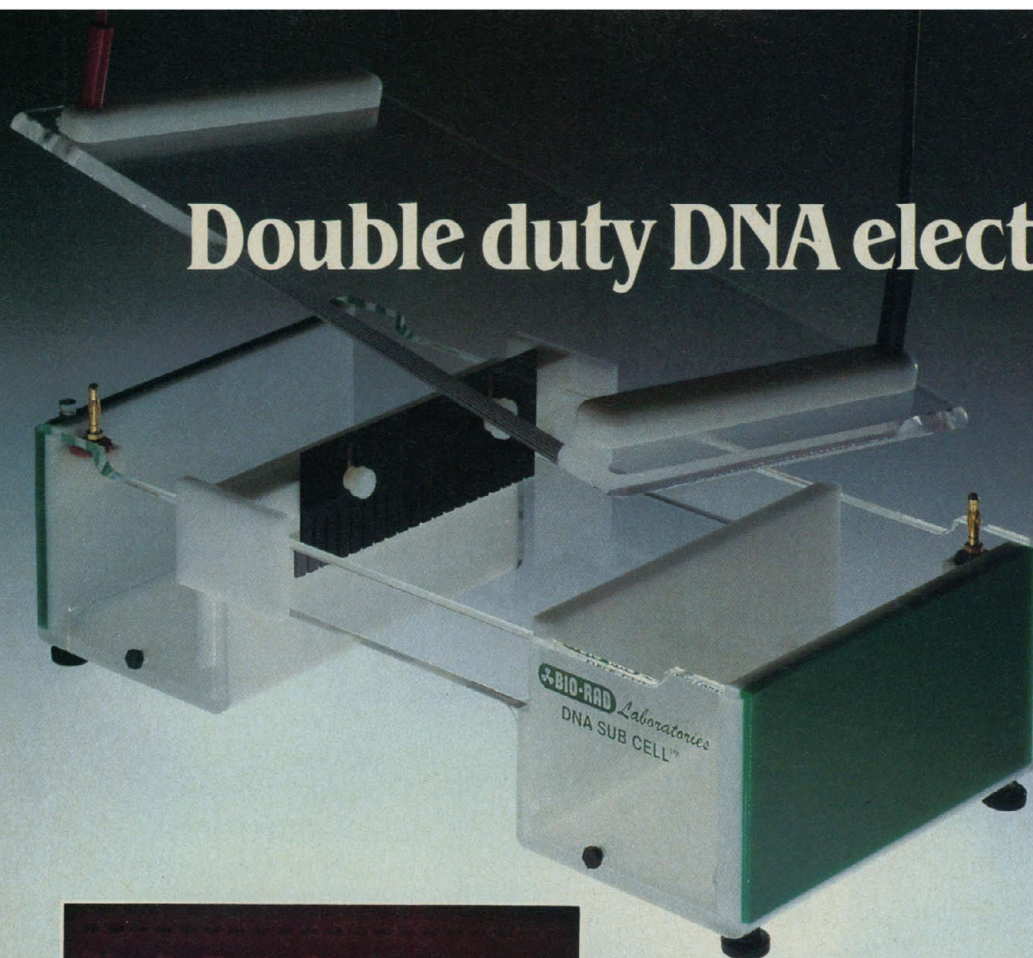
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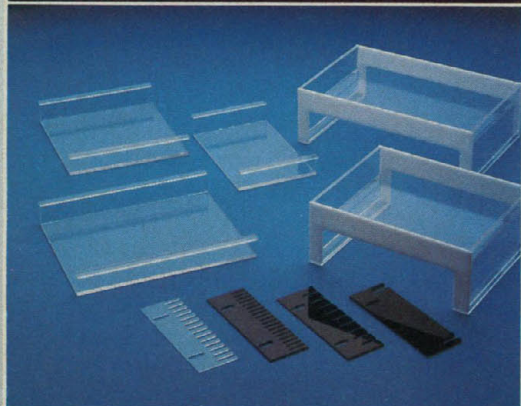
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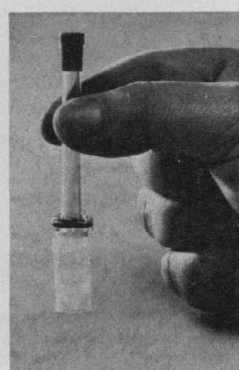
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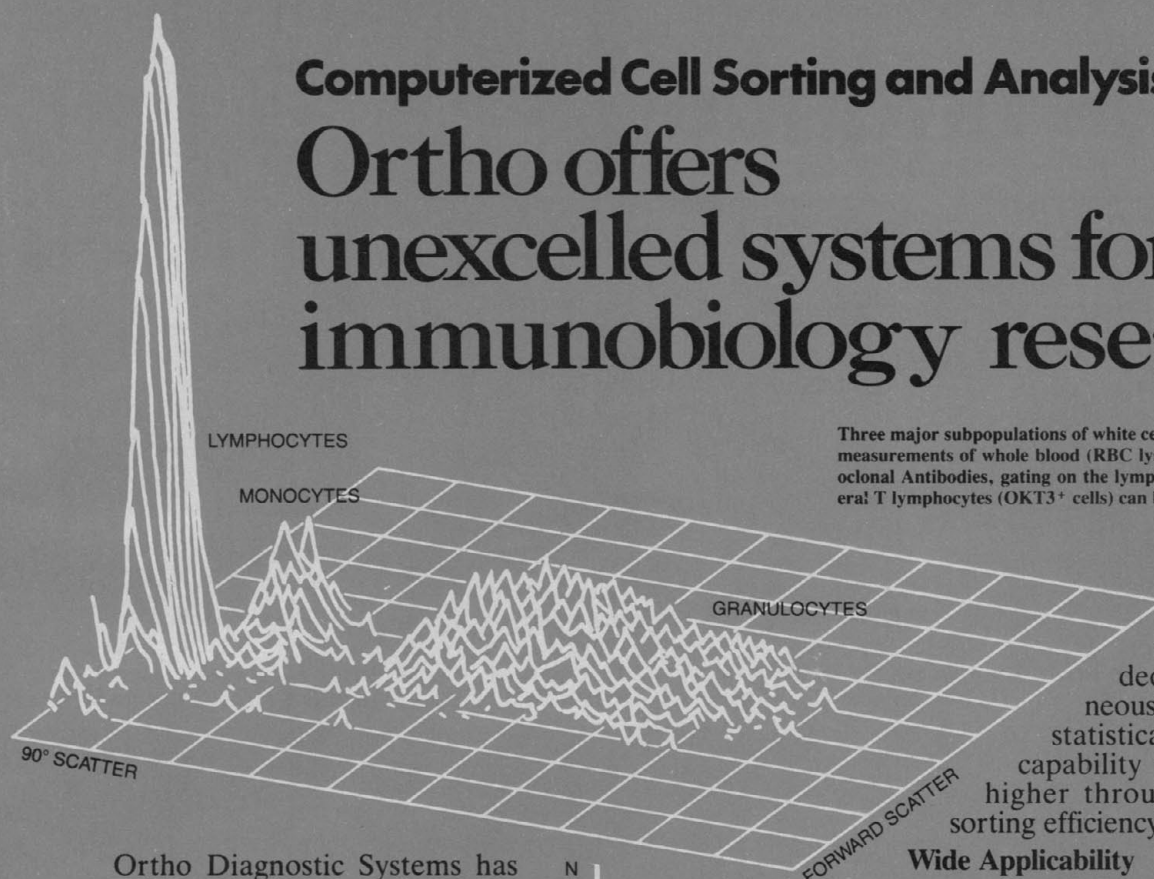
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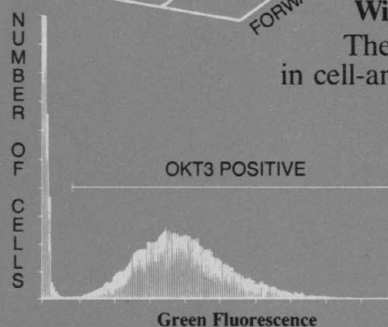
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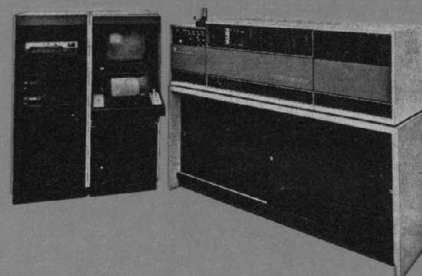


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- to foster the exchange of ideas, to evaluate new methods and new lines of investigation ;
 - to bring together scientists, mostly from European countries, working in universities and public or private research institutions.
- The meetings will be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

The INSERM CONFERENCES have the following special features :

- only highly topical subjects are dealt with ;
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- 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 or 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

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See overleaf...

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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 :

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

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)
G. BERNARDI	(Paris)	G. HURWITZ	(Bronx)
M. BOTCHAN	(Berkeley)	F. JACOB	(Paris)
S. BRENNER	(Cambridge)	A. KORNBERG	(Stanford)
J. CARBON	(Santa Barbara)	R. LASKEY	(Cambridge)
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R. DAVIS	(Stanford)	C. RICHARDSON	(Boston)
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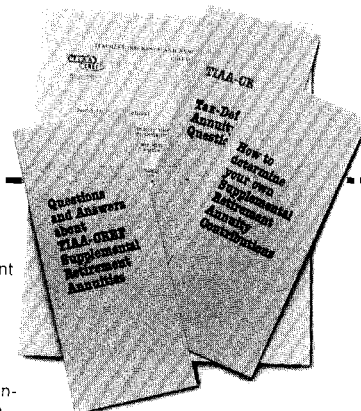
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THE LEADING EDGE

#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 opti-

cal 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

novel configuration.

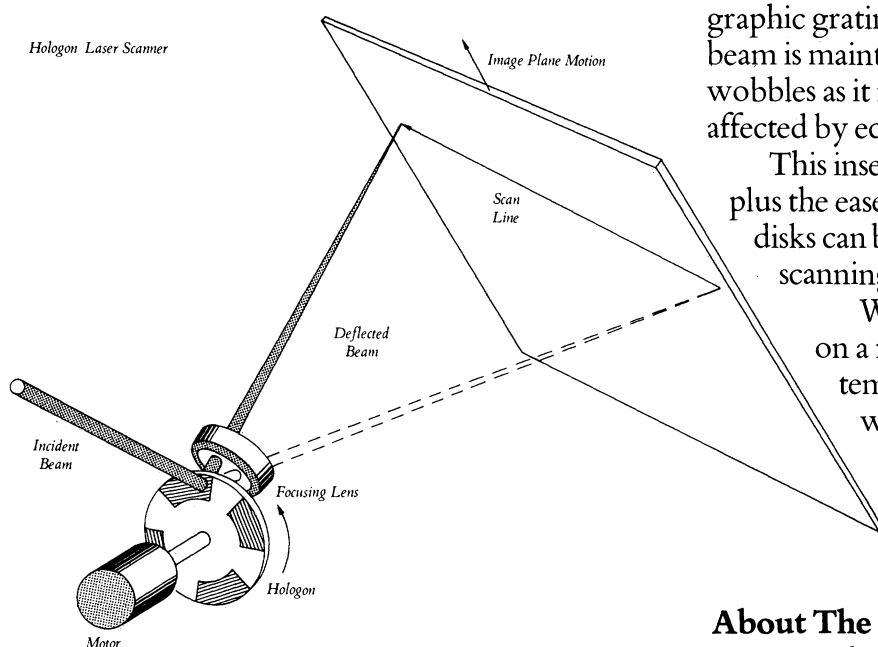
In a Hologon, a series of holographic gratings are formed around the circumference of a transparent disk. A laser shines through these gratings as the disk rotates. The gratings diffract the laser light, and the rotating action causes it to scan across the surface on which it is focused, as shown in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



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.

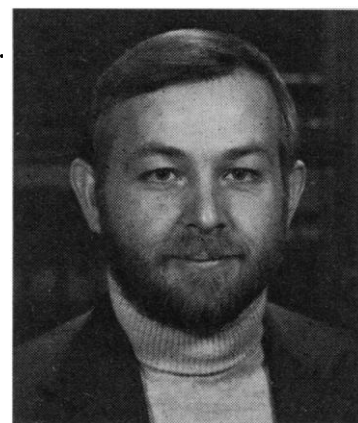
However, the holographic gratings used in a Hologon scanning system do not contain pictorial information. Only the optical diffraction properties of the gratings are utilized.

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

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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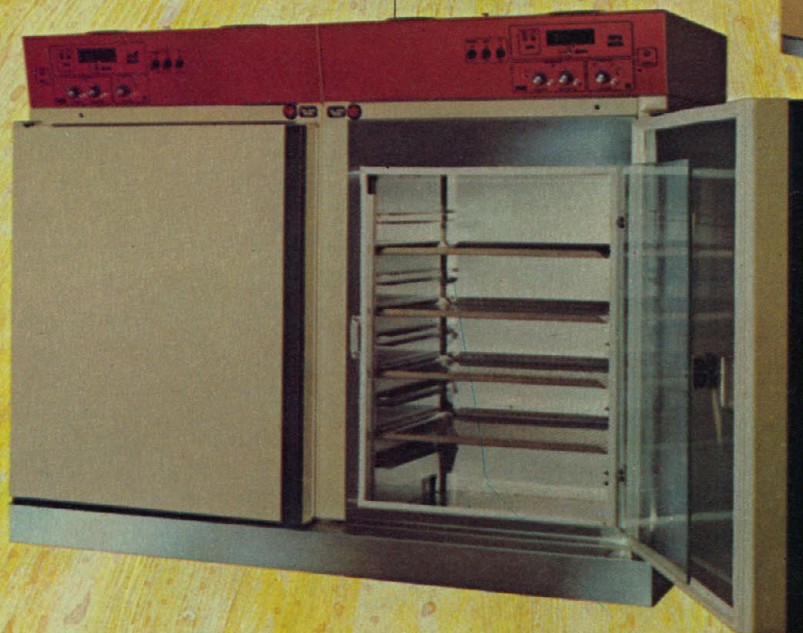
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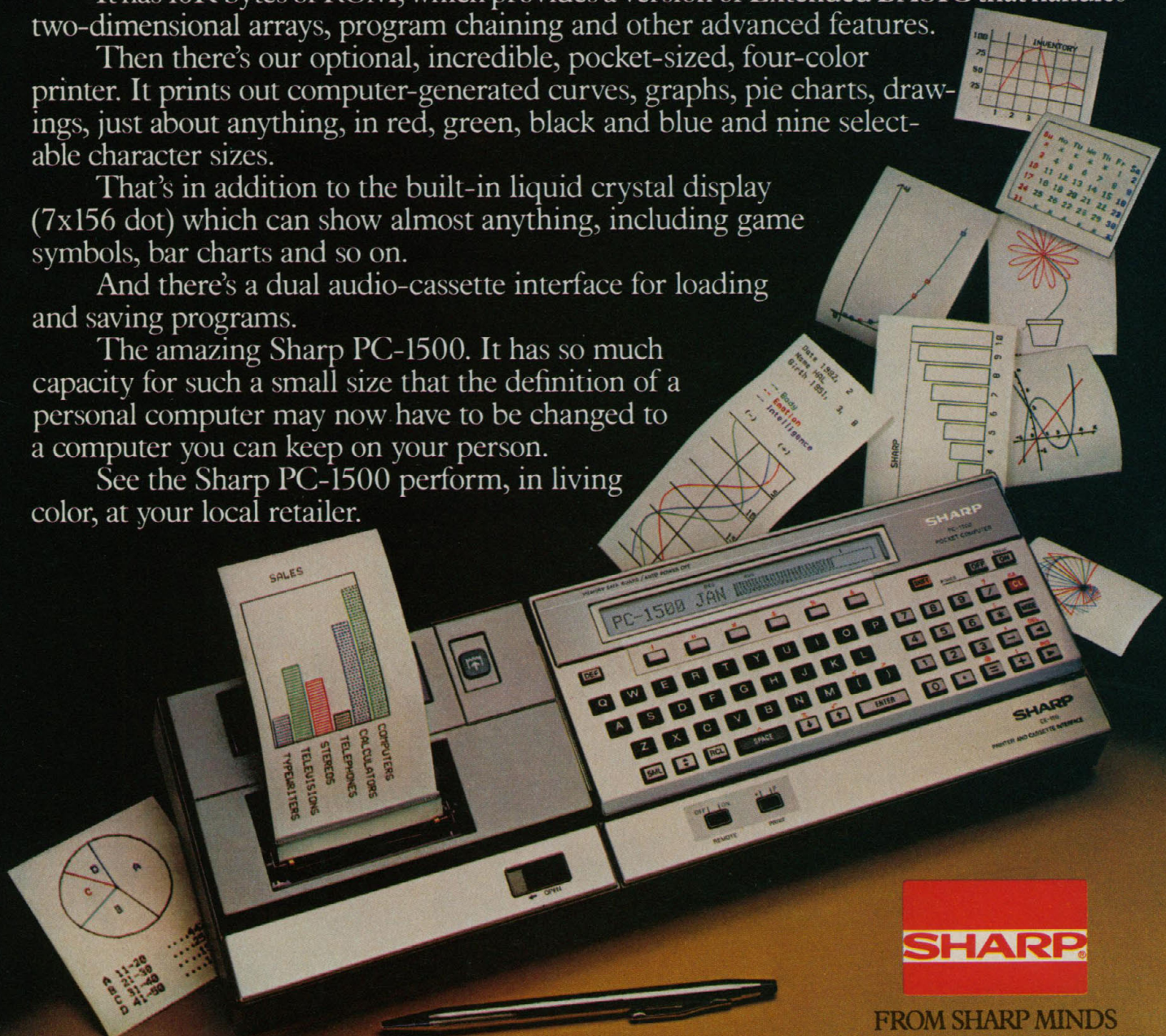
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The Government, Secrecy, and University Research

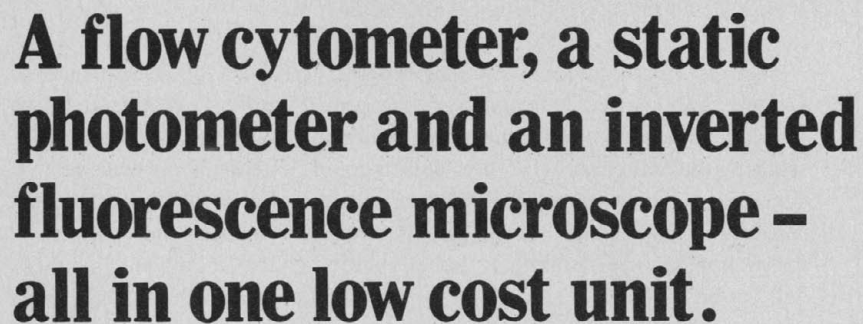
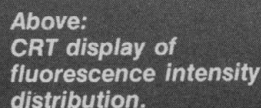
Fundamental science in the United States is a successful venture, but a peculiar one. Its success is attested by the dramatic increase in scientific awards won by Americans and by the contributions it makes to our technological productivity. Its peculiarity lies in the organizational arrangements for its sustenance. It is an activity pursued in one culture, supported out of another: more than two-thirds of the nation'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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