

26 May 1978 • Vol. 200 • No. 4344

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AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

Health Maintenance

Sequencing long proteins or short peptides, the secret's in the spinning cup.

From long proteins to short peptides, the one instrument that can handle all major methodologies in automated sequential analysis is the Beckman Model 890C Sequencer. Day and night, completely automatically, 20 to 24 amino acid residues a day, the Beckman spinning cup Sequencer reduces what used to take man-years to a matter of weeks.

For the now-classic Edman technique, the Sequencer routinely accomplishes 40 to 60 or more degradations for each large protein fragment. The Model 890C's spinning cup gives samples maximum exposure to reactants, which flow over the protein on the sides of the cup in an economically thin film. After extraction of reactants and cleavage product with appropriate solvents, the shortened protein left in the cup is ready for the next automatic cycle. Even detergent-containing samples can be sequenced in this fashion.

Small peptides (of a few residues only) and microsamples are handled equally well in the versatile spinning cup:

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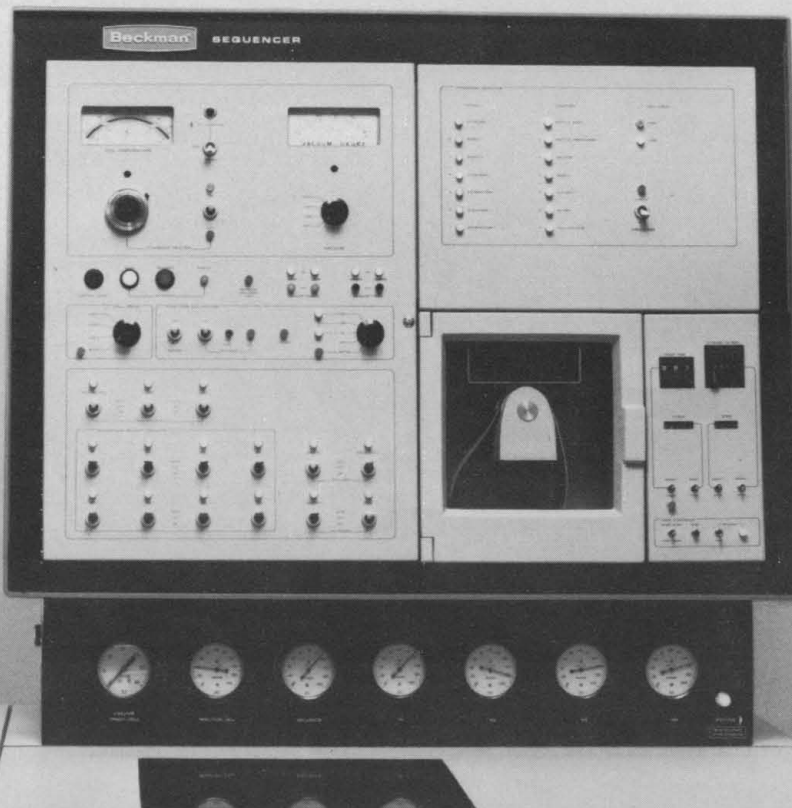
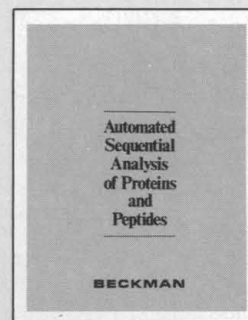
- By using radioactive reagents or radiolabeled amino acids to sequence picomole amounts of sample.

With these Sequencer strategies, you never again need to make tedious manual degradations: fragmenting and then isolating a large number of small peptides, determining their structure, and then laboriously piecing together their overlapping information. Just turn the job over to the complete Sequencer, the Beckman 890C.

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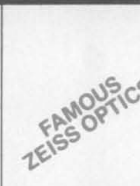
























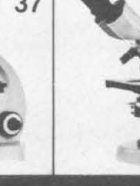



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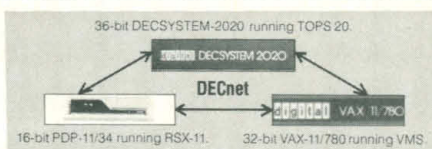
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DIGITAL, MAY, 1978.

CATCHING THE ANSI STANDARD MUMPS.



MUMPS, the interactive data base management system was pioneered at Massachusetts General Hospital in 1967. Digital has been in the forefront of its development ever since. Now Digital announces DSM-11, the first implementation of ANSI STANDARD MUMPS language to become available from a major computer manufacturer. Unique features of DSM-11 include journaling, spooling, distributed data base support, support for up to sixty-three jobs and eighty terminals, and data base capacity from 7.5 million to 1.4 billion bytes. To find out how to get MUMPS, check the coupon.

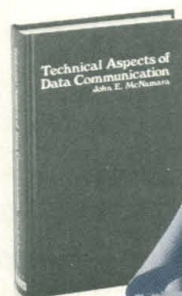


THE ULTIMATE DISTRIBUTED PROCESSING DEMONSTRATION. DECNET. LIVE AT NCC.

A 36-bit DECSYSTEM-2020 running the TOPS 20 operating system will be hooked up to a 32-bit VAX-11/780 running the VMS virtual memory system and these will be hooked up to a 16-bit PDP-11/34 running RSX-11. If you ever wanted concrete proof of DECnet's ability to link together different architectures, word lengths, and operating systems, come to Anaheim, June 5, and join the crowd in the West Hall. And if you want to read about why such acrobatic networking can be vitally important to you, check the coupon. (The secret is matching the computer to the job!)

TECHNICAL ASPECTS OF DATA COMMUNICATIONS NOW IN ITS THIRD PRINTING.

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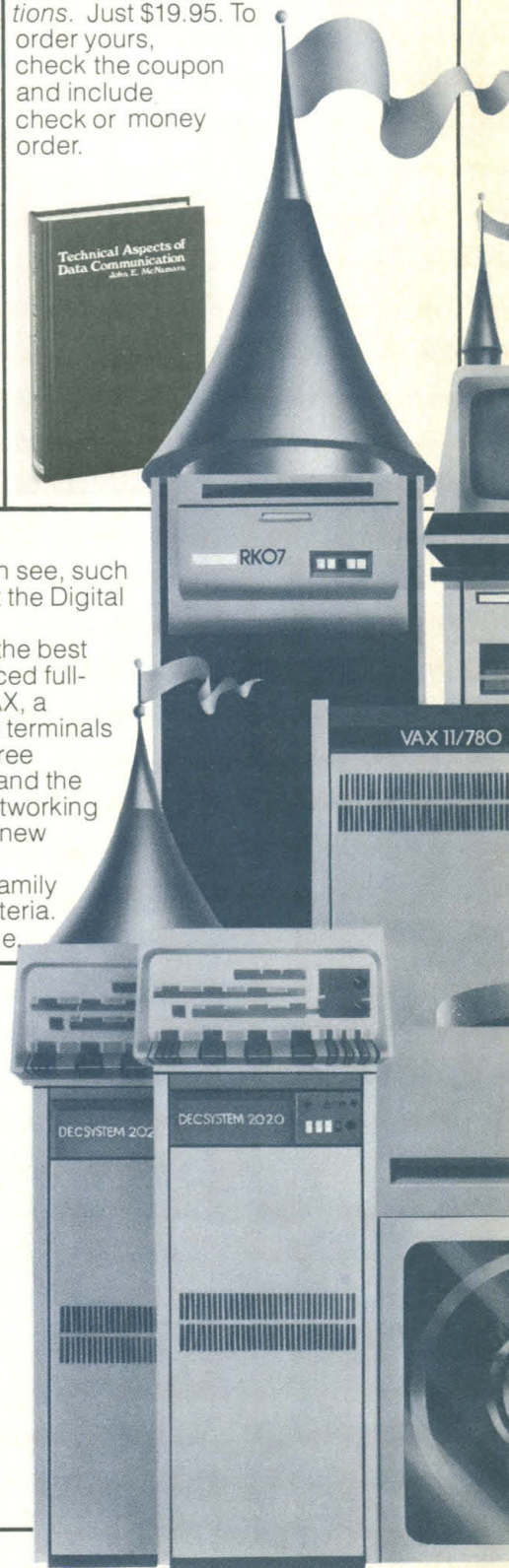


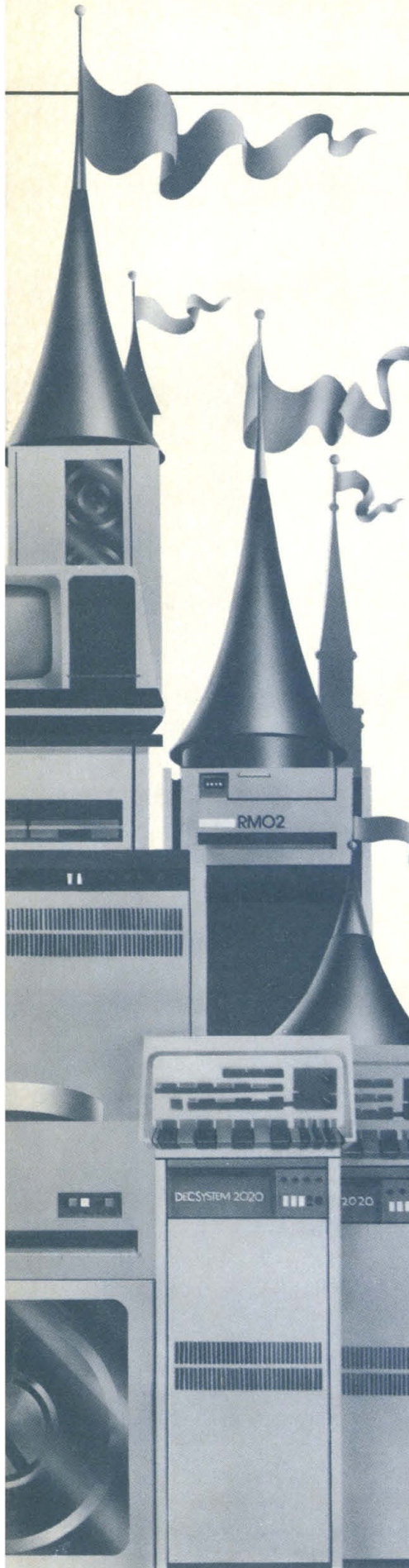
DIGITAL BRINGS ITS OWN TOMORROWLAND TO NCC AT ANAHEIM.

The National Computer Conference has never seen, and may never again see, such an array of major new products from a single company as will be on display at the Digital Booth June 5 through June 8.

In one corner, the VAX-11/780, rapidly becoming recognized as possibly the best FORTRAN machine ever made. In another, DECSYSTEM-2020, the lowest priced full-capability mainframe in the world. In a third, a PDP-11/70 running the new TRAX, a complete transaction processing system with specially designed block mode terminals that is easy on the user and easy on the pocketbook. And in the last corner, three computers, two of which are important new versions of established favorites, and the third participating in a dramatic demonstration of the new DECnet Phase II networking software. On the systems, the new RK07, the new RM02, and the dramatically new RL01 disk drives, new terminals, and a new tape drive.

And in the middle of the floor, for the first time ever, an entirely new Digital family of products as yet unannounced. Six of them. West Hall, on the way to the cafeteria. And if you can't make Anaheim, check the box. We'll send you a show package.

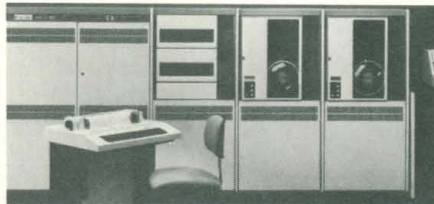




IS THE \$250,000 VAX A BETTER FORTRAN MACHINE THAN THE \$9 MILLION CDC 7600?

The incredible performance of the VAX-11/780 minicomputer, in benchmark after benchmark, is making serious FORTRAN users wonder. The 7600 is faster, of course. But VAX speed is exceptional. 1050K

Whetstone instructions single precision — 711K Whetstones double precision — fast enough for most 7600 users. And then... The difference in cost, and all that implies. Take throughput. If the 7600 is twelve times as fast, you can buy a dozen VAX's, get the same throughput, and save a cool \$6 million! FORTRAN users who



think speed but really need throughput take note.

And there is the matter of program size. VAX virtual memory, and a gigantic 32-bit address size, allow directly addressable programs 1,000 times larger than the 7600! FORTRAN users who think they need a 7600 for large programs also take note. Or take pencil and check box.



THREE SALES IN THE SUNSET.

Digital Sale days are drawing to a close. Have you placed your orders yet? Better hurry.

Memory Sale ends May 31. Spares Sale ends June 30. Logic Products Sale ends June 18.

For details contact your local Digital sales office. Quick.



NEW DECSYSTEM-2060-T JOINS ARPANET.

Introduced just three months ago, the new high end member of the DECSYSTEM-20 mainframe family has already landed a prestigious job in ARPANET and is successfully at work inside a lab at a major university in Boston. To find out why this mainframe is so instantly successful, check the coupon.

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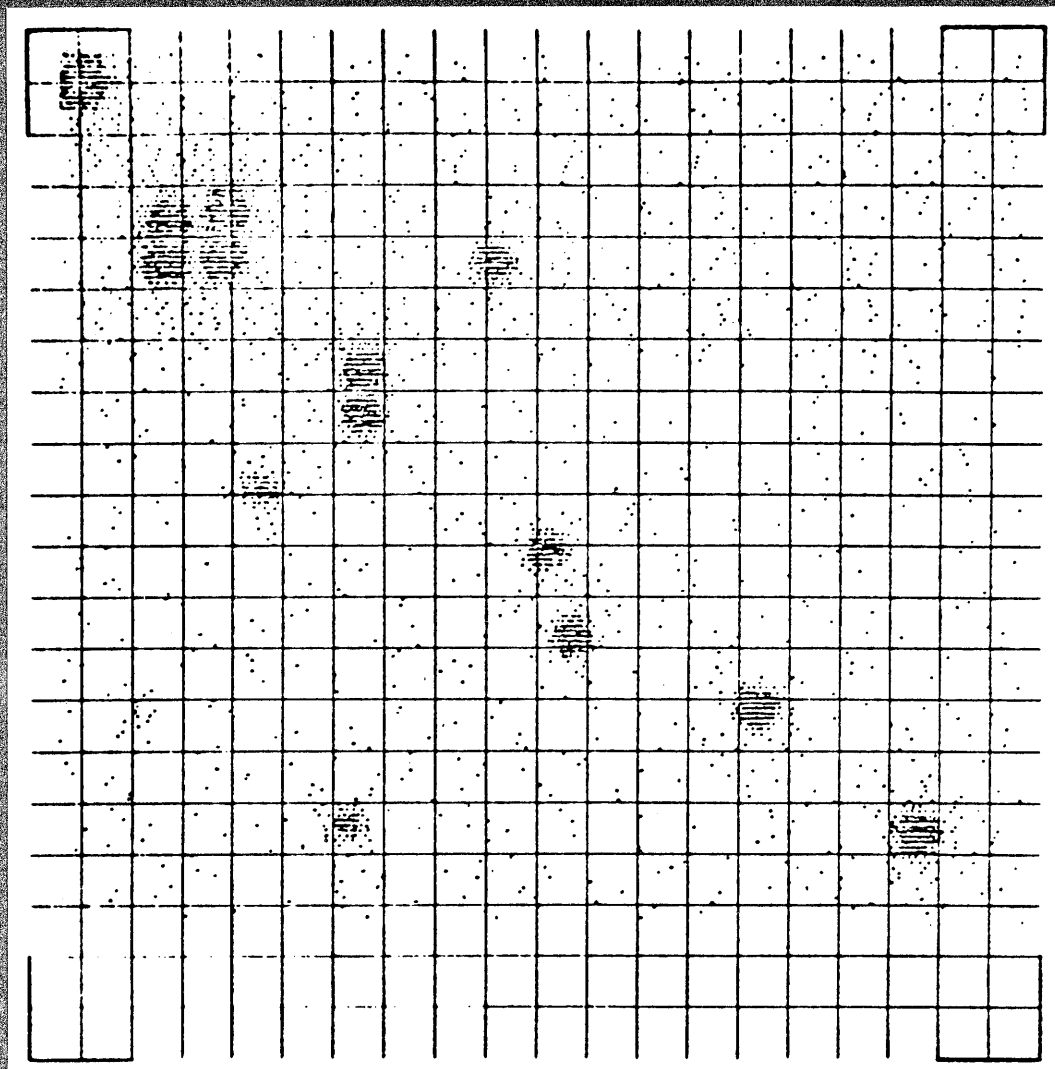
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The SCIENCE Report on Heart Research

Jean L. Marx and Gina Bari Kolata

Cardiovascular diseases — diseases of the heart and blood vessels — are the leading cause of death in this country. They afflict more than 29 million people and are responsible for almost a million deaths per year in the United States alone. The American Heart Association estimates that the total economic costs of these diseases in 1978 will be in excess of \$28 billion.

Medical scientists would like very much to know the causes of cardiovascular diseases. This knowledge would help prevent the diseases and reduce the death rate. But the causes are still eluding investigators despite vast expenditures of time and money.

COMBATING THE #1 KILLER, based on a series of award-winning articles* in SCIENCE Magazine, examines some of the recent research on cardiovascular diseases, with special emphasis on progress being made in understanding the biological mechanisms underlying the diseases.

Through interviews with the leading researchers in the health professions, Marx and Kolata investigated the current efforts now being made to deal with the epidemiology of heart disease, its diagnosis, its relationship to an individual's life-style and age, the most promising present and projected treatment strategies, the biochemical and clinical research in progress, and the ethical problems which may confound the results of any research which involves human patients.

COMBATING THE #1 KILLER — valuable precisely because its main focus is on key research currently in progress.

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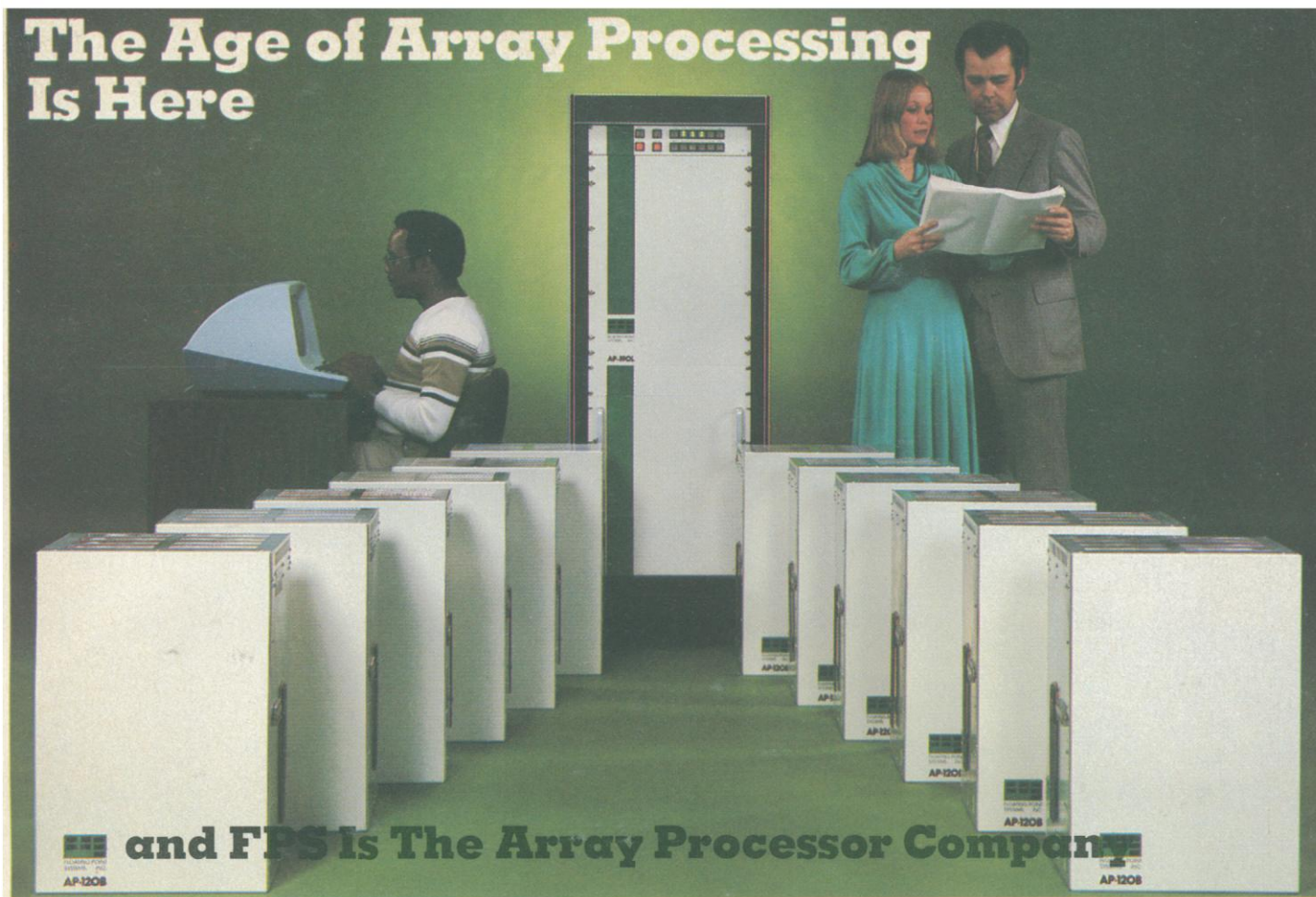
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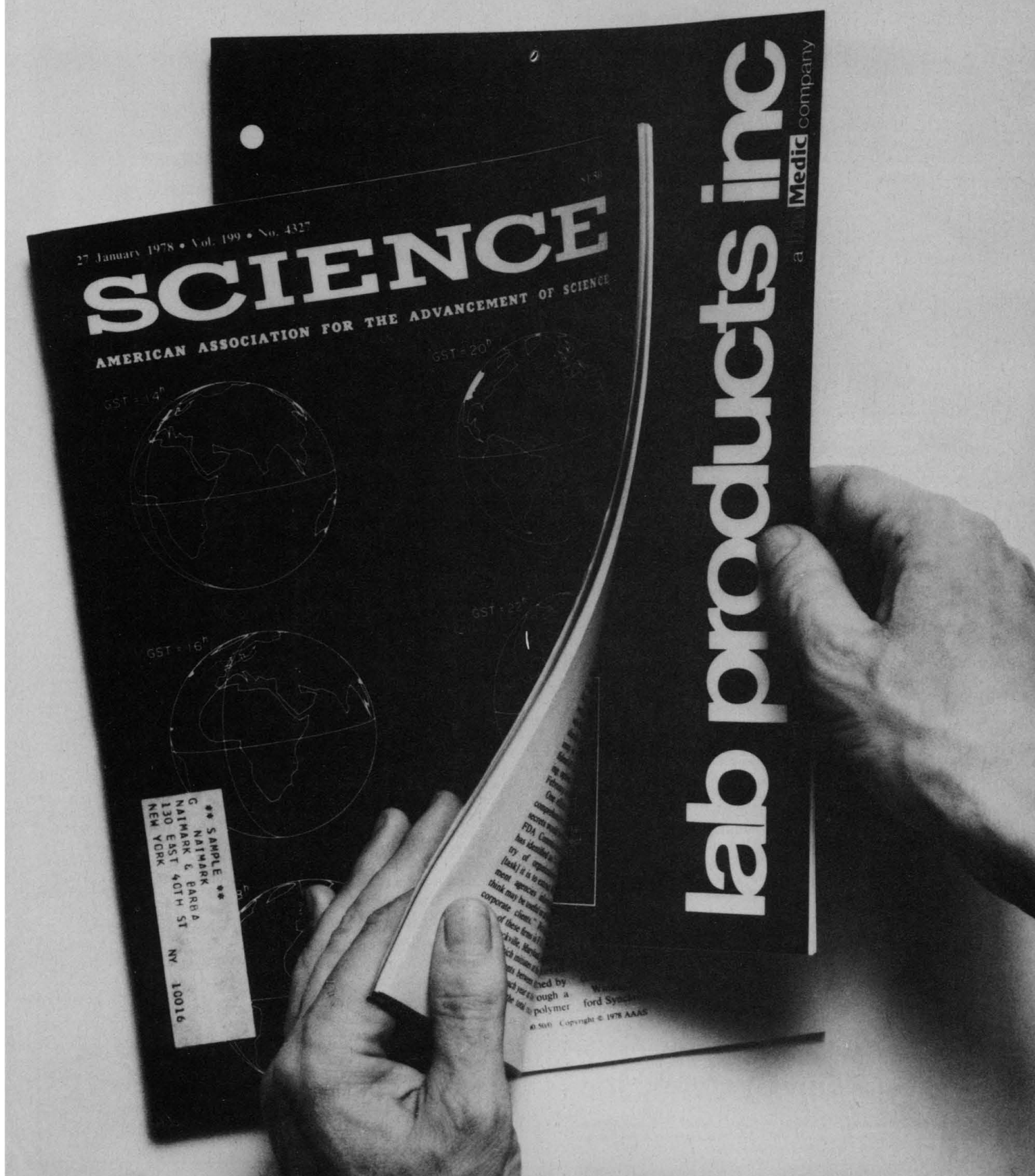
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My Computer System is _____ My application is _____

**“Whatever possessed you
to run the entire 68-page
Lab Products catalog in the
January 27, 1978 issue of SCIENCE?”**



A. We'll answer that if you'll first sit still for some "stage-setting".

Q. Like what?

A. Well, initially we ought to tell you a little about our client Lab Products, a most impressive designer, developer, and manufacturer of products for laboratory animal housing and care.

Q. Why so impressive?

A. Simply because they combine two rare qualities: (1) an unusual sensitivity to the needs of their marketplace, and (2) an innovative energy that enables them to interpret these needs skillfully and then to respond to them promptly.

Q. So?

A. So . . . as a result of all this, they have rapidly become leading suppliers of plastic cages, metal cages, laminar flow systems, bedding, automatic watering systems, etc. And that impressive product line is described in their 68-page catalog.

Q. Okay, but why then convert a 68-page catalog into what is probably the longest ad in scientific journal history?

A. Simply because this approach provided *instantaneous exposure* of the company's entire product line to the widest possible audience.

Q. But why—with all of the scientific journals available—was SCIENCE chosen for this signal honor?

A. For two compelling reasons. First, as the official organ of the AAAS, it provides access to that rather fantastic audience of approximately 150,000 key technical people. Secondly, almost every decision-making individual concerned with *any* scientific activity reads this magazine. This then virtually guarantees that almost every poten-

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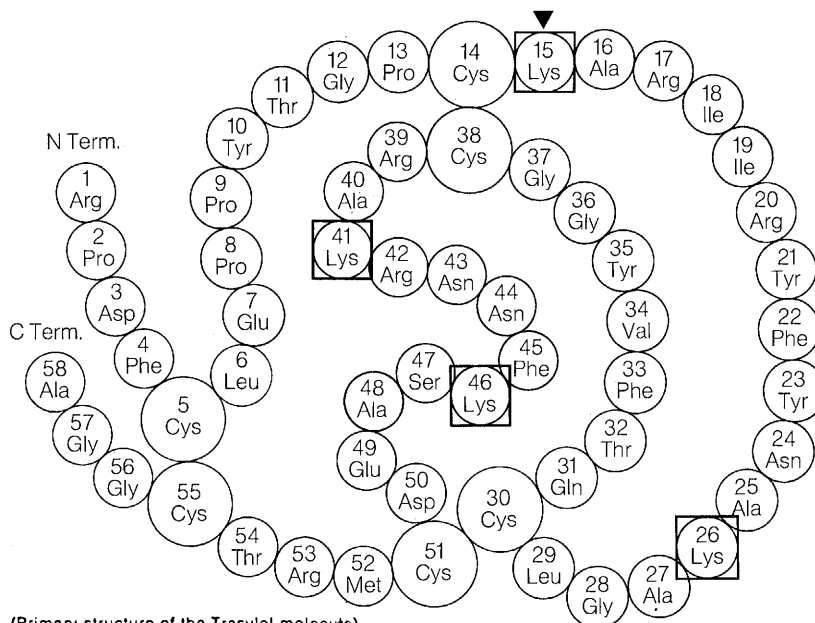
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1) S. R. Bloom: Hormones of the Gastrointestinal Tract. Brit. Med. Bull. 30, 62-67 (1974)

2) A. M. Eisentraut, N. Whissen and R. H. Unger: Incubation Damage in the Radioimmunoassay for Human Plasma Glucagon and its Prevention with "Trasylol". Amer. J. med. Sci. 255, 137-142 (1968).

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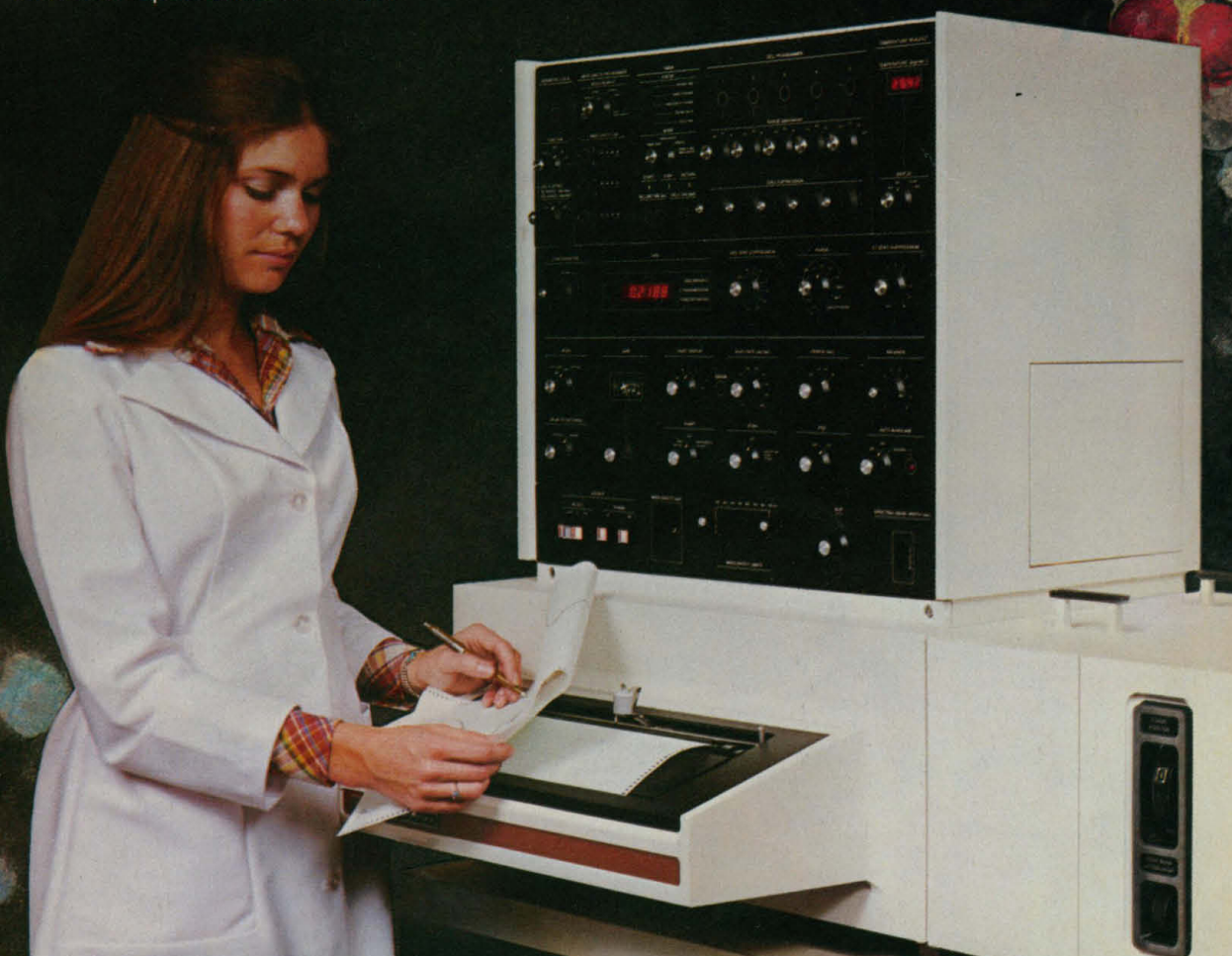
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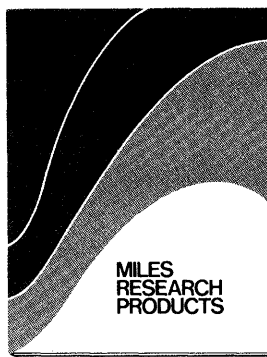
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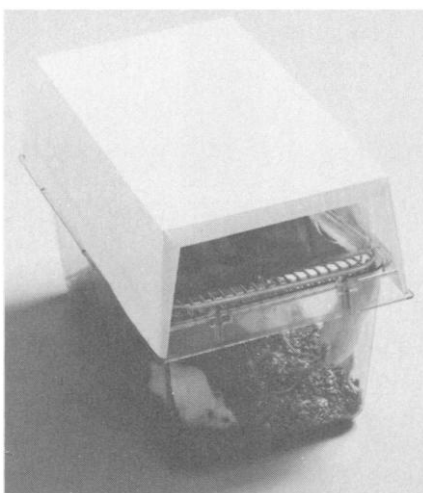
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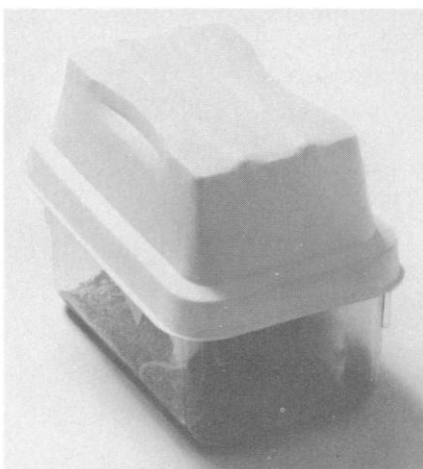
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A View of Health Research and Care

Science has devoted special issues to energy, food, materials, and electronics. These topics were spotlighted because they are of major long-range significance. Health care is a topic of comparable importance.

Health is ever present in the consciousness of most people. Because they have seen miraculous results in some instances, people have come to have unreasonable expectations about the cure of all ills. As a result, annual expenditures for health care rose to \$160 billion in 1977. At the same time, public concern about medicine has frequently been aroused by news stories concerning ethical problems, access to medical care, excessive surgery, and malpractice.

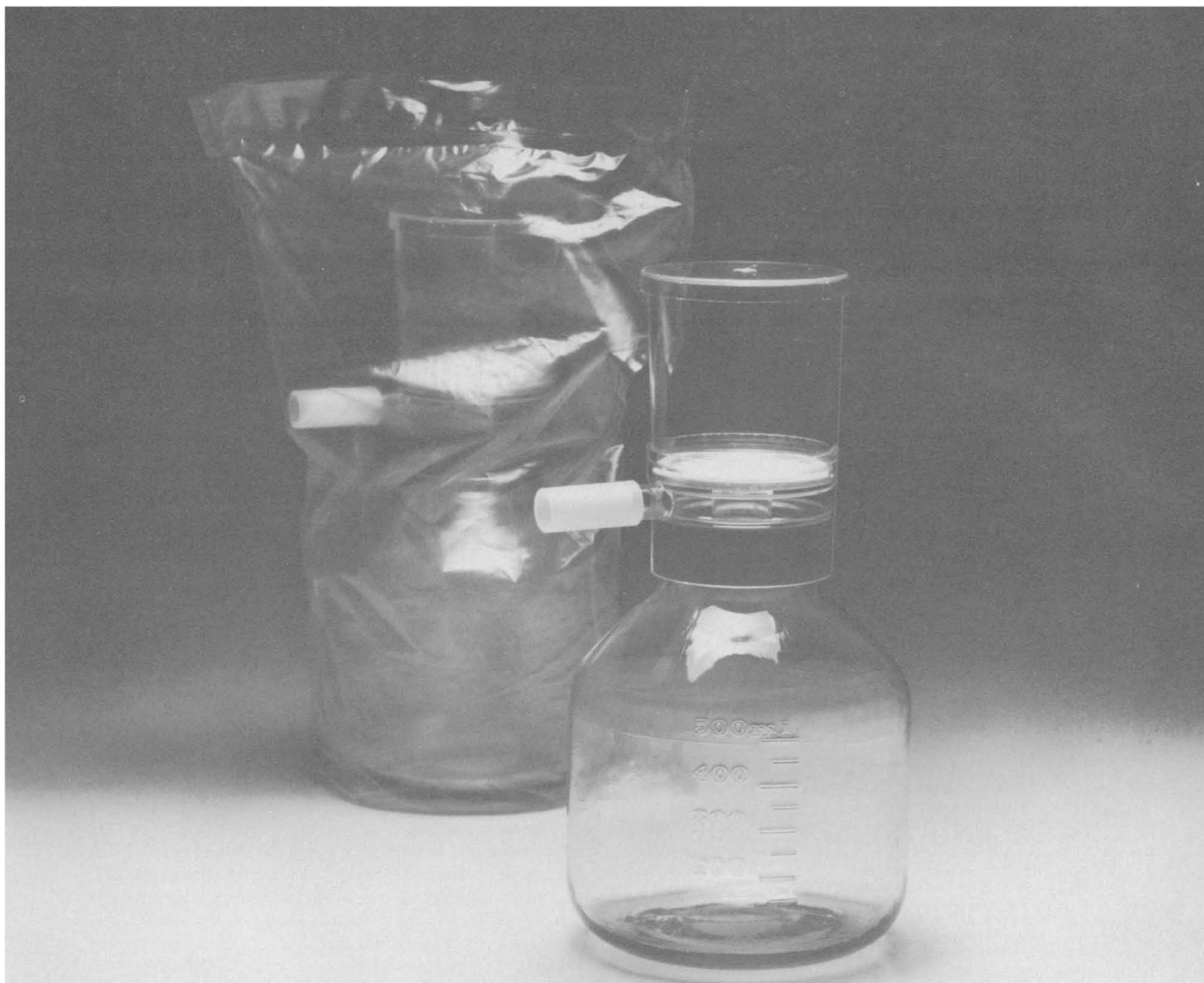
In choosing material for this issue we have not attempted to be encyclopedic. In part this is because some matters have recently been treated on these pages. For example, we have printed series on both cardiovascular and cancer research. Material for this issue was necessarily limited to 23 articles. These were selected from a much larger list. Efforts in identifying, selecting, and recruiting articles led to views about progress and priorities in medical research and health care. Over the past decades, research has resulted in antibiotics, vaccines, therapeutic drugs and devices, new diagnostic tools, and other aids. These have made possible great improvements in the practice of medicine.

But as one now surveys the scene, it appears that both research and care are focused too strongly on cardiovascular diseases and cancer and on using medicine and technology to prolong burdensome and meaningless existences. Each of us is programmed eventually to die. The day can be brought closer by accident or self-abuse, but sometimes it can be postponed only at great emotional and financial cost.

Obviously, we must continue to seek improvements in the prognosis for cardiovascular disease and cancer. But many believe that preventive measures are more useful than therapy in minimizing the impact of these disorders. Unfortunately, we do not have enough evidence of the effectiveness of such measures as exercise, appropriate diet, and adequate sleep. Even were such data at hand, many people would disregard them. However, perhaps as many as half of the population would be encouraged in measures designed to ensure better health.

One of the greatest accomplishments of medical research is in the area of mental problems. How the mind works is still a great puzzle. Treatment for mental patients leaves much to be desired. However, some of the progress that has been made can be gathered from Philip Berger's article in this issue. Describing the situation as it existed in mental hospitals before the advent of pharmacotherapies in the 1950's, he writes, "Hallucinating patients paced the floor, or rocked in chairs, and talked to their 'voices'; paranoid patients scanned the rooms, ever vigilant and ever fearful. Catatonic patients remained in fixed positions for days at a time, developing swollen limbs and pressure sores; withdrawn patients sat on wooden benches, year after year, doing nothing, while their physical health deteriorated."

Following the introduction of new drugs, the number of patients in mental hospitals fell from a peak of 559,000 in 1955 to the present level of 200,000. During this interval, public attitudes toward mental disorders changed from cold aversion to more sympathetic understanding that a treatable disease was involved. Mental disorders affect people of all ages. Thus, improvements in the care of mental patients can convert many young people from lifelong burdens on society to useful citizens. It has been estimated that the current economic cost of mental and emotional problems is upward of \$50 billion annually. Thus, much remains to be done. Prospects for improvements are excellent. Behavioral neurochemistry is in the midst of great advances aided by powerful new experimental tools and procedures. The article by Barchas *et al.* in this issue provides a solid basis for expectation that the coming years will bring rich new understanding of mental processes and further improvements in treatment.—PHILIP H. ABELSON



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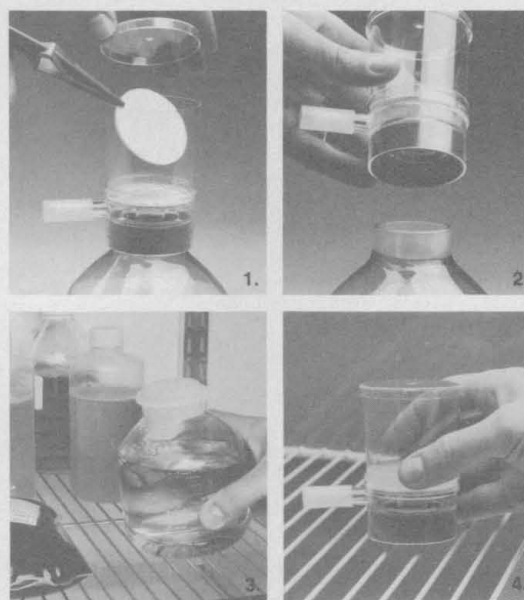
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