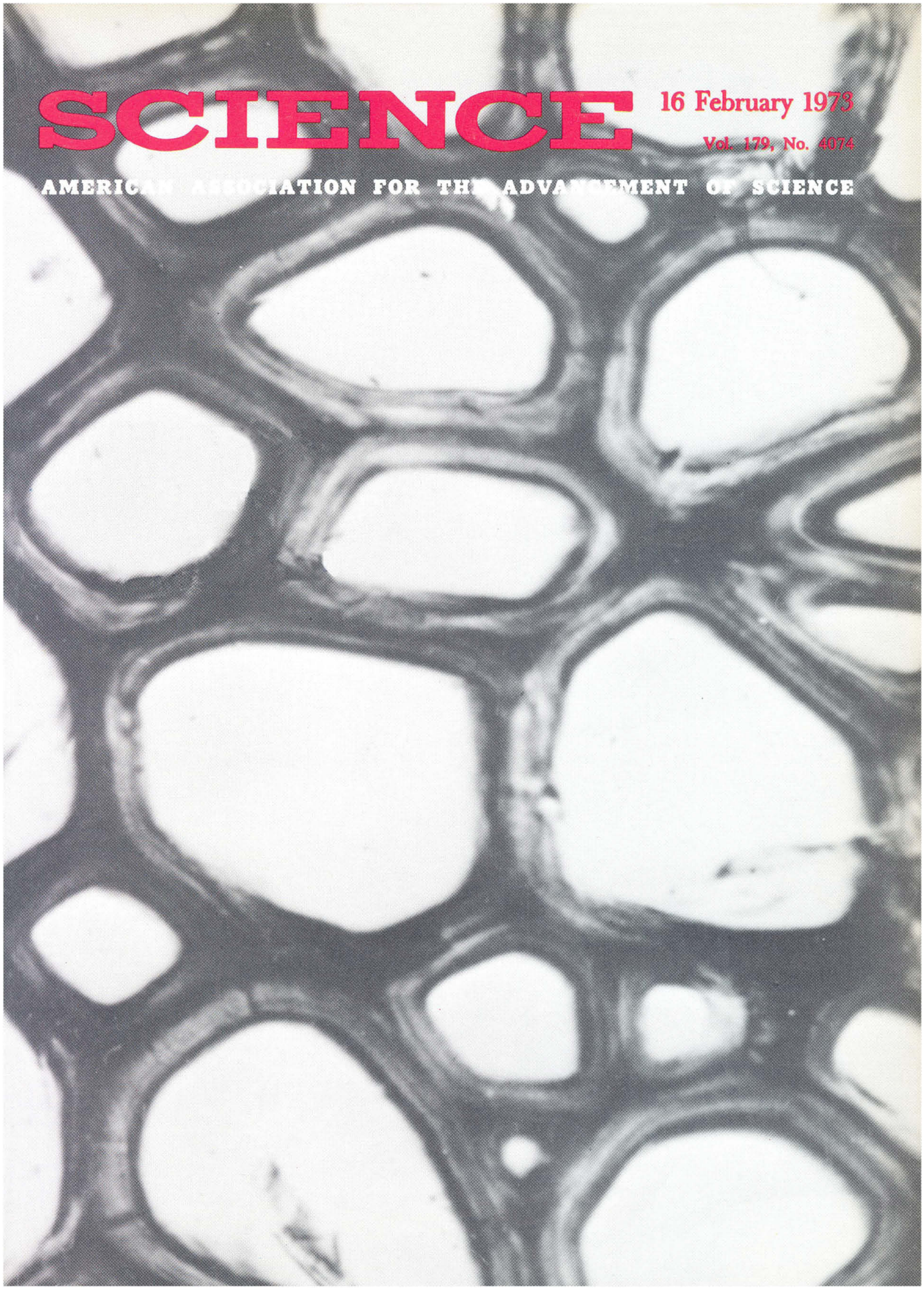
SCIENCE
16 February 1973
Vol. 179, No. 4074
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



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The LKB Ultrolab Diluter is one of the fastest and most accurate diluters on the market. It will siphon up a preset volume of a sample liquid and flush it out with a preset volume of a reagent at a rate of up to 1200 times an hour.

The Ultrolab Diluter can also be used as a dispenser, to dispense one or two reagents at the same high rate.

Each pump is permanently preset to deliver 10 different volumes, which can be selected by merely pressing a pushbutton. Three pumps are available to choose from, giving in all a choice of volumes from 10 μl to 3000 μl. These are high-precision pumps, with an accuracy of $\pm 1\%$ and a reproducibility of $\pm 0.5\%$. Tight, leak-free operation is achieved by employing smooth, sapphire pump plungers.

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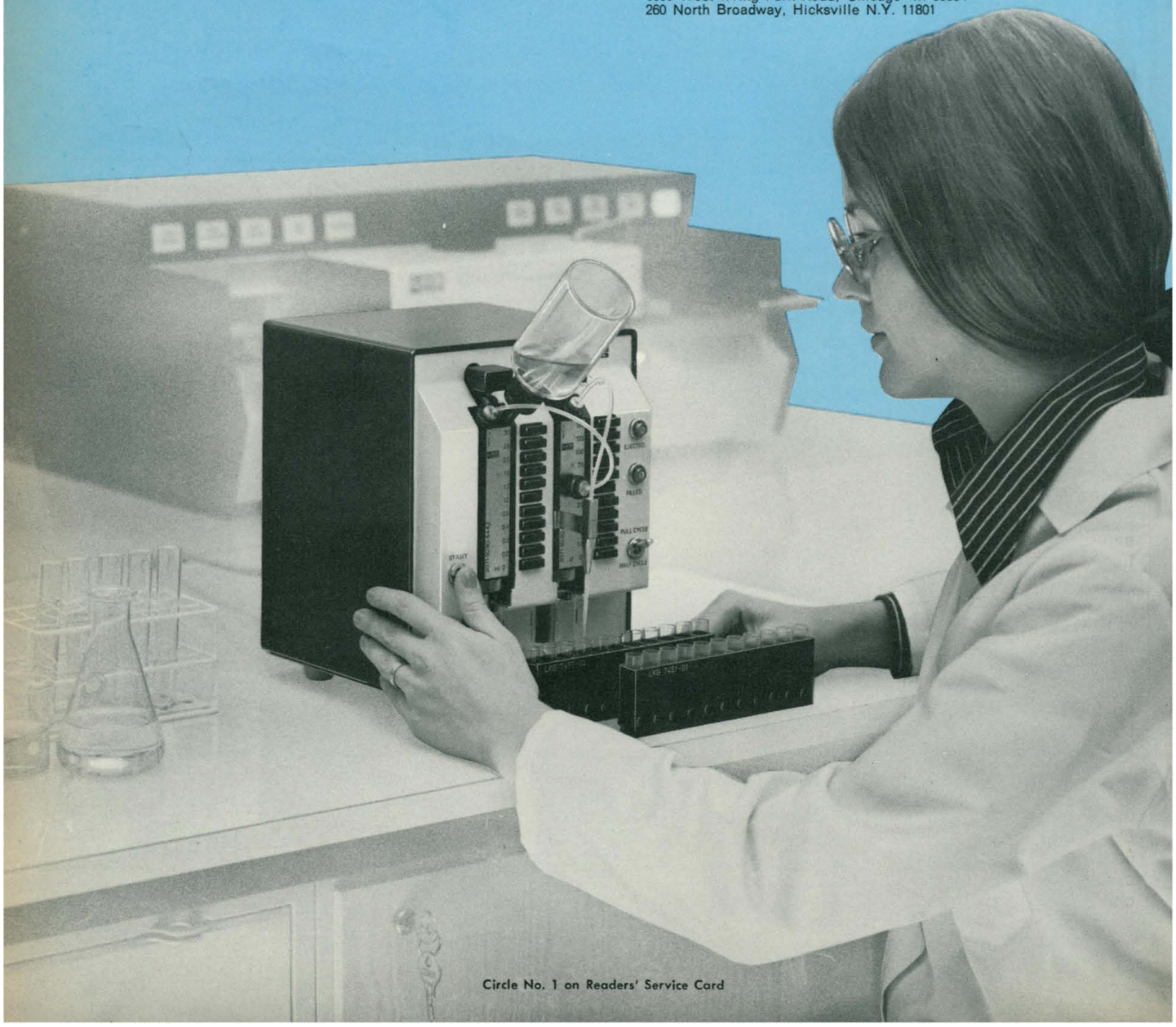

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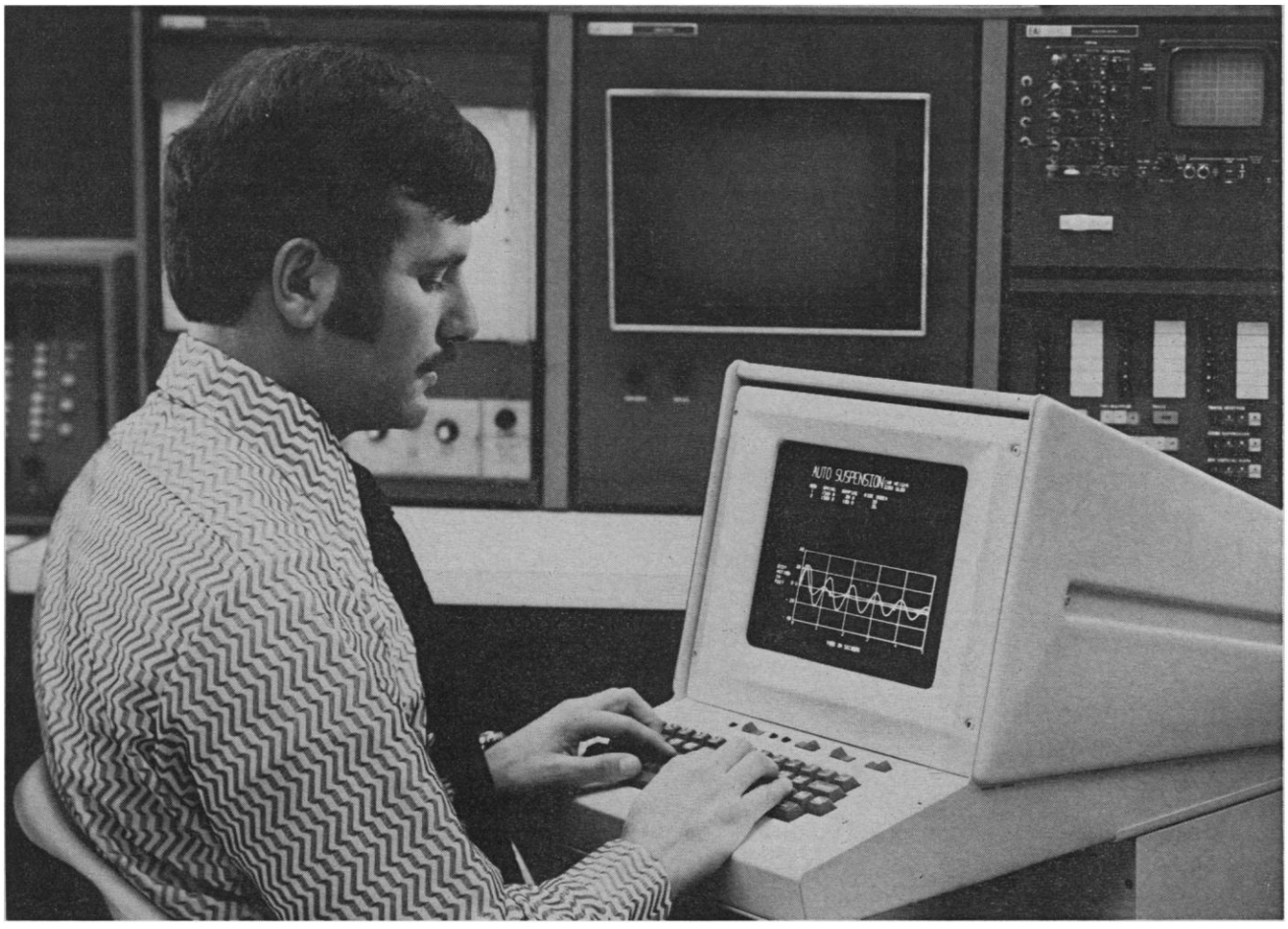

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That's just a fraction of our story. The new PACER™ computer systems by EAI can actually deliver price/performance ratios that run well over 100 times those of conventional digital computers. Whether the problem is simulation, optimization, control, design or data reduction.

The unique efficiency of PACER systems is due to many factors: First, they combine our new fourth-generation digital processor with three new high-speed parallel processors. New peripherals and software offer interactive graphics in a conversational mode of operation. So now scientists and engineers can achieve higher computational productivity and accuracy while tackling the complexities of multivariable problems in real time or even faster than real time.

The PACER systems simply deliver far more solutions per day or per dollar than any alternative systems.

Further, we help you zero in on optimum efficiency by offering three series of systems: PACER 500, PACER 600 and PACER 700. Each series offers three sets of options with a wide choice of peripherals. To let you choose a setup with capabilities matched almost precisely to the requirements of your problems or to your preference for input/output.

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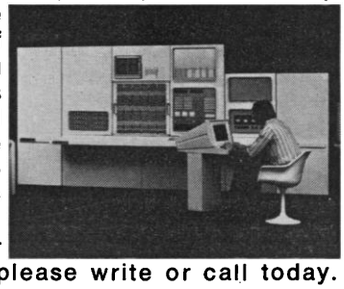
As for software, EAI can probably be of more help to you than anybody else in the world. Our library of compatible engineering and scientific software is the most generally useful ever assembled, and we have over 5,000 case histories of applications to prove it.



For details on our whole PACER story, please write or call today.

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16 February 1973

Vol. 179, No. 4074

SCIENCE

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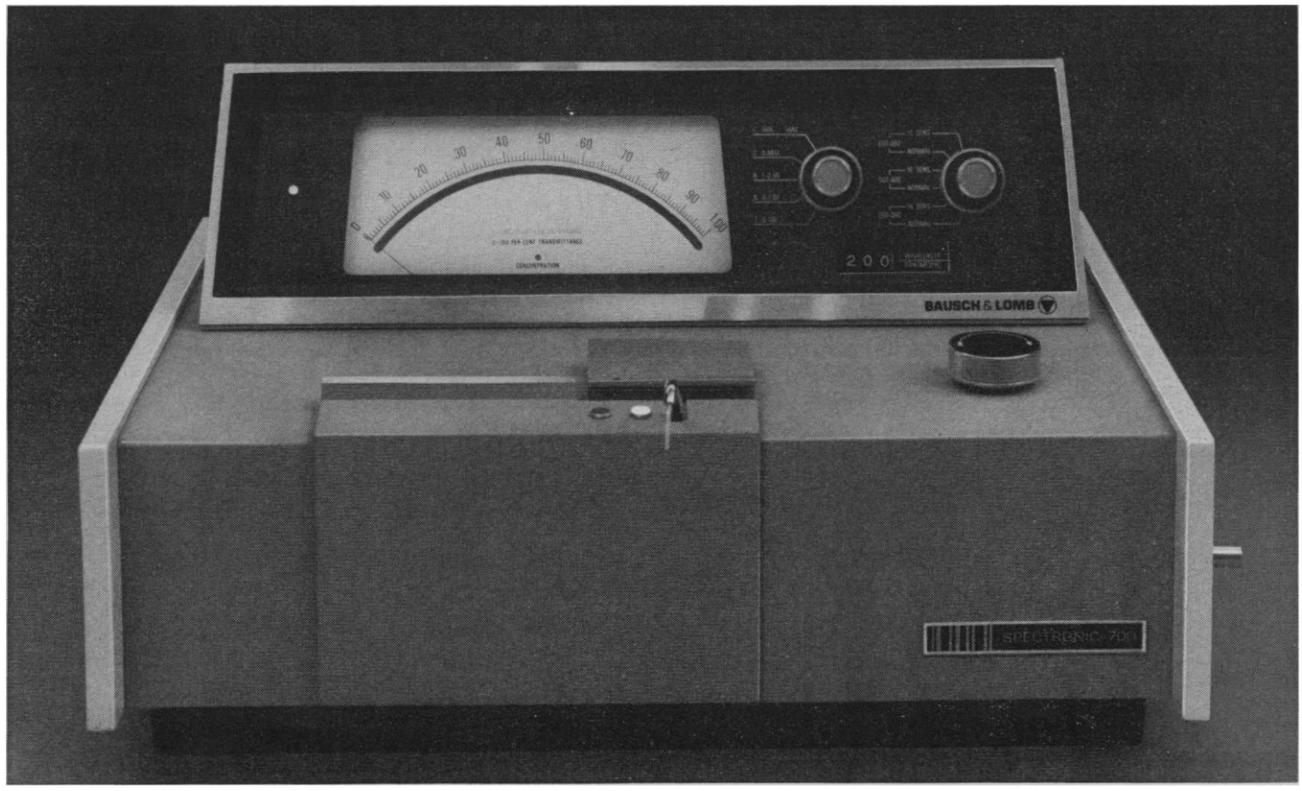
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

COVER

Ultraviolet photomicrograph of reaction wood fibers, *Lagunaria pattersonii* (× 3240). See page 647. [G. Scurfield, Forest Products Laboratory, Commonwealth Scientific and Industrial Research Organisation, South Melbourne, Victoria, Australia]



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SC-02

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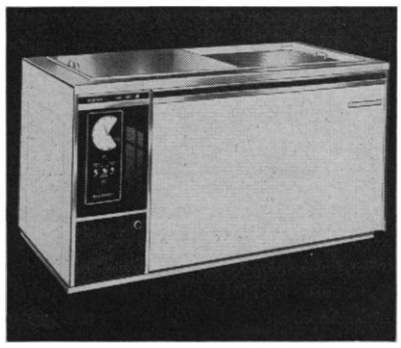
What's good about the chest model? It gets colder. And the top can give you some more work surface. And here too we've come up with a great way for you to identify the location of everything that's in it.

More. Both have automatic alarm systems and 2″ portholes to accommodate recorders. More importantly, both carry the name Kelvinator Commercial. The company that knows how to give you the best cold you ever had.



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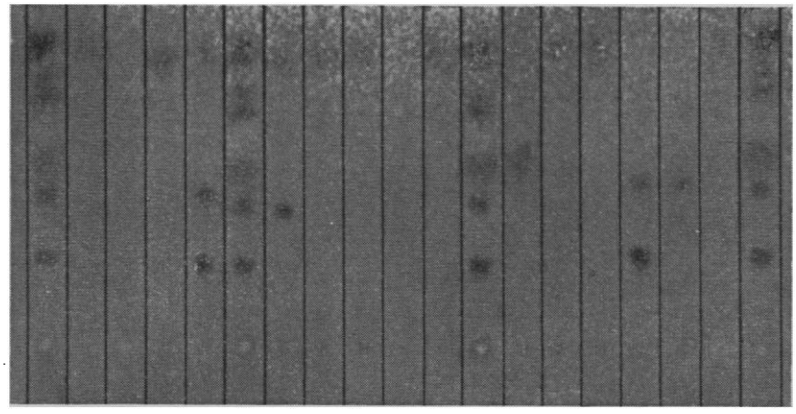

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EASTMAN CHROMAGRAM Sheet (Scribed Silica Gel), with or without fluorescent indicator. All the features of the family it joins . . . uniform, abrasion-resistant coating; flexible polyester base; scissorable; easy and safe to handle and store, both before and after use. And some important features all its own . . . 19 channels to make sample application and identification easier; no chance for wandering migration and cross contamination of samples; separated zones are more concentrated, so identification and quantitation are simpler.

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The KODAK Laboratory Sprayer, No. 13173, with dip tube and orifice designed for spraying TLC visualization reagents. Only 3 ounces of propellant, but a propellant-to-reagent spray ratio of 1:5, so you can spray approximately a pint of visualization reagent. More economical to use than many larger units which have higher propellant-to-reagent ratios.

Prepare your visualization reagents in advance. When you're ready to spray, simply screw the aerosol unit directly onto the bottle; no separate spray heads to buy or replace. The slim aerosol unit is easy to hold and easy to clean after use.

The spray is sold singly at $4.00 each and in convenient four-packs at $12.50 and, along with the scribed chromatographic sheet, is stocked locally by:

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For more information, return the coupon below.

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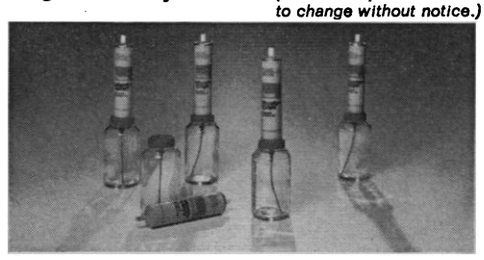

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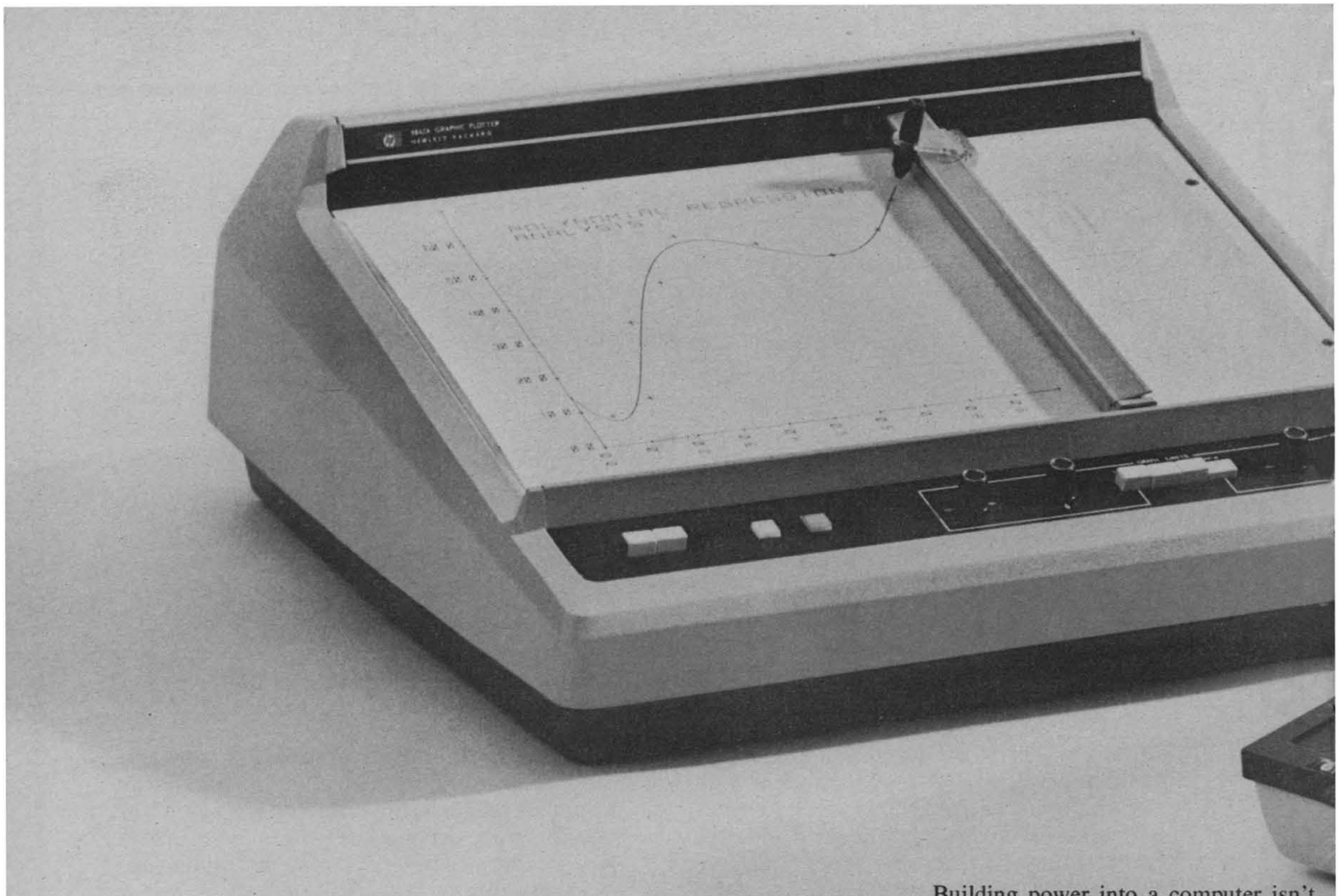

Hewlett-Packard Series 9800 Model 30. The Name And Number Bridge The Computing Gap.

Building power into a computer isn't much trouble, these days. The task is to make that power respond to the demands of you scientists and engineers who don't pretend to be computer experts. That's a feat we've accomplished with our new Series 9800/Model 30.

It joins the accessibility and easy operation of a programmable calculator with the power and overall capability of a minicomputer. The result? Significantly reduced turn-around time for those complex research and design problems you're now sending to a programmer or outside computing service.

Conversation guides you to the best solution. The secret to the Model 30's problem-solving efficiency is its ability to communicate with you on a very human level. Its language is BASIC, a standard language that gives you simple, straightforward programming.

In practice, you solve a problem by setting up a dialogue with the Model 30. You talk to it through the typewriter keyboard. It talks to you through the alphanumeric display.

Once you've entered your instructions in English words and Algebraic formulas, the Model 30 does all the rest, under the automatic control of its hard-wired executive system. It'll even

show you where you've made a mistake —so you can quickly correct anything from one character to an entire block of text with just a few quick strokes on the editing keys.

Powerful memory for solutions to big problems. Despite its apparent simplicity and small size, the Model 30 is an extremely powerful computing tool. Significant features include the executive system software implemented by built-in ROM (read-only-memory); the large MOS-LSI read/write memory for programs and data, and the built-in tape cassette operating system for mass storage. Adding it all up, the *basic* Model 30 gives you problem-solving power equivalent to a minicomputer system with 10K sixteen-bit words of memory. And that's just for starters, because the Model 30's modular design lets you add capacity any time your usage demands.

You can add programming and systems versatility with plug-in ROMs. You can increase your data and program storage with read/write memory modules. And you can plug in up to nine additional tape cassettes for whopping mass storage.

New Series 9800 Line Printer gives you fast formatted output. If your work calls for formatted hard copy, you'll be happy to know you no longer need suffer the tedium and noise of slow, mechanical output writers. Our new Series 9800/Model 66 Line Printer mounts atop your Model 30 to give you a fast output of 250 lines per minute. (That's equivalent to typing 3,600 words per minute.)

Series 9800 Peripherals let you handle data in any format. As a member of the Series 9800, the Model 30 is fully compatible with all 15 of the Series 9800 Peripherals—ranging from high-speed Tape Readers to Instrument Interfaces. Illustrated above is our unique X-Y Plotter that not only draws histograms, linear, log-log, semi-log, or polar plots—but writes alphanumerics as well.

Put the Series 9800/Model 30 through its paces on some of your problems. We're already shipping production units. Prices start at $5,975 for the basic Model 30. Add $2,975 for the Model 66 Line Printer.

For more information or a hands-on demonstration, call one of our 172 worldwide sales offices. Or write: Hewlett-Packard, P.O. Box 301, Loveland, Colorado 80537.

093/2

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Operate throughout the speed range of 2,000 to 55,000 rpm (up to 150,000g)

Model RK Refrigerated Ultracentrifuge

The Model RK Ultracentrifuge was designed for high g, continuous sample flow – either with density gradients or for pelleting. It utilizes a cylindrical rotor supported at either end by a hollow shaft and damper bearing. Fluids can be transmitted through the shafts in either direction to the rotor core or wall. An air turbine provides the driving force to the upper shaft with minimal heat transfer to the sample.

The static fluid lines are joined to the rotating shafts via a simple friction seal surrounded by a closed coolant system, eliminating aerosols and cross-leakage between in/out effluent lines. The result is a reliable seal for continuous flow up to 60 liters per hour throughout the entire speed range.

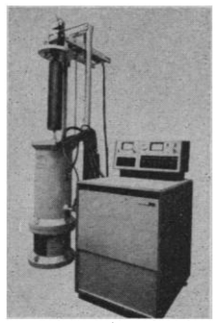
A variety of rotor configurations permit isopycnic banding, rate-zonal, pelleting, or fixed-angle tube separations.

The Model RK offers the highest available throughput and g forces for continuous flow operation. It is unequaled for the high-resolution concentration of cells and subcellular components from large quantities of fluids. Varying the speed and flow rate permits the separation of particles with sedimentation coefficients as low as 10.

The Model K, the production version of the RK, is used worldwide to manufacture over 90% of the annual supply of influenza vaccine.

All the major U. and identify qu utilize an RK or

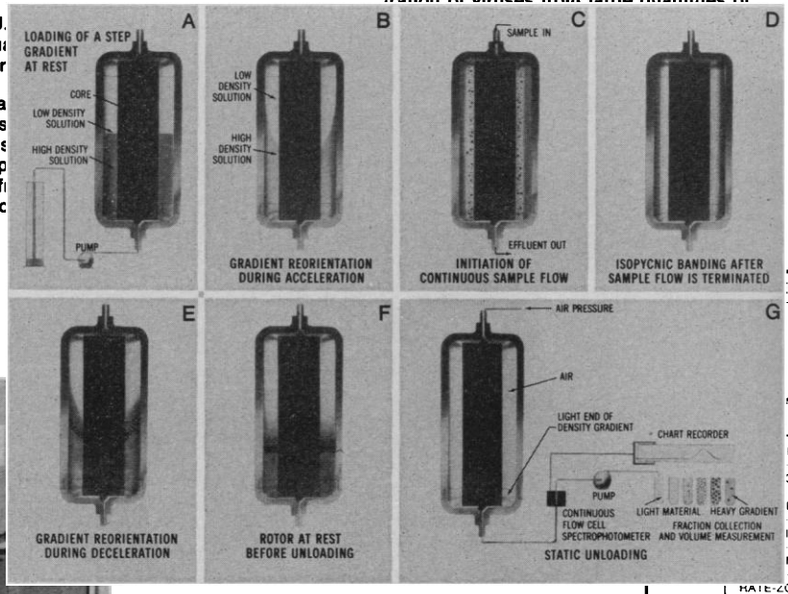
The design cha reliability and s hazardous subs permits the sep and rotor unit f installation, fac available.



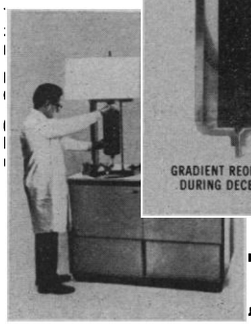
Technique For Isolating Subcellular Particles From Large Quantities Of Fluid

The simultaneous isolation and concentration of viruses from large quantities of

creasing density. They eventually band (isopycnically) in those cylindrical zones where the gradient density equals a particle's buoyant density (D). At the end of the run, the rotor is decelerated (E) and the gradient reorients to its original position without disturbing the particle bands (F). The banded particles are now ready to be unloaded with the rotor at rest. Fractions are collected (G) using air or water pressure and a small peristaltic pump to control flow.



MODEL RK
Research unit for small and intermediate volume applications



LECTED MODEL RK ROTORS*

	CONTINUOUS	BATCH	HOLDING VOLUME (L)	MAXIMUM PRACTICAL FLOW RATE (L/HR)	MAXIMUM FORCE (x g)	SEDIMENTATION PATH LENGTH (cm)
NIC BANDING	X		1.6	5-12	90,000	1.1
ONAL		X	4.2	–	90,000	4.5
NIC BANDING	X		4.0	5-12	90,000	3.9
ING	X	X	4.0	60	90,000	3.9
NIC BANDING	X		0.8	3-6	150,000	0.9
RATE-ZONAL		X	0.8	–	150,000	0.9
PELLETING	X	X	0.8	30	150,000	0.9

*All have 38.2cm flow path-length; fixed-angle tube rotor also available. Model K rotors have twice the capacity and flow rates.

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ue, Fairfield, N.J. 07006, U.S.A.

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Fluorescence microscopes from Zeiss come both large and small...with prices to match.

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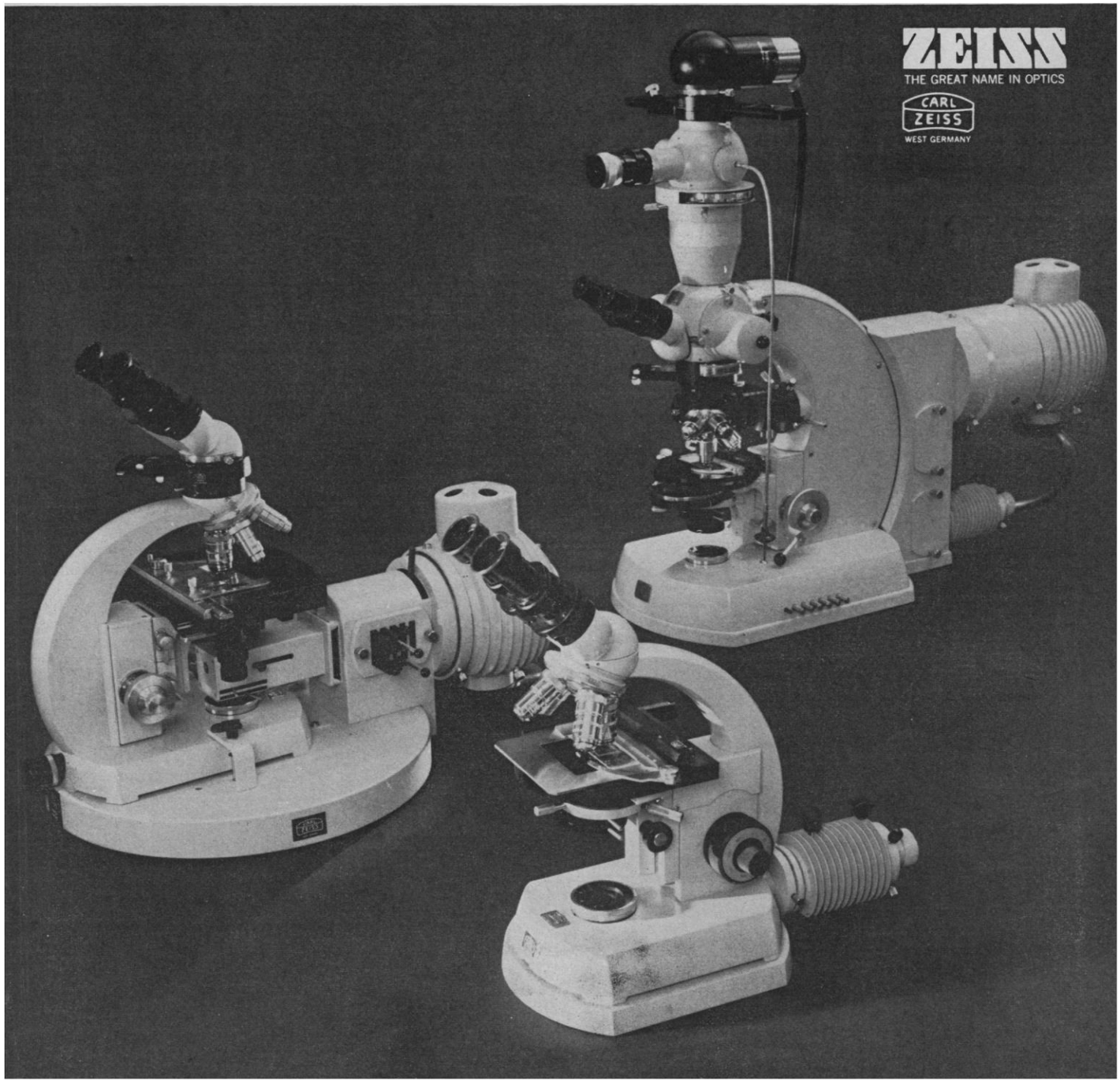
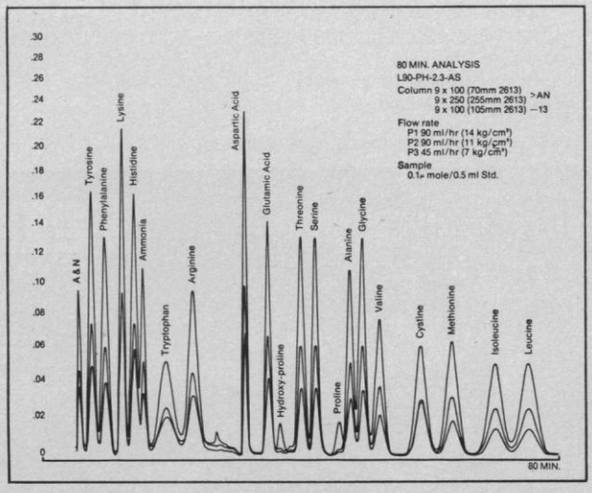


Do high speed Amino Acid analyses with our new KLA-5 Analyzer.

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RUN
INST   2   , AA   , METHOD    1    , FILE     13 :
STD CONC  **********:
TIMES     80.0,        .0,   3276.7,   3276.7,   3276.7,   3276.7,
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UNK/AIR     .000,       .0,
TOL    .000,      .10,    1.0,
REF PK     .000,      .0,       .0,
STD NAME   :
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6.1	1.4362	.061,	.0275,	.1002,	PHENYLALANINE:
9.0	1.7920	.090,	.0152,	.1004,	LYSINE:
11.1	1.6134	.111,	.0198,	.1009,	HISTIDINE:
12.6	.9406	.126,	.0238,	.0998,	AMMONIA:
17.4	.8912	.174,	.0225,	.1002,	TRYPTOPHAN:
20.9	1.5041	.209,	.0171,	.1010,	ARGININE:
29.7	1.2656	.297,	.0268,	.1007,	ASPARTIC ACID:
33.3	1.2085	.333,	.0281,	.0997,	GLUTAMIC ACID:
35.2	.3124	.352,	.0388,	.1000,	HYDROXY-PROLINE:
38.8	1.3650	.388,	.0225,	.0996,	THREONINE:
41.2	1.4212	.412,	.0245,	.1004,	SERINE:
45.3	.4687	.453,	.0160,	.1009,	PROLINE:
46.9	1.2884	.469,	.0265,	.1001,	ALANINE:
49.2	1.5465	.492,	.0264,	.1006,	GLYCINE:
51.9	1.3113	.519,	.0260,	.1007,	VALINE:
58.8	1.5937	.588,	.0150,	.0989,	CYSTINE:
64.8	1.·785	.648,	.0272,	.1011,	METHIONINE:
71.4	1.3296	.714,	.0290,	.1003,	ISOLEUCINE:
76.9	1.4889	.769,	.0282,	.1001,	LEUCINE:

The KLA-5 can give you 18 chromatograms like this in twenty-four hours.

The above is an actual chromatogram* produced in only *80 minutes* on Perkin-Elmer's new KLA-5 Amino Acid Analyzer.

This is about *twice as fast* as any conventional amino acid analyzer, but the increase in analysis rate is achieved without sacrificing either quality of results or instrument versatility. For example, the 80 minute protein hydrolyzate run is accomplished with the separation between serine-threonine and between tyrosine-phenylalanine better than 90%.

The KLA-5 is fully automated and programmed to analyze physiological *fluids, protein hydrolyzates or peptides.* It can utilize either *single* or *dual column* methodology and separation by conventional *ion exchange* or the unique *ligand exchange.* The KLA-5 operates at low pressures and therefore provides the flexibility of peptide analysis, *preparative chromatography* and is without the problems inherent in high pressure systems.

Besides speed and versatility, the KLA-5 offers the following benefits:

- *Complete Automation*—Automatic sampling and programmed operation provide complete analysis unattended. In only twenty-four hours, 18 complete protein hydrolyzate samples can be run.
- *Sensitivity*—Minimum detectability of each amino acid is 0.2 nanomole using our low volume 10 mm path flow cell.
- *Resolution*—Under conditions of accelerated analysis, serine-threonine and tyrosine-phenylalanine are separated to 90% of baseline or better.
- *Microsampling*—10 to 250 μl of sample can be injected making most efficient use of available sample.

* Redrawn here for clarity. Multipoint original available on request.

Add our PEP-1 Data System to the KLA-5 and it will give you 18 reports like this in twenty-four hours.

The PEP-1 is a computer based Data System designed specifically for acquiring, processing, and storing the data from liquid and gas chromatographs. From a standard sample it will automatically calculate calibration constants to apply to raw data to provide a finished, analytical report. Data is stored and may be reprocessed at any time employing different methods.

The PEP-1 can handle data from up to eight KLA-5's simultaneously, or from a combination of KLA-5's and gas and liquid chromatographs.

Think of the potential. The KLA-5 and PEP-1 can give you 18 complete protein hydrolyzate analyses including concentration determination and peak identification by name in 24 hours and at the same time process the data from gas chromatographs.

Both units are sold, serviced and guaranteed by Perkin-Elmer. Write for details to: Instrument Division, Perkin-Elmer Corporation, 723 Main Avenue, Norwalk, Connecticut 06856.

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Now we're giving it a new one.

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Even though you may be using one yourself, the name 'Büchi' may not be familiar, because until recently they were marketed by someone else under a different name in the USA and Canada. Now that they are Brinkmann products, we're giving these evaporators a new name, Büchi, the same name they're so well known by everywhere else.

To find out more about the complete Büchi line, including the Model EL Super Rotavapor with electronic speed control and patented duct system, get the new Büchi/ Brinkmann brochure. For your free copy, please write: Büchi Division, Brinkmann Instruments, Westbury, N.Y. 11590. In Canada, write: Brinkmann Instruments (Canada) Ltd., 50 Galaxy Boulevard, Rexdale (Toronto), Ont.

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Büchi/ Brinkmann

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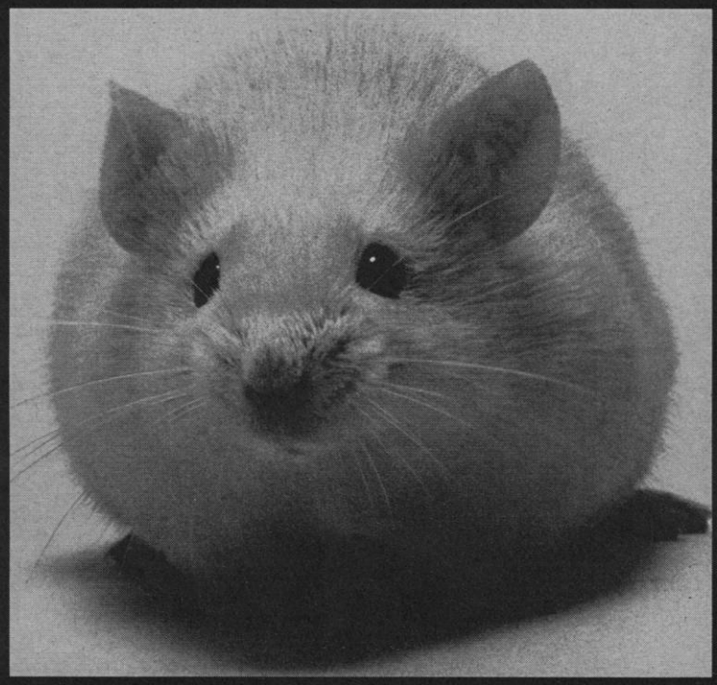

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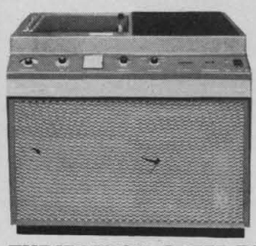

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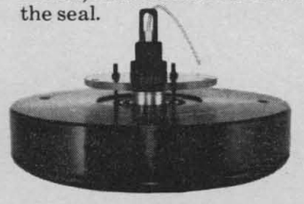

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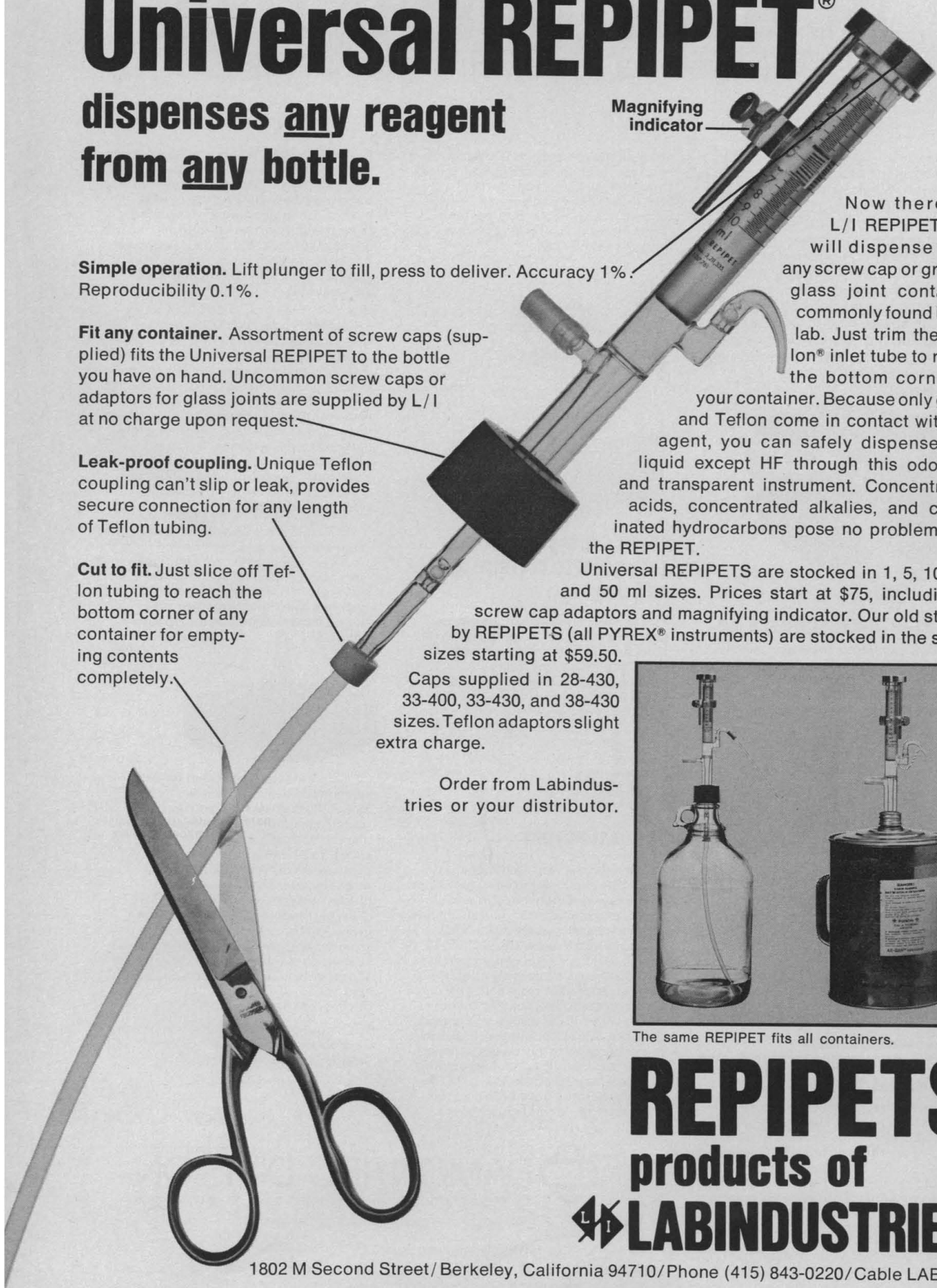

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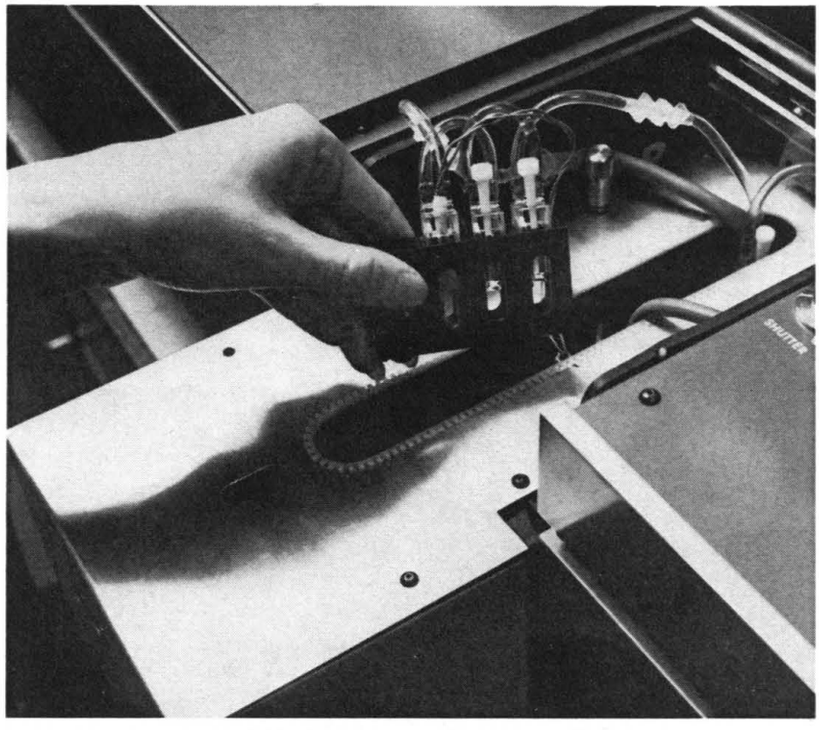

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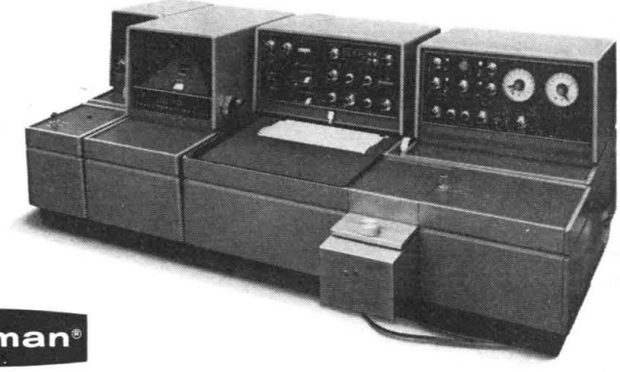

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and maximum absorption alternatives. To describe the "constant quality" projection as "his image of the normal educational condition" is a clear distortion.

Vaughan and Sjoberg attack my use of the word "normal" [for example, "In a normal year, approximately 50 percent of new doctorates take positions as college and university teachers" (*1*, p. 135)] to describe a steady trend, claiming that I "imply that it is fundamentally good." Surely anticipating the continuation of a customary pattern of growth or market behavior does not have "normative" overtones. They take even greater liberties when they refer to my "assumptions concerning the *ideal* proportion of Ph.D.'s in colleges and an *ideal* student-teacher ratio of 20 to 1 [italics added]." None of the one or two dozen economists and sociologists who have attempted to project trends in the academic labor market have ever assumed that likely events were therefore "ideal." The incremental student-teacher ratio of 20 to 1 happens to be the average for the period from 1958 to 1972, and 44 percent of college faculty members happen to have the doctorate. It surely is not my conception of the ideal world; it is part of the real world that one must contend with.

Finally, in one of the few instances where I *have* stated a personal preference among public policy alternatives, Vaughan and Sjoberg claim that I fail "to recognize the political dysfunctions of . . . [my] rather elitist educational commitment." "Implicit in the policy for restricting graduate programs is the notion that limited funds would be spent most expeditiously on those institutions wherein high quality is already judged to exist. By implication . . . this policy would lead to the support of a relatively small number of low-risk students who are carefully selected by these prestigious institutions." I have argued, and firmly believe, that it is inappropriate federal policy to merely let the market resolve the problem, imposing a kind of Malthusian adjustment upon academic institutions. Instead, I have argued for a positive program of federal support of graduate education that would attempt to provide long-term financial stability for the major graduate schools. I have suggested that "75 to 100 national universities" should receive basic federal support, but I hardly see that as being elitist. These same universities today produce 75 to 80 per-

cent of all the doctorates, and most of them have enviable records in recent years of enrolling minority students. One could hardly characterize the nearly quarter of a million graduate students enrolled in these universities a "small number of low risk students." Vaughan and Sjoberg create straw-man arguments that mislead the reader.

In summary, it is difficult to know what Vaughan and Sjoberg are positively recommending. They applaud the actions of institutions and government agencies in cutting back on enrollments, yet deplore my proposal for added federal aid to support the major graduate centers. They wax enthusiastic about educators taking "a more active role in defining the future social order" and "creating a more viable and meaningful way of life," but they provide few hints as to what that new order might be. They want graduate education to change markedly in undefined ways to better serve some future undefined society. I wish they would reveal that vision to their readers; many of us might share it.

ALLAN M. CARTTER
Carnegie Commission on Higher Education, 1947 Center Street, Berkeley, California 94704

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3. J. K. Folger, *J. Hum. Resour.* **2**, 143 (1967).
4. A. M. Cartter and R. L. Farrell, in *The Economics and Financing of Higher Education in the United States* (U.S. Congress, Joint Economic Committee, Government Printing Office, Washington, D.C., 1969), pp. 357–374.
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Although many of Cartter's comments reflect the pique of one personally offended, his response nevertheless is instructive: it more fully exposes his basic orientation to public scrutiny. We shall consider the more obvious areas of intellectual friction and, at Cartter's behest, outline our vision of the future.

1) A fundamental source of disagreement between Cartter and ourselves arises from our differing conceptions of the nature of the market. Cartter's central argument regarding the academic labor market rests on the premise that market outcomes necessarily result from invariant, impersonal forces. In our view, market operations are less determinate; outcomes emerge from choices among a range of alternatives partially defined by noneconomic fac-

tors. For one thing, the market has a political component.

Only by taking the existing power structure as a given can Cartter argue that educational needs are reflected in market demands. What is required by the broader society and what some persons in positions of power are willing to pay for are not necessarily the same. To equate social needs with effective market demand is to cling to a 19th-century definition of the market. To speak of a surplus of highly educated talent in a highly affluent society, where about 12 percent of the population over 25 has completed four or more years of college, is to denigrate the value and importance of higher education (*1*).

2) Cartter's conception of market operations leads him to accept long- or moderate-range social projections uncritically even though most social scientists have expressed major reservations about them. He resists the suggestion that some projections are realized because they are a case of self-fulfilling prophecy.

By asserting that "Galileo may or may not have preferred the earth to be round, but the protestations of the bishops did not alter the facts," Cartter would have us believe he studies invariant market forces much as a natural scientist would investigate his subject matter. But Cartter's reasoning is as faulty as his example. Galileo was persecuted not for arguing that the earth was round but for actively supporting the Copernican heliocentric theory. Nor are Cartter's projections and analysis of the market comparable with Galileo's experiments or his telescopic observations. Then too, Cartter, by his own admission, acted as adviser to the New York State Commissioner of Education and thereby influenced the nature of the academic labor market. Church leaders who censured Galileo did not exert a similar influence over the laws of nature. Cartter often seems to don the robes of a "cleric" who attempts to keep the academic labor market in line with a particular political orientation.

Does Cartter seriously believe that the reputed Ph.D. surplus and the operation of narrow economic forces are alone responsible for the precipitous decline in the number of federally supported graduate students "from 51,446 during fiscal year 1969 to 22,121 estimated for fiscal 1972" (*2*)? Surely political decisions on the part of the Nixon Administration have affected these developments.

More generally Cartter fails to recognize that the social researcher is a variable in the research process, and he seems unaware of Robert K. Merton's analysis of the self-fulfilling prophecy. By acting in terms of his own projections, and encouraging others to do likewise, Cartter is then better able to claim that his projections are being fulfilled.

Cartter to the contrary, we do not applaud the cutbacks in graduate programs or in graduate students. We discussed the present cutbacks in order to illustrate Cartter's contribution to a self-fulfilling prophecy. Our position is that major readjustments in the training, and hence in the kinds, of Ph.D.'s are required, and if some constraints on the market are overcome by purposive action and future possibilities realized, then higher education would expand rather than contract.

3) Cartter's rebuttal confirms our assertion that he fails to recognize the necessity for placing his projections of academic manpower within the context of broader sociocultural trends. He suggests, for instance, that the notion of a "postindustrial society" is a cliché. Cartter thereby ridicules the concerns of many eminent social scientists, such as Daniel Bell (*3*), as dealing with trivial nonissues. Although Bell, like Cartter, is locked into the categories of the present in projecting or predicting future events, Bell's discussion of the postindustrial order has highlighted fundamental *structural* changes, especially in the labor force, that have been occurring in American society. According to Cartter the trend toward a service economy has been underway since the turn of the century and therefore is not new. The implicit hypothesis that the growth of the service economy during the past two decades is similar to that during the first few decades of the 20th century, when America was moving from a rural- to an urban-manufacturing base, is demonstrably false.

Cartter reasons that examining sociocultural trends "does not really advance the argument" over the future need for Ph.D.'s. By implication, only the more readily quantifiable aspects of society—for example, selected demographic and economic phenomena—are worthy of special attention. This reasoning leads Cartter to accept only variables defined in official statistics as affecting the academic marketplace. Yet official statistics are constructed in terms of past and present social definitions, and officials generally ignore countervailing trends which, though often qualitative in nature, can readily, when viewed in their cumulative effects, undermine such projections as Cartter's.

4) The future is not a fact; it must be created by taking into account not only the constraints Cartter stresses but the possibilities he ignores. Our vision of higher education in the future, calling for its expansion, seeks to contend with complementary and contradictory forces. First, it is necessary to provide ever-expanding technical knowledge and skills for many sectors of the populace. The use of higher education to upgrade the knowledge and skills of such occupational groups as secretaries and policemen is illustrative of what can be done in such sectors. We also called attention to the possible upgrading of the skills of many college instructors. And new occupations, based upon increased scientific knowledge, must be created to cope with, for example, environmental concerns.

Moreover, Cartter should recognize the need as well as the potential for far more highly trained personnel in, say, the health services, and to be more specific, in the field of geriatrics. But educators must participate in redefining the social and economic rewards of such activities so that people will find greater satisfaction in service to humanity.

Second, we are far more concerned with the issue of the quality of life than is Cartter. He fails to acknowledge the equality movement in American society. He seems unaware of the grave difficulties that the lower-middle class, ethnic minorities, and women will experience if educators and politicians act according to his projections. Cartter persists in slighting the potential contributions of women to higher education and the broader society.

Equality can be approached only if we restructure higher education and if some income redistribution is achieved. Even so, expansion of higher education is essential. To attain relative equality through "compensatory justice," which favors the underprivileged at the expense of those immediately above, that is, the lower-middle class, can only intensify the current backlash against higher education.

We must also recognize that higher education can become leisure, leisure in Aristotelian terms as contemplative thought. Americans expend huge sums on entertainment and leisure-time activities. But higher education has come

to be viewed by many persons, whether members of the alternative society or other adults, as a laborious set of requirements that have to be met in order to acquire a job. A redefinition of education as leisure cannot be attained through commitment to present-day bureaucratized educational structures and the concomitant "efficiency model."

An elaboration of our image of the future of education must await another essay. However, our discussion has emphasized Cartter's call for a retrenchment in higher education, whereas we, though cognizant of constraining forces, deem its expansion essential if American society is to cope with accelerated social change. We must broaden the social and economic base of the college population and aggressively create multifaceted programs in higher education for use by persons throughout their adult years.

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Medical School Admissions

Samuel Z. Goldhaber's report "Medical school admissions: A raw deal for applicants" (News and Comment, 28 July 1972, p. 332) is a classic in its field and hopefully will prompt the needed reforms. However, I must caution that Goldhaber's suggested improvement in the admissions process of reducing or eliminating state preference regretfully will never be changed. The money which the federal government provides to most state medical schools is small in comparison to the state funds provided. Consequently, as long as the legislators control the purse strings, a majority of the entering class will be state residents. It would be interesting to compare statistics on the number of state residents educated in a state medical school who eventually practice medicine in that state versus the number of out-of-state students educated in the same school who set up practice in that "foreign" state. Legisla-

tors would be amazed at the results. The influence of specific state politics within the medical educational system is too deep to be uprooted now.

RICHARD D. PEPPLER
Departments of Anatomy and *Obstetrics and Gynecology, Louisiana State University Medical Center, New Orleans 70112*

Goldhaber did a very good job of summarizing the very real problems that face those applying to medical school today. The data speak for themselves, and certainly explain the anxieties and stresses which face those who would pursue a course in medicine.

Having spent a good many years in medical school administration, a number of those as chairman of the admissions committee at a so-called competitive medical school, I am fully aware that a situation that has been relatively difficult since the end of World War II has become progressively so in recent years.

Goldhaber's call for ". . . a more equitable system of medical school admissions . . ." is all to the good. He is, however, rather naive in asking medical schools to ". . . weigh more heavily applicants' motivation for applying to medical school and their personal attributes, such as compassion and general intelligence . . . ." It would be wonderful if we knew how to do these things, but to date I am rather unaware of any satisfactory way of measuring motivation. I have discussed this problem with knowledgeable colleagues in the field of psychology, and have never found any of them who believed that motivation could be measured accurately. Further, I don't remember ever interviewing a medical school applicant —and I interviewed hundreds—who ever seemed anything but well motivated. Similarly, no one would deny that compassion and general intelligence are very important qualifications for a would-be physician. I am afraid, however, that finding a way to determine objectively whether an individual is compassionate or not, particularly during the relatively brief time that medical schools have for evaluating candidates, poses an almost insuperable task.

I don't suggest we shouldn't keep trying to do a better job in our evaluation. Goldhaber is right in saying we need a better system, but how to get it is something else again.

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During his first term, Richard Nixon surprised friends and foes by his performance as President. He took long-overdue initiatives in foreign affairs and responded to domestic needs in ways unexpected of a conservative Republican. He showed ability to plan thoroughly and to execute well. He was able to recruit excellent people to fill government posts, notably at the subcabinet and bureau chief levels. This was especially true in areas involving science and technology. On a few occasions, he found it necessary to force the resignation of an official, but these firings were conducted one at a time and usually with dignity.

Since winning reelection, Nixon has departed from patterns that were successful. His Administration has taken dramatic actions, seemingly without adequate planning or consultation. It has fired or lost through resignation most of the government's best administrators of science and technology. It has downgraded the status of science in the government. It has adopted a new administrative organization that will make it more difficult for the President to obtain well-judged advice.

There are those who say that the abolition of the post of President's Science Adviser and of the Office of Science and Technology were small matters and that the functions of these offices can be carried out elsewhere. Perhaps so. But the way the deed was done was not worthy of a great nation. The office was first abolished. Then someone woke up to the fact that it served important functions. After scrambling around, someone had the inspiration to transfer the functions of the office to the National Science Foundation (NSF) and appoint Guyford Stever (head of the NSF) as science adviser. The solution has merit. However, if it is to represent more than a gesture, Stever and the NSF will be overloaded with conflicting responsibilities.

Another questionable action has been taken in the important matter of energy. Earl Butz, Secretary of Agriculture, has been designated key man reporting to Nixon on energy and natural resources. Butz's experience in these matters is limited, and his staff at the Department of Agriculture is not equipped to deal with energy problems. Latest indications are that authority in energy matters may be divided, with George B. Shultz assuming an important role.

A further example of the downgrading of science can be seen at the Department of the Interior. This department has a proud history of accomplishment and includes many science-oriented agencies, such as those dealing with fuels and natural resources. Are these agencies to be transferred to Agriculture? If not, is another—or several—administrative layers to be imposed between them and the President?

Another aspect of the situation at the Department of the Interior exemplifies the Administration's current personnel policies. Before the election, there were in the department six assistant secretaries and a solicitor general. All were competent, hard-working Republicans, loyal to the President. Today only one remains. Five of the assistant secretaries and the solicitor general have been fired. Their fate and that of many others is not likely to make government service more attractive, as the Administration will learn in attempting to recruit replacements for the large number of posts now vacant.

Nixon's efforts to make his Administration more efficient may ultimately be successful, but insofar as science is concerned, the moves thus far have damaged rather than enhanced the cause of good government.

—PHILIP H. ABELSON

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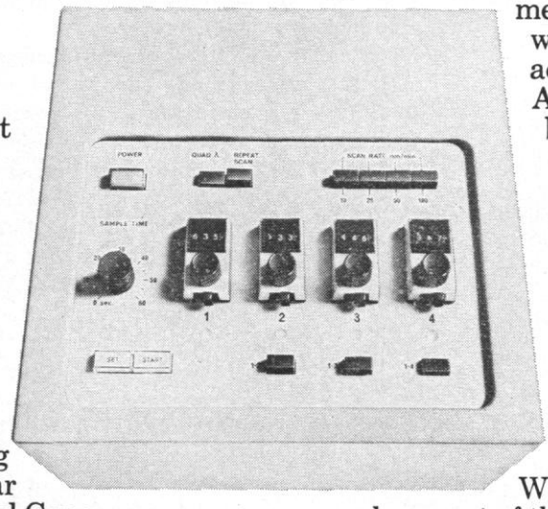

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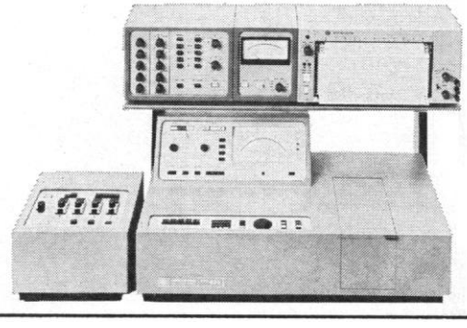

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