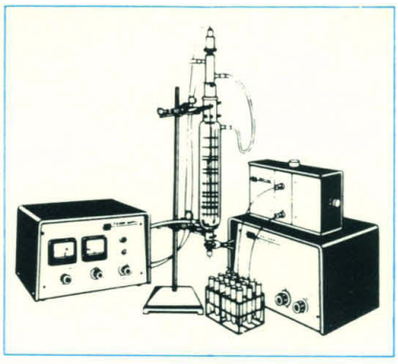
SCIENCE
18 September 1970
Vol. 169, No. 3951

Ampholine Electrofocusing equipment, including Power Supply, Uvicord ultraviolet Monitor and Recorder, ready for protein separation.



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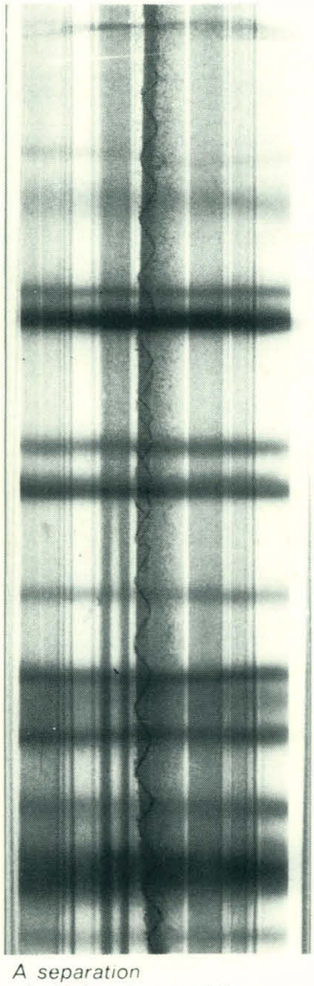
PROTEIN | Separation Purification Characterization



A separation of chicken haemoglobin.

Research establishments, hospitals, and industry throughout the world have used LKB Ampholine Electrofocusing to successfully separate the following kinds of protein.

Endotoxins from bacteria (lipopolysaccharides)
Capsular polysaccharide from H. Influenza
Urine gonadotrophins of pregnancy (human)
Pituitary hormones
Amonuim Sulfate preparations of human serum
Blood coagulation proteins, namely FXII
Whole serum
Gamma globulin
Steroid binding γ-globulin
Transcortin cortisol binding β_1 globulin
γ-globulin, transferrins
Cytochrome c from beef heart
Biliverdin-protein in eel serum
Rat fetal protein from albumin
Immunoglobulins
Bovine serum
Albumin
Ovalbumin
Intact platelet mebranes
E. coli nucleases
Enzymes catalyzing sulphydryl —disulfide interchanges
Enzymes-cellulases (some proteases)
Butyrylcholinesterases from human brain
Pancreatic enzymes
Bromelain + acid phosphatase from ananas comosus
Arylsulphatases of aspergillus oryzae
Mitochondrial transaminases
D-aspartic oxidase
Glycosidases from fungal or bacterial source
Lactoperoxidase
Invertase from yeast
Ribosomal
Catalase
Acid phosphotases
DNA polymerase
Enzymes of carbohydrate metabolism
Neurospora crassa invertase
Alkaline phosphatase in eel inthestinal mucosa
For myltetrahydrofolate syntetase from clostridium thermoaceticum
Haemoglobin
Isoenzymes of alcohol dehydrogenase
Soluble grape proteins
Influenza virus and adenovirus
Herpes simplex virus proteins
Renin (bovine, human)
Insulin
Glycopeptides of fibrinogen and platelets
Chondroitin sulfate glycoproteins
Myoglobin
Ferritin
Chemically modified myoglobin
Interferon samples from chicken eggs
High and low molecular weight glycosidases. Detergent-soluble glycosyltransferases (membrane bound)
Extracellular enzymes and toxins from staphylococcus aureus e.g. hyaluronate lyase

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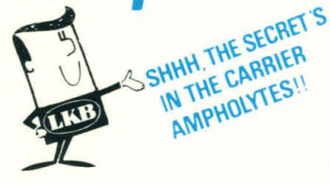
Ampholine?



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18 September 1970
Vol. 169, No. 3951

SCIENCE

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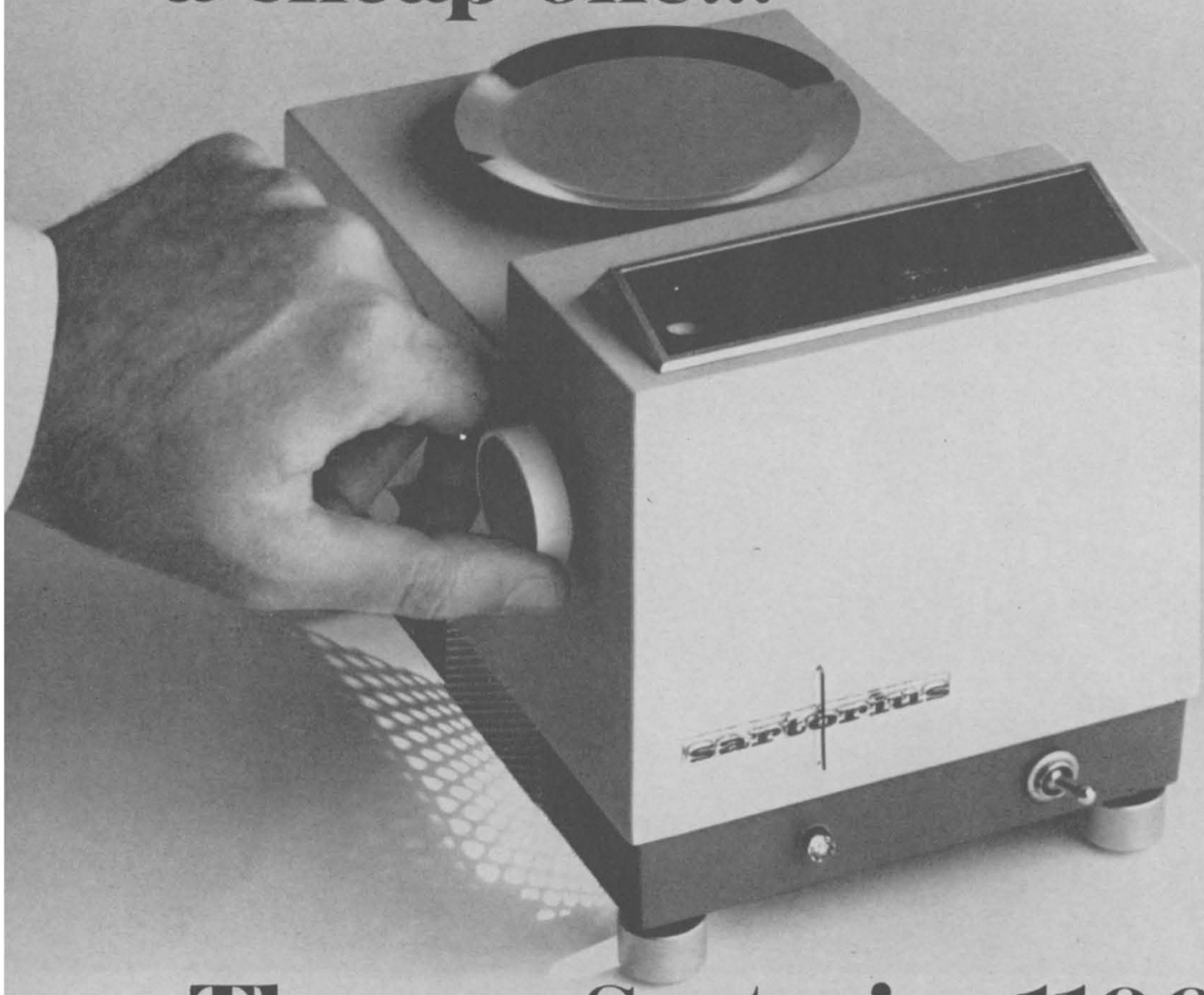
COVER

An example of unplanned growth, Los Angeles is representative of a low-density area beset by severe environmental problems caused by the absence of a mass transportation system. See page 1233 for summary of AAAS Symposium, Reducing the Environmental Impact of Population Growth. [William A. Garnett, Napa, California]

For laboratories that don't need an 'expensive' top loader, yet can't use a 'cheap' one...



The new Sartorius 1100. Only $425.

Why pay for an expensive balance your lab may not really need? Why buy slower and cruder equipment that doesn't meet today's standards? Sartorius solves the dilemma with its new Series 1100 top-loaders – the first balances to bridge the gap between modern design and low price.

At only $425, the Series 1100 offers many features usually found only on more expensive, sophisticated weighing instruments. For example: all-digital readout; results in less than 3 seconds; wide-range mechanical taring; fast, easy operation with no weights to handle and not even any dialing of built-in weights. It's a torsion-type balance, and the optical scale covers the entire weighing range.

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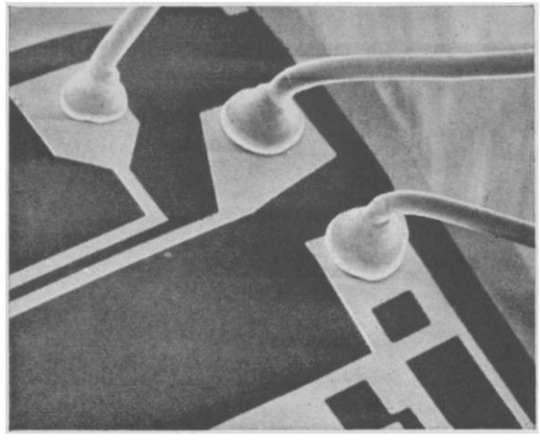
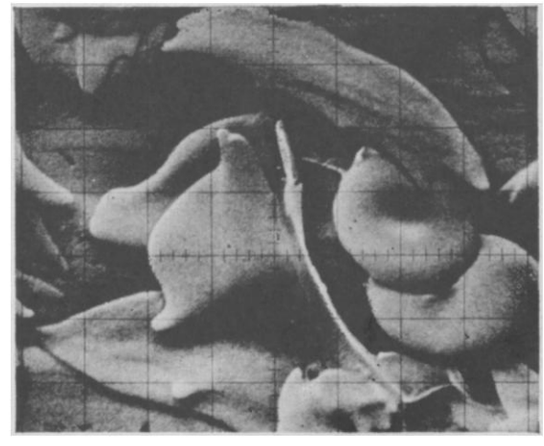
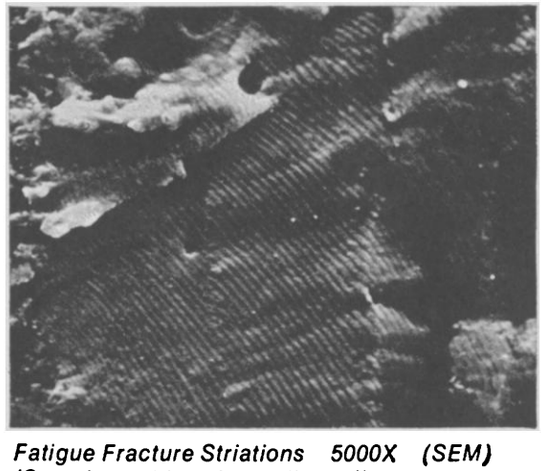


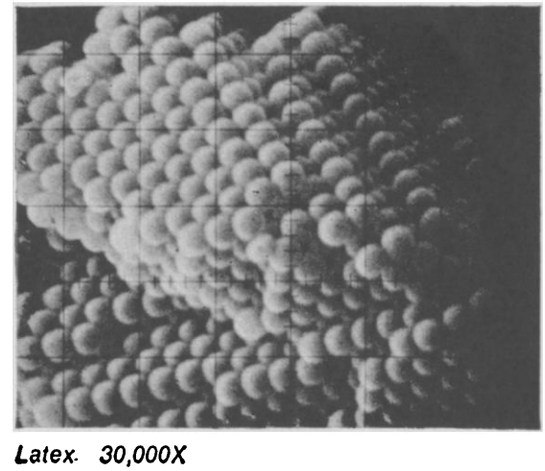
Microcircuit 200X (SEMM)



Diseased Blood Cell 5000X



Fatigue Fracture Striations 5000X (SEM)
(Sample could not be replicated)



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SERIES 7620 GAS CHROMATOGRAPHS

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With the 7620 GC's cryogenic module, sub-ambient oven temperature control is as easy and effective as high-temperature control has been for years.

It's easy because the cryogenic module controls oven temperature continuously down to −70°C and holds it within 0.1°C, for isothermal or programmed operation. It's synchronized with programmer operation: a blinking light tells you when the oven has cooled to the starting temperature, whether cryogenic or near ambient. It operates either with economical liquid CO_2 down to −70°C or with compressed air in the trans-ambient range. And it's a standard option: you can order it installed on a new 7620 or install it yourself later, with relative ease, without modification to the programmer.

The most important characteristic of the 7620's cryogenic module is its effectiveness. As evidence, we show the chromatogram of a complete separation of Argon from Oxygen in a sample of air, performed in 8 minutes on a 6-foot column (Molecular Sieve 5A) in a 7620 oven operated isothermally at −30°C. Any GC that can do this is clearly performing well in the sub-ambient region.

Still more evidence of the 7620's precision at sub-ambient temperatures is presented in Bulletin 7620, yours on request. Prices start at $5150 for a dual TC detector instrument; the cryogenic option adds $350. Hewlett-Packard, Route 41, Avondale, Pa. 19311. In Europe: 1217 Meyrin-Geneva, Switzerland.

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ANALYTICAL INSTRUMENTS

43004

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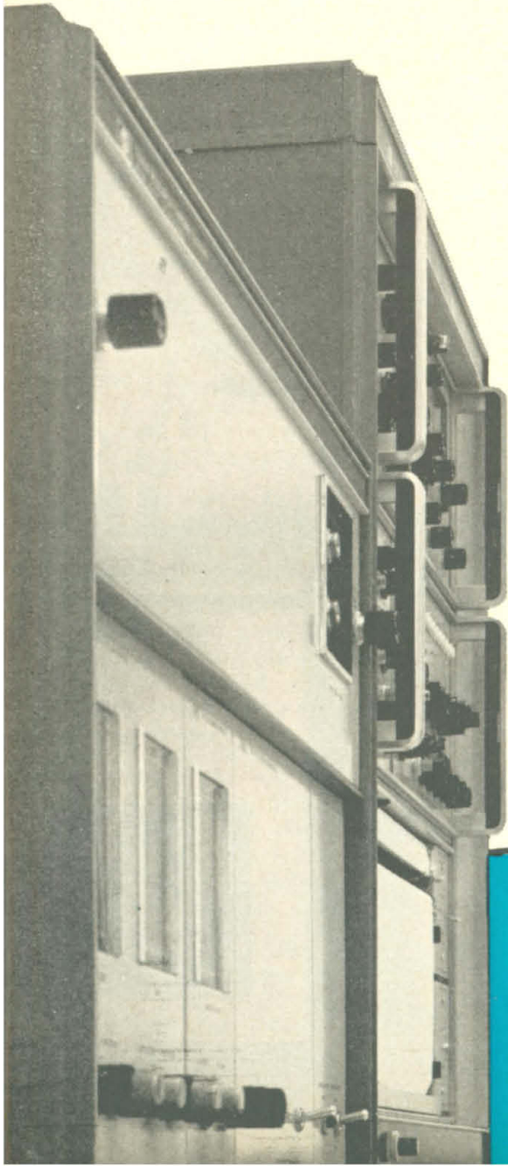

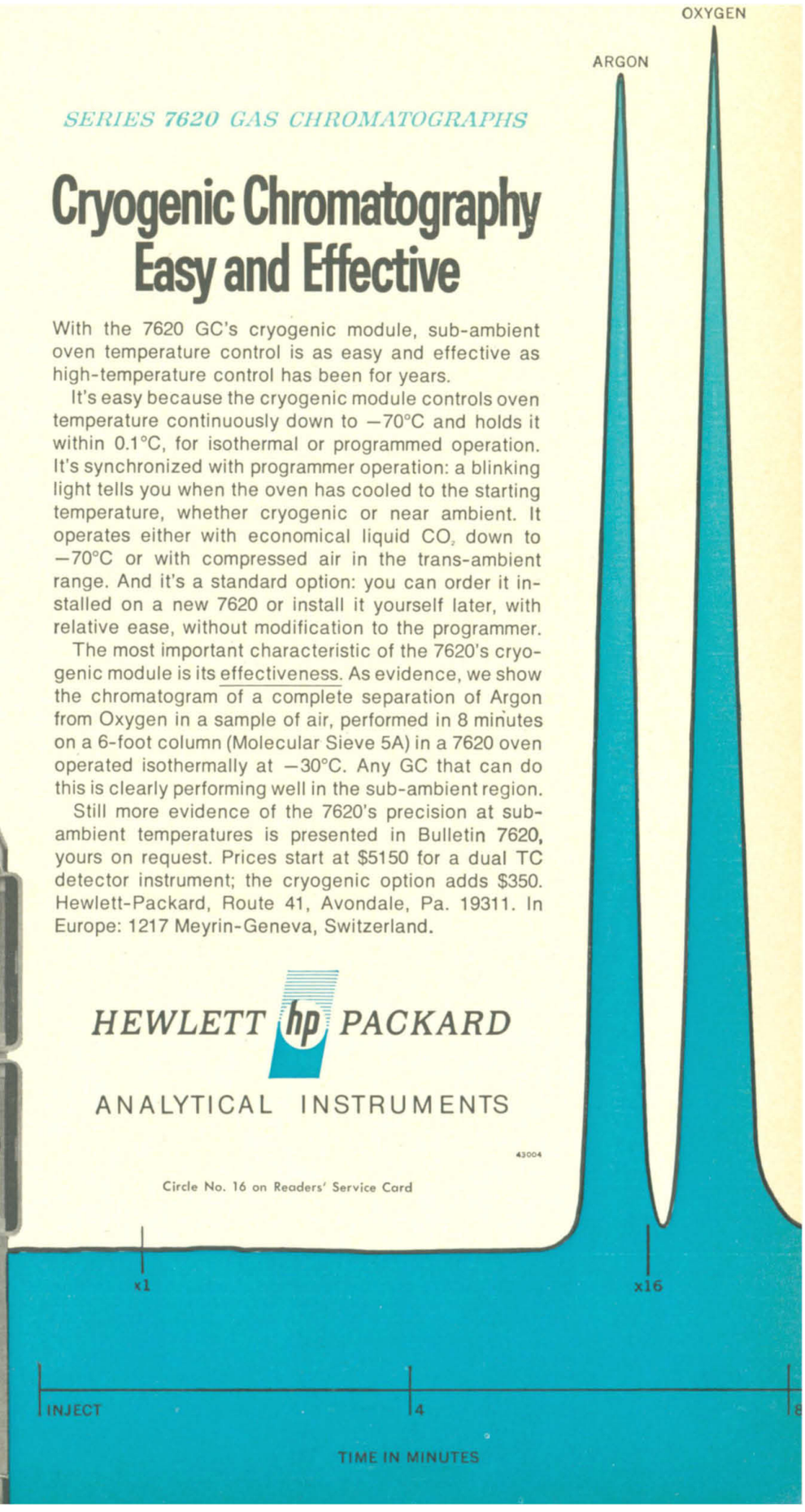

Circulatory problems? Try Temptrol

If you are experiencing hot and cold spells with your lab circulators, Temptrol offers positive relief!

You can select the level of precise temperature control you need, the capacity you need, the temperature range you need.

Temptrol combination constant-temperature-baths-and-circulating-systems provide accurate temperature control both within their built-in baths and in separate instruments or baths through which the bath media is circulated. Baths and circulating systems may be used simultaneously or either may be used alone.

Choose from nine different Temptrol units. Models equipped with a sensitive hydraulic thermostat achieve a uniformity of ±0.5C or better and a sensitivity of ±0.3C. Models with an ultra-fine Microset mercury Thermoregulator give you a uniformity of ±0.02C and a sensitivity of ±0.1C. Pumping capacities range from 42.5 to 300 gal./hr. at 0 head.

Reservoir capacity range is: 1.25, 2.25 and 2.75 gallons, plus the Lo-Temptrol which is a 15 gallon capacity unit that cools to −30C.

Two versatile portable units, Stir-Pump and Porta-Temp, complete the Temptrol line. When used with the Precision Porta-Cool, the Porta-Temp converts any container into a low cost, wide range—0 to 90C — constant temperature bath and circulating system, giving you the advantages of the "bucking technique."

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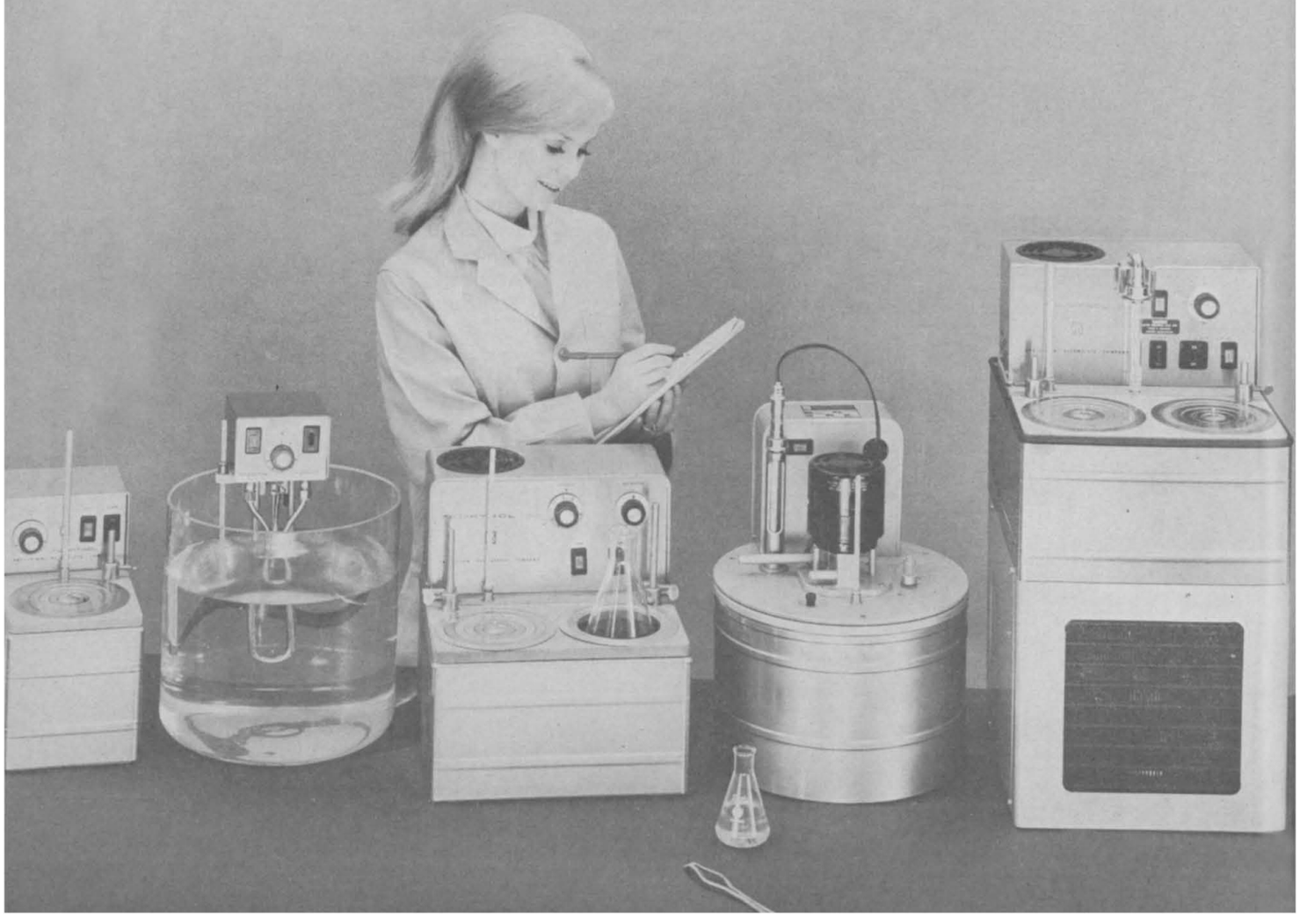
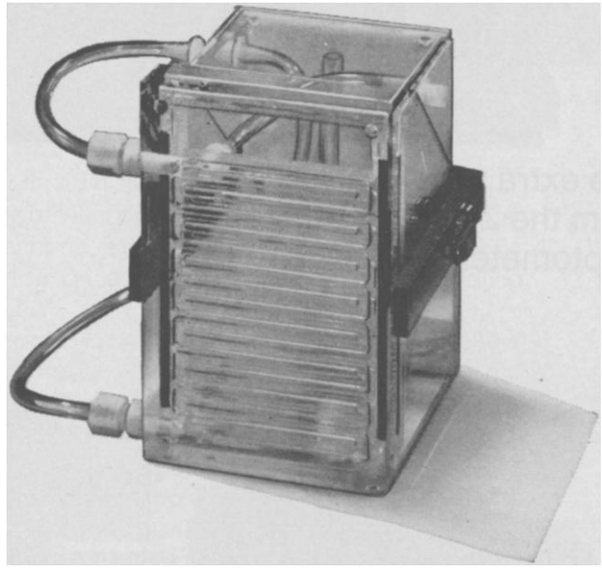


starter set



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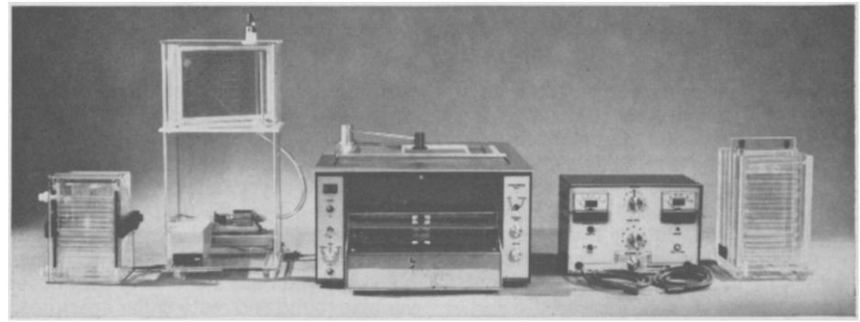

E-C Apparatus Corporation, 755 St. Marks St., University City, Philadelphia, Pa. 19104. *Please send me a copy of: "The E-C Total Vertical Gel Electrophoresis System"*

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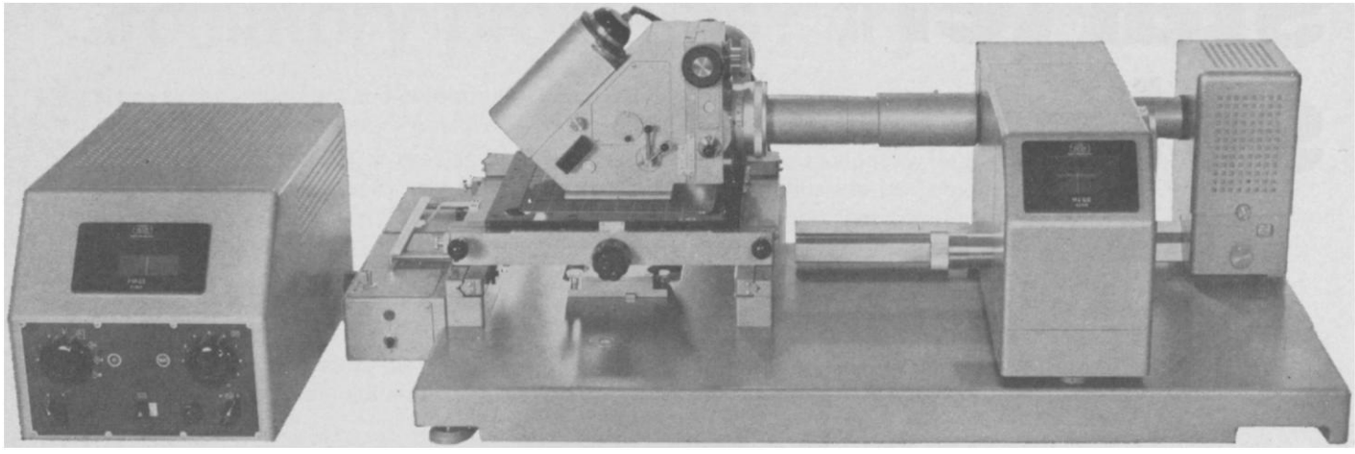
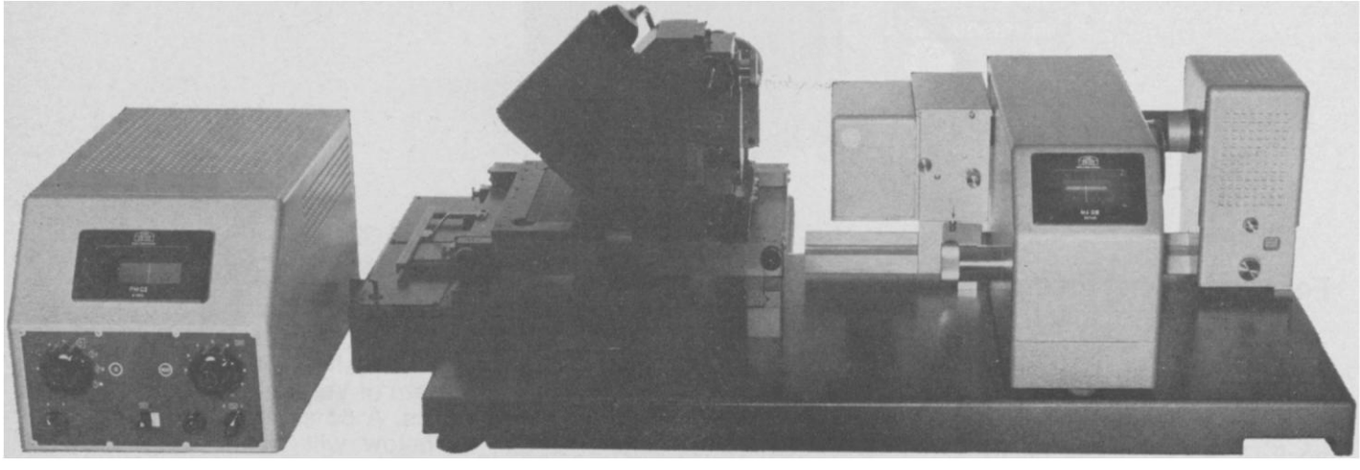


look for the extra value you get from the Zeiss Chromatogram Spectrophotometer for TLC...



...it can be converted easily to the universal PMQ II Spectrophotometer by the addition of units costing only $726. 2 instruments for just a little more than the price of 1.

Just because funds are hard to come by is no reason not to have the best. And the Zeiss TLC Spectrophotometer *is* the best. It offers accuracy and sensitivity significantly better than you can find elsewhere. A demonstration will prove it, and we'll be glad to arrange one for you. But right now we'd like to emphasize its versatility—the versatility that gives it extra value in these cost-conscious times.

First, over a wavelength range of 200-2500 nm, this spectrophotometer measures chromatographic separations by transmission, reflectance or fluorescence. And not only can it accommodate larger TLC plates than any other instrument, but also paper chromatograms, electrophoresis strips and film negatives. Provision is also made to measure gel discs and slabs, and to attach the recorder of your choice.

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But that only begins the story of its versatility. Chapter 2 starts with our picture caption—please read it. With that slight extra investment, you'll reward yourself with the world's most reliable and accurate universal spectrophotometer, and have two great instruments for little more than the price of one. The arithmetic is simple, and it all adds up in your favor.

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Most dispensers are gadgets. This one is an instrument.

It's accuracy (±.005ml) makes the difference.

There are numerous liquid dispensers on the market today, but unfortunately, most of them are gadgets. The new Brinkmann Dispenser, on the other hand, is an instrument, and it sets entirely new standards for performance and convenience in liquid handling systems.

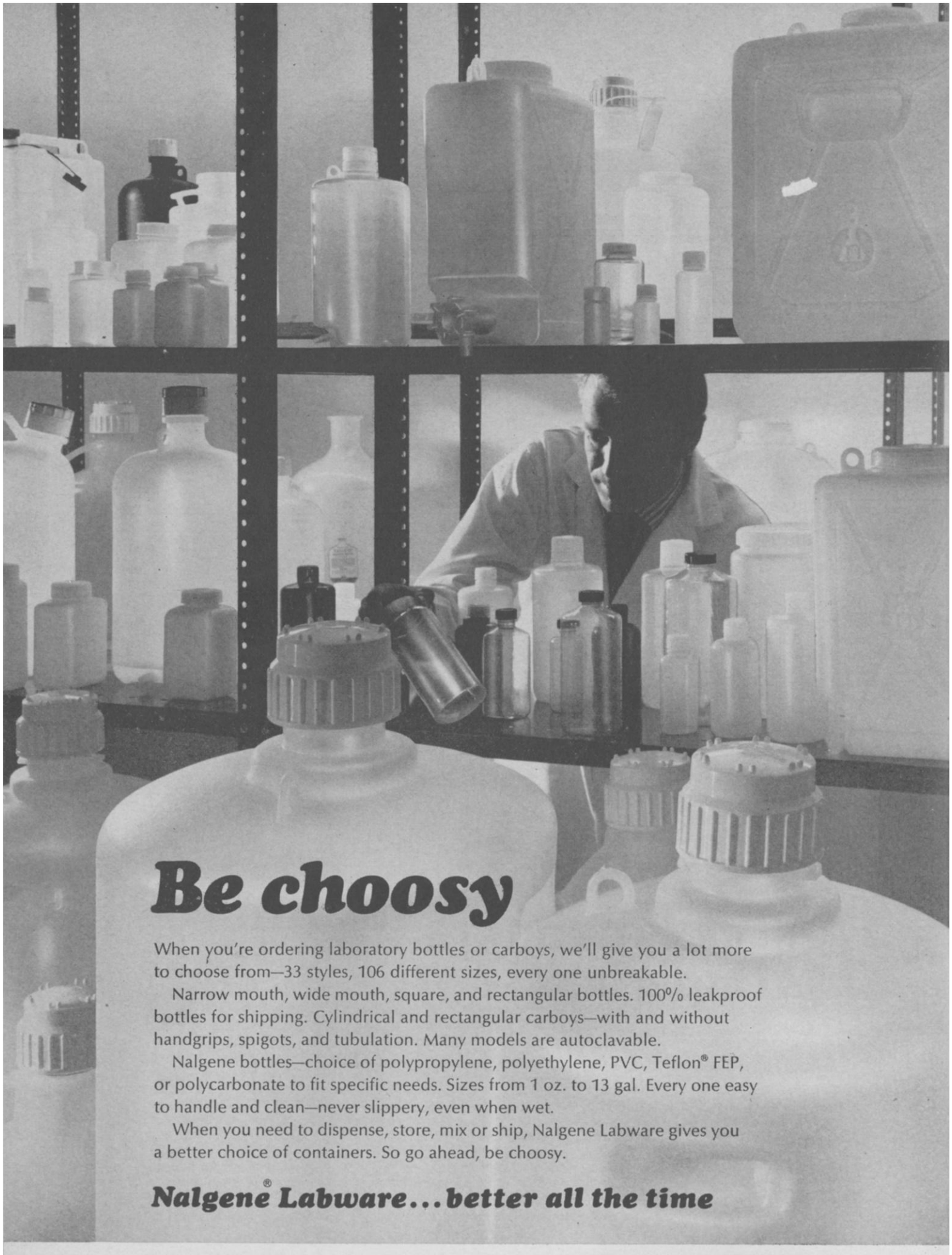
Consider the accuracy: from ±.005 ml (for the 2 ml model) to ±.02 ml (for the 15 ml model). This accuracy is nearly 100 times greater than that of conventional systems. Standard deviation is equally phenomenal: ±.0025 ml at 2 ml and ±.0035 ml at 15 ml. Next, consider its unique design. It converts from a hand-held pipettor to a flask-mounted dispenser simply by interchanging two valves to reverse liquid flow. All parts touched by liquid are either glass, Teflon*, or platinum-iridium. Lastly, consider ease of operation and repair. Its push-button action is simple and foolproof, and volume is easy to adjust.

To minimize breakage, there is no exposed glass; also any working part can be replaced by the user without special tools.

A complete line of accessories, including dispenser bottles, Teflon stoppers and Teflon hose connectors, is available. Our literature describes it all. For your free copy, just write: Brinkmann Instruments, Cantiague Rd., Westbury, N.Y. 11590. In Canada write: Brinkmann Instruments (Canada) Ltd., 50 Galaxy Boulevard, Rexdale (Toronto), Ont.

BRINKMANN **Brinkmann Dispensers**

*Teflon is a registered-trademark of the E. I. Dupont Co.



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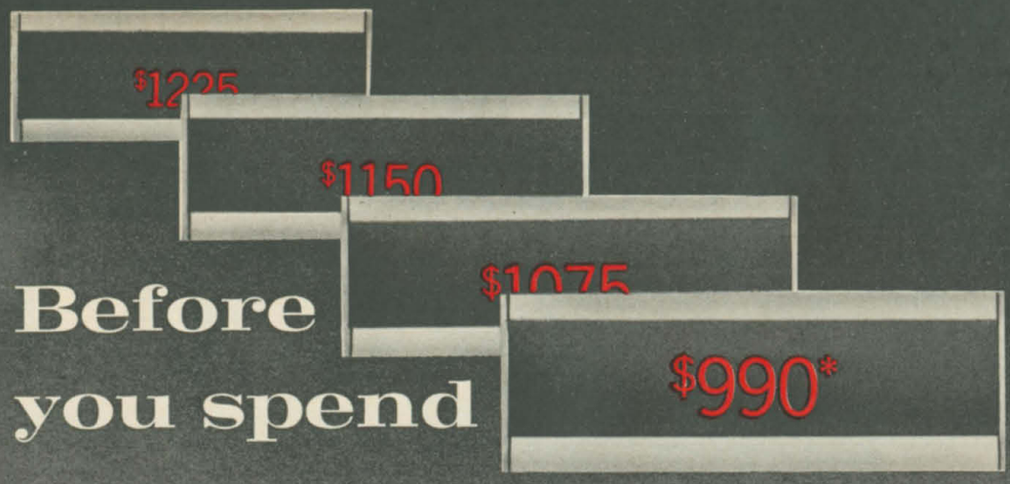

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A heritage of over 30 years' experience in producing quality pH meters is evidenced in Radiometer's PHM52 Digital. Start with the specifications . . . We believe they equal or exceed those of competitively priced Digital pH Meters. But don't stop there.

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0.0 to ±1400.0 mV	±0.1 mV	<0.001 pH/24 hours
0 to ±7000 mV	±1 mV	drift is non-cumulative.

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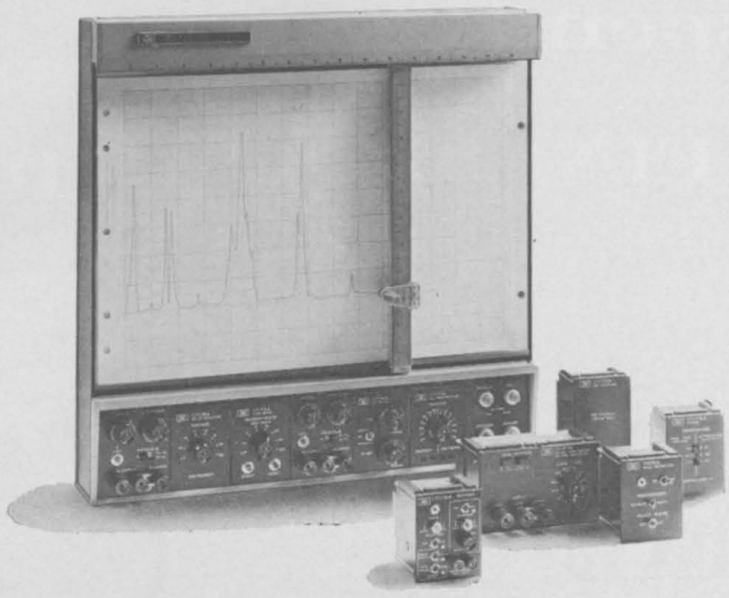
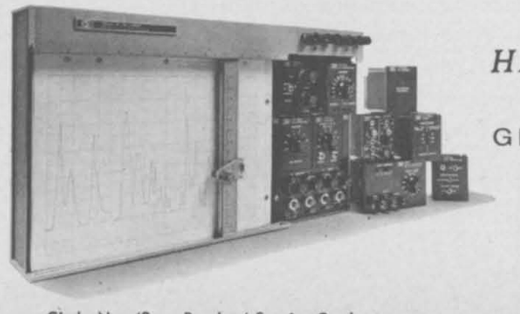


Or get an X-Y recorder you load up.

The world's first plug-in X-Y recorders let you buy modules, not mainframes, when you want to change applications. So you can order a single workhorse instrument to handle any analog and almost any digital job you have in mind. With the best dynamic performance on the market.

There are eight plug-ins for Hewlett-Packard's 7034A and 7004B X-Y's. You can use two plug-ins per axis. Besides taking care of all the routine tasks, they'll let you plot X-T, Y-T, single channel and discrete analog data. Extract signals superimposed on steady-state DC. Record AC from 5 Hz to 100 kHz. Plot two channels independently. And handle high-speed point plotting, too. You can specify the capability you want now and add to it later.

Dynamic performance is state-of-the-art. There's acceleration of better than 1500 in/sec^2 and slewing speed of 30 in/sec to catch all the transients that most recorders miss. Guarded circuits eliminate the effects of common mode voltages, and IC construction keeps your recorder running perfectly day after day. Autogrip electrostatic paper holddown and mess-free disposable ink pens are standard.



The 8½″ x 11″ 7034A costs just $1295 and the 11″ x 17″ 7004B is only $100 more. Modules start at $25. To lighten your load in X-Y recording, call your local HP field engineer. Or write to Hewlett-Packard, Palo Alto, California 94304; Europe: 1217 Meyrin-Geneva, Switzerland.

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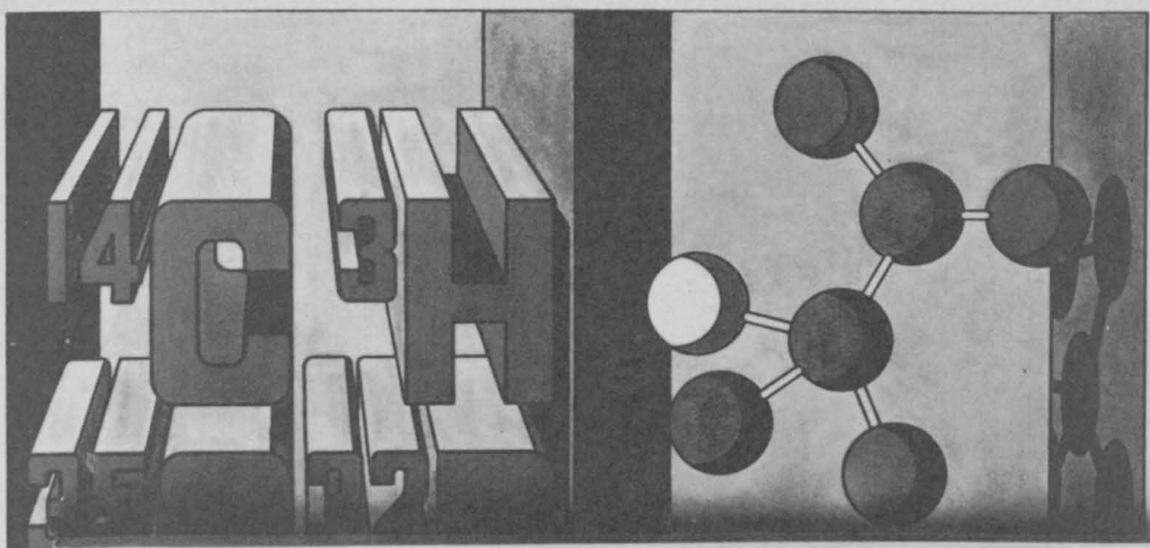

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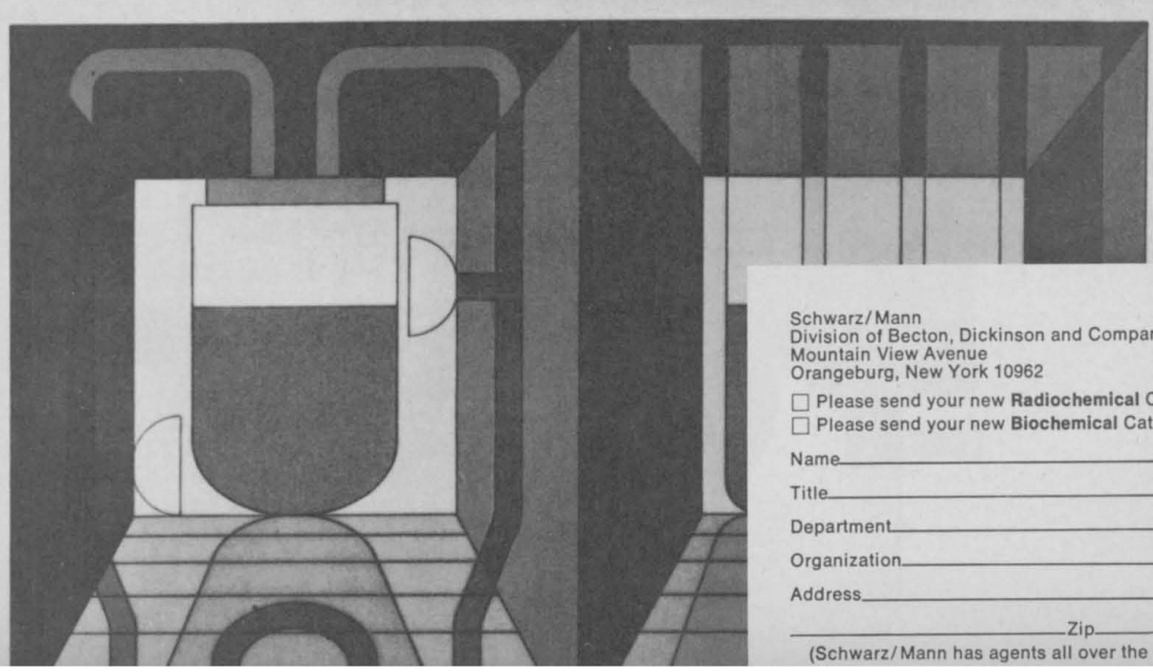

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With a 400-foot magazine and constant speed motor, the Bolex could have given you 12-minutes of shooting capacity for that film about the assembly line.

You could easily have attached the Bolex to the microscope for that sequence in the research film.

And the Bolex, with its wide range of lenses and easy one-man operation would have been the perfect choice for that worldwide public relations film. It could have handled the arctic and tropic sequences without getting frostbite or sunstroke. And done the sync sound portions, as well.

But you won't be able to borrow the Bolex this time. It's being used to do a time-lapse study of the construction of the new plant. And it's going to be tied up for awhile.

Maybe what you need is another Bolex.

A Bolex makes as good a second camera as it does a first. Because with Bolex you can get exactly what you want in a camera. You never have to buy more capacity than you need.

You might start off with a compact 100-foot Bolex and later extend your system to include a 400' magazine with motor drive for sync sound shooting.

If one of our zoom lenses (with or without automatic exposure control) will do the job, fine. If not, Bolex also offers extreme wide angle lenses. Telephoto lenses. Macro lenses that focus as close as 1". Lenses as fast as f/1.1, with pre-set diaphragm. Whatever you want. And never more than you want.

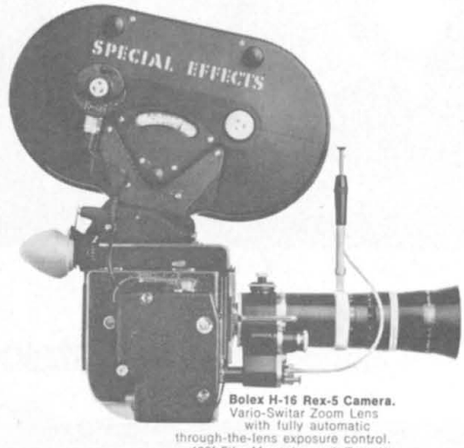
Whatever Bolex you choose, you'll have a camera capable of turning out films of professional quality—rock steady and sharp. A camera whose built-in features can produce fades, lap dissolves, double exposures and many other sophisticated effects.

Below are suggested Bolex combinations for various uses.

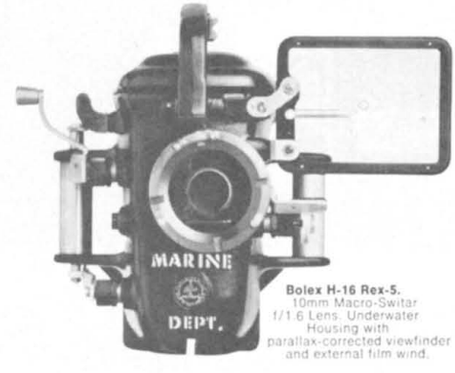
For a free 32-page catalog, Industrial Bulletin and list of Bolex dealers near you, write to address below:

BOLEX

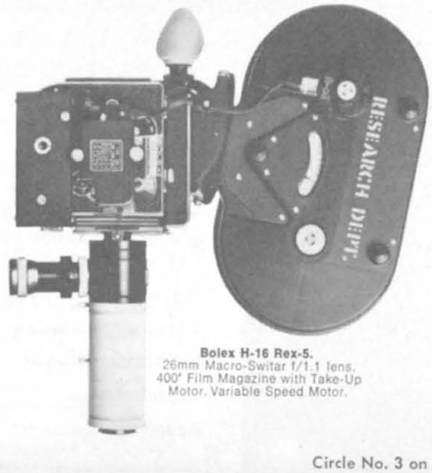
Paillard Incorporated,
1900 Lower Road, Linden, N.J. 07036.
Other products: Hasselblad cameras and accessories, Hermes typewriters and figuring machines.



Bolex H-16 Rex-5 Camera. Vario-Switar Zoom Lens with fully automatic through-the-lens exposure control. 400' Film Magazine with Take Up Motor. MST Constant Speed Motor with sync generator for synchronous sound recording.

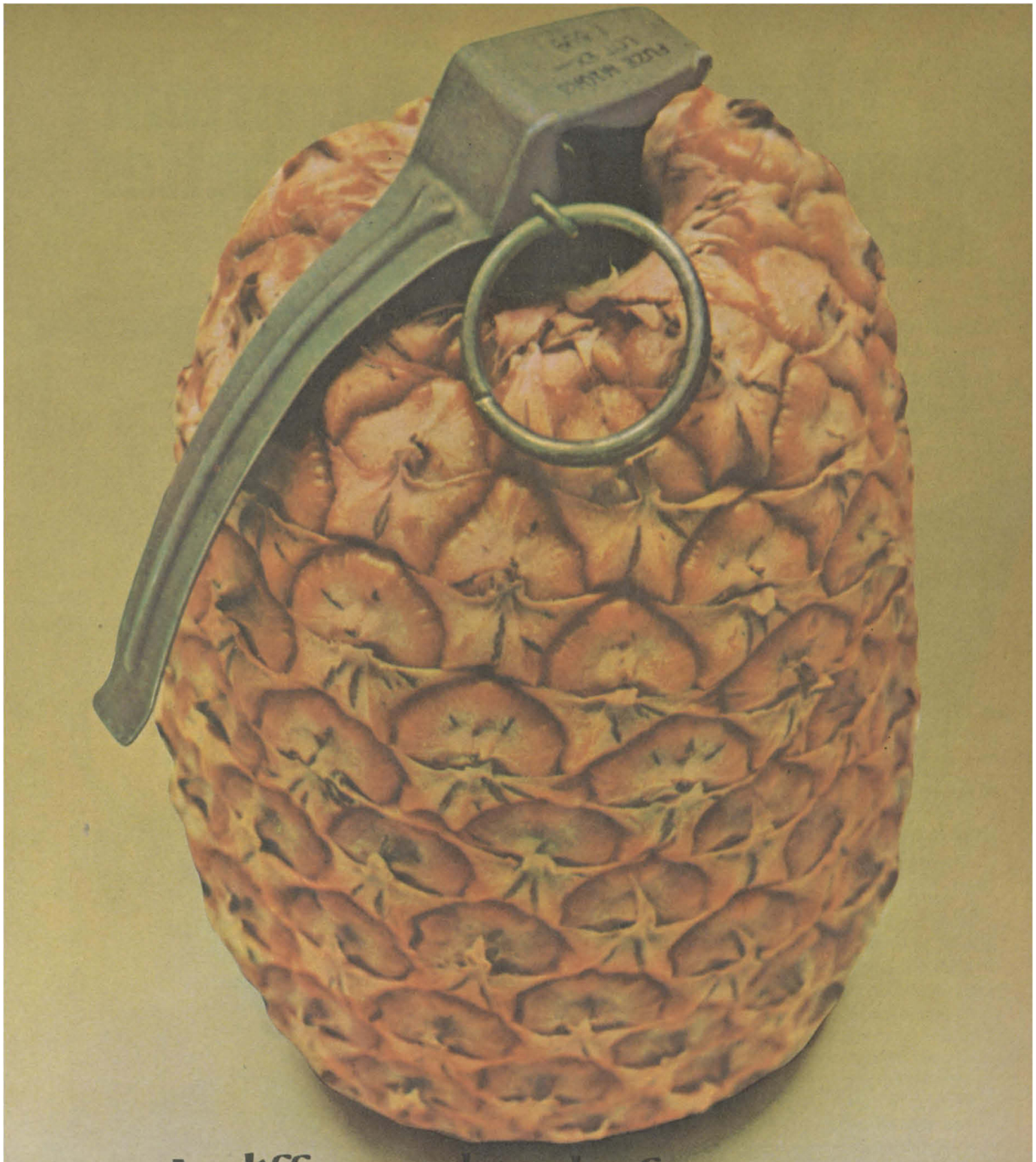


Bolex H-16 Rex-5. 10mm Macro-Switar f/1.6 Lens. Underwater Housing with parallax-corrected viewfinder and external film wind.



Bolex H-16 Rex-5. 26mm Macro-Switar f/1.1 lens. 400' Film Magazine with Take-Up Motor. Variable Speed Motor.

Bolex H-16 Rex-5. Vario-Switar Zoom Lens with fully automatic through-the-lens exposure control. 400' Film Magazine with Take Up Motor. MST Constant Speed Motor with sync generator. Blimp for silence.



A different kind of weapon

Once known only as a golden fruit, the pineapple has also given its name to the deadly "pineapple." Now this fruit whose name was used for the grenade of war is rapidly becoming a versatile source of articles of peace.

One of these promising products of the pineapple plant is a protein-splitting enzyme called bromelain. It has already proved its worth as a meat tenderizer . . . as an anti-gellant that keeps gelatine drinks free-flowing . . . as an ingredient in a variety of pharmaceutical products . . . in chill-proofing beer.

How will this plant protease continue to meet its high promise in the field of new products? As a digestive aid? As a miracle cleanser? As a cure for the common cold?

How can your company use bromelain? Dole will supply technical supporting data and research samples if you think there may be an application in your business. Just write. We'll send you all the facts. Or, if you are ready to try your idea on a larger scale, bromelain is also available in commercial quantities.

You may find the kind of explosion you're looking for by releasing the potential in bromelain.

Dole COMPANY
CHEMICAL DIVISION, P.O. BOX 5130,
SAN JOSE, CALIFORNIA 95150
A DIVISION OF CASTLE & COOKE, INC.

What makes one constant temperature circulator better than another?

For one thing, the Lauda Duplex Pump.

All constant temperature circulators heat. Some, like the Lauda K-2/RD shown here, also cool. But this Lauda model can do even more. Its duplex pump enables it to circulate liquid to and from an external open bath, no matter whether the bath is positioned higher, lower or level with the circulator. Liquid will always return to the K-2/RD because its duplex pump provides simultaneous pressure and suction. You won't find this feature on many constant temperature circulators.

Another nice thing about this Lauda is its automatic liquid level control. It prevents accidental emptying of the bath by balancing pressure and suction, thereby keeping liquid levels constant in all parts of the system. These features add up to a better, more versatile circulator.

Besides the K-2/RD, which circulates liquids at temperatures from −10°C to 150°C, duplex pumps and the automatic liquid level control are also available in our N and WB series models. Some of these heat up to 330°C, or cool down to −130°C. Of course, solid state relays, excess load protection, drainage and flow control valves and stainless steel construction of all immersed components are standard on all Lauda Circulators.

Which Lauda is best for you? Get our free catalog to help you decide.
Write: Lauda Circulators, Division of Brinkmann Instruments
Cantiague Rd., Westbury, N.Y. 11590.
In Canada, write: Brinkmann Instruments (Canada) Ltd.,
50 Galaxy Boulevard, Rexdale (Toronto) Ont.

LAUDA Circulators

A DIVISION OF
BRINKMANN

One of our brighter ideas just got a dimmer.

When we announced the Olympus KHC—the laboratory scope that you could afford for student and routine use in the lab—a lot of people thought it was a bright idea.

Maybe even too bright, for some investigations. Which is why we've just added a solid-state dimmer control to the 30 watt illuminator built into the KHC's base. It gives you exactly the light intensity you want, without accessory transformers or illuminators.

Of course, we've left all the KHC's other features unchanged, from the optics (the same as used on Olympus' most expensive instruments) to the built-in mechanical stage.

And the infinitely variable light intensity control makes the new KHC even more ideal for phase and dark-field work than the old one was.

All of which means simply that Olympus likes to make its bright ideas a little brighter. Even if it takes a dimmer to do it.

Olympus KHC
Lab/Teaching Medical Student Microscope

OLYMPUS CORPORATION OF AMERICA

Precision Instrument Div.
Dept. S
2 Nevada Drive
New Hyde Park, N.Y. 11040

Send information on
☐ the Olympus KHC
☐ the complete Olympus laboratory microsope line.

Name

Title

Organization

Address

City State Zip

The Brush 620 Data Logger converts multi-channel analog inputs to digital format, then records them on a ¼" endless-loop magnetic tape cartridge. The Brush Tape Reader (right) plays the cartridge for computer data reduction and presentation.

Thanks to the tape cartridge system you can put data loggers wherever you generate the analog input. The loggers are lightweight, portable, rugged, can be remotely-or intermittently-controlled, and are about as easy to operate as a car radio. Each logger accepts 18 channels of analog data and uses two additional channels for recording real time in hours, minutes and seconds at the start of each scan. The logger is expandable in increments of 10 channels to 118 channels. The continuous-loop cartridge will provide 60 minutes of continuous recording. As much as 1860 hours of operation are possible on a single tape in the one hour intermittent-recording mode.

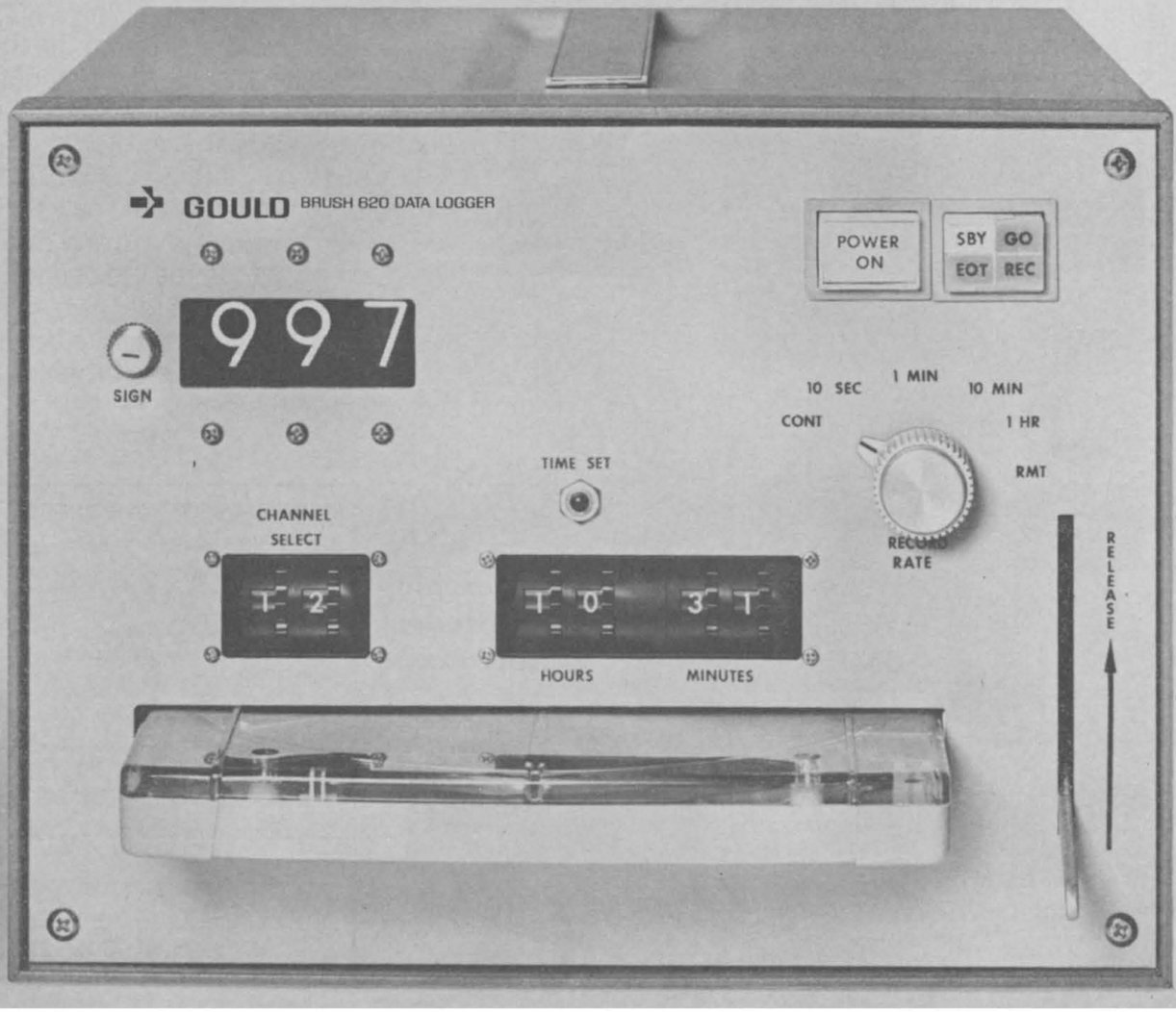
The Tape Reader offers two data reduction modes. In the computer mode, the reader takes the tape generated by the logger and through an interface card, transmits the data directly to the computer input bus. In the tape-to-tape mode, the data reader feeds a ½" incremental tape recorder to produce a computer-compatible tape.

This new analog-to-digital system is ideally suited for such applications as process data logging, pollution monitoring, weather and climatalogical studies, medical, geophysical and other types of research. And like we said, it can chop hundreds of manhours from your analog data handling procedures.

We've described all the details in a new brochure. Brush Division, Gould Inc., 3631 Perkins Avenue, Cleveland, Ohio 44114.

GOULD BRUSH

This portable analog data gatherer can save you hundreds of manhours.



Announcing a scanning electron microscope that puts scanning capability within reach of every laboratory. JSM-S1 from Jeolco. ☐ Jeolco's new S1 scanning electron microscope. Which puts quality, high-volume scanning capability in only 3 x 4 feet of laboratory floor space. ☐ Our unique way of getting right down to the surface of specimens. ☐ At a price you can afford. With TV scan to help you quickly find the area you're looking for. Continuous magnification from 19 to 100,000X with direct display readout in 8 fixed steps. ☐ And guaranteed resolution of 250 angstroms. ☐ With a unique goniometer stage tilting −5 to +45°, 360° continuous rotation. Air locks. 4 x 5" Polaroid camera. And a fully automatic vacuum system. ☐ With color-coded controls that work like people do. So the JSM-S1 is far simpler to learn and operate. ☐ With completely solid-state modular design that provides high reliability and low maintenance. With a solid-state high-voltage power supply built right into the column. ☐ Which all helps make the Jeolco S1 compact. And simple. ☐ Give it a little room in your lab. ☐ Never will so many owe so much to so little. ☐ For details, please write Jeolco (U.S.A.) Inc., 477 Riverside Avenue, Medford, Massachusetts 02155, Telephone (617) 396-6021.

Jeolco.

Putting the 70's into focus.

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Meet your new research assistant—the HP System 9100. It's ready to take over your statistical and data reduction tasks, so you can have more time for creative thinking or experimentation. With the System 9100 in your lab, you will no longer have to disrupt your thoughts to walk to a computer center—or break up an experiment to wait in line for a time-share terminal. A powerful memory, full program capabilities (looping, branching, and sub-routines), and easy program editing make the System 9100 your personal computer. It also plots complex mathematical and statistical problems, almost instantaneously. We call the System 9100 the Emancipator because it frees your time from data reduction. Forever.

The new HP Stat-Pac brings you over 100 practical programs for the applied statistical problems you use most in day-to-day scientific research. Areas covered are general statistics, distribution functions, test statistics, curve fitting, sampling theory, analysis of variance, operations research, and many more. They are formated and ready for instant entry into your 9100 Calculator. Since many of these programs include the 9125A X-Y Plotter, you will be free from tedious (and inefficient) hand plotting of graphs and charts.

Get computer capability for your lab for less than $1.11 per hour. Lease, rent, and purchase options available. For information and to arrange a "hands-on" demonstration in your lab, write: Hewlett-Packard, P.O. Box 301, Loveland, Colorado 80537.

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HEWLETT hp PACKARD

HP CALCULATOR SYSTEM 9100

The best way to measure pH?

It all depends on how you look at it.

Perhaps you place portability first in a pH meter. Look no further than our Model PBL, with its rugged case, taut-band meter, solid-state circuitry. Reads accurately to ±0.1 pH. Battery-operated, of course. Or plug it into an AC power source. Recorder output, Karl Fischer titration, and much more. A lot more than you'd expect in a portable meter priced at $230.

Maybe you'd like portability plus an expanded scale. Then you'd like the PBX. Full-scale expansion of as little as 0.7 pH. Accuracy, ±0.005 pH. Ready, too, for measurement of e.m.f. and activities of mono- or divalent ions. Ideal for determining specific-ion pollutants in streams and waterways. Battery-operated or AC-powered. Full-range adaptability. The PBX. The price — $375.

Are accuracy, sensitivity, and a large scale important to you? Consider our Model LS — the "laboratory standard." Accurate to ±0.05 pH (with a repeatability of ±0.01 pH). Ultra-stable solid-state circuitry. Big, easy-to-read scale at just the right angle. With buffer adjust, Karl Fischer polarizing output, manual or optional automatic temperature compensation, recorder output. The LS, priced at $355.

You might be looking for accuracy and sensitivity and a large, expanded scale. Our Model LSX fills the bill. Accurate to ±0.005 pH in full-scale expansion of 0.7 pH unit. Which you read on a 7½-inch scale. High-precision measurements of pH, e.m.f., and mono- or divalent ion activities. Maximum sensitivity and stability. High input impedance. A variety of built-in input/output adapters. The name: LSX. The price: $425.

Won't settle for anything less than direct, digital display? You and our Model DR should find each other. It has a digital counter (plus a graduated scale) for continuous measurements to 0.001 pH. Accurate to ±0.01 pH. Accommodates all electrodes. Lets you use manual or automatic temperature compensation. Solid-state circuitry to keep things trouble-free. The price? $600.

Or true-electronic, digital, direct reading may be your idea of perfection. Realized in our Model NX. Big, bright, luminescent numerals. No more parallax errors or interpolations. Readable to four significant figures (the decimal point is always in the right place, automatically). Responds instantly to rapidly changing inputs. With long-life display tubes, plug-in circuit boards, and a price of $595.

Look over the many faces of pH measurement with the help of your Sargent-Welch representative. Then arrange for a demonstration. Or write to us for details on any of our pH meters. 0-217

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Scientific instruments, apparatus, chemicals.
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Circle No. 19 on Readers' Service Card

Carl Zeiss, Inc.

Dept. Elo-5
444 Fifth Avenue
New York, N.Y. 10018

Gentlemen:

☐ Please send me your free booklet "How to Operate the World's Easiest-to-Operate Electron Microscope."
☐ Please have a technical representative call to give me complete information on installation, service and price.

Name_____ Title_____

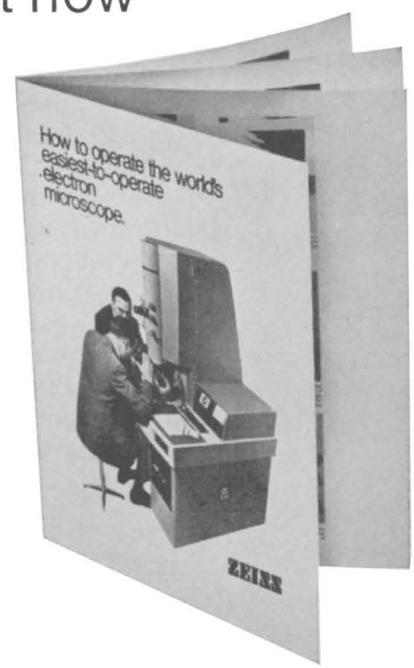
Institution_____

Address_____

City_____ State_____ Zip_____

The world's easiest-to-use electron microscope is the new Zeiss EM-9S.

This free booklet shows just how easy it is.



The new ZEISS EM-9S is the electron microscope for researchers and teachers interested in electron microscopic studies, not electron microscopes. It is the easiest-to-operate, most foolproof instrument on the market. To show you, or your students, just how easy it is, we've put together a little booklet that illustrates every step of the operation. It shows such features as:

(1) The *fully* automatic camera system—just moving one lever closes the shutter, moves the screen out of the beam path, reads the electron density *directly* (a spot reading, not an integration), opens the shutter for the correct length of time, closes the shutter, superimposes the exposure number photographically on the film, and changes the negative. A red warning light shines directly into the binocular to indicate when the film magazine is empty.

(2) The foolproof airlock—it lets you change specimens in less than 10 seconds, with one hand, sitting down, and in darkness.

(3) The standard-equipment, multiple (21 holes) thin-metal film aperture—specially made for all EM-9 models, it assures care-free use over prolonged periods of time.

When you've been sitting in the dark for hours, fighting specimens whose preparation has followed Murphy's Law, you'll appreciate these and the other features of the EM-9S that enable you to concentrate entirely on the screen, not on the machinery.

Combine all this with 7Å point-to-point resolution, a magnification range from 0 to 60,000x, small size and low price, and you have an instrument that is really in a class by itself.

Fill in the coupon and we'll rush you the free booklet and any other data you may wish on the EM-9S.

Nationwide Service.

ZEISS

THE GREAT NAME IN OPTICS

CARL ZEISS WEST GERMANY

ATLANTA, BOSTON, CHICAGO, COLUMBUS, DENVER, HOUSTON, KANSAS CITY, LOS ANGELES, PHILADELPHIA, SAN FRANCISCO, SEATTLE, WASHINGTON, D.C.

The Cary 16.
The world's best manual spectrophotometer costs $9,000.
Scanning and Kinetics are a touch more.

When you combine its price and performance, there's really nothing quite like the Cary 16 manual spectrophotometer. But that's only part of the story. By adding a few well-chosen, reasonably priced accessories, the 16 becomes a very precise scanning instrument. A few other peripherals make it a kinetics system nobody else can come close to.

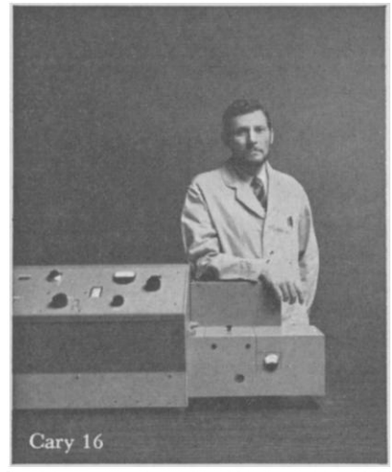
And so, you can end up with three research-quality spectrophotometers without having to buy three research-priced instruments.

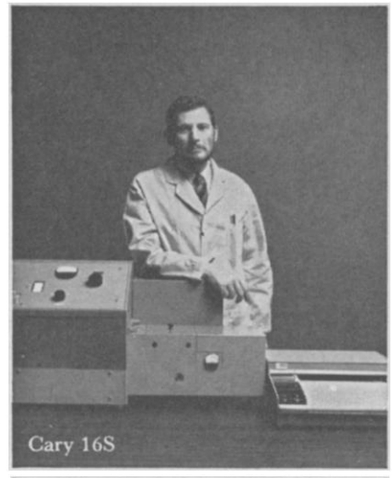
THE BASIC 16

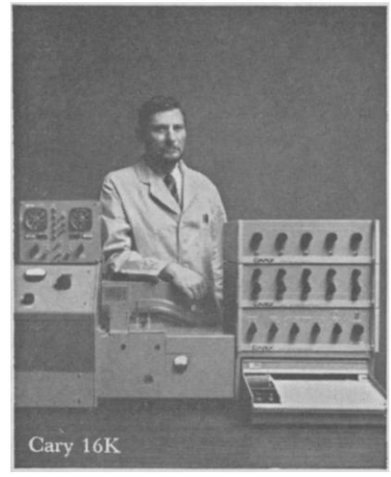
The heart of any spectrophotometer is its optical system. Ours has no equal. It combines a double-beam photometer, a double monochromator and a unique V-beam system of cell space optics. The result is high resolution, extreme photometric accuracy and negligible stray light. But, performance is no good if it's difficult to attain. So, in the manual Cary 16, we've reduced most analyses to a few simple steps.

SCANNING

To the basic 16 add a scan motor, slit servo mechanism, baseline compensator, and log recorder and it's the Cary 16S: a double-beam scanning spectrophotometer which uses a single detector photometric system and offers high accuracy and long term stability.


Cary 16


Cary 16S


Cary 16K

Both essential to recording meaningful spectra.

KINETICS

For automatic kinetics studies, the Cary 16K achieves a level of performance and convenience never before possible with commercially available equipment. Again, starting with the basic Cary 16, you select from a wide range of available kinetics accessories to tailor a system to suit your exact needs. These include a fully automatic five-cell sample changer with dwell and cycling timers, a recorder, an interface with individual scale expansions from 0.1 to 2.0 absorbance full scale, a dual wavelength drive, and a multi-balance accessory to permit individual zeroing of each sample.

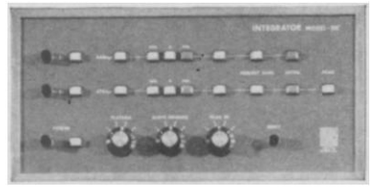
HANDY GUIDE

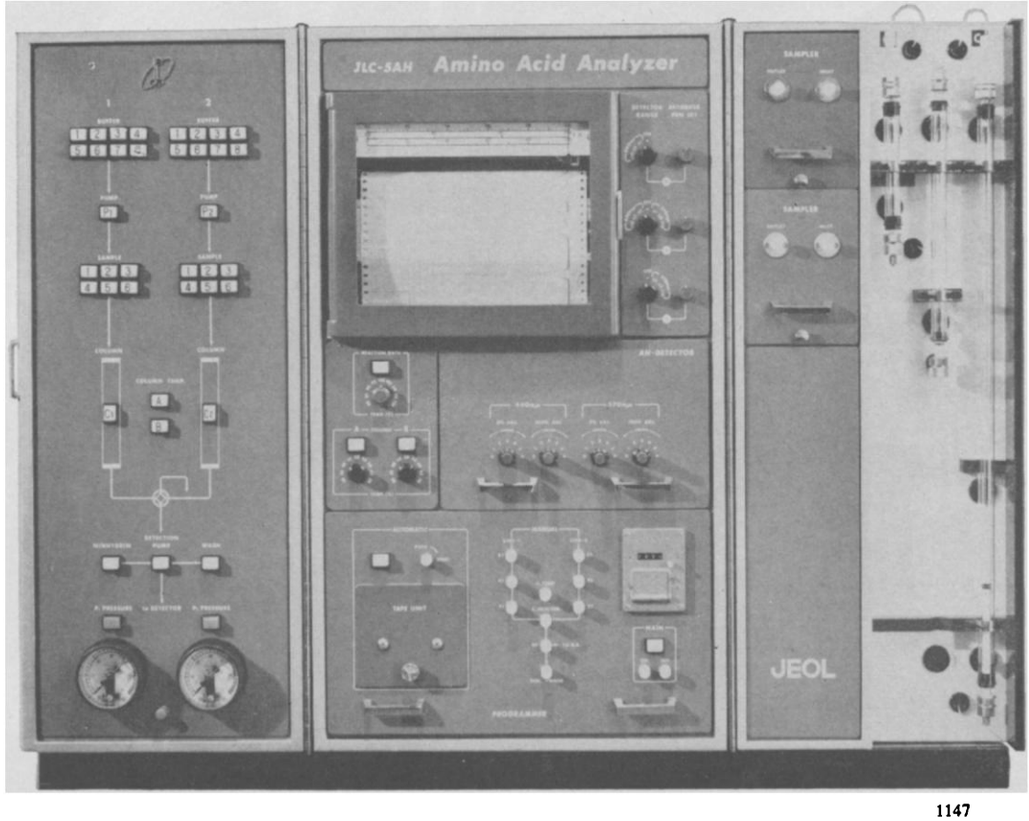
In addition to complete operating specs, we'd like to send you a copy of our handy new *Cary 16 Systems & Accessories Guide*. It explains how you can start with a $9,000 Cary 16 and end up with three research-quality spectrophotometers for a touch more. For your copy, or to arrange a demonstration, write Cary Instruments, a Varian subsidiary, 2724 South Peck Road, Monrovia, Calif. 91016. Ask for data file E006-90.

cary instruments

Now . . . Jeolco offers a TOTALLY automatic AAA SYSTEM. ☐ For less than the price of competitor B's AAA only, you can have a Jeolco 5AH TOTALLY automatic AAA System (including integrator). ☐ $27,340 ☐ And you will still have the world's most sensitive AAA. ☐ 1 x 10^{-9}mol. ☐ It performs peptide analysis without any extra accessory. ☐ It is also adaptable for nucleotide analysis. ☐ Adaptable for sugar analysis, too! ☐ This gives you the most versatile and universally adaptable automatic amino acid analysis system on the market today. ☐ Send for all of the details or call for immediate demonstration. ☐ Jeolco (U.S.A.), Inc., 477 Riverside Avenue, Medford, Massachusetts 02155 Tel. (617) 396-8620.

Jeolco. Putting the 70's into focus.





We have often referred to the Nikon SBR as "resourceful" and to the S-Ke as the "versatile researcher." There would seem to be no room for more. But more there is, in the added capabilities of the Nikon L-Ke.

The L-Ke, like the S-Ke, has integrated Koehler illumination. And it draws upon the same system of interchangeable objectives, eyepieces, attachments and accessories for its seemingly limitless capabilities.

It can be readily equipped for dark-field or phase-contrast microscopy, interference-phase, differential-interference or polarization. A teaching head may be attached to permit simultaneous observation by two people, or a projection screen head, for consultation viewing.

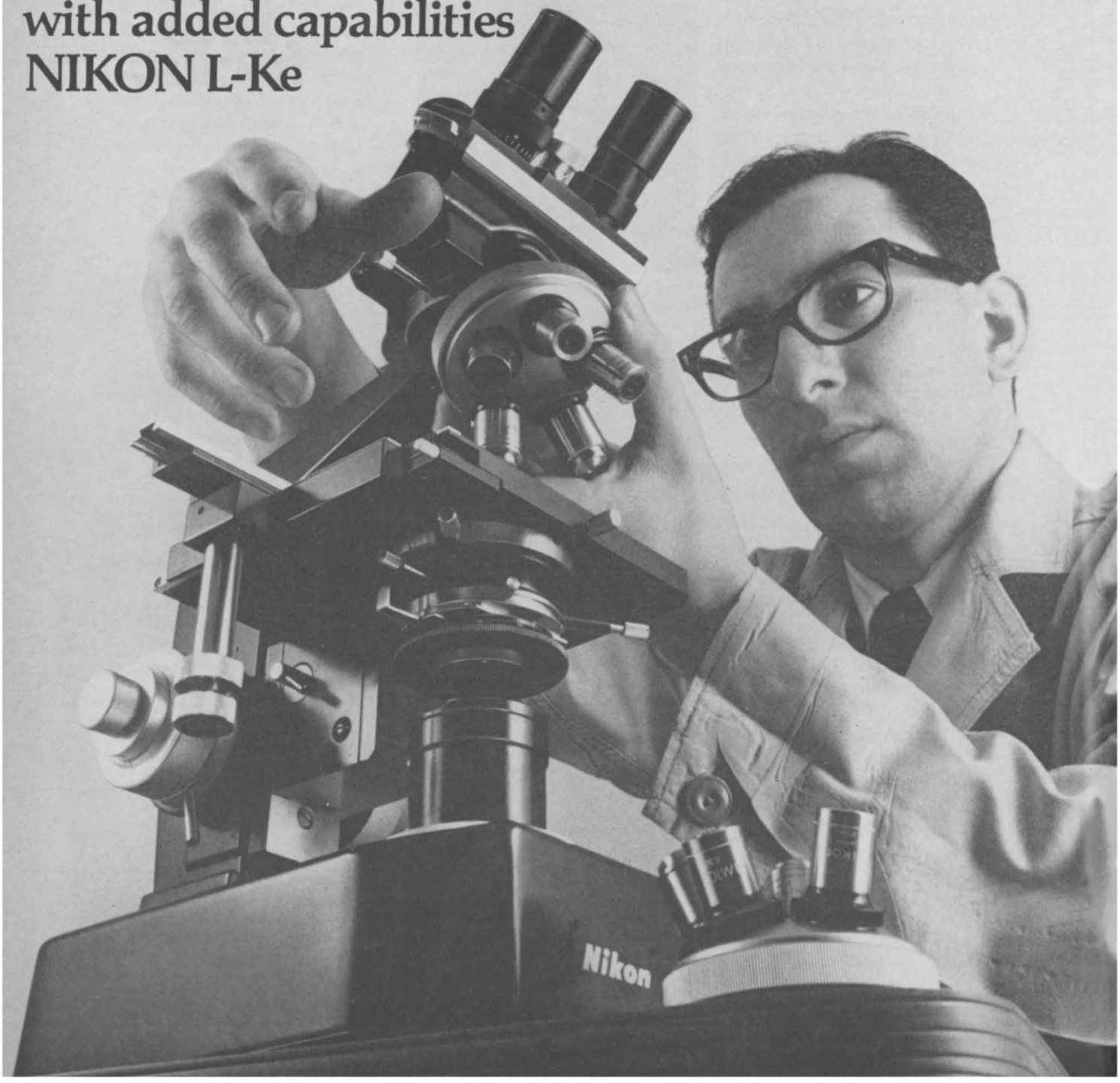
It can be fitted for cine or still photomicrography, or for low-power macrophotography. And, in all of these applications, you enjoy the same uncommon quality of optics and performance which have become distinguishing hallmarks in all Nikon equipment.

The Nikon L-Ke offers two additional facilities of special interest to the advanced researcher. First, a precision dovetail slide mount which permits ready nosepiece interchangeability. Second, a rack-and-pinion condenser mount with focusing and centering controls. Also, the L-Ke stage can be lowered as much as 71mm to provide clearance for culture dishes, chambers and large specimens.

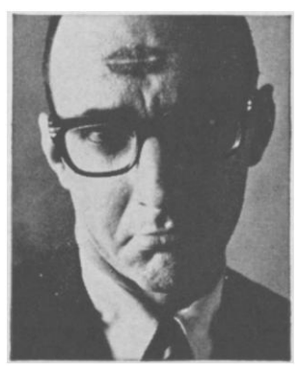
The Nikon L-Ke is as advanced and as flexible as your most critical needs. For complete details, write.

Nikon Inc., Instrument Division, Garden City, N.Y. 11530
Subsidiary of Ehrenreich Photo-Optical Industries, Inc.
(In Canada: Anglophoto Ltd., Ontario)

Versatile researcher with added capabilities NIKON L-Ke



We never love you and leave you.



S/P doesn't woo you, win you, then kiss you goodbye when something goes wrong. We service every one of the scientific instruments we sell. If you have an equipment or instrument breakdown, a phone consultation with an S/P Specialist usually will set things right. But if it doesn't, S/P has local repair service, too. The quality products we represent are reliable. Still it's nice to know that if anything does go wrong, we'll do right by you. S/P . . . the single source for laboratory equipment, supplies, scientific instruments. Scientific Products, a division of American Hospital Supply Corporation, 1210 Leon Place, Evanston, Illinois 60201. Look for the nearest S/P office in the Yellow Pages in major cities.

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Circle No. 42 on Readers' Service Card

Continuous-flow zonal ultracentrifugation: A beautiful technique awaiting a practical, non-temperamental research instrument.

(Wait no more: you're looking at it.)

Background
Continuous-flow zonal ultracentrifugation was a major development of Dr. N. G. Anderson and co-workers in the AEC-NIH Molecular Anatomy Program at Oak Ridge National Laboratory. And because this technique combined high resolution, high capacity, and high practicality, a production-scale centrifuge is now being used by major pharmaceutical companies for the production purification of influenza virus vaccine. The high resolution of this device is now providing vaccine up to 10X purer than any previously available commercially. (Electro-Nucleonics, Inc., is the only company making this ultracentrifuge—the Model K—available commercially.)

Now announcing the Model RK: the research and pilot-plant version of the Model K.
The high capacity of the Model K is beyond the requirements of many research and pilot-plant applications. The obvious need, then, has been for a simple, non-temperamental continuous-flow zonal ultracentrifuge as dependable and versatile as the production-oriented Model K, but designed for the smaller volumes of material typical of the research laboratory and the pilot plant. Enter the Model RK.

The Model RK
Oversimplifying somewhat: the Model RK is a smaller Model K. Accordingly, it too features continuous flow capability over the entire speed range. And, most importantly, the design, engineering, and construction aspects of the Model K—the elements responsible for its simplicity and dependability—are retained by the RK. Example: the RK has the K's unique single-pass rotating seal design and operates to 60,000 RPM completely eliminating fussing with complex temperamental demountable seal systems for loading and unloading the rotor.

Now specifications, briefly. The currently available aluminum and titanium RK rotors provide speeds of 35,000 RPM and gravitational forces in excess of 90,000 g. (Subsequent rotors—fully compatible with the RK system—will provide even higher gravitational fields at the RK's full speed of 60,000 RPM.) The RK rotor volume is typically 1.7 liters and the sample flow rate may be 500 ml/min or higher.

The RK is a safety-oriented instrument with a monitoring system which constantly scans the critical operating conditions and forecasts problem areas in sufficient time to correct them. Result: the RK monitoring system protects both your run *and* your instrument.

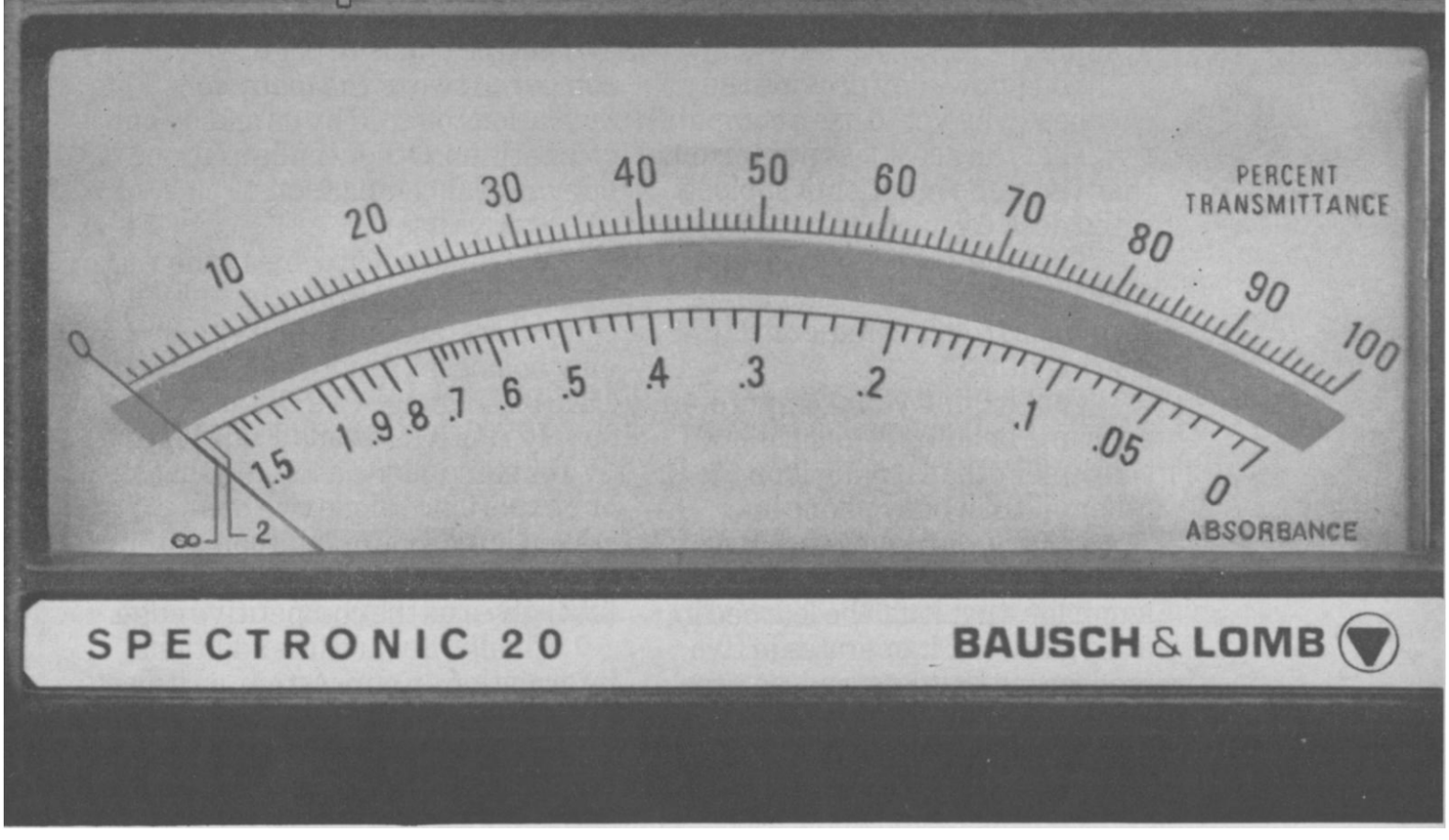
Applications of continuous-flow zonal ultracentrifugation
This technique has been most effectively used to isolate viruses, bacteria, mitochondria, polysomes, ribosomes, ribosomal subunits, macroglobulins, microsomes, and other sub-cellular particles. It has wide application wherever high-resolution separation of such components is desired. (For background information see: "The Development of Zonal Centrifuges and Ancillary Systems for Tissue Fractionation and Analysis," National Cancer Institute Monograph 21, GPO, Washington, D.C. 20402. $4.75)

For further details
We'll be happy to send further information on the new Model RK and/or the production-scaled Model K. Write Tom Guerin (or call collect 201-227-6700), Electro-Nucleonics, Inc., Fairfield, New Jersey 07006.

ELECTRO-NUCLEONICS

BAUSCH & LOMB
ANALYTICAL SYSTEMS DIVISION

the new wide meter spectronic 20



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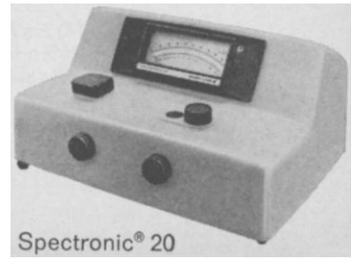
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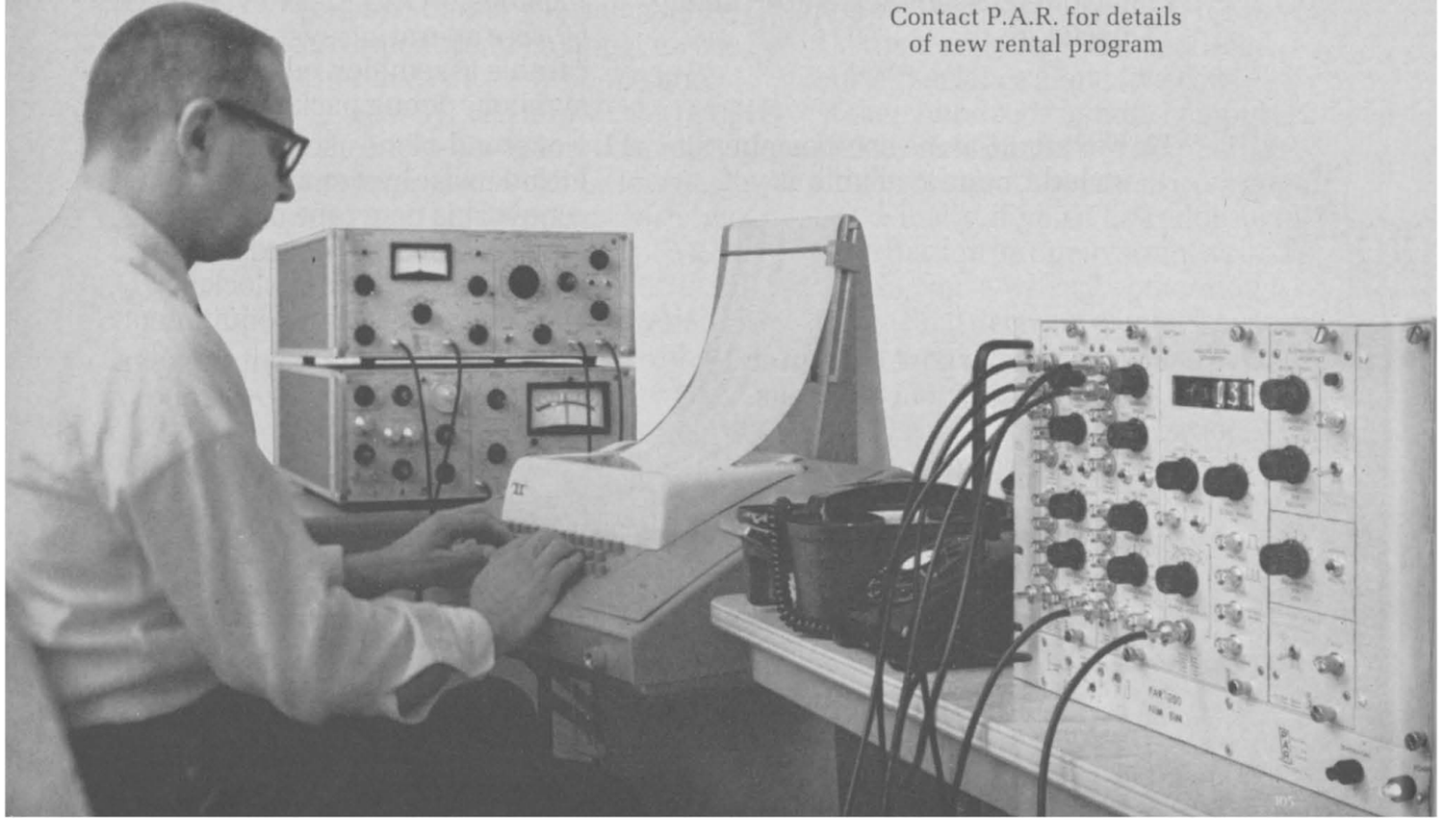


the intensity of a voter's feelings," is a key to the error. Representative government, both in election of candidates and in legislative deliberations, works because intensities of feeling can be expressed (*1*). Failure to recognize that basic fact leads Savas to management solutions and evidently led Crowe (*2*) to despair.

Despite the 19th-century hamstringing of legislative power (at the state level) and the 20th-century strengthening of executive power (at all levels), the system can make collective choices only through the legislatures. Pole (*3*) has elegantly detailed the origins and consequences of this Whig heritage.

EDWIN T. HAEFELE
Resources for the Future, Inc.,
1755 Massachusetts Avenue, NW,
Washington, D.C. 20036

References

1. E. T. Haefele, *Public Choice* **8**, 75 (1970).
2. B. L. Crowe, *Science* **166**, 1103 (1969).
3. J. R. Pole, *Political Representation in England and the Origins of the American Republic* (St. Martin's Press, New York, 1966).

Chichagof Island, Alaska

For 2½ years we have been attempting to establish a wilderness area on Chichagof Island, a large island just to the north of our island here in southeastern Alaska. Chichagof has much to recommend it—mountains, sheltered coves and bays, lakes, and forests. It is the home of brown bear, bald eagles, swans, ducks, land otter, and sea otter, just to name a few species. Unfortunately it belongs, as does all of the southeast, to the Tongass National Forest.

We have repeatedly asked the U.S. Forest Service for help in establishing this area, and have been told it is impossible. Alternate sites in our area which incorporate representative scenery are severely limited. Howard Johnson, the regional forester, has informed us that 98.4 percent of all marketable timber (in the Tongass Forest) has been sold and will be harvested.

In attempting to document our contention that surely some small part of this magnificent country should remain a wilderness, we have discovered we are limited by our backgrounds. In our small community we have no scientists to give us answers to such questions as: What are the effects of clear-cut logging on steep hillsides, especially with reference to salmon-spawning streams? Do spruce seedlings really

choke out older growth after clear-cut logging? What of the *p*H factor? In other words, we badly need some documented answers and references.

Is there anyone who would be willing to help us? We will be glad to send any further information, including a copy of the wilderness proposal.

DEE LONGENBAUGH
Sitka Conservation Society,
Box 377, Sitka, Alaska 99835

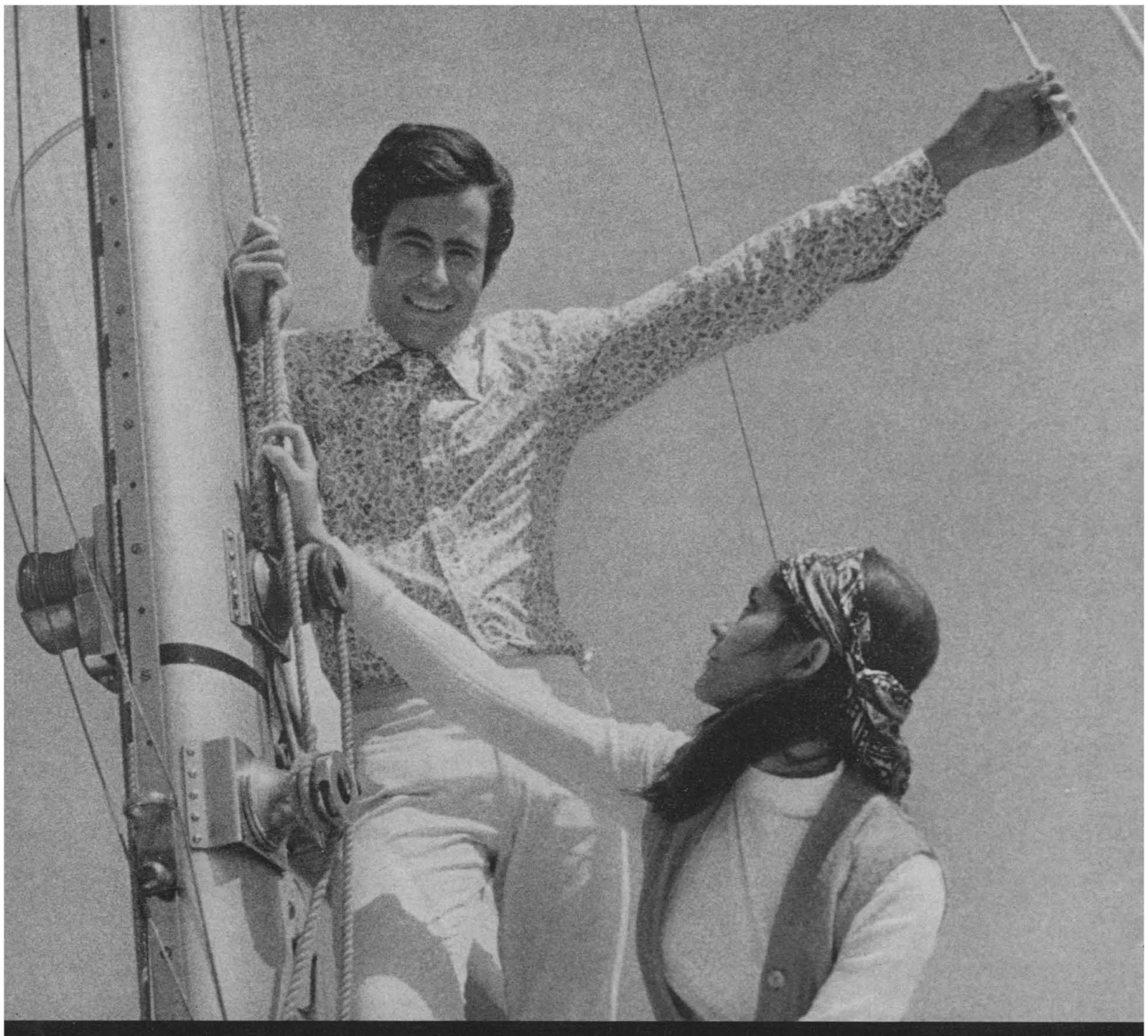
Surmounting a Crisis

Harry A. Ackley's letter (26 June) regarding events at the department of pediatrics of the University of California, San Francisco, needs clarification. On 7 May Governor Reagan requested that the university be closed until 11 May. The closing, plus events in Cambodia, Kent State, Augusta, and elsewhere stirred this campus as never before in its history. "Informal" faculty, staff, and student meetings were held continuously. All of the meetings were emotionally charged, and countless resolutions were passed. The entire campus community was searching for a rational response to what many perceived as a campus and national "crisis." During the official closing, the pediatrics department met all of its patient-care responsibilities, and when the campus reopened, it met its responsibilities to students, patients, and research.

On 11 May when the Academic Senate was able to resume official meetings, it stated: "The current nationwide and University crisis makes normal conduct of courses difficult if not impossible and these circumstances place a special obligation on faculty members to insure that the educational and personal needs of students are protected." Ackley stated later: "I have no knowledge as to whether research was interfered with or stopped during this period of time. Specifically my education was not interfered with; the University was officially closed 7 May through 10 May, and I was on vacation from 11 May through 25 May."

These were trying days. The campus was not "taken over" for use as a "political machine." The fact that patient-care responsibilities were met is an everlasting credit. . . .

EDWIN F. ROSINSKI
Office of the Chancellor,
University of California Medical Center,
San Francisco 94122



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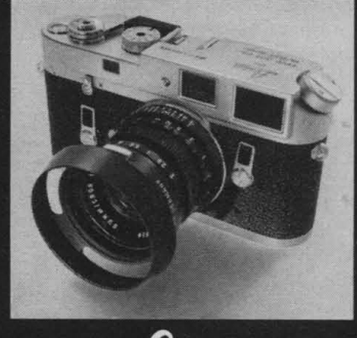

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18 September 1970, Volume 169, Number 3951 **SCIENCE**

Lunar Science and Planetary History

People are asking why man should return to the moon again and again to get more rocks or set up new geophysical stations. Even though the President himself has stated that the nation's first goal in space is to continue to explore the moon through additional landings, the six then scheduled have now been reduced to four.

It will be hard to find an informed scientist of any breadth who views this last reduction of the Apollo program with anything short of dismay. The reason is clear and compelling. Man goes to the moon to study the earth and its relations in space. In the process he crosses a mighty ocean in time, reaching back to the early episodes of solar system history. The first billion years of this history, during which Earth's final accretionary development and its major geochemical and structural differentiation occurred, cannot be deciphered here because the record has been erased by later events. The moon's record, however, appears to be rich just where Earth's is poor. This has profound implications for our understanding of both Earth and solar system, and perhaps for the origin and distribution of ore deposits, which are concentrated in Earth's older rocks. As a side benefit, the results of lunar studies, together with those of sea-floor geophysics, are pacing a conceptual revolution in the earth sciences.

The Apollo geological sites, Rover traverses, and geophysical networks are needed to provide primary control for eventual automated lunar studies. Such a program, when activated, will extend exploration to the far side and polar regions of the moon, and will lead to improvement in early-earth and early-solar-system models. Ultimately, permanent bases may capitalize on the advantages of the moon's far side for infrared, x-ray, and radio astronomy, or on the moon's high vacuum and other special properties for more practical applications.

The moon is the only other planet we can hope to study in sufficient detail for close comparison with our own. We have just begun that study. It is as if we were trying to understand North America by examining Plymouth Rock. Samples have been returned only from one mare site and from an embayment of Oceanus Procellarum. The ancient highlands have not been sampled directly, nor will they be at Fra Mauro, located on an ejecta blanket thrown out from Mare Imbrium. Five instead of three additional landings would still permit only two visits to the very old highland rocks; one to a site that includes a highland scarp, the edge of a mare mascon, and a sinuous rille; one to a large impact crater where shock metamorphism and deep ejecta can be studied; and one to the young volcanic terrain on the mid-ridge of Oceanus Procellarum. The sites then sampled would have constituted an austere but possibly adequate data frame for a first-order understanding of early earth-moon history. The announced reduction of missions exponentially degrades that base line. If Apollo 15 and 19 are indeed canceled, the nation will have failed to achieve its primary scientific goals on the moon.

Many billions of dollars were spent to get within reach of these goals. Only a small fraction of the investment already made would see the job to a fruitful conclusion. To stop short for reasons within our control would, in retrospect, be seen as one of history's most irresponsible follies. Nothing less than the early institution of a comprehensive automated program to get similar information and sample return could begin to ameliorate such a failure.—PRESTON CLOUD, *University of California, Santa Barbara*

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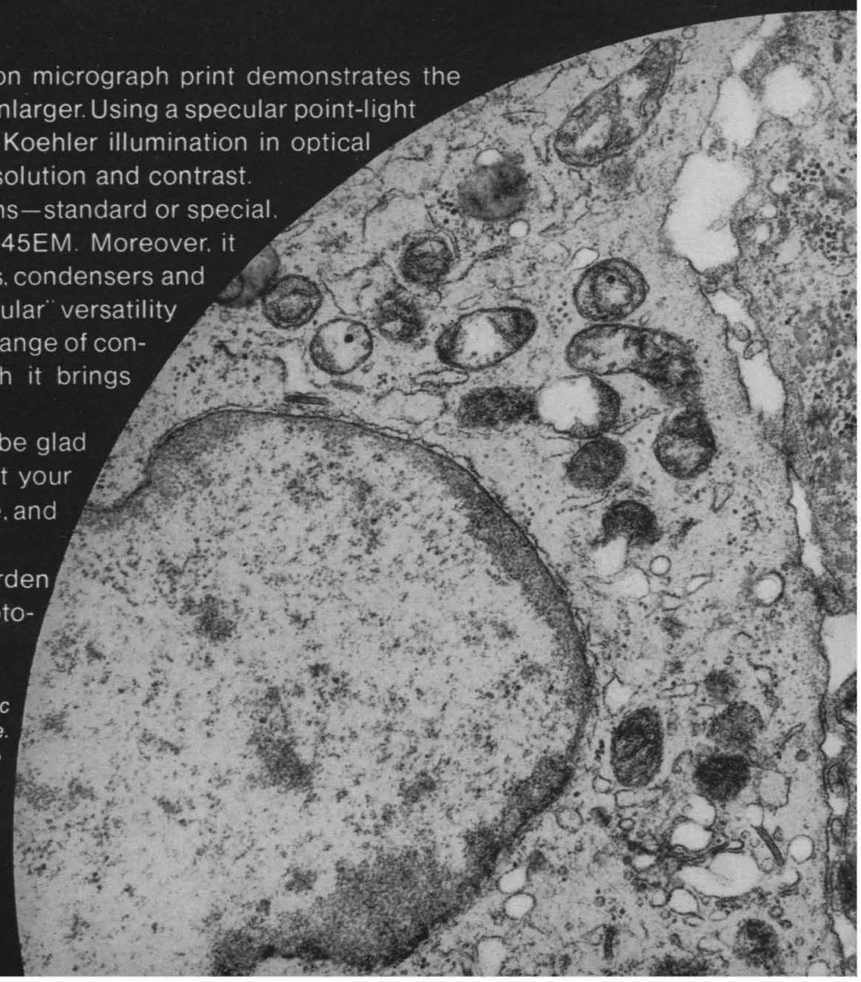

Section of human epidermis taken from a site of allergic eczematous contact dermatitis due to mercuric chloride. Parts of a Langerhans cell and of a keratinocyte are shown. Photographed at 6,000x in a Siemens Elmiskop 1 A electron microscope; enlarged to 16,000x with a Durst S-45 EM.

(Courtesy of Dr. Inga Silberberg, New York University School of Medicine, Department of Dermatology).

plication of human skin fragments dispersed by bacterial collagenase as a multiple graft system to speed up the healing of extensive burns. Dispersed skin cells in a freely flowing suspension were spread out evenly over the complete surface of the wound in small circular drops. After a few hours, skin regeneration had started from a number of foci which gradually became confluent. It was pointed out that this procedure might be worthy of further trials. In another experimental use cell dispersion with collagenase enabled Carlton Blackwood (Columbia University) to successively transplant an ovarian papillary serous cystadenocarcinoma of human origin beyond 40 transfer generations in rats and hamsters. Without collagenase, increasing amounts of connective tissue accumulated between tumor nodules; and serial transplants could not be carried out beyond three or four transfer generations. Removal of the collagen rendered the tumor transplantable indefinitely.

Leonard Shulman and his associates (Harvard) treated tooth allografts with bacterial collagenase prior to transplantation. This procedure dissolved the collagen fibers in the periodontal ligament and thus prevented early rejection caused by the immunogenicity of the periodontum without damaging the tooth cement. When a tooth is transplanted within the same mouth it reattaches to alveolar bone within 3 weeks and survives indefinitely; but tooth transplants between individuals do not reattach normally and are ultimately lost because of root resorption. It was demonstrated that, in the absence of prior treatment with enzyme, at 3 weeks there is extensive lymphoid infiltration leading to rejection of the foreign periodontal ligament. Comparison of control allografts and enzyme-treated allografts in rhesus monkeys after 3½ months showed that enzymolysis of the periodontal ligament before transplantation significantly reduced inflammation after transplantation and increased ankylosis leading to prolonged survival of the tooth allograft.

Two other applications of collagenase of great potential use to human patients were reported, though as yet both are restricted to experimental animals. Bernard Sussman (Howard University) used bacterial collagenase to dissolve the protruding cartilage which, through compression of the nerve root, causes severe pain in herniation of the intervertebral disk, the condition commonly referred to as slipped disk. This nonsurgical decompression of the nerve root is possible because of the selective enzymatic dissolution of the disk which assures a margin of safety not shared by common proteolytic enzymes. Sterile collagenase was injected directly into the nucleus pulposus of dogs. The cartilage was dissolved without any damage to the surrounding tissue. All dogs walked immediately after recovery from anesthesia and showed no evidence of dysfunction of any sort. Preliminary trials in vitro against tissues removed from human patients in the operating room or at autopsy showed similar favorable action. Collagenase mediated complete destruction of the nucleus pulposus and major dissolution of the fibrocartilage, the tissues that constitute the bulk of the offending mass in clinical disk herniation while hyaline cartilage is usually spared and osseous effects are insignificant.

Dogs were used by Frank Longo and John Lattimer (Columbia) in their evaluation of collagenase as an adjunct in cryoprostatectomy. With increasing life expectancy, more poor-risk patients unsuitable for conventional surgery present themselves with obstruction of the bladder caused by benign or malignant enlargement of the prostate gland. Cryoprostatectomy—which is fast, requires no or little anesthesia, and results in negligible blood loss or trauma—has many advantages for patients of advanced age. In this otherwise highly successful procedure, the single most frustrating complication has been the retention of slough which plugs up urinary passages and prevents elimination. Direct injection of collagenase into the prostate glands of 15 dogs before the cryoprobe was put in place gave the desired result of removing the slough and retaining normal urinary function without producing demonstrable histologic damage to vital tissues. In addition, several commercially available enzymes were tested for the purpose of degrading or decomposing "cryoslough" from patients after cryoprostatectomy. Collagenase was significantly superior to the other agents tested. In a concentration of 0.1 percent total dissolution was accomplished in 18 hours.

In the clinical sessions, good therapeutic effects were reported in more then 1500 patients who were given topical applications of bacterial collagenase in an ointment base for debridement of second- and third-degree burns prior to skin grafting and for the treatment of dermal ulcers. Ingo Mazurek (Knoll A.G.) summarized results

obtained by 69 investigating physicians in West Germany. Of 1356 patients treated, 78 percent had leg ulcers. In children, burns were the most frequent indication. In 20 percent of the patients, the enzyme took effect within 3 days, in 97 percent within 14 days. Overall, a satisfactory result was obtained in 80 percent of all patients. Walter Zimmermann (University of Freiburg, Germany) reported that, in almost 400 burn cases, not a single keloid was formed and none of the wounds contracted in contrast to the relatively high incidence of both with other treatments. The various presentations conveyed the general impression that, after some 20 years of animal and clinical experimentation, a valuable addition to the armamentarium of topical drugs available for ambulatory and institutionalized patients had emerged.

INES MANDL

Columbia University, College of Physicians & Surgeons, New York 10032

Forthcoming Events

October

20–23. American **Vacuum** Soc., 7th annual, Washington, D.C. (Miss D. M. Hoffman, RCA Labs., David Sarnoff Research Center, Princeton, N.J. 08540)

21–23. Society of **Mining Engineers** of the American Inst. of Mining, St. Louis, Mo. (J. C. Fox, 345 E. 47 St., New York 10017)

21–23. **Planetarium Teachers,** East Lansing, Mich. (V. D. Chamberlain, Michigan State Univ., Talbert and Leota Abrams Planetarium, East Lansing)

21–23. **Ultrasonic** Symp. (G-SU), San Francisco, Calif. (W. J. Spencer, Bell Telephone Labs., Allentown, Pa. 18103)

21–24. National Assoc. of **Biology Teachers,** Denver, Colo. (J. P. Lightner, NABT, 1420 N St., NW, Washington, D.C. 20005)

21–24. Society of **Photographic Scientists and Engineers,** Washington, D.C. (H. J. Hall, 10 Maguire Rd., Lexington, Mass. 02173)

22–23. National Acad. of **Engineering,** Washington, D.C. (National Acad. of Engineering, Editorial Office, 2101 Constitution Ave., NW, Washington, D.C. 20418)

22–24. American Soc. for **Aesthetics,** Boulder, Colo. (J. R. Johnson, ASA, 1150 East Blvd., Cleveland, Ohio 44106)

22–24. **Gerontological** Soc., 23rd annual, Toronto, Ont., Canada. (E. Kaskowitz, GS, 660 S. Euclid, St. Louis, Mo. 63110)

23–24. **Biological Sonar and Diving Mammals,** 7th annual conf., Menlo Park, Calif. (T. C. Poultier, Biological Sonar Lab., Stanford Research Inst., Menlo Park 94025)

25–28. National **Lubricating Grease** Inst., 38th, Atlanta, Ga. (C. V. Pickell,

4635 Wyandotte St., Kansas City, Mo. 64112)

25–29. Institute of **Sanitation Management**, Cleveland, Ohio. (H. C. Rowe, 1710 Drew St., Clearwater, Fla. 33515)

25–30. American College of **Chest Physicians**, Los Angeles, Calif. (A. Soffer, ACCP, 112 E. Chestnut St., Chicago, Ill. 60611)

25–30. International Congr. of **Internal Medicine**, 11th, New Delhi, India. (H. Ludwig, Burgerspital, Basel, Switzerland)

26–27. Interagency Chemical **Rocket Propulsion** Group, Pasadena, Calif. (A. Broido, Pacific Southwest Forest and Range Experiment Sta., U.S. Forest Service, Box 245, Berkeley, Calif. 94701)

26–28. **Electronic and Aerospace** Systems, Washington, D.C. (R. A. Stampfl, Natl. Aeronautics and Space Administration, Washington, D.C.)

26–28. **Spectroscopy**, 17th symp. and exhibition of instrumentation, 17th, Ottawa, Ont., Canada. (J. L. Dalton, 555 Booth St., Ottawa 4)

26–29. **Instrument** Soc. of America, Philadelphia, Pa. (H. S. Kindler, ISA, 530 William Penn Pl., Pittsburgh, Pa. 15219)

26–30. Symposium on the Use of **Nuclear Techniques in the Measurement and Control of Environmental Pollution**, Salzburg, Austria. (J. H. Kane, Div. of Technical Information, U.S. Atomic Energy Commission, Washington, D.C. 20545)

26–30. American College of **Preventive Medicine**, Houston, Tex. (E. A. Piszcek, 6410 N. Leona Ave., Chicago, Ill. 60646)

26–30. American **Public** Health Assoc., 98th, Houston, Tex. (B. F. Mattison, 1740 Broadway Ave., New York 10019)

26–30. American **Water Resources** Conf., 6th, Austin, Tex. (W. S. Butcher, Civil Engineering Dept., Univ. of Texas, Austin 78712)

27–28. Society of **Plastics Engineers**, Cherry Hill, N.J. (A. E. Whitney, Jr., 31 Alexander Ave., Nutley, N.J.)

27–29. Western **Space** Congr., 1st, Santa Maria, Calif. (C. E. Ewing, P.O. 1134, Santa Maria 93454)

27–31. Congress of **Neurological Surgeons**, Inc., 20th, St. Louis, Mo. (J. M. Thompson, 1955 Blossom Way, St. Petersburg, Fla. 33712)

28–30. **Electron Devices**, Washington, D.C. (Inst. of Electrical and Electronics Engineers, Electron Devices Group, 345 E. 47 St., New York 10017)

28–30. **Meteoritical** Soc., Skyland, Va. (L. S. Walter, Planetology Branch, Code 644, NASA/Goddard Space Flight Center, Greenbelt, Md.)

28–30. **Operations Research** Soc. of America, Detroit, Mich. (R. M. Oliver, Dept. of Industrial Engineering, Univ. of California, Berkeley 94720)

28–30. **Planetology and Space Mission Planning**, 3rd conf., New York, N.Y. (R. D. Enzmann, Raytheon Corp., Bedford, Mass.)

28–31. American Assoc. of **Medical Assistants**, 14th annual, Des Moines, Iowa. (AAMA, Inc., 200 E. Ohio St., Chicago, Ill. 60611)

28–1. Federation of Societies for **Paint Technology**, 48th annual, Boston, Mass. (R. W. Matlack, 121 S. Broad St., Philadelphia, Pa. 19107)

29–30. Joint **Engineering Management**

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Conf., 18th annual, Chicago, Ill. (G. J. Lukas, Keebler Co., 677 Lank Ave., Elmhurst, Ill. 60126)

29–2. Association of American **Medical Colleges**, 9th annual, Los Angeles, Calif. (D. E. Mattson, Div. of Educational Measurement and Research, AAMC, 2530 Ridge Ave., Evanston, Ill. 60201)

30–1. International Soc. of **Fire Service Instructors**, Clearwater, Fla. (B. Miles, Fire Administration Dept., St. Petersburg, Fla.)

November

1–4. American Soc. for **Horticultural** Science, Miami Beach, Fla. (C. Blackwell, 615 Elm St., St. Joseph, Mich. 49085)

1–4. American Soc. of **Tropical Medicine and Hygiene**, San Francisco, Calif. (M. M. Brooke, P.O. Box 15208, Emory Univ., Atlanta, Ga. 30333)

1–6. American Assoc. of **Medical Record Librarians**, Colorado Springs, Colo. (M. J. Waterstraat, 211 E. Chicago Ave., Chicago, Ill. 60611)

2–4. **Automated Analysis**, New York, N.Y. (N. B. Scova, Technicon Corp., Tarrytown, N.Y. 10591)

2–4. Society of **Engineering Science**, Inc., 8th annual, Washington, D.C. (N. W. Singpurwalla, School of Engineering and Applied Sciences, George Washington Univ., Washington, D.C. 20006)

2–6. American Assoc. for **Laboratory Animal Science**, 21st annual, Chicago, Ill. (T. W. Harris, AALAS, 4 E. Clinton St., P.O. Box 10, Joliet, Ill. 60434)

2–6. American **Concrete** Inst., St. Louis, Mo. (R. E. Wilde, Box 4754, Bedford Sta., Detroit, Mich. 48219)

2–6. **Electric Contact Phenomena**, Chicago, Ill. (R. E. Armington, Electrical Engineering Dept., Illinois Inst. of Technology, Chicago 60616)

2–11. **Reliability Engineering and Management** Inst., 8th annual, Tucson, Ariz. (D. Kececioglu, Aerospace and Mechanical Engineering Dept., Univ. of Arizona, Tucson 85721)

3–5. Conference on **Cold Forming of Metal Parts**, Detroit, Mich. (R. C. Rittenhouse, American Soc. of Metals, Metals Park, Ohio 44073)

3–6. **Acoustical** Soc. of America, Houston, Tex. (B. H. Goodfriend, ASA, 335 E. 45 St., New York 10017)

3–6. **Basic Science and Nuclear Divisions**, joint fall mtg., Gatlinburg, Tenn. (W. R. Jacoby, Nuclear Div., Westinghouse Electric Corp., P.O. Box 217, Cheswick, Pa. 15024)

3–6. **Health Physics** Soc., 5th annual, Idaho Falls, Idaho. (C. A. Pelletier, P.O. Box 2108, Idaho Falls 83401)

3–7. Technical Assoc. of the **Pulp and Paper Industry**, 24th annual, New Orleans, La. (M. A. Burnston, 360 Lexington Ave., New York 10017)

4–5. American Assoc. for the **Study of Liver Diseases**, Chicago, Ill. (F. Schaffner, Mount Sinai School of Medicine, Fifth Ave. and 100th St., New York 10029)

4–6. **Diffraction** Conf., 28th, Pittsburgh, Pa. (E. McGandy, Dept. of Biochemistry and Nutrition, Univ. of Pittsburgh, Pittsburgh 15213)

4–6. **Fuels and Lubricants and Transportation**, Society of Automotive Engineers, Philadelphia, Pa. (W. I. Marble, SAE, 345 E. 47 St., New York 10017)

4–6. Nuclear Symp. on **Nuclear Instrumentation** for Research and Development, New York, N.Y. [W. W. Managan, Argonne Natl. Lab. (D818), 9700 S. Cass Ave., Argonne, Ill. 60439]

4–6. American Assoc. of **Textile Chemists and Colorists**, Atlanta, Ga. (G. P. Paine, Box 12215, Research Triangle Park, N.C. 27709)

4–7. American Soc. of **Cytology**, 18th annual, Los Angeles, Calif. (W. R. Lang, 7112 Lincoln Drive, Philadelphia, Pa. 19119)

4–7. **Medical** Soc. of the United States and Mexico, 18th annual, Jalisco, Mexico. (V. E. Bryant, 333 W. Thomas Rd. No. 207, Phoenix, Ariz. 85013)

4–7. Symposium on **Nuclear Science**, New York, N.Y. (M. E. Cassidy, U.S. Atomic Energy Commission, 376 Hudson St., New York 10014)

4–7. **Plasma Physics**, Washington, D.C. (R. M. Sinclair, Physics Section, Natl. Science Foundation, Washington, D.C. 20550)

4–8. American Soc. of **Clinical Hypnosis**, Miami Beach, Fla. (W. T. Heron, 1500 NW 43rd Terrace, Park South, Fort Lauderdale, Fla. 33313)

4–8. American Assoc. of **Psychiatric Clinics for Children**, 22nd annual, Philadelphia, Pa. (J. L. Friend, AAPPCC, 250 W. 57 St., New York 10019)

5–7. Symposium on **Nutritional and Environmental Problems of the Inner City**, Nashville, Tenn. (H. A. Moses, Meharry Medical College, Nashville 37208)

5–8. Association of **Clinical Scientists**, Washington, D.C. (F. W. Sunderman, Jr., Univ. of Connecticut Medical School, 2 Holcomb St., Hartford 06112)

5–8. Italian Soc. of **Urology**, 43rd congr., Florence, Italy. (M. Rizzo, Instituto di Urologia Universita degli, Studi di Firenze, Firenze)

6–7. Central Soc. for **Clinical Research**, Chicago, Ill. (J. W. Eckstein, Dept. of Internal Medicine, Univ. of Iowa Hospitals, Iowa City 52240)

6–7. National Conf. on **Management of Occlusive Arterial Disease**, Nashville, Tenn. (W. A. Dale, 2010 Church St., Nashville 37203)

6–10. National **Biological** Congr., Detroit, Mich. (J. R. Olive, American Inst. of Biological Sciences, 3900 Wisconsin Ave., NW, Washington, D.C. 20016)

6–11. American Soc. of **Hospital Pharmacists**, Los Angeles, Calif. (J. A. Oddis, ASHP, 4630 Montgomery Ave., Bethesda, Md. 20014)

7–8. American College of **Dentists**, Las Vegas, Nev. (R. J. Nelsen, 4236 Lindell Blvd., St. Louis, Mo. 63108)

7–10. American **Medical Women's** Assoc., San Juan, Puerto Rico. (G. Conroy, AMWA, 1740 Broadway, New York 10019)

8–12. American **Dental** Assoc., Las Vegas, Nev. (C. G. Watson, ADA, 211 E. Chicago Ave., Chicago, Ill. 60611)

8–12. Society of **Exploration Geophysicists**, New Orleans, La. (H. Breck, P.O. Box 3098, Tulsa, Okla. 74101)

9–11. **Cyclic 3',5' AMP and Cell Function**, New York, N.Y. (G. A. Robison, Vanderbilt Univ., Nashville, Tenn.)

10–12. Society of **Plastics Engineers**,

2nd technical conf., St. Louis, Mo. (J. H. Hyden, SPE, 656 W. Putnam Ave., Greenwich, Conn. 06830)

11–12. **Sex and Gender Deviations in Children**, Columbia, Mo. (Office of Continuing Medical Education, Univ. of Missouri School of Medicine, 175 Medical Center, Columbia 65201)

11–13. **Geological** Soc. of America, 83rd annual, Milwaukee, Wis. (L. M. Cline, GSA, P.O. Box 1719, Boulder, Colo. 80302)

11–13. National Assoc. of **Geology Teachers**, Milwaukee, Wis. (M. B. Rosalsky, Dept. of Geology, City College of New York, Convent Ave. at 138th St., New York 10031)

11–13. **Paleontological** Soc., Milwaukee, Wis. (R. L. Langenheim, Dept. of Geology, Univ. of Illinois, Urbana 61801)

11–14. **Seismological** Soc. of America, Milwaukee, Wis. (D. Tocher, P.O. Box 826, Berkeley, Calif. 94701)

12–13. Canadian Symp. on **Communications**, Montreal, P.Q. (M. L. Blostein, Electrical Engineering Dept., McGill Univ., Montreal 110)

12–13. **Immunoglobulins**, Philadelphia, Pa. (H. M. Rawnsley, William Pepper Lab., Dept. of Pathology, Univ. of Pennsylvania, Philadelphia)

12–13. Symposium on **Man-Machine Systems**, Winter Park, Fla. (M. J. Kahn, AAI Corp., Cockeysville, Md. 21030)

12–15. American **Heart** Assoc., 43rd annual scientific sessions, Atlantic City, N.J. (AHA, 44 E. 23 St., New York 10010)

12–15. American Soc. of **Therapeutic Radiologists**, Phoenix, Ariz. (C. R. Bogardus, 800 NE 13th St., Oklahoma City, Okla. 73104)

14–15. Midwestern Conf. in **Comparative Endocrinology**, Cincinnati, Ohio. (W. W. Leavitt, Dept. of Physiology, College of Medicine, Univ. of Cincinnati, Cincinnati 45219)

15–19. **Engineering in Medicine and Biology**, 23rd conf., Washington, D.C. (R. Johns, 522 Traylor Bldg., Johns Hopkins School of Medicine, Baltimore, Md. 21205)

15–19. American **Nuclear** Soc., Washington, D.C. (J. Stouky, NUS Corp., 2351 Research Blvd., Rockville, Md. 20850)

16–17. American **Petroleum** Inst., 50th annual, New York, N.Y. (H. A. Fondu, 1271 Avenue of the Americas, New York 10020)

16–18. **Chemical Marketing Research** Assoc., San Francisco, Calif. (C. W. Slade, Jr., Chemical Marketing Research Assoc., 100 Church St., New York 10007)

16–19. Society of **Vertebrate Paleontology**, Toronto, Ont., Canada. (J. H. Ostrom, Yale Peabody Museum, 170 Whitney Ave., New Haven, Conn. 06520)

17–19. Fall Joint **Computer** Conf., 7th annual, Houston, Tex. (B. Pollard, RCA–NPL, 200 Forest St., Marlboro, Mass. 01752)

17–20. **Magnetism and Magnetic Materials**, 16th annual conf., Miami Beach, Fla. (H. C. Wolfe, American Inst. of Physics, 335 E. 45 St., New York 10017)

17–22. Pan American **Medical** Assoc., 45th, Hollywood Beach, Fla. (J. Eller, 745 Fifth Avenue, New York 10022)

18–20. Eastern **Analytical** Symp., New York, N.Y. (D. A. Pragay, P.O. Box 38, Buffalo, N.Y. 14215)

18–20. **Hamster Pathology**, Boston, Mass. (F. Homburger, Bio-Research Inst., Inc., 9 Commercial Ave., Cambridge, Mass. 02141)

18–20. National Assoc. of **Police Labs.** and the Bureau of **Narcotics and Dangerous Drugs**, New York, N.Y. (Lt. F. Fernez, Suffolk County Police Dept. Lab., Veteran's Highway, Hauppauge, N.Y. 11787)

19–20. American Assoc. for **Automotive Medicine**, Ann Arbor, Mich. (J. L. Weygandt, 716 Monroe St., Sheboygan Falls, Wis. 53085)

19–20. **Biomedical Materials**, London, England. (Meetings Officer, Inst. of Physics and The Physical Soc., 47 Belgrave Sq., London, S.W.1, England)

19–20. **Cancer** Conf., Houston, Tex. (F. Goff, M. D. Anderson Hospital, Univ. of Texas, Houston)

19–20. Conflicts in **Water Resources Planning**, What are the Remedies?, Austin, Tex. (S. Ferguson, Center for Research in Water Resources, Balcones Research Center, Route 4, Box 189, Austin 78757)

19–22. American **Anthropological** Assoc., San Diego, Calif. (E. J. Lehman, Executive Director, AAA, 1703 New Hampshire Ave., NW, Washington, D.C. 20009)

19–22. Society for **Psycho-physiological** Research, New Orleans, La. (L. H. Miller, Louisiana State Univ. Medical Center, 1542 Tulane Ave., New Orleans 70112)

20–21. Tennessee Acad. of **Science**, Memphis, Tenn. (J. D. Caponetti, Dept. of Botany, Univ. of Tennessee, Knoxville 37916)

20–23. American **Speech and Hearing** Assoc., New York, N.Y. (K. O. Johnson, ASHA, 9030 Old Georgetown Rd., Washington, D.C. 20014)

21–24. Association of Schools of **Allied Health Professions**, 3rd annual, Chicago, Ill. (J. Von Bargen, Suite 300, 1 Dupont Circle, NW, Washington, D.C. 20036)

23–25. American Physical Soc., Div. of **Fluid Dynamics**, 23rd, Charlottesville, Va. (Y. H. Pao, Boeing Scientific Research Labs., P.O. Box 3981, Seattle, Wash. 98124)

26–28. Central Assoc. of **Science and Mathematics Teachers**, Chicago, Ill. (D. R. Winslow, P.O. Box 246, Bloomington, Ind. 47401)

26–29. National Council for **Geographic Education**, Detroit, Mich. (L. Mitchell, NCGE, 111 W. Washington St., Chicago, Ill. 60602)

29–30. International **Exchange of Technology**, Research Triangle Park, N.C. (G. R. Herbert, Research Triangle Inst., P.O. Box 12194, Research Triangle Park 27709)

29–3. American Inst. of **Chemical Engineers**, Chicago, Ill. (F. J. Van Antwerpen, AICE, 345 E. 47 St., New York 10017)

29–3. Association of **Military Surgeons** of the United States, Washington, D.C. (F. E. Wilson, AMSUS, 8502 Connecticut Ave., Chevy Chase, Md. 20015)

29–4. American Soc. of **Mechanical Engineers**, New York, N.Y. (A. B. Conlin, Jr., Technical Dept., ASME, 345 E. 47 St., New York 10017)

29–4. **Radiological** Soc. of North America, Chicago, Ill. (M. D. Frazer, RSNA,

Inc., 713 E. Genesee St., Syracuse, N.Y. 13210)

30–2. Conference on the **Fatigue Problem**, Detroit, Mich. (J. A. Fellows, American Soc. for Metals, Metals Park, Ohio)

30–3. **Entomological** Soc. of America, Miami Beach, Fla. (W. P. Murdoch, 4603 Calvert Rd., College Park, Md. 20740)

30–4. **Engineering Materials and Design**, intern. exhibition and trade fair, London, England. (Industrial and Trade Fairs, Ltd., Commonwealth House, New Oxford St., London, W.C.1, England)

December

1–3. **Problems of Electroplating**, 3rd symp., Budapest, Hungary. (Scientific Soc. of Mechanical Engineers, Szabadsag Ter. 17, Budapest)

1–6. **Radiological** Soc. of North America, Chicago, Ill. (M. D. Frazier, 713 E. Genesee St., Syracuse, N.Y. 13210)

1–7. International **Hospital** Federation, 2nd, San Jose, Costa Rica. (J. Gonzalez, Pan American Office, 1 Farragut Sq., South, Washington, D.C. 20006)

1–8. International Symp. on the Results of **Research on Representative and Experimental Basins**, Wellington, New Zealand. (L. A. Heindl, Royal Soc. of New Zealand, P.O. Box 196, Wellington)

2–3. **Materials/Process Selection**, Phase II, Cleveland, Ohio. (J. A. Fellows, American Soc. for Metals, Metals Park, Ohio 44073)

2–4. **Vehicular Technology**, 21st conf., Washington, D.C. (P. M. Kelly, Kelly Scientific Corp., 3900 Wisconsin Ave., NW, Washington, D.C. 20016)

2–9. Management of **Emotional Problems in the Older Person**, New York, N.Y. (H. Gershman, American Inst. for Psychoanalysis, 329 E. 62 St., New York 10021)

3–4. Conference on **Clinical Pharmacology**, Washington, D.C. (L. I. Goldberg, Emory Univ. School of Medicine, Atlanta, Ga.)

4. American Assoc. of **Physicists in Medicine**, Chicago, Ill. (M. Rozenfeld, Argonne Hospital, 950 E. 59 St., Chicago 60637)

4–6. American Acad. of **Psychoanalysis**, New York, N.Y. (J. B. Miller, AAP, 510 E. 86 St., New York 10028)

5–10. American Acad. of **Dermatology**, Chicago, Ill. (F. A. J. Kingery, 2250 Northwest Flanders, Portland, Ore. 97201)

6. American Soc. of **Hospital Pharmacists**, 5th annual, Anaheim, Calif. (W. E. McConnell, Dept. of Education and Training, 4630 Montgomery Ave., Washington, D.C. 20014)

6–8. American Soc. of **Hematology**, San Juan, Puerto Rico. (F. H. Gardner, Presbyterian–Univ. of Pennsylvania Medical Center, Philadelphia 19104)

6–10. Association of **State and Territorial Health Officers**, Washington, D.C. (N. J. Swearingen, 128 C St., NE, Washington, D.C. 20002)

6–11. International **Clean Air** Congr., 2nd, Washington, D.C. (A. Arch, Air Pollution Control Assoc., 4400 Fifth Ave., Pittsburgh, Pa. 15213)

6–11. Pan American Congr. of **Rheumatology**, 5th, Punta del Este, Uruguay. (H. Havranek, Hospital Maciel, Calle 25 de Mayo 174, Montevideo, Uruguay)

BOOKS RECEIVED

(*Continued from page 1196*)

The Ends of Time. Eight Stories of Science Fiction. Robert Silverberg, Ed. Hawthorn, New York, 1970. xii, 228 pp. $5.95.

Environmental Geology. Conservation, Land-Use Planning, and Resource Management. Peter T. Flawn. Harper and Row, New York, 1970. xxii, 314 pp., illus. + map. $13.95.

Experiments in Physical Optics. M. Françon, N. Krauzman, J. P. Mathieu, and M. May. Gordon and Breach, New York, 1970. xii, 272 pp., illus. Reference edition, $19.50; text edition, $9.50.

Fat-Soluble Vitamins. R. A. Morton, Ed. Pergamon, New York, 1970. xii, 532 pp. + plates. $16. International Encyclopaedia of Food and Nutrition, vol. 9.

Fine Ceramics. Technology and Applications. F. H. Norton. McGraw-Hill, New York, 1970. xviii, 510 pp., illus. $24.50.

A First Course in Computing and Numerical Methods. John A. Jacquez. Addison-Wesley, Reading, Mass., 1970. xvi, 368 pp., illus. $11.50. Addison-Wesley Series in Mathematics.

Foreign Policy Priorities 1970–1971. Prepared by the editors of the Foreign Policy Association. Collier, New York, 1970. 96 pp. Paper, 95¢.

The Forgotten Peninsula. A Naturalist in Baja California. Joseph Wood Krutch. Morrow (Apollo Editions), New York, 1970. x, 280 pp. Paper, $2.25. Reprint of the 1961 edition.

Fundamental Organic Chemistry. K. Thomas Finley and James Wilson, Jr. Prentice-Hall, Englewood Cliffs, N.J., 1970. xviii, 430 pp., illus. $9.95.

The Fundamental Units of Physics and the Logic of Theoretical Physics. Eigil Rasmussen. Dorrance, Philadelphia, 1970. xvi, 136 pp. $6.95.

Global Weather Prediction. The Coming Revolution. Bruce Lusignan and John Kiely, Eds. Holt, Rinehart and Winston, New York, 1970. xii, 308 pp., illus. $15.

Glossary of Sugar Technology. In Eight Languages. English/French/Spanish/Swedish/Dutch/German/Italian/Danish. C. A. Müller. Elsevier, New York, 1970. x, 226 pp. $13. Glossaria Interpretum.

The History of Medical Education. An international symposium, Los Angeles, February 1968. C. D. O'Malley, Ed. University of California Press, Berkeley, 1970. xii, 548 pp. + plates. $20.

Human Growth and Development. Robert W. McCammon. Thomas, Springfield, Ill., 1970. xii, 296 pp., illus. $9.

Indians in the City. A Study of the Urbanization of Indians in Toronto. Canadian Research Centre for Anthropology, Saint Paul University, Ottawa, 1970. xvi, 112 pp. Paper, $2.50.

Interacting Macromolecules. The Theory and Practice of Their Electrophoresis, Ultracentrifugation, and Chromatography. John R. Cann. With a contribution by Walter B. Goad. Academic Press, New York, 1970. Molecular Biology.

An Introduction to Isozyme Techniques. George J. Brewer. With a contribution by Charles F. Sing. Academic Press, New York, 1970. xii, 188 pp., illus. $11.

Introduction to Marine Biology. Bayard H. McConnaughey. Mosby, St. Louis, 1970. x, 454 pp., illus. $11.50.

Introduction to the Study of Biological Membranes. Marcelino Cereijido and Catalina A. Rotunno. Gordon and Breach, New York, 1970. xii, 264 pp., illus. Cloth, $21; paper, $9.50.

Introduction to the Theory of Ion-Atom Collisions. M. R. C. McDowell and J. P. Coleman. North-Holland, Amsterdam; Elsevier, New York, 1970. x, 442 pp., illus. $25.75.

Laboratory Experiments in Organic Chemistry. Roger Adams, John R. Johnson, and Charles F. Wilcox, Jr. Macmillan, New York; Collier-Macmillan, London, ed. 6, 1970. xvi, 528 pp., illus. $8.95.

Learning, Memory, and Conceptual Processes. Walter Kintsch. Wiley, New York, 1970. xiv, 498 pp., illus. $9.95. Series in Psychology.

Lectures on Particles and Fields. H. H. Aly, Ed. Gordon and Breach, New York, 1970. viii, 380 pp., illus. Reference edition, $24.50; professional edition, $14.50.

Love and Sex and Growing Up. Eric W. Johnson and Corinne B. Johnson. Lippincott, Philadelphia, 1970. 128 pp., illus. $3.95.

Machine Intelligence 5. Proceedings of a workshop, Edinburgh, 1969. Bernard Meltzer and Donald Michie, Eds. With a previously unpublished report by A. M. Turing. Elsevier, New York, 1970. viii, 596 pp., illus. $22.50.

Marine Food Chains. Proceedings of a symposium, Aarhus, Denmark, July 1968. J. H. Steele, Ed. University of California Press, Berkeley, 1970. viii, 552 pp., illus. $13.50.

Mathematical Psychology. An Elementary Introduction. Clyde H. Coombs, Robyn M. Dawes, and Amos Tversky. Prentice-Hall, Englewood Cliffs, N.J., 1970. xii, 420 pp., illus. $10.95.

Metabolic Regulation and Enzyme Action. Vol. 19 of the Sixth Meeting of the Federation of European Biochemical Societies, Madrid, April 1969. A. Sols and S. Grisolia, Eds. Academic Press, New York, 1970. x, 382 pp., illus. $14.50.

Modern Methods of Applied Economics. Gérard Worms. Gordon and Breach, New York, 1970. xvi, 228 pp., illus. $17.50.

The Molecular Basis of Mutation. John W. Drake. Holden-Day, San Francisco, 1970. xiv, 274 pp., illus. $13.95.

Money and Emotional Conflicts. Edmund Bergler. International Universities Press, New York, 1970. xiv, 272 pp. Paper, $1.95. Reprint of the 1959 edition.

Mortality Decline and Its Demographic Effects in Latin America. Eduardo E. Arriaga. Institute of International Studies, Universtiy of California, Berkeley, 1970. xiv, 232 pp. Paper, $3. Population Monograph Series, No. 6.

The Nervous System and Electric Currents. Proceedings of a conference, Las Vegas, March 1970. Norman L. Wulfsohn and Anthony Sances, Jr., Eds. Plenum, New York, 1970. xii, 184 pp., illus. $12.50.

A New Technology for Dry Land Farming. Indian Agricultural Research Institute, New Delhi, 1970. x, 192 pp., illus.

The New York Aquarium Book of the Water World. A Guide to Representative

Fishes, Aquatic Invertebrates, Reptiles, Birds, and Mammals. William Bridges. American Heritage Press, New York, 1970. 288 pp., illus. Cloth, $6.95; paper, $2.95.

Nilpotent Rings. Robert L. Kruse and David T. Price. Gordon and Breach, New York, 1969. viii, 128 pp., illus. Cloth, $12.50; paper, $6. Notes on Mathematics and Its Applications.

Osteoporosis. A symposium, New York, June 1969. Uriel S. Barzel, Ed. Grune and Stratton, New York, 1970. xiv, 290 pp., illus. $25.

Pathophysiology of Congenital Heart Disease. Proceedings of a conference, Los Angeles, July 1967. Forrest H. Adams, H. J. C. Swan, and Victor E. Hall, Eds. University of California Press, Berkeley, 1970. xvi, 450 pp., illus. $26.50. UCLA Forum in Medical Sciences, No. 10.

Patterns of Mothering. Maternal Influence during Infancy. Sylvia Brody. International Universities Press, New York, 1970. 448 pp. Paper, $3.95. Reprint of the 1956 edition.

Pharmacology and Therapeutics. A Textbook for Students and Practitioners of Medicine and Its Allied Professions. Arthur Grollman and Evelyn Frances Grollman. Lea and Febiger, Philadelphia, ed. 7, 1970. xii, 1038 pp., illus. $19.50.

Physical Anthropology. An Introduction. A. J. Kelso. Lippincott, Philadelphia, 1970. xxiv, 360 pp., illus. $8.95.

Physics. Concepts and Consequences. Raymond L. Murray and Grover C. Cobb. Prentice-Hall, Englewood Cliffs, N.J., 1970. xx, 716 pp., illus. $12.95.

Physics. An Ebb and Flow of Ideas. Stuart J. Inglis. Wiley, New York, 1970. xviii, 430 pp., illus. $9.95.

The Physiology of Bone. Janet M. Vaughan. Clarendon (Oxford University Press), New York, 1970. xx, 328 pp., illus. Cloth, $22.50; paper, $9.95.

Planets and Life. P. H. A. Sneath. Funk and Wagnalls, New York, 1970. viii, 216 pp., illus. $6.95. World of Science Library.

Plasma Waves in Space and in the Laboratory. Proceedings of a NATO Advanced Study Institute, Røros, Norway, April 1968. J. O. Thomas and B. J. Landmark, Eds. Vol. 2. Elsevier, New York, 1970. x, 564 pp., illus. $21.

The Politics of Puerto Rican University Students. Arthur Liebman. Published for the Institute of Latin American Studies by the University of Texas Press, Austin, 1970. xii, 208 pp., $6. Latin American Monographs, No. 20.

Population Resources Environment. Issues in Human Ecology. Paul R. Ehrlich and Anne H. Ehrlich. Freeman, San Francisco, 1970. xii, 388 pp., illus. $8.95. Biology Series.

The Prevention of Drinking Problems. Alcohol Control and Cultural Influences. Rupert Wilkinson. Oxford University Press, New York, 1970. xvi, 304 pp. $10.

Principles of American Nuclear Chemistry: A Novel. Thomas McMahon. Little, Brown, Boston, 1970. vi, 250 pp. $5.95. Atlantic Monthly Press Book.

Principles of Comparative Anatomy of Invertebrates. W. N. Beklemishev. Translated from the third Russian edition (Moscow, 1964) by J. M. MacLennan. Z. Kabata, Ed. University of Chicago Press, Chicago, 1970. Vol. 1, Promorphology (xxx, 490 pp., illus.); vol. 2, Organology (viii, 536 pp., illus.). Boxed, $35 the set.

Principles of Extractive Metallurgy. Fathi Habashi. Vol. 1, General Principles (x, 416 pp., illus. Reference edition, $27.50; professional edition $14.50). Vol. 2, Hydrometallurgy (xii, 460 pp., illus. Reference edition, $27.50; professional edition, $14.50). Gordon and Breach, New York, 1969.

Proceedings of the Fifth International Cystic Fibrosis Conference. Cambridge, England, September 1969. David Lawson, Ed. Cystic Fibrosis Research Trust, London, 1969. xvi, 420 pp., illus. $5.

The Process of Biology: Primary Sources. Jeffrey J. W. Baker and Garland E. Allen. Addison-Wesley, Reading, Mass., 1970. viii, 380 pp., illus. Paper, $4.95. Addison-Wesley Series in Life Science.

Progress and Revolution. A Study of the Issues of Our Age. Robert Waelder. International Universities Press, New York, 1970. x, 374 pp. Paper, $3.45. Reprint of the 1967 edition.

Progress in Physiological Psychology. Vol. 3. Eliot Stellar and James W. Sprague, Eds. Academic Press, New York, 1970. xii, 276 pp., illus. $13.

Psychoanalytic Psychiatry and Psychology. Clinical and Theoretical Papers. Vol. 1, Austen Riggs Center. Robert P. Knight and Cyrus R. Friedman, Eds. International Universities Press, New York, 1970. viii, 392 pp. Paper, $3.95. Reprint of the 1954 edition.

The Psychological Assessment of Children. James O. Palmer. Wiley, New York, 1970. xviii, 476 pp. $12.50.

The Psychology of Gambling. Edmund Bergler. International Universities Press, 1970. xii, 244 pp. Paper, $1.95. Reprint of the 1958 edition.

The Quantitative Analysis of Social Problems. Edward R. Tufte, Ed. Addison-Wesley, Reading, Mass., 1970. xii, 452 pp., illus. Paper, $6.95. Behavioral Science: Quantitative Methods.

Radio Astrophysics. Nonthermal Processes in Galactic and Extragalactic Sources. A. G. Pacholczyk. Freeman, San Francisco, 1970. xxiv, 272 pp., illus. $13. Astronomy and Astrophysics Series.

The Response to Meprobamate—A Predictive Analysis. J. R. Wittenborn. Raven, New York, 1970. 128 pp. $5.95.

Rhythms of Dialogue. Joseph Jaffe and Stanley Feldstein. Academic Press, New York, 1970. x, 158 pp., illus. $8.50. Personality and Psychopathology, vol. 8.

Schering Symposium on Biodynamics and Mechanism of Action of Steroid Hormones. Berlin, March 1968. Gerhard Raspé, Ed. Pergamon, New York, 1969. viii, 354 pp., illus. Paper, $12. Advances in the Biosciences, vol. 2.

Schering Symposium on Mechanisms Involved in Conception. Berlin, March 1969. Gerhard Raspé, Ed. Pergamon, New York, 1970. viii, 476 pp., illus. $15. Advances in the Biosciences, vol. 4.

Science, Logic, and Political Action. Marcus C. Goodall. Schenkman, Cambridge, Mass., 1970. viii, 144 pp. $4.95.

Science Restated. Physics and Chemistry for the Non-Scientist. Harold G. Cassidy. Freeman, Cooper, San Francisco, 1970. xiv, 530 pp., illus. $8.75.

The Science, Technology and Application of Titanium. Proceedings of an international conference, London, May 1968. R. I. Jaffee and N. E. Promisel, Eds. Published for the organizing societies by Pergamon, New York, 1970. xxii, 1202 pp., illus. $48.

Scientific Foundations of Obstetrics and Gynaecology. Elliot E. Philipp, Josephine Barnes, and Michael Newton. Davis, Philadelphia, 1970. xvi, 744 pp. + plates. $30.

The Second International Meeting on Ferroelectricity. Kyoto, Japan, September 1969. Physical Society of Japan, Tokyo, 1970. xii, 464 pp., illus. $20.

Seismic Methods for Monitoring Underground Explosions. An Assessment of the Status and Outlook. Report by a study group. David Davies, Rapporteur. Almqvist and Wiksell, Stockholm, 1970 (U.S. distributor, Humanities Press, New York). 100 pp., illus. Paper, $3.50.

Separation of Flow. Paul K. Chang. Pergamon, New York, 1970. xviii, 778 pp., illus. $40. International Series of Monographs in Interdisciplinary and Advanced Topics in Science and Engineering, vol. 3.

Smithsonian Year 1969. Annual Report of the Smithsonian Institution for the Year Ended 30 June 1969. Smithsonian Institution Press, Washington, D.C., 1969 (available from the Superintendent of Documents, Washington, D.C.). viii, 708 pp., illus. Paper, $3.

The Soil Conservation Service. D. Harper Simms. Praeger, New York, 1970. xiii, 242 pp. + plates. $8.50. Praeger Library of U.S. Government Departments and Agencies.

Studies of Appalachian Geology. Central and Southern. George W. Fisher, F. J. Pettijohn, J. C. Reed, Jr., and Kenneth N. Weaver, Eds. Interscience (Wiley), New York, 1970. xx, 460 pp. + plates. $29.50.

Technical Dictionary of Data Processing, Computers, Office Machines. English/German/French/Russian. Erich Bürger, with the co-operation of Wolfgang Schuppe. Pergamon, New York; VEB Verlag Technik, Berlin, 1970. 1464 pp. $32.

Theory and Applications of Statistical Wave-Period Processing. A Coherent and Unified Treatment of the Signature Recognition Problem as Related to Detection Systems with Particular Applications to Sonar and Radar Systems. Vol. 1. Albert A. Gerlach. Gordon and Breach, New York, 1970. xx, 412 pp., illus. Reference edition, $27.50; professional edition, $17.50.

Two Children by Choice. The Why and How of the Two-Child Family. Isadore Rossman. Genevieve Millet Landau, Ed. Parents' Magazine Press, New York, 1970. 158 pp., illus. $3.95.

Visual Perception. Tom N. Cornsweet. Academic Press, New York, 1970. xvi, 480 pp. + plates. $15.

Wykeham Science Series for Schools and Universities. Nevill Mott and G. R. Noakes, Eds. Vol. 10, The Stars: Their Structure and Evolution. R. J. Tayler. xii + 208 pp., illus. Paper, 30s. Vol. 11, Superconductivity. A. W. B. Taylor. xii, 96 pp., illus. Paper, 25s. Wykeham, London, 1970 (U.S. distributor, Springer-Verlag, New York).