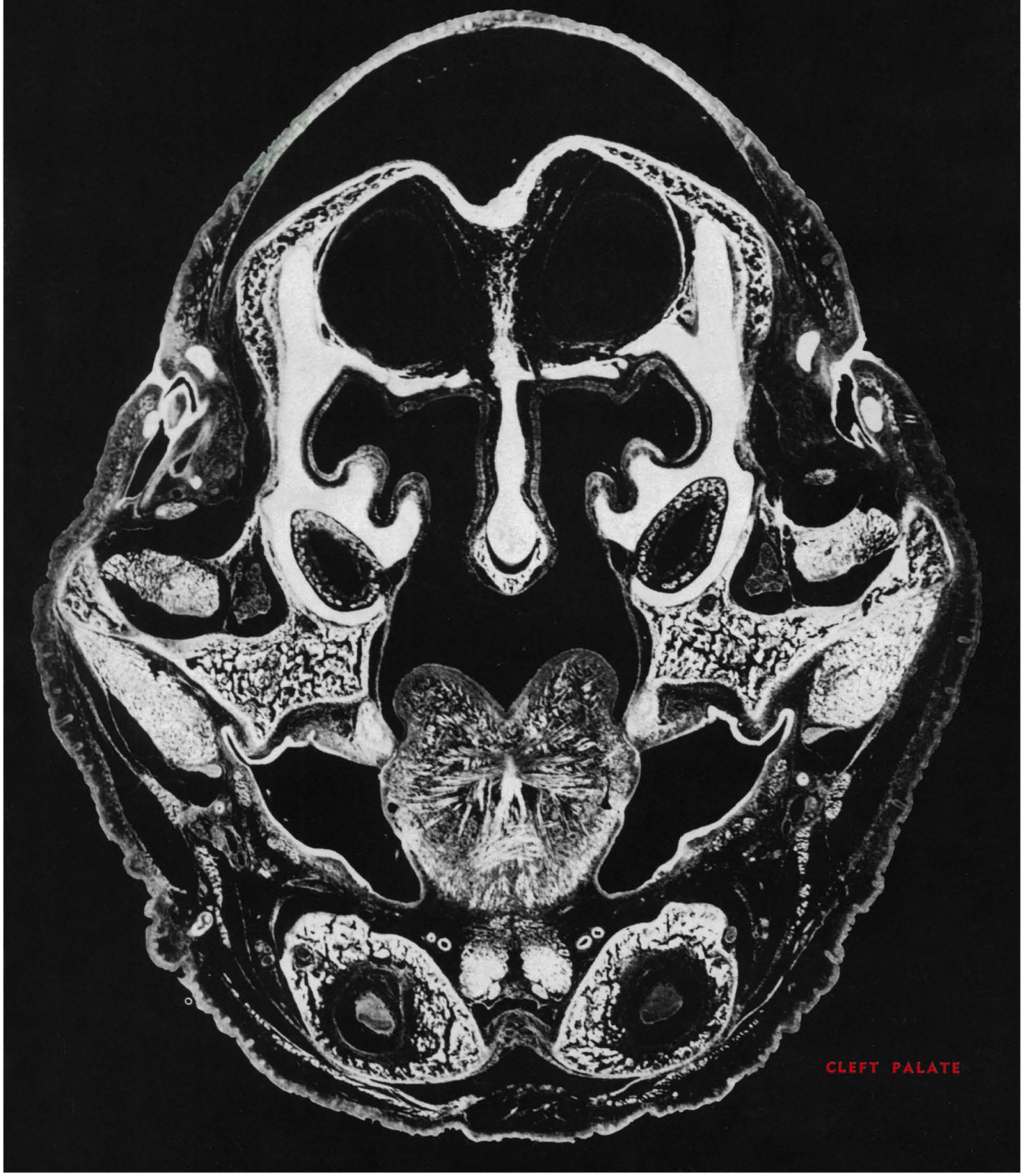
SCIENCE

7 June 1968

Vol. 160, No. 3832

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



CLEFT PALATE

By cutting two parallel grooves in our new pure titanium burner head, we've created a gas turbulence condition that entrains unwanted air higher in the flame—above the critical light path area. Better laminar flow results. The flame is leaner, steadier, quieter. And meter readings are more stable.

The ultimate result is greater sensitivity and lower detection limits due to a signal-to-noise ratio which is 3 to 5 times better than before. In addition, analyses are improved using a leaner flame even for elements which until now required a fuel-rich flame. The leaner the flame the less the carbon build-up.

The new grooved burner head now comes as standard equipment on every Techtron atomic absorption instrument we sell. There's the AA-4, a modular high quality system for research and control applications; the AA-100, a self-contained economy unit for fast, routine and accurate metals analysis; and the AR-200, a compact instrument for repetitive analysis of specific metals. We'll also sell you just the new burner. For more information, write Cary Instruments, 2724 South Peck Road, Monrovia, California 91016. Cary is a Varian subsidiary and sales and service agent for Varian Techtron Pty. Ltd., Melbourne, Australia. Ask for data File E804-8.

varian techtron

an unwavering new development in atomic absorption

The Hasselblad EL
it could be one of the most important research tools you ever buy.

In previous advertisements we have discussed the many and varied applications for which the Hasselblad System can be used in the scientific and industrial field. We would now like to discuss a unique combination of Hasselblad components and some of the rather unique applications to which they can be put.

The camera in question is the Hasselblad EL, an electrically driven 2¼" square, single lens, reflex camera, powered by one or two rechargeable batteries, each battery good for 1000 exposures on a single charge. The film is wound on and the shutter cocked automatically after each exposure. Exposures can be made manually or by remote control, using either long release cables or a radio release.

The Hasselblad EL accepts practically all the accessories that are available for the Hasselblad 500C (the standard body in the the Hasselblad System), including the 120-12 exposure magazine, the 220-24 exposure magazine, and, of particular interest with the EL, the 70mm-70 exposure magazine. The Hasselblad EL also accepts all seven lenses available in the Hasselblad System, from the extreme wide angle Zeiss Distagon of 40mm focal length, 88° angle of view, with maximum aperture f/4, to the Zeiss Tele-Tessar of 500mm focal length, 9° angle of view, maximum aperture f/8.

Listed below are five particular and diverse applications for the EL.

General Instrument Recording

Many Hasselblad EL cameras are already proving their worth, in industrial and research institutions all over the world, as recording devices for the constant surveillance of instrument banks and oscilloscope screens on a 24 hour basis.

By the use of the EL with a lens of the appropriate focal length, and the 70 exposure 70mm film magazine, banks of cameras, using the Hasselblad remote control timer, can make a number of exposures between 2 and 60 intervals for each of 3 time ranges—seconds, minutes or hours.

Thus, many valuable man hours can be saved which would otherwise be wasted making manual photographic records.

Hydraulic Engineering and Fluid Flow Research

The Hasselblad EL is particularly suited to many forms of fluid flow research and in the solving of river current and flow location problems. Banks of up to 20 Hasselblad ELs are suspended over a scale model of the river bed or sections of the ocean floor to be studied. By floating numbers of white polystyrene balls down the model and illuminating them by mercury vapor lamps, a series of tracks is formed on the negatives against the black of the river bed. By computing the distance of the tracks against a speed scale included in the photograph, flow speeds can be calculated.

By using much smaller plastic chips and the same photographic techniques, current patterns are formed at mouths of rivers, in bays and around structures in the river.

Obviously, the remote control features of the Hasselblad make it extremely useful for this kind of work, and the use of either the 70mm-70 exposure, or 220-24 exposure magazine, allows the researcher to make many exposures before bringing the camera down from the roof of the building. And, unless the building has an extremely high roof, (in which case the 80mm-Planar could be used) the 40mm Distagon will allow the maximum area to be covered by each camera.

Materials Testing

Other than the more regular forms of material testing which are usually carried out under ideal laboratory conditions, there are certain times when photographs of fractures or breakages of materials are needed. Yet, the structures are inaccessible to a photographer e.g., the inspection of blast furnaces or large capacity wine storage casks, both containing large quantities of toxic gas. In these instances, the lowering of the EL into the structures to be tested and the operation of the camera by remote control, provides the solution to the problem. Once again, the use of the 70mm magazine is desirable if numerous exposures are required.

Because of the confined space of the structures, the wide angle lenses available for the Hasselblad, the 40mm Distagon, with its 88° angle of view, or the 50mm Distagon, with its 75° angle of view, would be most useful.

Cave Photography & Speleology

A great deal of photography in cave and cavern research and its related sciences, palaeontology, anthropology and prehistory, is being done with the Hasselblad EL.

Working conditions are usually so bad—mud, water and of course, constant darkness—that film changes are not only undesirable but usually impossible. Use of either the 220-24 exposure or the 70mm-70 exposure magazine will reduce the number of film changes to the absolute minimum. Because of the spacial limitations of a cave, a wide angle lens is indispensable. Either the 40mm Distagon, with its 88° angle of view, or the 50mm Distagon with its 75° angle of view, can not be bettered.

Aerial Photography

The Hasselblad EL is also ideally suited for many phases of aeronautical research. In most aerial research photography the camera is not handled by a skilled photographer, but usually by a flight test engineer or even, in the case of a single seat airplane, by the pilot himself. These people do not have the time to be concerned with manual operations such as exposing, winding on or changing film.

Flight instrumentation recording by remote control operation of the pre-focused Hasselblad EL allows for the reconstruction of flight conditions at pre-determined intervals during the test flights.

Numerous accessories are available for the Hasselblad EL. These are fully outlined in a 40 page illustrated booklet which we would be happy to send to you on request. If you also have any particular problems of a photographic nature, please address your enquiries to our Technical Director . . . Paillard Inc., 1900 Lower Road, Linden, New Jersey 07036.

HASSELBLAD

7 June 1968
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SCIENCE

SCIENCE is published weekly on Friday and on the fourth Tuesday in November by the American Association for the Advancement of Science, 1515 Massachusetts Ave., NW, Washington, D.C. 20005. Now combined with **The Scientific Monthly**®. Second-class postage paid at Washington, D.C. Annual subscriptions $12; foreign postage: Americas $3; overseas $5; single copies, 50¢ (back issues, $1) except **Guide to Scientific Instruments**, which is $2. School year subscriptions: 9 months, $9; 10 months, $10. Provide 4 weeks notice for change of address, giving new and old address and zip codes. Send a recent address label. SCIENCE is indexed in the **Reader's Guide to Periodical Literature.**

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

COVER

Coronal section of a 20-day fetus obtained from a rat treated with chlorcyclizine on days 12 through 15 of pregnancy. The cleft palate (lower portion of photograph), with associated glossopalatine fusion produced after this treatment, is also obtained with other compounds of the benzhydrylpiperazine series (× 25). See page 1081. [A. J. Steffek, National Institute of Dental Research]

The new H-P 5960A Atomic Absorption Photometer is fundamentally faster and easier to use than any of its contemporaries. Other AA instruments employ a monochromator, a sensitive optical device that is better suited to basic research than to routine analysis because it requires careful adjustment at every use, preferably by a trained spectroscopist. In contrast, the 5960A eliminates the monochromator, replacing it with a series of discrete resonant wavelength filters that are instantly and correctly pushbutton-selected by any operator regardless of skill.

The practical significance of the 5960A design becomes abundantly clear when multi-element analyses are required, as they often are. With all monochromator instruments, a multi-element analysis takes a long time because you must adjust monochromator, slit and electronic balance *every time you change elements.* With the 5960A, you can perform a six-element analysis on a single sample in little more time than it takes to push a button for each element (see photo study of the actual 5960A procedure at right.)

Besides its speed and ease-of-use, the 5960A incorporates many useful and unique design features that give it the capability of operating routinely *at a higher degree of precision* than any of its contemporaries, in all kinds of analyses, routine and research:

■ **Six-element selector wheel** places any of six lamps in operating position instantly, without warm-up; all lamps pre-focused and pre-aligned; each lamp individually replaceable in minutes.

■ **Six pushbutton selectors** instantly and correctly position proper resonant wavelength filter; no monochromator or slit adjustments; expandable in minutes beyond the six filters initially specified.

■ **Fixed optical system** never needs alignment or adjustment; highly efficient from 1900 to 8000Å; dual-wavelength principle compensates for instabilities in a single pass without source modulation.

■ **Readout directly in concentration** on built-in meter (the nulling and calculations that are required in double-beam instruments are eliminated); connectors for recorder or printer.

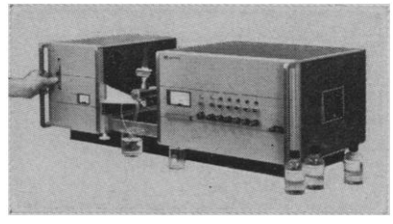
■ **Calibration controls** for each element establish direct readout with a wider *linear* operating range than that of the highest-priced "research" instruments; range switch for scale expansion of 1, 10, 100.

■ **Directly interchangeable burners,** completely accessible front and back; laminar flow and total consumption types, both safe by design; accurate elevator for burner height adjustment.

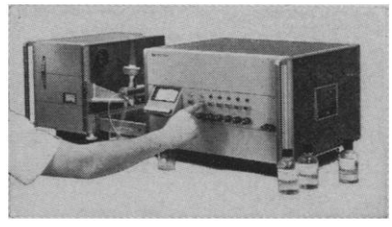
Prices start at $4400 including the safe and silent H-P Laminar Flow Burner. For complete information, call the nearest H-P sales office, or write for Bulletin 5960.

Hewlett-Packard, Route 41, Avondale, Pennsylvania 19311. In Europe: 54 Route des Acacias, Geneva.

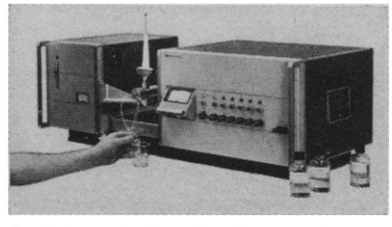
6 ELEMENTS IN 60 SECONDS



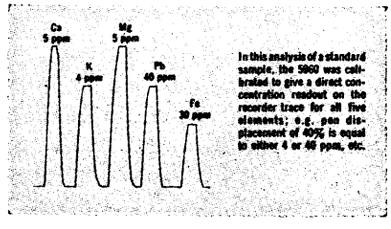
Rotate Element Selector Wheel—Choose any of six hollow cathode lamps, all instantly available without adjustment or warm-up.



Push Resonant Wavelength Selector Button—Choose any of six narrow bandpass filters, each accurately pre-calibrated and zeroed.



Read Concentration Directly—Aspirate your sample and read its concentration directly on the meter, within a few seconds.

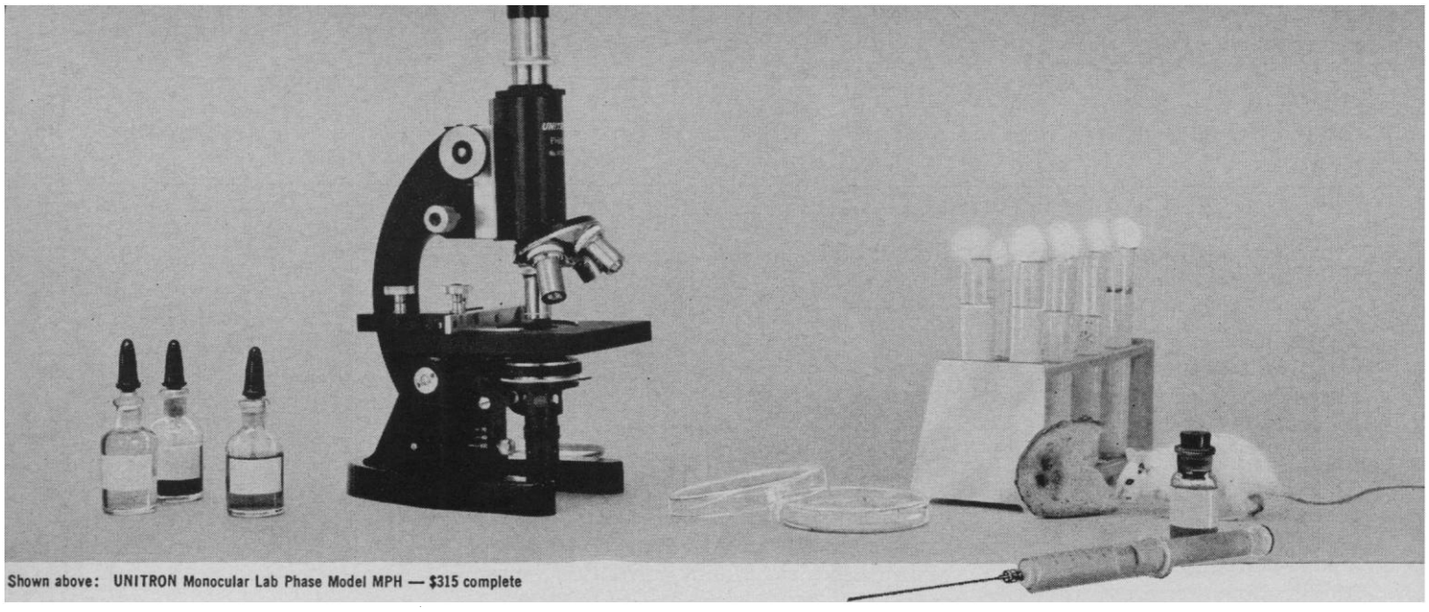


Repeat Up to Six Times—Using the same sample, repeat the procedure for as many as six elements, in as few as 60 seconds.

HEWLETT hp PACKARD

ANALYTICAL INSTRUMENTS

43804



Shown above: UNITRON Monocular Lab Phase Model MPH — $315 complete

There are 3 microscopes in this picture

. . . at a distinctly singular UNITRON price

Most lab microscopes are used for ordinary *brightfield* studies.

So is UNITRON's MPH.

Some lab microscopes can also be used for *darkfield.*

So can UNITRON's MPH.

Still other lab microscopes offer *phase contrast* to aid in the study of *living, unstained* material.

So does UNITRON's MPH.

Until now, no lab microscope has provided all 3 for the price of 1.

UNITRON's MPH does. The 3 most important techniques of microscopy are built-in, yet the MPH costs less than many single-purpose microscopes.

That's not all. UNITRON's MPH gives you more than just the advantages of 3 specialized microscopes. It unites them in "Continuous-Transition Microscopy." With a turn of the condenser knob, you change from *brightfield* to *darkfield* to *phase contrast,* all in rapid succession. Operation is so easy, it's almost automatic. There are no accessories to attach and no time-consuming adjustments to make. Everything has been factory-centered for you. Even the light source is built-in and permanently aligned.

Have cost and complexity kept you in the dark about phase? If so, you're in for a treat. UNITRON phase contrast will impress you all the more if you've tried to study *unstained, living* material with ordinary brightfield microscopes. There's no need to close the iris to pinhole size, reducing resolution and detail. Gone are those ghostly artificial images.

UNITRON Phase Contrast provides optical staining. You get the benefits of chemical staining, without the time-consuming preparation. And what's more, you see material *alive* with vivid contrast and pin-point detail. With phase, even your stained slides show unsuspected details. All this, without any special effort.

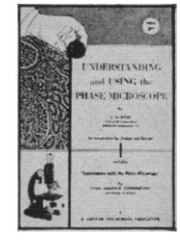
There's more. UNITRON's built-in illuminator provides five intensities . . . more than enough to meet your visual and photographic needs. Even the eyepieces are special . . . the widefield type for comfortable viewing.

And now, the moment of truth. The price. Only $315 for UNITRON's Monocular Laboratory Phase Model MPH . . . less than you pay for many ordinary brightfield lab microscopes. The Binocular Model BPH, with several additional features of its own, costs only $527.

UNITRON prices include everything but the specimens. In addition to all the special features of our phase models, you'll find everything else you expect in a good lab microscope. Four achromatic objectives (including high-power oil-immersion), mechanical stage, focusable substage condenser with iris diaphragm and filter system, fitted cabinet, etc. These, and all the other features we've described, are standard equipment with UNITRON. *There are no hidden extras to buy.*

Too good to be true? You needn't take our word for it. Borrow a UNITRON Monocular MPH or Binocular BPH for 10 days. No cost or obligation. (We'll even pay shipping charges for a chance to let you put our microscope through its paces.) Give this UNITRON an opportunity to prove its value in your lab. We think it will sell itself.

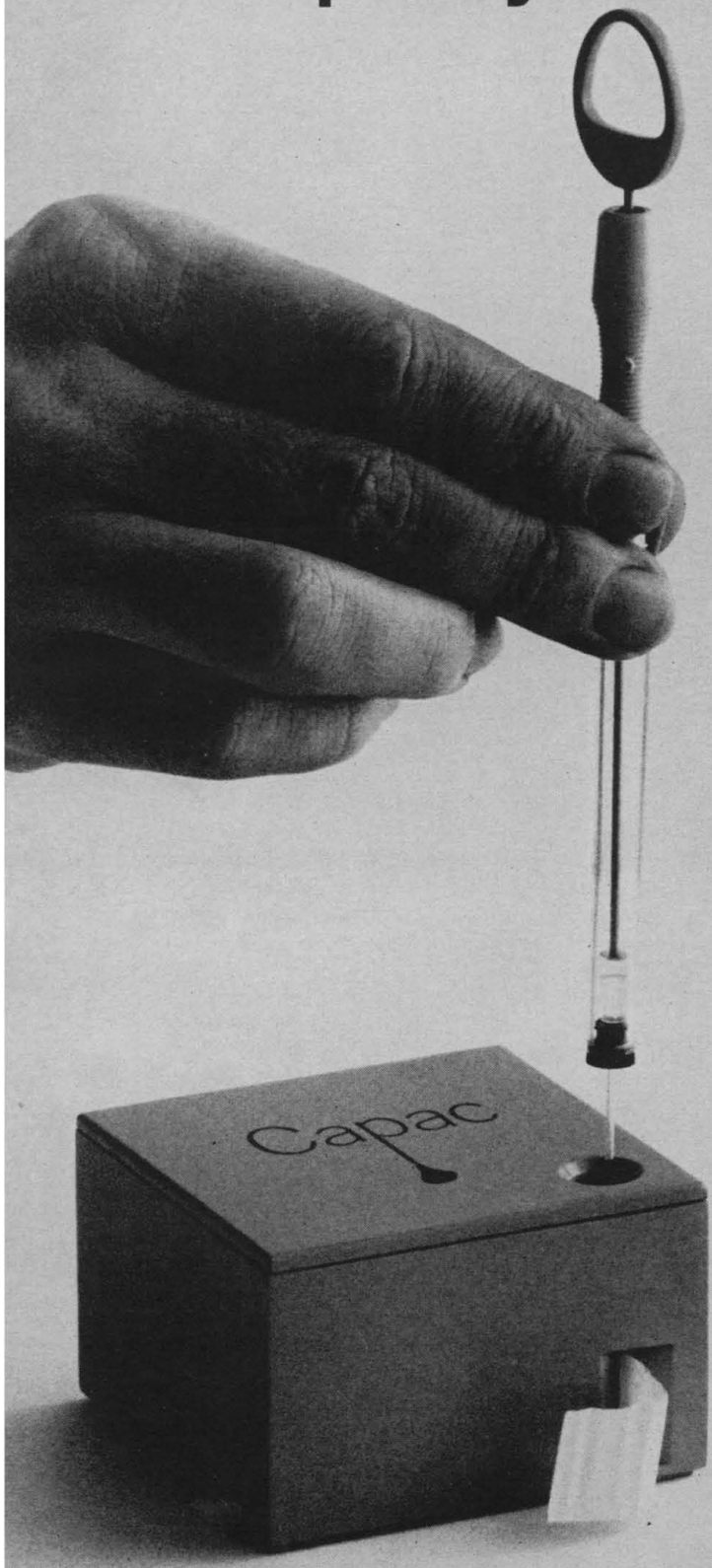
Teachers will be interested to learn that UNITRON even offers *student phase models* for as little as $99. To introduce phase to the student lab, and to other areas where it has been a stranger, UNITRON has published a fully illustrated 64-page booklet, *Understanding and Using the Phase Microscope.* The text includes a special chapter of experiments written by Professor Julian D. Corrington of the University of Miami. Other subjects are covered, including the optical theory of microscopes in general. The booklet normally sells for $1 00 but we will be glad to send a free copy to any interested teacher or researcher.



Ask for a free 10-day trial. Please specify whether you want to try Model MPH or BPH. A phase booklet is shipped with each microscope . . . or, you may request the booklet separately.

UNITRON INSTRUMENT COMPANY
MICROSCOPE SALES DIVISION • DEPARTMENT 4-U
66 NEEDHAM STREET, NEWTON HIGHLANDS 61, MASS.

You use our new micropipetting system without ever touching the capillary tube itself. (Really?)



These untouched disposable capillary tubes are part of our new Capac precision micropipetting system. With *this* system you can put a capillary tube into its holder, fill it, empty it, and finally eject the capillary itself *without* fingers having touched the tube at any time in the entire sequence. For these reasons, and others, many of the frustrations usually associated with repetitive micropipetting are minimized. Or totally eliminated.

The dispenser box with 250 capillary tubes: Part of the secret of how all this can be accomplished without handling the capillary tubes resides in the dispenser box shown on the left. It contains a roll of tape (see it protruding from the box?) which carries 250 tubes. When you pull this tape, you automatically position a new capillary beneath the hole in the top of the dispenser box.

The capillary tube holder: Now inserting the holder in the hole in the dispenser box automatically places a new capillary in the holder. The holder then does this: it controls the liquid level in the capillary, it ejects the liquid in the capillary, and finally, it ejects the capillary itself (whether filled or empty).

The capillary tubes: These tubes are accurate within ±1%, are inexpensive enough to be comfortably disposable, and are available in a wide range of sizes: 1, 2, 5, 10, 20, and 25 μl.

The cost: Modest. A Capac "demonstration package" with a single dispenser containing 250 capillary tubes *plus* a capillary tube holder costs only $11.25. The standard package has two dispensers and a capillary tube holder and costs only $21.50. Quantity costs are even more inviting.

A suggestion: Test the Capac precision micropipetting system. Order a Capac "demonstration package" of any one capillary size shown above, plus the holder, and simplify your life. Or, if you wish more information, write "Capac" on a postcard. Include your name, address and zipcode, please. Write Dept. S, Schwarz BioResearch, Mountain View Avenue, Orangeburg, N.Y. 10962.

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Western Electric sharpens its image.

The images in question are those defined by the masks used in making integrated circuits. And they *have* to be sharp because they contain areas that may be just a few microns wide but still have very complex geometries.

Western Electric manufactures integrated circuits. They're increasingly important in the communications equipment we build for the Bell System. So naturally we're increasingly concerned about our masks.

Since making masks is basically a photographic process, most of them are made with photographic emulsion. But even the finest emulsion is relatively thick—some five microns—and there's just no way to keep the edges from sloping down to the glass. When you put the mask in contact with the silicon the sloping edge of the emulsion causes some fuzziness in its transfer to the silicon. Moreover, the thickness of the emulsion varies with image size, which makes intimate contact between mask and silicon more difficult, causing problems in accurate size reproduction. Another very important point is that emulsion is relatively soft. It is easily scratched and can't be adequately cleaned for reuse in production.

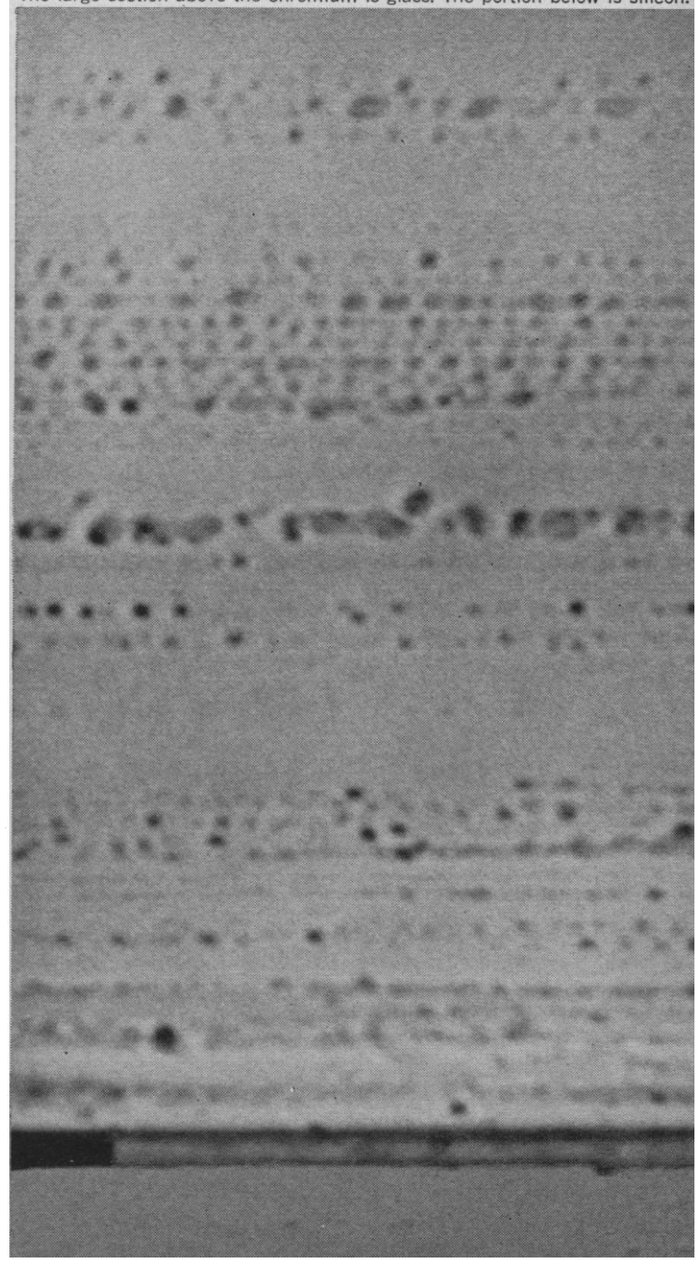
Replacing emulsion with a thin film of chromium solves all those problems very neatly. Western Electric engineers have developed a way to lay down a relatively pinhole free layer of chromium that is 1,000 angstroms thick. Unwanted portions of the chromium layer can be etched away so sharply that it is difficult to detect any slope in the edge. Therefore, reproduction of the image on the silicon is more accurate. Chromium is so much harder than emulsion that we can reclean and use it again in our manufacturing operation.

So now our masks are not only sharper but save us money too, which is the way we like to do things at Western Electric. Because it's our Bell System job to help bring you fast, reliable communications at a reasonable cost.

Western Electric
MANUFACTURING & SUPPLY UNIT OF THE BELL SYSTEM

Illustration of an enlarged cross section of emulsion mask, 4 microns thick, showing ragged, sloping edge of opaque area. It is the slope of the emulsion edge that causes some fuzziness in transfer of the image to the silicon. Portion above large emulsion area is glass. The portion below is silicon.

Chromium mask, as depicted by the narrow band in the lower portion of this illustration, is 1,000 angstroms thick. This mask has a sharply defined vertical edge, in comparison to the emulsion mask, and is only about 1/50th as thick. The large section above the chromium is glass. The portion below is silicon.



Our new atomic absorption spectrophotometer for people who can't afford a new atomic absorption spectrophotometer.

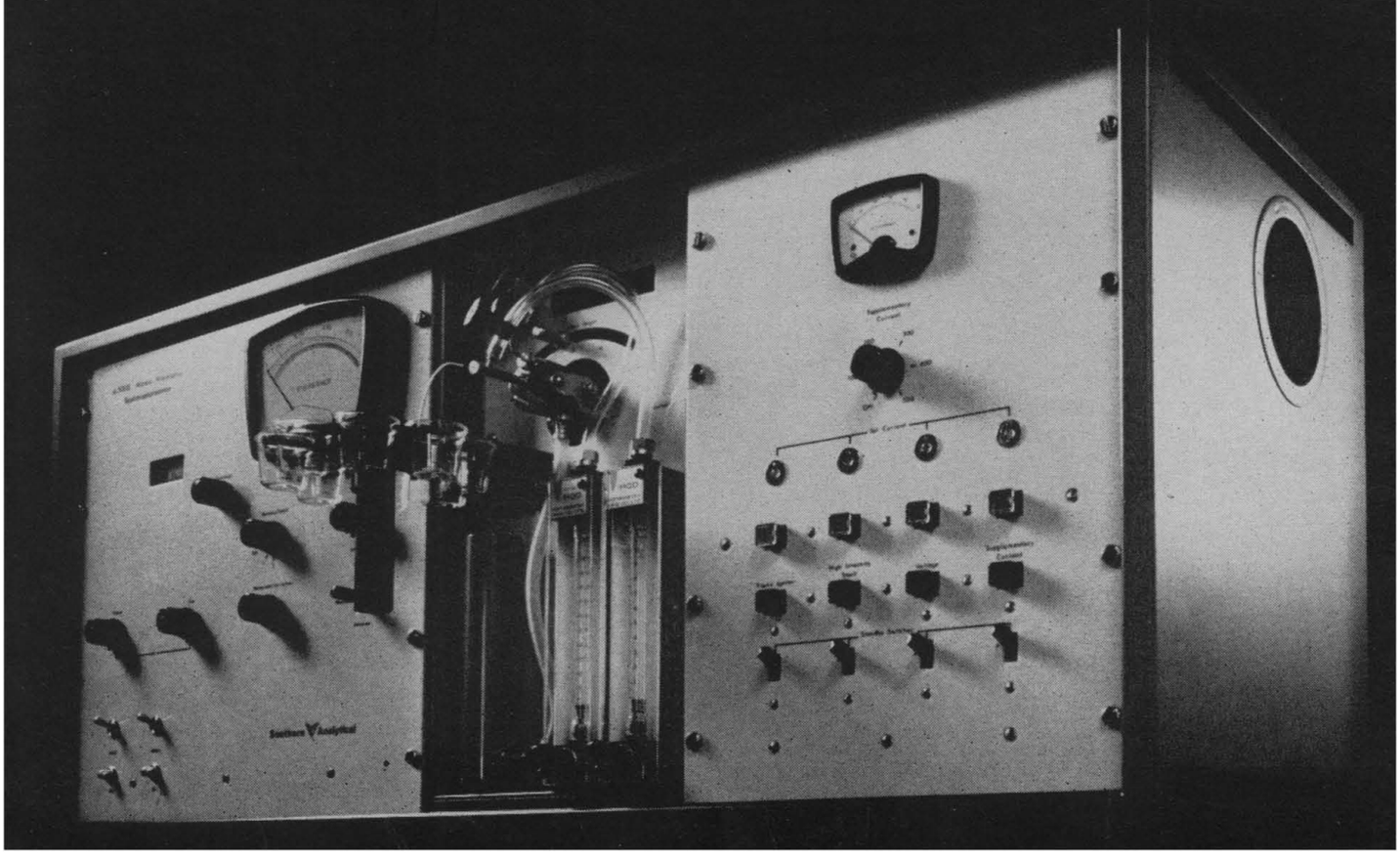
It's the Bendix A3000—a full-size, full-capability system that does everything a good atomic absorption spectrophotometer should do. Except cost like one.

Here is a low-cost instrument that gives you all the benefits of analysis with atomic absorption. It can detect trace metals in less than a minute for any number of applications, including clinical chemistry, metal analysis and food chemistry. And it does it with all the performance you'll ever need for practical lab work.

Another thing you'll like about the A3000 is its completeness. Everything normally required is included as standard equipment. There's a minimum number of optional accessories needed or offered. And controls are kept to a minimum, too, for ease of use. Anyone who can read and count can perform routine analysis with the A3000.

Can you afford the A3000? Chances are, you can't afford to be without it. Get complete information on it by writing: The Bendix Corporation, Scientific Instruments Division, 3625 Hauck Road, Cincinnati, Ohio 45241.

Bendix



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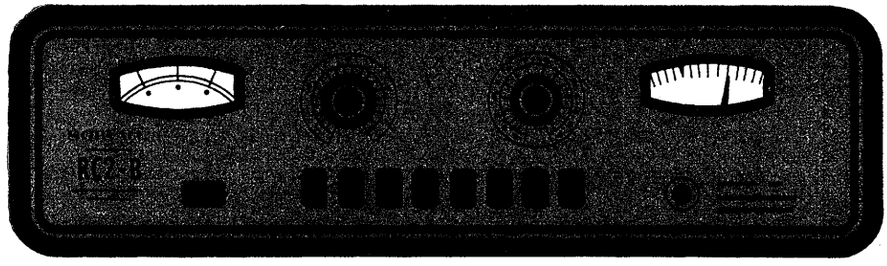
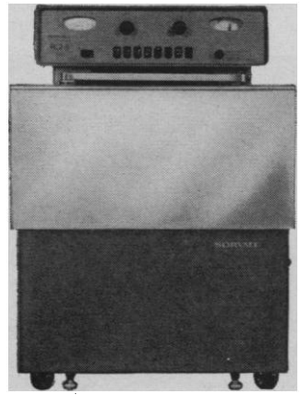
...PUSHING A BUTTON



The RC2-B Automatic Refrigerated Centrifuge provides the researcher with reliable, programmed acceleration, timing, and automatic braking that can be duplicated as many times as the operator requires. The Control Panel of the RC2-B is a feature in itself! It was designed for operator convenience and located for safety. Its elevated, rear position makes it easy to read and use while protecting it from accidental damage. All switches and dials are logically arranged, and plug-in components simplify any required maintenance. Controls may be altered (purposely or accidentally) while the centrifuge is running, and the instrument will respond automatically, without danger to user or instrument. Dynamic braking provides smoother deceleration than any other system available. Consequently, resuspension problems are eliminated. Briefly, if you want the best possible control over your separations — rely on SORVALL controls. Just write: Ivan Sorvall, Inc., Norwalk, Connecticut 06852. **SORVALL®**



For additional information, ask for Bulletin SC-6RC2-PB.

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From the frontiers of biology—today's headlines

"Genetic Abnormality Is Linked to Crime" read the headline of a recent *New York Times* article. The story discussed, "Dr. W. M. Court Brown of Edinburgh, a Government geneticist (who) called attention to the abnormally high rate of chromosomally aberrant men who had been committed to mental institutions after crimes ranging from larceny to murder."—a subject Dr. Court Brown deals with in detail in his book, HUMAN POPULATION CYTOGENETICS.

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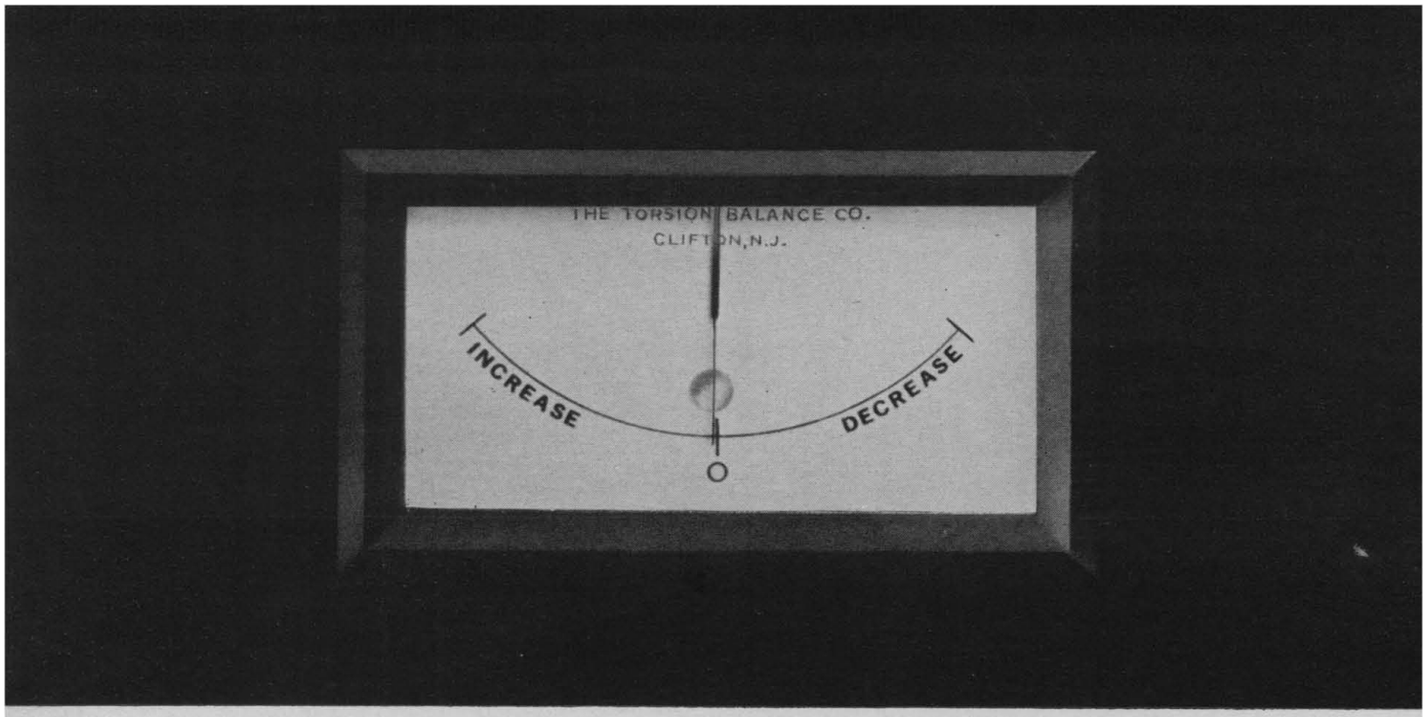

As long as you see this needle move for a 1/10 mg. weight change...

1/10 mg. weighs 1/10 mg. today, tomorrow, next week and next month

In the conventional knife-edge balance, when deflection sensitivity changes, the accuracy of your weighings will be affected. Unfortunately these changes can occur without the operator being aware of them.

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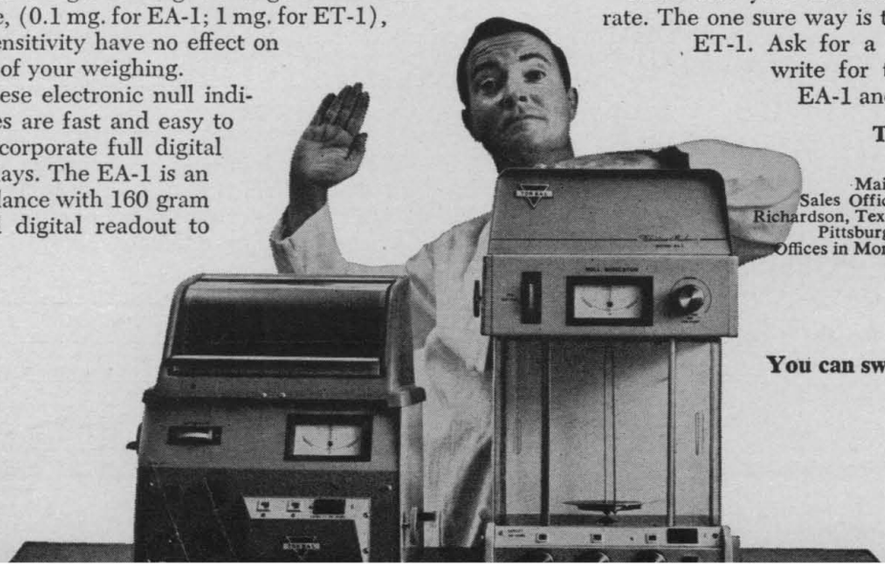

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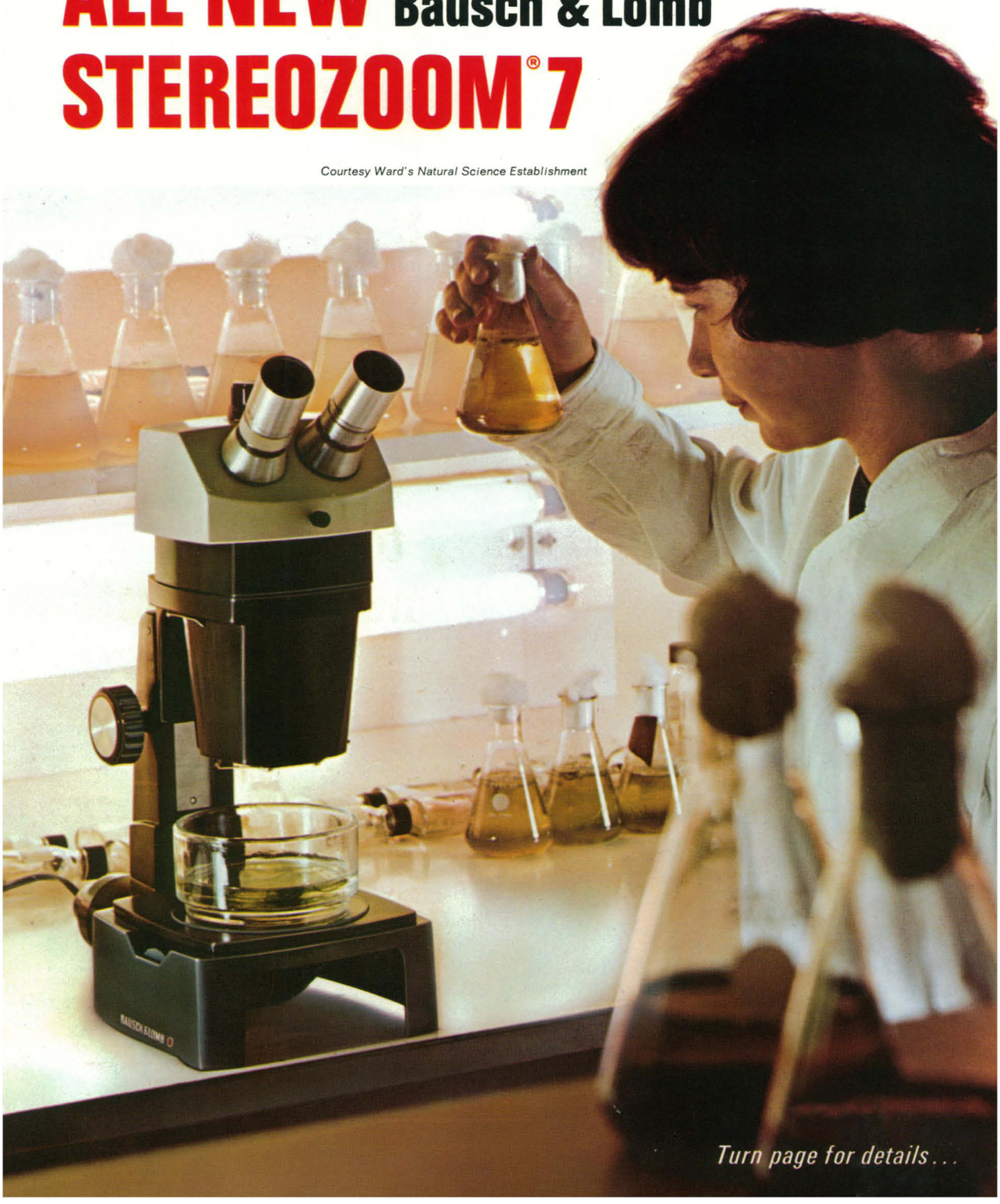

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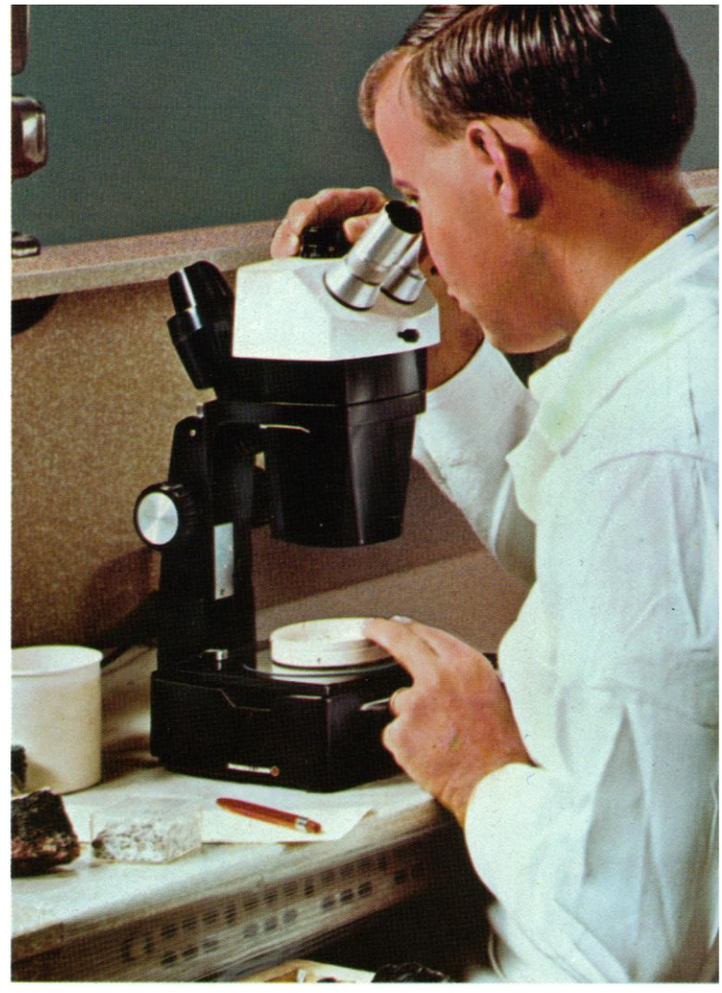

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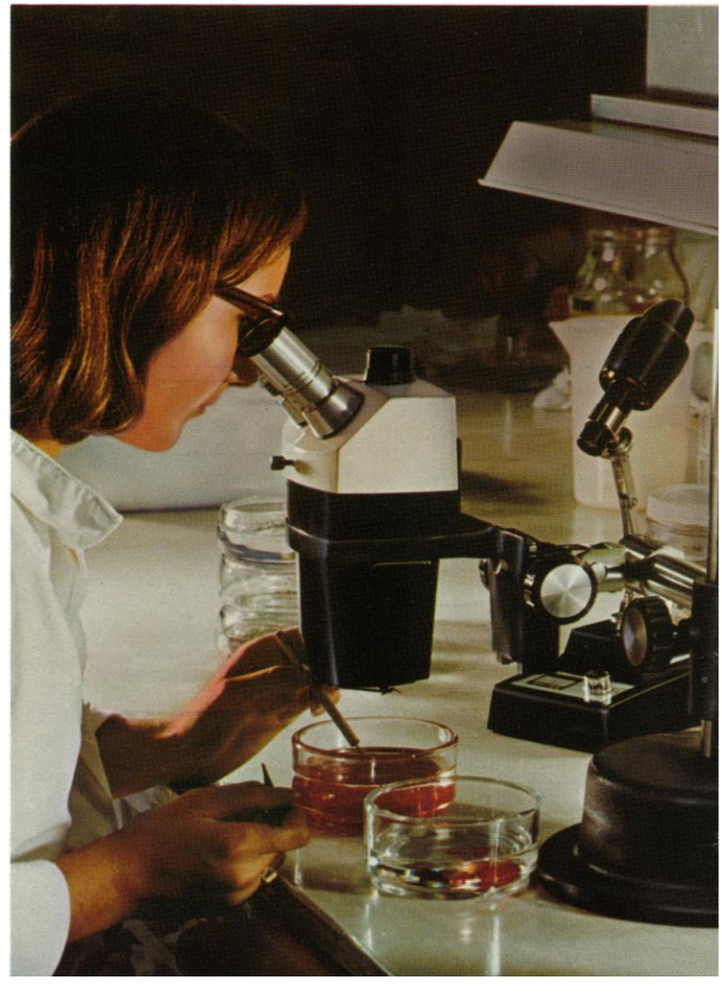

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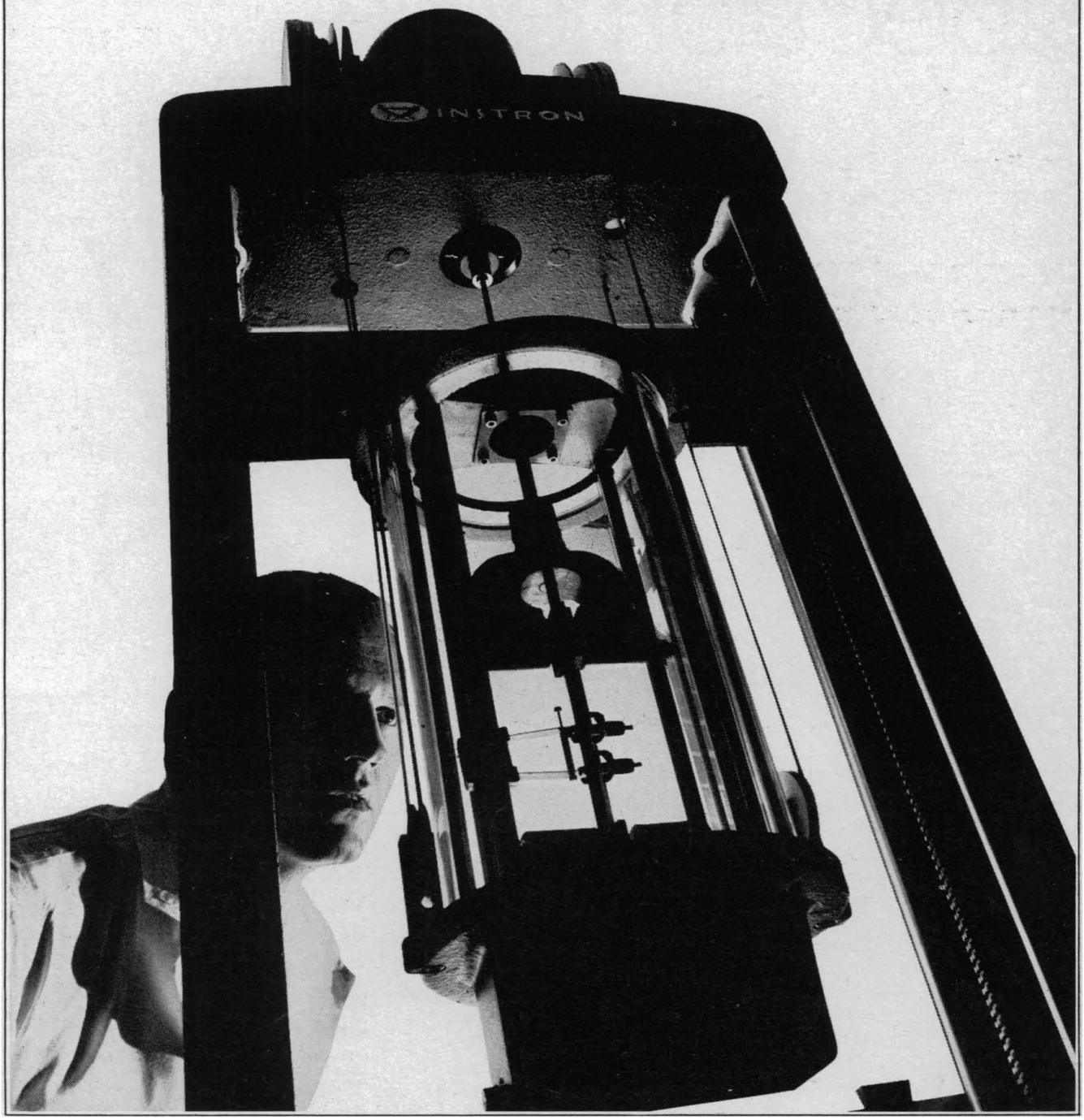

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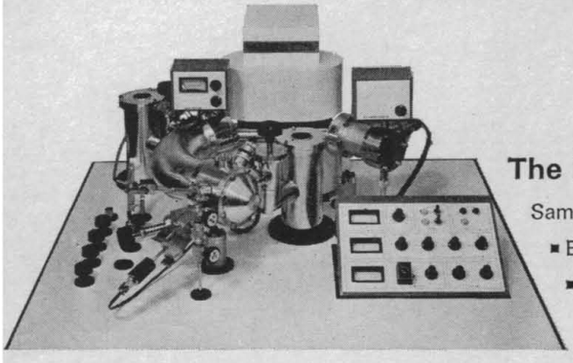

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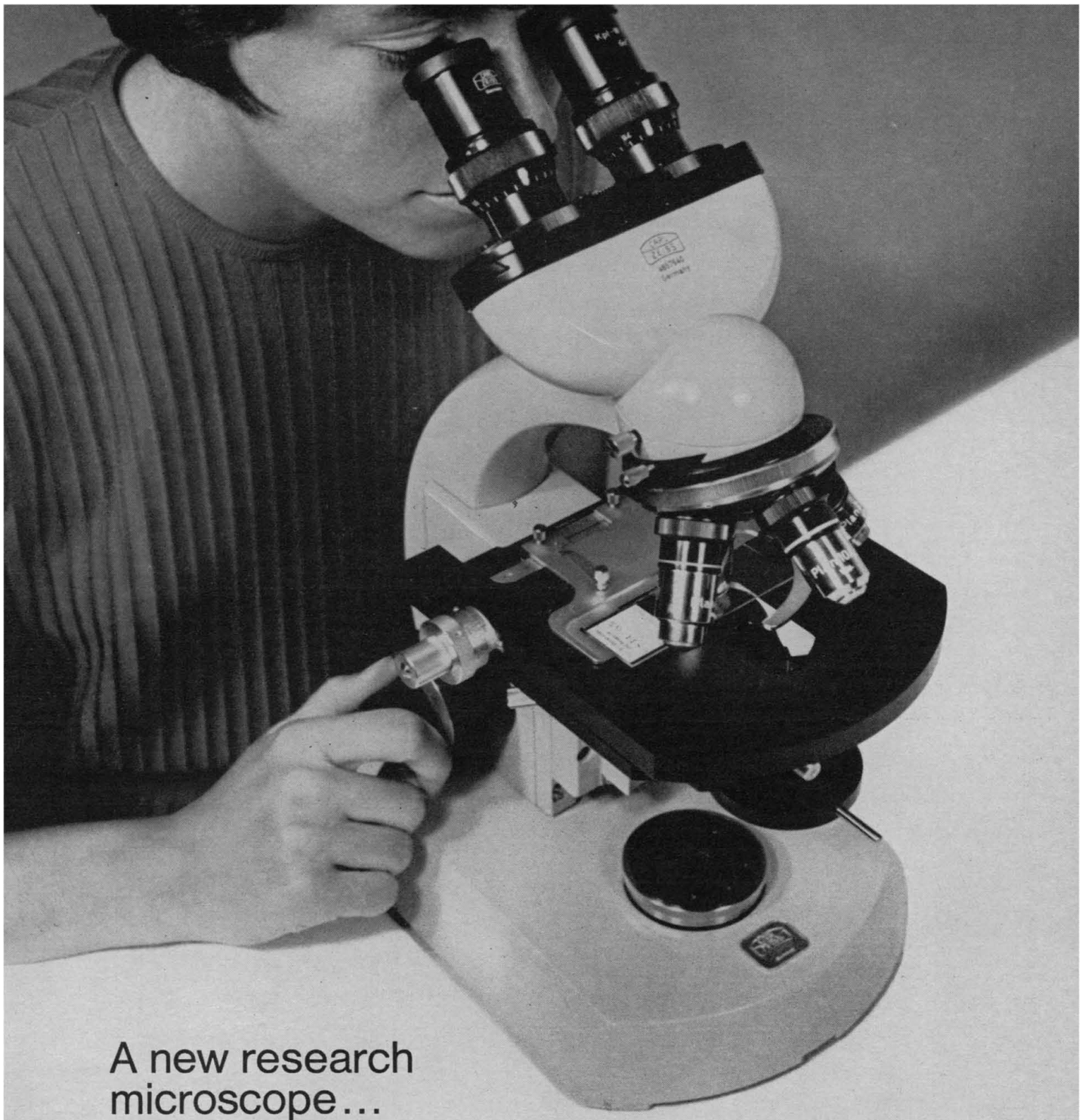

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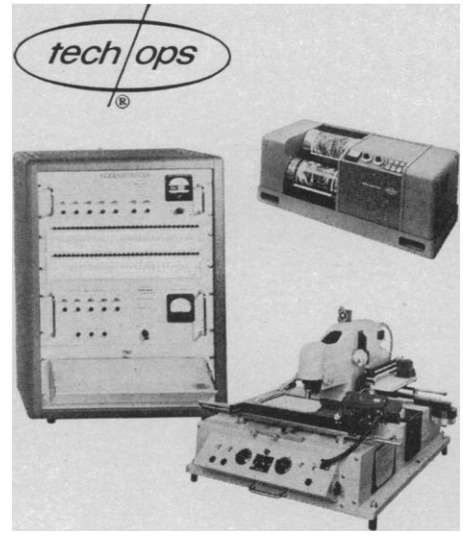

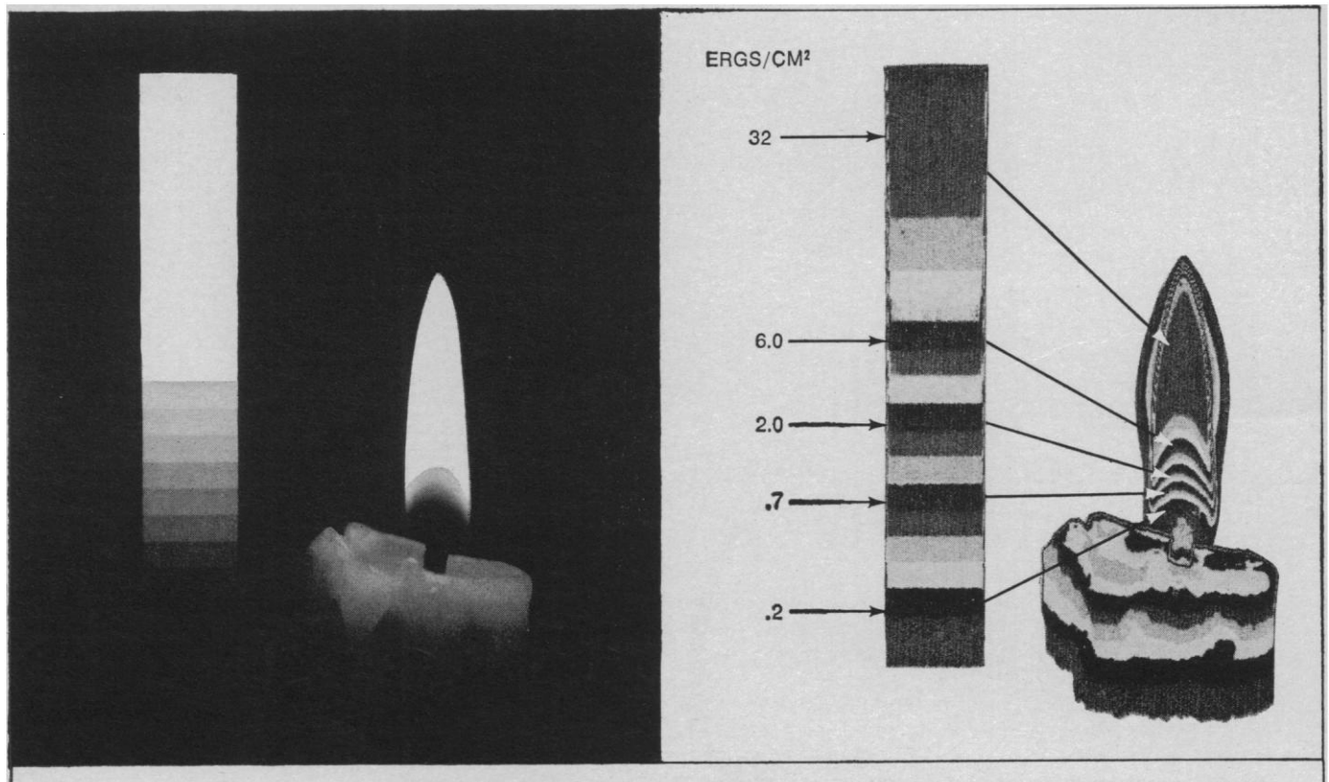

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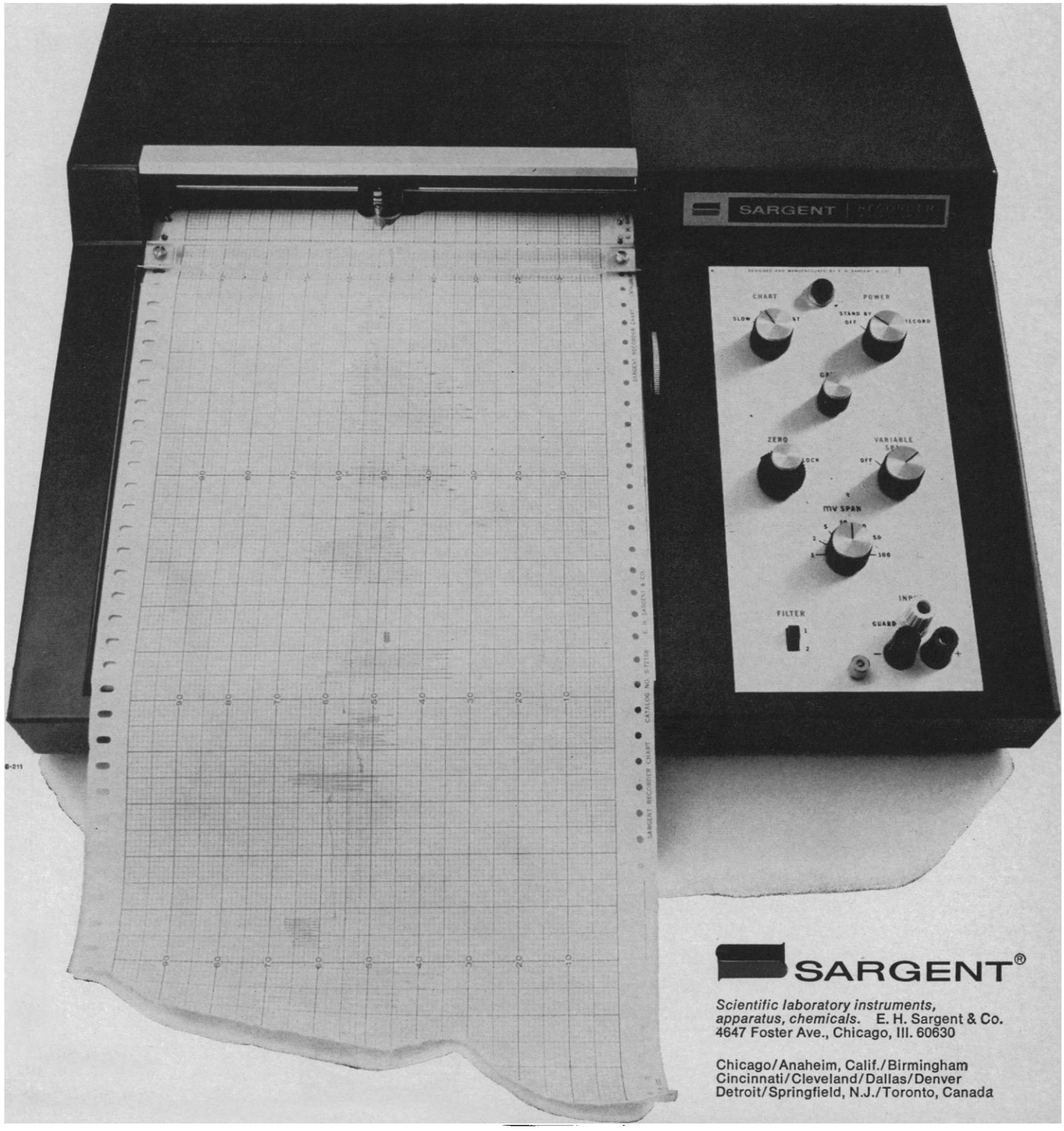

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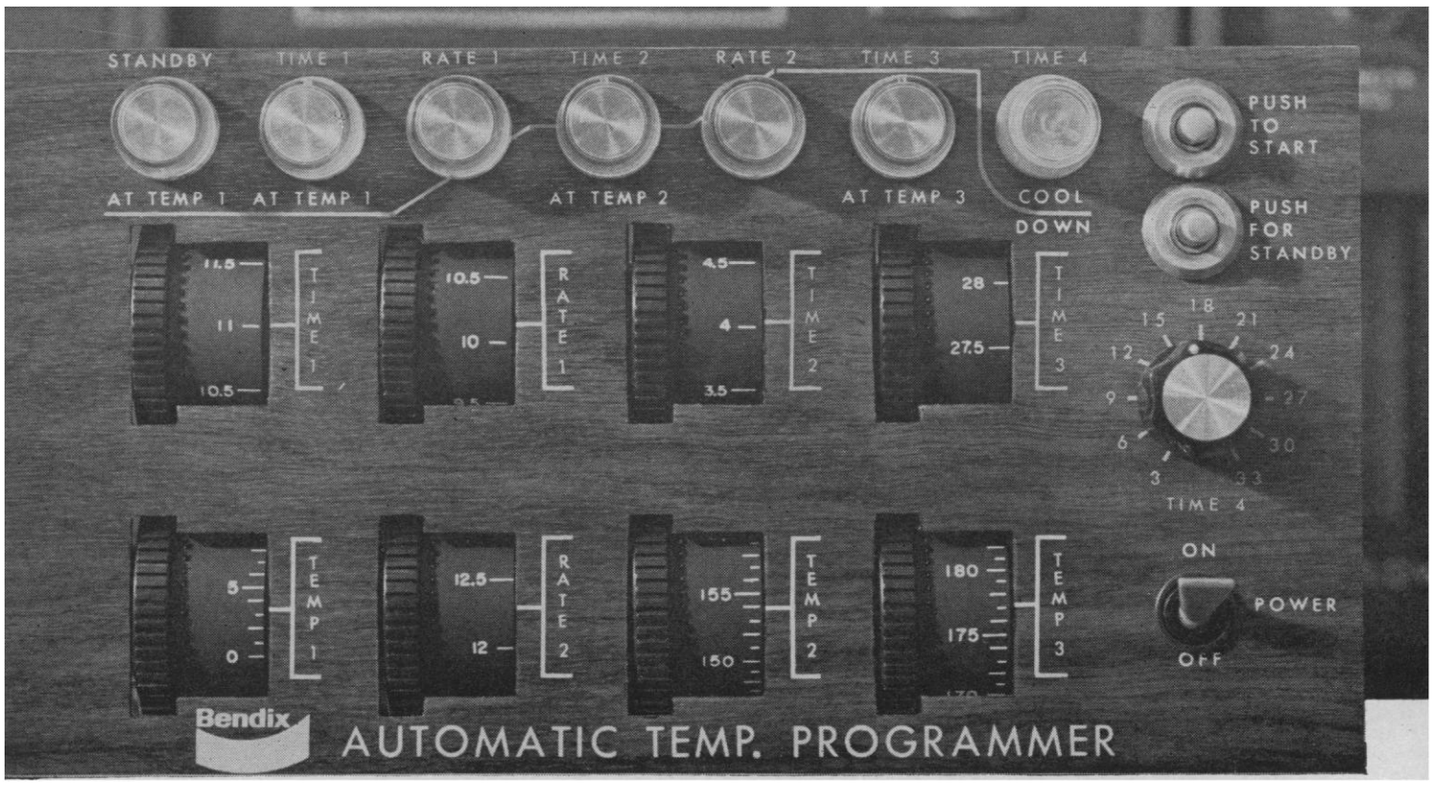

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their habit. Nor will a severe, punitive approach deter experimentation or misuse, as is evidenced by the current upsurge in marihuana use despite 31 years of harsh criminal codes.

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The change in attitude toward LSD is being rationalized by citing its harmful effects. The evidence, however, warrants no such conclusions. There is very little of it, and what does exist is about equally divided for and against the use of LSD. In opposition to Louria's view, cited by Abelson, that LSD may cause a variety of adverse effects, is the statement of Glickman of the Downstate Medical Center in Brooklyn that "everyone we see has a history of mental illness and to my knowledge we've never had an LSD user who was just a user and did not have previous mental [illness] history." In contrast to Louria's statement in the New York *Times* magazine (6 Aug. 1967) that "There is no evidence that [LSD increases creativity]," one can pose the unsigned article in *Progressive Architecture* (August 1966) "LSD—a design tool" in which numerous cases are reported of LSD and similar chemicals enhancing the solutions to specific architectural problems. Abelson's citation of Barron's observation that the press has glamorized psychedelic drugs and thus contributed to their use should be considered along with an article in *Scientific American* (April 1964) of which Barron was first author and which contains this statement:

> The most systematic survey of the incidence of serious adverse reactions to hallucinogens covered nearly 5000 cases, in which LSD was administered on more than 25,000 occasions. Psychotic reactions lasting more than 48 hours were observed in fewer than two-tenths of one percent of the cases.

Regarding possible chromosomal damage, a great deal more work must be done before any conclusions are warranted. There were two studies in *Science* which showed that LSD induced an abnormally high rate of chromosomal breaks in peripheral blood cells (*1*). But there was also a study which not only failed to find the effect, but also raised important methodological problems concerning the criteria for determining a chromosomal break as well as the dosages of LSD used in obtaining the effect (*2*). None of the three mentioned the problem of inferring damage to sex cells from evidence of damage to blood cells. After all, if the important question concerns genetic damage to offspring of LSD users, then data on peripheral blood cells is not, by itself, sufficient to conclude that LSD is a genetic risk. It isn't even known whether LSD penetrates gonadal tissue, let alone whether it causes chromosomal abnormalities there.

The studies on fetal abnormalities are of a quite different sort, since the mechanism by which LSD induces such damage is very likely not genetic and also because a wide variety of other drugs, if injected directly into the abdominal cavity of pregnant rodents, are teratogenic.

WILLIAM A. MYERS
Regional Primate Research Center,
University of Wisconsin, Madison

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1. M. M. Cohen, M. J. Marinello, M. Back, *Science* **155**, 1417 (1967); S. Irwin and J. Egozcue, *ibid.* **157**, 313 (1967).
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Is "pot" an enemy or a victim? Are we, as a supposedly advanced nation, pursuing a rational or hysterical line in handling consciousness-changing substances and educating for their appropriate uses or avoidance? We adhere to two points of view, often characterizing different aspects of the same individual or community. These are the "nobody's gonna tell me what to do" (inherited from our frontier past) and the "destroy evil" from our witch-burning past (a far less realistic, more medieval mystique). We must have a witch to burn.

In general, sexual mores are changing; most people drink some alcohol, many smoke tobacco, and an increasing number seem to be taking up other consciousness-changers. Cigarette smokers are medically warned but otherwise left alone to plague nonsmokers with their evil-smelling habit. Alcohol is available everywhere but the drinker is not molested unless he takes enough to destroy his judgment and control.

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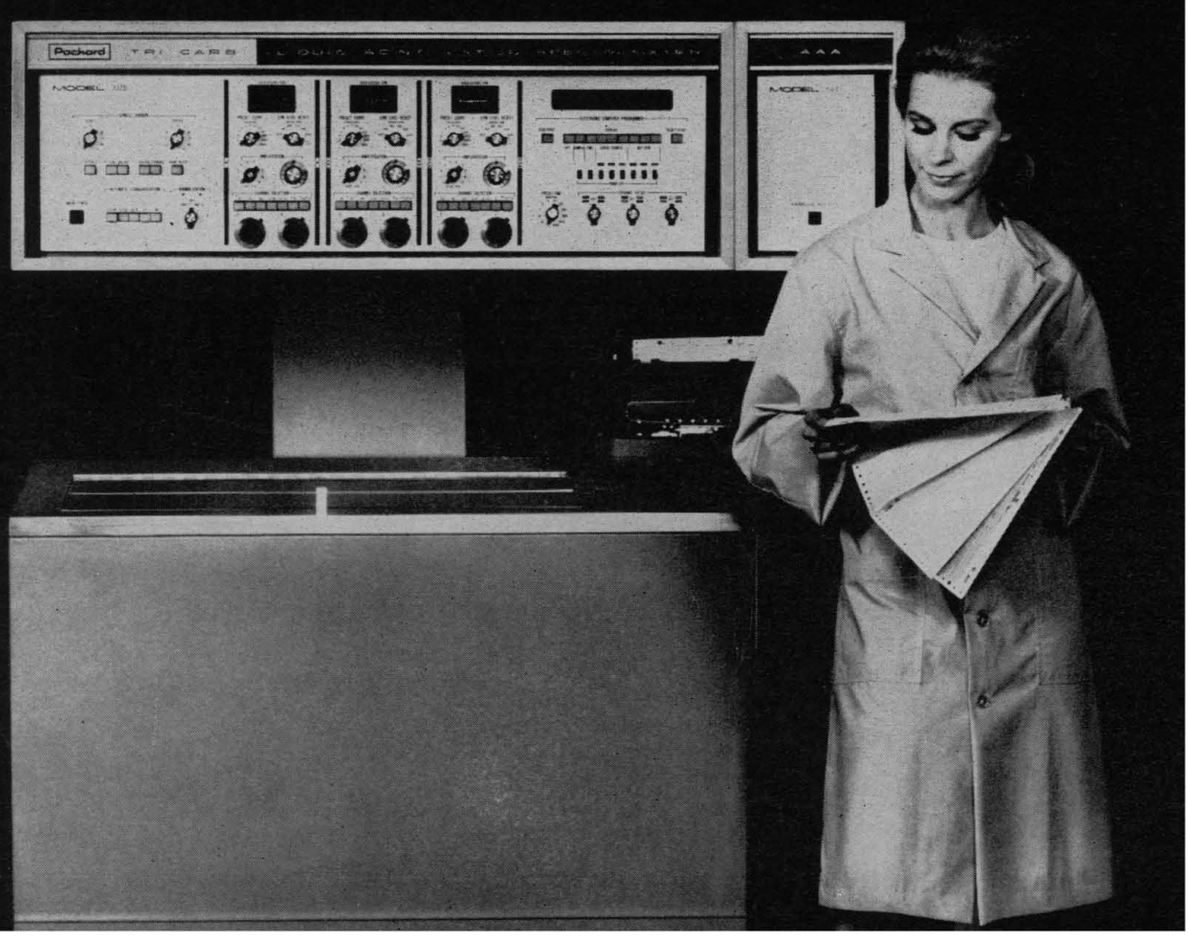

"Acid" (LSD) may indeed be a demon incarnate, yet until lately one might legally possess it. "Pot," however, seems to have been tapped for Witch without analysis, trial, or reconsideration. What is the solid and impartial evidence?

Maybe we should all just drink milk, but in these days of increased pressure and strain, as well as widening existential adventure, I doubt this will suffice. Consciousness-changing additives will continue in use. Therefore it would seem that education and rational control should supplant hysterical persecution and attempted suppression. Remember the old bootleg days before repeal? "Pot" is the Witch of today as alcohol was then.

I suggest that the effects and dosages of *all* consciousness-changers should be tested by competent scientists and a little manual (like a calorie counter) prepared. Everyone should understand and should watch—or avoid—intake, as many of us now watch calories and cholesterol levels. Second, if "pot" turns out to be relatively innocent, it should be legalized for sale, graded like coffee, and taxed like cigarettes. In this way the states and the federal government would make a steady profit instead of the bootleggers (should it be "grassleggers"?). In addition, carefully reasoned investigation would take the place of the wild honking, braying, and persecution which now prevail.

EMMA LOU DAVIS
San Diego Museum of Man,
Balboa Park, San Diego, California

I was intrigued by the recent cover painting executed under the influence of LSD (15 Mar.), in contrast to the artist's customary style, so I initiated a poll of 50 laboratory workers to determine which painting each preferred and why. Twenty preferred the painting done under the influence of LSD, and 30 preferred the conventional painting. Of the former group, the general consensus was that the painting was more expressive in contrast to the customary painting which was felt to be essentially reproductive and similar in value to that of a photograph. The group expressing preference for the customary painting simply indicated that they liked it better.

Of the 50 individuals polled, the group favoring the LSD painting had a mean age of 29 years, and the group favoring the conventional painting, 32 years. Examination of the entire group by age distribution revealed a difference

for those less than 25 years of age as compared with those more than 25 years of age. Thirty-five individuals were 25 years or older. Twelve of the 35 (34 percent) preferred the LSD painting, whereas 23 (56 percent) preferred the conventional painting. Fifteen individuals were less than 25 years of age. Of the 15, 8 (53 percent) preferred the LSD painting and 7 (47 percent) preferred the conventional painting. Thus, it is clear that there was a reversal of preference about the age 25. A further effort was made to characterize the group and evaluate each individual as to how much of a "swinger" he or she was. Scores of 1 to 5 were assigned, with 1 representing the least swinging of the group and 5 the most swinging of the group. This simple system obviously has deficiencies; however, it is interesting to note that the group preferring the LSD painting had a mean score of 3.4 and the group preferring the conventional painting had a mean score of 2.9.

Although the results suggest that the group preferring the painting executed under the influence of LSD is a younger and more swinging group, the sample is small and the methods of study informal and not precise. The members of the group who preferred the conventional painting as well as readers of the same mind are certain to counter that our study has shown *L*ittle *S*ignificant *D*ifference.

PAUL T. WERTLAKE
Clinical Laboratory,
679 South Westlake Avenue,
Los Angeles, California 90057

IBP Delays

May I add to your concise report on the ills of U.S. participation in the International Biological Program (22 Mar.): It is highly improbable that a group of individuals who cannot agree on what constitutes a community can agree to get together for international cooperative research on communities. Not only is this an inauspicious time to commence major projects requiring new funds, but there is reason to believe that the field of ecology is not mature enough to benefit from a large-scale, coordinated program. This double misfortune is particularly disheartening since we are already in very deep ecological trouble.

HERBERT CURL, JR.
Department of Oceanography, Oregon State University, Corvallis 97331

7 June 1968, Volume 160, Number 3832 **SCIENCE**

Matching Education to Jobs in Developing Nations *

One of the important resources of a developing country is human talent—specifically, trained managers and scientist-engineers. Not only is their availability crucial, but their training, experience, and interests should match the economic and job opportunities of their country. To be sure, talented people often develop their own opportunities. But where there is a serious mismatch, opportunities cannot be exploited because of lack of talent, or, conversely, talent emigrates and we witness a "brain drain."

What makes the matching difficult, and calls for planning, is the fact that the training of technologists requires a long lead time. This time can be reduced by giving students a sufficient grounding in the fundamentals of science, so that they can modify their area of specialization to fit changing economic conditions and keep abreast of new technical developments. But it is clearly not feasible to train just generalists; an engineering curriculum, for example, must include some specialization.

In the United States there is little conscious planning to relate academic training to prospective economic development; the marketplace eventually influences the development of new curricula. As a result, there is often a long time lag between requirement and availability, and, conversely, an oversupply of individuals with training of a particular kind after the requirement has disappeared. It is not unusual to find engineering schools teaching courses which are completely antiquated in terms of modern technology. On the other hand, new teaching departments are being set up in fashionable fields having current government support, often with little thought for the real requirements of the future.

For the less developed countries, a waste of trained manpower can be a serious problem. There must be planning if there is to be good coordination between academic curricula and economic development. It is not easy to specify the kind of planning in detail, but it usually involves a decision on which way the national university should expand. A group of experts from the country concerned, working in collaboration with technologists from other countries, might form some estimate of future economic opportunities in the light of probable technical developments.

Let me give some examples. (i) Development of nuclear power and nuclear desalting of seawater will require plants for the reprocessing of nuclear fuel. This will focus attention not only on the disposal but also on the economic utilization of radioactive waste material—developments that will require trained manpower. (ii) If there is a breakthrough in technology for exploiting the resources of the oceans, then a country having trained people would be able to benefit from it immediately. A parallel case is that of the transistor; it was invented in the United States, but Japan, because it had people with the needed training, was able to participate effectively in its exploitation.

The United States has been able to absorb inefficiency in its production of trained manpower. Developing countries, on the other hand, having limited educational facilities, a limited college population, and limited resources, cannot afford waste and will have to plan quite carefully the training and utilization of their human talent.—S. FRED SINGER, *Deputy Assistant Secretary for Scientific Programs, U.S. Department of the Interior*

* This editorial is adapted from remarks made before the Inter-American Development Bank, May 1968.—ED.

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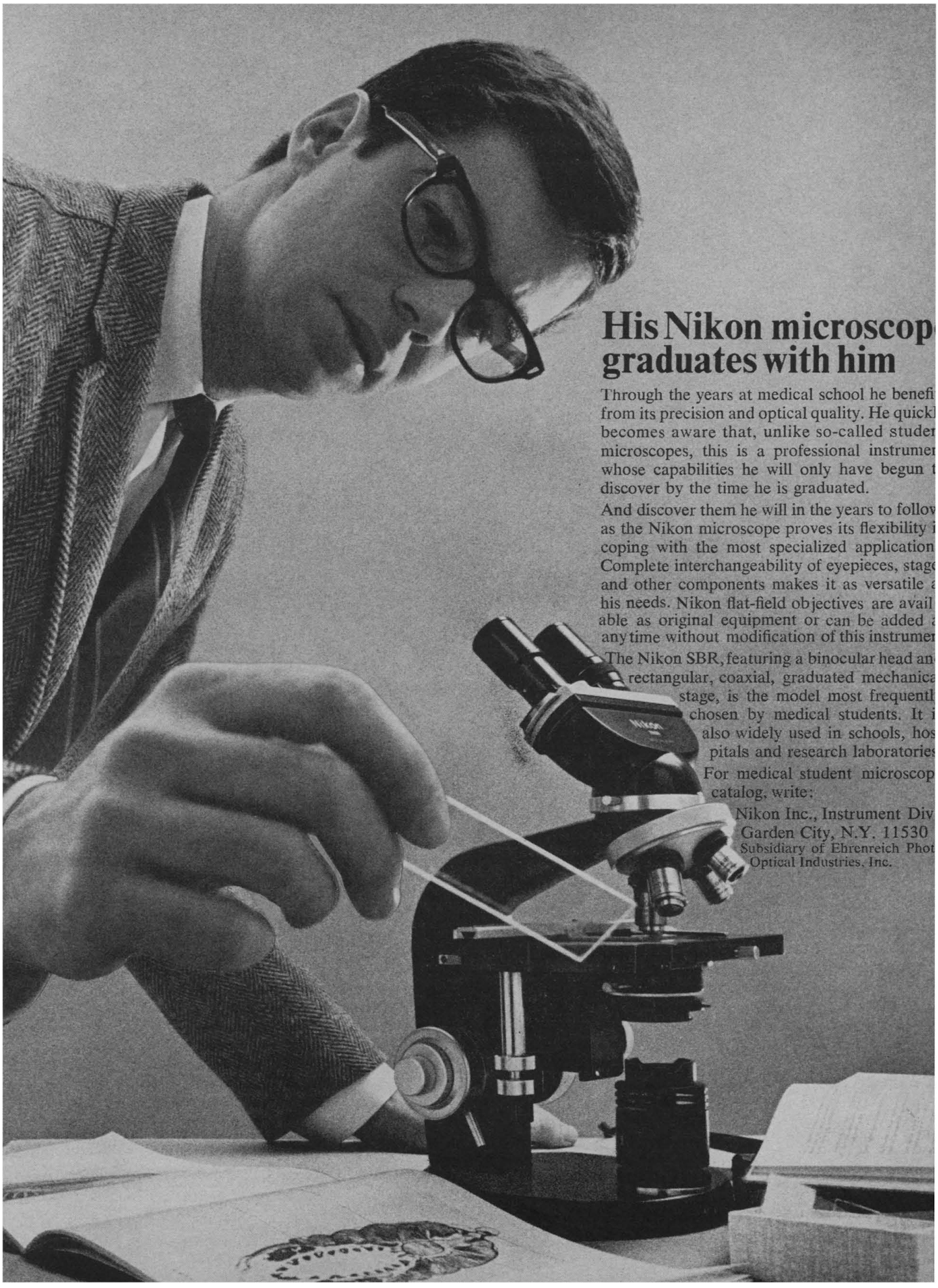

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graphical distribution of coral reefs is the high activation energy of the calcification process; a slight increase in temperature results in a great increase in calcification rate. The relatively high temperature for "cold death" of coral tissue may be a result of the association of the tissue with the calcified skeleton, or may be a secondary adaptation to warmer climes.

The unusual distribution among the coelenterates of two enzymes of carbohydrate metabolism was the subject of the final report (D. Powers, University of Kansas). Following the recent discovery in hydra by C. Rutherford (University of Miami) that glucose-6-phosphate dehydrogenase activity (G6PDH) is abundant and that 6-phosphogluconate dehydrogenase activity (6PGDH) is absent, Powers surveyed over 20 marine coelenterates for these two enzyme activities. He found that extracts of all hydroids tested (marine or fresh-water) had G6PDH, but lacked 6PGDH. Extracts of all other coelenterates tested, except the scyphozoans, had both activities. Two of three scyphozoans which were tested lacked detectable 6PGDH. Other enzyme activities that might be involved in the metabolism of 6-phosphogluconate (6PG) or of gluconic acid were assayed and found to be absent in hydroids. The hydroids and scyphozoans could degrade 6PG, however, presumably by the 6PG phosphatase activity described in hydra by Rutherford (in preparation).

The results presented at the formal and final session of the training program gave promise that more intensive application of a wider variety of experimental techniques to marine organisms will open new avenues for research in many virtually unexplored areas of experimental marine biology.

This program was supported by a grant (GB-6134) from the Facilities and Special Programs Section of the National Science Foundation awarded to Philip Helfrich and Vernon Brock of the Hawaii Institute of Marine Biology. The instructors were the undersigned. Visiting instructors were R. Mariscal (University of Miami) and A. Reed (Michigan State University). Lectures on Hawaiian lore were given by Kaupena Wong (Bishop Museum). Summary of the research will be published in a monograph, *Experimental Coelenterate Biology*, by University of Hawaii Press. The program for the summer of 1968 will be in molluscan biology, and the instructors will be M.

Wells (Cambridge University, England), V. Fretter (Reading University, England), A. Kohn (University of Washington), and A. H. Kay (University of Hawaii).

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2. W. F. Loomis, *Ann. N.Y. Acad. Sci.* **62**, 209 (1955).
3. C. Fulton, *J. Gen. Physiol.* **46**, 823 (1963).
4. L. Muscatine and H. M. Lenhoff, *Science* **142**, 956 (1963).
5. Contribution No. 288 of the Hawaii Institute of Marine Biology.

Calendar of Events

National Meetings

June

16–20. American Soc. of **Ichthyologists and Herpetologists**, Ann Arbor, Mich. (D. Tinkle, Museum of Zoology, Univ. of Michigan, Ann Arbor 48104)

16–21. American Soc. of **Parasitologists**, 43rd annual, Madison, Wis. (G. W. Hunter, Dept. of Microbiology, Univ. of Florida Medical School, Gainesville 32601)

16–21. **Weights and Measures**, 53rd natl. conf., Washington, D.C. (M. W. Jensen, National Bureau of Standards, Washington, D.C. 20234)

17–19. American **Marketing** Assoc., Philadelphia, Pa. (The Association, 230 N. Michigan Ave., Chicago, Ill. 60601)

17–19. American **Neurological** Assoc., Washington, D.C. (M. D. Yarh, 710 W. 168 St., New York 10032)

17–19. **Biomedical Engineering**, San Diego, Calif. (D. L. Franklin, Scripps Clinic and Research Foundation, La Jolla, Calif.)

17–19. American **Physical** Soc., Los Alamos, N.M. (W. W. Havens, 528 W. 120 St., New York 10027)

17–20. American **Dairy Science** Assoc., Columbus, Ohio. (C. Cruse, Executive Secretary, 903 Fairview Ave., Urbana, Ill. 61801)

17–21. **Automating and Miniaturizing Government Records**, Washington, D.C. (Director, Center for Technology and Administration, American Univ., 2000 G St., NW, Washington, D.C. 20006)

18–21. American Soc. of **Agriculture Engineers**, 61st annual, Logan, Utah. (The Society, P.O. Box 229, St. Joseph, Mich. 49085)

19–21. **Analytical Chemistry**, University Park, Pa. (A. T. Winstead, National Meet-

ings and News Div., 1155 16th St., NW, Washington, D.C. 20006)

19–21. **Colloids**, 42nd symp., Chicago, Ill. (P. Becher, Chemical Research Dept., Atlas Chemical Industries, Wilmington, Del. 19899)

23–27. **Air Pollution Control** Assoc., 61st annual, St. Paul, Minn. (A. Arch, Executive Secretary, 4400 Fifth Ave., Pittsburgh, Pa. 15213)

23–27. American Soc. of **Psychosomatic Dentistry and Medicine**, Tamiment, Pa. (H. S. Tobey, 700 Park Ave., Plainfield, N.J.)

23–28. American Inst. of **Homeopathy**, Washington, D.C. (W. O. Baker, 1635 Harvard St., NW, Washington, D.C. 20009)

23–28. American Soc. for **Testing and Materials**, 71st annual, San Francisco, Calif. (T. A. Marshall, Jr., 1916 Race St., Philadelphia, Pa. 19103)

24–26. American Assoc. of **Physics Teachers**, Tempe, Ariz. (S. Ballard, Univ. of Florida, Gainesville 32601)

24–26. **Thermophysics** Conf., American Inst. of Aeronautics and Astronautics, Los Angeles, Calif. (Meetings Secretary, 345 E. 47 St., New York 10017)

24–29. American **Meteorological** Soc., joint with AAAS Pacific Div., Logan, Utah. (The Society, 45 Beacon St., Boston, Mass. 02108)

24–29. Western Soc. of **Soil Science**, Logan, Utah. (J. L. Young, Agricultural Research Service, SWC-NWB, Soils Dept., Oregon State Univ., Corvallis 97331)

25–27. **Precision Electromagnetic Measurements**, Boulder, Colo. (Secretary, 1968 Conf. on Precision Electromagnetic Measurements, National Bureau of Standards, Boulder)

26–27. American **Geriatrics** Soc., New Orleans, La. (E. Henderson, Room 1405, 10 Columbus Circle, New York 10019)

26–28. Biennial **Polymer** Symp., American Chemical Soc., Amherst, Mass. (A. T. Winstead, Natl. Meetings and News Div., 1155 16th St., NW, Washington, D.C. 20006)

26–29. American **Optometric** Assoc. 71st annual congr., Miami Beach, Fla. (AOA Congr., 7000 Chippewa St., St. Louis, Mo. 63119)

27–30. Society of **Nuclear Medicine**, St. Louis, Mo. (S. N. Turiel, Executive Director, 333 N. Michigan Ave., Chicago, Ill. 60601)

30–5. American **Physical Therapy** Assoc., Chicago, Ill. (The Association, 1740 Broadway, New York 10019)

July

8–11. **Soil Conservation** Service and Experiment Stations, Clemson, S.C. (G. R. Craddock, Agronomy and Soil Dept., Clemson Univ., Clemson)

9–13. American **Therapeutic** Soc., Essex House, New York, N.Y. (R. T. Smith, 37 Narbrook Park, Narberth, Pa. 19072)

12. American Assoc. for the Study of **Headache**, New York, N.Y. (S. Diamond, 5214 N. Western Ave., Chicago, Ill. 60625)

13–17. American **Medical** Assoc., New York, N.Y. (F. J. L. Blasingame, 535 N. Dearborn St., Chicago, Ill. 60610)

14–16. American Inst. of **Aeronautics and Astronautics**, San Francisco, Calif.

(Meetings Manager, ASME, 345 E. 47 Street, New York 10017)

21–25. American **Veterinary Medical** Assoc., Boston, Mass. (Director, Business Div., 600 S. Michigan Ave., Chicago, Ill. 60605)

22–27. American **Medical Technologists**, Dallas, Tex. (American Medical Technologists, 710 Higgins Rd., Park Ridge, Ill. 60068)

23–26. American Soc. of **Pharmacognosy**, Iowa City, Iowa. (D. P. Carew, College of Pharmacy, Univ. of Iowa, Iowa City 52240)

25–30. American **Podiatry** Assoc., Chicago, Ill. (J. Tipton, Convention Manager, 2301 16th St., NW, Washington, D.C. 20010)

International and Foreign Meetings

June

20–6. Canadian **Physiotherapy** Assoc., Calgary, Alta. (A. Way, 208 40th Ave., SW, Calgary)

23–26. **Medicinal Chemistry** Symp., 11th joint with American Chemical Soc., Quebec, P.Q., Canada. (C. R. Engel, Dept. of Chemistry, Laval Univ., Quebec 10)

23–26. Canadian **Pediatric** Soc., Saskatoon, Sask. (W. Kinnear, 213 Canada Bldg., Saskatoon)

23–27. Conference on **Interactions between Sub-Units of Biological Macromolecules**, Cambridge, England. (D. C. Holmes, Lab. of Molecular Biology, Hills Rd., Cambridge)

23–27. Canadian Soc. of **Laboratory Technologists**, 32nd annual, Edmonton, Alta. (The Society, 99 Wentworth St., S., Hamilton, Ont.)

23–29. **Catalysis**, 4th intern. congr., Moscow, U.S.S.R. (B. D. Polkovnikov, Inst. of Organic Chemistry, Leninskii Prospect 47, Moscow B-334)

23–29. **High-Speed Photography**, 8th intern. congr., Stockholm, Sweden. (T. Ramqvist, % Research Inst. of National Defense, FAO 2, Stockholm)

23–29. International Union of **Pure and Applied Chemistry**, 4th intern. congr. on catalysis, Moscow, U.S.S.R. (B. D. Polknovnikov, % Inst. of Organic Chemistry, 47 Leninskii Prospekt, Moscow B-334)

24–27. Canadian Soc. of **Agronomy**, annual mtg., Hamilton, Ont. (R. Loilelle, Ottawa Research Station, Central Experimental Farm, Ottawa, Ont.)

24–27. Canadian Soc. for **Horticultural** Science, Hamilton, Ont. (E. C. Lougheed, Dept. of Horticulture, Univ. of Guelph, Guelph, Canada)

24–27. Canadian Soc. of **Soil Science**, Hamilton, Ont. (A. R. Mack, Soil Research Inst., Central Experimental Farm, Ottawa, Ont., Canada)

24–27. Structure of **Viruses and Other Micro-Molecules**, Cambridge, England. (J. Kendrew, % Laboratory of Molecular Biology, University Postgraduate Medical School, Cambridge)

24–28. **Great Lakes Water Resources**, joint Canadian–U.S. conf., Toronto, Ont., Canada. (W. H. Wisley, United Nations Plaza, 345 E. 47 St., New York 10017)

24–28. **High-Temperature Materials**, 6th intern. Plansee seminar, Reutte, Austria. (F. Benesovsky Metallweek Plansee, A.G., Postfach 74, A-6600 Reutte, Tyrol)

25–28. **Gas Chromatography and Its Exploration**, intern. symp., Copenhagen, Denmark. (C. L. A. Harborum, British Petroleum Research Co., Chertsey Rd., Sunbury-on-Thames, Middlesex, England)

25–4. Symposium on **Hill-Land Productivity**, Edinburgh and Aberdeen, Scotland. (Secretary, West of Scotland Agricultural College, Auchincruive, Ayr, Scotland)

26–28. Society of **Photo-Optical Instrumentation Engineers**, Paris, France. (G. Emschwiller, 10 rue Vauquelin 75, Paris 5°)

28–29. **Endocrine** Soc., Mexico City, Mexico. (N. L. Mattox, Executive Secretary, 1211 N. Shartel, Oklahoma City, Okla. 73103)

30–3. **Primatology**, 2nd intern. congr., Atlanta, Ga. (G. H. Bourne, Yerkes Regional Primate Research Center, Emory Univ., Atlanta 30322)

30–6. **Glass**, 6th intern. congr., London, England. (R. Gunther, Intern. Commission on Glass, Badenerstr. 49A, Darlsruhe Durlach, Germany)

30–6. World Problems in **Rehabilitation of the Disabled**, 3rd intern., Brighton, England. (I. R. Henderson, Tavistock House South, Tavistock Sq., London, W.C.1, England)

July

1–6. Conference on **Blood Groups and Protein Polymorphism** in Animals, Warsaw, Poland. (J. Gasparska, Inst. of Experimental Animal Breeding, Polish Acad. of Science, Warsaw)

1–6. **Glass**, 8th intern. congr., London, England. (D. Rider, Glass Manufacturers Federation, 19 Portland Place, London, W.1)

2–5. Engg Problems in **Controlled Thermonuclear Research**, Culham, England. (Technical Administration Office, Culham Laboratory, Room 140, Bldg. E5, Culham, Abingdon, Berks)

3–4. **Vehicle and Road Design for Safety**, Cranfield, England. (Public Relations Officer, Institution of Mechanical Engineers, 1 Birdcage Walk, Westminster, S.W.1, England)

3–5. Canadian **Home Economics** Assoc., Regina, Sask. (L. McConnell, Saskatchewan Power Corp., Regina)

4–11. International Union of **Pure and Applied Physics**, Dubna, U.S.S.R. (V. G. Soloviev, Lab. of Theoretical Physics, Joint Inst. for Nuclear Research, P.O. Box 79, Head Post Office, Moscow, U.S.S.R.)

5–6. **Digestive Endoscopy**, 1st European congr., Prague, Czechoslovakia. (Secretary, European Congr., of Digestive Endoscopy, Sokolska 31, Prague 2)

7–13. British Assoc. of **Paediatric Surgeons**, 15th intern. congr., Liverpool, England. (J. Lister, Children's Hospital, Western Bank, Sheffield 10, England)

7–13. Association of National European and Mediterranean Societies of **Gastroenterology**, 8th intern. congr., Prague, Czechoslovakia. (Z. Maratka, Sokolska 31, Prague 2)

8–9. Canadian **Aeronautics and Space** Inst., Montreal, P.Q. (Secretary, CASI, 77 Metcalfe St., Ottawa 4, Ont.)

8–13. **Chemistry of Natural Products**, 5th intern. symp., London, England. (Secretary, % The Chemical Soc., Burlington House, London, W.1)

8–20. International Soc. for **Photogrammetry**, 11th congr., Lausanne, Switzerland. (W. K. Buchmann, % Inst. de Photogrammetrie, 1000 Ave. du Cour, Lausanne)

9–12. **Chemistry of Organic Silicon Compounds**, Bordeaux, France. (R. Calas, Lab. of Organic Chemistry, Univ. of Bordeaux, 20, Cours Pasteur, Bordeaux)

10–12. Commonwealth Conf. on **Plant Pathology**, 8th, Surrey, England. (The Director, Commonwealth Mycological Inst., Ferry Lane, Kew, Surrey)

10–12. **Primatology**, 2nd intern. congr., Atlanta, Ga. (G. H. Bourne, Yerkes Regional Primate Research Center, Emory Univ., Atlanta 30322)

10–21. **Large Electric Systems**, 22nd intern. conf., Paris, France. (Conf. on Large Electric Systems, 112 Boulevard Haussmann, Paris 8)

11–13. British Assoc. of **Dermatology**, Aberdeen, Scotland. (S. Gold, 149 Harley St., London, W.1, England)

11–13. Canadian Soc. for the Study of **Fertility**, Calgary, Alta. (J. R. O'Brian, Suite 680, 3550 Cote Des Neiges Rd., Montreal, P.Q., Canada)

14–20. World Assoc. for **Animal Production**, Beltsville, Md. (R. E. Hodgson, USDA Animal Husbandry Research Div., Agricultural Research Center, Beltsville, Md. 20705)

15–19. Society for **Analytical Chemistry**, Nottingham, England. (Secretary, The Society, 14 Belgrave Sq., London, S.W.1)

15–22. **Virology**, 1st congr., Helsinki, Finland. (J. Melnick, Dept. of Virology, College of Medicine, Baylor Univ., Houston, Tex. 77025)

21–27. European Assoc. for the Study of **Diabetes**, 4th annual, Louvain, Belgium. (A. E. Renold, Inst. of Clinical Biochemistry, Sentier de la Roseraie, 1211, Geneva 4, Switzerland)

22–25. **Animal Production and Artificial Insemination**, 6th intern. congr., Paris, France. (C. Thibault, Station de Physiologie Animale, C.M.R.Z., 78-Jouy-En-Josas, Seine-et-Oise, France)

22–26. **Pharmaceutical Chemistry**, 2nd intern. symp. Müster/Westfalia, Germany. (IUPAC Symp., Pharmaceutical Chemistry, 44 Münster/Westfalia, Hittorfstrasse 58-62, Germany)

22–26. International Union of **Pure and Applied Chemistry**, 2nd, Münster, Germany. (Symposium Secretariat, IUPAC, Hittorfstrasse 58-62, 44 Münster)

23–25. Institute of **Information Scientists**, Sheffield, England. (R. Sewell, U.S. Steel Companies Ltd., Research and Development Dept., Swinden Laboratories, Rotherham, Yorks, England)

23–27. **Food Chains in the Sea**, Aarhus, Denmark. (H. Tambs-Lyche, Intern. Council for Exploration of the Sea, Charlottenlund Slot, Charlottenlund, Denmark)

24–4. Society of **Economic Geologists**, Cagliari, Sardinia. (R. A. Laurence, Secretary, P.O. Box 1549, Knoxville, Tenn. 37901)

29–23. Australian School of **Nuclear Technology**, Lucas Heights, New South Wales. (The Principal, Australian School of Nuclear Technology, Private Mail Bag, Sutherland, N.S.W.)

31–2. Commonwealth **Medical** Assoc., Canberra, Australia. (D. P. Stevenson, BMA House, Tavistock Sq., London, W.C.1, England)

BOOKS RECEIVED

(Continued from page 1103)

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Concrete Technology and Practice. W. H. Taylor. Angus and Robertson, Melbourne, ed. 2, 1967 (distributed in the United States by Elsevier, New York). xxx + 650 pp., illus. $15.

Conditional Markov Processes and Their Application to the Theory of Optimal Control. R. L. Stratonovich. Translated from the Russian edition (Moscow, 1966) by R. N. McDonough and N. B. McDonough for Scripta Technica, Inc. Elsevier, New York, 1968. xviii + 350 pp., illus. $14.75. Modern Analytic and Computational Methods in Science and Mathematics.

Corporate Management in a World of Politics. The Public, Political, and Governmental Problems of Business. Harold Braymen. McGraw-Hill, New York, 1967. xii + 272 pp. $7.50.

Culture. Man's Adaptive Dimension. M. F. Ashley Montagu, Ed. Oxford University Press, New York, 1968. viii + 289 pp. Cloth, $7.50; paper, $2.50.

The "De Mundo" of William Gilbert. Suzanne Kelly. Hertzberger, Amsterdam, 1965 (distributed in the United States by Schram, New York). 142 pp., illus. Facsimile reprint, 336 pp. $41.50.

Design and Application of Transistor Switching Circuits. Louis A. Delhom. McGraw-Hill, New York, 1968. x + 278 pp., illus. $14.50. Texas Instruments Electronics Series.

Detection, Estimation, and Modulation Theory. Part 1, Detection, Estimation, and Linear Modulation Theory. Harry L. Van Trees. Wiley, New York, 1968. xiv + 697 pp., illus. $20.

Digest of Literature on Dielectrics. Vol. 30, 1966. Prepared by the Committee on Digest of Literature of the Conference on Electric Phenomena, Division of Engineering, National Research Council. National Academy of Sciences, Washington, D.C., 1967. x + 427 pp. $20. NAS–NRC Publication 1496.

Discovery in Physics. Leonard H. Greenberg. Saunders, Philadelphia, 1968. x + 239 pp., illus. Paper, $5.15.

Disease, Pain, and Sacrifice. Toward a Psychology of Suffering. David Bakan. University of Chicago Press, Chicago, 1968. x + 134 pp. $5.95.

Disinfection, Sterilization, and Preservation. Carl A. Lawrence and Seymour S. Block. Lea and Febiger, Philadelphia, 1968. viii + 808 pp., illus. $30.

Drugs Affecting the Central Nervous System. Alfred Burger, Ed. Dekker, New York, 1968. xvi + 437 pp., illus. $19.75. Medicinal Research, vol. 2.

Dynamic Plasticity. N. Cristescu. North-Holland, Amsterdam; Interscience (Wiley), New York, 1967. xii + 614 pp., illus. $25. North-Holland Series in Applied Mathematics and Mechanics, vol. 4.

Ecology and Resource Management. A Quantitative Approach. Kenneth E. F. Watt. McGraw-Hill, New York, 1968. xii + 450 pp., illus. $14.50. McGraw-Hill Publications in the Biological Sciences.

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troduction to a Microscopic Approach. Pierre M. V. Résibois. Harper and Row, New York, 1968. x + 166 pp., illus. $11.25. Harper's Chemistry Series.

Elementary Algebra for College Students. Irving Drooyan and William Wooton. Wiley, New York, ed. 2, 1968. xii + 302 pp., illus. $6.95.

The Elements of Probability and Sampling. Frank A. Friday. Barnes and Noble, New York, 1967. xviii + 130 pp., illus. $6.

Electromagnetics and Plasmas. James R. Wait. Holt, Rinehart and Winston, New York, 1968. xii + 144 pp., illus. $7.95.

Elsevier's Dictionary of High Vacuum Science and Technology. In Six Languages: German, English, French, Spanish, Italian, Russian. Compiled and arranged on a German alphabetical basis by Fritz Weber. Elsevier, New York, 1968. Unpaged. $29.

The Eruption of Hekla 1947–1948. I. The Eruptions of Hekla in Historical Times. A Tephrochronological Study. S. Thorarinsson. Leiftur, Reykavík, 1967. 183 pp., illus. Paper, Kr. 250. Societas Scientiarum Islandica.

Essentials of Modern Physics Applied to the Study of the Infrared. Armand Hadni. Pergamon, New York, 1967. xvi + 728 pp., illus. $24. International Series of Monographs in Infrared Science and Technology, vol. 2.

The Experimental Basis of Gastric Ulcer Pharmacotherapy. S. V. Anichkov and I. S. Zavodskaya. Translated from the Russian edition (Leningrad) by Alan Huxley. Pergamon, New York, 1968. vi + 171 pp., illus. $10.

Experimental Chemotherapy. Vol. 5, Chemotherapy of Neoplastic Diseases, part 2. R. J. Schnitzer and Frank Hawking, Eds. Academic Press, New York, 1967. xviii + 540 pp., illus. $28.

Fibrinogen. Koloman Laki, Ed. Dekker, New York, 1968. xiv + 398 pp., illus. $19.50.

Finite-Difference Equations and Simulations. Francis B. Hildebrand. Prentice-Hall, Englewood Cliffs, N.J., 1968. xii + 338 pp., illus. $12.75.

Finite Groups. Daniel Gorenstein. Harper and Row, New York, 1968. xvi + 527 pp. $17. Harper's Series in Modern Mathematics.

Finite Mathematics. William H. Richardson. Harper and Row, New York, 1968. xii + 191 pp., illus. $7.95.

First Holloman Symposium on Primate Immunology and Molecular Genetics. Proceedings of a symposium, New Mexico, September 1966. C. H. Kratochvil, Ed. Karger, Basel, 1968 (distributed in the United States by Phiebig, White Plains, N.Y.). xvi + 99 pp., illus. $4. Primates in Medicine, vol. 1.

Formulation of Research Policies. Collected papers from a Gordon Research Conference international symposium, Santa Barbara, Calif., January–February 1966. Lawrence W. Bass and Bruce S. Old, Eds. AAAS, Washington, D.C., 1967. viii + 210 pp., illus. $7.75; AAAS members, $6.75 (cash order). AAAS Publication No. 87.

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$3.95. Harper's Experimental Psychology series.

The Frontier States. Alaska and Hawaii. Richard Austin Smith and the Editors of Time-Life Books. Time-Life Books, New York, 1968. 192 pp., illus. $4.95.

Fundamental Genetics of Streptomycetes. J. Horváth. Akadémiai Kiadó, Budapest, 1968. 119 pp., illus. $4.90.

Fundamentals of Operations Research. Russell L. Ackoff and Maurice W. Sasieni. Wiley, New York, 1968. xii + 455 pp., illus. $10.50.

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Gel Chromatography: Gel Filtration, Gel Permeation, Molecular Sieves. A Laboratory Handbook. Helmut Determann. Translated from the German by Erhard Gross. Springer-Verlag, New York, 1968. xii + 195 pp., illus. $8.

Giants, Dragons, and Gods. Constellations and Their Folklore. Text and illustrations by Dirk Gringhuis. Meredith Press, New York, 1968, 76 pp., $3.95.

The Grasshoppers (Acrididae) of New Zealand. Their Taxonomy and Distribution. R. S. Bigelow. University of Canterbury, Christchurch, New Zealand, 1967. 152 pp., illus. $3.30. University of Canterbury Publications, No. 9.

Growth Regulating Substances for Animal Cells in Culture. Proceedings of a symposium, Philadelphia, March 1967. Vittorio Defendi, Michael Stoker, and Angela Parsons, Eds. Wistar Institute Press, Philadelphia, 1967. iv + 125 pp., illus. Paper, $5. Wistar Institute Symposium Monograph, No. 7.

A Handbook of Numerical Matrix Inversion and Solution of Linear Equations. Joan R. Westlake. Wiley, New York, 1968. x + 171 pp., illus. $10.95.

Handbook of Physiology. A Critical, Comprehensive Presentation of Physiological Knowledge and Concepts. Section 6, Alimentary Canal; vol. 3, Intestinal Absorption. Charles F. Code *et al.*, Eds. American Physiological Society, Washington, D.C., 1968 (distributed by Williams and Wilkins, Baltimore). viii + 651 pp., illus. $22.

Health Insurance for Mental Illness. Patricia L. Scheidemandel, Charles K. Kanno, and Raymond M. Glasscote. Joint Information Service of the American Psychiatric Association and the National Association for Mental Health, Washington, D.C., 1968. xiv + 89 pp., illus. Paper, $2.50.

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illus. $13.50. Reprint of the 1949 edition.

Heredity. Disease, and Man. Genetics in Medicine. Alan E. H. Emery. University of California Press, Berkeley, 1968. xii + 247 pp., illus. $6.95. Perspectives in Medicine.

High Energy Physics and Nuclear Structure. Proceedings of the 2nd international conference, Rehovoth, Israel, February–March 1967, under the auspices of the Israel Academy of Sciences and Humanities and the International Union of Pure and Applied Physics. Gideon Alexander, Ed. North-Holland, Amsterdam; Interscience (Wiley), New York, 1967. viii + 489 pp., illus. $23.

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Historical Roots of Contemporary Psychology. Benjamin B. Wolman, Ed. Harper and Row, New York, 1968. viii + 376 pp., illus. $11.75.

Hormones in Blood. Vol. 2. C. H. Gray and A. L. Bacharach, Eds. Academic Press, New York, ed. 2, 1967. xviii + 686 pp., illus. $26.

Iceland and Mid-Ocean Ridges. Report of a symposium, Reykjavík, February 1967. Sveinbjörn Björnsson, Ed. Leiftur, Reykjavík, 1967 (available from Jonsson, Reykjavík). 209 pp., illus. Paper, Kr. 250. Societas Scientiarum Islandica, 38.

Inquiry into Life. Henry E. Childs, Jr., and L. Louise Cramer. Illustrated by Michael G. Burns and Beverly Eckles. Brown, Dubuque, Iowa, ed. 3, 1968. xii + 177 pp. Loose-leaf binder, $3.75.

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International Symposium: Enzymatic Aspects of Metabolic Regulation. Mexico City, November–December 1966. M. P. Stulberg, Ed. U.S. Department of Health, Education, and Welfare, Bethesda, Md., 1967 (available from Biology Division, Oak Ridge National Laboratory, Oak Ridge, Tenn.). xiv + 343 pp., illus. $3.25. National Cancer Institute Monograph 27.

In the Name of America. The conduct of the war in Vietnam by the armed forces of the United States as shown by published reports, compared with the Laws of War binding on the United States government and on its citizens. Seymour Melman, Director of Research. Study commissioned and published by Clergy and Laymen Concerned about Vietnam, 1968. x + 421 pp. Cloth, $4.95; paper, $2.95.

Intra-Uterine Development. Allan C. Barnes. Lea and Febiger, Philadelphia, 1968. xiv + 530 pp., illus. $18.50.

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