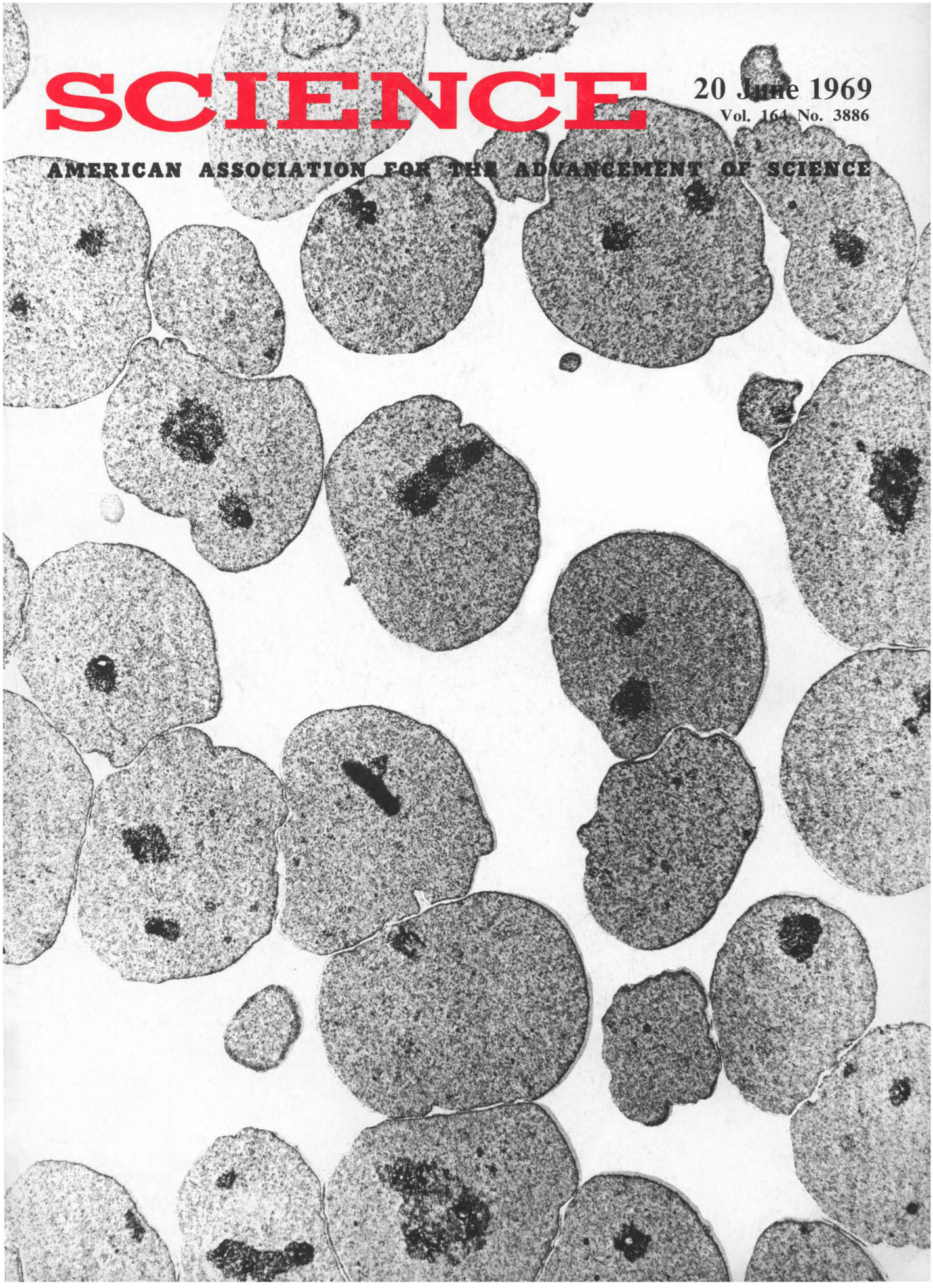
SCIENCE

20 June 1969

Vol. 164 No. 3886

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



At $5500, the new L3-40 is the outstanding value in the low and intermediate speed range. It combines the heart of an ultracentrifuge with the acceleration and convenience of a centrifuge. At low speeds, it gobbles up material like bacteria and cells two liters at a time. At top speeds, it generates a wrenching 272,000g of force to spin down viruses and subcellular particles.

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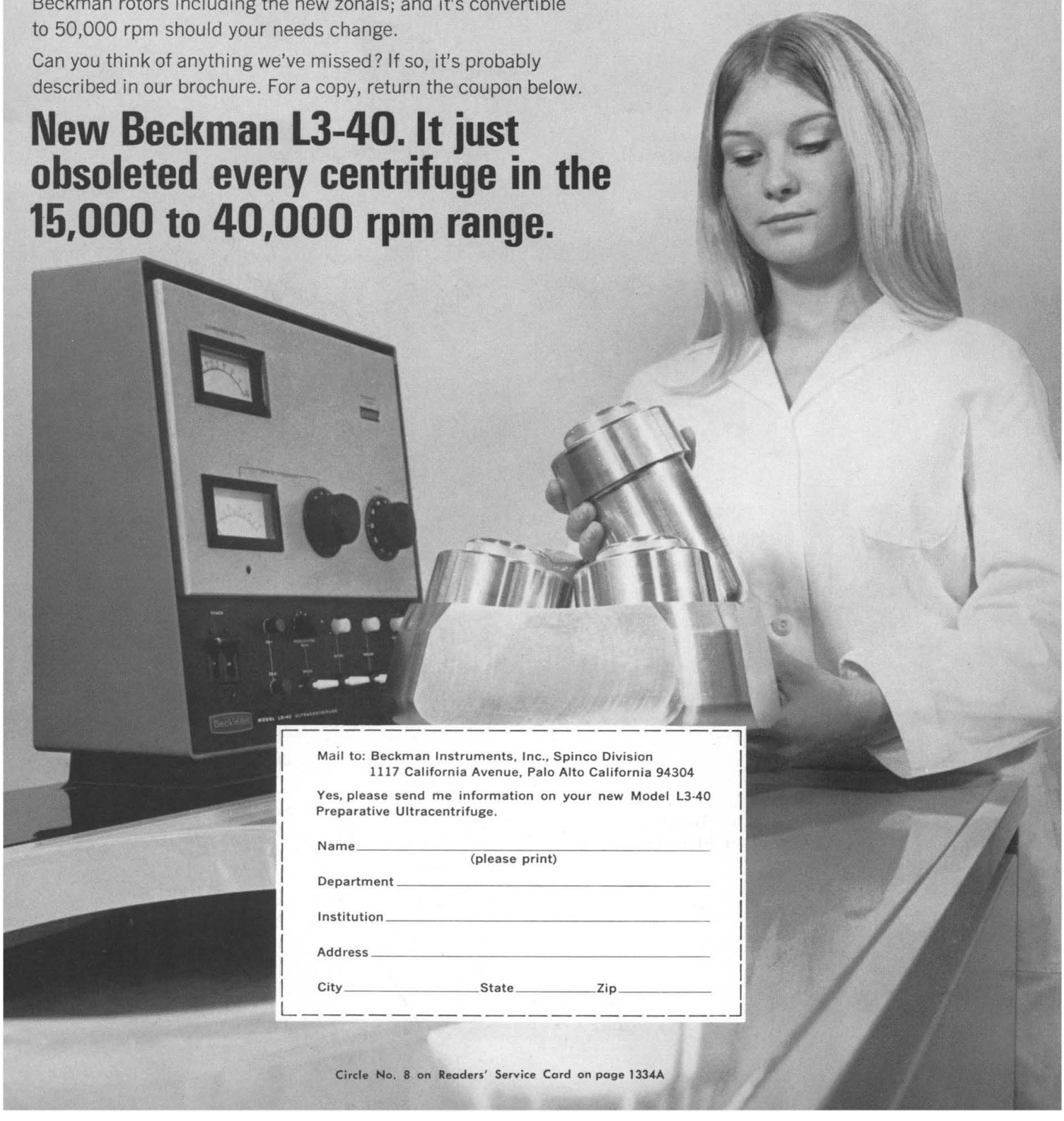

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Yes, please send me information on your new Model L3-40 Preparative Ultracentrifuge.

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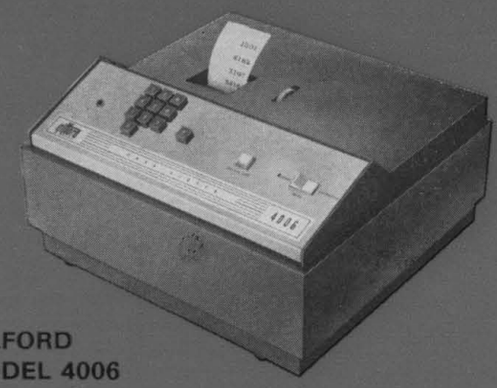

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Routine clinical determinations can now be processed with sizable savings in sample preparation time and reagent costs.

***We have prepared new *Gilford Clinical Chemistry Procedures,* featuring micro-sample techniques adaptable to your laboratory. You are invited to call 216/774-1041 or write for your copies, today.**

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As an extension of the productivity and convenience of the Gilford Model 300-N Micro-Sample Spectrophotometer, the Gilford Model 4006 Data Lister automatically prints out four-digit absorbance or concentration measurements. Transcription time and error are minimized. In addition, the data lister can be manually programmed to obtain a permanent record of patient, date or other identifying code.

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Permanent Printed Record: Urea Nitrogen test results with patient identifying code.

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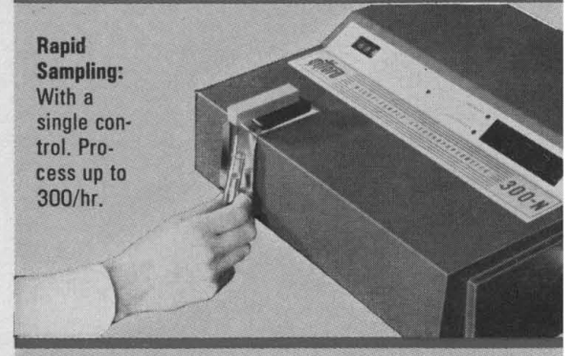
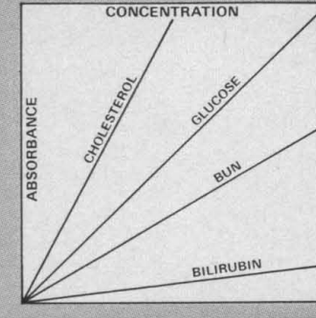
6158	0099
6173	0224
6176	0173

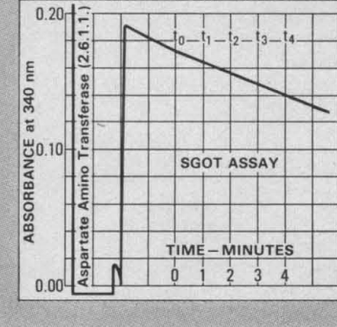
Rapid Sampling: With a single control. Process up to 300/hr.



Standard Curves Built In: Read concentration *directly.* Calibrate just once. Then read your unknowns.



Enzyme Analysis Directly. Recorded:



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20 June 1969
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SCIENCE

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AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

COVER

Isolated nuclei from HeLa cells (human carcinoma of uterine cervix, grown in tissue culture). The embedding background has been removed by the photoengraver. See page 1408. [Electron micrograph (about × 5000), T. Kakefuda and E. Olson, National Institutes of Health]

The Emancipator Becomes a Show-off!

The HP 9100A Calculator gave you

Freedom from waiting to get on the BIG computer;

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NOW—EVEN GREATER COMPUTING FREEDOM IS YOURS. GRAPHIC DISPLAY

Add the new HP 9125A X-Y Recorder. Make your HP 9100A desk-top computing calculator a show-off. You will be liberated from the tediousness of hand-plotting, from the omnipresent human errors and from inundating reams of data that go with point-to-point hand plotting.

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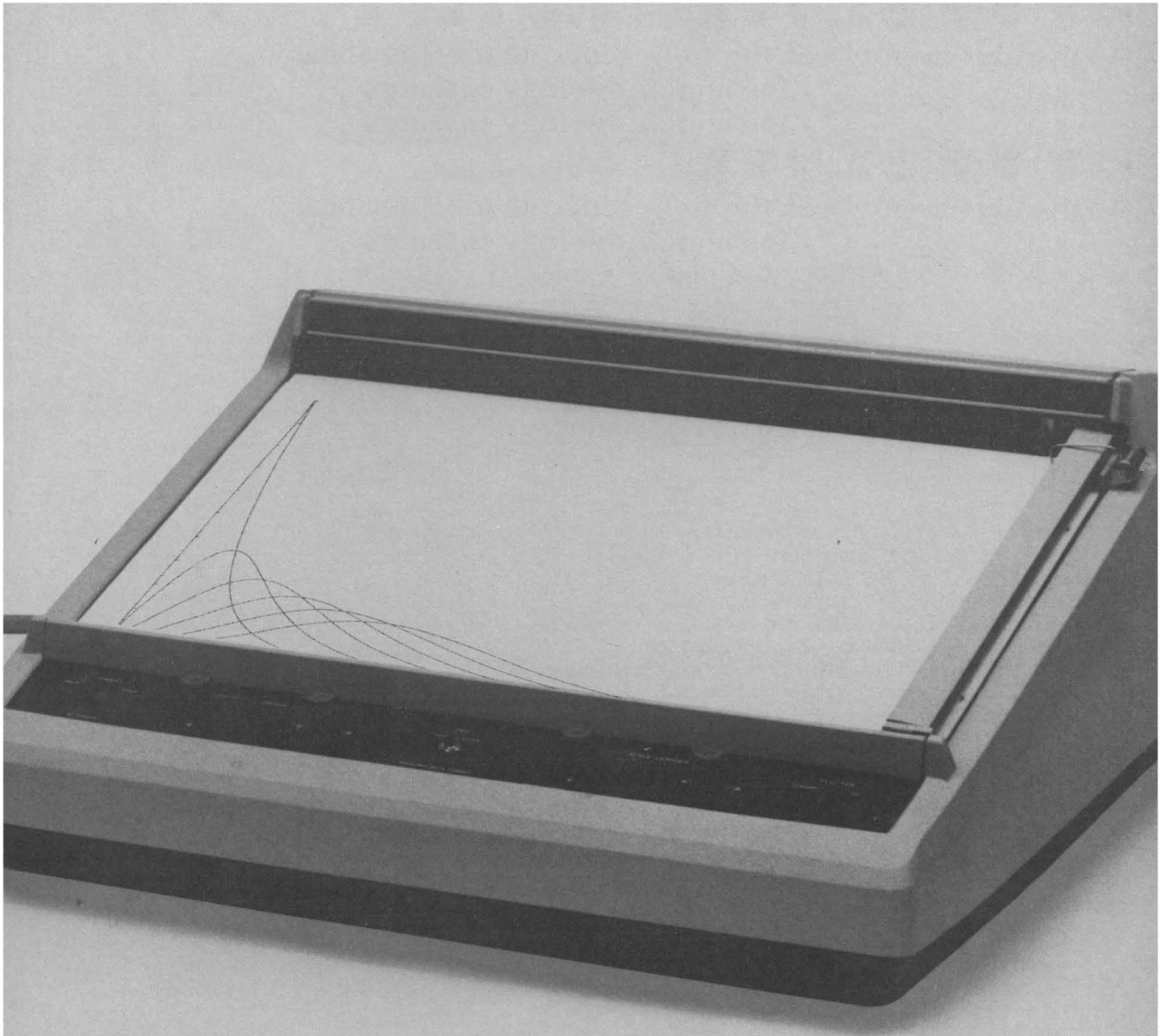

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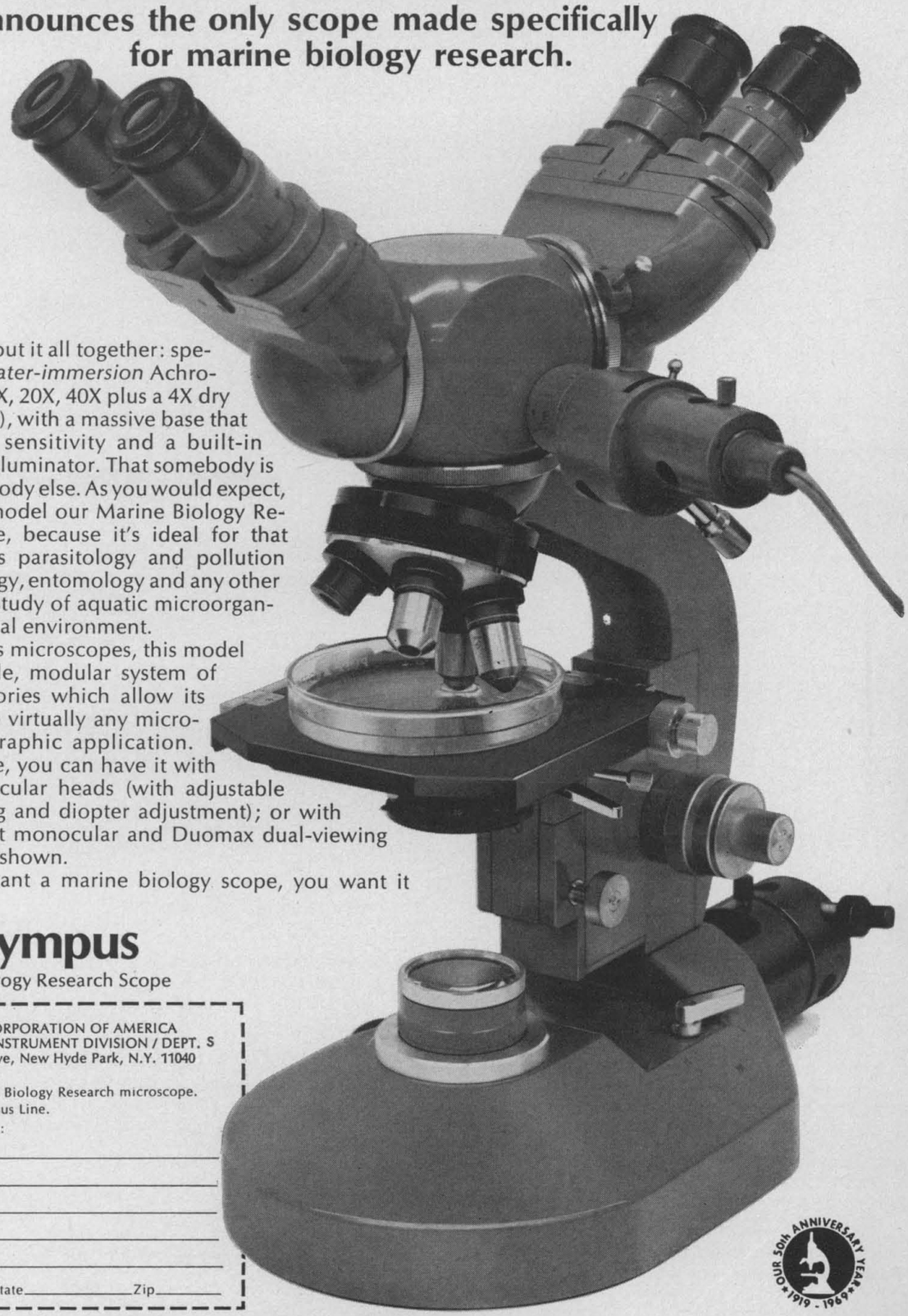

Somebody finally put it all together: specially computed *water-immersion* Achromat objectives (10X, 20X, 40X plus a 4X dry scanning objective), with a massive base that offers 0.0005mm sensitivity and a built-in Koehler substage illuminator. That somebody is Olympus. And nobody else. As you would expect, we call this new model our Marine Biology Research microscope, because it's ideal for that science as well as parasitology and pollution control, bacteriology, entomology and any other science requiring study of aquatic microorganisms in their original environment.

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1324

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(Its numerical print-out never throws you a curve.)

Automatic titrations are a fine idea as long as accuracy isn't compromised by convenience. The new Metrohm Titroprint E-475 was designed to avoid this very pitfall by reproducing a manual titration and providing a numerical print-out rather than a graphic one. Titroprint titrations are more accurate because numerical print-outs are not subject to error from paper changes due to humidity or other atmospheric conditions. Also, there's no problem about speed variation in the paper advance mechanism. Interpretation error, inherent whenever calculations are made from a graph, is eliminated completely.

The E-475 is particularly well-suited for redox titrations where endpoint potential is not precisely defined and the titration must be continued beyond the end point. Titroprint prints out volume, potential change (pH or mv) and sample number continuously as titrant is added. Titrating speed is automatically reduced as the end point nears and the end of the titration is signalled by blinker light or alarm. The Titroprint uses 5, 10, 20, or 50 ml. burettes, and measures potential changes with an accuracy of better than 0.5 mv (0.005 pH).

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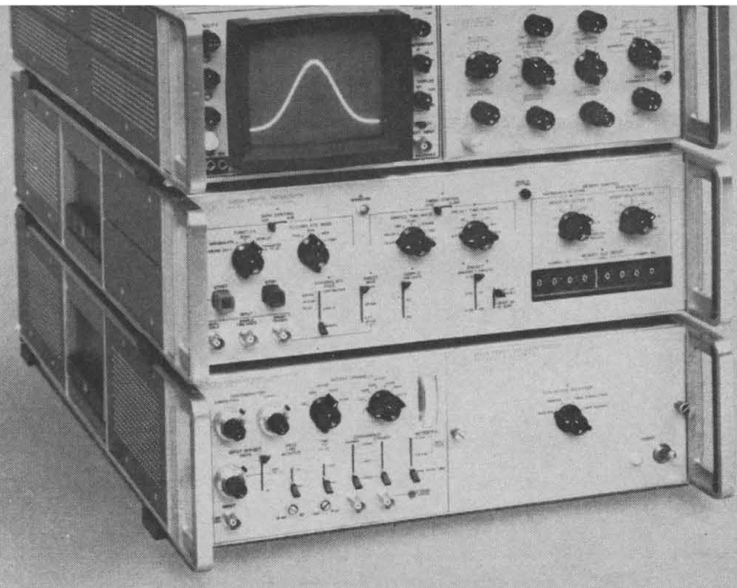

Master Plotter

The fastest way to get permanent records of digitized analog data — from pulse height analyzers, signal averagers, or any multi-channel analyzer (whether or not it comes from Hewlett-Packard)— is to use the versatile HP 7004A X-Y Recorder. It's not only the fastest way . . . it's more economical, too.

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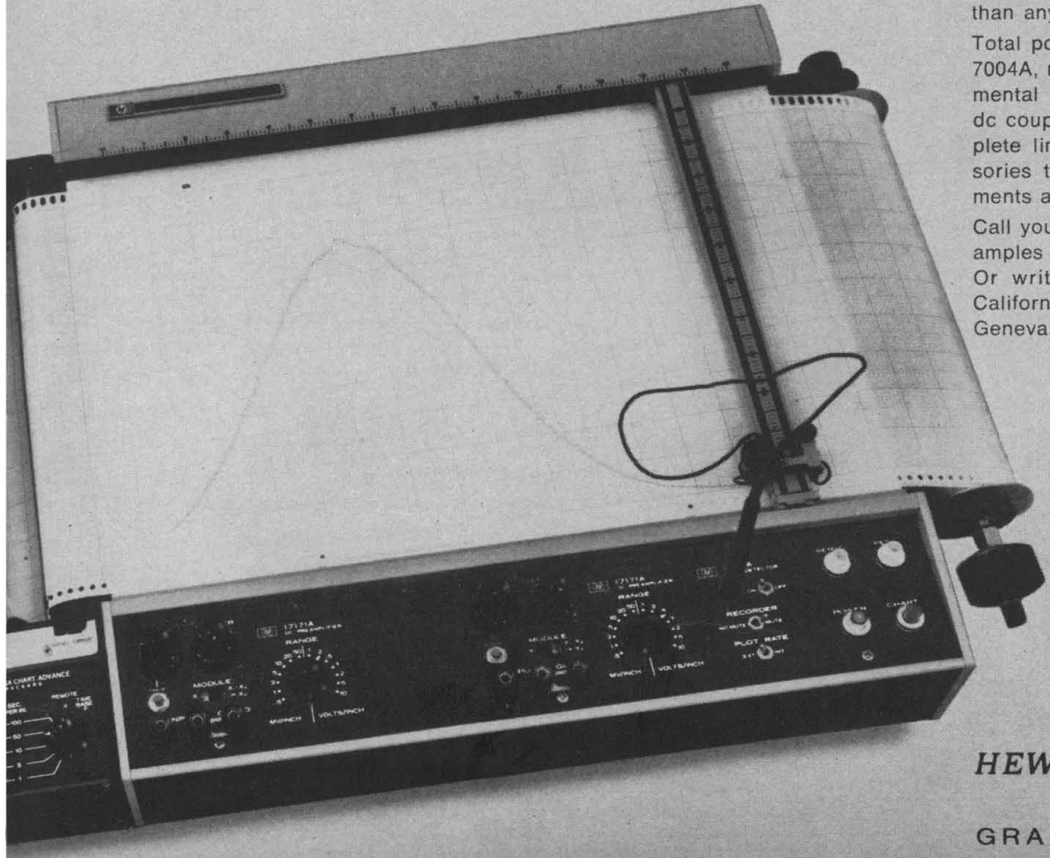

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GRAPHIC RECORDERS

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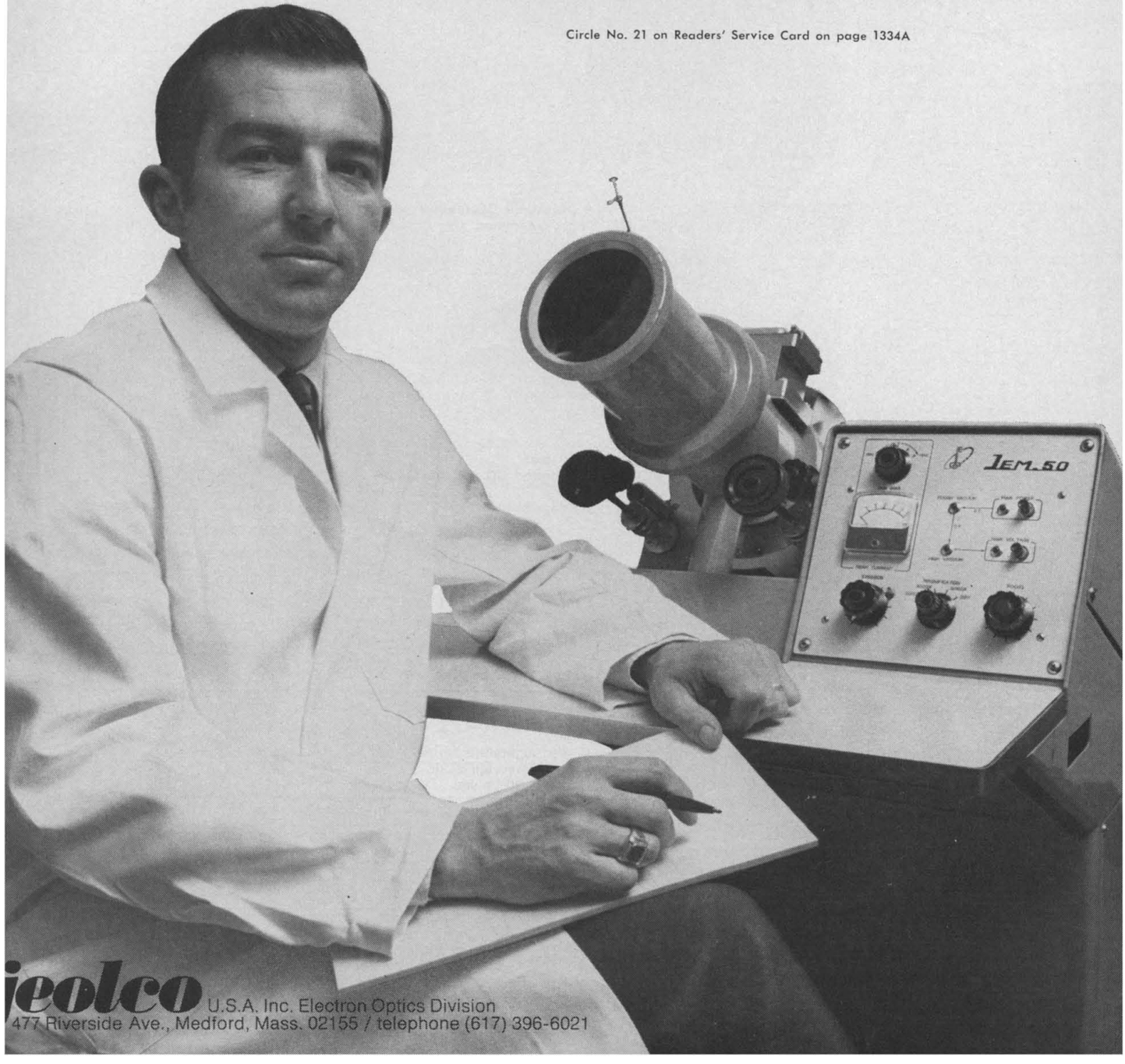
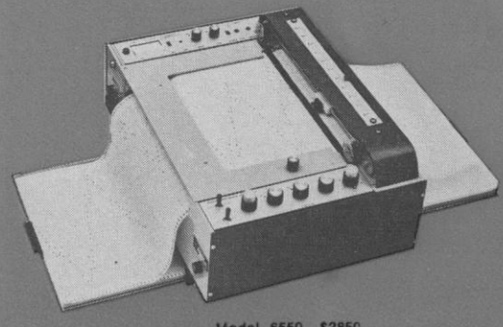


jeolco U.S.A. Inc. Electron Optics Division
477 Riverside Ave., Medford, Mass. 02155 / telephone (617) 396-6021

Omnigraphic™ Plotters Continue to Offer More Features, Less Cost



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High speed point plotting for the Nuclear Lab:

Here is the popular OMNIGRAPHIC™ point plotter designed for use with pulse height analyzers, digital oscilloscopes, DVM's, counters or scanners. Simply plug in the 6550 and you get:

- ☐ A plotting speed of 1200 points/minute
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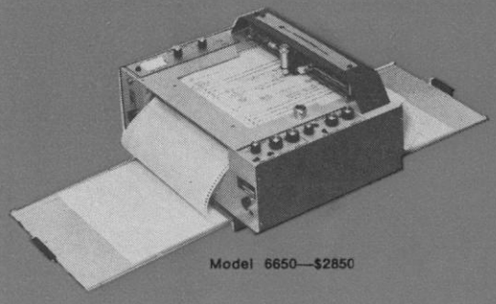

Model 6650—$2850

The 6650 digital plotter records data from computers, encoders or other incremental signals:

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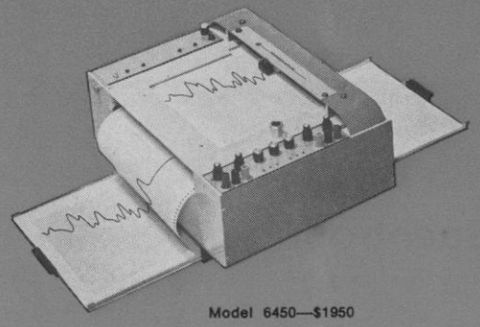
- ☐ Accepts AC or DC input signals
- ☐ Z-fold chart paper
- ☐ Infinite Scale Expansion available
- ☐ Send for complete information on this and other computer plotters.



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X-Y Plotting is now more convenient with the Omnigraphic™ 6450 because it has all the advantages of conventional X-Y's, yet offers:

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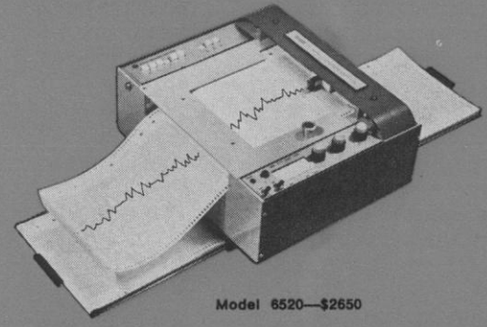
- ☐ Pen control local or remote
- ☐ Front panel switch for automatic English/Metric scaling
- ☐ Ask about 2 pen model 6452



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Here's an X-Y, Sequential Chart, External Chart Control, X-Y Programmed Voltage, Strip Chart and X-Y Programmed Movement: All in one recorder!

The 6520 does the job of six . . . without additions or modifications. Features include:

- ☐ Continuous or automatic paper feed.
- ☐ 18 speed selections from 2″/sec. to .05 in/hr. (144,000:1) range.
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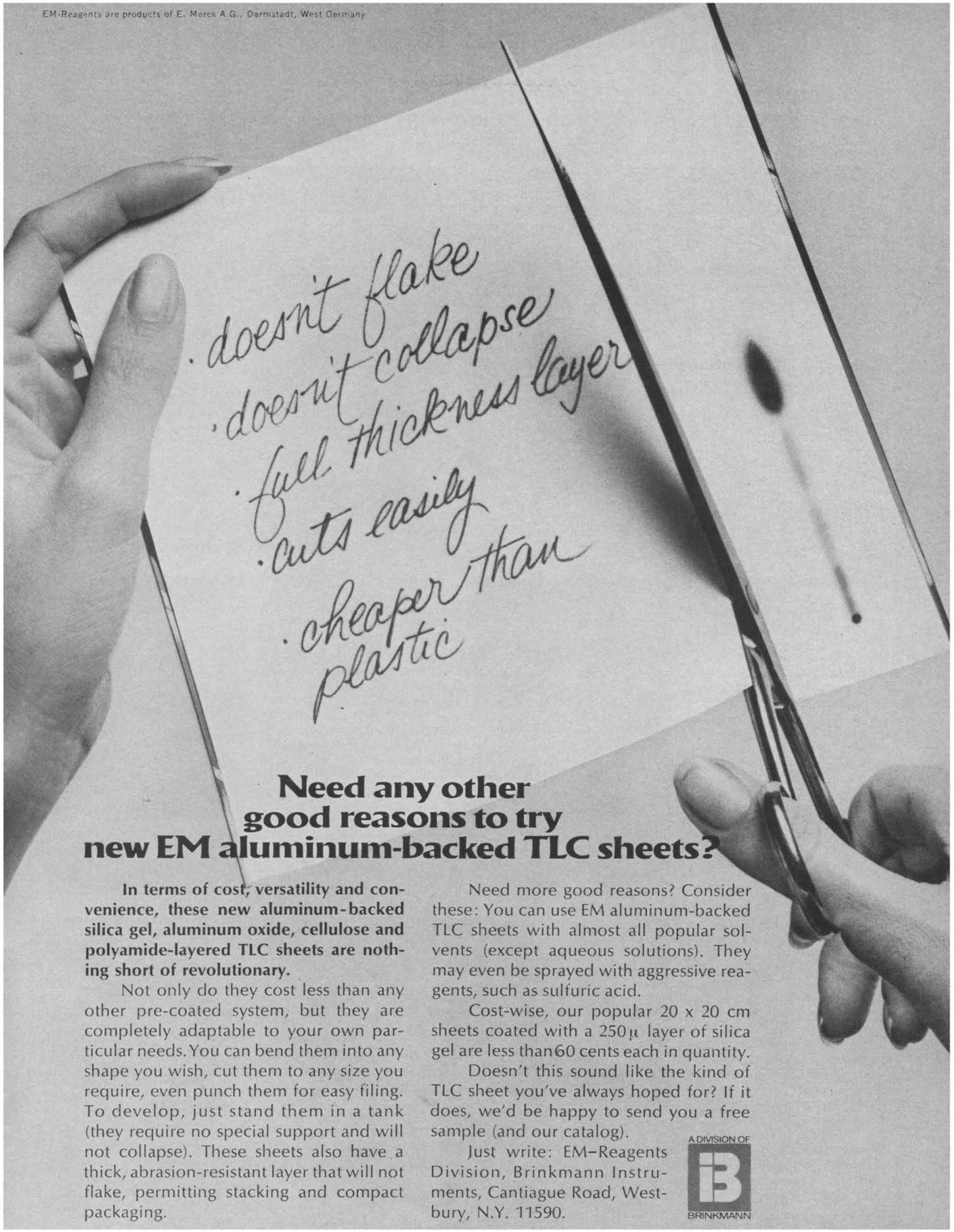
EM-Reagents are products of E. Merck A.G., Darmstadt, West Germany



Need any other good reasons to try new EM aluminum-backed TLC sheets?

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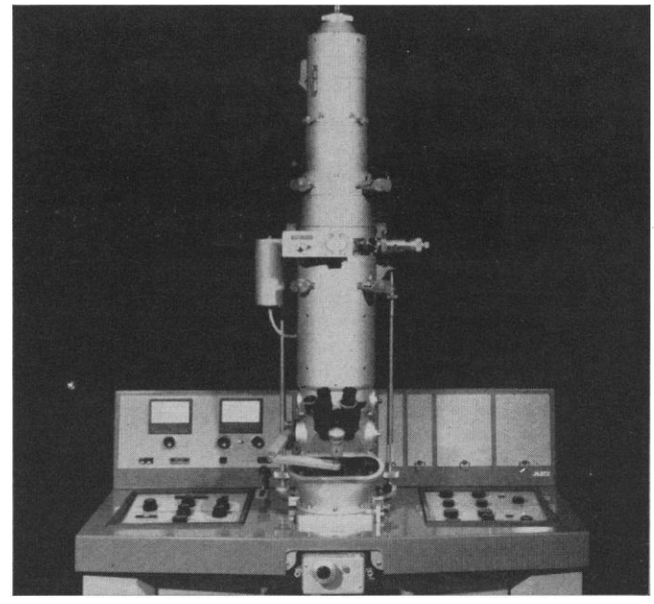

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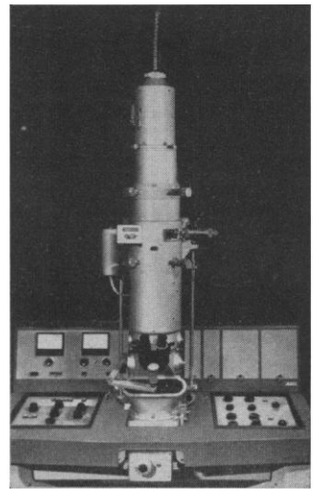

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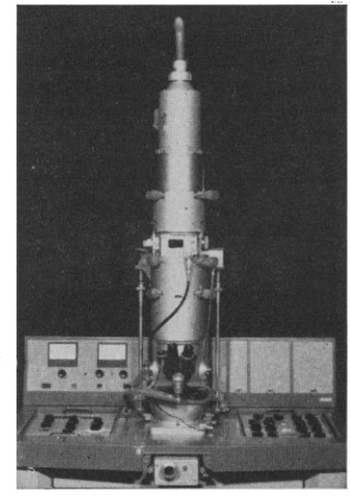

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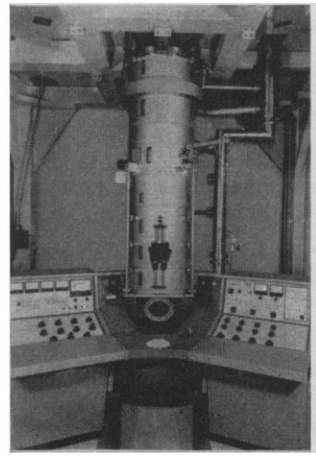

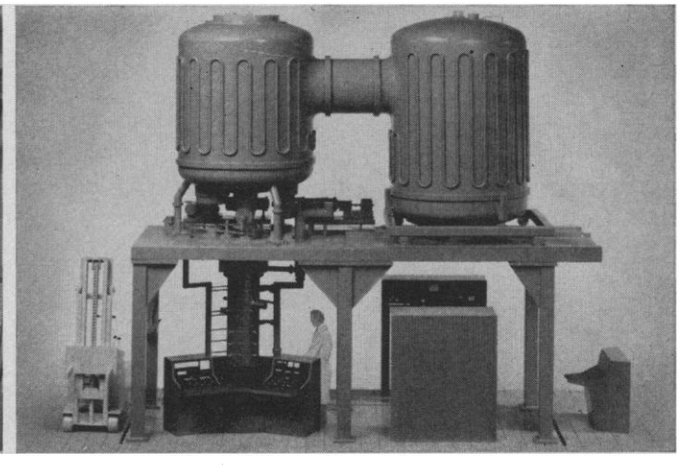

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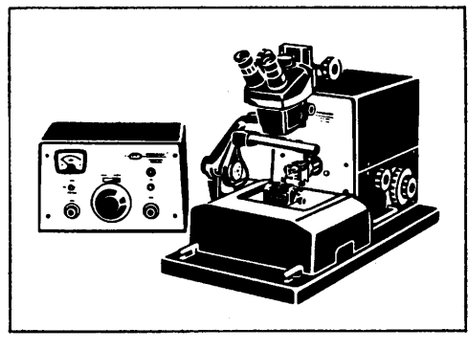

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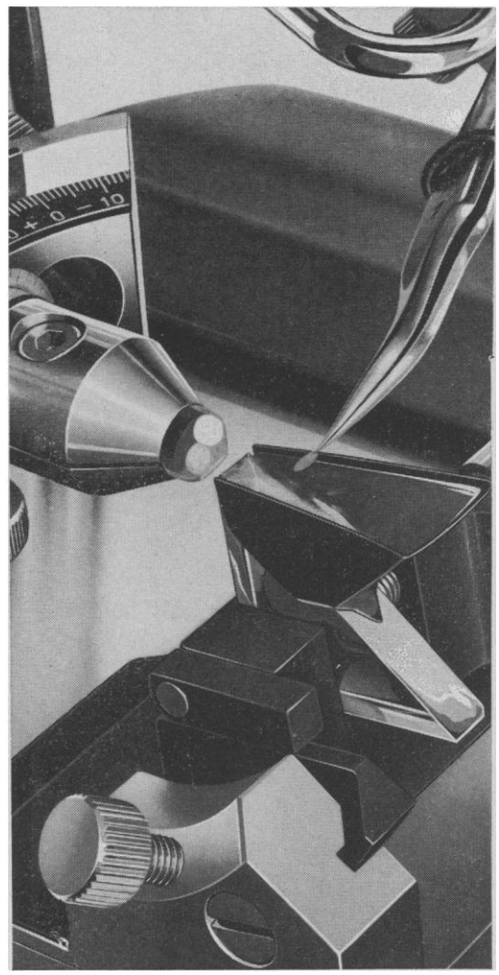

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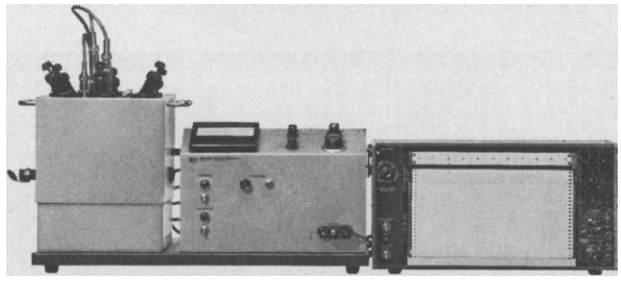

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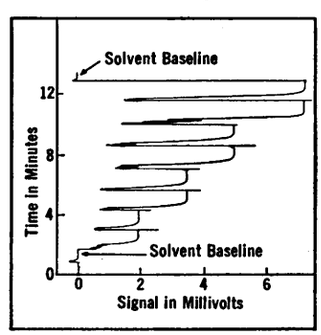

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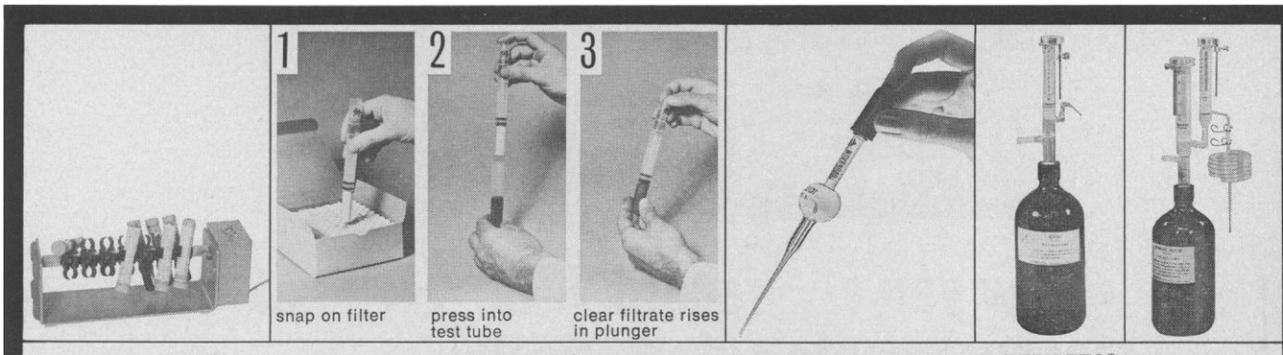

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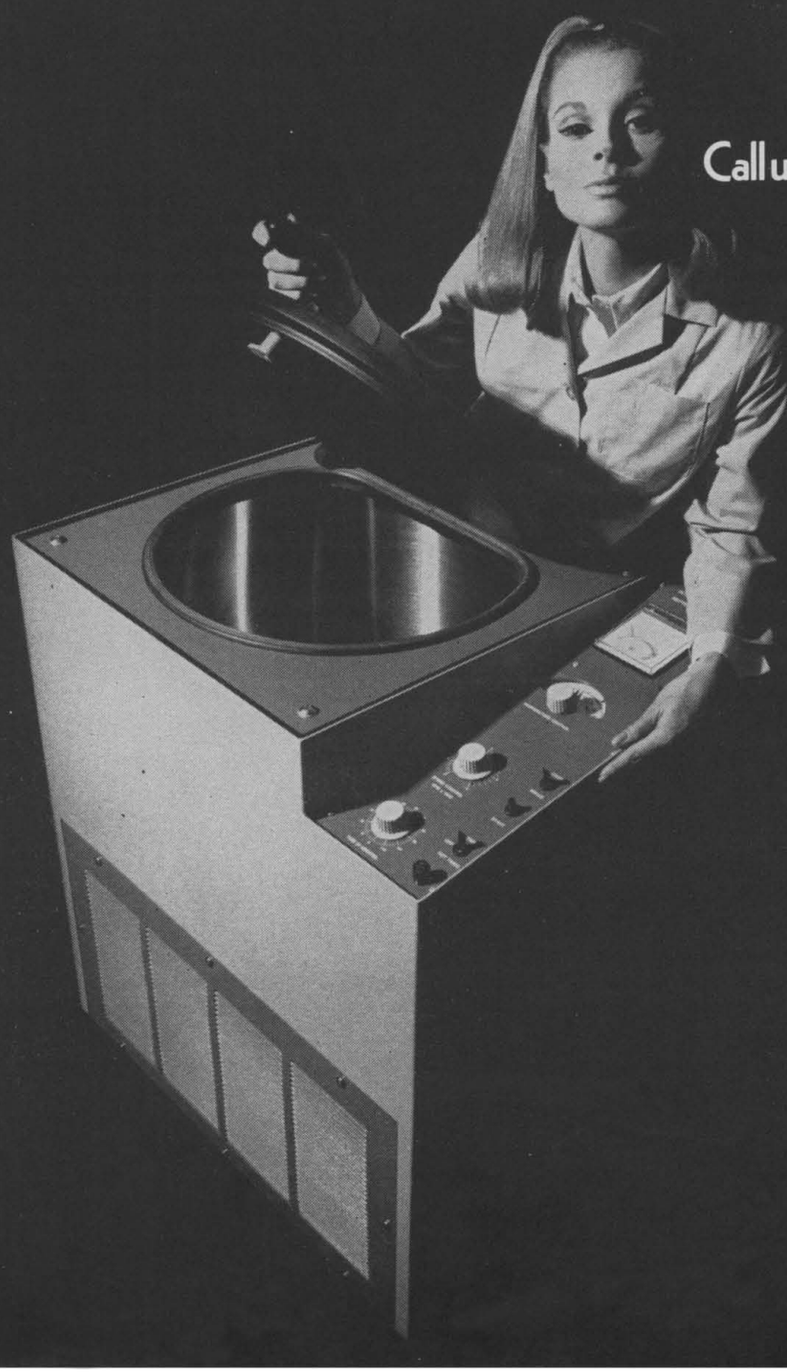

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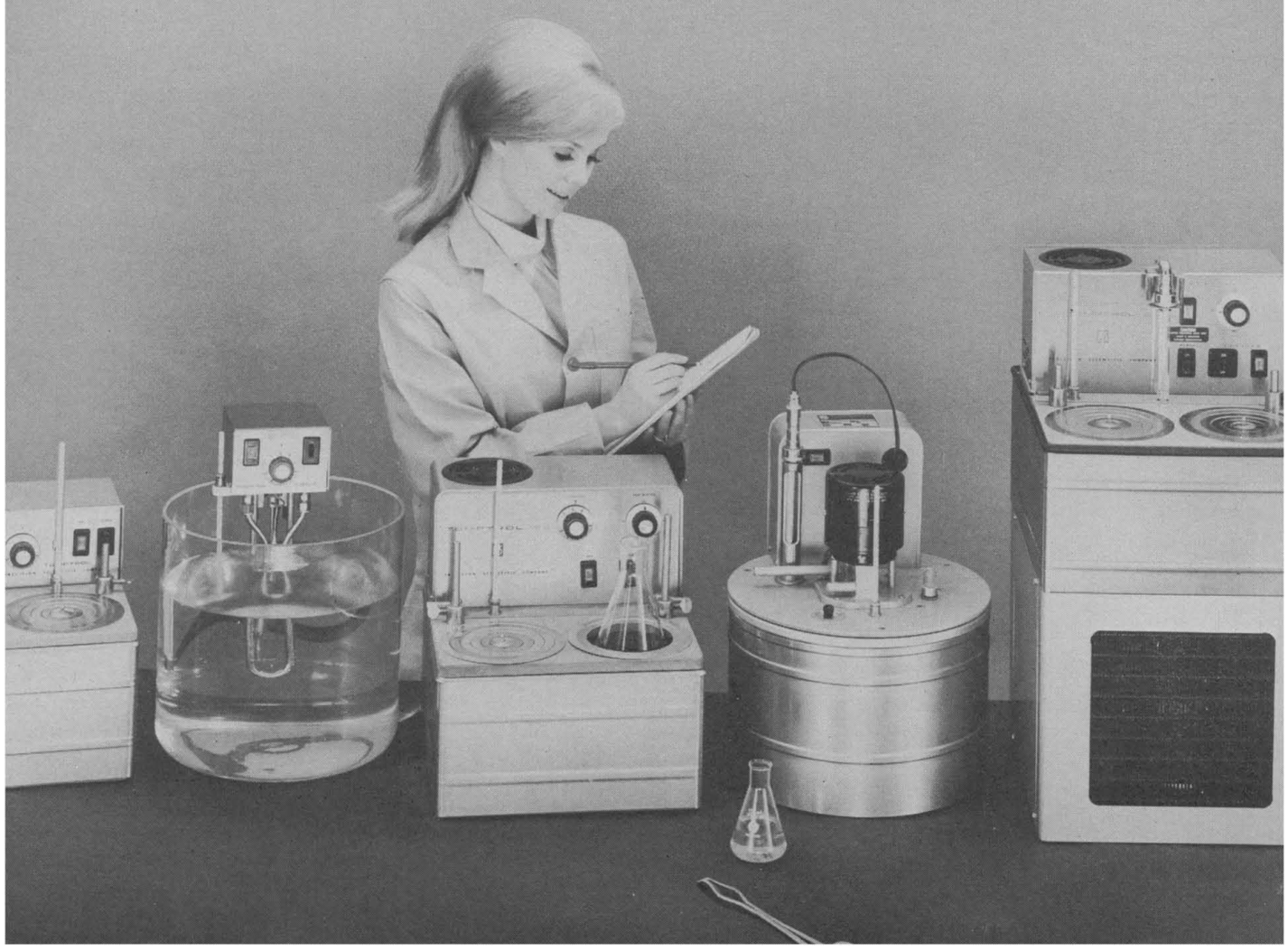


Electroluminescence Seen in 1907

H. C. Gatos in "Electronic materials and applications" (11 Apr., p. 137) states that "Electroluminescence was discovered in 1937, 10 years before the transistor." Electroluminescence in zinc sulfide was first observed by G. Destriau (*1*) in 1936 (*2–4*), not 1937. However, it has been known for a long time that electroluminescence in silicon carbide (also referred to by Gatos) had been seen as early as 1923 by Lossew (*5*). Furthermore, I recently reported (*6*) that similar observations on silicon carbide were made as long ago as 1907 by Round (*7*). Electroluminescence thus predates the transistor by 40 years, not a mere 10 years.

I would also like at this time to correct a misleading statement made in my reference 6. At the time Round published his results on silicon carbide, he was residing in New York City as stated. However, it has been pointed out to me (by P. C. Newman of Northampton, England) that Round was an English citizen and one of the pioneers of "wireless" in that country. Furthermore, in 1966 he was still alive and had attained the age of 85.

HENRY F. IVEY
Westinghouse Electric Corporation,
Churchill Boro.,
Pittsburgh, Pennsylvania 15235

References

1. G. Destriau, *J. Chim. Phys.* **33**, 587 (1936), **34**, 117 (1937); *Trans. Faraday Soc.* **35**, 227 (1939).
2. ——— and H. F. Ivey, *Proc. IRE (Inst. Radio Engrs.)* **43**, 1911 (1955).
3. H. F. Ivey, *J. Electrochem. Soc.* **104**, 740 (1957).
4. ———, *Electroluminescence and Related Effects* (Academic Press, New York, 1963).
5. O. W. Lossew, *Telegrafia i Telefonia*, No. 18, 61 (1923); *Wireless World* **15**, 93 (1924); *Phil. Mag.* **6**, 1024 (1928).
6. H. F. Ivey, *J. Electrochem. Soc.* **113**, 140C (1966); *IEEE Spectrum* (June 1966), p. 146.
7. H. J. Round, *Elec. World* **49**, 308 (1907).

Relevance of Research to Students

In general, I find myself in strong agreement with Stephen J. Tonsor's speech of 1 April to the education committee of the National Association of Manufacturers which was endorsed by President Nixon (*1*). In particular, his proposal that the student exercise the choice in the placement of the funds supporting his or her education is the strongest possible reinforcement of diversification and, ultimately, relevance of an education.

However, I strongly disagree with

his general condemnation of research at universities. He contends that research leads to disengagement between students and faculty as if the only engagement is the classroom relationship. This is a mistake—both the implication that the only relevant engagement should be the classroom and, most important, that university faculty and administration should allow research to grow without ensuring a major and relevant relationship with students. The tragedy and mistake is that universities have allowed research to grow without demanding and ensuring a continuing student, and particularly undergraduate student, involvement. This involvement should take the form of part-time jobs—recognizing and forcing cognizance of the necessary so-called "inefficiency." Indeed, part-time student help requires considerably more time and effort on the part of the faculty member, but this is just the so-called inefficiency that should, and must, be demanded. Undergraduate student employment in research at New Mexico Tech (60 percent of all undergraduate students) goes a long way toward achieving the student-faculty involvement that is so desperately needed at this time.

STIRLING A. COLGATE
New Mexico Institute of Mining and Technology, Socorro 87801

Reference

1. For partial text, see *Chronicle of Higher Education* (1424 16th St., Washington, D.C., 5 May 1969), p. 3.

Misinterpretation

A policy of not replying to reviews is overridden in this case by unwillingness to let obviously false statements stand. In his review (9 May, p. 697) of my *Languages of Art*, Rudolph Arnheim writes: "This neatness entices Goodman to assert that a work of music is its score, just as he believes that a work of literature is its text." I quote from page 210 of my book: "Thus in the different arts a work is differently localized. . . . In music, the work is the class of performances compliant with a character. In literature, the work is the character itself."

The quality of the review may be judged from this sample.

NELSON GOODMAN
Department of Philosophy, Harvard University, Cambridge, Massachusetts 02138

Circle No. 1 on Readers' Service Card on page 1334A

20 June 1969, Volume 164, Number 3886 **SCIENCE**

The Use of Arid Lands

The approximately 14 percent of the world's cropped lands that are under irrigation produce a fourth or more of the world's agricultural crops. As the food needs of a too rapidly growing population continue to increase, more and more of the arid and semiarid regions will be cultivated, for much of this land is capable of year-round use, and conditions are more favorable than in humid regions for the control of insects and disease and the advantageous timing of water application. One estimate is that by the year 2000 there will be twice the present 370 million acres under irrigation, even though the cost of new irrigation projects, which now averages almost $400 per acre, is substantially higher than the cost of bringing new land in humid regions under cultivation.

The investment required means that irrigation agriculture can be economically successful only when combined with sophisticated farm technology. Yet too often, over the world, expensive water storage and distribution facilities have been uneconomically coupled with moderately primitive methods of farm operation.

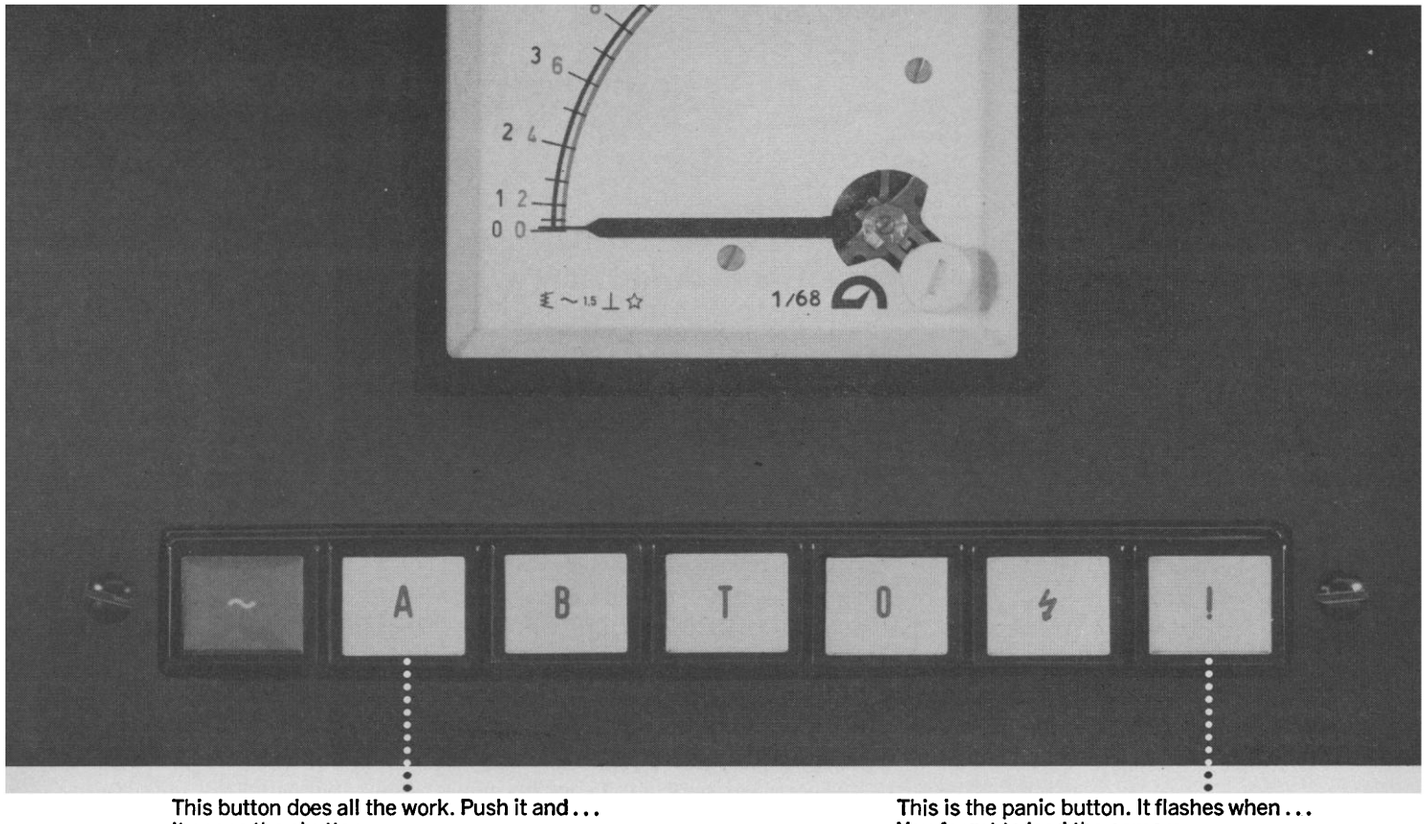
These were some of the points made at the International Conference on Arid Lands in a Changing World which AAAS held in Tucson, Arizona, on 3 to 13 June. This was the second international arid lands conference held by the Association, and there were some significant differences between this one and the one held in 1955.

The participants, who came from every major arid area of the world, had a variety of technological advances to discuss—for example, remote sensing systems, desalting methods, and the new high-yield grains. Yet more significant than these developments was the greater attention paid to economic, to sociological, and especially to the management aspects of the complex problem of using a fragile environment continuously without destroying it. There were a few examples of long-enduring irrigation successes. But they were more than counterbalanced by reminders of how extensively man has unwittingly turned grassland and food-producing areas into wasteland and desert. The Sahara, for example, is still increasing by 40,000 acres a year.

A frequently expressed theme was the fact that agricultural improvement alone can do but little for the economic advance of many arid countries. One speaker estimated that a doubling by 1980 of the agricultural output of Iraq, without any increase in input—an implausible assumption—would raise per capita income from $190 to $220 a year. It was also reported that the economic effect of the High Aswan Dam and other projects in Egypt might be to increase per capita income from about $130 to about $142 a year, and that the irrigation canals were also responsible for a grave increase in schistosomiasis.

Other means than traditional agriculture with emphasis on grains and staples will be necessary if substantial increases in per capita income are to be achieved. Specialty products, industrial or other nonagricultural developments, and—as many speakers mentioned—increased tourism will be needed if most of the arid regions are ever to reach the stage of self-generating economic growth.

But traditional agriculture is the base from which these regions must start, and thus the need for wise land management was reemphasized. The arid lands experts were uncertain whether the pressure to exploit more of the arid lands would, quite literally, in the long run make the deserts bloom or produce more Saharas. In a larger sense they were illustrating, from the consequences of several millennia of irrigational history, that trying to control the environment is hazardous and insufficient. Man must also adapt to it.—DAEL WOLFLE



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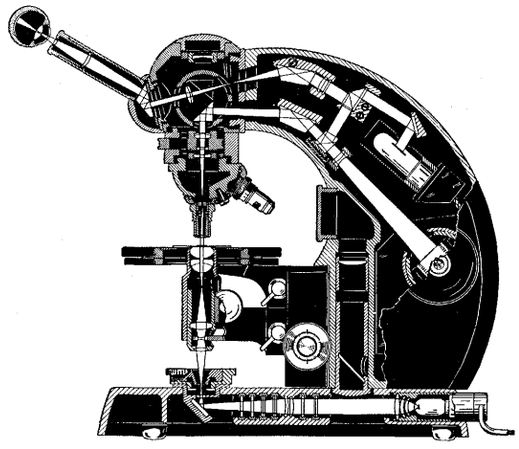

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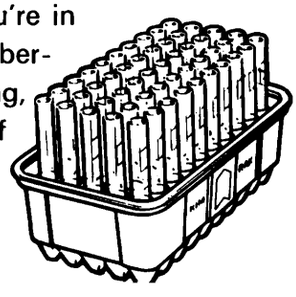

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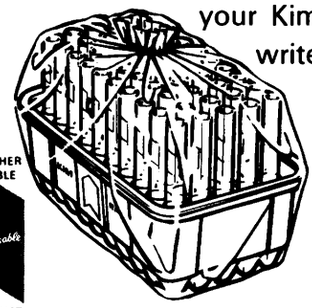

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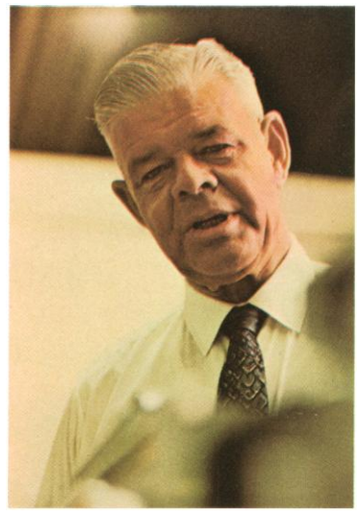

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We have two of the best recording spectrophotometers in the business. We also have a slight problem because some people still don't know which instrument does what better. So I thought this may be the appropriate time to clear up the confusion once and for all.

THE MAIN DIFFERENCE

For work in the ultraviolet through visible and near infrared wavelength range, the Cary 14 has no peer. For studies in the ultraviolet and visible only, the Cary 15 cannot be equalled. It's that simple.

There are other differences, of course. For instance, the 14 is more versatile than the narrower-ranged (1850-8000Å) 15. But because it was designed to perform specific tasks, the 15 is easier to operate. Then there's price. The Cary 14 sells for about $18,000, while the Cary 15 costs a little over $12,000. The additional $6,000 becomes a worthwhile investment when you consider the variety and quality of the studies routinely available with this instrument whose range extends from 1860Å to 2.65 microns. Studies like hydrogen bonding investigations in the near infrared. Or quantitative protein analyses in the ultraviolet.

CONSERVATIVE DESIGN: WHAT & WHY

One similarity between the two instruments is the fact that both are conservatively designed. By conservative design we mean (1) that at no point in the instrument system are the electrical or mechanical components operated near their tolerance limits, and (2) that performance specifications are greater than required under normal sample conditions. This design philosophy produces acceptable performance even under the most rigorous sampling conditions. Just as important, it insures longer instrument life and complete confidence in

outperform the Cary 14 is the Cary 15. And, vice-versa.

the quality of the recorded information.

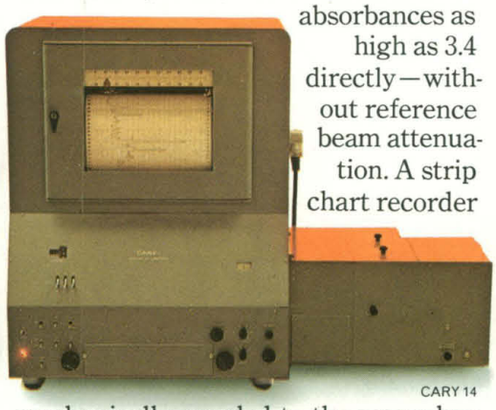
PHOTOMETRIC ACCURACY

While the electronics of the Cary 14 and 15 differ, the photometric accuracy of each is competitively unsurpassed.

The Cary 14 uses a prism-grating double monochromator, plus a dual beam sampling system and a single detector. Reference and sample beams are separated by time then compared and the ratio recorded on a chart which is effectively 20 inches wide. Measurements are accurate within 0.002 abs between zero and 1 abs; 0.005 near 2 abs. At high absorbance levels of 4, or even 5, valid measurements can be obtained using reference beam attenuation.

The Cary 15 employs a two-prism double monochromator and two detectors. Sample and reference beams are separated in space and measured simultaneously by the matched detectors.

From zero to 1 abs the accuracy is between 0.002 and 0.005 abs; at 2 it's 0.008. Because of the dual detector photometric system, the 15 measures at absorbances as high as 3.4 directly—without reference beam attenuation. A strip chart recorder



CARY 14

mechanically coupled to the monochromator records the information.

STRAY LIGHT

The double monochromator and optical design of the 14 and 15 hold stray light to a negligible amount—less than 0.0001% (14) and 0.001% (15) over most of the range; 0.1% at range limits for both instruments.

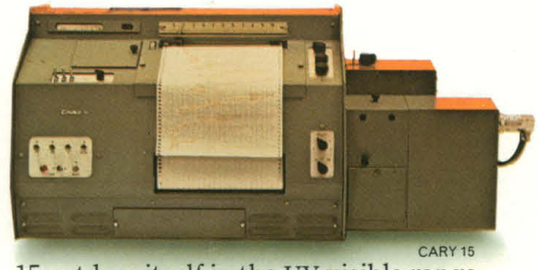
Because of this low stray light, both the 14 and 15 can work at high absorbances without sacrificing photometric accuracy—an extremely useful asset in most spectrophotometric work.

RESOLUTION

Another notable contribution of the double monochromator is the ability to achieve resolution as good as or better than any other recording spectrophotometer (at the same signal-to-noise ratio) in one-half to one-fourth the scanning time.

Some people, no doubt, may feel that they'll never need the high resolution offered by the Cary 14 and 15. What they fail to realize is that much of the "unneeded" resolving power can be exchanged for additional energy (resulting in better accuracy) when working with very dense or micro samples.

There's a lot more to tell about the Cary 14 and 15. Like the wide variety of accessories available for each. Or the fact that we've made instrument drift just about obsolete. For now, just remember that the 14 is unexcelled in the UV-visible-to-near infrared, while the



CARY 15

15 outdoes itself in the UV-visible range.

We have a catalog which describes the spectrophotometers. If you'd like a copy, write Cary Instruments, 2724 So. Peck Road, Monrovia, California
Ask for data file E805-69.

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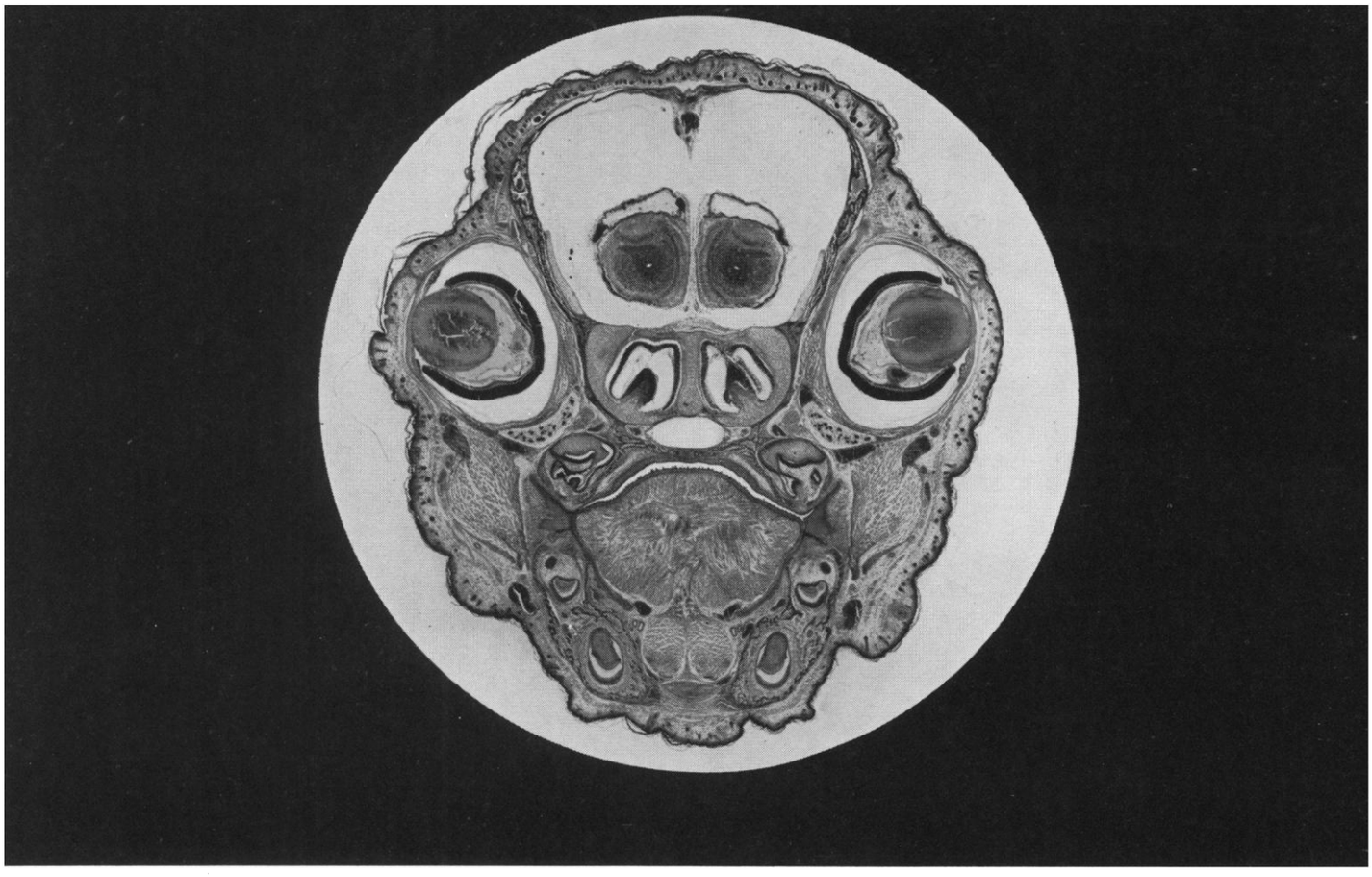

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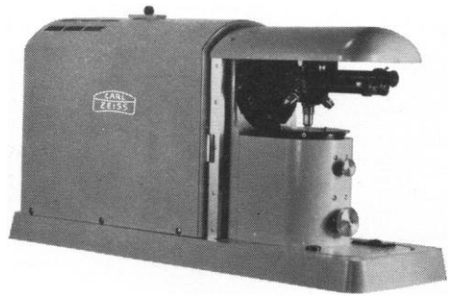

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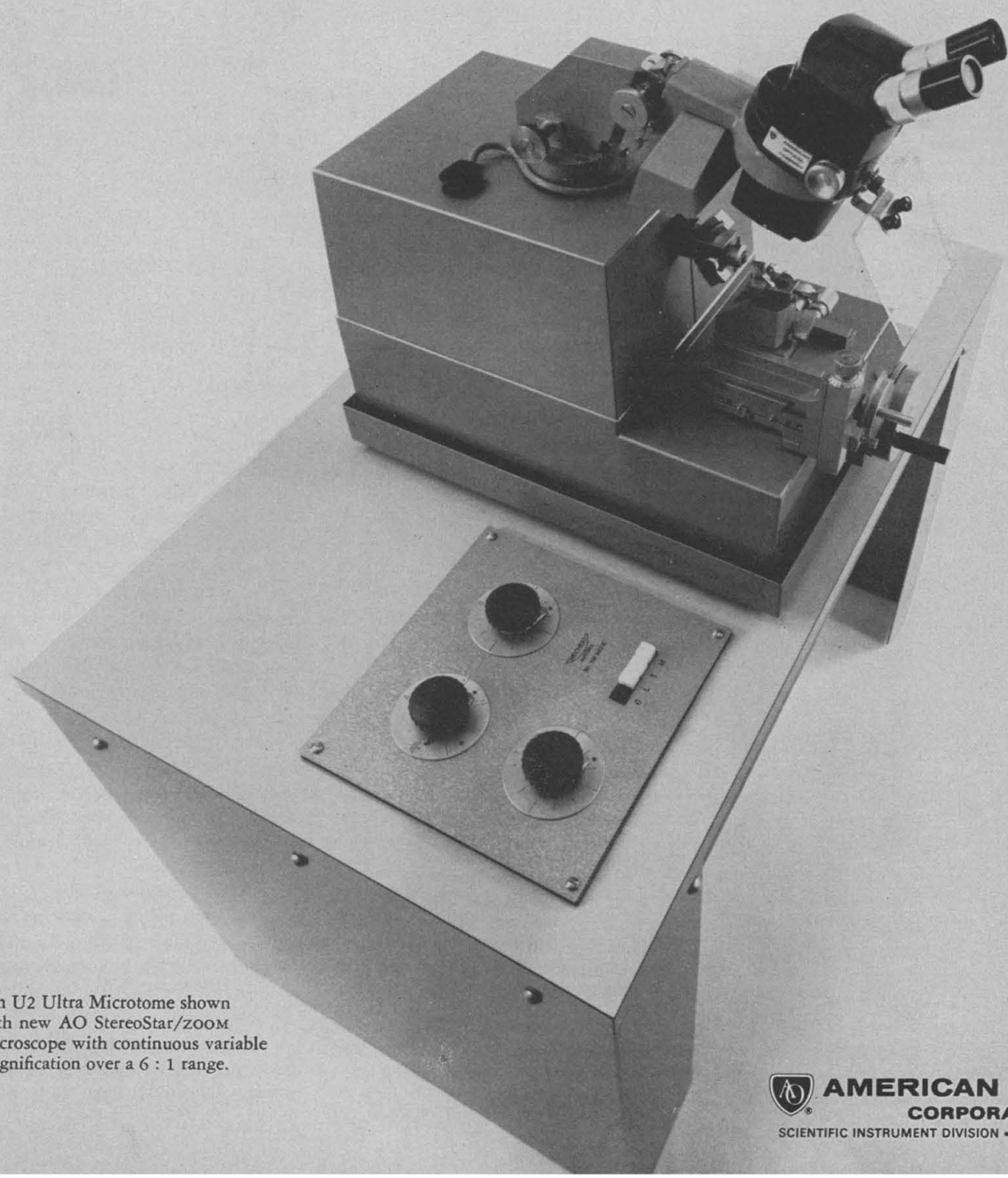

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cies significant loss of red cells into the tissues may occur with moderate thrombopenia in the absence of overt hemorrhage. An apparent interaction between neutropenia and platelet deficiency was pointed out by Fliedner and Heit (University of Ulm).

A model relating events at the cellular level to the mortality rate in irradiated mammals was presented by Robinson (Brookhaven). The animal's LD_{50} was expressed in terms of five parameters: the n and D_0 for stem cells, their original number, a mature-cells-per-stem-cell or proliferation factor, and a parameter for the animal's mature cell requirement. It was inferred that the shape of the animal dose-survival curve sets an upper limit on the possible interindividual variation of each of the five parameters, and in particular a relatively low limit for that of the stem-cell D_0. It was pointed out (Sinclair, Argonne; Patt, University of California) that additional refinements would be desirable, especially that of making the proliferation rate after exposure dose-dependent. The finding of "small colonies" in tissue culture by Sinclair, confirmed in studies with splenic colony formation units, indicates that this would be a more realistic assumption.

Sugahara (Kyoto) showed that physiological stresses such as hypoxia, exercise, and bleeding, which may or may not be related to changes in size of cell populations, increase resistance. The work of Schooley and of Stohlmann referred to previously, emphasizes the importance of mechanisms that control cell proliferation in the normal and stressed animal.

Microorganisms normally nonpathogenic can be quite pathogenic in the heavily irradiated animal, for example, the presence of pseudomonas is known to greatly decrease the LD_{50} of mice. Wild rodents, however, that would be expected to harbor a number of parasites, are among the most radioresistant of mammals. Van Bekkum (TNO, Rijswijk) showed that the $LD_{50/30\ days}$ of pathogen-free guinea pigs is more than twice that of nonpathogen-free animals. The increase in resistance of gnotic animals may be related to the absence of actual infection (Wilson, Van Bekkum); to an increased rate of utilization of mature elements (Nakamura, Fliedner); to difference in the metabolism of normal substances, for example, bile (Fry, Argonne); to the presence of different flora (several authors); to toxins; or to as yet poorly defined additional factors. Wilson (Notre Dame) showed, using mono-contaminated, previously germ-free animals, that radioresistance may be primarily or secondarily related to the activities of intestinal microorganisms. Antibodies increased survival even in germ-free animals, perhaps because recovery is stimulated by them in some as yet undefined fashion.

"Recovery" in the intact mammal over a time period of days to weeks, undoubtedly including both repair of sublethal cellular damage and cell proliferation, was described by Casarett (University of Rochester). Split-dose experiments in the mammal show that recovery rates so determined are markedly dependent on a number of factors including species, strain, and size of conditioning dose. An exponential decay curve represents a rough approximation to much of the recovery data. The large differences in recovery rates among species do not correlate with factors such as body size, life span, or metabolic rate.

Kondo (University of Nagoya) differentiated inbred strains of mice on the basis of differences in original gene pool and on differences in natural and artificial selection through sister-brother inbreeding. His studies using ten inbred strains indicate that the variability in lethal dose among mice selected from a given strain was not distinguishable from that among mice from different strains.

Tazima (National Institute of Genetics, Nirsima) showed that two fractionated doses of 500 roentgens produced a greater effect than 1000 roentgens (single dose) with respect to mutation frequency in the silkworm. He suggested that a demonstrated pileup of cells in G_2 might account for the differences. Sinclair (Argonne) indicated that there must also be a pileup in G_1, which might be even more likely to show a higher mutation frequency.

Bond (Brookhaven) showed that species differences in LD_{50} values for the gastrointestinal syndrome are considerably less than the variation in LD_{50} for the bone-marrow syndrome (a factor of less than 2 versus a factor of 10). At the high-dose levels involved, severe bone-marrow damage and resultant depletion of blood neutrophils is severe even at the early time associated with the G.I. syndrome. Irradiation of only the bowel or a large segment of the bowel requires higher doses to kill, and the survival time is longer. These findings show a signifi-

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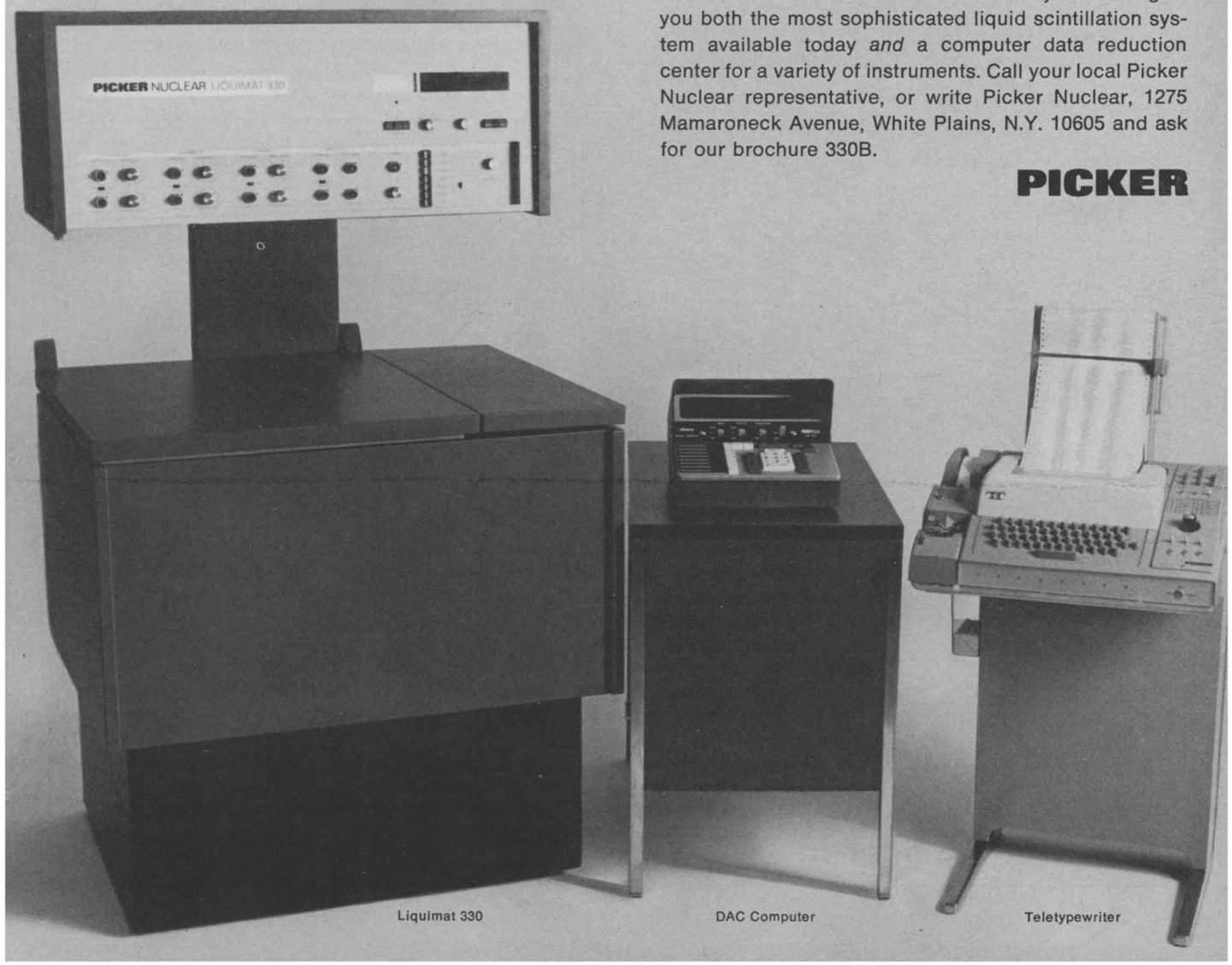

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cant contribution of neutropenia and infection to the G.I. syndromes seen with whole-body radiation.

Lushbaugh (Oak Ridge Associated Universities) indicated that while changes in underlying cell populations probably are of cardinal importance in mortality among animals exposed to doses in the "hematopoietic death" range and somewhat above, additional factors assume importance as the dose is increased (above perhaps 1000 roentgens in most species). Direct damage to the small vessels and capillaries become increasingly important. Thus, while the term "hematopoietic syndrome" may be appropriate, the terms "gut syndrome" and "central nervous system syndrome" may in a sense be misnomers. Damage to the principal cell populations presumably involved may not be the critical factor that determines mortality.

Matsuzawa (Aichi Cancer Center Research Institute) counted surviving crypt stem cells after exposure of mice to graded doses of radiation. He obtained a D_0 of 220 rads and an extrapolation number of 4.8. (Earlier estimates by Hornsey *et al.* and by Withers showed a similar broad "shoulder" but a lower D_0). Fry (Argonne) studied the relationship between the LD_{50} for the G.I. syndrome and the parameters of gastrointestinal epithelial cell proliferation in eight mammalian strains and species. Differences in radiosensitivity appeared to be related to the ratio of proliferating to functional cells; the transit time in proliferating and functional compartments; the cell cycle time; the relative rapidity of feedback mechanisms and cell turnover; and the time required for differentiation. That sensitivity and survival time depend on the kinetics of cell proliferation of gastrointestinal cells was indicated by the data of Wilson (Notre Dame), Matsuzawa (Aichi Cancer Center Research Institute) and Fliedner (University of Ulm). The transit time of cells from the crypts to the tips of the villi is prolonged in germ-free animals, and the time for death from the G.I. syndrome is delayed proportionately.

Lushbaugh (Oak Ridge Associated Universities) presented data of Casarett *et al.* (University of Rochester) showing that appreciable capillary damage in the villi probably is present at dose levels corresponding to the G.I. syndrome, which may be in part responsible for denudation of the villi. He also indicated that actual fluid loss from the body during the G.I. syndrome in

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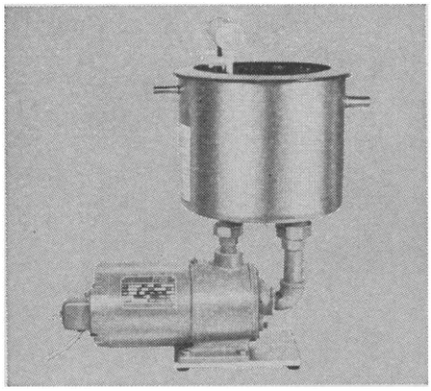

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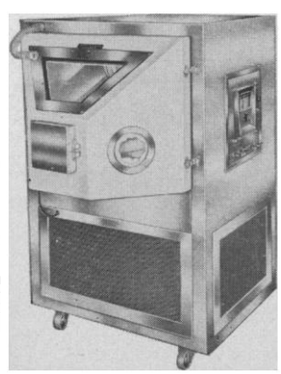

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rodents is minimal, but that loss of fluid into tissues (edema) may be an important factor. His data indicate that sodium loss (as determined by studies using radioactive sodium) may be minimal, at least prior to the time that the animal approaches the moribund stage. Hyodo-Taguchi and Egami showed a distinct increase in loss of sodium from irradiated goldfish suffering from gastrointestinal syndrome. Lushbaugh pointed out that such loss may well be from vessel damage particularly in the gills of the fish.

In summary of the conference, the problems involved in differential species radiosensitivity were brought into sharper focus, but a great deal of work needs to be done before the differences can be understood. Detailed work is required on differences in pool sizes, the kinetics of cell proliferation, and control mechanisms of cell proliferation in the different species. Physiological variables must be better defined, particularly the rate of utilization of mature functional cells in the irradiated versus normal individual. The possible role of the reticuloendothelial system deserves a great deal more attention, as do changes in blood vessels and the supporting matrix for proliferating tissues, particularly at dose levels high in the lethal range for the bone-marrow syndrome and above.

V. P. BOND
Brookhaven National Laboratory, Upton, New York
T. SUGAHARA
Kyoto University, Kyoto, Japan

AAAS-Westinghouse Science Writing Competition for 1969

Awards of $1000 each will be presented for outstanding nonmedical science writing in (i) newspapers of over 100,000 daily circulation, (ii) newspapers of less than 100,000 daily circulation, and (iii) magazines of general circulation. Writers in these media are invited to enter the 1969 competition.

The awards were established to recognize and encourage outstanding popular science writing, to stimulate public interest in science, and to foster a deeper understanding of the significance of science among the general public.

The AAAS-Westinghouse awards are provided by the Westinghouse Educational Foundation, which is sponsored by the Westinghouse Electric Corporation.

The board of six judges, prominent in the fields of journalism, science, and public affairs, include: Loren C. Eiseley, University of Pennsylvania; Dennis Flanagan, editor of *Scientific American*; Morris

Meister, director of planning, Hall of Science of the City of New York, Inc.; Henry Allen Moe, president emeritus, Guggenheim Memorial Foundation; DeWitt C. Reddick, School of Communication, University of Texas; and William P. Steven, vice president, Chicago *Sun Times*/Chicago *Daily News*.

To be eligible for the 1969 awards, the newspaper or magazine articles on the natural sciences and their engineering and technological applications must have appeared in print between 1 October 1968 and 30 September 1969, in publications within the United States.

A newspaper entry can be any of the following: a single story, a series of articles, or a group of three unrelated stories, articles, editorials, or columns.

The three awards will be presented on 27 December 1969 at the annual dinner of the National Association of Science Writers during the 1969 meeting of the AAAS in Boston.

Additional information and application forms may be obtained from Grayce A. Finger, Dept. E, AAAS, 1515 Massachusetts Ave., NW, Washington, D.C. 20005 (202-387-7171).

Courses

Workshop in Genetic Chemistry, Madison, Wis., 15–21 Aug. Will provide an introduction to the methodology of genetic chemistry for study of systems such as oxidative phosphorylation, membrane function, and enzymic catalysis. Enrollment is limited to 20 chemists who wish to explore the possibility for application of their skills and experience to problems in genetic chemistry. Applicants should describe their interests, list publications, and provide a brief curriculum vitae. Also request travel and per diem if it is needed. Deadline for applications: *15 July*. (Professor Robert M. Bock, Laboratory of Molecular Biology, University of Wisconsin, Madison 53706)

International Seminar for Hydrology Professors, Urbana, Ill., 13–25 July. Is intended to acquaint hydrology professors with new technological developments in hydrology, such as nuclear techniques, space applications, stochastic analysis, and systems simulation; to determine the current status of teaching and research in basic hydrology; to provide for discussion of teaching and research methods, techniques, and instrumentation; to ascertain gaps in knowledge and to determine research needs and anticipated research trends; and to discuss impact of hydrologic education on manpower, on relation with government agencies, on international cooperation, and on water resources development. (Professor V. T. Chow, Director, International Seminar for Hydrology Professors, 3118 Civil Engineering Building, University of Illinois, Urbana 61801)

Technical and Industrial Communications, Fort Collins, Colo., 20–25 July. Will emphasize the application of communication techniques in business, industry, and institutions of government and education. Current research and new applications, including computer science and communicology, will be discussed. The

seminar is designed for technical writers, editors, administrators, educators, and those concerned with the presentation of specialized communications to a selected audience. *Fee*: $100. (Director, Institute in Technical and Industrial Communications, C-225 Social Science Building, Colorado State University, Fort Collins 80521)

Chemical Reaction Engineering, Glen Arbor, Mich., 20–26 July. An advanced seminar on experimental method, data sources, modeling and technique in the design and analysis of reacting systems. *Fee*: $375 (includes American plan accommodations at the Homestead Inn on Lake Michigan). (Dr. Robert E. C. Weaver, Department of Chemical Engineering, Tulane University, New Orleans, La. 70118)

Biological Electron Microscopy, Los Angeles, Calif., 2–13 September. For professional and laboratory personnel who desire knowledge and experience in tissue preparation and ultrathin sectioning for electron microscopy. *Fee*: $250. Limited to 12 participants. (Dr. Robert F. Bils, Hancock Foundation, University of Southern California, Los Angeles 90007)

National Meetings

July

5–11. Tri-Organizational **Science and Clinical Rehabilitation** Conf., 13th, Albany, N.Y. (J. Timmerman, 1520 Van Hoesen Rd., Castleton-on-Hudson, N.Y.)

6–10. **Forest Products** Research Soc., 23rd, San Francisco, Calif. (K. E. Huddleston, The Society, 2801 Marshall Court, Madison, Wis. 53705)

7–18. Conference on **Environmental Effects on Antenna Performance**, Boulder, Colo. (P. Blacksmith, AFCRL (CRD), L. G. Hanscom Field, Bedford, Mass. 01730)

7–18. **Science for Clergymen**, Oak Ridge, Tenn. (Special Projects Office, Oak Ridge Associated Universities, P.O. Box 117, Oak Ridge 37830)

8–11. **Nuclear and Space Radiation Effects**, University Park, Pa. (E. A. Burke, AFCRL (CRWH), Stop 30, L. G. Hanscom Field, Bedford, Mass. 01730)

9–12. National Soc. of **Professional Engineers**, Kansas City, Mo. (P. H. Robbins, The Society, 2029 K St., NW, Washington, D.C. 20006)

10–13. American **Therapeutic** Soc., 70th, New York, N.Y. (R. T. Smith, The Society, 37 Narbrook Park, Narberth, Pa.)

11–12. **Programming Language Users Conf.**, Binghamton, N.Y. (J. A. Higgins, Computer Center, State Univ. of New York, Binghamton 13901)

12–13. Society for **Surgery of the Alimentary Tract**, 10th, New York, N.Y. (J. V. Prohaska, The Society, 950 E. 59 St., Chicago, Ill. 60637)

12–13. Society for **Vascular Surgery**, New York, N.Y. (R. M. Nelson, Surgical Research Lab., Latter-Day Saints Hospital, Salt Lake City, Utah 84103)

13–16. **Physiology and Biochemistry of Muscle as a Food**, Madison, Wis. (E. J. Briskey, Muscle Biology Lab., College of Agricultural and Life Sciences, Univ. of Wisconsin, Madison 53706)

13–17. American **Medical** Assoc., New York, N.Y. (W. E. Burmeister, The Association, 535 N. Dearborn St., Chicago, Ill.)

14–16. **Sanitary Engineering Research, Development, and Design**, 2nd natl. symp., Ithaca, N.Y. (A. W. Lawrence, 219 Hollister Hall, Cornell Univ., Ithaca 14850)

14–18. Symposium on **Ecology as a Guide to Social Change**, New Haven, Conn. (Z. W. White, Yale Univ., New Haven 06511)

14–18. Symposium on the **Nature, Induction, and Utilization of Mutations in Plants**, Pullman, Wash. (J. H. Kane, Div. of Technical Information, U.S. Atomic Energy Commission, Washington, D.C. 20545)

14–18. **Persistence of Food Habits:** Problem in the War on Hunger, Milwaukee, Wis. (Engineering Foundation Research Conf., Room 308, 345 E. 47 St., New York 10017)

16–18. **Electron Probe Analysis** Soc. of America, 4th, Pasadena, Calif. (A. A. Chodos, Geology Dept., California Inst. of Technology, Pasadena 91109)

18–19. Rocky Mountain **Cancer** Conf., Denver, Colo. (D. G. Derry, Colorado Medical Soc., 1809 E. 18th Ave., Denver 80218)

20–25. Association for the **Advancement of Medical Instrumentation**, Chicago, Ill. (J. J. Post, 19 Brook Rd., Needham Heights, Mass. 02194)

21. Group Representations in **Mathematics and Physics**, Seattle, Wash. (R. S. Paul, Battelle Memorial Inst., 4000 NE 41st St., Seattle 89105)

21–25. **Transportation Systems Analysis**, Milwaukee, Wis. (Engineering Foundation Research Conferences, Room 308, 345 E. 47 St., New York 10017)

23–25. Montana **Radiological** Soc. Symp., Glacier National Park. (C. H. Agnew, 1231 N. 29th St., Billings, Mont. 59101)

25–26. **Linguistic** Soc. of America, Urbana, Ill. (R. B. Lees, Dept. of Linguistics, Univ. of Illinois, Urbana 61801)

28–29. Society of **Research Administrators**, San Francisco, Calif. (K. Hartford, Biology Dept., Yale Univ., 102 Kline Biology Tower, New Haven, Conn. 06520)

28–30. Society of **Research Administrators**, 3rd annual, San Francisco, Calif. (K. Hartford, Yale Univ., 102 Kline Biology Tower, New Haven, Conn. 06520)

28–1. **Instrumentation Science,** research conf., Geneva, N.Y. (T. E. Tremellen, Education and Research Services, Instrument Soc. of America, 530 William Penn Pl., Pittsburgh, Pa. 15219)

28–1. **Quality Engineering and Research**, Milwaukee, Wis. (Engineering Foundation Research Conferences, Room 308, 345 E. 47 St., New York 10017)

August

3–6. National **Heat Transfer** Conf., 11th, Minneapolis, Minn. (D. C. Kelly, American Inst. of Chemical Engineers, 345 E. 47 St., New York 10017)

3–7. Society for **Cryobiology**, 6th annual, Buffalo, N.Y. (R. E. Greco, 3175 Staley Rd., Grand Island, N.Y. 14072)

4–5. **Aerospace Structures Design** Conf., Seattle, Wash. (J. R. Fuller, Boeing Co., P.O. Box 707, Orgn. 6-8650, M/S 77-89, Renton, Wash. 98055)

4–6. **Deterioration and Preservation of Library Materials,** 34th annual conf., Chicago, Ill. (H. W. Winger, Graduate Library School, Univ. of Chicago, 1116 E. 59 St., Chicago 60637)

4–8. **Molecular Biology and Pathology,** 2nd conf., Saratoga Springs, N.Y. (K. T. Lee, Dept. of Pathology, Albany Medical College, Albany, N.Y. 12208)

5–8. World Conf. on **Records,** Salt Lake City, Utah. (S. E. Beesley, 1030 S. Orchard Dr., Bountiful, Utah 84010)

6–8. Applications of **X-Ray Analysis** Conf., Denver, Colo. (B. L. Henke, Div. of Metallurgy, Denver Research Inst., Denver 80210)

10–13. **Soil Conservation** Soc. of America, Fort Collins, Colo. (H. W. Pritichard, 7515 NE Ankeny Rd., Ankeny, Iowa 50021)

11–13. Symposium on **Crystal Growth,** Washington, D.C. (H. S. Peiser, Room B316, Bldg. 223, National Bureau of Standards, Washington, D.C. 20234)

11–14. Society of **Photo-Optical Instrumentation Engineers,** 14th annual technical symp., San Francisco, Calif. (H. L. Kasnitz, SPIE Symposium, P.O. Box 288, Redondo Beach, Calif. 90277)

12. American **Astronomical** Soc., Albany, N.Y. (G. C. McVittie, Univ. of Illinois Observatory, Urbana 61801)

13–24. Frontier Topics in **Crystallography,** Stony Brook, L.I., N.Y. (E. H. Kone, American Inst. of Physics, 335 E. 45 St., New York 10017)

17–22. **Animal Behavior** Soc., Burlington, Vt. (B. Dane, Tufts Univ., Medford, Mass.)

17–22. American Inst. of **Biological Science,** Burlington, Vt. (J. R. Olive, 3900 Wisconsin Ave., NW, Washington, D.C. 20016)

17–22. American Soc. of **Zoologists,** Burlington, Vt. (J. R. Shaver, Dept. of Zoology, Michigan State Univ., East Lansing 48823)

18–20. **Genetics** Soc. of America, Madison, Wis. (B. Wallace, Dept. of Genetics, Cornell Univ., Ithaca, N.Y. 14850)

18–21. American **Hospital** Assoc., Chicago, Ill. (E. L. Crosby, 840 N. Lake Shore Dr., Chicago 60611)

18–22. New England Assoc. of **Chemistry Teachers,** 31st summer conf., Plymouth, N.H. (M. P. Olmsted, Publicity Chairman, NEACT, 9 Brookmont Dr., Wilbraham, Mass. 01095)

18–22. American Soc. of **Pharmacognosy,** 10th annual, Corvallis, Ore., with **Marine Biomedicinals** Symp. (P. Catalfomo, School of Pharmacy, Oregon State Univ., Corvallis 97331)

18–22. American **Phytopathological** Soc., Spokane, Wash. (J. P. Fulton, Dept. of Plant Pathology, Univ. of Arkansas, Fayetteville 72701)

18–22. National Goals in **Water Pollution Control,** Santa Barbara, Calif. (F. A. Butrico, Coordinator of Environmental Sciences Programs, Battelle Memorial Inst., Columbus Laboratories, Washington, D.C.)

19. **Biometric** Soc., western North American regional, Pullman, Wash. (J. S. Williams, Statistical Lab., Colorado State Univ., Fort Collins)

19–21. **Birch Symp.,** Durham, N.H. (R. R. Weyrick, Dept. of Forest Re-

sources, Univ. of New Hampshire, Durham 03824)

19–22. **Biometric** Soc., eastern North American regional, New York, N.Y. (D. G. Gosslee, P.O. Box 713, Oak Ridge, Tenn. 37830)

19–22. American Assoc. of **Clinical Chemists**, 21st natl. mtg., Denver, Colo. (J. Preston, P.O. Box 18323, Capitol Hill Station, Denver 80218)

19–22. Western **Electronic** Show and Convention, San Francisco, Calif. (D. W. Martin, WESCON, 3600 Wilshire Blvd., Los Angeles, Calif. 90005)

19–22. American Soc. for **Horticultural Science**, 44th annual, Pullman, Wash. (C. Blackwell, The Society, 615 Elm St., St. Joseph, Mich. 49085)

19–22. American **Statistical** Assoc., 129th, New York, N.Y. (D. C. Riley, The Association, 810 18th St., NW, Washington, D.C. 20006)

19–23. American **Fern** Soc., Seattle, Wash. (A. M. Evans, Dept. of Botany, Univ. of Tennessee, Knoxville 37916)

20–22. American Soc. of **Civil Engineers**, Hydraulics Conf., Logan, Utah. (ASCE Hydraulics Conf., % Utah Water Research Lab., Utah State Univ., Logan 84321)

21–23. American **Nature Study** Soc., Pullman, Wash. (J. Geisler, Milewood Rd., Verbank, N.Y. 12585)

24–25. **Programming Languages Definition**, San Francisco, Calif. (J. A. Painter, IBM Corp., Research Lab., Dept. 978, Bldg. 025, Monterey and Cottle Rds., San Jose, Calif. 95114)

24–27. **Alaska Div., AAAS**, College. (V. Fisher, Inst. of Social, Economic and Government Research, Univ. of Alaska, College 99701)

24–27. **Defects in Electronic Materials for Devices**, Boston, Mass. (D. P. Seraphim, IBM Components Div., Bldg. 300, Hopewell Junction, N.Y. 12533)

24–27. Conference on **Food-Drugs from the Sea**, Kingston, R.I. (G. F. Greene, Jr., % Professional Services, Abbott Labs., North Chicago, Ill. 60064)

24–29. **Gerontological** Soc., Washington, D.C. (E. Kaskowitz, The Society, 660 S. Euclid St., St. Louis, Mo. 63110)

24–2. **Botanical** Soc. of America, Seattle, Wash. (R. C. Starr, Dept. of Botany, Indiana Univ., Bloomington 47401)

25–27. **Applied Mechanics** Western Conf., Albuquerque, N.M. (A. B. Conlin, Jr., Technical Depts., 345 E. 47 St., New York 10017)

25–27. **Mathematical** Assoc. of America, Eugene, Ore. (A. B. Willcox, The Association, 1225 Connecticut Ave., NW, Washington, D.C. 20036)

25–28. **Chromosphere-Corona Transition**, Boulder, Colo. (J. W. Evans, Sacramento Peak Observatory, Sunspot, N.M. 88349)

26–28. Engineering Applications of **Electronic Phenomena** Conf., Ithaca, N.Y. (H. J. Carlin, School of Electrical Engineering, Cornell Univ., Ithaca 14850)

26–29. **Electron Microscope** Soc. of America, St. Paul, Minn. (G. G. Cocks, Olin Hall, Cornell Univ., Ithaca, N.Y. 14850)

28–1. Society of **Petroleum Engineers**, Denver, Colo. (J. B. Alford, 6200 N. Central Expressway, Dallas, Tex. 75206)

31–4. American **Psychological** Assoc., Washington, D.C. (K. Goodall, The Society, 1200 17th St., NW, Washington, D.C. 20036)

31–4. **Psychometric** Soc., Washington, D.C. (W. B. Schrader, Educational Testing Service, Princeton, N.J. 08540)

31–6. **Quantum Solids: Hydrogen and Helium**, Aspen, Colo. (J. C. Raich, Colorado State Univ., Fort Collins 80521)

International and Foreign Meetings

August

4–7. International Conf. on **Raman Spectroscopy**, Ottawa, Ont., Canada. (J. A. Koningstein, Chemistry Dept., Carleton Univ., Ottawa)

4–9. International **Rhinologic** Soc., Mexico, D.F. (G. H. Drumheller, 1515 Pacific, Everett, Wash. 98201)

4–15. **Vertebrate Evolution: Mechanism and Process**, Istanbul, Turkey. (M. K. Hecht, Dept. of Biology, Queens College, Flushing, N.Y. 11367)

6–12. International Congr. of **Crystallography**, 8th, Buffalo, N.Y. (E. H. Kone, American Inst. of Physics, 335 E. 45 St., New York 10017)

10–14. International Conf. on **Medical Physics**, 2nd, Boston, Mass. (E. W. Webster, Dept. of Radiology, Massachusetts General Hospital, Boston 02114)

10–15. **Chemotherapy**, 6th intern. congr., Tokyo, Japan. (W. P. Boger, P.O. Box 265, Princeton, N.J. 08540)

11–15. International Conf. of **Medical Physics**, Boston, Mass. (W. T. Maloney, Suite 620, 6 Beacon St., Boston 02108)

12–15. International **Photoconductivity** Conf., 3rd, Palo Alto, Calif. (G. S. Picus, Hughes Research Labs., 3011 Malibu Canyon Rd., Malibu, Calif. 90265)

17–21. International Assoc. of **Milk, Food and Environmental Sanitarians**, Louisville, Ky. (H. L. Thomasson, Box 437, Shelbyville, Ind. 46176)

20–21. International **Electronic Circuit Packaging** Symp., San Francisco, Calif. (IECPS Papers Selection Committee, % WESCON, 3600 Wilshire Blvd., Los Angeles, Calif. 90005)

20–27. International Union of **Pure and Applied Chemistry**, 22nd, Sydney, Australia. (J. R. Price, Box 2249U, G.P.O. Melbourne, Australia 3001)

21–28. International Symp. on **Statistical Ecology**, New Haven, Conn. (G. P. Patil, Dept. of Statistics, 302 McAllister Bldg., Pennsylvania State Univ., University Park 16802)

24–26. Laurentian **Hormone** Conf., Mont Tremblant, P.Q., Canada. (Laurentian Hormone Conf. Office, 222 Maple Ave., Shrewsbury, Mass. 01545)

24–28. **Mobilizing Canada's Agricultural Resources**, 49th, Saskatoon, Sask. (R. H. Burrage, 1969 AIC Convention Committee, Box 800, Sub. P.O. No. 6, Saskatoon)

24–29. **Gerontology**, 8th intern. congr., Washington, D.C. (N. W. Shock, 9650 Rockville Pike, Bethesda, Md. 20014)

25–29. International Conf. on **Luminescence**, Newark, Del. (F. Williams, Dept. of Physics, Univ. of Delaware, Newark 19711)

BOOKS RECEIVED

(*Continued from page 1390*)

Biopathology of Pattern Alopecia. Proceedings of an international symposium, Rapallo, Italy, 1967. Aldo Baccaredda-Boy, Giuseppe Moretti, and Johann Rudolf Frey, Eds. Karger, Basel, 1968 (U.S. distributor, Phiebig, White Plains, N.Y.). x + 222 pp., illus. $14.15.

Biology and Man. George Gaylord Simpson. Harcourt, Brace and World, New York, 1969. xii + 180 pp. $5.95.

Boundary Value Problems of Mathematical Physics and Related Aspects of Function Theory. Part 1. V. P. Il'in, Ed. Translated from the Russian edition (Leningrad, 1967). Consultants Bureau, New York, 1969. viii + 96 pp. Paper, $15. Seminars in Mathematics, vol. 5.

The Climatic Physiology of the Pig. L. E. Mount. Williams and Wilkins, Baltimore, 1968. x + 274 pp., illus. $14.50. Monographs of the Physiological Society, No. 18.

Clinical Vitaminology. Methods and Interpretation. Herman Baker and Oscar Frank. Interscience (Wiley), New York, 1969. xii + 244 pp., illus. $13.95.

Coal and Coal-Bearing Strata. Based on the 13th Inter-University Geological Congress, Newcastle upon Tyne, England, 1965. Duncan Murchison and T. Stanley Westoll, Eds. Elsevier, New York, 1968. xii + 420 pp., illus. + 42 plates. $28.50.

Community Fact Book for Washington Heights, New York City. 1965–1966 and 1960–1961. Jack Elinson, Paul W. Haberman, and Cyrille Gell. School of Public Health and Administrative Medicine, Columbia University, New York, 1968. vi + 102 pp., illus. Paper, $5.

Dosage Non Destructif de la Composante Minérale du Tissu Osseux par Densitométrie Radiographique. W. Mouvet. Éditions Arscia, Brussels; Librairie Maloine, Paris, 1968. 184 pp., illus. Paper, 360 F.B. Collection "Médico Monographies d'Angrégés."

The Economic Effect of Declining Fertility in Less Developed Countries. Gavin W. Jones. Population Council, New York, 1969. iv + 32 pp., illus. Paper.

Effects of Pesticides on Fruit and Vegetable Physiology. Subcommittee on Chemicals Affecting Fruit and Vegetable Physiology, Committee on Plant and Animal Pests, National Research Council. National Academy of Sciences, Washington, D.C., 1968. x + 90 pp. Paper, $3.25. Principles of Plant and Animal Pest Control, vol. 6. NAS Publication 1698.

Elektronische Bauelemente und Netzwerke I. Physikalische Grundlagen der Bauelemente. H.-G. Unger and W. Schultz. Vieweg, Braunschweig, 1968. xvi + 208 pp., illus. Paper, DM 16.80. Unitexte.

Fetal Homeostasis. Vol. 3, Proceedings of the Third Conference, Princeton, N.J., 1967. Ralph M. Wynn, Ed. Appleton-Century-Crofts, New York, 1968. xiv + 306 pp., illus. $12.75.

Fluidization Engineering. Daizo Kunii and Octave Levenspiel. Wiley, New York, 1969. xxii + 538 pp., illus. $14.95.

The Fossil Flora of the Drywood Formation of Southwestern Missouri. Philip W. Basson. University of Missouri Press,

Columbia, 1969. x + 174 pp., illus. $4.50. University of Missouri Studies, vol. 44.

Heredity and Environment in the Functional Psychoses. Case Histories. Einar Kringlen. Universitetsforlaget, Boston, 1968. viii + 278 pp. Paper, $8. Norwegian Monographs on Medical Science.

Intracranial Aneurysms and Subarachnoid Hemorrhage. A Cooperative Study. Adolph L. Sahs, George E. Perret, Herbert B. Locksley, and Hiro Nishioka, Eds. Lippincott, Philadelphia, 1969. xii + 302 pp., illus. $10. Reprinted from the *Journal of Neurosurgery* 1966, vols. 24 and 25.

An Introduction to Mathematical Logic. Gerson B. Robison. Prentice-Hall, Englewood Cliffs, N.J., 1969. xii + 212 pp., illus. $5.95.

Lecture Notes on the Use of the Microscope. R. Barer. Davis, Philadelphia, ed. 3, 1968. viii + 84 pp., illus. Paper, $1.75.

Linear Ferrite Devices for Microwave Applications. Wilhelm H. von Aulock and Clifford E. Fay. Academic Press, New York, 1968. xiv + 226 pp., illus. $12. Advances in Electronics and Electron Physics, Supplement 5.

The Machining of Metals. E. J. A. Armarego and R. H. Brown. Prentice-Hall, Englewood Cliffs, N.J., 1969. x + 438 pp., illus. $13.95.

The Motivated Working Adult. Ray C. Hackman. American Management Association, New York, 1969. 208 pp., illus. $13.

The Nation's Water Resources. The First National Assessment of the Water Resources Council. Water Resources Council, Washington, D.C., 1968 (available from the Superintendent of Documents, Washington, D.C.). xvi + 450 pp., illus. Paper, $4.25.

The Nation's Water Resources Summary Report. The First National Assessment of the Water Resources Council. Water Resources Council, Washington, D.C., 1968 (available from the Superintendent of Documents, Washington, D.C.). xvi + 32 pp., illus. Paper, 65¢.

Natural Proteinase Inhibitors. Rosmarie Vogel, Ivar Trautschold, and Eugen Werle. Translated from the German edition (Stuttgart, 1966) by Express Translation Service. Academic Press, New York, 1968. xiv + 162 pp., illus. $10.

Organic Syntheses. An Annual Publication of Satisfactory Methods for the Preparation of Organic Chemicals. Vol. 48, 1968. Peter Yates, Ed. Wiley, New York, 1969. x + 166 pp., illus. $6.95.

Organozinc Coordination Chemistry. J. Boersma and J. G. Noltes. International Lead Zinc Research Organization, New York, 1968. 120 pp., illus. Paper, $2.

A Pictorial Guide to the Identification of Fusarium Species According to the Taxonomic System of Snyder and Hansen. T. A. Toussoun and Paul E. Nelson. Pennsylvania State University Press, University Park, 1968. 52 pp., illus. Spiral bound, $5.95.

Prague's 200 Days. The Struggle for Democracy in Czechoslovakia. Harry Schwartz. Praeger, New York, 1969. x + 278 pp. $5.95.

Prenatal and Postnatal Mortality in Cattle. Subcommittee on Prenatal and Postnatal Mortality in Bovines, Committee on Animal Health, National Research Council. National Academy of Sciences,

Circle No. 30 on Readers' Service Card on page 1334A →

Washington, D.C., 1968. vi + 130 pp. Paper, $3.25. NAS Publication 1685.

Principles of Demography. Donald J. Bogue. Wiley, New York, 1969. xiv + 930 pp., illus. $16.50.

Psychological Problems in Mental Deficiency. Seymour B. Sarason and John Doris, with chapters by Frances Kaplan and M. Michael Klaber. Harper and Row, New York, ed. 4, 1968. xii + 500 pp. $9.95.

A Revised Check-List of the Birds of the Maltese Islands. C. De Lucca. Classey, Hampton, Middlesex, England, 1969. 96 pp. Paper, $2.

Science and Civic Life in the Italian Renaissance. Eugenio Garin. Translated from the Italian by Peter Munz. Anchor (Doubleday), Garden City, N.Y., 1969. xxiv + 176 pp. Paper, $1.25.

The Science of Culture. A Study of Man and Civilization. Leslie A. White. Farrar, Straus and Giroux, New York, 1969. xxxvi + 444 pp. Paper, $2.85. Revised edition with a new preface by the author.

Selected Bibliography on Algae. No. 9. Nova Scotia Research Foundation, Halifax, 1968. xiv + 166 pp. Paper, $5.

Semantic Information Processing. Marvin Minsky, Ed. MIT Press, Cambridge, 1968. viii + 440 pp., illus. $15.

Semiconductor Nuclear-Particle Detectors and Circuits. Proceedings of a conference, Gatlinburg, Tenn., 1967. W. L. Brown, W. A. Higinbotham, G. L. Miller, and R. L. Chase, Eds. National Academy of Sciences, Washington, D.C., 1969. xviii + 798 pp., illus. $25. Nuclear Science Series Report No. 44. NAS Publication 1593.

Symposium on Radioecology. Proceedings of the 2nd National Symposium, Ann Arbor, 1967. Daniel J. Nelson and Francis C. Evans *et al.*, Eds. U.S. Atomic Energy Commission, Oak Ridge, Tenn., 1969 (available from Clearinghouse for Federal Scientific and Technical Information, Springfield, Va.). xii + 774 pp., illus. Paper, $3. CONF-670503, Biology and Medicine, TID-4500.

The Talented Student. A Validation of the Creativity-Intelligence Distinction. Michael A. Wallach and Cliff W. Wing, Jr. Holt, Rinehart and Winston, New York, 1969. xiv + 146 pp. Paper, $3.95.

Vertebrate Adaptations. Readings from *Scientific American*. Introduction by Norman K. Wessells. Freeman, San Francisco, 1969. viii + 368 pp., illus. Cloth, $10; paper, $5.45.

Violent Men. An Inquiry into the Psychology of Violence. Hans Toch. Aldine, Chicago, 1969. xviii + 270 pp. $7.50.

Weather and Health. An Introduction to Biometeorology. Helmut E. Landsberg. Anchor (Doubleday), Garden City, N.Y., 1969. xii + 148 pp., illus. Cloth, $4.95; paper, $1.25. Science Study Series.

Wildlife in Danger. James Fisher, Noel Simon, Jack Vinvent, *et al.* Viking, New York, 1969. 368 pp., illus. $12.95. Studio Book.

William Whewell's Theory of Scientific Method. Robert E. Butts, Ed. University of Pittsburgh Press, Pittsburgh, 1969. xii + 360 pp. $8.95.

The World as Teacher. Harold Taylor. Doubleday, Garden City, N.Y., 1969. xii + 324 pp. $6.95.