SCIENCE

9 April 1976

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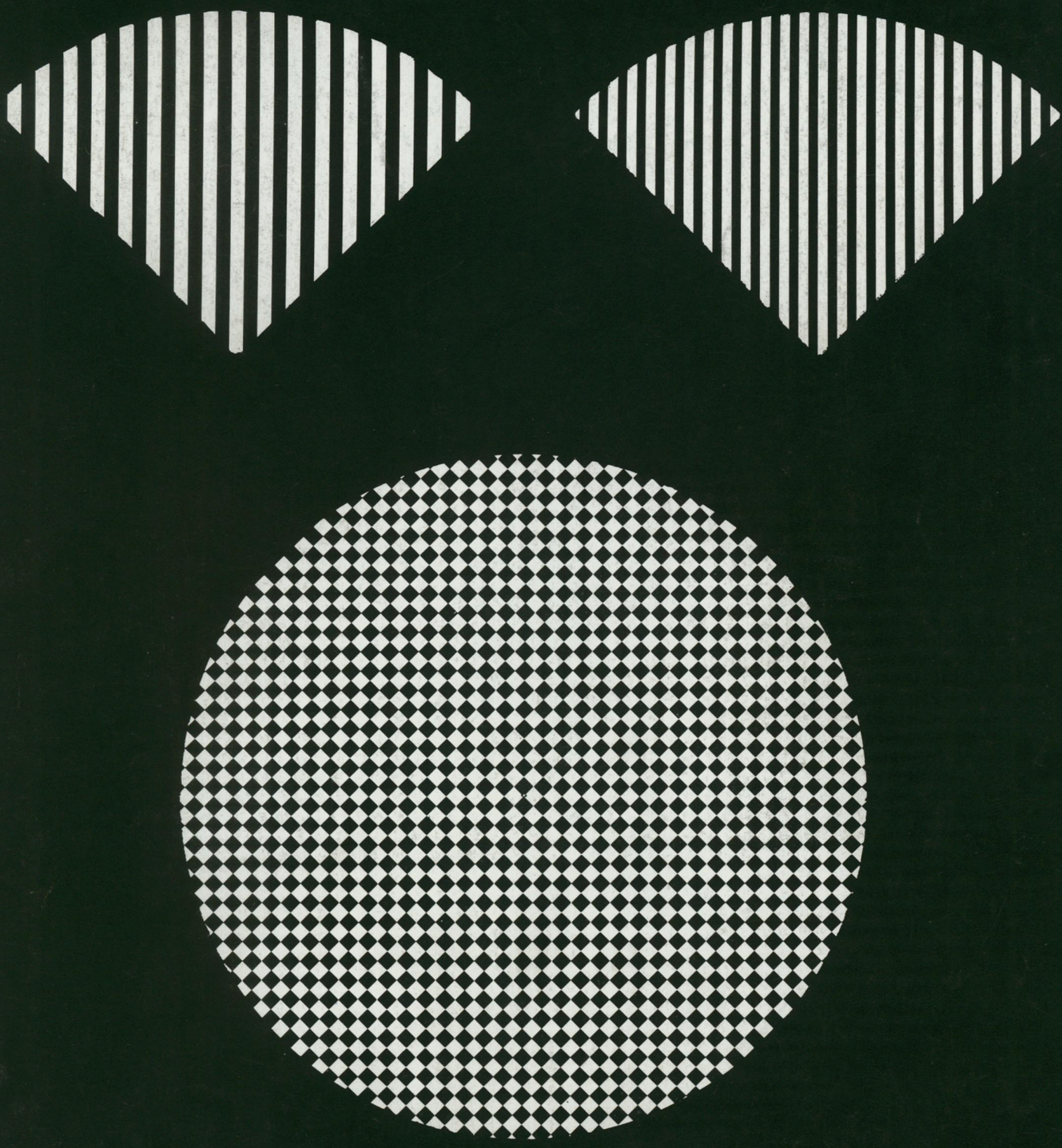

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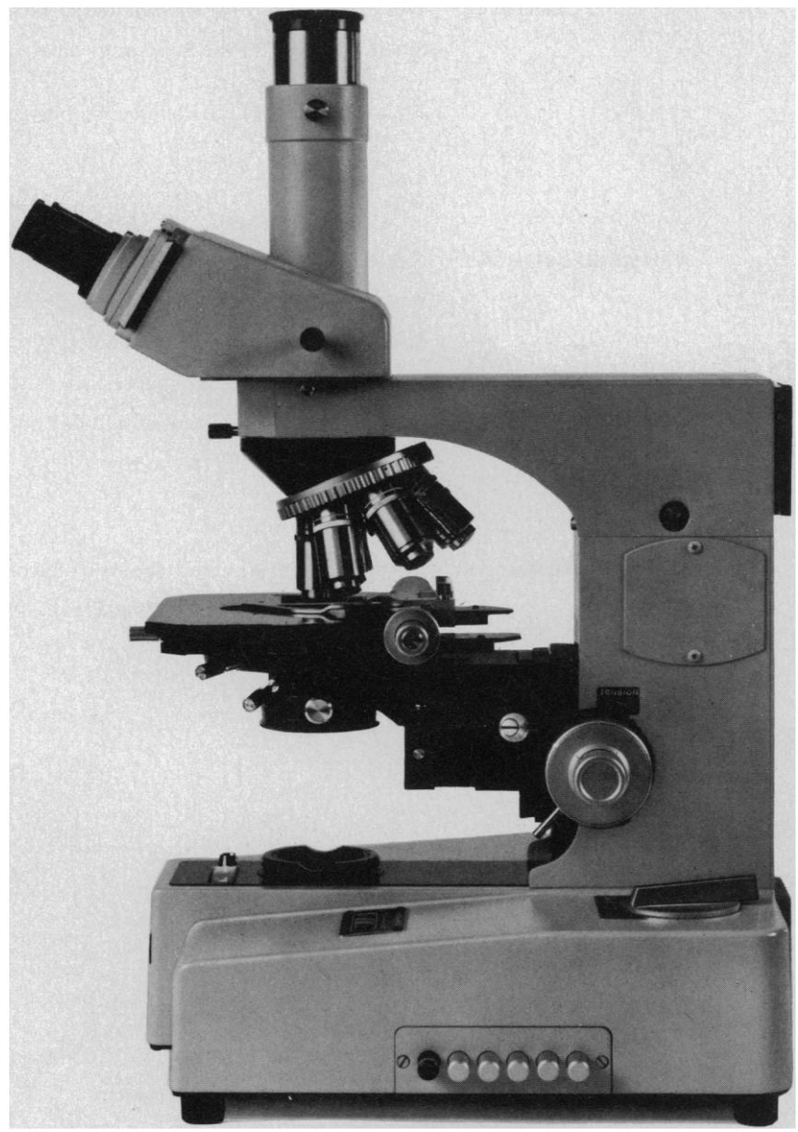

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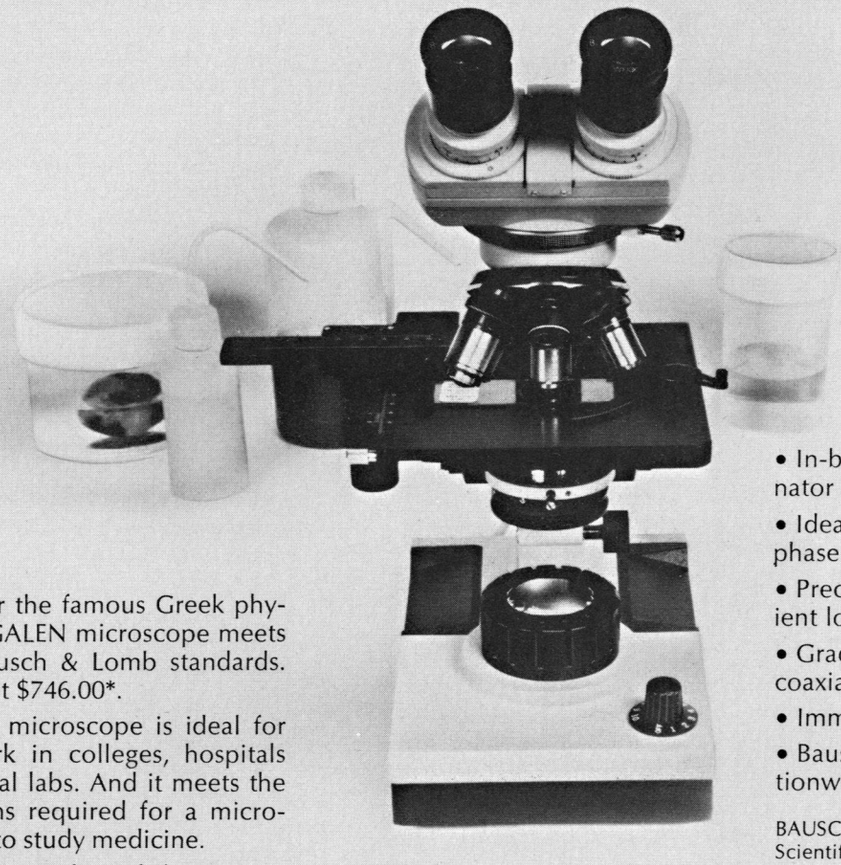

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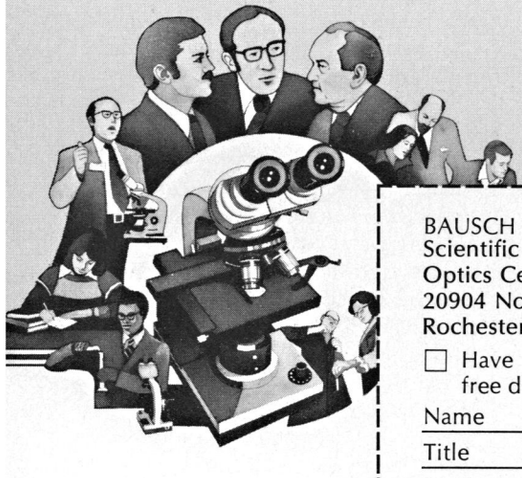

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LETTERS

Drug Shortages

The article "Penicillin G: Suddenly a shortage" by Barbara J. Culliton (News and Comment, 19 Mar., p.1157) accurately describes the shortage of intravenous penicillin G which has existed during the past few months. Shortages of other drugs (injectable local anesthetics, vasopressor agents, electrolyte additives, and so forth) have been occurring with increasing frequency during the past year, posing numerous problems, particularly in hospitals.

The American Society of Hospital Pharmacists and the Food and Drug Administration have jointly developed a nationwide Drug Shortage Monitoring Program which will be operational within the next few weeks. This program will enable us to anticipate drug supply problems and will provide information about their extent and expected duration. An important goal of the program is to help eliminate artificial shortages caused by rumor, such as the toilet tissue panic a year or so ago.

MICHAEL H. STOLAR
American Society of Hospital Pharmacists, 4630 Montgomery Avenue, Bethesda, Maryland 20014

Big University

The editorial "Big University—Humane or bureaucratic?" by Susan Artandi (19 Mar., p. 1129) is well stated and expresses what many of us have been thinking for some time. At the University of Florida, the change from an academic institution to a huge bureaucracy has occurred slowly, and only over the last several years has the faculty realized with horror what has occurred.

There are seven levels of administration over the professor in our state university system. The upper six levels are occupied by what I would term "professional administrators." That is, they are not associated to any extent with an academic discipline. This has led to cleavage of the academic community into administrators and faculty. The "Big University" should utilize the organization practiced by some of the better private universities: administration positions from department head to president should be filled by election or appointment from the senior faculty on a rotating basis. The highest academic rank in the university should be that of professor.

As for the myriad of lower echelon administrative personnel, their cost should be reduced to no more than 10 percent of the operating budget. This could be done by the university's negotiating with the state and federal governments for some less demanding accounting system. Then we could do away with personnel departments, publicity bureaus, personnel evaluation forms, time cards—in fact most forms and more than three copies of anything.

KENNETH W. MCKERNS
Department of Obstetrics and Gynecology, University of Florida College of Medicine, Gainesville 32610

Aleut Life Expectancy

W. S. Laughlin's very interesting work with Soviet scientists on the ecology and archeology of the Aleutian peoples (15 Aug. 1975, p. 507) cites the population structure and processes of Aleut and Eskimo peoples as an expression of the ecological adaptation of the Aleuts. A closer look at the demographic data presented, however, raises some doubts about whether he has really established the theoretical points he makes.

Questions immediately arise when one notes that in Laughlin's figure 3, presenting life expectancy of males at age 15, 3 of the 12 columns of data are based on skeletons. Skeletons have an estimated age at death but obviously have no life expectancy, not simply because they are already dead but because life expectancy is a property of populations, not individuals. Three more columns are based on a census, a form of data from which one can derive life expectancy estimates only by making stringent and rather unlikely assumptions about the growth rate of the population and the constancy of past mortality (*1*). One column in figure 3, that labeled "Unalaska 1822," is noted in the text as being based on a population of 411 deaths from which a life table can readily be constructed. However, Laughlin gives no information about the size of the population from which these deaths were drawn and what proportion of all deaths during that period were recorded, no assurance that the extremely likely underrepresentation of infant deaths has been assessed or corrected, and no information on the crucial question of how the age of these people was estimated.

If the data in figure 3 represent the true expectation of life at age 15 for males, I wouldn't necessarily describe this as an "Aleut achievement of longevity." The model life table for all human populations which gives an expectation of life at age 15 for males of 35 years (comparable to the Unalaska 1822 data) gives an expectation of life at birth of 30 years for women and 27.7 years for men, and nearly 45 percent of the babies born die before reaching the age of 15 (*2*). This is comparable to the results I have found for the hunting and gathering !Kung (*3*) people of the Kalahari desert and represents "a better management policy for natural resources" only in comparison to the Eskimos, who seem to have an expectation of life at birth well under 20 years—below the level of the "worst" model life table presented in the Coale-Demeny series (*2*).

When we go back to look at the three very different age distributions of Aleut and Eskimo populations shown in Laughlin's figure 2, more questions arise about whether the conclusions can be accepted. Cross-sectional age distributions, which provide valuable information for ecological studies about the "dependency" burden of youth and old age on adults, tell us much more about the growth rate of the population than about the longevity (*4*). Figure 2 cannot be an age distribution in percentages, as it is labeled, or it would be impossible to have 100 percent at age 0, 80 percent at age 10, and so forth; apparently it represents the percentage at each age and older. I suspect, although I can't be sure, that the data in segment A represent the survivorship curve (the l_x column) of the life table based on those 411 deaths discussed above. If the data in segments B and C are cumulative age distributions of living populations, they are not comparable to those in segment A. If, on the other hand, they too are survivorship curves, I would be surprised and impressed at the low level of survivorship. In the absence of clear labeling and a basis for age estimation, I am not inclined to believe it.

The demography of small populations of primitive people is a sufficiently new and difficult field that it will be necessary to spell out the basis for conclusions, including such items as the procedure of age estimation, the data base, and the exact analysis performed, for some time, until a standard methodology is established.

NANCY HOWELL
Division of Social Sciences, Scarborough College, University of Toronto, West Hill, Ontario, Canada M1C 1A4

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3. N. Howell, in *Kalahari Hunter-Gatherers*, R. Lee and I. DeVore, Eds. (Harvard Univ. Press, Cambridge, Mass., in press).
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Human Vaginal Odors

The study by Doty *et al.* (Reports, 26 Dec. 1975, p. 1316) on human vaginal odors claims not to support "the notion that such odors are particularly attractive to humans in an in vitro test situation," since odors studied during all phases of the menstrual cycle showed mean estimates on the unpleasant side of the neutral zero point. The authors imply that the absence of pleasantness in the "out-of-context test situation" may be the result of cultural or learning factors, or the underdevelopment of man's olfactory system, or his lack of a functioning vomeronasal organ.

Although this research has an elegant methodology, and contextual factors are appreciated, it is inadequately conceptualized, since the investigators appear to tacitly assume that pleasantness of these odors is independent of the *state* of the judges. It is commonly experienced that a state of sexual excitement profoundly alters perception; for example, a tactile input which is painful in a state of sexual nonarousal may be quite pleasurable when experienced during a state of sexual arousal. Since the observers making judgments in Doty *et al.*'s experiment were apparently not sexually aroused, the authors' conclusion referred to above is hardly justified. This well illustrates that psychological science, however sophisticated, often requires grounding in the phenomenology of ordinary experience.

GORDON G. GLOBUS
HARRY B. COHEN
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We reported that the general absence of pleasantness responses to human vaginal odors *in our particular out-of-context in vitro test situation* may be the result of cultural or learning factors or man's comparatively undeveloped olfactory system or his lack of a functioning vomeronasal organ. We did not suggest, as Globus and Cohen "appear to tacitly assume," that such odors in other contexts would be perceived similarly, or that the factors mentioned by Globus and Cohen were the only ones potentially involved in producing our effects. The *opinion* of Globus and Cohen that hedonic responses to vaginal odors change as a function of sexual arousal provides an interesting hypothesis for future research. Unfortunately, no experimental data exist on this point, making their opinion pure conjecture at the present time. Examples of changes in another, quite different, sensory modality during sexual arousal cannot be taken as strong support for the efficacy of such a notion.

A sampling of a number of individuals' *opinions* (including our own) regarding the perceived pleasantness of vaginal odors in heterosexual contexts suggests a wide variety of experiences, presumably depending upon factors such as the partners involved, their ages, sexual proclivities, histories, and a host of situational variables. The salience of odor memory (*1*) and the close relationship of the chemical senses to emotional processes suggest the possibility of various types of odor conditioning occurring in human sexual situations. Aversions to vaginal secretions can be produced quite easily in hamsters (a species whose vaginal secretions appear to be sexually attractive to conspecific males) by pairing ingestion of the secretion with gastrointestinal illness (*2*).

As we are the first to admit, a study such as ours has many inherent limitations, particularly in the eyes (or noses) of readers who wish to generalize its findings to coital situations. We hope that our experiment and the opinions of Globus and Cohen will entice scientists specifically interested in the perception of vaginal odors in coital situations to perform in vivo experiments on this topic. We hope such individuals will use a variety of participants so as not to bias their findings with too small a sample of the frequently misleading "phenomenology of ordinary experience."

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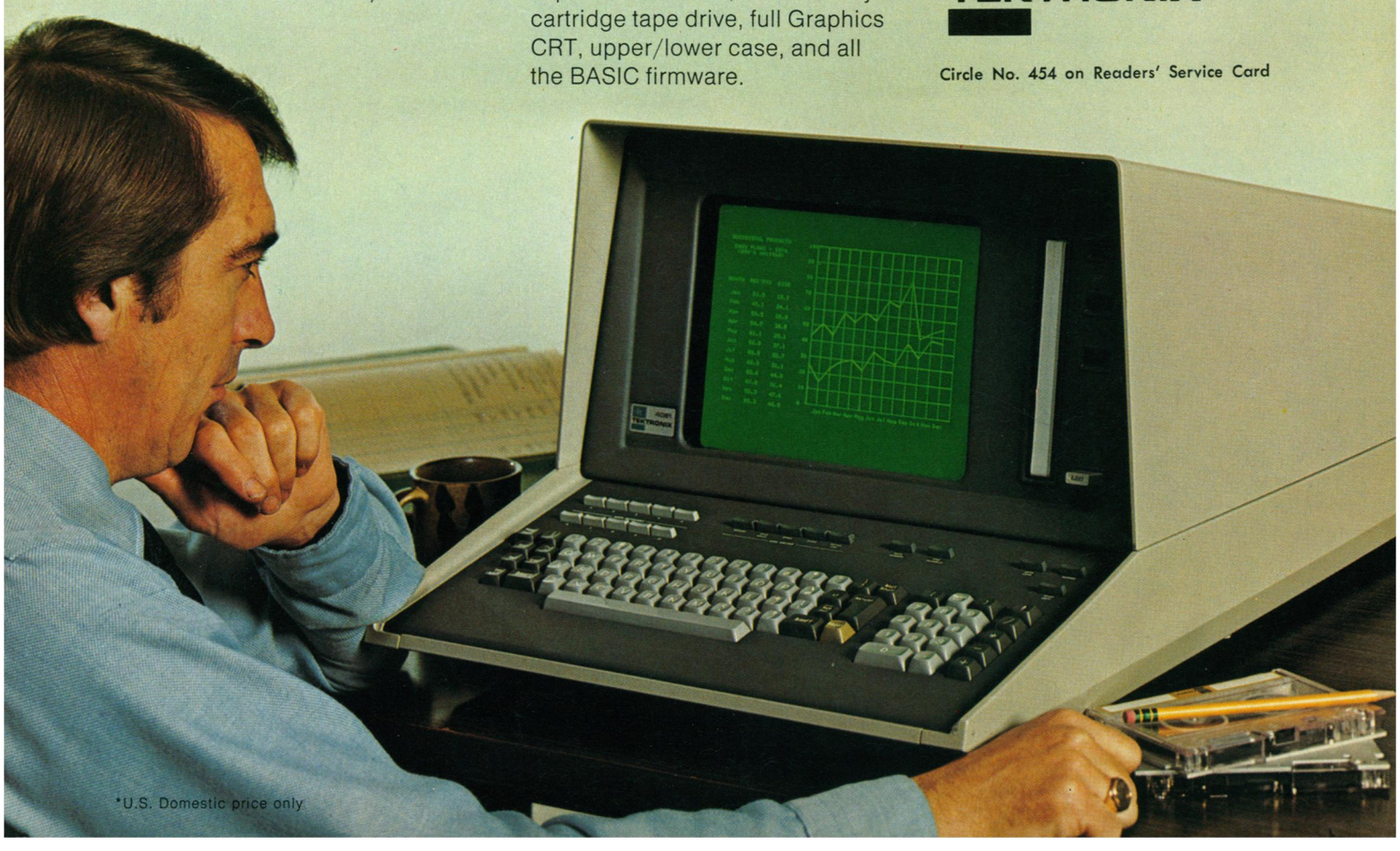

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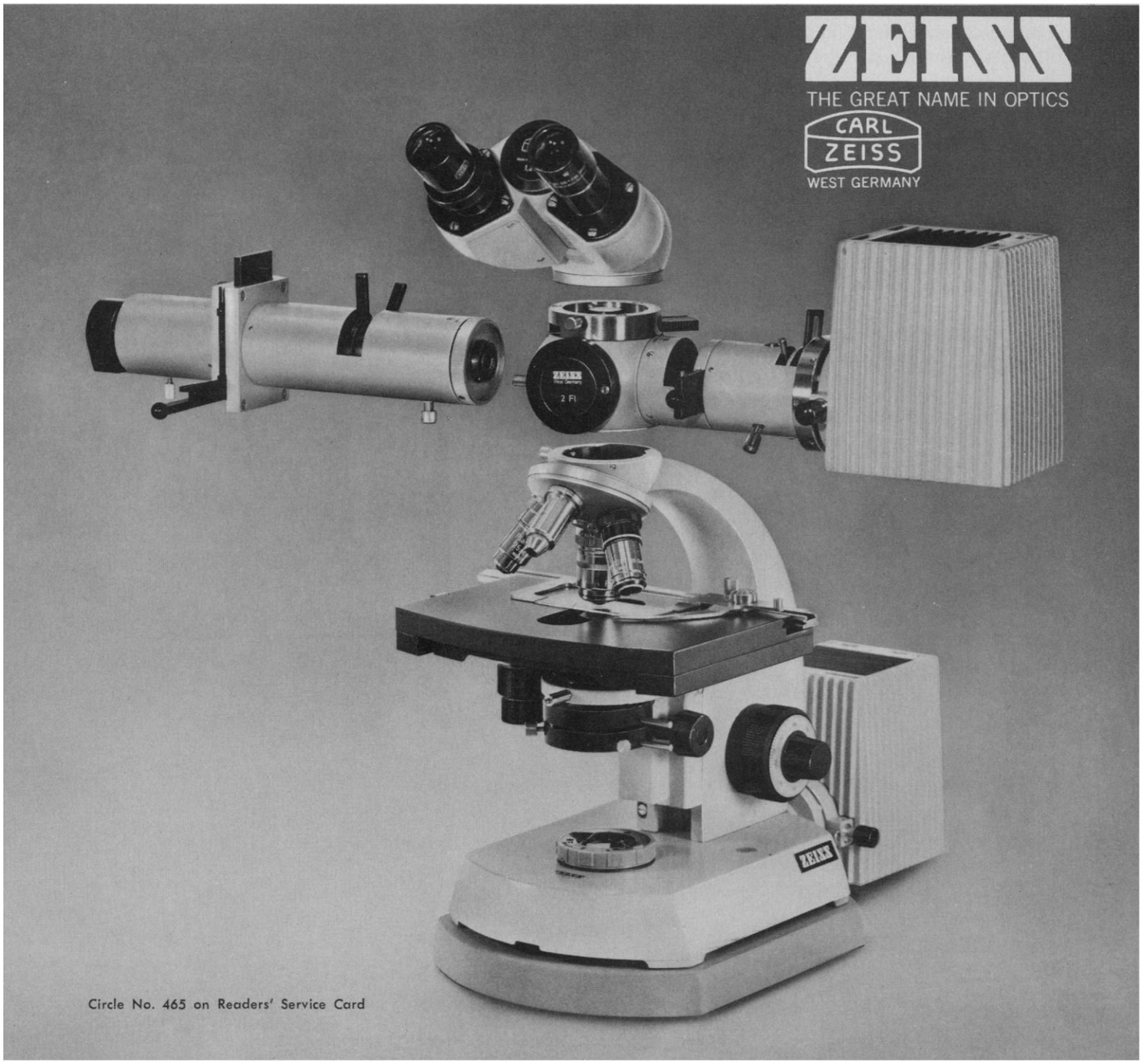

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9 April 1976, Volume 192, Number 4235

SCIENCE

Scientific Quests and Governmental Principles

Basic science is now on the defensive. It is being assailed by groups and governments as being costly and dangerous, as being silly or ominous. Now that modern biology, for example, has achieved some mastery over genetics, various scenarios of deliberate intrusion into the human gene pool are being rehearsed, almost always with more anxiety than insight. These fears reflect our society's failure to understand the fundamental process of basic research and its relation to our historical and legal heritage. As a result of this failure, the ever-growing influence of scientific invention and technology has terrified us as much as it has given us peace.

In no age of Western history has a philosophical procedure been so tacitly accepted and used without understanding as has science by modern governments. I believe this is so because the people who govern are no longer in a sensible position to make wise decisions based on the advice of a Mandarin bureaucracy of scientific specialists. Our legislators are in that predicament because their present education and legal discipline simply exclude any understanding of the procedures and disciplines of scientific research. This is true for three reasons. First, science is not so complicated as it is abstract and far removed from ordinary sensory experience. Like the law, it requires discipline and training to become familiar with its abstractions. Second, only recently have historians and sociologists of science begun to show us the difference between the generative or creative aspects of science and its formulation and application in teaching. In the ignorance of their findings, science is usually experienced as a dead collection of facts rather than a characteristically human cultural activity. And third, legal precedent, which is the pillar of Anglo-Saxon law, has so far largely failed to incorporate the changes brought about by the impact of new scientific knowledge upon our lives and societies.

We have not two cultures, but two disciplines, the politico-legal and the scientific, and they very rarely intersect. Because of this, we are faced with two extreme ideological positions—scientism and anti-scientism. Both are dangerous as well as erroneous. Such ideological conflicts can be understood historically, but in order to understand their true basis and fully resolve them, we must understand how the brain itself produces thought and language. In our search for new knowledge, we have not yet fully committed ourselves to take on this most challenging and important task. When we know better how the brain works, I believe that we will better understand the relationship between scientific facts and those facts and ideologies that are not susceptible to verification in a laboratory.

Until we have some scientific comprehension of the basis of knowledge itself, how can we deal with the difficulties posed by the separate customs of the disciplines of science and the disciplines of government? The main problem is how to encourage a higher level of understanding by scientists and lawyers of each others' discipline. There are short-range and long-range approaches to this problem. The short-range approach is one of testimony. Some have suggested that adversary proceedings are the only way in which scientific issues bearing upon society can be democratically handled. The essential difficulty is to decide who shall conduct such proceedings—the scientists or the lawyers. Resolution of this difficulty can only come by testing various alternatives in real situations.

The long-range and more substantial approach is to revamp our educational systems in law and science to provide a wider view of the fundamental questions in each discipline and to deepen the understanding of both the limits and the powers of their particular procedures. For now, we must continue to find ways to mix at least some legislators into our scientific brew (not to give us grants but to share our excitement) and to persuade more scientists to join the polity not as advisers but in political roles themselves.—GERALD M. EDELMAN, *The Rockefeller University, New York*

This editorial is adapted from a paper presented at the symposium, "Beyond Tomorrow: Trends and Prospects in Medical Science," held at The Rockefeller University, 8 March 1976.

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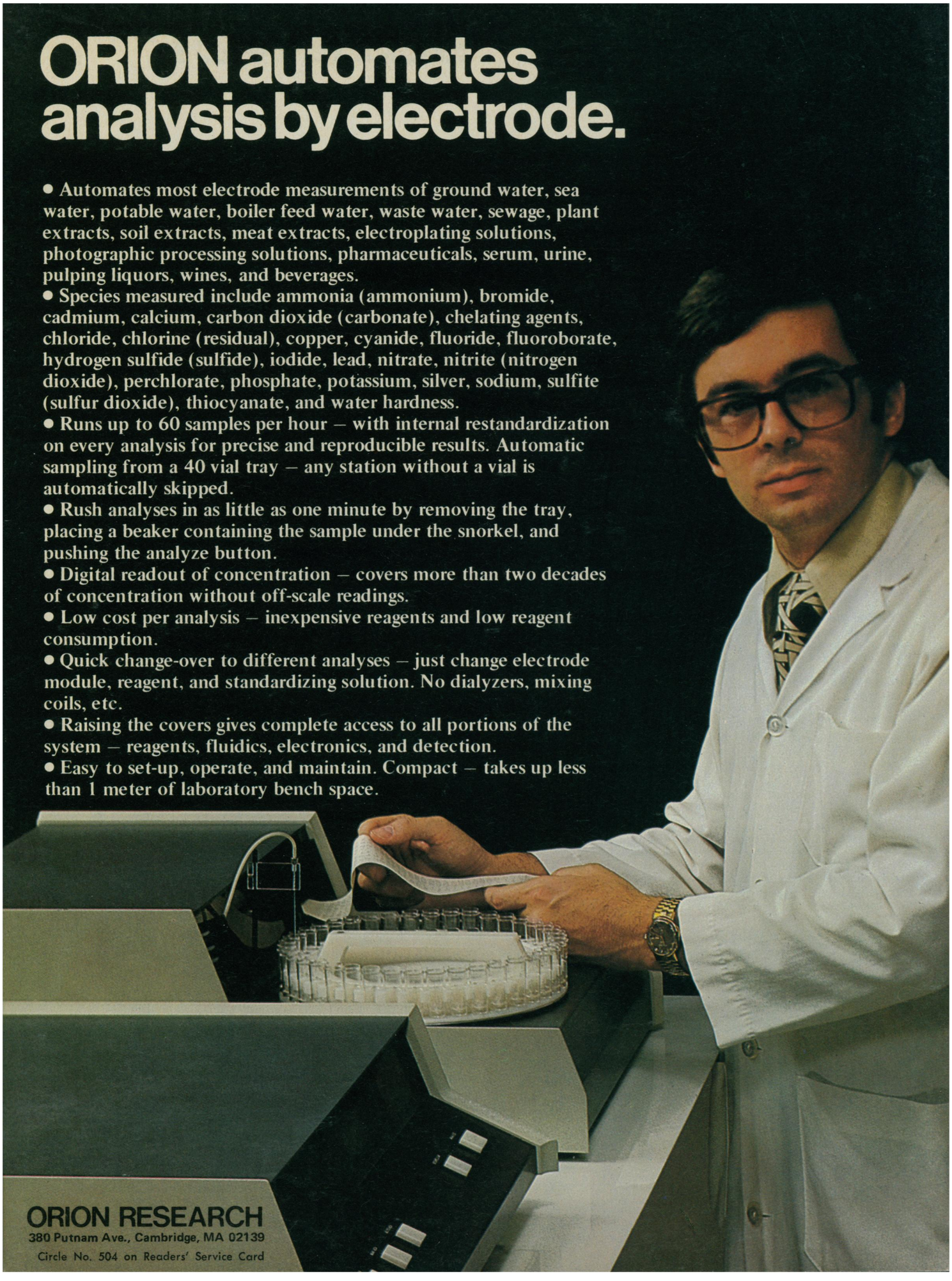

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Melting Point Apparatus

This device provides a simple, accurate means for determining the melting point of organic or inorganic compounds. Melting points up to 350°C may be read to within 0.2°C without interpolation. Uniform illumination without shadows is provided for three sample tubes simultaneously. Samples may be viewed against a white or black background by turning a knob. Temperature in the melting block is adjusted by a variable transformer. National Instrument. Circle 887.

Carbon Rod Atomizer

The CRA-90 carbon rod atomizer gives 100 to 500 times the sensitivity for a wide range of samples compared to that achieved with flame atomic absorption systems. It may be used with samples 1/250 the size of those required for flame methods. An accurate temperature programmer assures the precision and reproducibility of conditions required for drying, ashing, and atomizing. Atomizing may be approached at any rate from 25°C per second to 800°C per second. The 3000°C upper limit may be held for up to 5 seconds. Applications include elemental analysis in agriculture, forensic science, metallurgy, geochemistry, and other fields. Varian Instrument Division. Circle 882.

Tritium-Labeled Thymidine and Uridine

(Methyl-^{3}H)thymidine and (5-^{3}H)uridine are prepared by paper chromatography in solvent systems consisting of ethyl acetate : formic acid : water (60 : 5 :35) followed by column chromatography and elution with distilled water. The chemical purity is checked by ultraviolet spectrometry in aqueous solution. Radiochemical purity is checked by paper radiochromatography. Technical data accompanies each shipment and reports the results of the purity checks. Research Products International. Circle 884.

Nitrogen Detection System

Model 703 nitrogen system consists of the model 720 nitrogen detector and model 771 Pyro-reactor. The system analyzes samples in three steps: samples are injected by syringe or capillary; they are pyrolyzed in the presence of oxygen; finally nitrogen is detected by the chemiluminescence emitted when metastable nitrogen dioxide relaxes to its ground state. Metastable nitrogen dioxide is formed when nitric oxide formed during pyrolysis reacts with ozone. The detector will sense as little as 10^{-8} g with precision of ±3 percent. Antek Instruments. Circle 886.

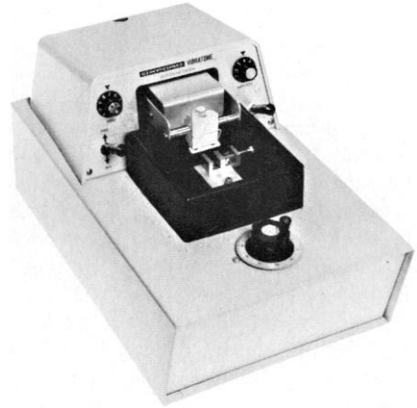

Fig. 1. The Vibratome tissue sectioning device from Oxford Laboratories sections plant and animal tissues without freezing or embedding procedures. The Vibratome uses an injector-type razor blade under a controlled rate of vibration.

Gas Chromatograph

The model 69-150 is designed for instructional use but it is suitable for routine analyses. It is supplied with two independently adjustable ¼-inch (outside diameter) by 4-foot columns; one is filled with DC-200, the other is filled with Carbowax 20M. Two heated injection ports permit "on-column" sample injection. The thermal conductivity detector employs two rhenium-tungsten filaments in a flow-through design. Output is compatible with any standard potentiometric recorder. Gow Mac Instrument. Circle 889.

Zeta Potential/Mobility Sensor

Laser Zee System 3000 is a fully automatic microelectrophoresis instrument. It measures the particle mobility of colloids, from which zeta potentials may be calculated. An optional feature is the automatic display of particle charge histograms to characterize colloid electrokinetics. In these histograms, the relative number of particles is plotted against mobility expressed as micrometers per second over volts per centimeter. The system can make up to 60 zeta potential determinations in an hour. Analog and digital outputs are produced for data processing and process monitoring. The system includes an influent conditioner module, a sensor module, and an electronics module. In research or clinical applications in which small discrete samples are analyzed only the sensor and electronics modules are required. Pen Kem. Circle 883.

Computerized X-ray Spectrometer

The EXAC-5000 analyzes samples for light elements without a vacuum. The system includes an x-ray excitation tube, a sample presentation system, a silicon x-ray detector, and a computer-based x-ray analyzer. Quantitative data reduction programs are supplied and BASIC

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Literature

Gas-Chrom Newsletter for January-February 1976 features a sensitive reagent for fatty acid analysis. Applied Science Laboratories. Circle 890.

Liquid Chromatography Products is a 12-page bulletin devoted to a modular line of system components. Tracor. Circle 665.

MicroSyringes and Chromatography Accessories is a 44-page catalog that includes new analytical products. Unimetrics. Circle 666.

Buyers Guide for Electronics lists prices and specifications for the product lines of over 100 manufacturers. Electronic Distributors Research Institute. Circle 667.

Tunable Diode Laser Instruments is a brochure devoted to these lasers for research applications. Laser Analytics. Circle 668.

Thin-Layer Chromatography Plates and Accessories includes a new line of plates designed for drug screening and other high volume separations. Analtech. Circle 669.

Photosensitive Devices features instrumentation for light measurement and detection in research applications. Hamamatsu. Circle 670.

Automatic Sampling Equipment and Flowmeters comprises an illustrated catalog complete with design specifications. Sigmamotor. Circle 671.

Wiped-Film Molecular Still is the subject of a data sheet describing short-path vacuum distillation of high molecular weight compounds. Pope Scientific. Circle 672.

Arad 50 Image Digitizer permits computer analysis of radiographs and other complex images. Antech Inc. Circle 673.

Labstill Water Distillation System details performance and design features of systems for research laboratories. Culligan. Circle 674.

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(Continued from page 136)

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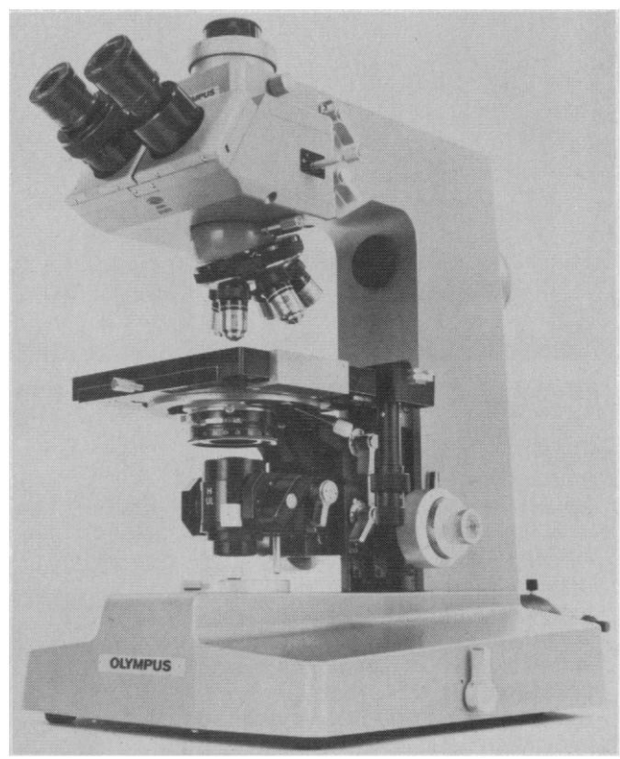

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