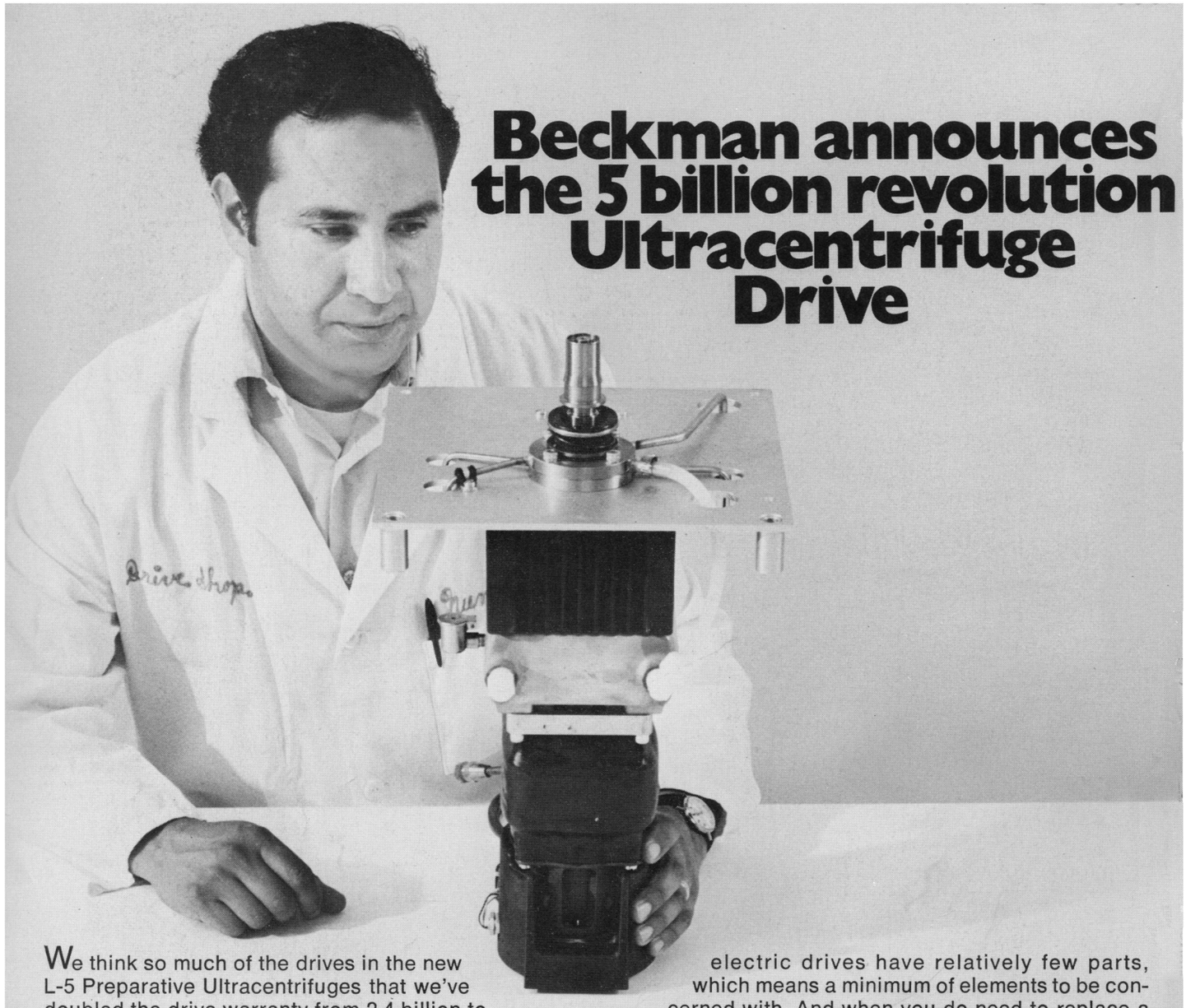
SCIENCE
10 January 1975
Vol. 187, No. 4171

Beckman announces the 5 billion revolution Ultracentrifuge Drive



We think so much of the drives in the new L-5 Preparative Ultracentrifuges that we've doubled the drive warranty from 2.4 billion to 5 billion revolutions. If the drive doesn't last that long, all you pay for are the revolutions used, and at a cost much less than under the previous warranty.

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Superior drives are only one of the reasons to choose a Beckman L-5 Preparative Ultracentrifuge. For the full story of the L-5's, send for Brochure SB-400 to Beckman Instruments, Inc. Spinco Division, 1117 California Avenue, Palo Alto, California 94304.

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10 January 1975

Volume 187, No. 4171

SCIENCE

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COVER

Nickel screen whose holes are filled with the eggs of the seaweed *Pelvetia*. The eggs have a known orientation in the holes and such screens are used to measure the ion fluxes into and out of the two poles of these eggs. Each hole has a diameter of 75 micrometers. See page 70. [Kenneth R. Robinson, Purdue University, Lafayette, Indiana]

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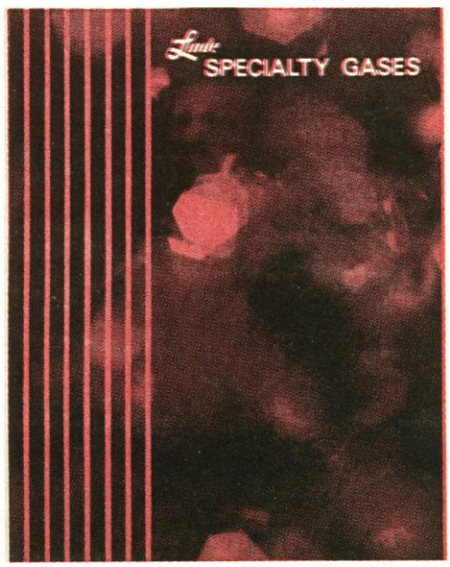

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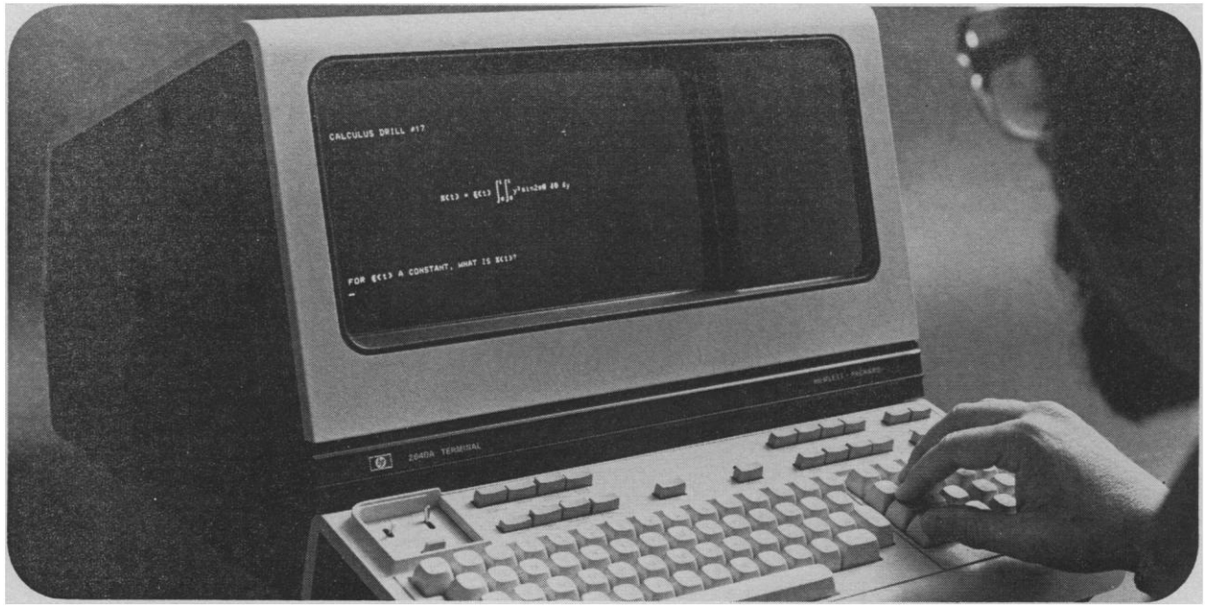

Hewlett-Packard's new CRT terminal: the intelligent next step.

Although we've been manufacturing computers and peripherals for about 10 years, we are just now introducing our first HP-manufactured cathode ray tube (CRT) terminal.

It's fair to ask why.

Our designers felt that recent technological advances—specifically in microprocessors and semiconductor random access memories (RAMs)—had great potential for terminal applications. At the same time, our computer business has generated a customer demand for time-share terminals. We have manufacturing experience in CRT displays, keyboards, and power supplies, coupled with high-volume production experience.

Drawing on these resources, we knew we could make a better terminal at a competitive price.

Our first entry, the HP 2640A, offers special conveniences and capabilities that are useful for time-share applications as well as more sophisticated data entry environments.

It has an *intelligent memory* with 4K RAMs that automatically eliminates blank spaces at the end of the line. Consequently it can store as many as 50 short lines with a standard 1K-byte memory and more than three full pages with the expanded 8K-byte memory. Lines are viewed 24 at a time on a 5- by 10-inch screen.

It has a *high resolution display*, easier to read than any CRT terminal we've ever seen. Each character is well resolved on a 7- by 9-dot matrix; each is well formed, thanks to the 2640's dot-shifting capability (it makes a curve look like a curve); and each is centered on a 9 by 15 cell that allows distinct separation between characters and lines. It can handle four plug-in 128-character sets *concurrently*, including a line drawing set and a math set with sub- and superscripts and Greek letters.

$$\Xi(t) = \xi(t) \int_0^1 \int_0^1 y^3 \sin 2\pi\theta \; d\theta \; dy$$

Inverse video, underlining, blinking, and half-bright displays are possible in all sets, and sets may be mixed in adjacent characters.

It has *comprehensive editing* capability. The 2640 can operate character-by-character in completely interactive mode; or touch a switch, and it can transmit a block at a time. In block mode, you can prepare and edit text off-line before transmission to the computer, thus significantly reducing computer time. And you save a lot of your own time through such standard editing features as character and line insert or delete; cursor addressability and positioning control; scrolling; programmable protected fields; and eight special function keys for user-defined routines.

It has *pop-in modularity and expandability*. Push the TEST key, for example, and the 2640 checks its own RAMs, firmware, and display, then signals NO GO if service is required. Pop-in modularity makes it easy to replace logic boards when needed, without tools. The terminal's computer-like structure has 14 powered slots to accommodate a wide choice of pop-in options, memory additions, peripheral interfaces...and the capacity to handle new developments as they come along. The 2640A price is $3,000*.

The cardiorespirograph: a new way to keep the newborn healthy.

Ask almost any American to name the nation's greatest health problem and he's likely to say cancer or heart disease. Another answer is more surprising: Estimates are that each year in the U.S. alone some 50,000 newborn suffer permanent brain damage and another 50,000 die immediately after birth. Although most are high-risk neonates—either premature or low-weight infants—a large number are apparently healthy and normal...until disaster strikes.

Most neonatologists contend that many of these tragedies can be prevented by specially-trained perinatal medical teams using intensive care techniques. The point has already been conclusively demonstrated in the growing number of hospitals that operate well-staffed intensive care nurseries.

For distressed neonates, the greatest need is to monitor their respiration and heart rate continuously because a dramatic change in either requires an immediate response by the medical team. It's also important that the physician know the *correlation* between heart rate and respiration: an accurate diagnosis of the child's specific condition may well depend on it.

Now, HP introduces the cardiorespirograph, a new instrument for monitoring the newborn. Based on patient monitoring techniques evolved at HP during the last decade, the cardiorespirograph fills three important needs in caring for distressed infants.

First, it continuously *monitors* heart rate and respiration, displays each digitally, and sounds an alarm when either falls outside the limits set by the medical team. Using adhesive electrodes that are easily and quickly applied to the neonate, the instrument measures beat-to-beat heart rate and thus makes available valuable variability information that is not seen in averaged heart rate values. Respiratory status is further monitored by a respiration waveform. This, measured through impedance changes, portrays the newborn's pulmonary status in more detail than a mere rate index.

Second, it continuously records these two vital parameters, thus giving the physician an objective *documentation* of the effectiveness of therapy and of the infant's progress throughout a period of crisis. Finally, it provides a detailed record of the correlation between heart rate and respiration, a valuable *diagnostic* aid. The cardiorespirogram is sufficiently sensitive to help detect and differentiate between various life-threatening abnormalities such as asphyxiation, inflammatory cerebral diseases, cardiopulmonary disorders and respiratory distress syndrome.

The Model 78250A Cardiorespirograph is priced at $4765* and is completely compatible with HP's extensive line of modular patient monitors. In the hands of a skilled perinatal medical team, the cardiorespirograph not only helps prevent disaster in the nursery but also helps reduce the frequency of permanent damage to distressed neonates.

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DeRobertis, Saez & DeRobertis: Cell Biology, 6th Edition. This respected text has long stood out from others in its field by virtue of its full and balanced consideration of morphological, chemical, and physiological aspects of cell biology. The new sixth edition upholds this reputation through its extensively revised and expanded coverage of enzyme kinetics, chloroplasts, and molecular biology of muscle. The student will find that this book provides crisp new insights into all aspects of life at the cellular level. *By E.D.P. DeRobertis and E.M.F. DeRobertis Jr., both of the Univ. of Bueno Aires; and Francisco A. Saez, Institute for the Investigation of Biological Sciences, Montevideo. About 500 pp. 400 ill. Ready March.*

Balinsky: Introduction to Embryology, 4th Edition. The developmental biology of animals has come to mean *Balinsky* to thousands over the years. Today the revised fourth edition continues to meet the needs of modern courses through major revisions in the text. Substantial coverage has been added on the recent research on cell shape changes, while additional coverage details the morphogenetic movements in mesenchyme. The material on gastrulation, the genetic activities involved, and the role of induction in differential translation and transcription is greatly expanded. New discussion of *in vitro* studies of mammalian eggs, and more information on the chemical aspects of differentiation have been added. *By B. I. Balinsky, Univ. of Witwatersrand, South Africa. About 575 pp. 475 ill. Ready April.*

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Wetzel: Limnology. A renowned authority on lakes and streams correlates modern curricular trends with his own teaching experience in this, the first limnology text specifically designed for the North American college student. The book opens with a classical approach to basic physical and chemical properties and the functioning of lake systems. The bulk of the text is then devoted to an integrated functional treatment of the biota and their interaction with the environment—an integration unique in the literature. *By Robert G. Wetzel, Kellogg Biological Station, Michigan State Univ. About 400 pp. 150 ill. Ready July.*

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proved varieties of high-yielding rice developed at IRRI were named and released by the Vietnamese government in November 1973. One more became available in November 1974, and at least two more will be named in April 1975.

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R. P. BOSSHART

Cooperative Vietnam Rice Research Project, International Rice Research Institute, Post Office Box Q-11, Saigon 1, Vietnam

Marine Faunal Areas

In his review (13 Dec., p. 1028) of my book *Marine Zoogeography* (*1*), Richard Rosenblatt comments that there is not an explicit statement of criteria to be used in the establishment of regions, provinces, and boundaries, that the chapter on the pelagic realm has a literature list that ends in the 1960's, and that he could not find any mention of the central oceanic gyres. The facts are that the province (the basic zoogeographic unit) is defined in chapter 1 (*1*, p. 16), the chapter on the pelagic realm refers to five works published in 1970 or more recently, and that the latter chapter also includes a discussion of water masses and currents (*1*, pp. 335–338) in which the gyres are mentioned.

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References

1. J. C. Briggs, *Marine Zoogeography* (McGraw-Hill, New York, 1974).

The Big Horn Medicine Wheel

In his article (7 June, p. 1035), John A. Eddy describes the solstitial alignment of the cairns of the Big Horn Medicine Wheel in northern Wyoming and suggests that the heliacal risings of the stars Adebaran, Rigel, and Sirius could have been used as signals of the summer solstice. He also suggests that the 28 irregularly spaced spokes of the Medicine Wheel might

have been used to mark the days of the lunar cycle and that the circumferential stones depicted the structure of the Sun Dance Lodge or were decorative and not astronomically significant. A quotation from Walker (*1*) may cast further light on this matter. The preconquest Sioux gave the timing of the Sun Dance, a midsummer festival, as occurring "when the Moon is four hands' breadth above the edge of the world, when the Sun goes down out of sight." This raises the possibility that the Plains Indians were aware of eclipse seasons and that the 28 spokes functioned as an eclipse-predicting computer in a manner similar to the 56 Aubrey holes of Stonehenge. Many of the stone rings of England, Wales, and Scotland are not circular, and Hutchinson (*2*) has discussed the data pointing to a sophisticated grasp of metrology, geometry, and astronomy by the builders of these megaliths. The peculiarly flattened circumference of the Medicine Wheel may ultimately be shown to be geometrically rather than accidentally constructed. The archeological and astronomical studies now in progress by Eddy and his colleagues may clarify these and other speculations about this unique high-altitude observatory and "preliterate" notational systems.

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References

1. R. J. Walker, *Anthropol. Pap. Am. Mus. Nat. Hist.* **16** (part 2), 51 (1919).
2. G. E. Hutchinson, *Am. Sci.* **60**, 24, 95, 210 (1972).

Eddy's article "Astronomical alignment of the Big Horn Medicine Wheel" was excellent, but I would like to add a note. Eddy asks, "Why would a nomadic people wish to mark the solstice?" since this is a practice "more commonly associated with agricultural societies." This problem should be seen in the proper context: in 1700, the "nomadic" big game hunters familiar to homesteaders and John Ford fans were largely agricultural people. The 19th-century bison hunters practiced some agriculture, but their grandparents were even more dependent on agriculture and a sedentary economy. It should also be noted that hunting requires a detailed understanding of seasonal changes.

JOHN R. COLE
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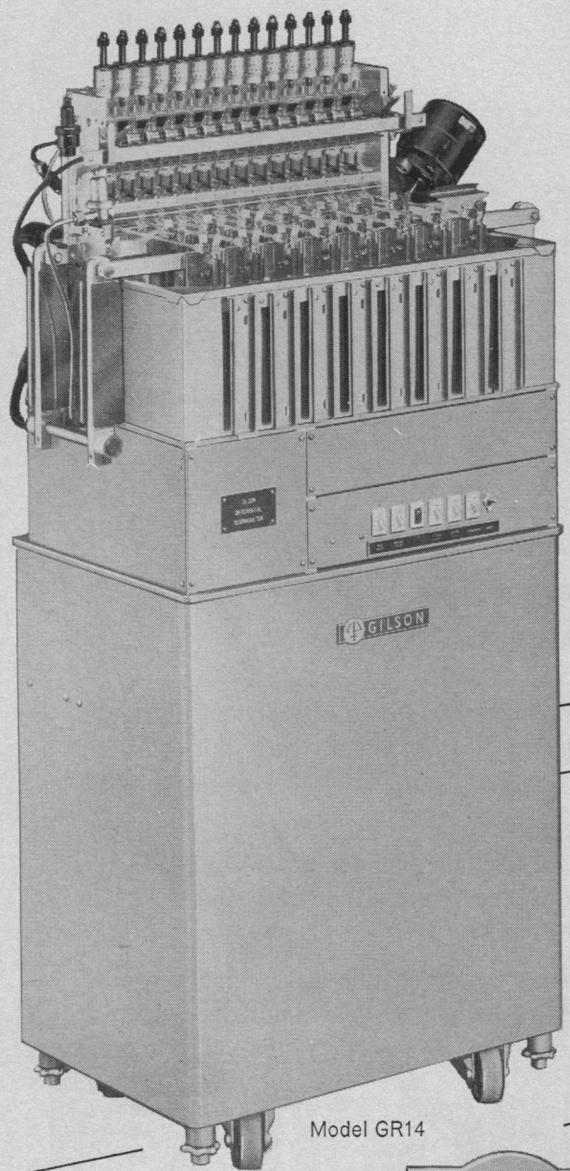

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10 January 1975, Volume 187, Number 4171 **SCIENCE**

Delays in Tapping Energy Sources

The public continues to enjoy adequate supplies of energy, but severe shortages lie ahead. Consumption of energy goes on unabated in spite of a recession, higher prices, and presidential appeals. But domestic reserves of hydrocarbons are being depleted rapidly and the stage is being set for empty gasoline pumps, cold homes, and large-scale unemployment unless there is a drastic change in attitudes soon. A major factor is the long time span involved in creating new sources of energy.

This country's experience with nuclear energy is an example of the time necessary to develop a major new source. The first reactor went critical in December 1942. In 1973, nuclear energy accounted for only 1 percent of the nation's energy consumption. Ten years from now, nuclear energy will meet at most 7 percent of the nation's needs. Moreover, the energy will be made available as electricity and not in forms that will be in short supply. Prospects for quick, large-scale utilization of geothermal energy, fusion, and solar energy are even dimmer than those for nuclear energy.

Thus, for at least the next decade, energy horizons will be limited by oil, natural gas, and coal. But available domestic supplies of oil and gas are diminishing, at the rate of 4 to 6 percent per year for oil and about 7 to 8 percent per year for natural gas,* and barriers have been erected to obtaining more oil or gas and to the use of coal.

Perhaps the most serious and certainly the least recognized problems lie in the supplies of natural gas. It heats 55 percent of the nation's homes, is widely used as a feedstock for petrochemicals, including fertilizer, and is by far the largest source of energy for industry. The energy content of the natural gas used daily by industry is equivalent to that of about 5 million barrels of oil. National policy accords priority to residential demand for natural gas, taking it away from industry. Already, shortages have caused layoffs. During the period August 1974 to August 1975, industry will use 400 million additional barrels of oil because of gas curtailments.† The rate of decay of supplies is such that by 1980, with a few exceptions, industry will be prevented from using natural gas. This would have enormous effects on the economy.

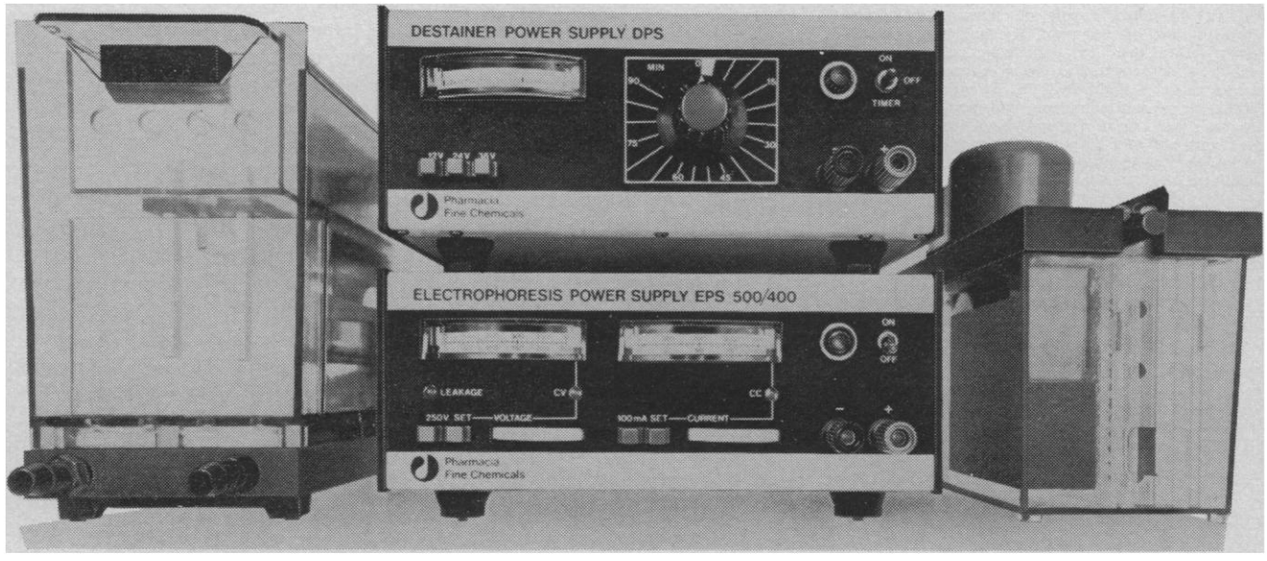
In large measure, although not entirely, future natural gas supplies will be tied to those of petroleum. There are good reasons to believe that onshore and undiscovered gas reserves of the 48 contiguous states are comparatively small.‡ New supplies could come from the outer continental shelves and from Alaska. At best, 4 to 6 years will elapse before these can be made available. However, at the present pace of resolving environmental disputes, supplies will be much longer in arriving.

An important aspect of the decaying position is that the kind of conservation that was achieved in 1973 and 1974 would make only a small dent in the problem. Then the public cut its use of natural gas by 6 to 8 percent, that is, 3 to 4 percent of total consumption. If the public spent many billions of dollars on storm windows and added insulation, 1 year's decay in the supplies of natural gas might be compensated for.

Conservation is not enough. To make good the energy deficit due to decay of natural gas alone, a doubling of coal production during the next 6 years would be required. But to open a new underground mine requires about 5 years. The quickest path toward relief is expansion of surface mining of low-sulfur coal in the Rocky Mountain States. But with various delays connected with changeovers from gas or oil to coal and with environmental controversies, heaven only knows when this country will emerge from the years of travail and discontent that it is now entering.—PHILIP H. ABELSON

* *Oil and Gas Journal*, 4 November 1974. † *Oil and Gas Journal*, 25 November 1974. ‡ R. Gillette, *Science* **185**, 127 (1974).

This is a new P.A.G.E.



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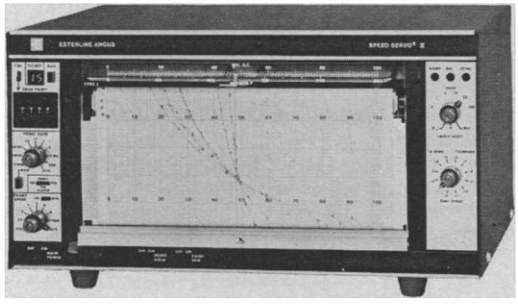

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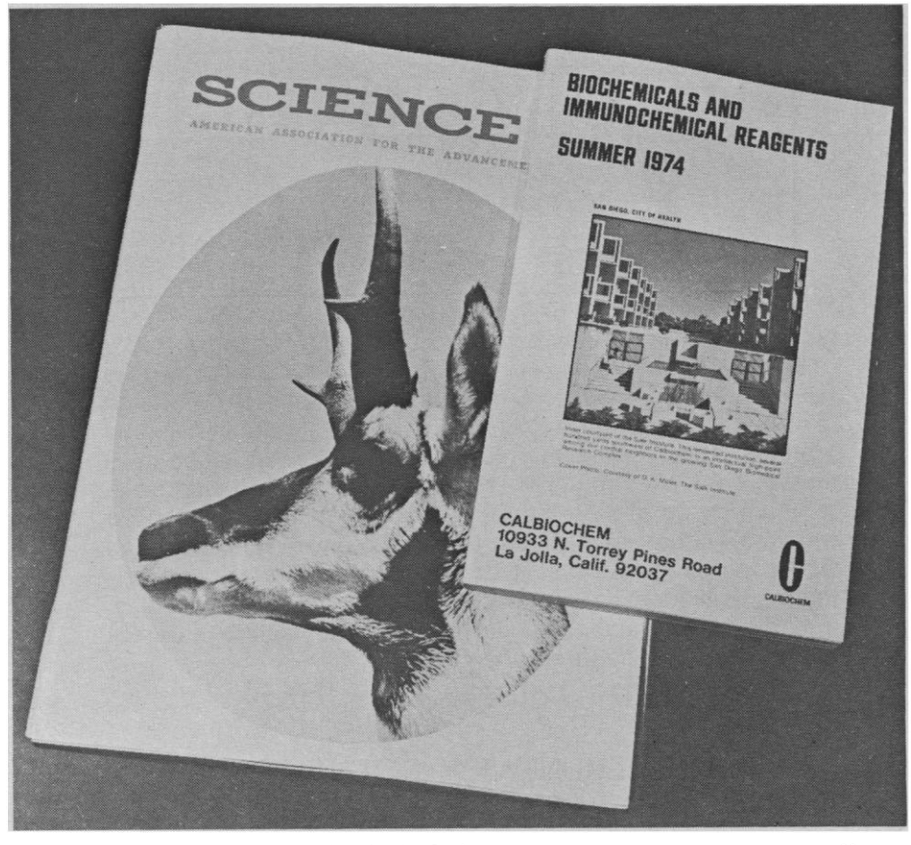

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BOOKS RECEIVED

(Continued from page 56)

CB Weapons. 396 pp. $10. Vol. 2, CB Weapons Today. 420 pp. $16.50. Vol. 3, CBW and the Law of War. 194 pp. $10. Vol. 4, CB Disarmament Negotiations, 1920–1970. 412 pp. $16.50. Vol. 5, The Prevention of CBW. 286 pp. $10.

Proceedings of the VI International Conference on Sarcoidosis. Tokyo, Sept. 1972. Kazuro Iwai and Yutake Hosoda, Eds. University Park Press, Baltimore, 1974. xxxviii, 666 pp., illus. $39.50.

Proceedings of the 6th International Symposium on Electron and Photon Interactions at High Energies. Bonn, Germany, Aug. 1973. H. Rollnik and W. Pfeil, Eds. North-Holland, Amsterdam, 1974 (U.S. distributor, Elsevier, New York). viii, 580 pp., illus. $73.10.

Progress in Paediatric Neurosurgery. Proceedings of a congress, Gottingen, Germany, Sept. 1972. K.-A. Bushe, O. Spoerri, and J. Shaw, Eds. Hippokrates, Stuttgart, Germany, 1974. 320 pp., illus.

The Psychology of Leisure. Research Approaches to the Study of Leisure. John Neulinger. Thomas, Springfield, Ill., 1974. xxii, 216 pp. $9.75.

Psychotropic Drugs and the Human EEG. Turan M. Itil, Ed. Karger, Basel, 1974. x, 378 pp., illus. $54.75. Modern Problems of Pharmacopsychiatry, vol. 8.

Reproduction in Farm Animals. E. S. E. Hafez, Ed. Lea and Febiger, Philadelphia, ed. 3, 1974. xviii, 480 pp., illus. $17.50.

Residential Fuel Policy and the Environment. Alan S. Cohen, Gideon Fishelson, and John L. Gardner. Eds. Ballinger (Lippincott), Cambridge, Mass., 1974. xx, 176 pp., illus. $11.

Rheumatology. An Annual Review. Vol. 5, Immunosuppression, Systemic Lupus Erythematosus. J. Rotstein, Ed. Karger, Basel, 1974. viii, 274 pp., illus. $42.

Science and Anti-Science. Morris Goran. Ann Arbor Science Publishers, Ann Arbor, Mich., 1974. xii, 128 pp. $10.

A Self-Directing Introduction to Psychological Experimentation. B. R. Hergenhahn. Brooks/Cole (Wadsworth), Monterey, Calif., ed. 2, 1974. vi, 442 pp., illus. Paper, $9.50.

Solid State Reaction. Hermann Schmalzried. Translated from the German edition (Weinheim, Germany, 1971) by A. D. Pelton. Verlag Chemie, Weinheim, Germany, and Academic Press, New York, 1974. x, 214 pp., illus. $21.75.

The Structure of the Earth's Crust. Based on Seismic Data. Papers from a symposium, Moscow, July 1971. Stephan Mueller, Ed. Elsevier, New York, 1974. xii, 392 pp., illus. $40. Upper Mantle Scientific Report No. 39, reprinted from *Tectonophysics*, vol. 20. Developments in Geotectonics, 8.

Studies in Cryobiology. Adaptation and Resistance of Organisms and Cells to Low and Ultralow Temperatures. L. K. Lozina-Lozinskii. Translated from the Russian edition (Leningrad, 1972) by P. Harry. Halsted (Wiley), New York, and Israel Program for Scientific Translations, Jerusalem, 1974. xii, 260 pp., illus. $27.50.

The Synaptic Organization of the Brain. An Introduction. Gordon M. Shepherd. Oxford University Press, New York, 1974. xxii, 364 pp., illus. Cloth, $7.95; paper, $4.95.

Systematique de la Tribu des Scymnini (Coccinellidae). Contribution à l'Etude de la Faune de France. J. M. Gourreau. Institut National de la Recherche Agronomique, Paris, 1974. 224 pp., illus. Paper, 85 F. Annales de Zoologie, Ecologie Animale.

Teaching the Basic Medical Sciences: Human Biology. Report of a conference, Williamsburg, Va., Nov. 1973. John Z. Bowers and Elizabeth F. Purcell, Eds. Josiah Macy, Jr. Foundation, New York, 1974 (distributor, Independent Publishers Group, New York). viii, 154 pp., illus. Paper, $7.50.

Theory of Elementary Atomic and Molecular Processes in Gases. E. E. Nitkin. Translated from the Russian edition (Moscow, 1970) by M. J. Kearsley. Clarendon (Oxford University Press), New York, 1974. xiv, 472 pp., illus. $42.50.

Le Titane et Ses Applications. Jacques Lachnitt. Presses Universitaires de France, Paris, 1974. 128 pp., illus. Paper, Que Sais-je?, No. 1568.

Topology and Normed Spaces. G. J. O. Jameson. Chapman and Hall, London, and Halsted (Wiley), New York, 1974. xvi, 408 pp., illus. $17.75. Chapman and Hall Mathematics Series.

Treating Psychosexual Dysfunction. Ben N. Ard, Jr. Aronson, New York, 1974. xviii, 246 pp. $12.50.

The Working-Class Majority. Andrew Levison. Coward, McCann and Geoghegan, New York, 1974. 318 pp. $8.95.

MARIJUANA: Effects on Human Behavior

edited by LOREN L. MILLER

CONTENTS: H. Klonoff: The Logistics of Marijuana Research: Methodological, Legal, and Societal. *A. Wikler*: The Marijuana Controversy. *J. E. Manno, B. R. Manno, G. F. Kiplinger,* and *R. Forney*: Motor and Mental Performance with Marijuana: Relationship to Administered Dose of Tetrahydrocannabinol and Its Interaction with Alcohol. *C. F. Darley* and *J. R. Tinklenberg*: Marijuana and Memory. *F. L. DeLong* and *B. I. Levy*: A Model of Attention Describing the Cognitive Effects of Marijuana. *H. Klonoff* and *M. D. Low*: Psychological and Neurophysiological Effects of Marijuana in Man: An Interaction Model. *L. L. Miller* and *W. G. Drew*: Cannabis: Neural Mechanisms and Behavior. *L. L. Miller*: Marijuana and Behavior: Human and Infrahuman Comparisons. *R. L. Dornbush*: The Long-Term Effects of Cannabis Use. *H. Cappell* and *P. Pliner*: Cannabis Intoxication: The Role of Pharmacological and Psychological Variables. *J. A. Halikas*: Marijuana Use and Psychiatric Illness. *E. Goode*: Marijuana Use and the Progression to Dangerous Drugs. *J. R. Tinklenberg*: Marijuana and Human Aggression. *H. Klonoff*: Effects of Marijuana on Driving in a Restricted Area and on City Streets: Driving Performance and Physiological Changes. *1974, 468 pp., $29.50/£14.15*

ADDICTION

edited by PETER G. BOURNE

CONTENTS: P. G. Bourne: Issues in Addiction. *R. E. Meyer*: On the Nature of Opiate Reinforcement. *H. D. Beckett*: Hypotheses Concerning the Etiology of Heroin Addiction. *C. D. Chambers*: Evaluating the Success of Addiction Programs. *B. S. Ramer* and *R. B. Flohr*: Rational Planning for Drug Abuse Services. *R. L. Dupont* and *M. H. Greene*: Beginning to Dissect a Heroin Addiction Epidemic. *R. G. Newman*: Involuntary Treatment of Drug Addiction. *A. Goldstein* and *B. A. Judson*: Three Critical Issues in the Management of Methadone Programs. *N. E. Zinberg*: The Search for Rational Approaches to Heroin Use. *D. F. Musto*: Early History of Heroin in the United States. *R. F. Hesse*: Drug Abuse: Changing Perspectives in Long-Term Social and Political Strategies.

1974, 256 pp., $17.50/£8.40

HANDBOOK OF PSYCHOBIOLOGY

edited by MICHAEL S. GAZZANIGA and COLIN BLAKEMORE

CONTENTS: FOUNDATIONS OF PSYCHOBIOLOGY: *G. Hoyle*: Neural Mechanisms Underlying Behavior of Invertebrates. *M. F. Land*: Similarities in the Visual Behavior of Arthropods and Men. *L. Heimer* and *A. H. M. Lohman*: Anatomical Methods for Tracing Connections in the Central Nervous System. *H. V. B. Hirsch* and *M. Jacobson*: The Perfectible Brain: Principles of Neuronal Development. THE CHEMISTRY OF BEHAVIOR: *L. L. Iversen* and *S. D. Iversen*: Chemical Pathways in the Brain. *L. L. Iversen* and *S. D. Iversen*: Central Neurotransmitters and the Regulation of Behavior. *D. Entingh, A. Dunn, E. Glassman, J. E. Wilson, E. Hogan,* and *T. Damstra-Entingh*: Biochemical Approaches to the Biological Basis of Memory. VERTEBRATE SENSORY AND MOTOR SYSTEMS: *C. Blakemore*: Central Visual Processing. *S. M. Anstis*: Visual Perception. *W. R. Webster* and *L. M. Aitkin*: Central Auditory Processing. *B. Henning*: Auditory Localization. *P. D. Wall*: The Somatosensory System. *R. P. Erickson* and *S. S. Schiffman*: The Chemical Senses: A Systematic Approach. *E. Bizzi*: Motor Coordination: Central and Peripheral Control During Eye-Head Movement.

1975, about 475 pp., in preparation

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to provide for a much broader dissemination than can be achieved from the courses alone.

The OSE also collaborates with regional environmental councils to advance environmental education programs, and with the American School Counselors Association to improve secondary school counseling in science. A prime concern of the latter project is to reverse the current pattern of counseling women and minorities out of the sciences in secondary school. Another program starting in 1975 will focus on improving science education in elementary schools that have large numbers of students from minority groups.

Science Education News, published by the Office six times a year, carries brief accounts of innovative educational programs and materials. *Science for Society: A Bibliography*, published annually, assists secondary school and college teachers and their students who are concerned with science/technology/society issues.

Notes from Other Offices

Opportunities in Science: A new publication, *Rosters of Minority and Women Professionals*, which contains information for makers of rosters as well as suggestions on the effective use of rosters to achieve equal opportunity, is available for $3.95.

* * *

Communications: Science on Television, the most recent in a series of occasional publications on science in the media, is available for $2.50. The issue covers commercial and public television, as well as the BBC in Great Britain and NHK in Japan.

Copies of a study guide and annotated bibliography to accompany Jacob Bronowski's television series *The Ascent of Man* are available on request.

* * *

Science and Society Programs: The deadline for the receipt of applications for the 1975–76 Congressional Fellows program is 31 March 1975.

* * *

Annual Meeting Notices: Several of the Offices are arranging special events in conjunction with the AAAS Annual Meeting. All of them will be held in the Americana Hotel unless otherwise noted.

Two meetings will be of special in-