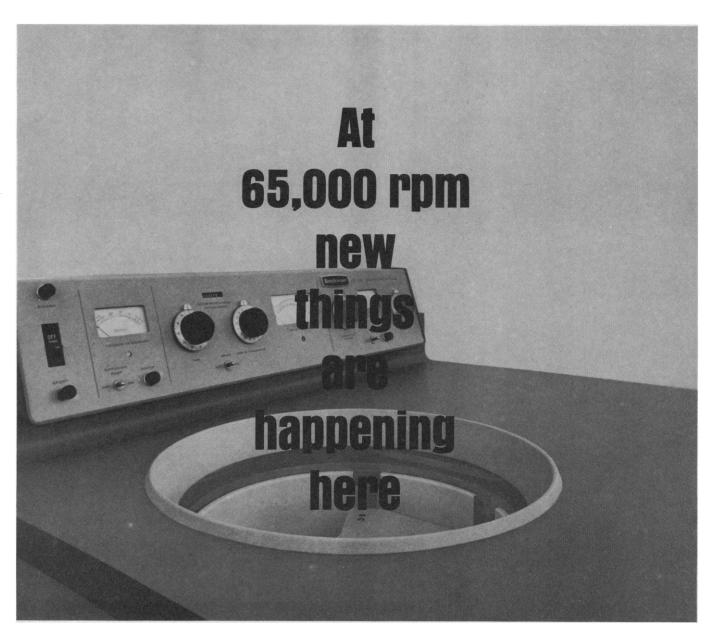
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COVER

Large colony of *Montastrea annularis* without *Mycale*, Maria Buena Bay, Jamaica, 40 meters in depth. The outer edges of the coral lack pronounced folds. A heavy growth of encrusting organisms hangs from the under surface of the coral. The trumpet-shaped sponge (*Agelas* sp.) in the foreground is 1.25 meters long. See page 343. [T. F. Goreau, University of the West Indies]





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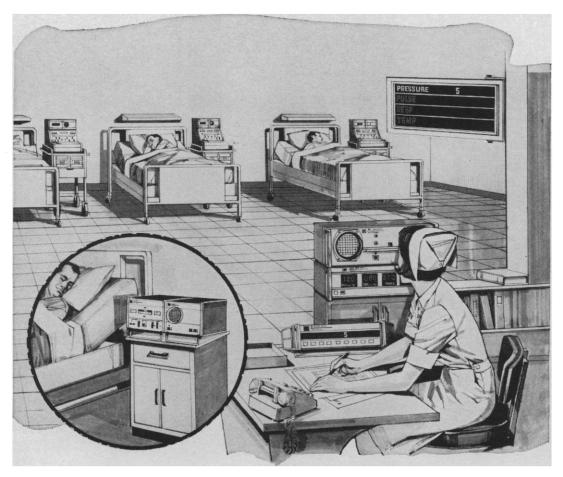
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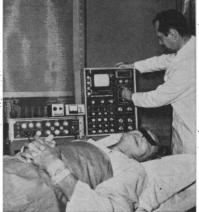
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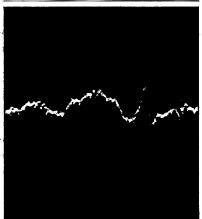
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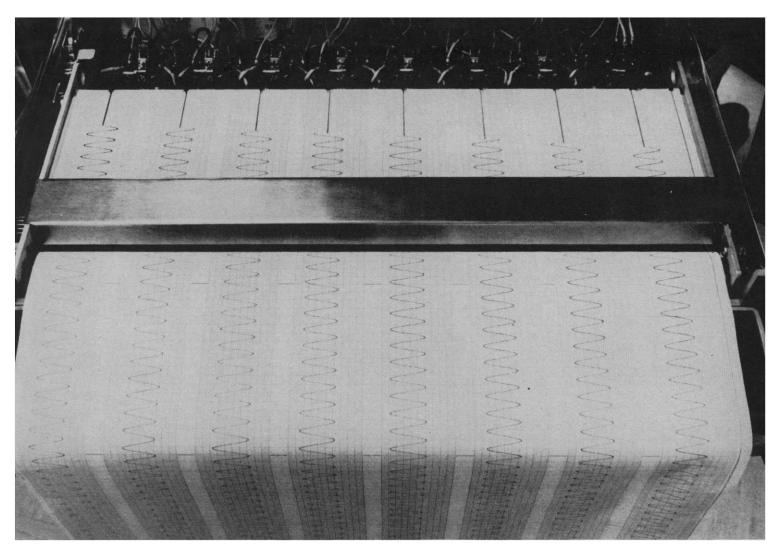
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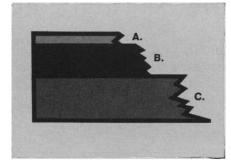


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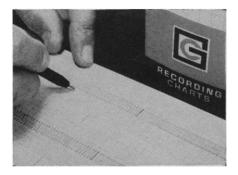
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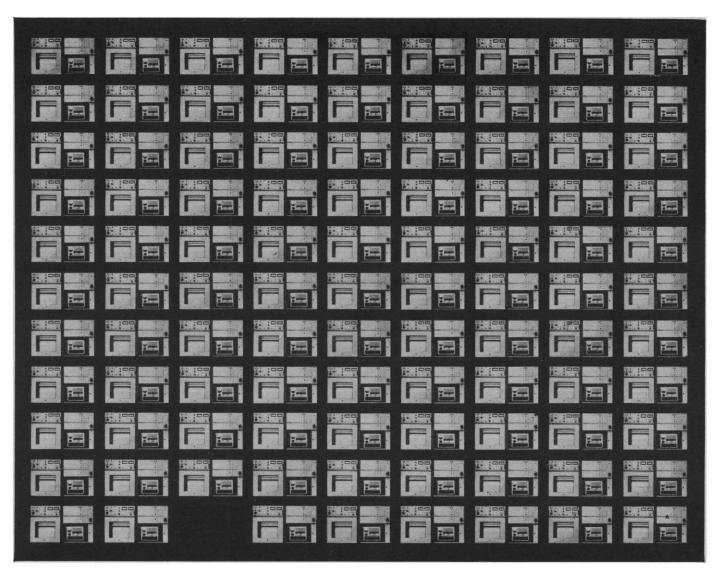
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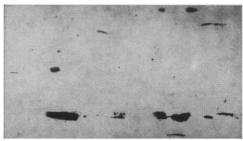
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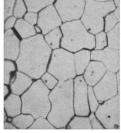


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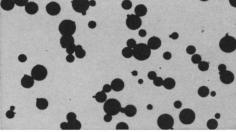
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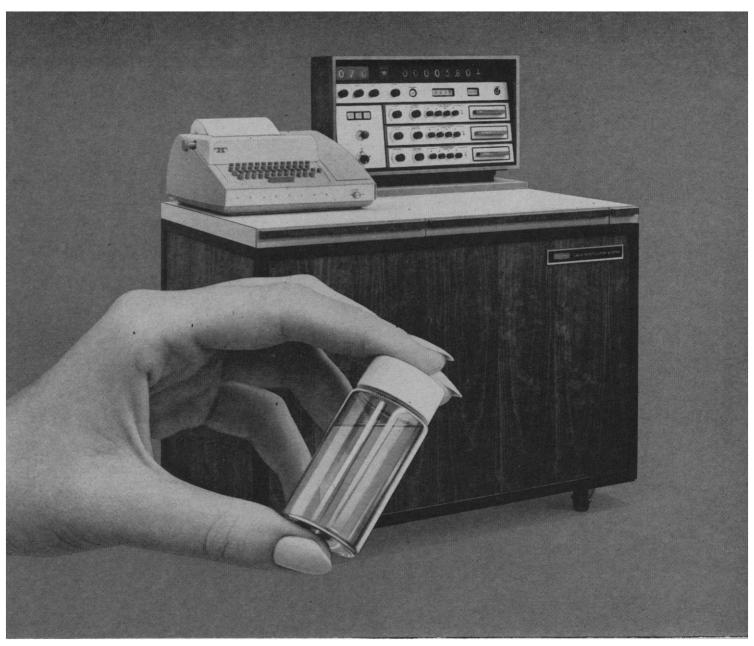
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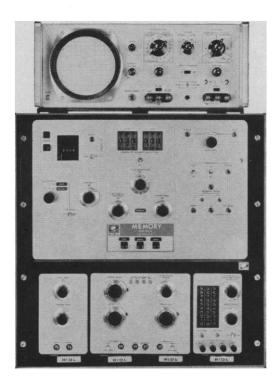
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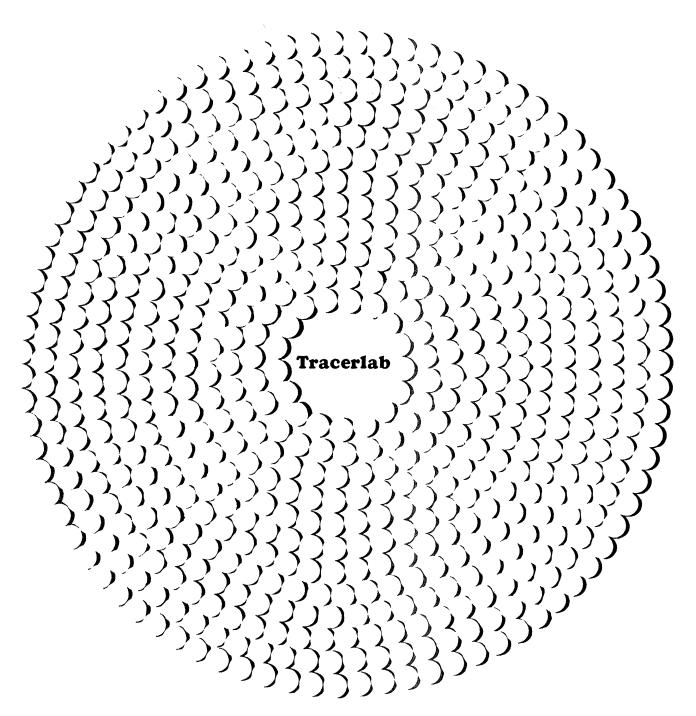
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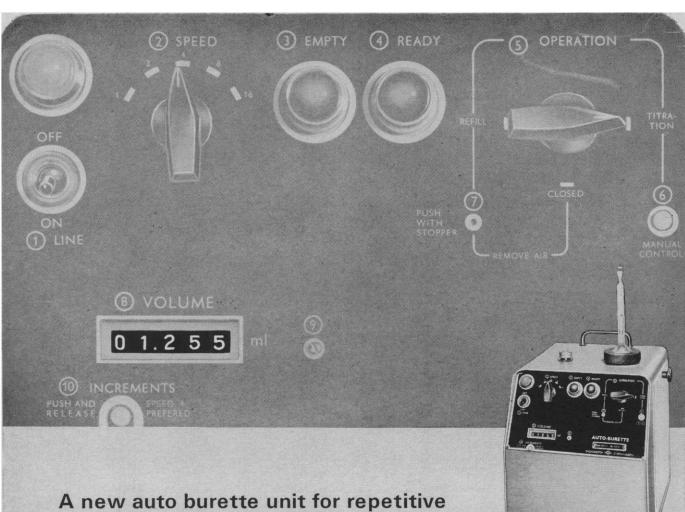




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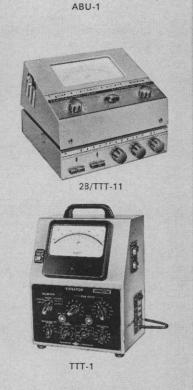
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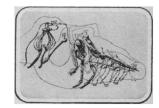












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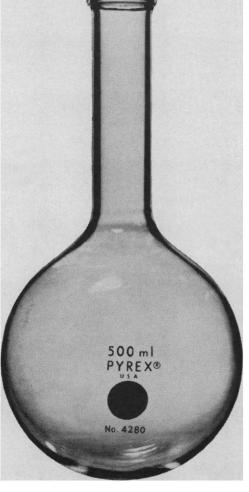
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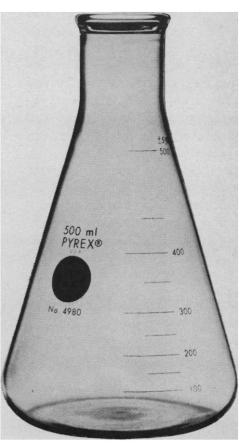
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21 JANUARY 1966 26



We sell two kinds of equipment for making ultramicrotome knives

(the expensive one is cheaper)

Perfectly good glass knives can be made with the inexpensive equipment shown on the left. Sometimes. However, as you well know if you make knives this way, it is not uncommon for an expensive ultramicrotome, an even more expensive electron microscope, several expensive people, and your research to stand by immobilized while awaiting a usable knife to be made with these rather primitive, albeit inexpensive, hand tools. Frustrating. And now unnecessary because of the new unit on the right.

This unit on the right—henceforth called the Knifemaker—is the first and only precision instrument for breaking glass knives. The design goals for the Knifemaker were these: to provide a simple, rapid, mechanized technique for making usable knives with highly reproducible (but adjustable) cutting angles without requiring prolonged experience, manual dexterity, or some special "touch". Happily, these goals were achieved. (All of this requiring a most modest sacrifice of bench space on your part. The Knifemaker uses only 19" X 13½".)

But how long does it take to learn to make usable knives with the Knifemaker? Assume that your new Knifemaker has just been delivered. Since it arrives completely assembled with a supply of glass and an explicitly helpful instruction manual, it will take less than an hour from removal from shipping carton until you make your first usable knife-even if you've never seen the Knifemaker before. Subsequently, with modest experience, you will be producing knives having at least 1/3 usable edge perhaps 90% of the time. And about half of this time, you'll get two usable knives from each break rather than one. Total time required for scoring and breaking square and then scoring and breaking square into two knives? Less than a minute.

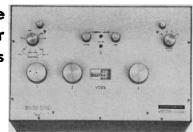
You might wish to consider ordering the Knifemaker from this ad immediately since you now know most of the story and the price. (For prices, etc., outside the United States, please contact our Stockholm address shown below.) If, however, you desire more information, a demonstration, or both, we'll be happy to oblige. Write today and refer to 7800S1.

Incidentally, we also stock and will be pleased to sell to you the inexpensive hand tools shown on the left instead of the Knifemaker. But we respectfully suggest that you can't afford them.

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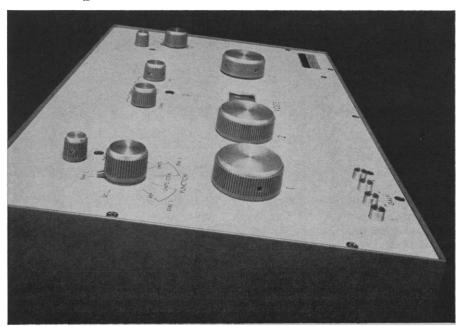
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Twice as accurate as any potentiometer in its price class



Half the price of any potentiometer in its accuracy class

Here's the biggest news in potentiometers in 10 years!



It's the all-new Model 2784 Laboratory Potentiometer from Honeywell! We invite you to check specs and prices on all other pots—you'll find that only instruments costing three to four times as much offer the features built into the new 2784. Features such as:

Extremely High Accuracy — .002% at the one volt range. Most other pots in the 2784's price range are .01% accurate.

Wide Range — From 0 to 11.110 volts, with a resolution of 5 ppm. The 2784 is the first <u>extended range</u> pot from a major manufacturer.

And, its range is <u>direct</u>—no voltage dividers are used.

Versatile—Low temperature coefficient design lets you use the 2784 as a laboratory potentiometer or a production calibration instrument.

Completely Self-Checking—Another first for instruments in this price range.

Total Double Guarding—The 2784 is the first potentiometer in <u>any</u> price class to offer guarding of <u>all</u> measuring system devices.

Smooth Performance—Because it uses a <u>non-convoluted slide</u> wire,

you get infinite resolution on the wire . . . not the bumpy, discontinuous measurements produced by a convoluted slide wire.

Low Thermal EMF's—Less than .1 microvolt; residual EMF's are well within the 2784's limits of resolution

In addition, the new Model 2784 offers recessed terminals; automatic decimal point location; single window in-line readout; printed circuitry; very low temperature coefficient; main dial standardizing; correctable auxiliary output, and dual EMF input.

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AMBILOG 200 — the computer chosen to solve these signal processing problems

BIOMEDICAL MONITORING

An Adage AMBILOGTM 200 system is in use at the University of Virginia School of Medicine as an intensive-care patient monitor following complex operations such as open-heart surgery.

A "flood" of biomedical data is acquired and processed on line from .) input sources such as electrocardiograms, continuous biochemical and blood gas determinations, cardiovascular pressures, and multi-point temperatures. Instantaneous analysis of these complex waveforms - detection of maxima and minima, slopes and discontinuities, and measurement of their times of occurrence - provides secondary and derived data such as pulse propagation time, lung compliance, work of breathing, and cardiac output. Visual presentation of selected variables is provided attending physicians by an array of digital and analog displays under AMBILOG 200 control. Patient data is also stored on digital magnetic tape for off-line use in studies of cardiovascular and pulmonary control systems.

A completely new kind of signal processor, the AMBILOG 200 is designed from the ground up to exploit the best of both analog and digital techniques. It combines parallel hybrid arithmetic with stored-program sequential operation: the first true hybrid. High processing speeds (often many times faster than comparablypriced conventional machines) and extensive input/output for both analog and digital data make AMBILOG 200 ideal for Telemetry data processing . Wind tunnel and test stand instrumentation • Display generation • Spacevehicle simulation · Laboratory research · Radar signal processing · Communications research · Flight trainer control · Automatic test and check-out - among others.

SONAR SIGNAL PROCESSING

At the U.S. Navy Underwater Sound Laboratory, New London, Ct., an AMBILOG 200 system calculates power spectral density functions of sonar signals to obtain norms for sea noises

The computer acquires data by reading directly from analog tape, sampling at a real-time rate of 83 kc. The desired signal is selected from any of 14 channels, passed through a parallel bank of 40 narrow-band logit filters, digitized, squared and integrated.

A double table look-up algorithm and a specially-designed bank of logarithmic amplifiers calculate PSD components to an accuracy of 1 db over a range of 60 db signal amplitude. The PSD solutions are formatted and recorded on digital magnetic tape.

All operations, from initial acquiring of data to final recording, are under stored-program control.

Complete user services for the AMBILOG 200 are provided. The program library includes ASA Basic FORTRAN, an assembly system, applications programs, source language editing, on-line symbolic debugging and control programs, and a wide range of subroutines. Full system documentation, programmer and maintenance training, and installation and maintenance services are furnished.

For technical reports describing in detail these and similar AMBILOG 200 applications, or for a demonstration, write Irving Schwartz, Vice President, 1079 Commonwealth Avenue, Boston, Mass. 02215.

SEISMIC RESEARCH

The California Institute of Technology's Kresge Seismological Laboratory and The Institute of Geophysics and Planetary Physics of the University of California (San Diego) are using AMBILOG 200 computers in research programs aimed at recognizing underground nuclear explosions by distinguishing their tremors from other seismic events.

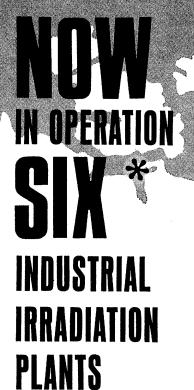
The Caltech system acquires and processes seismic signals read from a multi-channel FM analog tape unit and filtered through a Butterworth array. Time records written in VELA format are decoded. The computer performs time-domain digital filtering for accomplishing waveform pattern recognition. Digitized raw data and processed results are recorded on a magnetic tape, with provision made for "quick look" and analog playback.

The Institute of Geophysics and Planetary Physics' system has been processing seismic signals on line—sensor outputs are fed directly to the computer—at the Tonto Forest Seismological Observatory. Data from multi-channel inputs is multiplexed, edited (scaled, offset and monitored), digitized, and formatted for tape recording. The machine is also programmed to produce Fourier transformations of selected signals.

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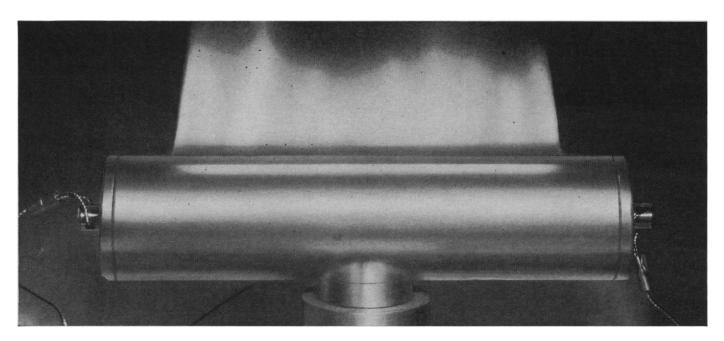
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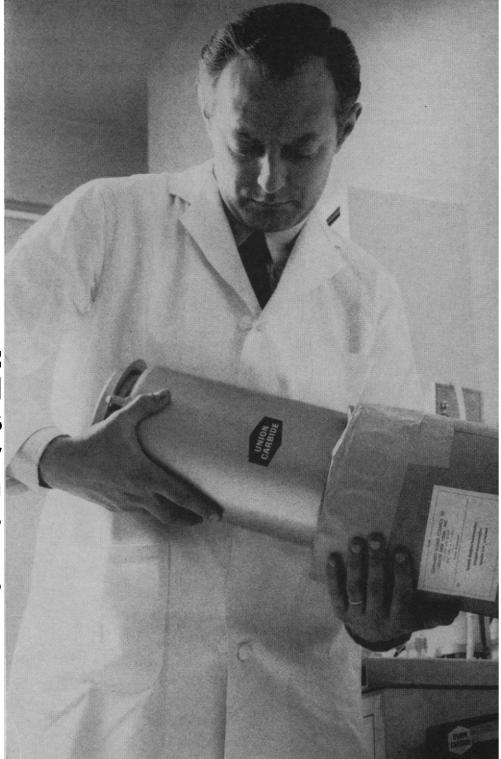
... and so forth.

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THE COLOR ATLAS OF INTESTINAL PARASITES (2nd Ptg.)

By Francis M. Spencer, San Angelo Medical and Surgical Clinic, Texas, and Lee S. Monroe, Scripps Clinic and Research Foundation, La Jolla, Calif. Presents a virtually complete series of original photomicrographs in full color which demonstrate the characteristic morphology and diagnostic forms of the important intestinal parasites of man, and the many variations in size, structure, and morphologic detail to which some species are subject. Brief comment is included regarding the geographic distribution, pathogenicity, incidence, and importance of each species. A wide variety of common and confusing structures, pseudoparasites, and harmless commensals are included.

January 1966 \$9.50 160 pp. 260 il. (232 in full color)

CELLULAR CONCEPTS IN RHEUMATOID ARTHRITIS

Holbrook Memorial Symposium. Compiled and edited by C. A. L. Stephens, Jr., Southwestern Clinic and Research Institute, Inc., and A. B. Stanfield, Univ. of Arizona. Both of Tucson. With the assistance of Margaret L. Doorly. (10 Contributors) Men outstanding in various disciplines in the fields of medicine and biology share their specialized knowledge in a common cause. Partial list of Contents: Studies in Auto-immunity—An Exercise in Clinical Investigation: Antinuclear Factors in Rheumatoid Arthritis and Lupus Erythematosus; etc.

January 1966 \$14.75 $232 \ pp. \ (7 \times 10)$ 78 il.

SELECTED HISTOCHEMICAL AND HISTOPATHOLOGICAL METHODS

By Samuel Wesley Thompson. With two chapters contributed by Ronald D. Hunt. Both of Fitzsimons General Hosp., Denver. Several methods are presented for most tissue components, of man and animals, demonstrable histochemically. With each method is detailed information as to applications of the method, fixatives or special preparations to be used, special equipment required, type of tissue sections, specific directions for preparation of reagents and staining or processing schedules, applicable control measures, probable or known modes of action, discussion of results, etc.

January 1966 \$65.00 1,680 pp. (7×10) 401 il.

VISION:

Biophysics and Biochemistry of the Retinal Photoreceptors

By Jerome J. Wolken, Carnegie Institute of Technology, Pittsburgh. New instrumentation in spectroscopy is used to follow the chemistry of the photosensitive retinal rod and cone pigments in situ . . . giving new insight into the phenomena of color vision. Physical-chemical analytical methods of chromatography and ultracentrifugation are used to further elucidate the chemistry and structure of the visual pigment-complexes. (Amer. Lec. Living Chemistry edited by I. Newton Kugelmass)

January 1966

216 pp. 154 il., 9 tables

7 IMPORTANT NEW BOOKS IN SCIENCE AND TECHNOLOGY

ROCKY MOUNTAIN SPOTTED FEVER

By Jerry K. Aikawa. Univ. of Colorado, Denver. The life of Dr. Howard T. Ricketts is recounted briefly... his remarkable contributions described in detail. Subsequent chapters review studies into the gross and microscopic pathology of Rocky Mountain spotted fever, events lead-

ing to discovery of the etiologic agent, evolution of an effective vaccine, recognition of the disease, artificial cultivation of the Ricksettia of Spotted Fever, diagnostic and immunologic studies, pathophysiology, prevention, and treatment.

January 1966 In Press About 128 pp. About 23 il.

RESEARCH METHODOLOGY AND NEEDS IN PERINATAL STUDIES

By Sidney S. Chipman, Univ. of North Carolina, Chapel Hill; Abraham M. Lilienfeld, The Johns Hopkins Univ.; Bernard G. Greenberg, Univ. of North Carolina; and James F. Donnelly, North Carolina State Board of Health, Raleigh. (67 Participants) Recent work on the study of chromosomal patterns in a general neonatal population is reported here for the first time. The epidemiological aspects of prematurity are reviewed in detail including studies of specific etiologic factors. Large-scale epidemiological studies are described and discussed in detail.

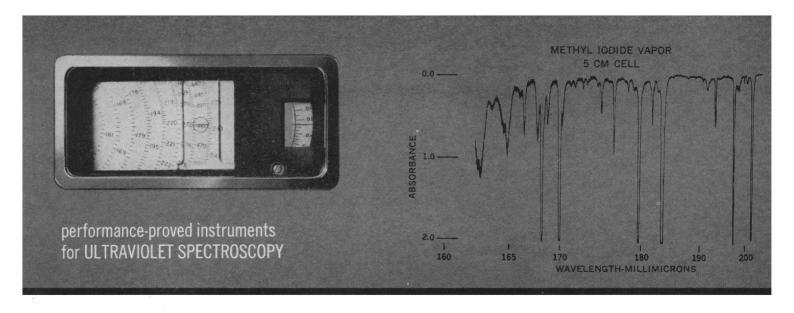
January 1966 \$16.50 328 pp., 16 il. 33 tables

DISTURBANCES IN HEME SYNTHESIS:

Special Considerations of the Sideroachrestic Anemias and Erythropoietic Porphyrias

By Ludwig Heilmeyer. With the collaboration of Roman Clotten and Ludwig Heilmeyer, Jr. All of Univ. of Freiburg, Germany. Translated by Manfred Steiner, New England Center Hospital, Boston. The first published study of disorders of heme synthesis in various disease states . . . accomplished by two newly-developed methods—by setting up the hemoprecursor pattern and by incubation tests with peripherous erythrocytes in vitro. The sideroachrestic anemias are presented in both their congenital and acquired forms, and the three known erythropoietic porphyrias are discussed. (Amer. Lec. Hematology edited by Walter H. Seegers)

January 1966 \$10.50 250 pp., 39 tables 83 il. (3 in full color)



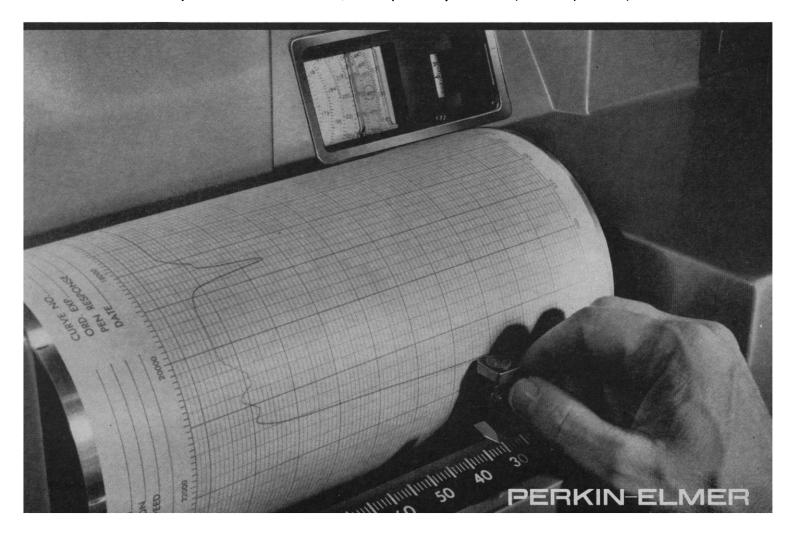
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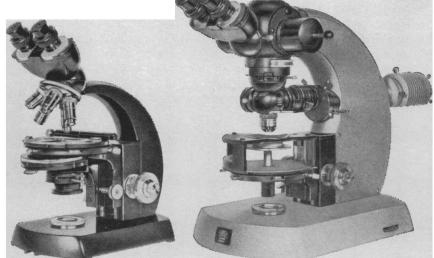
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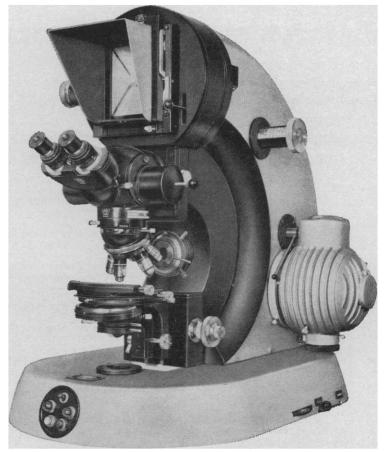
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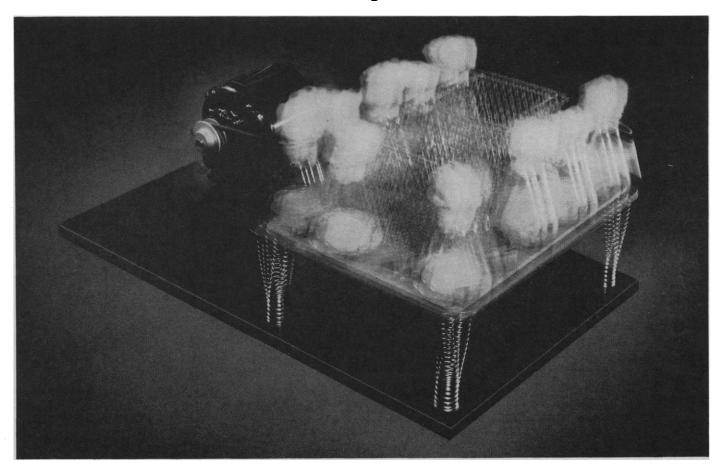
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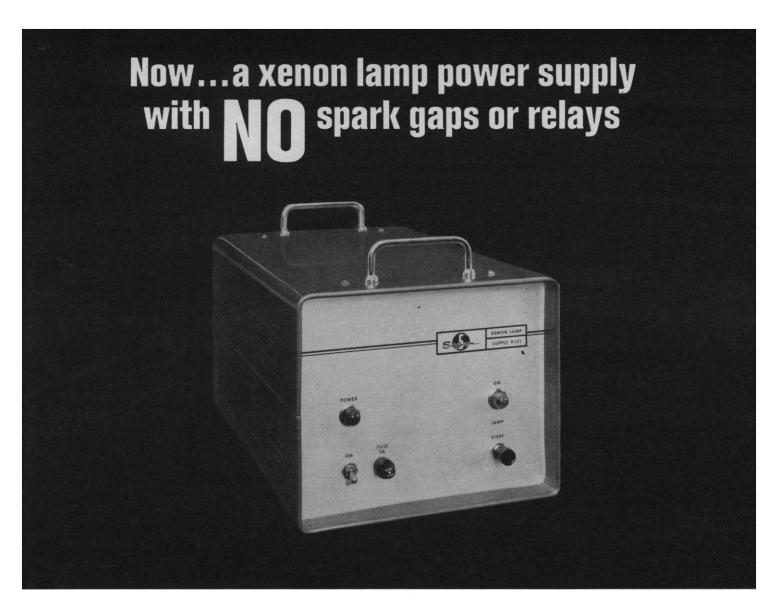
A "Guide to Biological Shakers" has just been published. We'll be happy to send a copy to you on request.





NBS New Brunswick Scientific Co., Inc.
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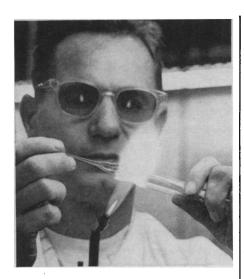
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ELECTRICAL SPECIFICATIONS								
MODEL Number	INPUT VOLTAGE*	INPUT FREQUENCY	OUTPUT STARTING VOLTAGE	OPERATING VOLTAGE	OPERATING CURRENT	CURRENT REGULATION	CURRENT RIPPLE	LIST PRICE
XLS-1A (150W) XLS-1B (150W)	Single Phase	60cps ± 1% 50cps ± 1%	(starting energy than 0.5 joules)	20 VDC ± 3V 20 VDC ± 3V	7.5 ADC nominal 7.5 ADC nominal	Better than ± 1.0%** over full input vol- tage range	to peak RMS	\$375 415
XLS-2A*** (35W) XLS-2B*** (35W)	100-130/200-260 VAC SI	60cps ± 1% 50cps ± 1%	20 KV (starti less than 0	12 VDC ± 2V 12 VDC ± 2V	3.5 ADC nominal 3.5 ADC nominal	Better than ± 0.25% over full input vol- tage range	less than 5.0% peak	325 360
XLS-3A (450W) XLS-3B (450W)	100-130/2	60cps ± 1% 50cps ± 1%	30KV (starting energy less than 1 joule)	20 VDC ± 3V 20 VDC ± 3V	22-28 ADC (adjustable in 1 ampere steps)	Better than ± 1.0%** over full input vol- tage range	less the less	715 785

^{*}Shipped wired for 100-130 VAC operation

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INTERNATIONAL SUBSIDIARIES: GENEVA; MUNICH; GLEN-ROTHES, SCOTLAND; TOKYO; PARIS; CAPETOWN; LONDON ments in the vehicle. Driving and roads must also be improved, but vehicle improvements are long overdue.

Seats that do not break, and shoulder straps as well as the lap belt (provided riders use them) are one answer. We are exploring an alternative possibility—airbags about the passengers (but not the driver) that would inflate automatically if sensors detect a potential accident situation, or ultimately and at a faster rate if impact actually occurs. The passengers would be protected even though they had not "strapped in." Work on such a device for astronauts and aircraft passengers, done with NASA support, has had promising results.

We should insure that the study of the problems and the development of solutions bear a growing relation to the magnitude of our losses, whichroughly measured by the cost of car accidents, injuries, and deaths (including insurance settlements and wages lost)—are about \$9 billion this year. The approximately 25 cents per car which Nader indicates manufacturers spend for safety research, and the 4 or 5 cents per car passenger which the federal government spends each year for highway safety research, should be increased until the number of deaths and injuries each year no longer climbs and indeed is significantly reduced. . . . Apparently legislators must take the next steps, for the informed consumer cannot obtain or afford to buy the safety features which he should have. while manufacturers sell us "tuned" and "styled" tigers.

CARL CLARK

Martin

Research Department, Martin Company 3033, Baltimore, Maryland

. . . The evidence of great resistance within the automotive industry to changes that would reduce deaths and injuries in highway accidents is seen as well in changes that would reduce the likelihood of an accident. Major features of cars that have been shown to be hazardous because they interfere with vision are tinted windshields, distorted windshields, large windshield corner posts, view-obstructing inside rear-view mirrors, chromium windshield trim, chromium covers on the inside of the corner posts, and chromium on the steering wheel. Recently Chrysler and General Motors began using, in most of their models, a dull, relatively dark paint or padding on their dash panels. The Ford Motor Company is still selling cars with glossy painted dash panels, which reflect into the windshields with devastating effect on vision under certain circumstances. Chromium anywhere within the field of view that can reflect the sky or headlights into the driver's eyes is known to be harmful. Apparently manufacturers believe the natives want to buy shiny trinkets, and if they complain of glare they can then be sold tinted windshields.

Manufacturers's indifference to safety problems is well illustrated by their failure to adopt periscopic, panoramic rear-view mirrors that were publicly demonstrated over 10 years ago, and by failure to use a method of windshield wiping by a flow of air that prevents water, dirt, and bugs from getting on the windshield at all. The currently standard shield placed above the filament in headlights was not adopted for over 17 years after its invention, although the inventor tried to sell it to the automobile and lightbulb manufacturers before his patent expired.

A very serious omission can be seen in the continued absence of standards for signals. Turn signals can be buried in bumpers, hidden by fenders. and covered by chromium. They can be small or huge, feeble or bright, and close to headlights or far removed. Tail lights may be combined with brake, turn, and backup lights in all possible combinations, or they may exist alone. They may be high, low, widely separated, close together, large, small, bright or dim, single or double, shielded by fenders, covered by chromium, and colored deep red, orange red, or amber. That this most important safety feature has not been removed from the stylists' manipulations is indeed remarkable.

That manufacturers apparently have little interest in drivers' safety is seen in the so-called after-market. Millions of dollars' worth of useless automotive accessories, some hazardous, are widely promoted and sold each year with never any word of caution from the automobile manufacturers. An example is the chromium "sleepy eye" headlight covers that lie flat against the upper half of the bulb. (Some new car advertisements in magazines and on billboards have implied the presence of these covers by a line drawn across the head lamp.) Our studies have shown that the claims made for these covers are fraudulent. They do not reduce glare as claimed, but rather increase it from two to ten times, and they do not increase useful light on the road as claimed, but reduce it, sometimes to less than 50 percent. Any automotive lighting engineer worth his salt knows these facts....

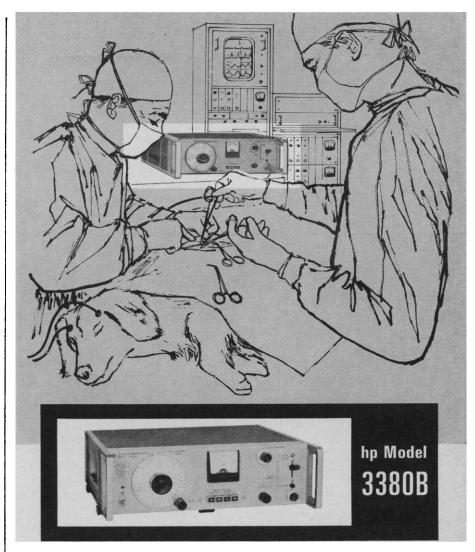
MERRILL J. ALLEN
Division of Optometry,
Indiana University, Bloomington

It is astounding to me and should be humiliating to the scientific community that *Science* would permit the printing of such an unscientific book review as that given to Ralph Nader's *Unsafe at Any Speed*. The reviewer says that the book "is likely to be the *Silent Spring* of traffic safety." To me this only means that it will be as packed full of errors and leftist propaganda as was *Silent Spring*.

The controversy over automobile safety sorely needs the application of more true science. An approach to this was made some 15 years ago in a joint study by the Pennsylvania State Police and the Union Switch and Signal Company on the cause of crashes (I refuse to call them "accidents") on the Pennsylvania Turnpike. This study, which certainly approached scientific status, showed that the major cause of all crashes on the turnpike was not speed, or poor car design, or poor car maintenance, but driver ineptitude. I hold that more. many more, studies of this type are needed.

I disagree wholeheartedly with the reviewer's comments on Nader's references to the Corvair. I drove a 1961 Corvair for 4 years and have driven a 1965 for almost a year without the slightest difficulty, and I have some scientist friends who have done similarly. I'll admit that I do not try to make 90-degree turns at 75 miles per hour, nor do I try to stop on a dime on an icy road. I believe that, if the cause of the alleged difficulties with the Corvair were truly known, they would be no different from similar difficulties with other cars when ordinary drivers in thick traffic start imagining they are driving the "500" at Indianapolis.

Close observation on a short drive in almost any large U.S. city will readily demonstrate that an appreciable element in the causes of crashes is the disregard of very ordinary safety practices by one or more of the drivers involved. This in turn is caused by such driver characteristics as (i) ignorance of safe practice, (ii) simple ineptitude, (iii) lack of coordinating ability, (iv) disregard of the welfare of



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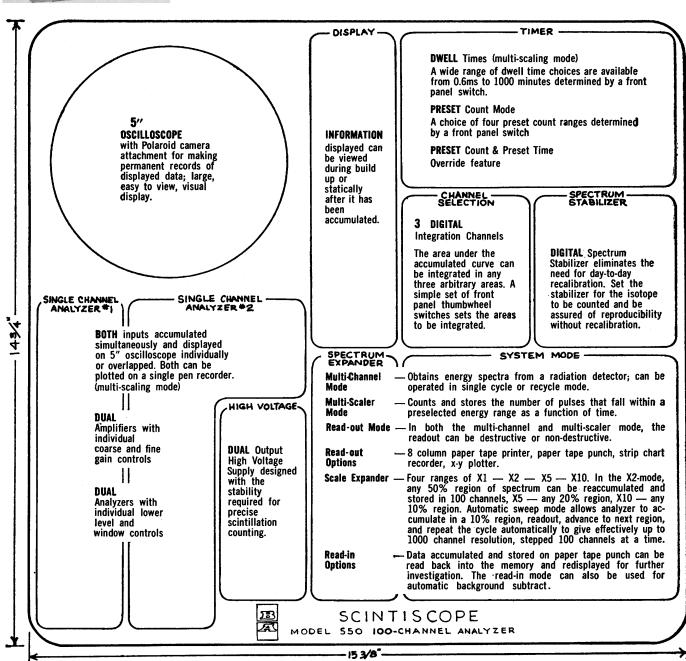
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SCIENCE, VOL. 151

others and themselves, (v) aggressiveness, determination to get ahead no matter what happens, (vi) driving too fast for traffic conditions. The tendency to blame the manufacturers, aside from the socialistic implications of the federal government, represents a tendency in nearly all walks of life for people to blame external things for their own shortcomings. There is a greatly increasing tendency to abhor the acceptance of personal responsibility.

If the manufacturers ever contrived to build a car safe enough for all of the nuts on the road, it would look like a tank and cost like one. It is almost as though the flying public were to demand that passenger-carrying aircraft be designed and built to withstand any kind of crash from any altitude. Anyone who has driven cars for the past 45 years, as I have, will, I think, agree that through the years cars have become progressively safer. Anyone who has seen the wooden wheels of a Model T catch fire coming down Laurel Mountain will agree to this. In fact, it is to be wondered how enough people survived the earlier cars to nurture the automotive industry to its present state.

So please! Let's have more science in Science and less politics.

ROBERT C. DICKINSON 19 Verona Road, Pittsburgh, Pennsylvania 15235

Grants and Copyrights

The U.S. Office of Education has recently ruled that materials produced by its grantees are not to be copyrighted but are to be placed in the public domain. Although the clear intent of the regulation is to serve the public interest, it appears likely that, in practice, it will have the opposite effect.

What are the probable effects of this new regulation on the future production and dissemination of curriculum materials similar to those, for example, prepared recently by the secondary school science projects in biology, chemistry, geology, and physics, which have been quite widely regarded as of great public value? (I am not concerned here with the effect of the regulation on studies of primarily technical or academic interest.) If a USOE grantee were to produce a manuscript for a good chemistry textbook that could not be copyrighted, the reaction of the major textbook publishers would

be, I believe, generally negative. An ethical publisher might acknowledge the excellence of the new text and might recognize how satisfactorily it could supplement his line of textbooks. But he would realize that the same materials could also be published by any other publisher, with or without change, and perhaps more rapidly and cheaply. Thus, he might well decide that his necessarily extensive investment in such a book, for careful editing, preparation of illustrations, training of salesmen, national advertising, and printing and distribution, would place him at a competitive disadvantage with respect to other publishers who might use the same materials with a minimum investment. It appears probable that contemporary publicdomain materials would be ignored by the more substantial publishers who have full facilities for national distribution, and might even be considered too risky by virtually all publishers.

But there is a more fundamental consideration. Such materials as these do not emerge simply as the result of a grant; they depend also on the creative efforts of scholars and writers. They have an intellectual as well as a fiscal component. Surely the traditional rights of an author should not be summarily discarded simply because his work promises to be of public benefit and has therefore been judged worthy of support from public funds.

The director of a curriculum project supported by the Office of Education may find it difficult to recruit writers who are seriously interested in producing new curriculum materials for our schools, if they are aware of the possible effects of the public domain policy on their efforts. They would realize that their materials might never be published and made available for use in the schools; that their carefully devised themes and logical presentations could be altered at will by editors and publishers; that they might be completely excluded from the opportunity to revise their original ideas on the basis of actual use in the schools...

It seems clear to me that the public domain policy of the Office of Education requires further study. Execution of the policy should be postponed until it is abundantly clear that it is not contrary to the public interest.

Arnold B. Grobman

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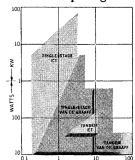
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ICT 300	300	15 mA	4'4"	1.32	4	1.2
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The Need for Leaders*

Leadership is dispersed among a great many groups in our society. The President, of course, has a unique, and uniquely important, leadership role, but beneath him, fragmentation is the rule.

Although our decentralized system of leadership has served us well, we must not be so complacent as to imagine that it has no weaknesses, that it faces no new challenges, or that we have nothing to learn. There are grave questions to be answered concerning the leadership of our society. Are we living up to standards of leadership that we have achieved in our own past? Do the conditions of modern life introduce new complications into the task of leadership? Are we failing to prepare leaders for tomorrow?

Nothing should be allowed to impair the effectiveness and independence of our specialized leadership groups. But such fragmented leadership does create certain problems. One of them is that it isn't anybody's business to think about the big questions that cut across specialties—the largest questions facing our society.

Very few of our most prominent people take a really large view of the leadership assignment. Indeed, it is my belief that we are immunizing a high proportion of our most gifted young people against any tendencies to leadership. Most of our intellectually gifted young people go from college directly into graduate school or into one of the older and more prestigious professional schools. There they are powerfully indoctrinated in a set of attitudes appropriate to scholars, scientists, and professional men. This is all to the good. The students learn to identify themselves strongly with their calling and its ideals. They acquire a conception of what a good scholar, scientist, or professional man is like.

As things stand now, however, that conception leaves little room for leadership in the normal sense; the only kind of leadership encouraged is that which follows the performing of purely professional tasks in a superior manner. Entry into what most of us would regard as the leadership roles in the society at large is discouraged. As a result the academic world appears to be approaching a point at which everyone will want to educate the technical expert who advises the leader, or the intellectual who stands off and criticizes the leader, but no one will want to educate the leader himself.

Leaders worthy of the name, whether they are university presidents or senators, corporation executives or newspaper editors, school superintendents or governors, contribute to the continuing definition and articulation of the most cherished values of our society. They offer, in short, moral leadership.

So much of our energy has been devoted to tending the machinery of our complex society that we have neglected this element in leadership. I am using the word *moral* to refer to the shared values that must undergird any functioning society. The thing that makes a number of individuals a society rather than a population or a crowd is the presence of shared attitudes, habits and values, a shared conception of the enterprise of which they are all a part, shared views of why it is worth while for the enterprise to continue and to flourish. Leaders can help in bringing that about.

Leaders have a significant role in creating the state of mind that is the society. They can serve as symbols of the moral unity of the society. They can express the values that hold the society together. Most important, they can conceive and articulate goals that lift people out of their petty preoccupations, carry them above the conflicts that tear a society apart, and unite them in the pursuit of objectives worthy of their best efforts.—John W. Gardner

^{*}Condensed from "The Antileadership Vaccine," by John W. Gardner, in the 1965 annual report of the Carnegie Corporation of New York.

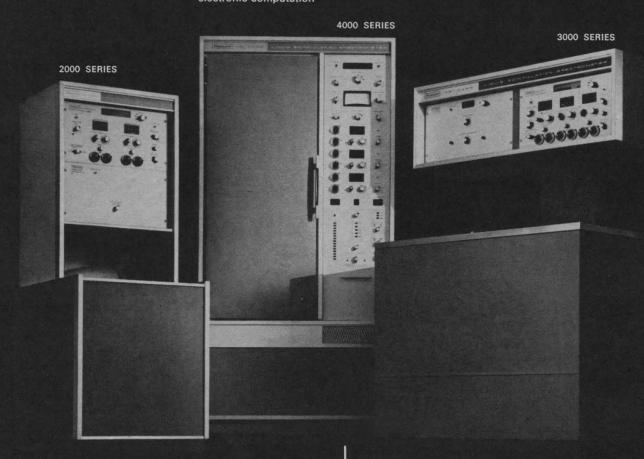
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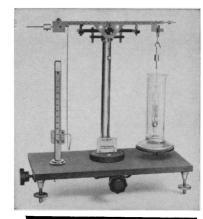
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Forthcoming Events

Januarv

26-29. American Physical Soc., annual mtg., New York, N.Y. (K. K. Darrow, APS, 335 E. 45 St., New York 10017)

26-29. American Assoc. of **Physics Teachers**, annual mtg., New York, N.Y. (M. Phillips, Ryerson Physical Laboratory, Univ. of Chicago, Chicago, Ill. 60637)

27-29. American Group Psychotherapy Assoc., Philadelphia, Pa. (AGPA, 1790 Broadway, New York 10019)

27-29. International Medical Assembly of Southwest Texas, San Antonio. (S. E. Cockrell, Jr., 202 W. French Pl., San Antonio 78212)

28-29. Proteins, 21st conf., Rutgers Bureau of Biological Research, Rutgers Univ., New Brunswick, N.J. (R. L. Squibb, Rutgers Univ., New Brunswick)

30-4. Institute of Electrical and Electronics Engineers, Power Group, winter mtg., New York, N.Y. (E. C. Day, IEEE, 345 E. 47 St., New York 10017)

30-4. American Soc. for Testing and Materials, spring mtg., Washington, D.C. (T. A. Marshall, ASTM, 1916 Race St., Philadelphia 3, Pa.)

31-2. Information Theory, intern. symp., Inst. of Electrical and Electronics Engineers, Univ. of California, Los Angeles. (A. V. Balakrishnan, Dept. of Engineering, Univ. of California, Los Angeles 90024)

31-2. Solid Propellant Rockets, 7th conf. (American Inst. of Aeronautics and Astronautics, 1290 Sixth Ave., New York)

31-3. Scientific Aspects of **Pest Control**, symp., Washington, D.C. (Agricultural Board, National Academy of Sciences, 2101 Constitution Ave., NW., Washington)

February

2-4. Aerospace and Electronic Systems, winter conv., Inst. of Electrical and Electronics Engineers, Los Angeles, Calif. (A. S. Jerrems, Aerospace Group, Hughes Aircraft Co., Culver City, Calif.)

2-6. American College of Cardiology, Chicago, Ill. (W. D. Nelligan, 9650 Rockville Pike, Bethesda, Md. 20014)

3-4. American Chemical Soc., 1st Middle Atlantic regional mtg., Philadelphia, Pa. (Philadelphia Section Office, ACS, 212 Harrison Laboratory, 34th and Spruce St., Philadelphia 19104)

3-9. Medical Education, congr., Chicago, Ill. (W. S. Wiggins, 535 N. Dearborn St., Chicago 60610)

6-9. American Inst. of Chemical Engineers, Dallas, Tex. (The Institute, 345 E. 47 St., New York 10017)

7-8. Perspectives in Virology, 5th mtg., New York, N.Y. (M. Pollard, Lobund Laboratory, Notre Dame, Ind.)

7-9. Reactor Physics in the Resonance and Thermal Regions, mtg., San Diego, Calif. (G. Joanou, General Atomic Corp., P.O. Box 1111, San Diego, 92112)

7-18. World Meteorological Organization, regional assoc. #5, 4th session, Wellington, New Zealand. (WMO, 4 Avenue, Giuseppa Motta, Geneva, Switzerland)

8-9. Cost Aspects of Water Supply, 8th sanitary engineering conf., Urbana, Ill. (J. H. Austin, 203 Civil Engineering Hall, Univ. of Illinois, Urbana 61803)

9-11. Solid State Circuits, 13th annual conf., Philadelphia, Pa. (K. H. Fischer, U.S. Army Electronics Command, Attn: AMSEL-KL-I, Fort Monmouth, N.J.)

10-11. Snow, eastern conf., Hartford, Conn. (G. Ayer, P.O. Box 948, Albany 1, N.Y.)

10-12. Intermediate Energy Physics, conf., College of William and Mary, Williamsburg, Va. (R. T. Siegel, Physics Dept., College of William and Mary, Williamsburg 23185)

13-16. Radiation Research Soc., 14th annual mtg., Coronado, Calif. (F. Smith, Biology Dept., American Univ., Washington, D.C.)

14-16. Transplantation, 7th intern. conf., New York Acad. of Sciences, New York, N.Y. (F. T. Rapaport, New York Univ. Medical Center, 550 First Ave., New York 10016)

14-18. Society of Economic Geologists, New York, N.Y. (J. O. Kalliokoski, Dept of Geology, Princeton Univ., Princeton, N.J. 08540)

15-17. Radioisotope Applications in Aerospace, symp., Dayton, Ohio. (P. Polishuk, Flight Dynamics Laboratory, Wright-Patterson AFB, Ohio)

15-18. Treatment and Storage of Highly Radioactive Waste, symp., Richland, Wash. (W. H. Regan, Jr., U.S. Atomic Energy Commission, Washington, D.C. 20545)

16-17. Voluntary Health, 2nd natl. conf., Chicago, Ill. (Dept. of Community Health and Health Education, American Medical Assoc., 535 N. Dearborn St., Chicago, 60610)

16-18. Practical Space Applications, symp., San Diego, Calif. (C. Tross, Box 931, Rancho Santa Fe, Calif.)

16-19. National Soc. of College Teachers of Education, Chicago, Ill. (E. H. Goldenstein, Administration Bldg., 413, Univ. of Nebraska, Lincoln 68508)

16-19. Institute of Management Sciences annual mtg., Dallas, Tex. (W. M. Campbell, Atlantic Refining Co., P.O. Box 2819, Dallas 75221)

17-19. American Educational Research Assoc., Chicago, Ill. (R. A. Dershimer, The Association, 1201 16th St., NW, Washington, D.C. 20036)

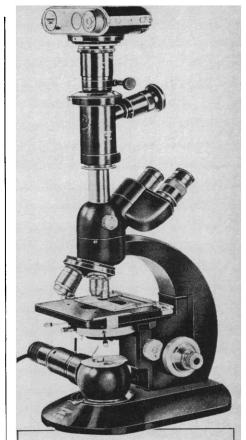
18-20. American Psychopathological Assoc., symp., New York, N.Y. (F. A. Freyhan, The Association, Natl. Inst. of Mental Health, c/o St. Elizabeths Hospital, Washington, D.C. 20032)

19. Pleistocene of Ohio, interdisciplinary conf., Ohio Acad. of Science, Columbus. (J. L. Forsyth, Dept. of Geology, Bowling Green State Univ., Bowling Green, Ohio)

21-25. Analytical Chemistry and Applied Spectroscopy, Pittsburgh, Pa. (R. E. Hein, Mellon Inst., 4400 Fifth Ave., Pittsburgh 15213)

21-25. Society for Nondestructive Testing, spring natl. conv., Los Angeles, Calif. (E. L. Criscuolo, U.S. Naval Ordnance Laboratory, White Oak, Silver Spring, Md. 20910)

21-25. Non-Elastic Processes in the Upper Mantle, symp., Upper Mantle Committee, Intern. Union of Geodesy and Geophysics, Newcastle, England. (D. C. Tozer, School of Physics, The University, Newcastle-upon-Tyne, 1, England)



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22-26. Canadian Assoc. of Radiologists, 29th annual, Montreal, Quebec. (The Association, 1555 Summerhill Ave., Montreal 25)

23-25. **Biophysical** Soc., 10th annual mtg., Boston, Mass. (J. Baruch, Bolt, Beranek and Newman Inc., 50 Moulton St., Cambridge, Mass. 02138)

24-26. American Acad. of Forensic Sciences, Chicago, Ill. (S. R. Gerber, Law-Medicine Center, Western Reserve Univ., Cleveland, Ohio 44106)

24-26. Interdisciplinary Aspects of Radiative Energy Transfer, Philadelphia, Pa. (J. J. Welsh, Space Sciences Laboratory, General Electric Co., Box 8555, Valley Forge, Pa.)

25-26. Thoracic Soc., spring mtg., London, England. (H. M. Foreman, Sully Hospital, Sully, Glamorganshire, England)

27-3. American Inst. of Mining, Metallurgical, and Petroleum Engineers, annual mtg., New York, N.Y. (The Institute, 345 E. 47 St., New York 10017)

27-4. International Anesthesia Research Soc., Bal Harbour, Fla. (A. W. Friend, 227 Wade Park Manor, Cleveland, Ohio 44106)

28-4. Aerial Triangulation, symp., Urbana, Ill. (M. B. Scher, Intern. Soc. for Photogrammetry, Commission 3, 9701 East Light Dr., Falls Church, Va.)

28-4. American Crystallographic Assoc., mtg., Univ. of Texas, Austin. (W. L. Kehl, Gulf Research and Development Co., P.O. Drawer 2038, Pittsburgh, Pa. 15230)

28-4. American Assoc. of **Junior Colleges**, 46th annual conv., St. Louis, Mo. (The Association, 1315 16th St., NW, Washington, D.C. 20036)

March

1-2. Dairy Engineering, natl. conf., Michigan State Univ., East Lansing. (C. W. Hall, Agricultural Engineering Dept., Michigan State Univ., East Lansing)

1-3. Space Maintenance and Extra-Vehicular Activities, natl. conf., Orlando, Fla. (M. B. Goldman, Mail No. 302, Martin Co., Baltimore, Md. 21203)

1-10. Industrial Development in the Arab Countries, regional symp., Kuwait. (Intern. Agency Liaison Branch, Office of the Director General, Food and Agriculture Organization, Via delle terme di Caracalla, Rome, Italy)

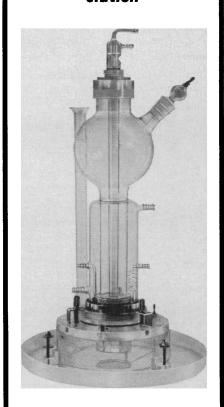
2-4. Air Pollution Medical Research, AMA conf., Los Angeles, Calif. (Dept. of Environmental Health, American Medical Assoc., 535 N. Dearborn St., Chicago, Ill. 60610)

2-4. Plasmadynamics, conf., Monterey, Calif. (American Inst. of Aeronautics and Astronautics, 1290 Sixth Ave., New York 10019)

2-4. Scintillation and Semiconductor Counters, 10th symp., Washington, D.C. (W. A. Higinbotham, Brookhaven Natl. Laboratory, Upton, L.I., N.Y.)

3-4. Louisiana Soc. for Electron Microscopy, 3rd annual symp., New Orleans. (W. R. Goynes, Southern Regional Research Laboratory, Box 19687, New Orleans)

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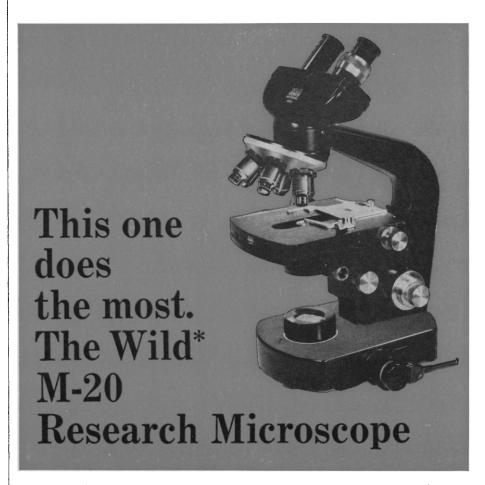
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- 3-5. Central Surgical Assoc., Chicago, Ill. (C. E. Lischer, 457 N. Kingshighway, St. Louis 8, Mo.)
- 4-5. Cineradiology, 5th symp., Rochester, N.Y. (R. Gramiak, Div. of Diagnostic Radiology, Univ. of Rochester Medical Center, Rochester 14620)
- 4-6. American Assoc of Pathologists and Bacteriologists, 63rd annual mtg., Cleveland, Ohio. (P. Fitzgerald, Downstate Medical Center, 450 Clarkson Ave., Brooklyn 3, N.Y.)
- 5-7. Society for American Archaeology, 31st annual mtg., Univ. of Nevada, Reno. (D. D. Fowler, Dept. of Anthropology, Univ. of Nevada, Reno 89507)
- 5-10. International Acad. of Proctology, 18th annual conv., Miami Beach, Fla. (A. F. Cantor, 147-41 Sanford Ave., Flushing, N.Y. 11355)
- 6-11. American Soc. of **Photogrammetry**, Washington, D.C. (C. E. Palmer, 5917 Brookview Dr., Brookland Estates, Alexandria, Va.)
- 7-9. Fundamental Cancer Research, 20th annual symp., Univ. of Texas, Houston. (M. Mandel, Dept. of Biology, M. D. Anderson Hospital and Tumor Inst., Univ. of Texas, Houston 77025)
- 7-9. Electric Propulsion, 5th conf., American Inst. of Aeronautics and Astronautics, San Diego, Calif. (A. T. Forrester, Electro-Optical Systems, Inc., 300 N. Halstead St., Pasadena, Calif. 91107)
- 7-9. **Space**, 3rd congr., Cocoa Beach, Fla. (R. M. Barnes, PAA-Guided Missiles Range Div., Bldg. 423, MU 111, Patrick Air Force Base, Fla.)
- 7-11. American Soc. for Metals, western metal and tool exposition and conf., Los Angeles, Calif. (The Society, Metals Park, Ohio)
- 7-11. Society of Plastics Engineers, 22nd annual technical conf., Montreal, P.Q., Canada. (G. L. Bata, Union Carbide Canada, Ltd., P.O. Box 700, Pointe-aux-Trembles, P.Q.)
- 7-12. Inter-American Nuclear Energy Commission, 6th mtg., Washington, D.C. (J. D. Perkinson, Jr., Pan American Union, Washington 20006)
- 8-3. World Meteorological Organization, commission for synoptic meteorology, 4th session, Wiesbaden, Germany. (WMO, 41, avenue Giuseppe Motta, Geneva, Switzer-
- 9-11. Ethics in Medical Progress, Ciba Foundation symp., London, England. (Ciba Foundation, 41 Portland Pl., London W.1)
- 9-13. Teaching Machines and Programmed Instruction, intern. symp., Nürtingen, Germany. (Arbeitsgemeinschaft Programmierte Instruktion, Inst. für Kybernetik, Pädagogische Hochschule Berlin, Malteserstr. 74-100, 1 Berlin 46)
- 10-11. Heat Transfer to Non-Newtonian Fluids, 12th annual heat transfer conf., Oklahoma State Univ., Stillwater. (J. D. Parker, Dept. of Mechanical Engineering, Oklahoma State Univ., Stillwater 74075)
- 11-13. National Council of Teachers of Mathematics, San Diego, Calif. (J. D. Gates, 1201 16th St., NW, Washington, D.C. 20036)
- 11-13. National Wildlife Federation, annual mtg., Pittsburgh, Pa. (T. L. Kimball, 1412 16th St., NW, Washington, D.C. 20036)

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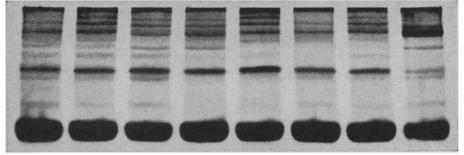
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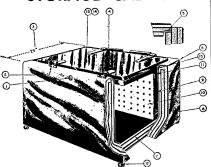
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12-13. Linguistics, 11th natl. conf., Linguistic Circle of New York, New York. (L. Pap, State Univ. College, New Paltz 12561)

14-16. Society of Toxicology, annual scientific mtg., Williamsburg, Va. (C. S. Weil, Mellon Inst., 4400 Fifth Ave., Pittsburgh, Pa. 15213)

14-16. Wildlife and Natural Resources 31st North American conf., Pittsburgh, Pa. (C. R. Gutermuth, Wildlife Management Inst., Wire Bldg., Washington, D.C.

14-20. Obstetrics and Gynecology, 8th Australian congr., Hobart. (J. F. Correy, 173 Macquaire St., Hobart)

14-6 May. Extraordinary Administrative Aeronautical Radio conf., 2nd session, Geneva, Switzerland. (Intern. Telecommunication Union, Place des Nations, Geneva)

15-16. Flame Resistant Polymers, conf., London, England. (Secretary, Plastics Inst., 6 Mandeville Pl., London, W.1)

15-18. Optical Soc. of America, spring mtg., Washington, D.C. (M. E. Warga, 1155 16th St., NW, Washington, D.C. 20006)

17-19. Isobaric Spin in Nuclear Physics, intern. conf., Florida State Univ., Talla-hassee. (D. Robson, Dept. of Physics, Florida State Univ., Tallahassee)

18-19. Rural Health, conf., Colorado Springs, Colo. (B. L. Bible, 535 N. Dearborn St., Chicago, Ill. 60610)

18-20. American Psychosomatic Soc. annual mtg., Chicago, Ill. (W. A. Greene, The Society, 265 Nassau Rd., Roosevelt, N.Y. 11575)

20-23. Solar Energy Soc., 2nd annual mtg., Boston, Mass. (F. Edlin, Arizona State Univ., Tempe 85281)

21-24. Aerospace Instrumentation, 4th intern. symp., College of Aeronautics, Cranfield, England. (E. K. Merewether, ISA Aerospace Industry Div., 4515 Canoga Ave., Woodland Hills, Calif.)

21-25. Institute of Electrical and Electronics Engineers, intern. conv., New York, N.Y. (IEEE, 345 E. 47 St., New York 10017)

22-23. Biomagnetics, 3rd intern. symp., Univ. of Illinois, Chicago. (M. F. Barnothy, Univ. of Illinois, 833 S. Wood St., Chicago)

22-23. Modern Concepts of Cardiovascular Diseases, conf. and workshop, Reno, Nev. (G. T. Smith, Laboratory of Patho-Physiology, Univ. of Nevada, Reno 89507)

22-24. Measurement and Applications of Neutron Cross Sections, conf., Washington, D.C. (W. W. Havens, Dept. of Physics, Columbia Univ., 538 W. 120 St, New York 10027)

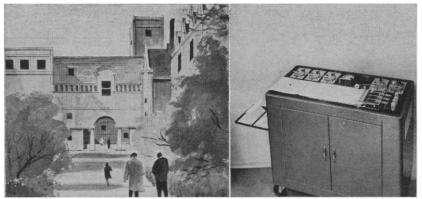
22-31. American Chemical Soc., spring mtg., Pittsburgh, Pa. (ACS, 1155 16th St., NW, Washington, D.C.)

23-25. Institute of Mathematical Statistics, Purdue Univ., Lafayette, Ind. (G. E. Nicholson, Jr., Univ. of North Carolina, Chapel Hill)

23-25. Modern Methods of Weather Forecasting and Analysis. Chicago, Ill. (J. R. Fulks, U.S. Weather Bureau, 5730 S. Woodlawn Ave., Chicago)

24-26. Biomathematics and Computer Science in the Life Sciences, symp., Houston, Tex. (Dean, Div. of Continuing Education, Univ. of Texas Graduate School

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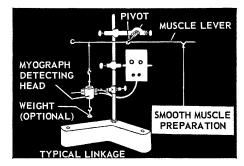
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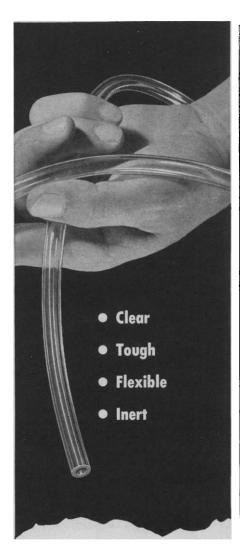
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The Genetics of Colonizing Species. Proceedings of the First International Union of Biological Sciences Symposia on General Biology (Asilomar, Calif.), February 1964. H. G. Baker and G. Ledyard Stebbins, Eds. Academic Press, New York, 1965. 606 pp. Illus. \$24. Twenty-five papers contributed by R. W. Allard, H. G. Baker, M. H. Bannister, L. C. Birch, Hampton L. Carson, Paul DeBach, Theodosius Dobzhansky, Friedrich Ehrendorfer, Frank Fenner, Alex Fraser, John L. Harper, Charles B. Heiser, Jr., Walter E. Howard, J. Katznelson, R. C. Lewontin, Ernst Mayr, F. H. W. Morley, Gerald A. Mulligan, J. W. Purseglove, Forbes W. Robertson, Kan-Ichi Sakai, G. Ledyard Stebbins, C. H. Waddington, Edward O. Wilson, Frank Wilson, Kazimierz Wodzicki, and Daniel Zohary.

Marine Geochemistry. A symposium (Kingston, R.I.), October 1964. David R. Schink and James T. Corless, Eds. Narragansett Marine Laboratory, Univ. of Rhode Island, Kingston, 1965. 380 pp. Illus. Paper. Thirteen papers: "The data ing of molluscs from raised marine terraces" by David L. Thurber; "Deposition rates by protactinium method" by William M. Sackett; "Trace element economy in the oceans" by Karl K. Turekian and Donald F. Schutz; "Some thoughts on dissolved gases in the oceans" by Bruce B. Benson; "Distribution of gamma emitting radio-nuclides in the Gulf of Mexico" by J. Frank Slowey, David Hayes, Bryon Dixon, and Donald W. Hood; "Sulfur isotopes in the marine environment" by M. L. Jensen; "Factors affecting the distribution of deuterium in the ocean" by Alfred C. Redfield and Irving Friedman; "Radiogenic leads of the Canadian and Baltic Shield regions" by Tsaihwa J. Chow; "Geochemistry of iodine, bromine, and chlorine in the air-sea-sediment system" by John W. Winchester and Robert A. Duce; "Marine geochemistry: Some guesses and gadgets" by Dayton E. Carritt; "Concentrations of common lead in Greenland snows" by M. Murozumi, T. J. Chow, and C. Patterson; "Manganese-iron accumulations in the shallow marine environment" by F. T. Manheim; and "Isotopic oceanography: Deuterium and oxygen 18 variations in the ocean and the marine atmosphere" by H. Craig and L. I. Gordon.

Molecular Biophysics. Proceedings of an international summer school (Squaw Valley, Calif.), August 1964. Bernard Pullman and Mitchel Weissbluth, Eds. Academic Press, New York, 1965. 462 pp. Illus. \$19.50. Fifteen papers presented at a summer school sponsored jointly by NATO and the U.S. Office of Naval Research.

Mossbauer Effect Methodology. vol. 1. Proceedings of a symposium (New York), January 1965. Irwin J. Gruverman, Ed. Plenum Press, New York, 1965. 208 pp. Illus. \$12.50. Fifteen papers: Reviews (3 papers); Spectrometers (3 papers); Measurement (5 papers); and Environment (4 papers).

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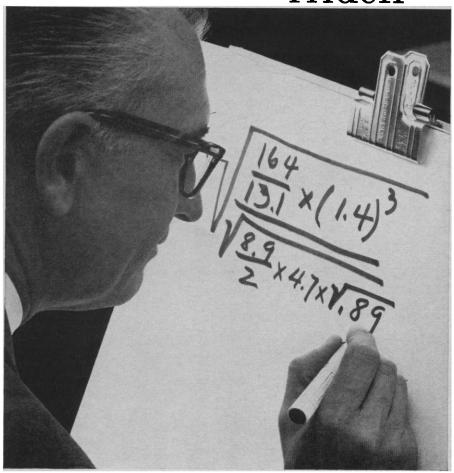


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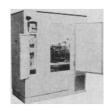
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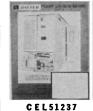








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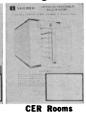














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(Amherst, Mass.), July 1964. Tsoo E. King, Howard S. Mason, and Martin Morrison, Eds. Wiley, New York, 1965. vol. 1, 560 pp; vol. 2, 632 pp. Illus. \$32.50 set. Forty-seven papers.

Oxygen. Proceedings of a symposium sponsored by the New York Heart Association. Alfred P. Fishman, Ed. Little, Brown, Boston, 1965. 295 pp. Illus. \$6. Eleven papers: Structure and function of oxygen (2 papers); Oxygen-transporting pigments (3 papers); Oxygen consumption by the cell (3 papers); and Nonhemoproteins and

oxygen (3 papers).

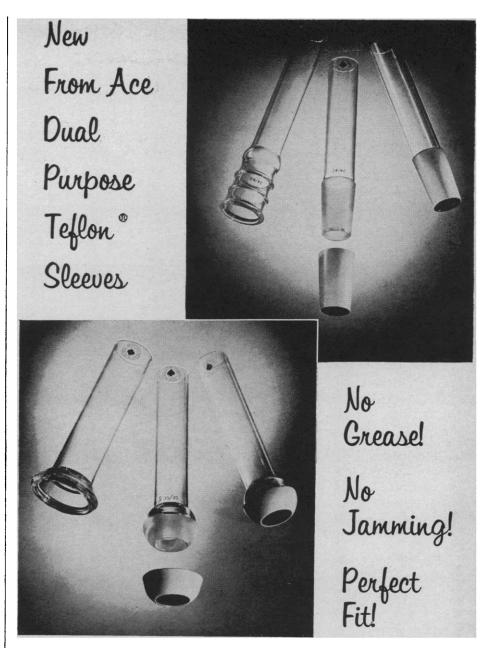
Physics of Solids at High Pressures. Proceedings of the first international conference (Tucson, Ariz.), April 1965. C. T. Tomizuka and R. M. Emrick, Eds. Academic Press, New York, 1965. 617 pp. Illus. \$14.50. Thirty-six papers: Electronic properties (11 papers); Magnetism (6 papers); Lattice defects (8 papers); Phase transformations (6 papers); and Phase transformations and lattice properties (5 papers).

Population Dynamics: International Action and Training Programs. Proceedings of the international conference on population (Baltimore), May 1964. Minoru Muramatsu and Paul A. Harper. Johns Hopkins Press, Baltimore, 1965. 256 pp. Illus. \$6.50. Nineteen papers.

Programmed Teaching. A symposium on automation in education. Joseph S. Roucek, Ed. Philosophical Library, New York, 1965. 204 pp. \$10. Thirteen papers: "Teaching machines—Six dangers and one advantage" by Robert B. Nordberg; "The effects of the preparation and utilization of automated teaching on the classroom teacher" by Jerome P. Lysaught; "Teacher education and teaching machines" Emma E. Plattor; "The programmed textbook or the teaching machine?" by Kenneth V. Lottich; "Exploring the limits on the automation of guided, planned experiences in creative thinking" by E. Paul Torrance; "Programmed learning and the teaching of the humanities and social sciences: "Some practical applications" by Robert M. Frumkin; "Automation in the secondary school social studies" by Eldon E. Snyder; "Programmed instruction in the language arts" by Regina M. Goff; "Automation and culturally deprived children" by Ralph H. Hines; "The use of instrumentation in special education" by Norman R. Willey; "The use of teaching machines with the mentally retarded" by Betty M. Bradley; "Programmed instruction for retarded children" by Leslie F. Malpass and others; and "Instructional television" by Donald L. Barnes.

Regeneration in Animals and Related **Problems**. An international symposium (Athens, Greece), April 1964. V. Kiortsis and H. A. L. Trampusch, Eds. North-Holland, Amsterdam, 1965. 592 pp. Illus. Forty-five papers given at a symposium sponsored by NATO's Division of Scientific Affairs.

Science in the Sixties. "Tenth Anniversary AFOSR Scientific Seminar (Cloudcroft, New Mexico), June 1965. David L. Arm, Ed. Univ. of New Mexico, Albuquerque, 1965. 214 pp. Illus. \$4.50. Fifteen papers: "Paths to the sixties" by A. Hunter Dupree; "The concept of mathematics historically surveyed" by Morris



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The Social Responsibility of Gynecology and Obstetrics. Proceedings of a conference (Baltimore, Md.), May 1965. Allan Barnes, Ed. Johns Hopkins Press, Baltimore, Md., 1965. 224 pp. Illus. \$5.95. Thirteen papers: "The population crisis: The magnitude of the problem" by Robert "Evaluation of contraceptive techniques for demographic population control" by Hugh J. Davis; "Problems in motivation in family planning" by Carl E. Taylor; "The organic basis" by Lonnie S. Burnett; "Behavioral excellence" by Leon Eisenberg; "Education for prevention" by Clifton R. Read; "Divorce: Sex education in the Baltimore city schools" by Eli Frank, Jr.; "Divorce: Marriage counseling" by Ethel M. Nash; "Abortion, artificial insemination, and sterilization" by G. C. A. Anderson; "The pregnant school girl" by Ghislaine Godenne; "Social aspects of family-focused obstetrics" by Gloria Bean; "The psychologic and family impact of the diseases peculiar to women" by Irvin M. Cushner; "Educating the physician for his role" by John Romano.

The Scientific Basis of Drug Therapy in Psychiatry. A symposium (London), September 1964. John Marks and C. M. B. Pare, Eds. Pergamon, New York, 1965. 231 pp. Illus. \$10.50. Fourteen papers: Basic concepts (3 papers); Major tranquilizers (4 papers); Anti-depressants (3 papers); Anti-anxiety compounds (2 papers); and General considerations (2 papers).

A Symposium on Continental Drift. Organized for the Royal Society (London), March 1964, by P. M. S. Blackett, Sir Edward Bullard, and S. K. Runcorn. Royal Society, London, 1965. 340 pp. Illus. \$25. Nineteen papers: Continental reconstructions (4 papers); Horizontal displacements in the earth's crust (5 papers); Convection currents and continental drift (5 papers); and Physics of convection currents in the earth's mantle (5 papers).

General

Adventures in Living Plants. Edwin B. Kurtz, Jr., and Chris Allen. Univ. of Arizona Press, Tucson, 1965. 128 pp. Illus. \$4.95.

Animal Conflict and Adaptation. J. L. Cloudsley-Thompson. Dufour, Philadelphia, Pa., 1965. 172 pp. Illus. \$8.95.

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Bibliographic Guide to Refrigeration, 1961–1964. International Institute of Refrigeration, Paris; Pergamon, New York, 1965. 895 pp. \$25. The Guide contains all abstracts published during 1961–1964 in the Bulletin of the International Institute of Refrigeration; the references, which are given in both English and French, are classified according to subject. Two indexes—of contents and of names—are provided.

Bibliography of Levant Geology: Including Cyprus, Hatay, Israel, Jordania, Lebanon, Sinai, and Syria. Compiled and arranged by M. A. Avnimelech. Israel Program for Scientific Translations, Jerusalem; Davey, New York, 1965. 204 pp. Paper \$6

Bibliography of North American Geology, 1961 (Geol. Survey Bull. 1197). U.S. Department of the Interior, Washington, D.C., 1965 (order from Superintendent of Documents, Washington, D.C.). 681 pp. Paper, \$2. This annual volume of the Bibliography is the first to be compiled by the use of computer techniques; the use of data processing is expected to expedite the publication of future volumes so that they will be available within a short time after the close of the period covered.

Bibliography of Statistical Literature, 1940–1949. Maurice G. Kendall and Alison G. Doig. Hafner, New York, 1965. 194 pp. \$10.50. This volume, the second of three projected volumes that will cover the literature of statistics and probability from the 16th century, contains about 6000 references to articles published from 1940 to 1949 inclusive. The entries are arranged in order of author's name, and titles not in English, French, or German are accompanied by a translation into one of those languages. Russian is transliterated. Most entries give the date of publication, title, and source.

Biographical Memoirs of Fellows of the Royal Society. vol. 11. Royal Society, London, 1965. 227 pp. Ilfus. \$6. Fourteen memoirs: "Edward Battersby Bailey" by Sir James Stubblefield; "Leonard Bairstow" by G. Temple (notes by A. Fage, J. L. Nayler, and E. F. Relf); "David Brunt" by Sir Graham Sutton; "James Franck" by H. G. Kuhn; "Jacques Hadamard" by Mary L. Cartwright; "John Hammond" by Sir William Slater and J. Edwards; "Reginald William James" by Sir Lawrence Bragg; "James McFadyen McNeill" by Sir Andrew McCance; "Werner Wolfgang Rogosinski" by W. K. Hayman; "Robert Beresford Seymour Sewell" by C. F. A. Pantin; "George Clarke Simpson" by E. Gold; "David Thoday" by W. Stiles; "Harold Albert Wilson" by Sir George Thomson; and "Donald Devereux Woods" by E. F. Gale and Sir Paul Fildes.

Birds Around the World: A Geographical Look at Evolution and Birds. Dean Amadon. Published for the American Museum of Natural History by the Natural History Press, Garden City, N.Y., 1966. 187 pp. Illus. \$3.95.

The Birth of the Missile: The Secrets of Peenemünde. Ernst Klee and Otto Merk. Translated from the German edition (Hamburg, 1963) by T. Schoeters.

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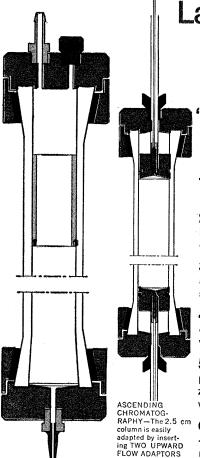
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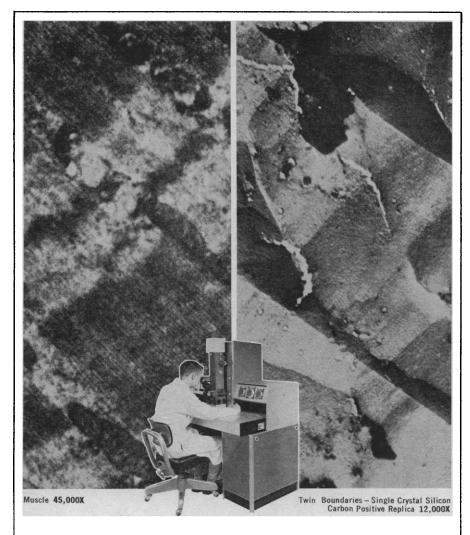
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Bugs or People? Wheeler McMillen. Appleton-Century (Meredith), New York, 1965. 240 pp. Illus. \$4.95.

Calculator's Cunning: The Art of Quick Reckoning. Karl Menninger. Translated from the 10th, revised, German edition (1961) by E. J. F. Primrose. Basic Books, New York, 1965. 132 pp. Illus. \$4.50.

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David T. Stanley. Brookings Institution, Washington, D.C., 1965. 159 pp. \$3.95.

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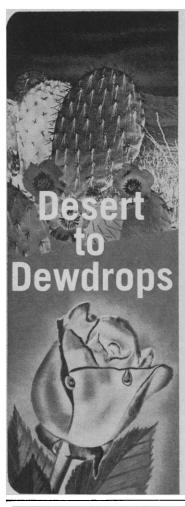
Community Health: Its Needs and Resources. John D. Porterfield, Ed. Basic Books, New York, 1966. 264 pp. Illus. \$4.95. Twenty lectures originally prepared for and presented on Voice of America programs.

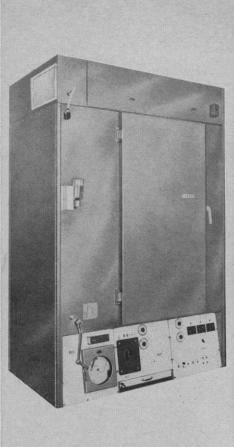
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Conservation of Natural Resources. Guy-Harold Smith, Ed. Wiley, New York, ed. 3, 1965. 545 pp. Illus. \$9.95. Twenty-three papers.

Contributions to the Prehistory of Nubia. Assembled by Fred Wendorf. Fort Burgwin Research Center and Southern Methodist Univ. Press, Dallas, 1965. 200 pp. Illus. Paper, \$4; cloth, \$6.50. Five papers: "Preliminary results of a geological expedition to Lower Nubia and to Kurkur and Dungul oases, Egypt" by Rushdi Said and Bahay Issawy; "The geological history of the Nile Valley in Sudanese Nubia: Preliminary results" by Jean de Heinzelin and Roland Paepe; "The Early and Middle Palaeolithic of Nubia: A preliminary report" by Jean Guichard and Genevieve Guichard; "A preliminary report on four epi-Levallois sites" by John Waechter; "Archaeological research on Pleistocene and lower Holocene sites in northern Sudan: Pre-liminary results" by W. Chmielewski, and an introductory paper by Fred Wendorf, Joel L. Shiner, and Anthony E. Marks.





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Dictionary of Technical Terms for Aerospace Use. William H. Allen, Ed. Natl. Aeronautics and Space Administration, Washington, D.C., 1965 (order from Superintendent of Documents, Washington, D.C.). 326 pp. Illus. \$3.

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Compiled by Theo. L. Hills. Department
of Geography, McGill Univ., Montreal,

Canada, 1965. 236 pp. Paper.

Doctors and the State: The British Medical Profession and Government Action in Public Health, 1870–1912. Jeanne L. Brand. Johns Hopkins Press, Baltimore, 1965. 323 pp. Illus. \$7.95.

The Ecological Theater and the Evolutionary Play. G. E. Hutchinson. Yale Univ. Press, New Haven, Conn., 1965. 153 pp. Illus. \$5. Essays based on lectures given by the author.

The Education of a Physician. By the Editors, The Johns Hopkins Magazine. Shelley, New Brunswick, N.J., 1965. 76 pp. Illus. Paper, \$1.50. An account of the education of a physician; it is intended for laymen and for young people who have not decided on a career.

Essays on Knowledge and Methology. Edward D. Simmons, Ed. Cook, Milwaukee, Wis., 1965. 151 pp. \$5.95. Eleven papers: "Wondering how and that we know" by Francis H. Parker; "What is it to know?" by Marc F. Griesbach; "The problem of sensory cognition" by Julius R. Weinberg; "Two kinds of reality" by Eugene P. Wigner; "Demonstration and science" by William Baumgaertner; "Demonstration regarding the realm of the sensible" by Francis J. Collingwood; "Man's knowledges of physical reality" by Robert J. Henle: "The elements of the physical universe" by Paul Weiss; "On proof in metaphysics" by James F. Anderson; "Demonstration in moral philosophy" by William E. Dooley; and "Value and meaning" by George A. Schrader.

The Excitement and Fascination of Science. A collection of autobiographical and philosophical essays. George H. Bishop and others. Annual Reviews, Palo Alto, Calif., 1965. 576 pp. Illus. Paper, \$1.95; cloth, \$5. Thirty-five papers reprinted from various volumes of the Annual Review of Biochemistry, Annual Review of Physical Chemistry, and Annual Review of Physiology.

Excursions into Chemistry. John H. Woodburn. Lippincott, Philadelphia, 1965. 145 pp. Illus. \$4.50.

Forestry in Communist China. S. D. Richardson. Johns Hopkins Press, Baltimore, 1966. 255 pp. Illus. \$6.95.

The Fulbright Program: A History. Walter Johnson and Francis J. Colligan. Univ. of Chicago Press, Chicago, 1965. 396 pp. \$8.50.

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The Geography of Frontiers and Boundaries. J. R. V. Prescott. Aldine, Chicago, 1965. Illus. \$5. University Library of Geography, edited by W. G. East.

The Geography of Soil. Brian T. Bunting. Aldine, Chicago, 1965. 213 pp. Illus. \$5. University Library of Geography.

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A Guide to Case Studies of Scientific Activity. Ben-Ami Lipetz. Intermedia, Carlisle, Mass., 1965. 358 pp. \$12.

A Guide to the Selection, Combination, and Cooking of Foods. vol. 2, Formulation and Cooking of Foods. Carl A. Rietz and Jeremiah J. Wanderstock. Avi Publishing Co., Westport, Conn., 1965. 454 pp. Illus. \$15.

A History of Genetics. A. H. Sturtevant. Harper and Row, New York, 1965. 175 pp. Illus. \$5.50. Modern Perspectives in Biology, edited by Herschel L. Roman, Eugene Bell, and Harlyn O. Halvorson.

History of the Primates: An Introduction to the Study of Fossil Man. Sir Wilfrid Le Gros Clark. British Museum (Natural History), London, ed. 9, 1965. 135 pp. Illus. Paper, 7s. 6d.

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How to Find Out About Physics. A guide to sources of information, arranged by the decimal classification. B. Yates. Pergamon, New York, 1965. 185 pp. Illus. Paper, \$2.95. Commonwealth and International Library.

Industrial Management in the Atomic Age: Patterns, Restraints, Opportunities, and Trends in Government-Sponsored Technology. V. Lawrence Parsegian. Addison-Wesley, Reading, Mass., 1965. 384 pp. Illus. \$10.75.

In Search of Philosophic Understanding. Edwin A. Burtt. New American Library, New York, 1966. 349 pp. \$5.75.

Introduction to Archaeology. Shirley Gorenstein. Basic Books, New York, 1965. 175 pp. Illus. \$4.50.

Introduction to Photographic Principles. Lewis Larmore. Dover, New York, ed. 2, 1965. 239 pp. Illus. Paper, \$1.50.
Introduction to Psychology. F. R. C.

Introduction to Psychology. F. R. C. Casson. Arco, New York, 1965. 180 pp. Illus. Paper, \$1.65; cloth, \$3.50.

Life on the Sea-Shore. A. J. Southward. Harvard Univ. Press, Cambridge, Mass., 1965. 163 pp. Illus. \$3.

Magnetism and Magnetic Materials: 1965 Digest. A survey of the technical literature of the preceding year. R. L. White and K. A. Wickersheim, Eds. Academic Press, New York, 1965. 274 pp. \$11. Nineteen papers.

The Mammals: A Guide to the Living Species. Desmond Morris. Harper and Row, New York, 1966. 448 pp. Illus. \$12.95.

Marine Archaeology. Developments during sixty years in the Mediterranean. Joan du Plat Taylor, Ed. Crowell, New York, 1966. 208 pp. Illus. \$9.50. Six papers: "Underwater work and archaeological problems" by Frédéric Dumas; "Mediterranean trade" by Fernand Benoit; "Some notable wreck excavations (a) Antikythera; (b) Mahdia; (c) Albenga; (d) Grand Congloué; (e) Titan; (f) Dramont 'A'; (g) Spargi; (h) Cape Gelidonya" by George Karo, Guy de Frondeville, Nino Lamboglia and others, Yves Girault, Ph. Tailliez, C. Santamaria and others, Gianni Roghi, and George F. Bass; "Underwater surveys" by Alessandro Pederzini and others; "Ports, harbours, and other submerged sites" by several authors; and "The future" by Joan du Plat Taylor and others.

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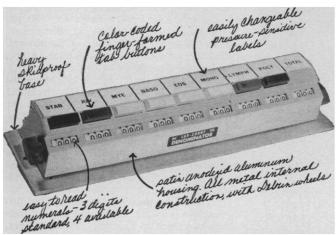
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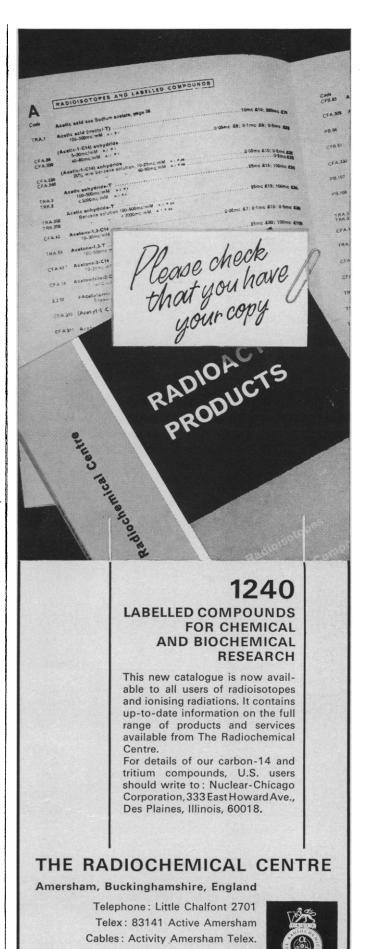
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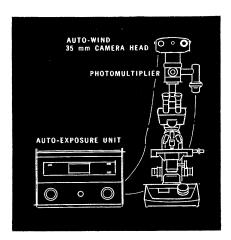
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Methods of Estimating Reserves of Crude Oil, Natural Gas, and Natural Gas Liquids. Wallace F. Lovejoy and Paul T. Homan. Published for Resources for the Future, Washington, D.C. by Johns Hopkins Press, Baltimore, 1965. 181 pp. Paper, \$3.

Methods of Forensic Science. vol. 4. A. S. Curry, Ed. Interscience (Wiley), New York, 1965. 381 pp. Illus. \$15.50. Eight papers: "Methods for determining alcohol" by H. Ward Smith; "The examination of glass fragments" by D. F. Nelson; "Coloured fibres in criminal investigation with special reference to natural fibres" by Max Frei-Sulzer; "Searching for drug metabolites in viscera" by L. K. Turner; "Thin-layer chromatography (TLC) in forensic science" by G. Machata; "The detection of soap abortoins" by Wolfgang Schwerd; "Infra-red absorption spectroscopy in forensic toxicological practice" by Antti Alha and Veikko Tamminen; and "Recent advances in the grouping of dried blood and secretion stains" by R. A. Outteridge.

The Nature of Cancer. P. M. Sutton. Crowell, New York, 1965. 159 pp. Illus. \$3.50.

New Views of the Nature of Man. John R. Platt, Ed. Univ. of Chicago Press, Chicago, 1965. 162 pp. \$5. Six papers: "Man's place in the physical universe" by Willard F. Libby; "Determinacy, individuality, and the problem of free will" by George Wald; "The science of science" by Derek J. de Solla Price; "Mind, brain, and humanist values" by Roger W. Sperry; "The impact of the concept of culture on the concept of man" by Clifford Geertz; and "The sense of crisis" by James M. Redfield.

North American Landscape. F. J. Monkhouse and A. V. Hardy. Cambridge Univ. Press, New York, 1965. 96 pp. Illus. Paper, \$1.75; cloth, \$3.75.

On the Philosophy of Science. Bertrand Russell. Charles A. Fritz, Ed. Bobbs-Merrill, New York, 1965. 260 pp. Paper, \$1.45.

Operating Room Manual: A Guide for O. R. Personnel. Mary Ellen Yeager. Putnam, New York, ed. 2, 1965. 319 pp. Illus. \$7.50.

The Organization of Research Establishments. Sir John Cockcroft, Ed. Cambridge Univ. Press, New York, 1965. 281 pp. Illus. \$11.50. Fourteen papers: "The National Physical Laboratory" bv Sir Gordon Sutherland; "The Royal Aircraft Establishment" by M. J. Lighthill; "The Atomic Energy Research Establishment, Harwell" by F. A. Vick; "The National Institute for Medical Research" by Sir Charles Harington; "The Medical Research Council, Social Psychiatry Research Unit" by Sir Aubrey Lewis; "The Agricultural Research Council Institute of Animal Physiology, Babraham" by J. H. Gaddum; "The Empire Cotton Growing Corporation and the organization of research on raw cotton" by Sir Joseph Hutchinson and D. F. Ruston; "The Glaxo Research Organization" by Sir Harry Jephcott; "Cooperative research in the British iron and steel industry" by Sir Charles Goodeve; "British railways research and development" by C. C. Inglis; "The Bell Telephone Laboratories" by J. B. Fisk; "The Rutherford High Energy Physics Laboratory" by T. G. Pickavance; "CERN: The European Organization for Nuclear Research" by J. B. Adams; "What makes a good research establishment?" by Sir Edward Bullard.

Pepys' Diary and the New Science. Marjorie Hope Nicolson. University Press of Virginia, Charlottesville, 1965. 210 pp.

Plants, Animals, and Man in the Outer Leeward Islands, West Indies. An ecological study of Antigua, Barbuda, and Anguilla. David R. Harris. Univ. of California Press, Berkeley, 1965. 194 pp. Illus. Plates. Paper, \$5. University of California Publications in Geography, vol. 18.

La politica del CNEN (1960-63). Felice Ippolito. Il Saggiatore, Milan, 1965. 306 pp. Illus. Paper, L. 700.

Practical Programming. Peter Pipe. Holt, Rinehart, and Winston, New York, 1966. 80 pp. Illus. Paper, \$1.50.

Psychoanalytic Pioneers. Franz Alexander, Samuel Eisenstein, and Martin Grotjahn, Eds. Basic Books, New York, 1966. 636 pp. \$15.

The Railroad and the Space Program: An Exploration in Historical Analogy. Burce Mazlish, Ed. M.I.T. Press, Cambridge, Mass., 1965. 245 pp. \$7.50. Technology, Space, and Society Series, edited by Raymond A. Bauer and Edward E. Furash.

Red Man's Religion: Beliefs and Practices of the Indians North of Mexico. Ruth M. Underhill. Univ. of Chicago, Chicago, 1965. 311 pp. Illus. \$7.95.

The Research and Development Effort: In Western Europe, North America, and the Soviet Union. C. Freeman and A. Young. Organisation for Economic Cooperation and Development, Paris, 1965 (order from McGraw-Hill, New York). 152 pp. Illus. Paper, \$2.50.

The Reverend John Clayton, a Person with a Scientific Mind. His scientific writings and other related papers. Edmund Berkeley and Dorothy Smith Berkeley, Eds. Published for the Virginia Historical Soc. by the University Press of Virginia, Charlottesville, 1965. 234 pp. Illus. \$6.50.

Satellites of the Solar System. Werner Sandner. Elsevier, New York, 1965. 151 pp. Illus. \$6.50.

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Science for the Space Age. Victor C. Smith and B. Bernarr Vance. Lippincott, Philadelphia, ed. 2, 1966. 624 pp. Illus.

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Science Teasers. Rose Wyler and Eva-Lee Baird. Harper and Row, New York, 1966. 112 pp. Illus. \$2.95.

Scientific Societies in the United States. Ralph S. Bates. M.I.T. Press, Cambridge, Mass., ed. 3, 1965. 342 pp. \$8.75.

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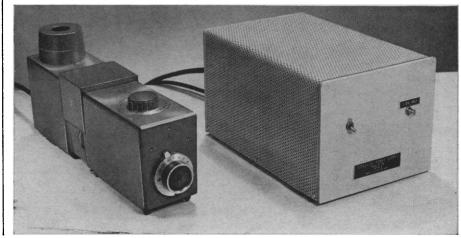
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SER 3: Environmental Analysis. Directed by C. Theodore Larson. Architectural Research Laboratory, Univ. of Michigan, Ann Arbor, 1965. Unpaged. Illus. Three papers in which the SER staff attempts to "provide guidelines on such environmental research [that is, research on the impact of environment on learning in particular or on human behavior in general] and environmental design..."

Sound and Hearing. S. S. Stevens, Fred Warshofsky, and the Editors of *Life*. Time Inc., New York, 1965. 200 pp. Illus. \$3.95. Life Science Library.

A Study of Frege. Jeremy D. B. Walker. Cornell Univ. Press, Ithaca, N.Y., 1965. 215 pp. \$5.

Such Agreeable Friends, Bernhard Grzimek. Hill and Wang, New York, 1965. 224 pp. Illus. \$5.

Surface Anatomy. Joseph Royce. Davis, Philadelphia, Pa., 1965. 270 pp. Illus. \$12.50.

Tangrams—330 Puzzles. Ronald C.

Read. Dover, New York, 1965. 158 pp. Illus. Paper, \$1.

Theories in Social Psychology. Morton Deutsch and Robert M. Krauss. Basic Books, New York, 1965. 256 pp. \$3.95. Basic Topics in Psychology Series, edited by Edwin G. Boring.

The Theory of Relativity and A Priori Knowledge. Hans Reichenbach. Translated from the German edition by Maria Reichenbach. Univ. of California Press, Berkeley, 1965. 162 pp. \$5.

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The Therapeutic Nightmare. Morton Mintz. Houghton, Mifflin, Boston, 1965. 620 pp. Illus. \$6.95.

Time and Space, Weight and Inertia. A chronogeometrical introduction to Einstein's theory. A. D. Fokker. Translated from the Russian edition by D. Bijl. D. Field, Translation Ed. Pergamon, New York, 1965. 204 pp. Illus. \$10. International Series of Monographs in Natural Philosophy, vol. 2.

Toward a Theory of Instruction. Jerome S. Bruner. Harvard Univ. Press, Cambridge, Mass., 1966. 190 pp. Illus. \$3.95.

The Trail of the Invisible Light. From x-strahlen to radio(bio)logy. E. R. N. Grigg. Thomas, Springfield, Ill., 1965. 1116 pp. Illus. \$36.75. An attempt to place radiology in proper perspective with respect to medicine and the physical sciences.

The Voices of Time. A cooperative survey of man's views of time as expressed by the sciences and by the humanities. J. T. Fraser, Ed. Braziller, New York, 1966. 736 pp. Illus. \$12.50. Twenty-seven papers: Time in Thought: Philosophy,

Religion, and Man's Attitude Toward Change (6 papers); Time and Man: Communications, Rhythm, and Behavior (6 papers); Time and Life: Rhythm, Life, and the Earth (5 papers); and Time and Matter: Clocks, Man, and the Universe (10 papers).

Understanding Science for the Space Age. Victor C. Smith. Lippincott, Philadelphia, ed. 2, 1966. 496 pp. Illus. \$4.40 (elementary textbook).

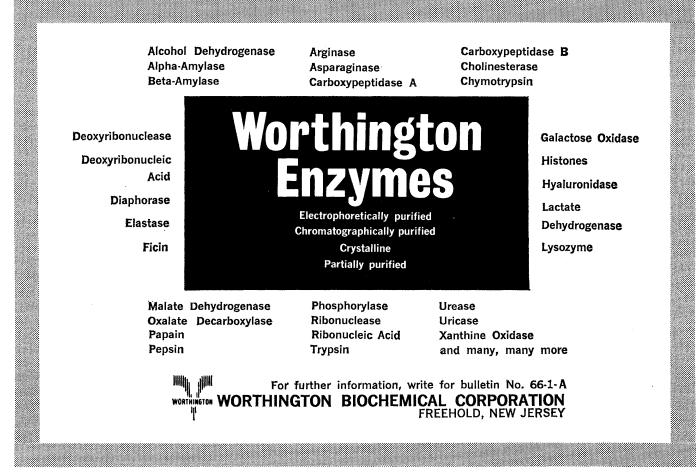
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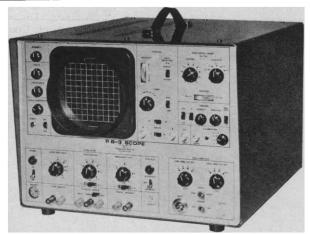
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Mathematics, Physical Sciences, and Engineering

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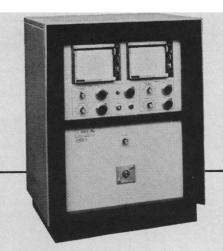
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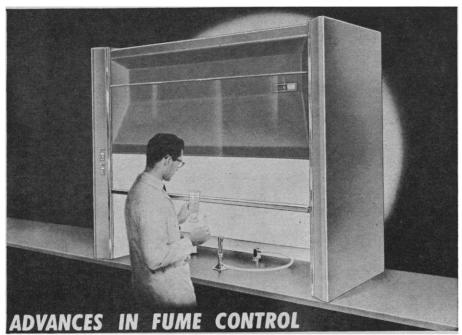


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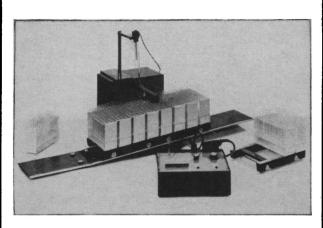
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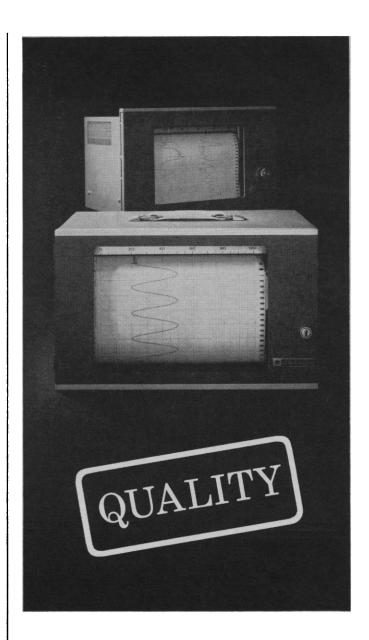
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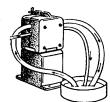


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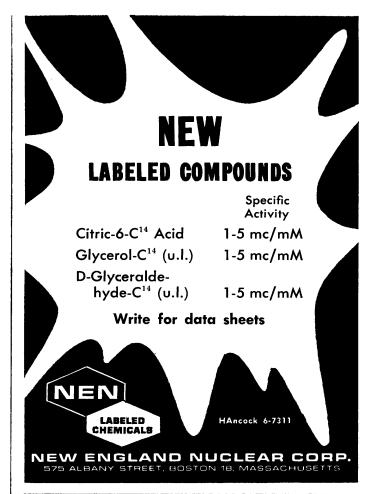
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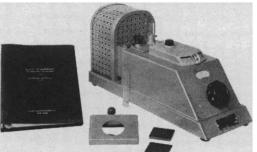
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