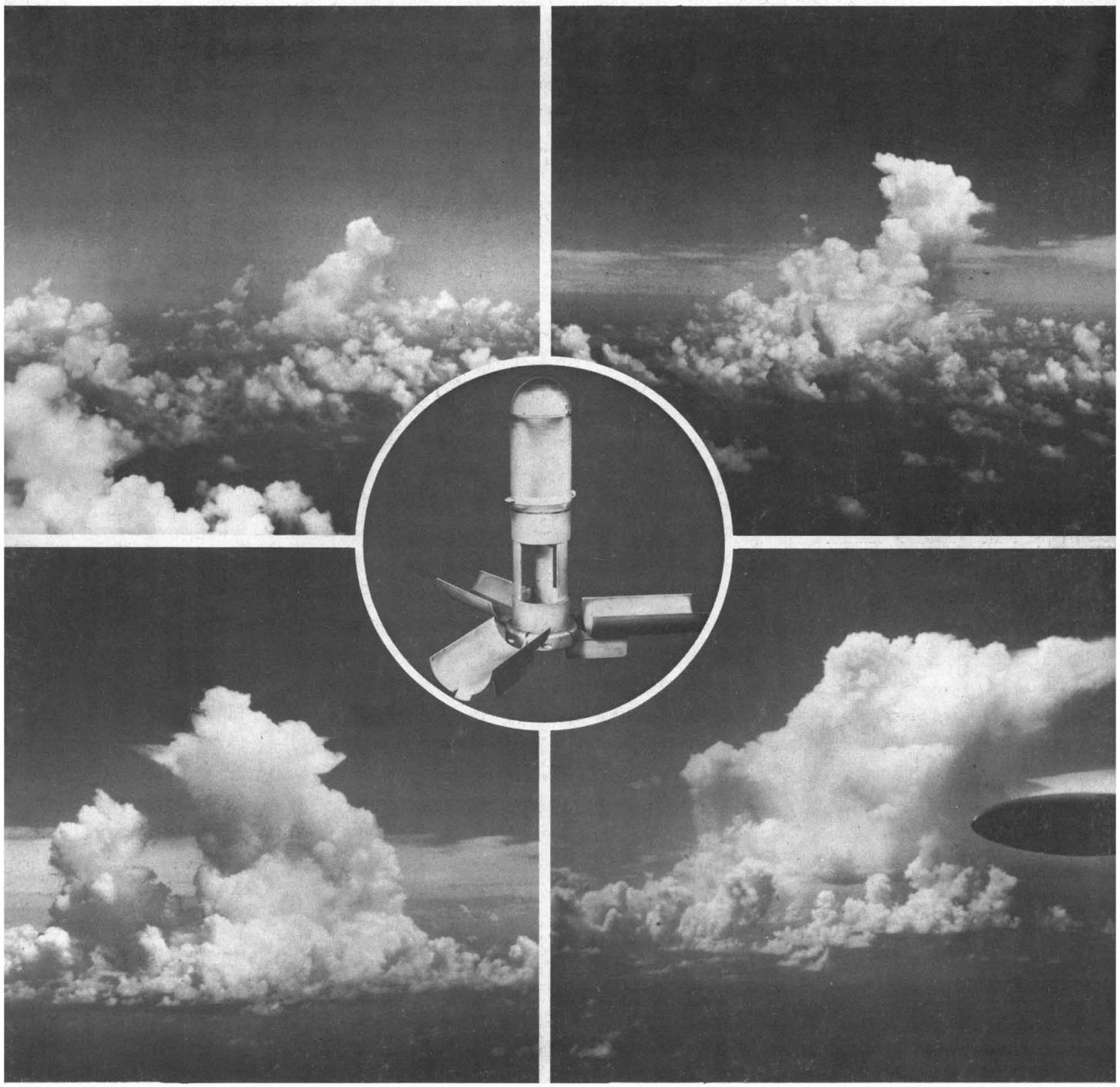
SCIENCE

7 August 1964

Vol. 145, No. 3632

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



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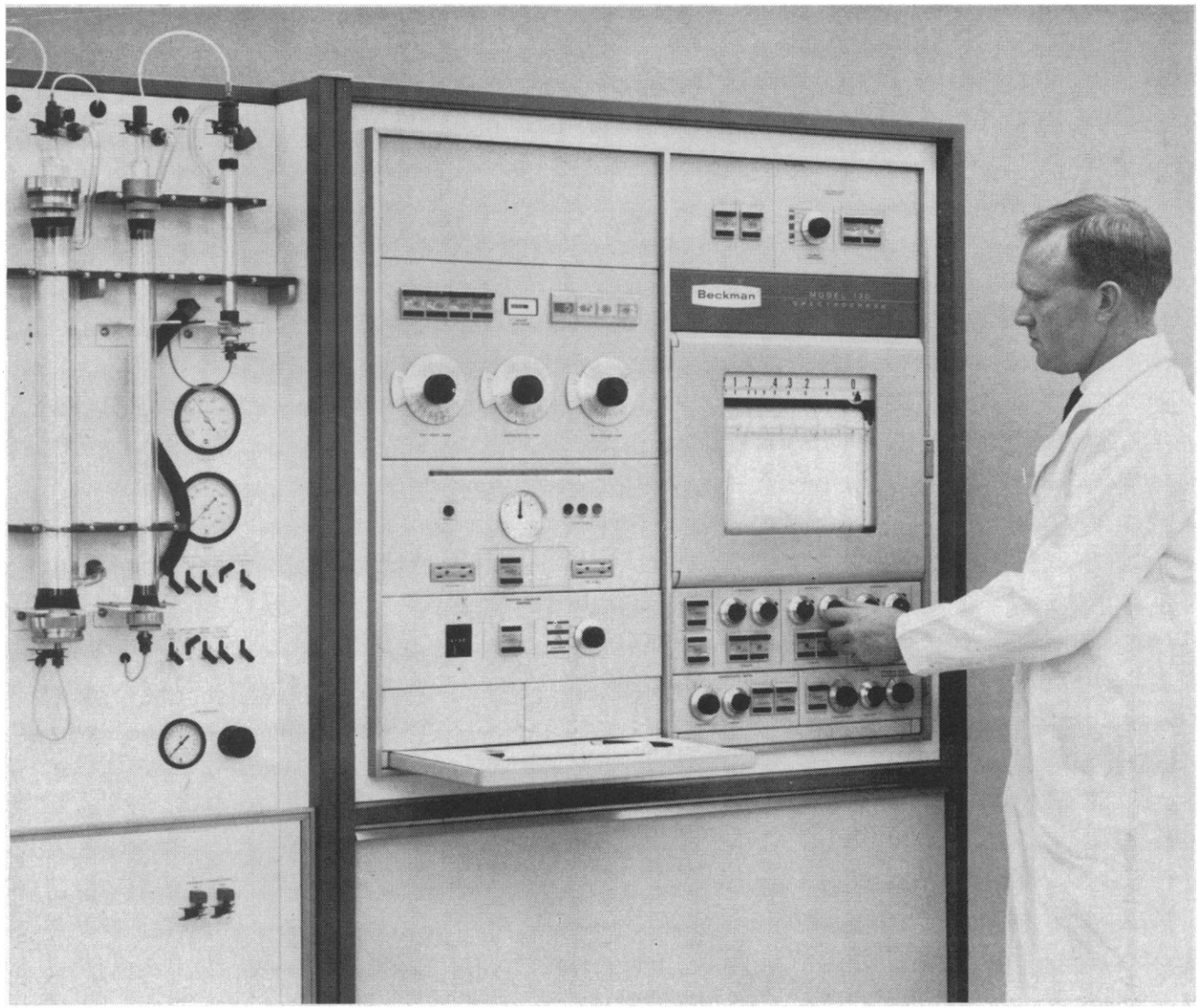

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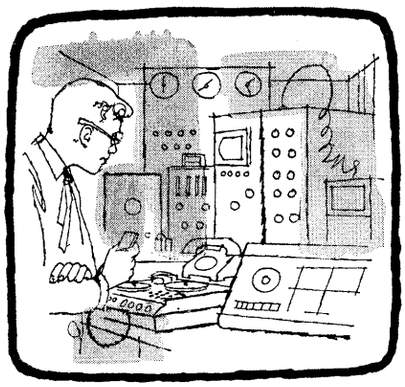

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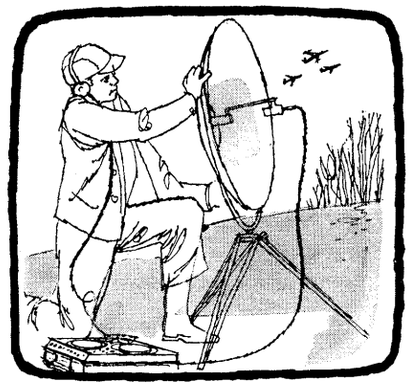

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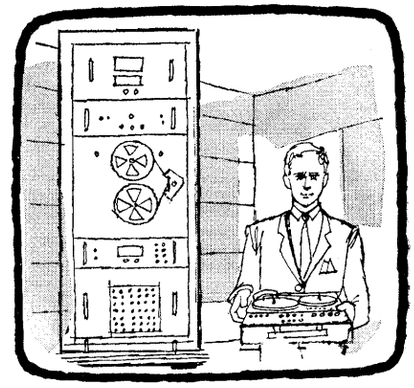

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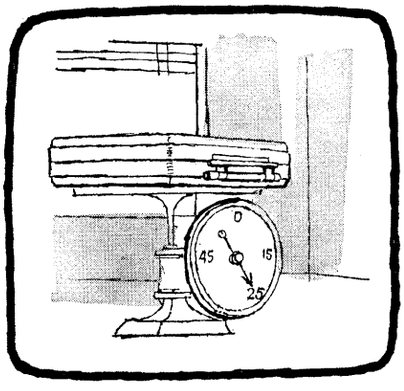

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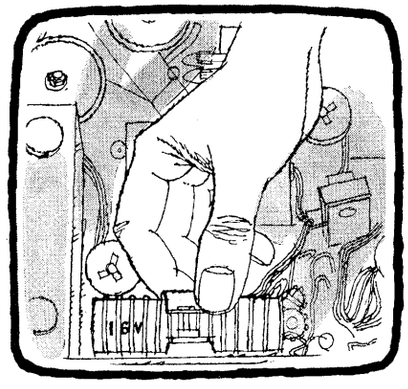

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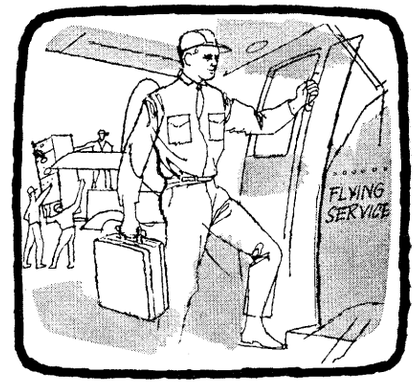

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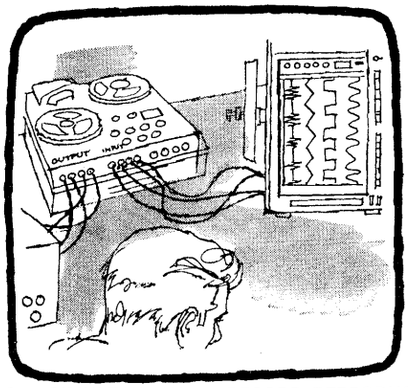

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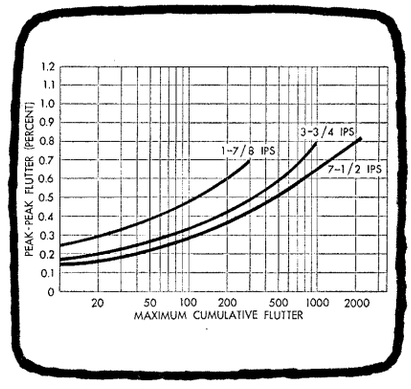

WITH EXTREMELY LOW FLUTTER

7 August 1964
Vol. 145, No. 3632

SCIENCE

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AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

COVER

Development of seeded cloud on 20 August 1963. (Top left) Time of seeding; (top right) just before maximum vertical growth, 9 minutes later. (Bottom left) Horizontal "explosion" underway, 19 minutes after seeding; (bottom right) cloud has attained giant proportions, 38 minutes after seeding. The pyrotechnic silver iodide generator (center) was developed by the Naval Ordnance Test Station for this experimental program. See page 541.

Recent AAAS Symposium Volumes

#75. **Mechanisms of Hard Tissue Destruction.**

1963. 776 pages. 430 illustrations.
One color plate.
Edited by: Reidar F. Sognnaes.
Symposium by 49 outstanding co-authors on destruction of mineralized structures by organisms and by physical and chemical agents, ranging from rock boring to bone resorption and tooth decay.

Price: $13.00. *AAAS Member's Cash Price:* $11.00.

#74. **Aridity and Man.**

The Challenge of the Arid Lands in the U.S.
1963. 604 pages. 98 illustrations.
Edited by: Carle Hodge and Peter C. Duisberg.
"Best collection of background material . . . well balanced and highly readable . . . probably the broadest and most nearly complete treatment of arid lands yet published." *Journal of Forestry,* May 1964.

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#73. **Land and Water Use.**

With special reference to the Mountain and Plains Regions.
1963. 364 pages. 8 illustrations.
Edited by: Wynne Thorne.
"Lively symposium . . . three main divisions: The Resource Setting, Criteria and Policies, and The Role of Government . . . deserves continuing reference as a provocative contribution to the urgent problems of western resource disposition and management." *Journal of Forestry,* November 1963.

Price: $8.00. *AAAS Member's Cash Price:* $7.00.

#72. **Spermatozoan Motility.**

1962. 322 pages. 113 illustrations.
Edited by: David W. Bishop.
"This book is an excellent assemblage of recent findings and reports of new data relative to the perplexing problem of sperm mobility and includes the opinions and ideas of cytologists, biophysicists, biochemists and physiologists." *Journal of Animal Sciences,* March 1963.
"Of great value to the research worker who is interested in the problems of flagellar motion." *The American Journal of the Medical Sciences,* March 1963.

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#71. **Great Lakes Basin.**

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Edited by: Howard J. Pincus.
". . . Difficulty . . . in attempting to do justice to all the topics covered in a book as rich as this one in content, interpretation, and discussion. . . . Well designed and pleasing in appearance. . . . Highly recommended to scientist and layman alike." *Transactions, American Geophysical Union,* December 1963.

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#70. **Fundamentals of Keratinization.**

1962. 202 pages. 136 illustrations.
Edited by: E. O. Butcher and R. F. Sognnaes.
"This book . . . makes fascinating reading for all clinicians and research workers interested in keratinising tissues." *British Dental Journal,* 15 Jan. 1963.

Price: $6.50. *AAAS Member's Cash Price:* $5.75.

#69. **Biophysics of Physiological and Pharmacological Actions.**

1961. 612 pages. 212 illustrations.
Edited by: Abraham M. Shanes.
"Excellently arranged. . . . It is a fascinating book for basic physiologists and pharmacologists, students interested in the basic sciences, and teachers." *Connecticut Medicine,* December 1963.

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#68. **Sciences in Communist China.**

1961. 884 pages. 23 illustrations.
Edited by: Sidney H. Gould.
". . . strongly recommended to all who are in search of facts and source material on the sciences in China."—*Science,* 22 September 1961

Price: $14.00. *AAAS Member's Cash Price:* $12.00.

#67. **Oceanography.**

1961. 2nd printing, 1962. 665 pages. 146 illustrations.
Edited by: Mary Sears.
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#66. **Germ Plasm Resources.**

1961. 394 pages. 59 illustrations.
Edited by: Ralph E. Hodgson.
"This book will be of interest to nonplant and animal breeders, for the rather general treatment of various topics . . . allows for rapid perusal."—*Bulletin of the Entomological Society of America,* September 1961

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#65. **Aging . . . Some Social and Biological Aspects.**

1960. 436 pages. 65 illustrations.
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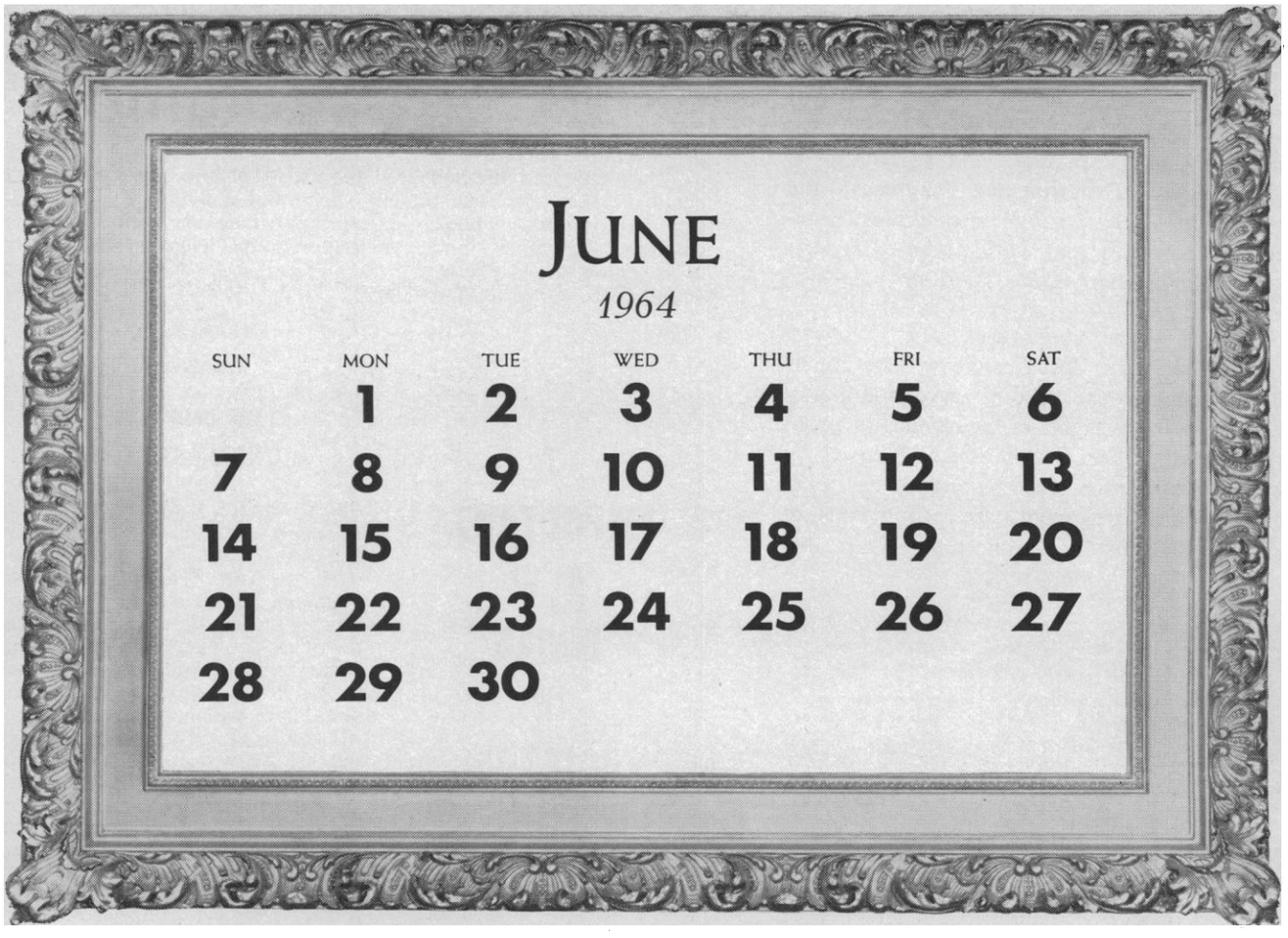

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By **H. M. Frost**, *Henry Ford Hosp., Detroit, Mich.* This monograph deals with one of the most basic properties of living matter—*the control of directionality of cell activity in three dimensional space.* The laws presented here represent a breakthrough on the theoretical side of biomechanics. A series of appendices provide basic information about the mathematics, materials, properties, and bone physiology involved. Technical terms are defined in the glossary. (*Henry Ford Hospital Surgical Monograph edited by Conrad R. Lam*)

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PHYSIOLOGICAL PROBLEMS IN SPACE EXPLORATION

Edited by **James D. Hardy**, *Yale Univ., New Haven, Conn. (With 7 Contributors)* Presents background information and the state of knowledge in the several aspects of space psychophysiology: Temperature Problems; High Energy Radiations; The Gaseous Requirements (Respiration); Food Requirements; Acceleration; Weightlessness and Sub-Gravity Problems; Sensory and Perceptual Problems; Isolation and Disorientation; and Physiologic Rhythms. (*Amer. Lec. Physiology*)

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$12.50 — *100 il.*

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By **S. H. Lawrence**, *Univ. of Calif., Los Angeles, Calif.* The author introduces enzymology into medicine and develops advances which have led to the discovery and practical values of the heterogeneity of enzymes. *He discusses its relation to diagnosis and genetics and probes into the future of this new tool.* Also included are the most widely used methods for the study of the zymogram with detailed tables of stains, buffers, substrates, activators, and inhibitors. An important book that will persuade researchers of the diagnostic potentials of the "multizymogram" as opposed to study of isozymes of only one enzyme. (*Amer. Lec. Living Chemistry edited by I. Newton Kugelmass*)

June 1964 — *124 pp.*
$5.75 — *33 il.*

7 IMPORTANT NEW BOOKS IN SCIENCE AND TECHNOLOGY

THE CHEMICAL ORIGIN OF LIFE

By **Alexander I. Oparin**, *U.S.S.R. Academy of Sciences, Moscow, U.S.S.R. Translated from the Russian by* **Ann Synge**, *Stonehaven, Scotland.* In this classic monograph Doctor Oparin describes in as great detail as achievements of contemporary science will allow the three stages in the evolution of organic substances which preceded the appearance of life on Earth. He makes the widest possible use of the data of evolutionary biochemistry to sketch in a picture of later development of biological metabolism and cellular structure. (*Amer. Lec. Living Chemistry*)

July 1964 — *About 80 pp.*
About $4.75 — *33 il.*

STEROID ANALYSIS BY GAS LIQUID CHROMATOGRAPHY

By **A. Anne Patti** *and* **Arthur A. Stein**, *both of Albany Medical Coll., Albany, N. Y.* Presents observations utilizing gas-liquid chromatography (GLC) for steroid analysis in biological fluids and tissues. Selected methods which give reproducible results with semi-purified extracts and which permit the separation and identification of one or more steroids in biological fluids are described. *These methods have been chosen for rapid clinical screening.* Some biochemistry is included to clarify the methodology and *applications of GLC to steroid analysis in the normal and diseased states.*

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By **Jack Schubert**, *Nuclear Science & Engineering Corp., Pittsburgh, Pa.* An unusual book . . . written not to satisfy but to *stimulate research on the unique and widespread role played by copper in living organisms.* Includes chapters critically reviewing selected aspects of current knowledge of copper chemistry; copper in biochemistry and medicine; peroxides and copper oxidases in radiobiology. Medical aspects include new views on Wilson's disease, cancer and aging, antipyresis, and hypothermia. *Special emphasis is given to radiobiology.*

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7 August 1964, Volume 145, Number 3632

SCIENCE

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AAAS Space Poll

Polling a cross section of members of AAAS with respect to the space program (*Science*, 24 July) was an interesting experience. At a time when many people are on vacation, the response was more than 56 percent, virtually by return mail. Answers to a question concerning the highest academic degree of the respondent reminded us of the excellent educational background of AAAS members. Nearly half are Ph.D.'s, and another tenth are M.D.'s. *Science* reaches a substantial fraction of the leaders of academic and industrial research—for example, half of the members of the Chemistry and Physics section of the National Academy of Sciences. Thus the poll sampled a cross section of a substantial fraction of the best minds of this nation. The resultant data are important, but what do they mean?

The group, while having reservations, endorses the objective of a manned lunar landing. Only 7 percent thought there should never be a manned lunar landing. The reservations concern the priority of the program, the costs involved, and the benefits to be derived. Only 31 percent thought a high priority should be given to landing a man on the moon by 1970. Indeed, only one-fifth considered a landing by 1970 a reasonable objective. An overwhelming majority felt the present level of support of space activities is too high. Currently about 40 percent of federal research and development funds are devoted to space. A clear majority (61 percent) believed that space should receive one-fifth or less of the R&D budget.

The respondents indicated reservations as to the benefits of exploring the moon. When asked to choose "the most important justification for manned exploration of the moon," a majority chose "scientific." Yet when asked to rank fields in order of their "potentiality for producing important new knowledge," respondents gave lunar exploration a low rating.

The question concerning potentialities of various fields made some respondents unhappy and evoked the most comment. A few felt that the question was unanswerable. Obviously, responses must represent guesses. But these are the kinds of guesses that scientists must continually make. There was a considerable write-in vote for the behavioral sciences. If the questionnaire had included this item as one of the formal choices, it probably would have ranked high.

Some respondents made comments which they signed. Among these was one from a former president of the American Chemical Society. He may have enunciated the view of many when he said:

> If we were struggling to maintain a high living standard we could not afford the luxury of space travel, but we have an affluent society and can spare the effort. It is an innocent, harmless project which appeals to the public spirit of adventure. . . . All the money is spent within the country and spurs the economy. It is vastly better to stimulate the economy and arouse the enthusiasm of the public in this way than to have it done by war.

At present scientists go along with the space program but without enthusiasm. There is little doubt that manned space exploration will be carried out, but the program will be subject to continuing reexamination and controversy.—PHILIP H. ABELSON