SCIENCE 25 October 1968
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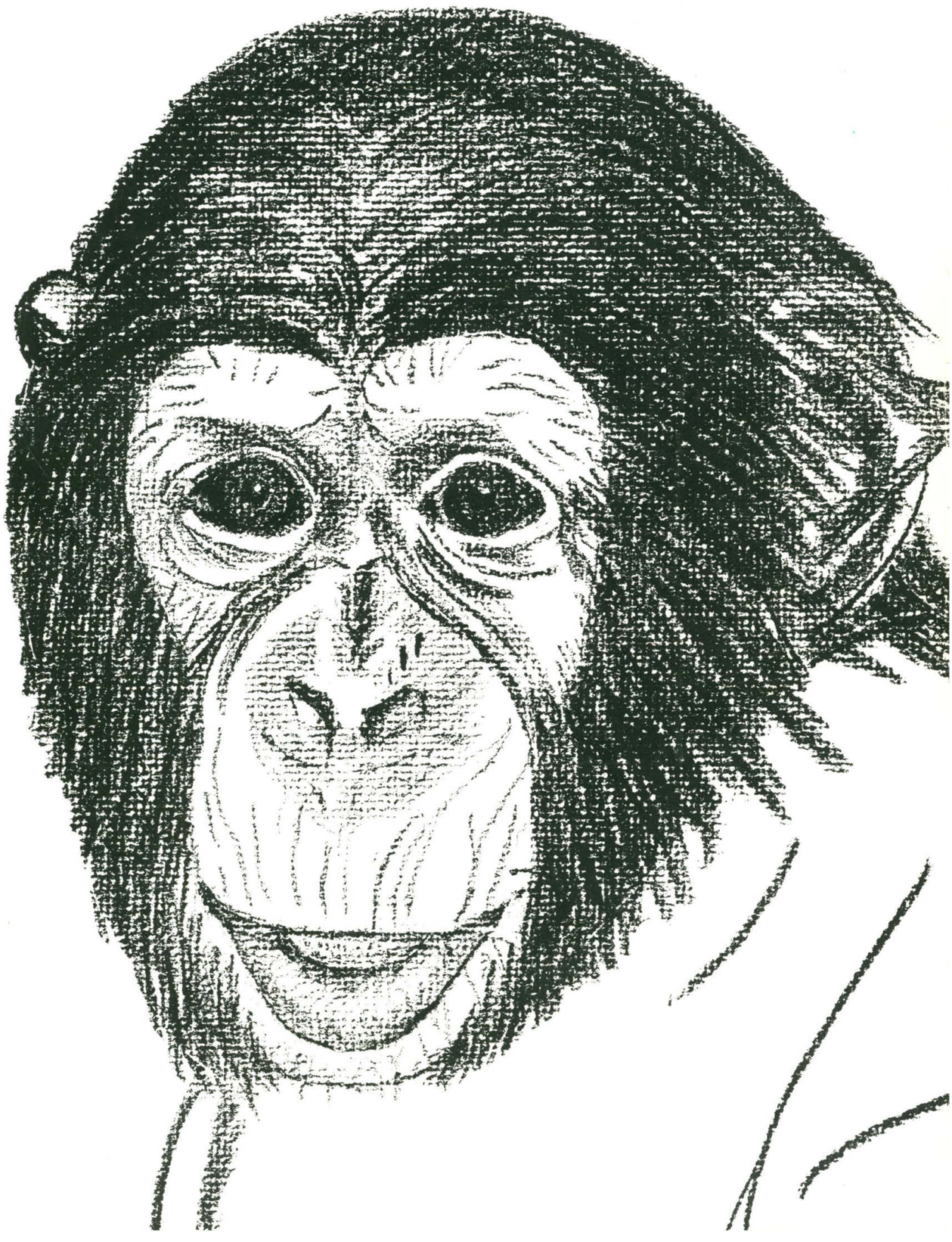
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



AAAS SYMPOSIUM VOLUMES

In Agriculture and Related Fields

AGRICULTURE AND THE QUALITY OF OUR ENVIRONMENT

Editor: N. C. Brady

476 pages, bibliography, author and subject indexes. 1967.
Price: $13.50. AAAS members' cash orders: $11.50.

Agriculture and the Quality of Our Environment addresses itself to this two-pronged problem: How does environmental quality affect agriculture and how does agriculture affect the quality of the environment?

This book provides a good summary and analysis of agriculture's stake in the quality of our environment. It also identifies the part which science must play to solve environmental pollution problems.

AGRICULTURAL SCIENCES FOR THE DEVELOPING NATIONS

Editor: A. H. Moseman

232 pp., 37 illus., bibliog., index, 1964.
Price $6.75. AAAS members' cash orders: $6.00.

The symposium was devoted to the role of agricultural science and technology in the acceleration of economic progress in newly developing nations. The twelve chapters of this volume comprise an informed summary of the problems and opportunities of technical, economic, and educational assistance in agriculture. The book will be helpful in furnishing some background experience for the use of agricultural planners in the newly emerging countries.

GROUND LEVEL CLIMATOLOGY

Editor: Robert H. Shaw

408 pp., 144 illus., bibliog., index, 1967.
Price: $12.50. AAAS members' cash orders: $10.50.

Ground Level Climatology consists of twenty papers dealing generally with the theme of weather and agriculture (including forestry) and specifically with the climate closely surrounding plants and animals—the microclimate. Investigators in the field of ground level climatology seek to understand the complex relationships between living organisms and their environment: the relation of climate to the distribution and abundance of plants and animals; the effects of weather modification on physical processes within the microclimate; and the effects of moisture, temperature, and energy balance on physiological functions.

GERM PLASM RESOURCES

Editor: Ralph E. Hodgson

394 pp., 59 illus., bibliog., index, 1961.
Price: $9.75. AAAS members' cash orders: $8.50.

The 25 papers treat the subject according to origin of germ plasm, developmental programs, new approaches to uses and perpetuation, and protection of plant and animal germ plasm.

Progress in improving the usefulness of the available germ plasm is measured. The need for additional germ plasm is pointed out, and problems relating to further development, preservation, and utilization of germ plasm to advance plant and animal production are indicated.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

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COVER

Viki, a home-raised chimpanzee, was taught with great difficulty to say the words "mama," "papa," and "cup." Although the chimpanzee readily imitates the behavior of others, it seems to lack the ability for vocal imitation. A chimpanzee in the home, as in the wild state, uses gestures or movements as communicative signals. See page 423. [Courtesy of Keith J. Hayes, White Memorial Medical Center, Los Angeles, California, and Mrs. Catherine H. Nissen, Skokie, Illinois]

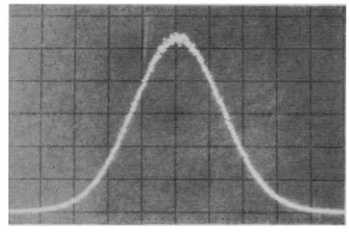
Tame complex scientific data... produce useful information directly

How to See Through 1000 Windows at a Time

Since the early days of the Manhattan Project, the study of nuclear phenomena has been on a steep rise. Not surprisingly, this started a train of responses by the instrumentation industry to answer the need of research scientists for analytical data about radiation. Of most service have been instruments to measure the gamma radiation that originates in the unstable nuclei of radioactive isotopes as they decay to stable states.

It's not really difficult, with today's more sophisticated electronic instrumentation to measure accurately the energy of a discrete gamma ray and the time of its occurrence. But that's only a small part of the information that the nuclear scientist needs to know. Usually the radiation 'signature' that identifies a material consists of a variety of gamma rays at characteristic energy levels, and it's precisely the knowledge of this *variety*—or spectrum—that interests the scientist.

Initially the nuclear scientist measured the gamma spectrum by looking at voltage pulses derived from the overall radiation through a series of energy "windows", one window at a time. He built the "frame" for each window using a high and a low voltage discriminator, each with adjustable threshold, thus being able to look only at pulses whose peak value fell between the two levels. Since an adequate measure of the gamma spectrum may require that the scientist look at it through more than a thousand different windows, this one-at-a-time procedure is often inadequate. Not only is it laborious, it is also so slow as to be useless where the decay rate (half-life) is very short.



Probability density display of Gaussian noise

Enter the multichannel analyzer (MCA), newest of which is the H-P 5400A. The MCA looks at gamma radiation through as many as 1024 windows, *simultaneously* sorting the pulses into as many amplitude groups. It counts and totalizes the pulses in each group and stores the results in memory for live or static display on the built-in cathode ray tube, for readout on a paper record or for input to a computer.

Speed, the essential characteristic of an MCA, reaches its peak in the 5400A. Employing a new analog-to-digital converter with a clock rate of 100 MHz, the 5400A sorts and digitizes input signals into one of 1024 categories in no more than 13 microseconds.

In its present state of refinement, the 5400A MCA has not only met the nuclear scientist's need for a gamma spectrum analyzer, but has also attracted the attention of analytical scientists in other disciplines. Biochemists for example have used it as a multichannel scaler to accumulate time/rate curves of activity for uptake/clearance studies in nuclear medicine. Design engineers have performed probability density analysis of continuous input signals with the 5400A to isolate signal and noise characteristics. Other solutions of complex measurement problems are described in the March 1968 issue of the *Hewlett-Packard Journal*, yours on request.

Designing for the Electronics-Shy Analyst

Natural strangers to the complex world of electronics, chemists and other analysts have long since been trapped in it because of their seemingly insatiable appetite for analytical instruments that are essentially electronic creations. Both readily admit the impossibility of doing their analytical work at today's speed and accuracy standards without electronics. But upon introspection they also acknowledge a deep yearning somehow to exclude the whole complicated world of transistors, diodes and integrated circuits from their laboratories.

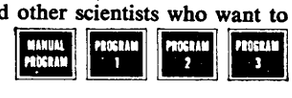
Yet exactly the reverse is happening: as the scientist uses more and more instruments in his quest for analytical speed, he produces greater and greater quantities of analog chart recordings, each of which he must laboriously interpret if he is to decode its analytical message. Bogged down in this task, the analyst once again has had to turn to the electronic designer . . . this time for a device which automatically interprets the *analog* output of such analytical instruments as the ubiquitous gas chromatograph, and translates it into *digital* data, the stuff of which quantitative analysis is made.

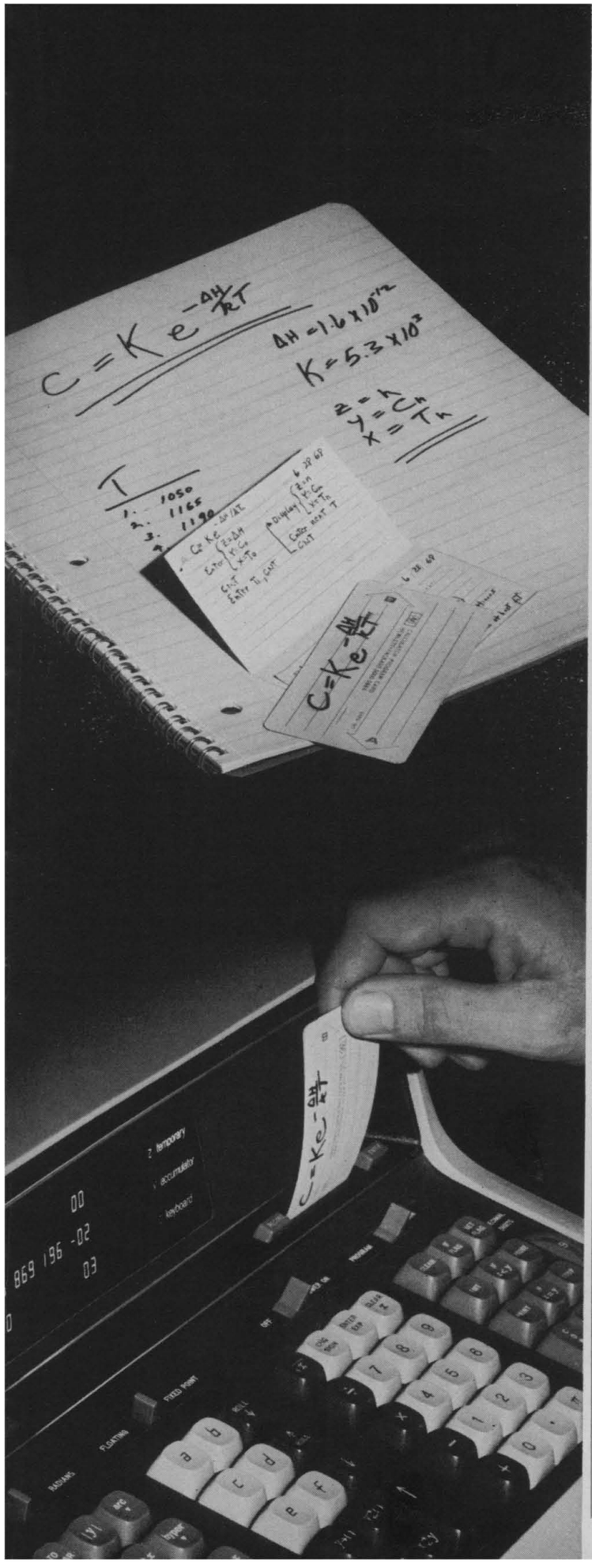
The device which does this job best—the digital integrator—employs even more complex electronic circuits than does the gas chromatograph. And it requires frequent adjustments of a dozen or more programming controls, each somewhat mysterious to the electronics-shy analyst.

For many, this is the last straw. Consequently they have refused to admit into their laboratories the one electronic device that, ironically, can do more than any other to speed their analyses and simplify their routine.

Aware of this problem in human engineering, a team of H-P chemists and electronic engineers together have recently completed the design of an integrator that can be programmed for an almost unlimited variety of analytical conditions just by pushing buttons. No longer must the recalcitrant analyst make the difficult choice of plunging into the strange world of integrator programming, or living in a world bereft of the benefits of digital integrators. The H-P 3370A lets him have the best of both worlds.

For electronics-shy chemists and other scientists who want to know how this was accomplished, we offer a new Bulletin 3370A, on request.





Restoring the Balance Between Analysis and Computation

Time was when the scientist enjoyed sitting at his desk to manipulate the raw analytical data that he had accumulated while standing at the bench. Somehow complex computations with classical formulae created a pleasant interlude between creative sessions at the bench.

During the post-war period, this somewhat romantic attitude has gradually disappeared. Backed by a seemingly endless parade of new automatic instruments for analysis, the scientist has become such a prodigious producer of analytical data that the balance between his analytical and computational loads has been destroyed. One of the top technical management problems of the day is to release the scientist from the time-consuming drudgery of massive computations and return him to creative work.

Obvious solutions are not always satisfactory. The typical electronic desk calculator is simply not up to the job: many of the commonest mathematical routines of science and engineering are beyond its scope. On the other hand, the computer is often too imposing for the problem immediately at hand, too inconvenient of access or too expensive to justify, and always relatively difficult to program and use.

What is needed is a machine that combines the accessibility of the calculator and the capacity and speed of the computer. Such is the H-P 9100A computing calculator. It not only resembles but even surpasses the computer in its ability to handle very large (10^{99}) and very small (10^{-98}) numbers at the same time. In practical terms, for example, the 9100A allows the scientist to use Avogadro's number (6×10^{23}) and Planck's constant (6.6×10^{-27}) in the same computation without risk of overflowing its capacity, and without requiring the scientist to keep orders of magnitude in his head.

The 9100A also shares with the large computer the ability to solve complicated computations in fractions of a second. This stems from its ability to store as many as 196 program instructions, some of which may be decisions based on conditional branching and looping commands. But the 9100A is far easier to use than any computer because of two unique characteristics which bring it within easy reach even of the scientist who has no knowledge of computer programming techniques. First, all programming is carried out in English or common math symbols, not in special computer language. Second, even the most complex program can be stored on wallet-size magnetic cards and entered into the 9100A simply by inserting the card in a slot (as in the photo at left) and pushing a button.

As a result the 9100A can, for example, determine the straight line that best fits a set of experimentally obtained X-Y points in seconds. The scientist need only insert the appropriate program card and enter the data points on the keyboard. The 9100A then carries out the entire 'least squares fit' computation and displays the slope (m), intercept (b), and correlation coefficient (r). It will even plot the line itself when equipped with the forthcoming H-P X-Y plotter.

Yet the 9100A is no bigger and costs no more than a calculator. More important, it is as easy to use since all machine operations are in English or common math symbols. This includes single-key operation for log, exponential, trig and hyperbolic functions, and for coordinate conversions from polar to rectangular and vice-versa.

If you want to know how the 9100A can restore the balance between analysis and computation in your lab, get a copy of our new 22-page brochure. Write Hewlett-Packard, 1501 Page Mill Road, Palo Alto, California 94304. In Europe: 54 Route des Acacias, Geneva.

HEWLETT hp PACKARD

ANALYTICAL INSTRUMENTS

00870

LETTERS

Structure of an Organism

I would like to question the validity of what I take to be Michael Polanyi's main argument in his article "Life's irreducible structure" (21 June, p. 1308). In his own words, it is this:

> 1) [An organism's] structure serves as a boundary condition harnessing the physical-chemical processes by which its organs perform their functions.
> 2) If the structure of living things is a set of boundary conditions, this structure is extraneous to the laws of physics and chemistry which the organism is harnessing.
> 3) Thus the morphology of living things transcends the laws of physics and chemistry.

Even without further elucidation of Polanyi's conception of an organism's structure as a boundary condition harnessing physical-chemical processes, it is easy to see that this argument is invalid. For, granting the premises, the most that follows is that the morphology of an organism "transcends" *those* physical-chemical processes which it harnesses. It does not follow that it "transcends" *all* physical-chemical processes. But the latter conclusion is surely what is needed if one is to go on to claim that "both machines and living mechanisms are irreducible to the laws of physics and chemistry."

Probing deeper we see that we may not even have to accept the weaker conclusion, for the second premise of the argument is questionable. Polanyi supports this premise with the following analogy:

> In Galileo's experiments on balls rolling down a slope, the angle of the slope was not derived from the laws of mechanics, but was chosen by Galileo. . . . this choice of slopes was extraneous to the laws of mechanics . . .

To take a different, but similar, example, consider the solar system. The positions and momenta of the components at a given time, t, serve as boundary conditions for determining the state of the system at all other times according to the laws of mechanics. Now it is an obvious truth that the boundary conditions at t do not follow from the laws of mechanics alone. But to describe this truth by saying that the structure of the solar system transcends the laws of mechanics is at best misleading, for clearly the boundary conditions at t do follow from the laws of mechanics provided only that we supply some other boundary conditions; for example, the state of the system at t'. Or, to carry the example somewhat further, it is at least logically possible that the solar system should have been formed from hydrogen atoms by the action of gravitation alone. Thus, while it may be of some interest to think of the universe as a hierarchy of systems, each providing boundary conditions for "lower" systems, it has not been shown that any but physical-chemical laws are needed throughout the hierarchy. It has not even been shown that the *same* laws may not be operative throughout. . . .

RONALD N. GIERE
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UFO Story: Is Propriety the Issue?

In letters recently published here (30 Aug. and 27 Sept.), Condon and Branscomb question the propriety of *Science* reporting on the administrative difficulties surrounding the UFO study that Condon is conducting for the Air Force. Since they raise the question of propriety, I think it is desirable for *Science* readers to be informed of the following concerning the celestial Bay of Pigs that Condon is running in Boulder.

Not long after the publication of a *Look* article attacking Condon for his management of the project, Condon offered to help *Science* prepare a story about the project. It was his hope, he explained, that an article in *Science* would present the situation in a way that would counteract the effects of the *Look* article. As it turned out, independent of the *Look* article or Condon's invitation, the news department was planning a story anyway. Condon assured us of his complete cooperation and did not raise any question of propriety.

When the *Look* article, though critical, failed to evoke any significant public interest, Condon concluded that it would be inappropriate for *Science* to touch the matter, withdrew his offer of cooperation, and proceeded to enunciate high-sounding principles in support of his new-found belief that *Science* should not touch the subject until after publication of his report. When reminded that he had sought to initiate an article and had assured *Science* of his cooperation, Condon flatly refused to discuss the matter further.

Since Condon does not set the editorial policy of this journal, we pro-

ceeded to investigate the situation and prepared an article on the basis of the information that could be obtained. When there was reason to believe that relevant information was lacking, it was so indicated in the article. (For such lacks, it might be added, Condon can only blame himself.)

As for the propriety of an article in *Science* prior to the issuance of the Condon report (which we await with great interest), it is difficult to know where to begin. But when public funds and matters of public concern are involved, where is it prescribed that nothing may be said until the public is presented with a *fait accompli*?

As for Branscomb's anguished assertion that "the tragedy is that *Science* apparently fails to perceive that public acceptance of the rationality of science is at stake"; if it is at stake, it should be noted that *Science* merely presented a report on the interesting events in Boulder, it didn't create those events.

D. S. GREENBERG

Science

Since Condon (Letters, 30 Aug.) characterizes *Science*'s article on his UFO project as gossip, perhaps he could be persuaded to answer two questions:

1) Is the memo printed at the end of the article "Colorado UFO fiasco" by Curtis Fuller beginning on page 30 of the magazine *Fate* (September 1968) an accurate transcription or copy of a memo written by Robert J. Low concerning the UFO project at the University of Colorado?

2) Is Low the author of this project's report, or otherwise associated with it in some capacity in the past or now?

J. B. HATCHER

3104 Silver Lake Road,
Minneapolis, Minnesota 55418

Conservation: Guideline for the Courts

Kesteven's excellent article, "A policy for conservationists" (24 May, p. 857), is a timely assist to the group of conservation-minded congressmen who have sponsored legislation for a National Conservation Bill of Rights. The resolution to amend the Constitution of the United States by setting forth a statement of national policy concerning the environment and natural resources was introduced in the House on 12 June. Congressman Richard L. Ottinger of New York sponsored the resolution

along with Congressmen Kupferman, Saylor, Dent, Scheuer, Button, Cleveland, Farbstein, Walker, Edwards (Calif.), Eilberg, and Podell.

The purpose of the amendment is to define the rights of citizens of this country with respect to the condition of our general environment and to the use and conservation of natural resources. "The right of the people to clean air, pure water, freedom from excessive and unnecessary noise, and the natural, scenic, historic, and esthetic qualities of their environment shall not be abridged." The resolution calls for periodic inventories and evaluation of "natural, scenic, esthetic and historic" resources and restrictions on actions that would adversely affect resource values on public lands. A constitutional statement of the nation's will in respect to resources and environment is essential to provide a legal basis for resolving conservation issues. As it now stands, litigation to protect the public from actions damaging to its environment has been only marginally successful. The courts find insufficient basis in existing statutes to give favorable opinions on behalf of the public in conservation matters, and, since these concerns are relatively new, there is practically no protection in common law. The constitutional amendment would set a guideline which the courts could follow.

The Conservation Bill of Rights, now in the Judiciary Committee, faces a long uphill struggle in Congress, and then it must be ratified by the legislatures of two-thirds of the states. If adopted, it will have far-reaching, positive effects on conservation theory and practice in this country and perhaps on human survival in centuries to come.

JOHN CLARK
American Littoral Society, Sandy Hook, Highlands, New Jersey 07732

Milkweed Mystery

An unusually large number of the milkweed plants, *Asclepias,* in this area of Nassau County, Long Island, have not formed pods this year. The plants seem to be of average height for this time of year and in all other ways appear normal. Have readers in other areas observed lack of pod formation this year?

WALTER LENER
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25 October 1968, Volume 162, Number 3852

SCIENCE

Selective Service Promises

The 1968 Democratic and Republican platforms both promise to reduce Selective Service discrimination and to shorten the period of draft vulnerability and uncertainty. Both platforms also hope for an eventual change to a wholly voluntary military service, but that is not for 1969.

Neither platform proposes a system of national service (including military and civilian alternatives) for all young people. Nevertheless, the idealism of national service and its potential social and personal benefits make the concept an appealing one. It will be widely discussed, for it is the high-school debate topic this year and will be debated on some college campuses as well. Appearing just in time to provide much material for these debates is the report of a national conference on national service.*

In between national service and a wholly voluntary system are the platform promises of greater equity in selection and a reduced period of vulnerability. The Democratic platform also endorses a random method of selection. These changes could be achieved in 1969.

How the Selective Service System got to be what it is and how greatly reform is needed are the themes of a recent book by Harry Marmion,† the American Council on Education staff member who for the past 2½ years has been immersed in Selective Service matters. From this experience Marmion has written a knowledgeable, blow-by-blow history of the recommendations that evolved in the extensive discussions of 1966–67; the appointment by the House Armed Services Committee and the President of special commissions to study Selective Service issues; and the President's recommendations to Congress and his failure either to press for their adoption when a congressional Old Guard took command or to adopt those of his own recommendations—such as the induction of younger men first—that were permitted him by the Military Service Act of 1967.

What likelihood is there that a new administration will carry out the platform promises? Greater equity, a random method of selecting those who must be inducted through Selective Service, and a reduction in the period of uncertainty would all have widespread and bipartisan support. But Congress has already heard and overridden the excellent arguments for these reforms; Senator Russell and Congressman Rivers will probably continue to be chairmen of the armed services committees of the Senate and House, and are unlikely to want to take up in 1969 a law that still has 2 years to run; General Hersey is not one to advocate major changes in the present arrangements; and the heavily military Task Force on the Structure of the Selective Service System has reported that it considers no major change in the organization to be necessary.‡ The opposition to reform will be strong.

Only if the new President puts Selective Service reform high on his own list of priorities and either uses the power of his office to push changes through Congress or capitalizes on his opportunities to institute improvements through executive action can we look for betterment. The time to start pressing the winner of the November election to fulfill his platform's promises will come very soon.—DAEL WOLFLE

* Donald J. Eberly, Ed., *National Service: A Report of a Conference* (Russell Sage Foundation, New York, 1968).

† Harry A. Marmion, *Selective Service: Conflict and Compromise* (Wiley, New York, 1968).

‡ *Report of the Task Force on the Structure of the Selective Service System* (Government Printing Office, Washington, D.C., 1968).

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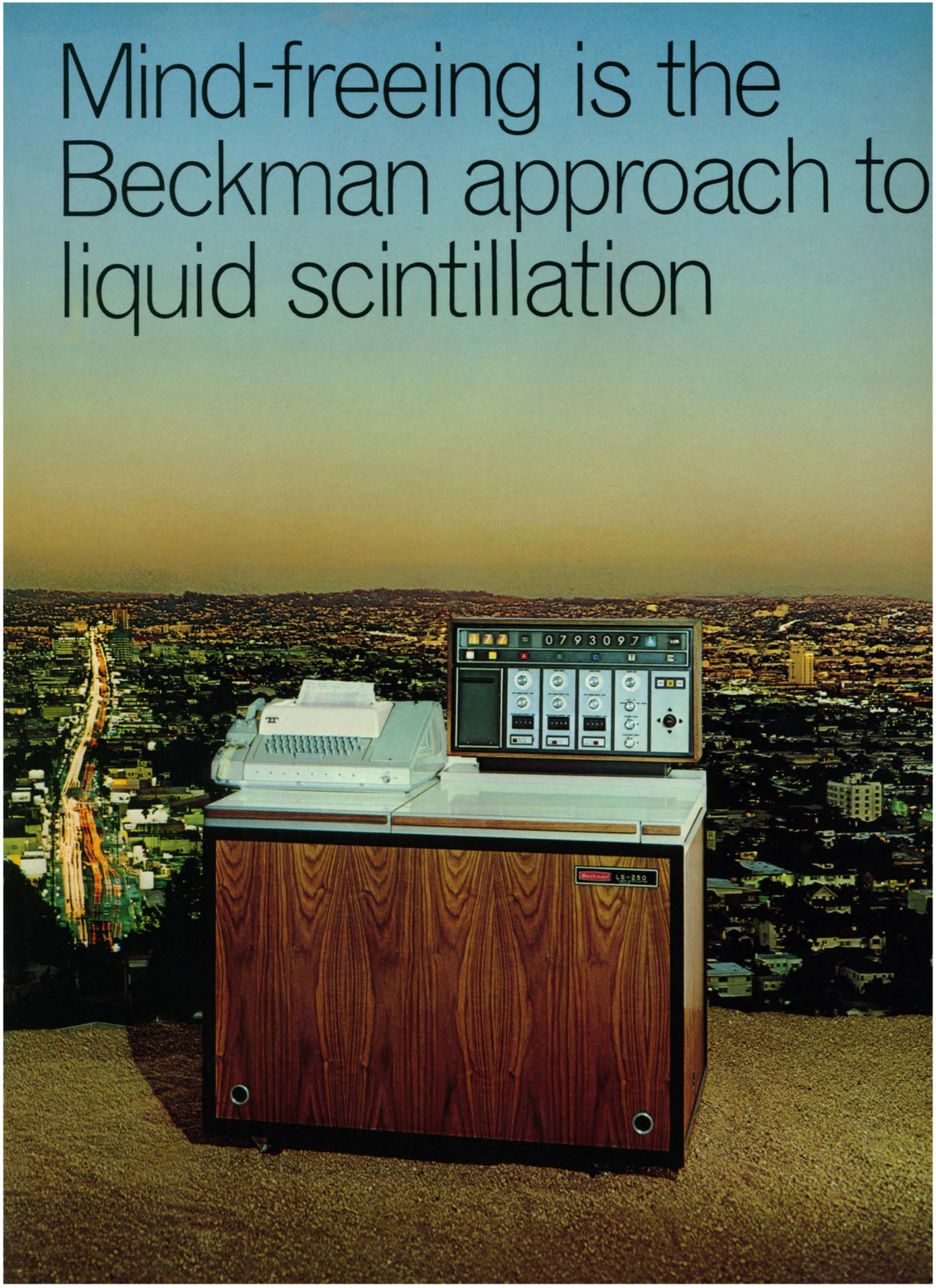

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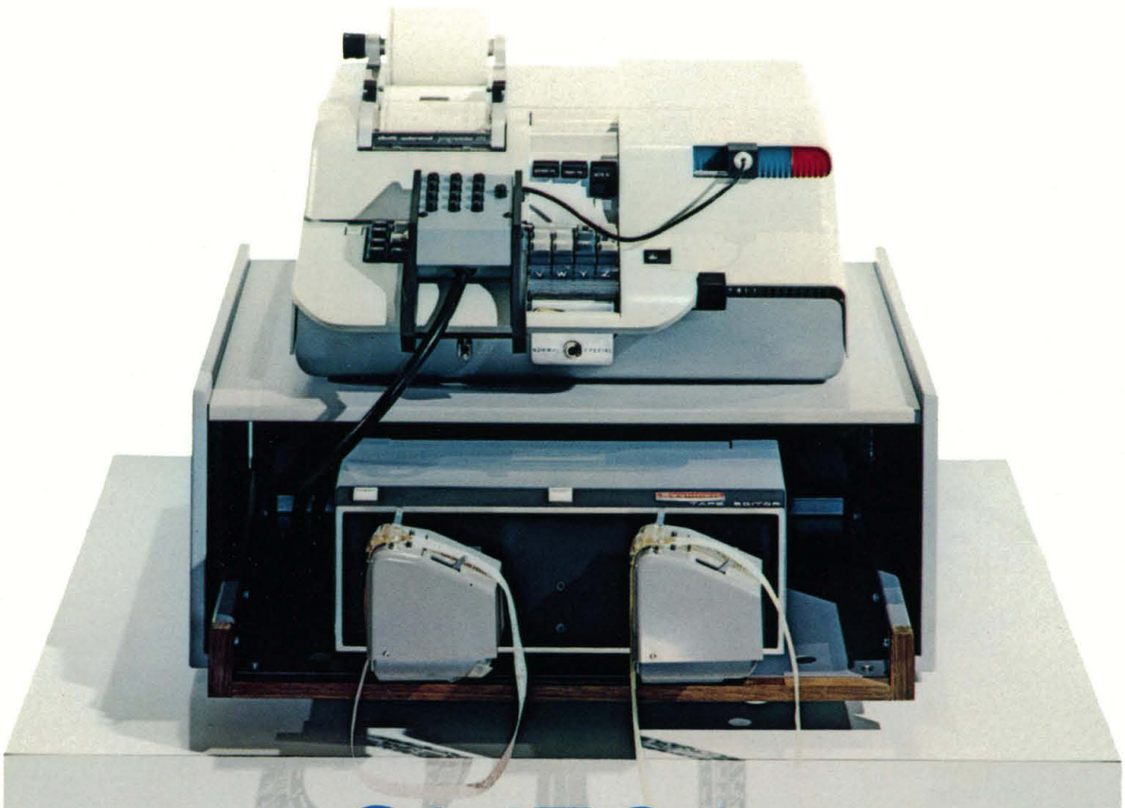

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MEETINGS

Glaciers

A conference on surging glaciers was held at the Center for Continuing Education of the Banff School of Fine Arts, Banff, Alberta, Canada, 6–8 June 1968. Particular emphasis was placed on the possible geologic effects of surging glaciers, both now and in the past. Some attention was also given to the hydrology of such glaciers. Because the Steele Glacier, in the southwest Yukon, is one of the better known surging glaciers, it was the topic of several papers.

It was apparent from the beginning of the conference that the term "surging glacier" was used by the participants in different ways. At least three field criteria were suggested as indicative of a surge: (i) an unusually high velocity of the glacier; (ii) a depression or collapse of the ice surface in the accumulation zone of the glacier; and (iii) the presence of intensely crevassed or fractured surface of the glacier. A surprisingly large number of glaciers seem to have surged, but the distribution of this type of glacier is not well known, mainly because of the difficulties of access to the areas of their occurrence. Almost all information on surging glaciers is from areas of mountain glaciers. One paper and some informal discussion brought out the fact that there is no synchroneity of surges of mountain glaciers.

The possibility of glacial surges at the margins of continental glaciers is of great importance to Pleistocene geologists, because the interpretations of glacial history are now based on the assumption that ice fronts were stable for relatively long time spans in areas of prominent recessional moraines, and that synchroneity existed in advances along the margins of different ice lobes. The means of recognition in the geologic column of the deposits from a surging glacier are little known. N. W. Rutter (Geological Survey of Canada) presented the results of a comparative study of the deposits of mountain glaciers. One glacier had surged in the past, and the other lacked any evidence for a surge. There was no clear-cut orientation in the till fabric of the moraine of the surged glacier.

The conference concluded with a panel discussion on the needs for future study of surging glaciers. The panel consisted of Walter A. Wood, Aleksis Dreimanis, A. E. Harrison, and L. A. Bayrock. From the discussion, a number

of conclusions could be drawn: (i) a need for standardization of the terminology of surging glaciers; (ii) a need for further study of the physics of the ice in such glaciers, preferably starting on glaciers on which a surge is anticipated; (iii) a need for more data on the weather in the area of such glaciers; and (iv) a need for a careful examination of the stratigraphic record, with the purpose of recognizing possible large-scale glacier surges during the Pleistocene.

The conference was sponsored jointly by the National Research Council of Canada and the University of Alberta.

A. J. BROSCOE
Department of Geology, University of Alberta, Edmonton, Canada

Calendar of Events

National Meetings

November

8–11. American **Physical** Soc., Plasma Physics Div., Austin, Tex. (W. E. Drummond, Physics Bldg. 330, Univ. of Texas, Austin 78712)

10–15. American Soc. of **Agronomy**, New Orleans, La. (M. Stelly, c/o The Society, 677 S. Segoe Rd., Madison, Wis. 53711)

10–15. **Crop Science** Soc. of America, New Orleans, La. (Secretary, The Society, 677 S. Segoe Rd., Madison, Wis. 53711)

10–15. American Assoc. for **Inhalation Therapy**, Houston, Tex. (M. T. Bowers, 4075 Main St., Riverside, Calif. 92501)

11–13. Soc. of **Engineering Science**, 6th technical mtg., Princeton, N.J. (A. C. Eringen, Dept. of Aerospace and Mechanical Sciences, Engineering Quadrangle, Princeton Univ., Princeton 08540)

11–13. **Genetics** Soc. of America, Boston, Mass. (B. Wallace, Dept. of Genetics, Cornell Univ., Ithaca, N.Y.)

11–14. American **Nuclear** Soc., Washington, D.C. (Executive Secretary, 244 E. Ogden Ave., Hinsdale, Ill. 60521)

11–15. Society of the **Plastics Industry**, Inc., Chicago, Ill. (The Society, 250 Park Ave., New York 10017)

11–15. American College of **Preventive Medicine**, Detroit, Mich. (E. A. Piszcek, 6410 N. Leona Ave., Chicago, Ill. 60646)

11–15. American **Public Health** Assoc., 96th, Detroit, Mich. (Executive Director, 1790 Broadway, New York, N.Y.)

13–15. Eastern **Analytical** Symp., New York, N.Y. (L. M. Brancone, Lederle Labs., Pearl River, N.Y. 10965)

13–16. National Easter Seal Soc. for **Crippled Children and Adults**, Boston, Mass. (Natl. Easter Seal Soc., 2023 W. Ogden Ave., Chicago, Ill. 60612)

14–16. Southern **Thoracic Surgical** Assoc., San Juan, Puerto Rico. (H. H. Seiler, 517 Bayshore Blvd., Tampa, Fla. 33606)

15–16. American **Psychiatric** Assoc., Chicago, Ill. (L. Rudy, Illinois Psychiatric

Inst., 1601 W. Taylor St., Chicago 60612)

17–20. Academy of **Pharmaceutical** Sciences, 5th, Washington, D.C. (S. W. Goldstein, 2215 Constitution Ave., NW, Washington, D.C. 20037)

18–20. Institute of **Electrical and Electronics Engineers**, 7th, Cocoa Beach, Fla. (L. E. Williams Aerospace Corp., P.O. Box 4007, Patrick Air Force Base, Fla. 32925)

18–20. American **Petroleum** Inst., Chicago, Ill. (Secretary, Program Commission, 1271 Avenue of the Americas, New York 10020)

18–21. Symposium on **Basic Mechanisms of the Epilepsies**, Colorado Springs, Colo. (J. K. Penry, Section on Epilepsy, Room 8A-03, Bldg. 31, National Inst. of Neurological Diseases and Blindness, National Institutes of Health, Bethesda, Md. 20014)

18–21. Conference on **Engineering in Medicine and Biology**, Houston, Tex. (W. T. Maloney, Suite 620, 6 Beacon St., Boston, Mass. 02108)

18–21. Conference on **Magnetism and Magnetic Materials**, 14th, New York, N.Y. (D. T. Teaney, IBM Thomas J. Watson Research Center, Box 218, Yorktown Heights, N.Y. 10598)

18–22. American **Water Resources** Conf., 4th, New York, N.Y. (P. Cohen, U.S. Geological Survey, 1505 Kellum Place, Mineola, N.Y. 11501)

19. **Air Pollution Control**, Columbia, Mo. (Extension Div., Whitten Hall, Univ. of Missouri, Columbia)

19–20. Council on **Arteriosclerosis** of the American Heart Assoc., Bal Harbour, Fla. (Dept. of Councils and International Program, American Heart Assoc. Natl. Office, 44 E. 23 St., New York 10010)

19–20. **Systems** Symp., 4th, Cleveland, Ohio. (P. Schneider, Systems Research Center, Case Western Reserve Univ., Cleveland)

19–21. **Photovoltaic Specialists** Conf., 7th, Pasadena, Calif. (R. E. Fischell, Applied Physics Lab., Johns Hopkins Univ., 8621 Georgia Ave., Silver Spring, Md. 20910)

19–22. **Acoustical** Soc. of America, Cleveland, Ohio. (The Society, 133 E. 45 St., New York 10017)

20–22. **Microelectronic Packaging and Interconnection** Conf., Palo Alto, Calif. (D. H. O'Neill, Soc. of Automotive Engineers, 485 Lexington Ave., New York 10017)

20–22. National Soc. for the **Prevention of Blindness**, Inc., New York, N.Y. (J. W. Ferree, 79 Madison Ave., New York 10016)

20–24. Society for **Clinical and Experimental Hypnosis**, 20th, Chicago, Ill. (The Society, 353 W. 57 St., New York 10019)

21–22. **Chemical Kinetics** Symp., Chapel Hill, N.C. (L. Pedersen, Dept. of Chemistry, Univ. of North Carolina, Chapel Hill 27514)

21–24. American **Anthropological** Assoc., Seattle, Wash. (Executive Secretary, The Association, 1530 P St., NW, Washington, D.C. 20005)

25–27. International Symp. on the **Metabolic Function of Vitamin A**, Cambridge, Mass. (G. Wolf, Room 56-235, Massachusetts Inst. of Technology, Cambridge 02139)