

# SCIENCE

8 November 1974

Vol. 186, No. 4163

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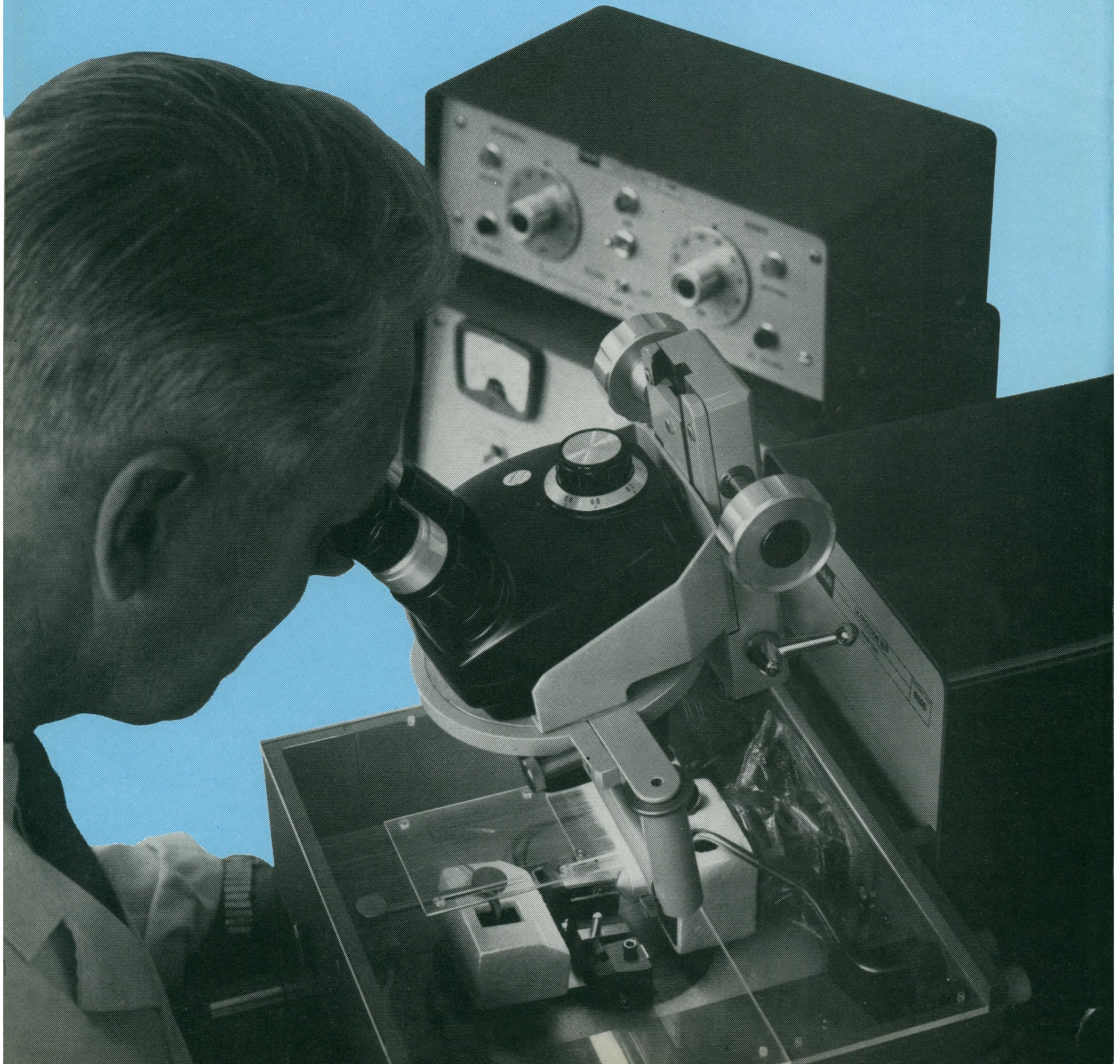
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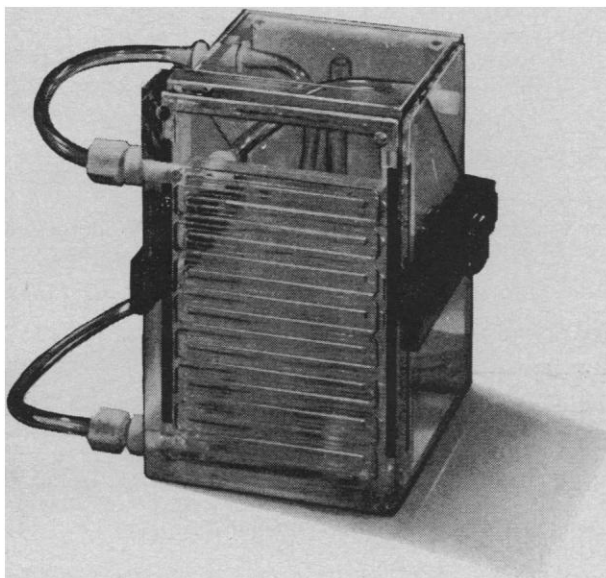
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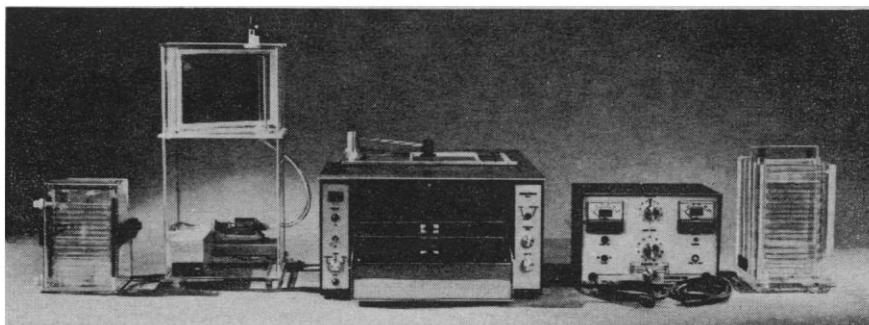
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SCIENCE

LETTERS	Approach to Societal Problems: <i>L. V. Azároff; I. D. J. Bross; A. Etzioni</i> ; Pseudoscience: <i>J. E. Holmes; S. Neddermeyer; W. A. Tiller; S. F. Osler</i> ; <i>J. M. Burgers</i> ; Of Skunks and Tomato Juice: <i>R. D. Coye</i> . . . . .	478
EDITORIAL	The Wages of Inflation: <i>R. G. Kennedy</i> . . . . .	485
ARTICLES	Landscape Development, Forest Fires, and Wilderness Management: <i>H. E. Wright, Jr.</i> . . . . .	487
	From Mars with Love: <i>R. S. Young</i> and <i>D. L. DeVincenzi</i> . . . . .	495
	Are Scientists Obsolete?: <i>H. Brooks</i> . . . . .	501
NEWS AND COMMENT	Marine Archeology: Troubled Search for Spanish Treasure Ship . . . . .	509
	Energy: Cannibalism in the Bureaucracy . . . . .	511
	TIAA-CREF: for Richer, for Poorer, Married to the Market . . . . .	513
	Changes in Energy High Command . . . . .	514
RESEARCH NEWS	The 1974 Nobel Prize for Physiology or Medicine: <i>K. R. Porter; A. B. Novikoff</i> . . . .	516
	Laser Fusion Secrecy Lifted: Microballoons Are the Trick . . . . .	519
	Analysis of Algorithms: Coping with Hard Problems . . . . .	520
ANNUAL MEETING	Science and Human Environment: <i>A. Herschman</i> ; Science and the Metropolis: <i>A. Herschman</i> ; Interscience International . . . . .	522
BOOK REVIEWS	The Genetic Basis of Evolutionary Change, reviewed by <i>B. Clarke</i> ; The Economy of Nature and the Evolution of Sex, <i>R. L. Trivers</i> ; Biomechanics, <i>M. Cartmill</i> ; Insect Hormones and Bioanalogues, <i>A. M. Ajami</i> ; Books Received . . . . .	524

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AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

REPORTS	Manganese and Biotic Debris Associations in Some Deep-Sea Sediments: <i>J. Greenslate</i> .....	529
	Baring High-Albedo Soils by Overgrazing: A Hypothesized Desertification Mechanism: <i>J. Otterman</i> .....	531
	Antarctic Glacial History from Analyses of Ice-Rafted Deposits in Marine Sediments: New Model and Initial Tests: <i>N. D. Watkins</i> et al. ....	533
	Anomeric Specificity of Glucose-Stimulated Insulin Release: Evidence for a Glucoreceptor: <i>G. M. Grodsky</i> et al. ....	536
	Pulsatile Growth Hormone Secretion: Suppression by Hypothalamic Ventromedial Lesions and by Long-Acting Somatostatin: <i>J. B. Martin, L. P. Renaud,</i> <i>P. Brazeau, Jr.</i> .....	538
	Sex-Dependent Behavioral Effects of Cerebral Cortical Lesions in the Developing Rhesus Monkey: <i>P. S. Goldman</i> et al. ....	540
	Community Structure of Coral Reefs on Opposite Sides of the Isthmus of Panama: <i>J. W. Porter</i> .....	543
	Studies of Squeezing: Handedness, Responding Hand, Response Force, and Asymmetry of Readiness Potential: <i>M. Kutas</i> and <i>E. Donchin</i> .....	545
	Circadian Oscillations in Rodents: A Systematic Increase of Their Frequency with Age: <i>C. S. Pittendrigh</i> and <i>S. Daan</i> .....	548
PRODUCTS AND MATERIALS	Digital Photometer; Large Capacity Blood Freezer; Infrared Detector; Structure Display System; Water Quality Analyzer; Data Acquisition System; Pens; Flocculation Testing; Vane Pumps; Cell Culture System; Chemical Data Processing; Rotary Microtome; Literature .....	557

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COVER

Plating *Montastrea annularis* (center) on Caribbean coral reefs off the Atlantic coast of Panama. In contrast to reefs on the Pacific coast of Panama, areas of dense coral growth in the Caribbean are also areas of high coral diversity. See page 543. [J. W. Porter, University of Michigan, Ann Arbor]

The American Association for the Advancement of Science was founded in 1848 and incorporated in 1874. Its objects are to further the work of scientists, to facilitate cooperation among them, to improve the effectiveness of science in the promotion of human welfare, and to increase public understanding and appreciation of the importance and promise of the methods of science in human progress.



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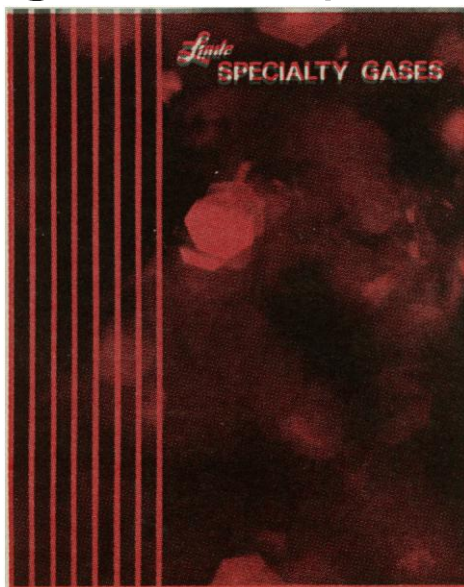
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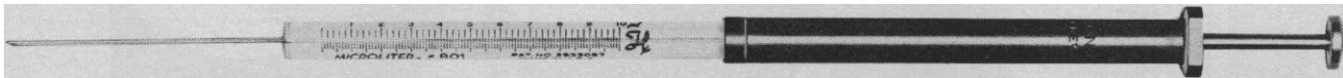
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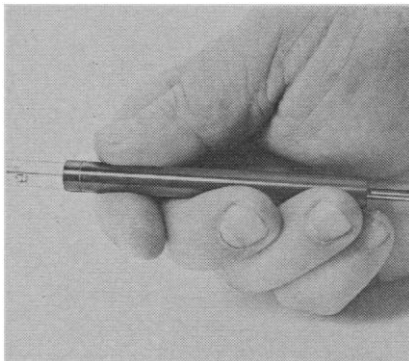
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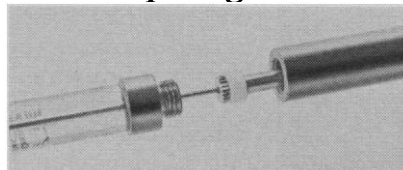


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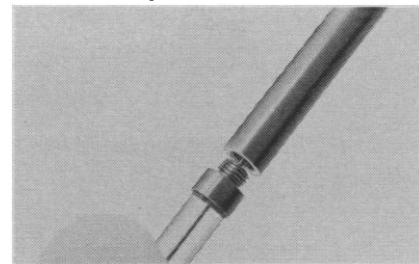
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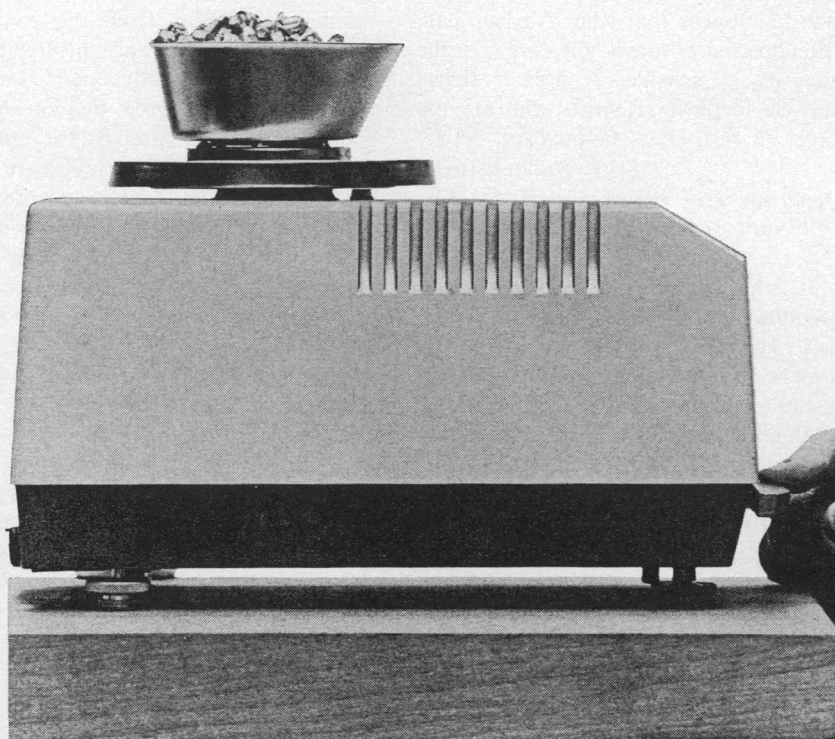
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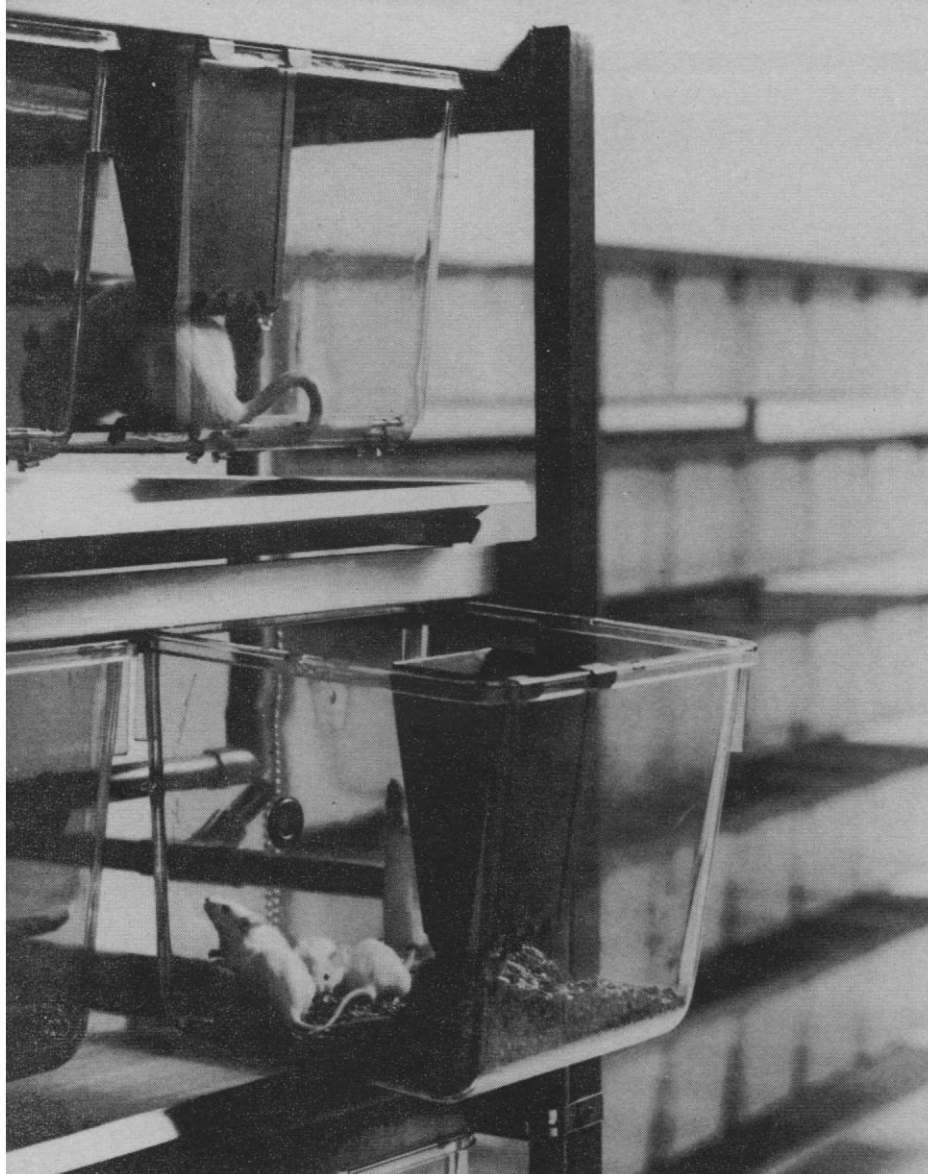
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quirk of human nature—a predisposition to believe in the supernatural." What is a quirk? Certainly not anything deserving of serious consideration. Abelson tells us in effect to ignore certain deep-seated aspects of human nature. This, I submit, is pseudoscience. Nature is orderly, and scientists want to understand human nature and its deep-seated motives, whether these relate to mysticism or to any other areas. In an orderly universe there are no quirks.

SONIA F. OSLER

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I heartily agree with Abelson's concern about the "pseudoscience" that seems to be cropping up in many places. Nevertheless, I believe that we must ask ourselves whether there is perhaps something missing in the current presentations of science, in particular in the domain of biology, which can lead to misunderstanding.

Abelson points out that research in plant biology is one of the great scientific frontiers today. This cannot be denied, but it must be kept in mind that the outcome of this research is presented from the point of view that explanations must be sought exclusively in the system of description developed for present-day physics and chemistry. Thus every explanation looks for causal relationship with past events, insofar as these can be described in physical terms. The relation can be deterministic or statistical, but there is no possibility of finding a link with judgments concerning that which may be termed to be "good" or "bad" for the future. Important and valuable as the hypothesis of causal relationship is in the domain of the physics of nonliving systems, there is no proof that it can fully explain the nature of living organisms.

I am not looking for anything "supernatural"—a term and a complex of unclear notions which I abhor. However, daily observation shows that, within ourselves (and with great probability also in many animals), there is active, along with causal relationship, an effect of an *anticipation* of a near future, associated with a feeling that we can choose between options which seem to be open to us (1). This feeling is a part of nature—not something outside of it. The problem is how much attention must be given to this concept. Rather than denying its importance and its effects, or being content with a vague suggestion that future developments in



quantum theory will clarify it, I propose that we hold the concept of anticipation before us as a descriptive term which has a place in biology. At present, physics has nothing in its descriptive system to which the notion of a value judgment can be linked, and it must leave completely unanswered the question of whether value judgments have effects upon our actions. I believe that a genuine extension of our scientific world picture is possible, one which would give us hope of finding a bridge between science and values. Perhaps this could be helpful to the young people who now are looking elsewhere for a connection.

J. M. BURGERS

*Institute for Fluid Dynamics  
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#### References

1. J. M. Burgers, *Proc. R. Neth. Acad. Sci. Ser. B* 75, 375 (1972).

### Of Skunks and Tomato Juice

The report by Thomas H. Maugh II on Anderson and Bernstein's work on the chemistry of skunk scent (*Speaking of Science*, 27 Sept., p. 1146) reminded me of the last day of a week-long hunt in North Dakota several years ago. My German shorthaired pointer, Belle, tangled with a skunk in a marsh, as she had done many times before. She was heavily doused, which resulted in severe lacrimation, profuse salivation, and emesis. Seconds later, however, she was on a rock-solid point, and we shot our last pheasant of the trip with the help of the smelliest dog in seven counties. We then took her to the nearest village, where we scrubbed her down with a No. 10 canful of tomato juice. We were watched with amusement by the local residents who were on their way to church that beautiful Sunday morning.

I suggest that Anderson and Bernstein investigate the following questions: Why don't hunting dogs learn that skunks stink? How can they smell pheasants after being doused? Why does tomato juice work so well? Could the tomato molecules fit between the double bonds?

ROBERT D. COYE

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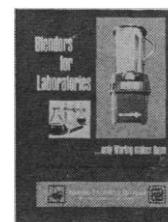
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## The Wages of Inflation

A large chunk of the savings of many Americans has been taxed away while they weren't looking. Taxing savings through inflation has, in effect, become a part of our public policy. The consequences of this kind of taxation are severe. Everybody knows that individual savings have lost value, but not everybody has been watching while this country has suffered a serious erosion of the vigor of its independent institutions.

During the 1960's the Johnson Administration chose to try to fund a war in Southeast Asia, along with huge domestic programs, without taxing earnings or income enough to pay for them. The government printed money to pay its debt; the economy continued to overheat. Inflation became a "tax" levied upon those who saved.

The next Administration administered more of the same mode of surreptitious taxation. Then came dollar devaluations and, in their wake, American buyers paid higher prices for foreign oil and goods.

While everybody paid part of the bill for continuing deficits, we are just beginning to recognize how much was paid by the endowed institutions of the country. A small college, for example, which had its \$20 million endowment in long-term corporate bonds in 1960 had lost \$10 million in market value by 1970. The trustees of such a college, watching their assets decline and hearing tales of triumph in the great speculative stock market of the late 1960's, might well have moved half or more of the remaining endowment into stocks. If they did so in 1968, and fared no better than other investors, they would have lost half the money they put into stocks. Meanwhile, their operating costs have increased at the rate of about 7 percent a year.

It is not right to remain silent when so much that has been painfully built, so much that is precious to our tradition and our present values, is being eroded by a continuing, unadmitted capital levy. Other independent institutions are being taxed away, slowly it is true, but surely. Does it matter? I think it does.

The strongest argument for independent institutions is that they provide sanctuary, support, and stimulus to independent persons. Some solecists are alone, some saints chose to stand alone, but most men need a community to form a horizontal dimension in their lives. We require the sustenance of ideas shared with contemporaries.

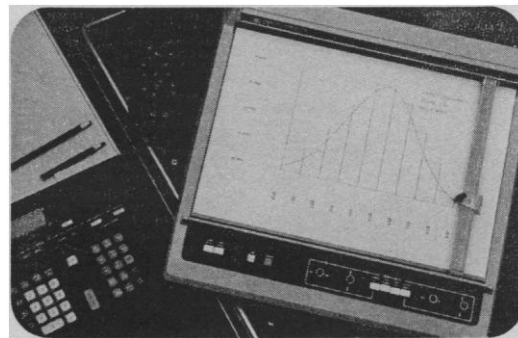
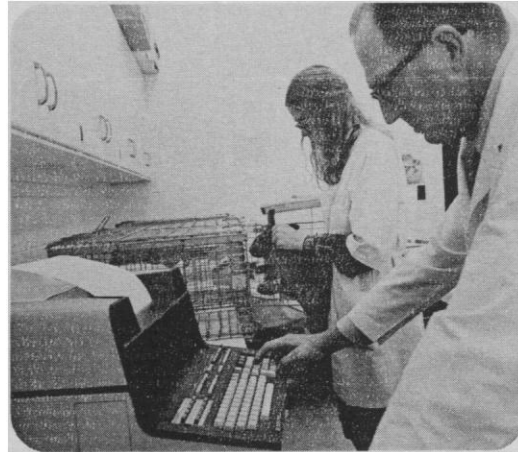
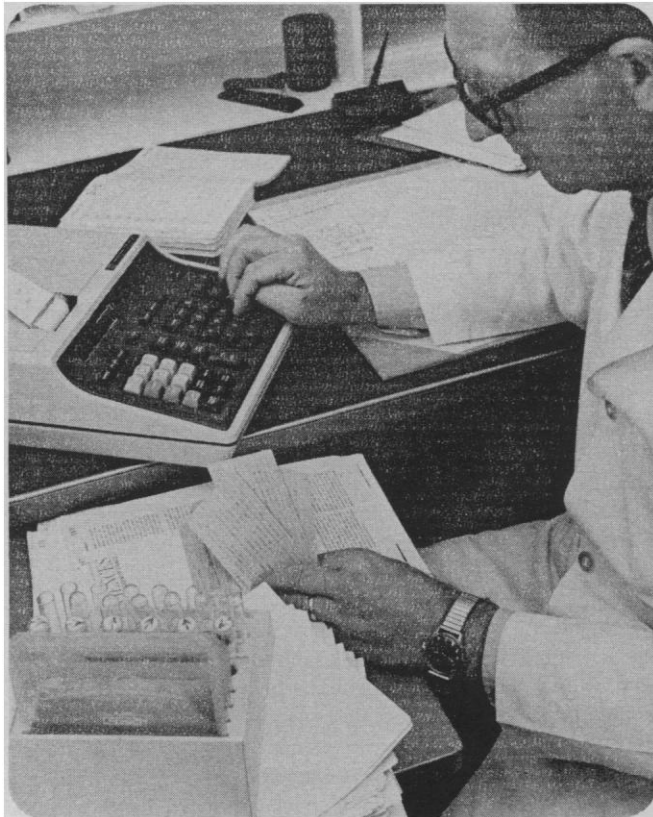
Endowed institutions help provide community. But even in the company of the like-minded, there is a sort of temporal loneliness; although we may have the agreement of contemporaries, most of us require some solace of tradition. Each of us can serve better our special truth if we find a few others enough like us to be relevant, and better still, if we can locate ourselves in time through discovering that we stand in some continuity. Churches, colleges, and libraries provide continuity, and their savings—endowments—provide for continuity.

A community of shared values within diversity and continuity of values over time sustain vigorous individuals and a heterogeneous society. Without institutions to provide community and continuity, few men could stand alone against bullying despots or bullying crowds.

These sanctuaries do not protect themselves. They are very easily lost. Liberty, expressing itself through diverse institutions, dies unless it is in the interest of powerful groups to maintain it. In the 18th century its death was feared most from despotism, a blunt instrument. In the 20th century, in this country, inflation is a more subtle, but deadly, peril. Inflation alters the balance between the government and independent institutions. It transfers money from the latter to the former, and with money goes the power to make a fact out of an opinion. It is a perilous transfer, and it is being made every day by taxation through inflation.—

ROGER G. KENNEDY, *Ford Foundation, 320 East 43 Street, New York 10017*

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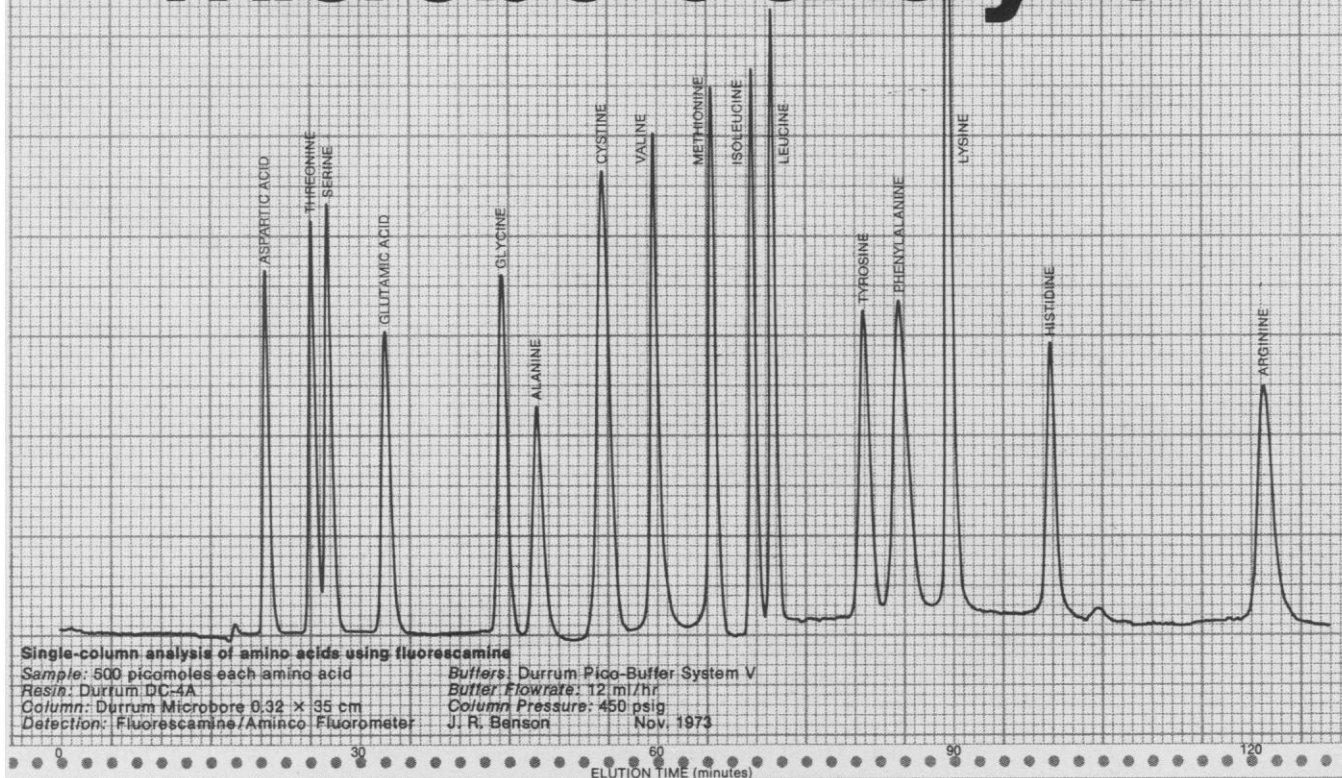
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1. S. Udenfriend, S. Stein, P. Bohlen, W. Dairman, W. Leimgruber, M. Weigle, *Science* 178, 871 (1972).
2. S. Stein, P. Bohlen, J. Stone, W. Dairman, S. Udenfriend, *Arch. Biochem. and Biophys.* 155, 203 (1973).
3. S. Udenfriend, S. Stein, P. Bohlen, W. Dairman, *Third American Peptide Symposium, Boston, June 1972*, J. Meienhofer, Ed., (Ann Arbor—Humphrey Science, Ann Arbor, Michigan).
4. J. Benson, P. E. Hare (in press).
5. P. E. Hare, *Carnegie Institution in Washington Yearbook* 1972 (1973).

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## BOOKS RECEIVED

(Continued from page 528)

Gordon R. Willey and Jeremy A. Sabloff. Freeman, San Francisco, 1974. 252 pp., illus. Cloth, \$9.95; paper, \$4.95.

**Indefinite Inner Product Spaces.** János Bognár. Springer-Verlag, New York, 1974. x, 226 pp. \$19.70. *Ergebnisse der Mathematik und ihrer Grenzgebiete, Band 78.*

**Information Technology.** The Human Use of Computers. Harry Katzan, Jr. Petrocelli Books, New York, 1974. xii, 350 pp., illus. \$11.95.

**Innovative Treatment Methods in Psychopathology.** Karen S. Calhoun, Henry E. Adams, and Kevin M. Mitchell, Eds. Wiley-Interscience, New York, 1974. xiv, 430 pp., illus. \$16.95. Wiley Series on Personality Processes.

**Insects.** Instructions for Collectors. No. 4a. British Museum of Natural History, London, ed. 5, 1974. vi, 170 pp., illus. Paper, £1.50.

**Internal Rotation in Molecules.** W. J. Orville-Thomas, Ed. Wiley-Interscience, New York, 1974. xviii, 606 pp., illus. \$39.95. Wiley Monographs in Chemical Physics.

**International Symposium on Smallpox Vaccine.** Proceedings of a symposium, Bilthoven, The Netherlands, Oct. 1972. R. H. Regamey and H. Cohen, Eds. Karger, Basel, 1974. xii, 366 pp., illus. \$27.50. *Symposia Series in Immunobiological Standardization, vol. 19.*

**An Introduction to Behavior Theory and Its Applications.** Robert L. Karen. Harper and Row, New York, 1974. x, 470 pp., illus. \$10.95. Harper's Experimental Psychology Series.

**Introduction to Organic Electrochemistry.** M. R. Rifi and Frank H. Covitz. Dekker, New York, 1974. xii, 418 pp., illus. \$26.50. *Techniques and Applications in Organic Synthesis.*

**Introduction to the Quantum Theory.** David Park. McGraw-Hill, New York, ed. 2, 1974. xvi, 670 pp., illus. \$16.95. *International Series in Pure and Applied Physics.*

**Laboratory Studies in Integrated Zoology.** Frances M. Hickman and Cleveland P. Hickman, Sr. Mosby, St. Louis, ed. 4, 1974. xii, 464 pp., illus. Paper, \$6.50.

**The Limits of Law.** Papers from a meeting, Chicago, Dec. 1970. J. Roland Pennock and John W. Chapman, Eds. Lieber-Atherton, New York, 1974. xii, 276 pp. \$8.95. *Nomos, vol. 15.*

**Linear Programming in Industry.** Theory and Applications. Sven Danø. Springer-Verlag, New York, ed. 4, 1974. xii, 172 pp., illus. Paper, \$16.

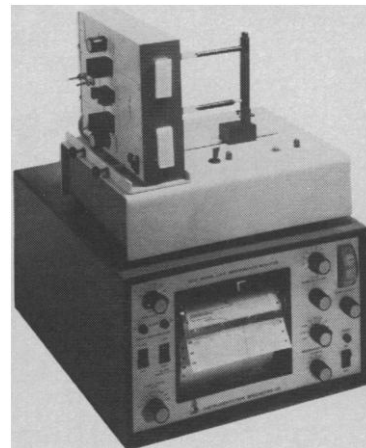
**Liquid-Phase Reaction Rate Constants.** E. T. Denisov. Translated from the Russian edition (Moscow, 1971) by R. K. Johnston. IFI/Plenum, New York, 1974. xxvi, 772 pp., illus. \$50.

**Magnetic Materials and Their Applications.** Carl Heck. Translated from the German edition by Stuart S. Hill. Crane, Russak, New York, 1974. xiv, 770 pp., illus. \$49.50.

**Management and Research Management.** A Book of Excerpts/Articles. J. Corboy Ryan, Ed. Krieger, Huntington, N.Y., 1974. viii, 404 pp. Paper, \$12.50.

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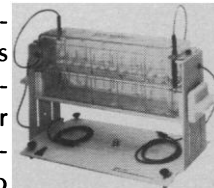
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copy in **Pesticide Chemistry**. Proceedings of a symposium, Dallas, Texas, Apr. 1973. Rizwanul Haque and Francis J. Biros, Eds. Plenum, New York, 1974. xii, 348 pp., illus. \$19.50. Environmental Science Research Series, vol. 4.

**Membrane Structure and Mechanisms of Biological Energy Transduction**. J. Avery, Ed. Plenum, New York, 1973. viii, 602 pp., illus. \$20. Reprinted from *Journal of Bioenergetics*, vols. 3 and 4 (1972).

**Metabolic Interconversion of Enzymes 1973**. Proceedings of a symposium, Seattle, Wash., June 1973. E. H. Fischer, E. G. Krebs, H. Neurath, and E. R. Stadtman, Eds. Springer-Verlag, New York, 1974. xvi, 400 pp., illus. \$29.90.

**Methods in Cell Biology**. Vol. 8. David M. Prescott, Ed. Academic Press, New York, 1974. xxiv, 464 pp., illus. \$35.

**Modern Developments in Thermodynamics**. An Interdisciplinary Collective Treatise. Benjamin Gal-Or, Ed. Halsted (Wiley), New York, and Israel Universities Press, Jerusalem, 1974. xxviii, 458 pp., illus. \$22.50.

**Natural Philosophy at Dartmouth**. From Surveyors' Chains to the Pressure of Light. Sanborn C. Brown and Leonard M. Rieser. Dartmouth College, Hanover, N.H., 1974 (distributor, University Press of New England, Hanover, N.H.). xii, 128 pp., illus. \$6.50.

**A Neurophysiological Model of Emotional and Intentional Behavior**. John L. Weil. Illustrated by Gayanne DeVry and Elaine Adele Gampp. Thomas, Springfield, Ill., 1974. xiv, 190 pp. \$15.75.

**North American Indians**. An Anthropological Perspective. William W. Newcomb, Jr. Goodyear Publishing Co., Pacific Palisades, Calif., 1974. x, 278 pp., illus. Cloth, \$7.95; paper, \$4.95. Good-year Regional Anthropology Series.

**Nuclear Magnetic Resonance**. F. A. Rushworth and D. P. Tunstall. Gordon and Breach, New York, 1974. xii, 254 pp., illus. \$24. Documents on Modern Physics.

**Nuclear Structure Study with Neutrons**. Proceedings of a conference, Budapest, Hungary, July 1972. J. Erö and J. Szücs, Eds. Akadémiai Kiadó, Budapest, and Plenum, New York, 1974. 514 pp., illus. \$27.50.

**Optimum Structural Design**. Theory and Applications. Papers from a symposium, Swansea, England, Jan. 1972. R. H. Gallagher and O. C. Zienkiewicz, Eds. Wiley, New York, 1973. xiv, 358 pp., illus. \$22.50.

**The Orchids**. Scientific Studies. Carl L. Withner, Ed. Wiley-Interscience, New York, 1974. xiv, 604 pp., illus. \$22.50.

**Organic Reaction Mechanisms 1972**. An Annual Survey Covering Literature dated December 1971 through November 1972. B. Capon and C. W. Rees, Eds. Interscience (Wiley), New York, 1973. x, 678 pp., illus. \$47.50.

**The Origin of Landscapes**. A Synthesis of Geomorphology. H. F. Garner. Drawings by Mary Craig Garner. Oxford University Press, New York, 1974. xxii, 734 pp., illus. \$18.50.

**Particle Size Analysis**. Zdeněk K. Jelínek. Translated from the Czech edition (Prague, 1970) by Ota Sofr. W. A. J. Bryce, Transl. Ed. Ellis Horwood, Chi-

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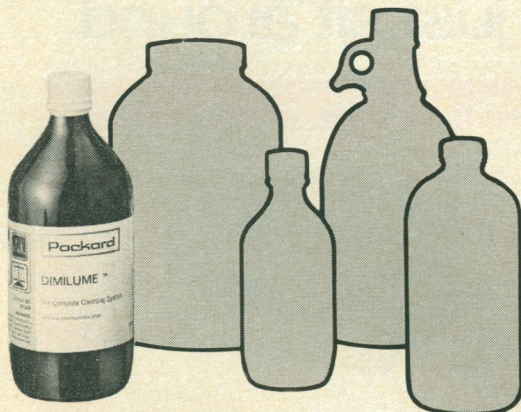
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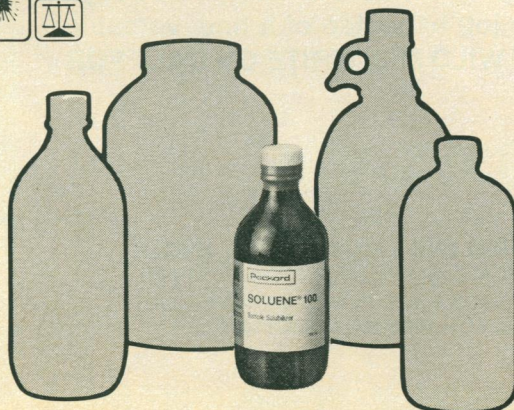
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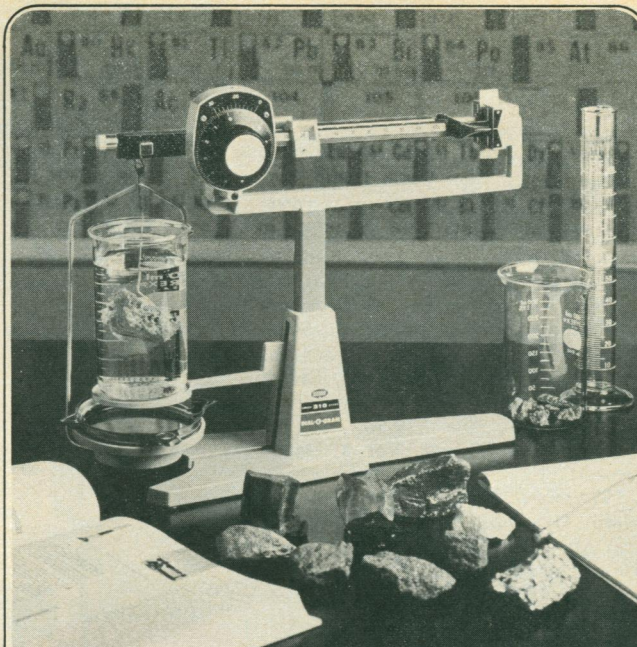
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