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18 November 1977, Volume 198, No. 4318

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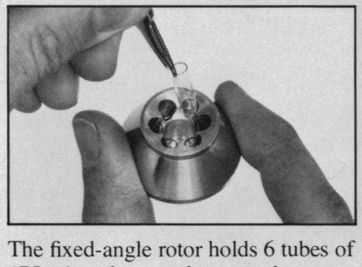

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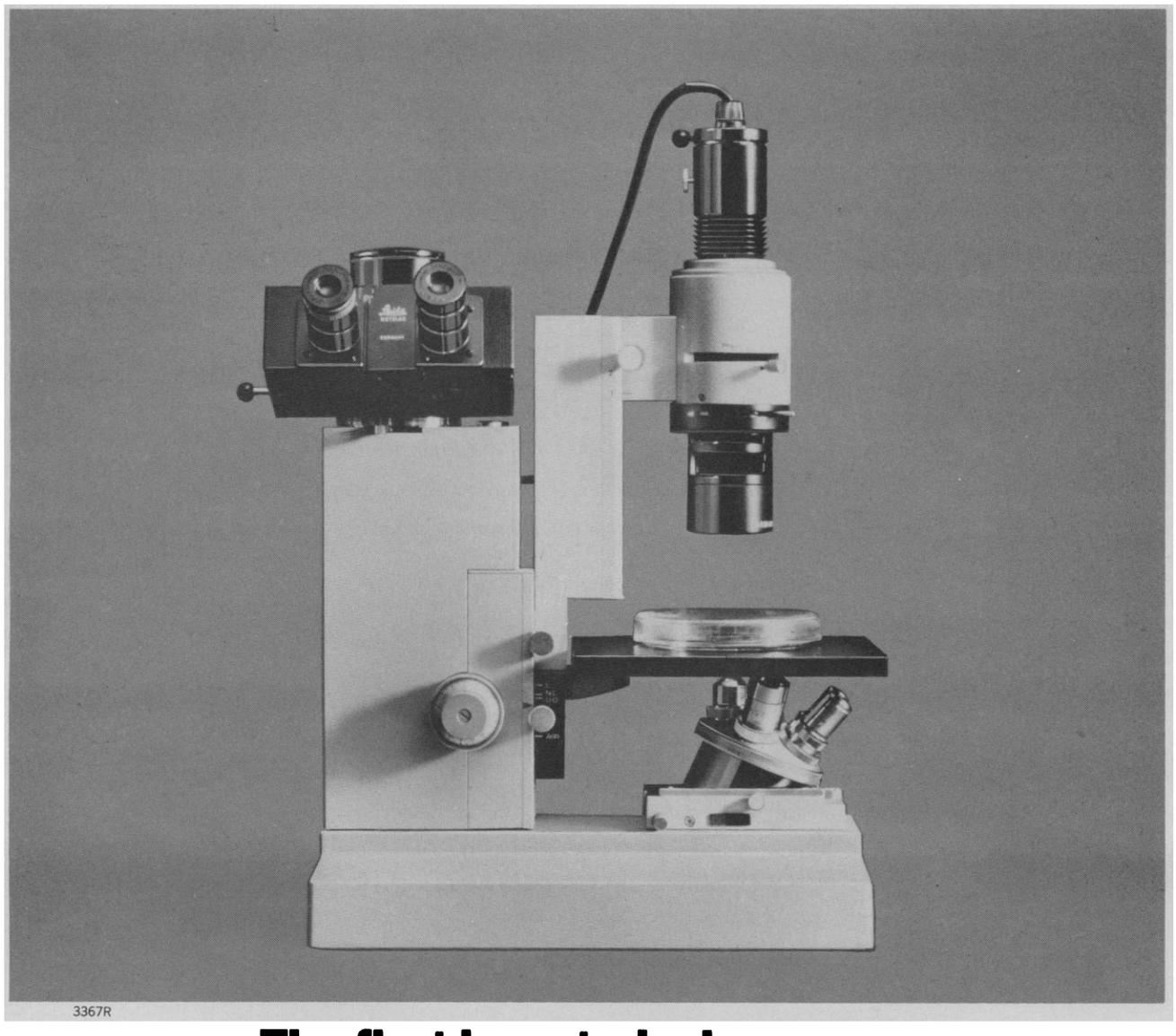

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18 November 1977

Volume 198, No. 4318

SCIENCE

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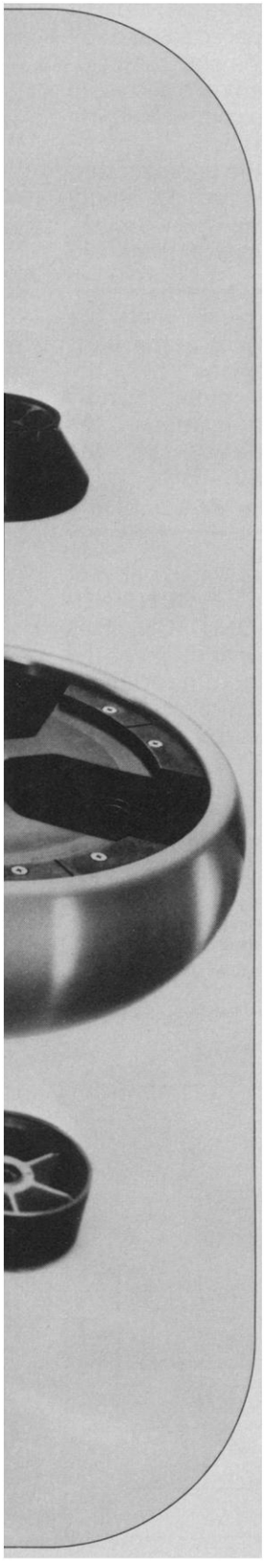
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

COVER

Subadult bottle-nosed porpoise nosing or "spy-hopping" out of the water in Golfo San José, southern Argentina. Photographs were used as a technique to recognize members of a porpoise group which consistently swam close by shore during a 21-month study. See page 755. [Bernd Würsig, State University of New York, Stony Brook]

an evolutionary line:



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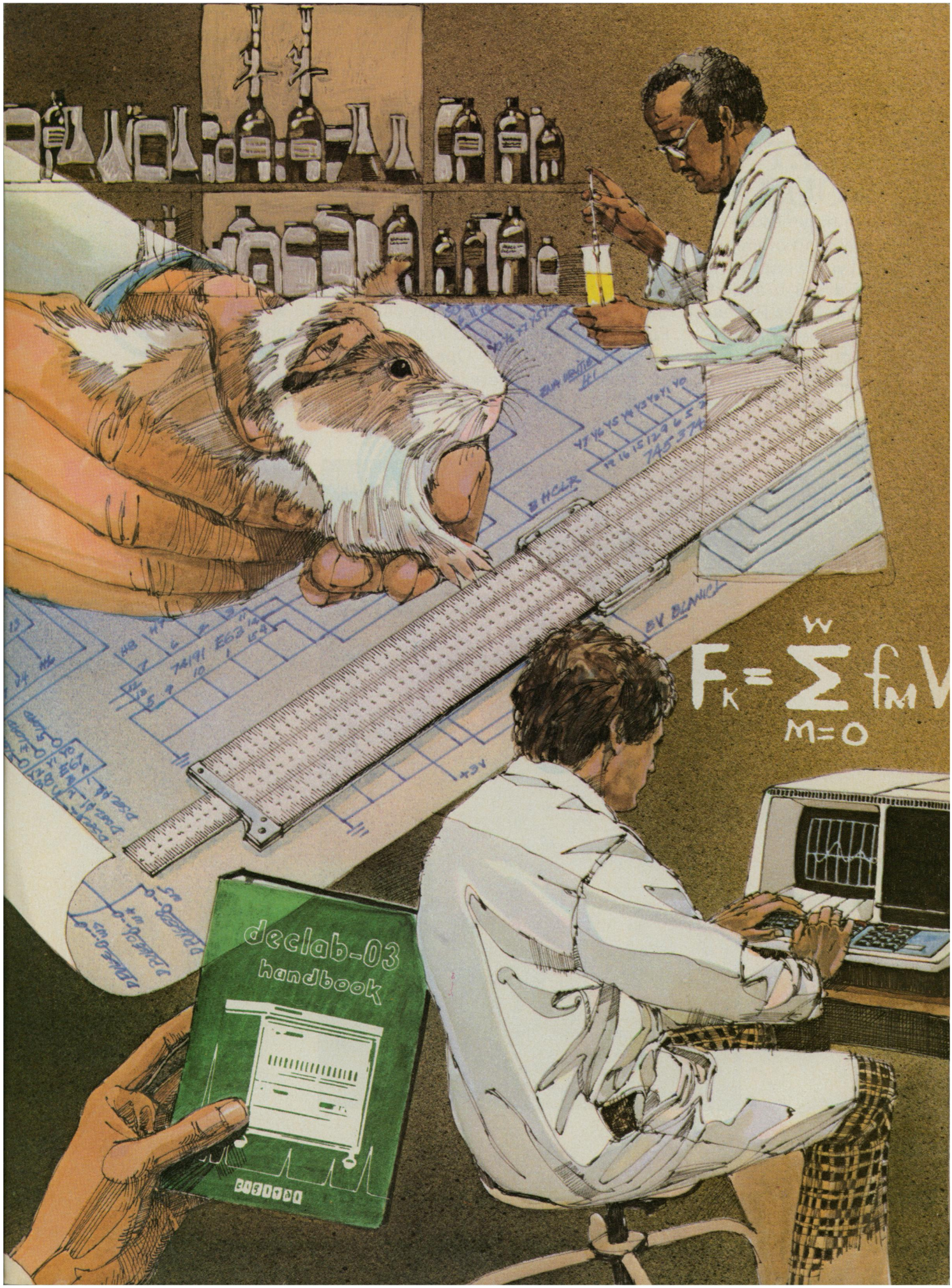
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LETTERS

Amaranth: Use as Food

Regarding the article in which cultivation and consumption of plants of the genus *Amaranthus* are discussed (Research News, 7 Oct., p. 40), we would like to point out that at least one of the pigweeds, *A. retroflexus*, is considered to be poisonous to swine (*1*, *2*), cattle (*1*, *3*–*5*), and probably to other species (*5*). The plant is apparently a nitrate accumulator (*4*, *6*), and its oxalate content may be as high as 30 percent (*7*). These toxicants, however, may not be primarily responsible for the plant's nephrotoxicity (*1*, *2*, *5*), as other effects include hyperkalemia and elevated levels of blood urea nitrogen and serum creatinine (*1*). The usual symptoms in swine are ataxia, posterior paralysis, collapse, and death. The most prominent abnormality found at autopsy is perirenal edema, and coagulation necrosis of both the proximal and distal convoluted tubules has been observed microscopically (*1*, *5*). More recently, β-D-galactose pyranosyl, a lectin with possible mitogenic activity, has been found in *A. caudatus* (Inca wheat) (*8*).

While the article does not specify *A. retroflexus*, one of the common pigweeds of North America and elsewhere, it is important to realize that at least one member of the genus is associated with livestock intoxication. Furthermore, it would seem wise to ascertain whether or not this and other species of *Amaranthus* are toxic to humans before encouraging people to cultivate them for use as food.

C. M. STOWE
T. P. O'LEARY
College of Veterinary Medicine, University of Minnesota, St. Paul 55108

THOR KOMMEDAHL
Department of Plant Pathology, University of Minnesota, St. Paul

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Style and Science

Can form be separated from content, even in the writings of scientists [see R. Grantham (Letters, 14 Oct., p. 124)]?

The first qualification of a writer, is a perfect knowledge of the subject which he undertakes to treat; since we cannot teach what we do not know, nor can properly undertake to instruct others while we are ourselves in want of instruction. The next requisite is, that he be master of the language in which he delivers his sentiments; if he treats of science and demonstration, that he has attained a style clear, pure, nervous, and expressive; if his topics be probable and persuasory, that he be able to recommend them by the superaddition of elegance and imagery, to display the colours of varied diction, and pour forth the music of modulated periods.

If it be again inquired, upon what principles any man shall conclude that he wants these powers, it may be readily answered, that no end is attained but by the proper means; he only can rationally presume that he understands a subject, who has read and compared the writers that have hitherto discussed it, familarized their arguments to himself by long meditation, consulted the foundations of different systems, and separated truth from error by a rigorous examination.

In like manner, he only has a right to suppose that he can express his thoughts, whatever they are, with perspicuity or elegance, who has carefully perused the best authors, accurately noted their diversities of style, diligently selected the best modes of diction, and familiarized them by long habits of attentive practice.

Apart from the first sentence, the above is not mine. It is from the pen of Samuel Johnson and appeared in the *Adventurer*, No. 115, on Tuesday, 11 December 1753.

RYAN HUXTABLE
Department of Pharmacology, College of Medicine, University of Arizona, Tucson 85724

Research, Regulation, and the Public Interest

In fairness to those of us who seek to protect the public from the hazards of allowing toxic substances to endanger our air and water, I believe the remarks of Columbia University president William J. McGill (News and Comment, 21 October, p. 275) deserve a reply.

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His quoted comments suggest that scientific activity should be singled out, in contrast to all other enterprises, to be immune from all regulation in the public interest. But unregulated recombinant DNA activity, for instance, whether practiced in a university or an industrial laboratory, could present hazards from which the public deserves protection.

The claim that we who seek reasonable controls to protect laboratory workers, their families, and their neighbors from the spread of disease are seeking to somehow inhibit scientific inquiry does not withstand scrutiny. At present there are no legal safeguards regarding laboratory safety and containment of microorganisms in recombinant DNA experiments. Legislation to safeguard the public, far from "interven[ing] in the administration of research," is no different from laws regulating other professions and activities—medicine, aviation, building construction—to ensure that standards of safety exist.

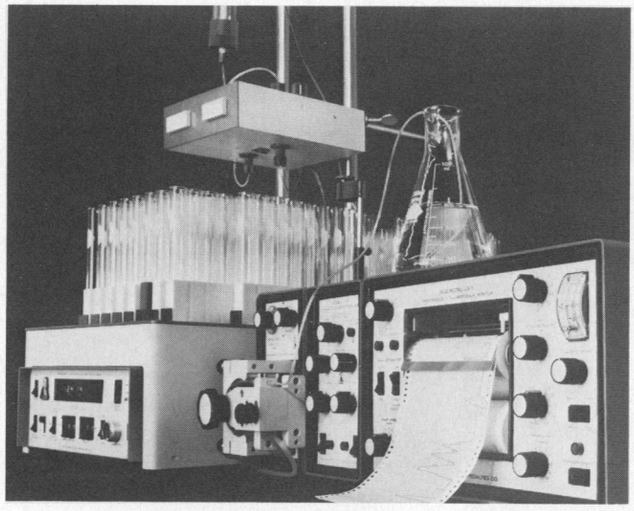
McGill's statement that "the adversary method for arriving at truth" is "not appropriate for arriving at sound public policy on scientific matters" implies that such decisions should be left solely to the "experts." Where the importance of these issues transcends the expertise of any one discipline and where the public must run the risks implicit in those decisions, the public must have a say in its own protection. It was public concern expressed to government which led to regulation of DDT, fluorocarbons, toxic substances, and other hazards. Had we relied on self-regulation alone we would still be exposed to these dangers.

As I see it, the needs of environmental protection and of scientific research are not antithetical. Both should be partners in seeking a healthier and better life for all of us.

PHILIP WEINBERG
Environmental Protection Bureau,
Office of the Attorney General,
State of New York,
Two World Trade Center,
New York 10047

Nuclear Power Initiatives: the IEEE Position

In his article "IEEE: A policy challenge for big engineering society" (News and Comment, 19 Aug., p. 741), John Walsh discusses criticism of the Institute of Electrical and Electronics Engineers' nontechnical activities. In describing reaction to the IEEE's opposi-



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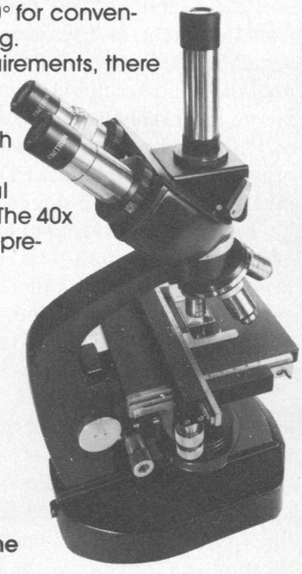

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tion to the California iniatiative on nuclear power, he says that critics "protested vigorously" and that the institute's position drew "intense fire." The IEEE Energy Committee has instructed me to offer the following relevant facts.

We were active not only in California in 1975 and 1976 but also in six other states where antinuclear initiatives were offered later in 1976. Letters were sent to 44,036 IEEE members in the seven states stating the IEEE's position and offering a packet of information, covering both sides of the argument, to assist members in their voting. The "intense fire" of disapproval consisted of about 45 negative replies. Conversely, 5153 positive responses were received, requesting the information, with 550 of these contributing substantially to the cost of the printing and mailing. Thus, current IEEE president Robert M. Saunders' estimate that 90 percent of the membership approved of the position would appear to be conservative.

Walsh mentions "an internal debate over official [IEEE] policy-making . . . aired in the IEEE's monthly journal, *Spectrum*," which, he says, was precipitated by criticism of the institute's position on the California initiative. An article in the March 1977 *Spectrum* was incorrect on this matter. A rebuttal by R. L. Clark, then secretary of the Energy Committee, appeared in the June 1977 *Spectrum* and fairly states the facts concerning the issue.

We also take issue with the implication by critics that the controversial issue of nuclear energy has little to do with engineers' interests. If a subject as technical as nuclear energy has little to do with engineers' interests, who should be involved in the debate and what are the proper interests for engineers?

The IEEE's stand was taken with the interests of all citizens in mind—not just those of engineers. It was taken with a background of fundamental knowledge of the need for energy and a belief that our present nuclear technology can provide the safest, cleanest form of energy to supply this country's future demands.

Moreover, our stand on the issue in California (and in the other states) was taken because the initiatives were not for just "strict control" of nuclear energy, which we favor, but because they would have virtually prohibited further development of the nuclear option and would have shut down existing nuclear plants.

T. H. LEE

Energy Committee,
Institute of Electrical and Electronics Engineers, Inc., 345 East 47 Street, New York 10017

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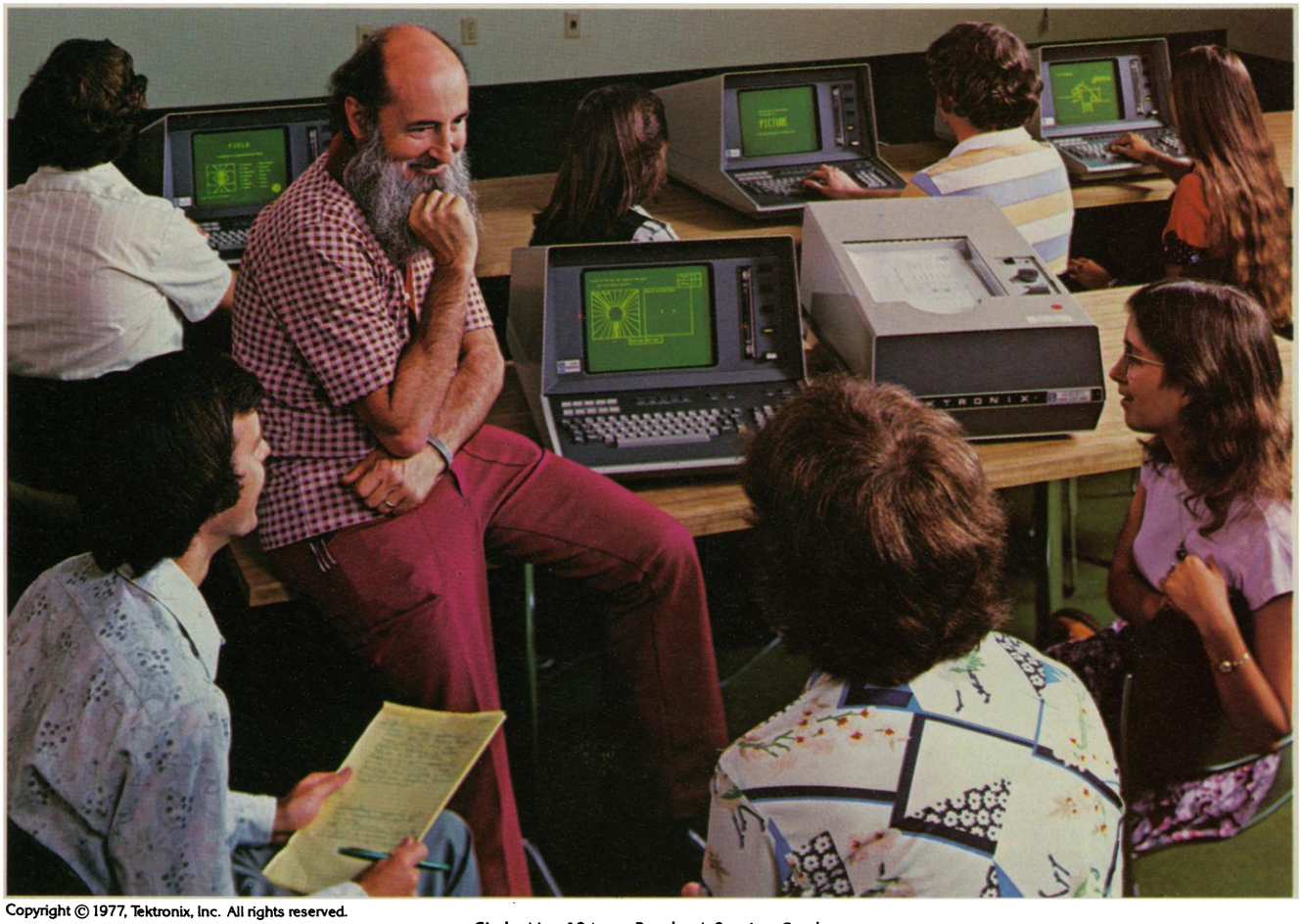

18 November 1977, Volume 198, Number 4318 SCIENCE

Biostatistics in Medicine

About 60 years ago, within a single decade, it was discovered that the course of three of the most complex and lethal of diseases—pellagra, pernicious anemia, and diabetes—could be turned around swiftly and precisely by the restoration of absent biochemical reactants. Thus a new era opened, and a few years later the discovery of the sulfonamides and penicillin made the fact of the revolution plain to everyone. Human disease was curable by the use of scientific methods.

The impact of this discovery is now only dimly remembered, but at the time it was overwhelming. Therapy had fallen out of fashion long since, as the result of another, earlier revolution. Two catastrophic observations had been made in the 19th century and were accepted with reluctance: the first was that many human ailments could reverse themselves without treatment; the second, that the stupendous therapeutic armamentarium of that time, which included everything from botanical extracts to applications of electrical currents and leeches, simply did not work. At around the time of Sir William Osler there began a long period of therapeutic nihilism, and it came to a close with the introduction of penicillin. Since the 1940's, medicine has been undergoing transformation from an art, as it was earlier termed, to a mixture of science and technology.

But the transformation is still in its early stages. There is a long list of formidable human diseases whose underlying mechanisms are not at all clear, and these are presently unapproachable by such precisely targeted techniques as the use of penicillin against streptococci. There is a long way to go. As a science, medicine has started, but it will not have arrived until biological problems posed by the senile dementias, arthritis, cancer, and so on are well on the way to being solved. What is new in medicine is the general awareness that these are biological problems and that they are ultimately solvable.

It is precisely because of the success of medicine in some of these problems that research on the unsolved diseases poses such complex ethical problems. It used to be agreed that therapy did not matter all that much, that most pharmacological agents were essentially trivial and at best marginal in their effects. We edged away from that attitude when the antibiotics turned up, and were finally wrenched away by the new anticancer drugs, the diuretics, the antihypertensives, and most of all by recent discoveries in neuropharmacology. The stakes have become very much higher, and the possible remedies for disease much more powerful and potentially dangerous.

In studying potential new therapeutic agents the design of experiments and the evaluation of results have become more difficult than ever before, partly because of what has already been learned about the natural history of the diseases under study. Excepting only cancer (and even here there are scattered reports of spontaneous cures) and certain inexorable forms of heart disease, most illnesses *can* reverse themselves. In schizophrenia and rheumatoid arthritis, for example, it is estimated that 35 percent of cases will recover no matter what is done. A great many patients with hypertension can have a normal life-span. Also, the remarkable potency of placebos in providing transient relief of symptoms in many illnesses has become an important complication for clinical research.

From here on, as far ahead as one can see, medicine must be building, as a central part of its scientific base, a solid underpinning of biostatistical and epidemiological knowledge. Hunches and intuitive impressions are essential for getting the work started, but it is only through the quality of the numbers at the end that the truth can be told.—LEWIS THOMAS, *Memorial Sloan-Kettering Cancer Center, New York 10021.*

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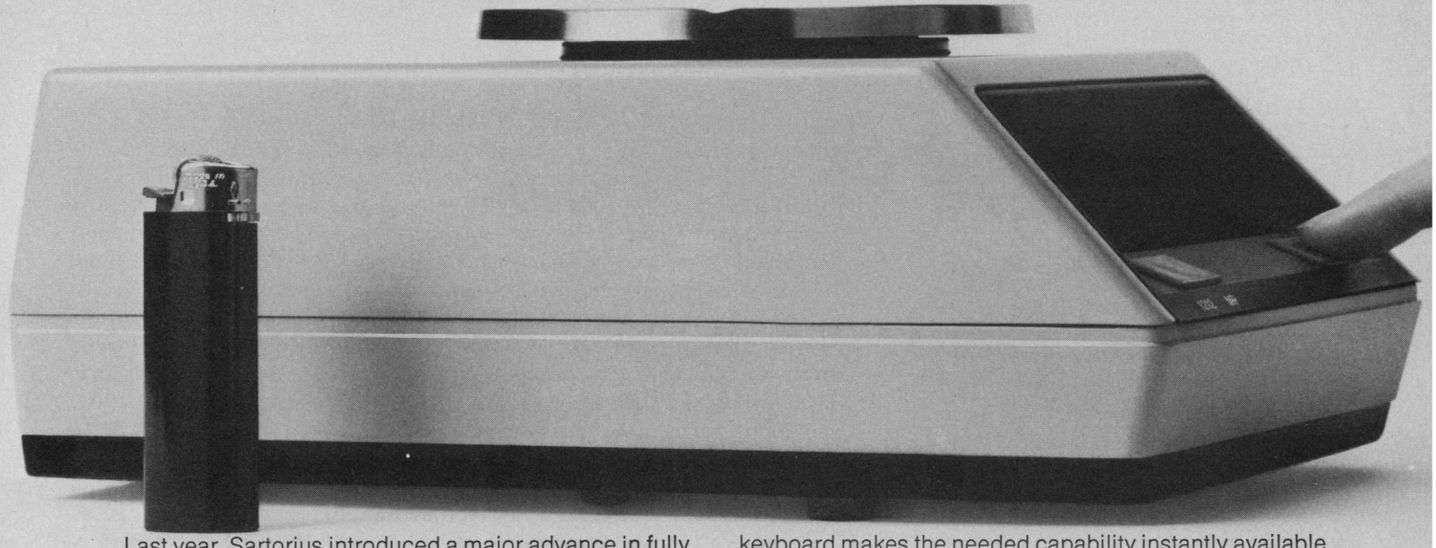

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Weighing Range	0-160g	0-300g	0-30g 0-300g	0-1200g	0-120g 0-1200g	0-300g 0-3000g	0-6000g
Readability	0.001g	0.01g	0.001g 0.01g	0.01g	0.01g 0.1g	0.01g 0.1g	0.1g
Price	$2295.	$1295.	$1650.	$2195.	$1995.	$2495.	$3225.

Annual Meeting Washington
12-17 February 1978

Tours and Cultural Events

For the Annual Meeting Program, please see the Preliminary Program in the 5 November issue of *Science*, pages 487–497). Tours are limited to Meeting Registrants only.

In keeping with a long and honored tradition, the forthcoming AAAS Annual Meeting in Washington (12–17 February 1978) will be graced by an exceptional set of tours. Advance reservations should be made at once (using the form on this page). Tickets will be ready at the Ticket Desk in the Meeting Registration Area (Upper Concourse of the Sheraton-Park Hotel) and should be picked up at least 24 hours before the tour. A minimal charge will be made to defray transportation costs. *Lunch will not be provided*; however, all facilities to be visited, except for the Patuxent Wildlife Research Center, have adequate cafeteria accommodations. Further information about places to see and cultural events in Washington during the Meeting can be obtained at the Welcome (Hospitality) Center in the Potomac Room (on the Upper Concourse). Handicapped persons who need assistance for the tours (or for any other Meeting function) should consult the staff at the Resource Center for Disabled Persons in the Wardman Room (Upper Concourse).

Note: The first time listed for each tour is the time at which the bus departs the Sheraton-Park Hotel, the second time listed is the time at which the bus departs the tour site. Travel time to the various sites is in the vicinity of 1 hour (or somewhat less).

Tours

1a. National Bureau of Standards—Energy; Monday, 13 February, 8:30 a.m.–noon.

NBS solar townhouse, consumer appliance testing laboratory, and a magnetohydrodynamics and coal gasification laboratory.

1b. National Bureau of Standards—Tools of Science; Monday, 13 February, 1:15 p.m.–4:30 p.m.

Computer-controlled device (robot), on-line data acquisition in the laboratory, the 3-D Moore measuring machine, and air pollution measuring equipment.

NOTE: Those electing both tours **1a** and **1b** may remain at NBS, have lunch at one of the cafeterias, and return with the second tour.

2. Beltsville Agricultural Research Center; Tuesday, 14 February, 8:30 a.m.–3:30 p.m.

Virology, Nematology, Florist and Nursery Crops, and Instrumentation Research Laboratories; Windshield Areas; Biological Waste Management and Soil Nitrogen Laboratory; and the Human Nutrition and Medicinal Plants Laboratories.

Reservation Form for Tours

AAAS Meeting registrants who wish to reserve tickets for any of the tours should fill out the coupon below and mail it in as soon as possible, since capacities are limited. Tickets should be picked up (and minimal bus fare paid) at the AAAS Ticket Desk in the Meeting Registration Area (Upper Concourse of the Sheraton-Park Hotel) during the Annual Meeting, about 24 hours before the scheduled tour. *Do not send any remittance with this coupon*; it is a reservation form only.

Tour		No. of tickets
1a.	**NBS—Energy** [Mon., 13 Feb., 8:30 a.m.–noon]	_____
1b.	**NBS—Tools of Science** [Mon. 13 Feb., 1:15 p.m.–4:30 p.m.]	_____
2.	**Agr. Research Ctr.** [Tues., 14 Feb., 8:30 a.m.–3:30 p.m.]	_____
3a.	**NIH—Tour** [Wed., 15 Feb., 8:30 a.m.–12:30 p.m.]	_____
3b.	**NIH—Demonstration** [Wed., 15 Feb., 1:00 p.m.–4:30 p.m.]	_____
4.	**NASA Goddard SFC** [Thur., 16 Feb., 9:00 a.m.–noon]	_____
5.	**Univ. of Maryland** [Thur., 16 Feb., 1:00 p.m.–4:30 p.m.]	_____
6.	**Patuxent Wildlife Res. Ctr.** [Fri., 17 Feb., 8:30 a.m.–2:30 p.m.]	_____

Total No. of Tickets Reserved_____

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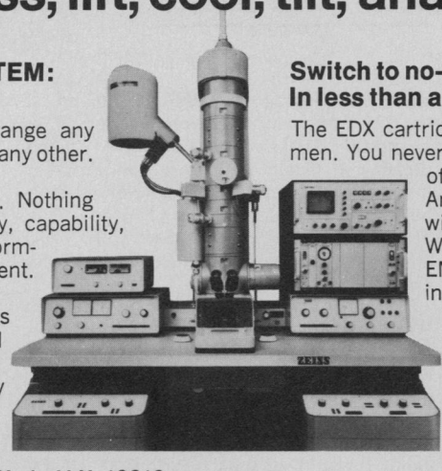

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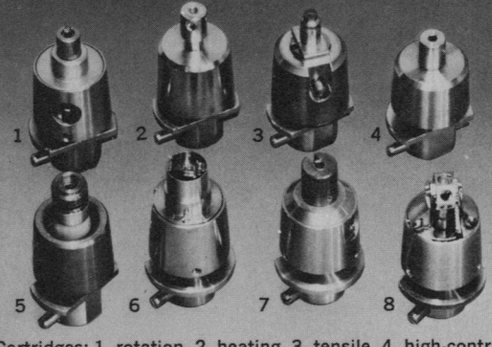

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Medico-Social Management of Inherited Metabolic Disease. Papers from a symposium, Feb. 1974. D. N. Raine, Ed. MTP Press, St. Leonardgate, Lancaster, England, 1977 (U.S. distributor, University Park Press, Baltimore). x, 310 pp., illus. $29.50.

Molecular Mechanisms of Protein Biosynthesis. Herbert Weissbach and Sidney Pestka, Eds. Academic Press, New York, 1977. xiv, 722 pp., illus. $55. Molecular Biology. *To order this book circle No. 384 on Readers' Service Card*

The Moon Book. Bevan M. French. Penguin, New York, 1977. 288 pp. + plates. Paper, $4.95.

Multivariate Analysis—IV. Proceedings of a symposium, Dayton, Ohio, June 1975. Paruchuri R. Krishnaiah, Ed. North-Holland, Amsterdam, 1977 (U.S. distributor, Elsevier, New York). xiv, 550 pp. $49.

Multivariate Statistical Inference. Narayan C. Giri. Academic Press, New York, 1977. xvi, 320 pp. $25. Probability and Mathematical Statistics. *To order this book circle No. 385 on Readers' Service Card*

Nuclear Reactor Safety. F. R. Farmer, Ed. Academic Press, New York, 1977. xiv, 216 pp., illus. $17.50. Nuclear Science and Technology, 12. *To order this book circle No. 386 on Readers' Service Card*

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Oxides and Oxide Films. Vol. 5. Ashok K. Vijh, Ed. Dekker, New York, 1977. xiv, 184 pp., illus. $26.50. The Anodic Behavior of Metals and Semiconductors Series.

Pauli Lectures on Physics. Wolfgang Pauli. Translated from the German by S. Margulies and H. R. Lewis. Charles P. Enz, Ed. MIT Press, Cambridge, Mass., 1977. Six volumes. Vol. 1, Electrodynamics. xii, 160 pp., illus. Vol. 2, Optics and the Theory of Electrons. xii, 160 pp., illus. Vol. 3, Thermodynamics and the Kinetic Theory of Gases. xii, 138 pp., illus. Vol. 4, Statistical Mechanics. xii, 122 pp., illus. Vol. 5, Wave Mechanics. xviii, 206 pp., illus. Vol. 6, Selected Topics in Field Quantization. xii, 188 pp. Paper, $19.95. Reprint of the 1973 edition.

Philosopher at Large. An Intellectual Autobiography. Mortimer J. Adler. Macmillan, New York, 1977. xiv, 350 pp. + plates. $12.95.

Planetary Satellites. Papers from a colloquium, Ithaca, N.Y., Aug. 1974. Joseph A. Burns, Ed. University of Arizona Press, Tucson, 1977. xxiv, 598 pp., illus. $19.95.

Potential Scattering in Atomic Physics. P. G. Burke. Plenum, New York, 1977. viii, 138 pp. $22.50.

Pragmatic and Semantic Aspects of Early Language Development. Ernst L. Moerk. University Park Press, Baltimore, 1977. xii, 330 pp. $18.50.

Proceedings of the Fifth New England Bioengineering Conference. Durham, N.H., Apr. 1977. Michael R. Cannon, Ed. Pergamon, New York, 1977. xvi, 284 pp., illus. Paper, $35. *To order this book circle No. 388 on Readers' Service Card*

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SOVMOD I. A Macroeconometric Model of the Soviet Union. Donald W. Green and Christopher I. Higgins. Published for the Strategic Studies Center of the Stanford Research Institute by Crane, Russak, New York, 1977 (distributor, Academic Press, New York). xxii, 312 pp. $22.50. *To order this book circle No. 376 on Readers' Service Card*

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Terrestrial Vegetation of California. Michael G. Barbour and Jack Major, Eds. Wiley-Interscience, New York, 1977. xii, 1002 pp., illus., + map. $47.50.

The Theory of Computer Science. A Programming Approach. J. M. Brady. Chapman and Hall, London, and Halsted (Wiley), New York, 1977. xiv, 288 pp., illus. $17.95.

Theory of Ionization of Atoms by Electron Impact. R. K. Peterkop. Translated from the Russian edition (Riga, 1975) by Elliot Aronson. D. G. Hummer, Transl. Ed. Colorado Associated University Press, Boulder, 1977. vi, 264 pp. $10.95.

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