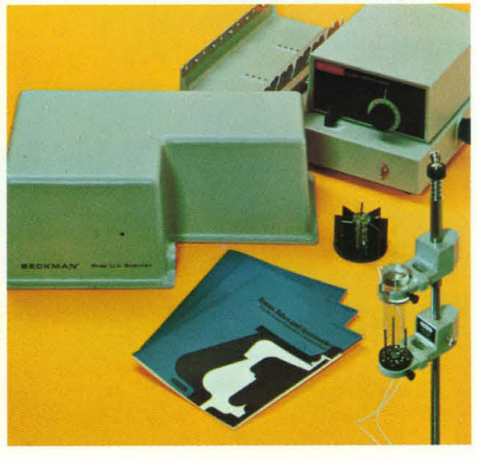
SCIENCE 10 September 1976

Volume 193, No. 4257

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

Beckman L5 Ultracentrifuges: they offer you the important choices.



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- You have a choice of four different Beckman L5's, ranging from the 40,000 rpm Model L5-40, to the 75,000 rpm Model L5-75, — the most sophisticated preparative ultracentrifuge available.
- There are 37 Beckman titanium and aluminum rotors — 18 fixed angle, 10 swinging bucket, 5 zonal, 1 continuous flow, and 3 new vertical tube rotors. They offer a wide variety of volumes, forces, and other characteristics to meet virtually any separation need.
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The Mitchell Prize

$50,000 to be awarded in 5 equal prizes of $10,000

Announcing the second of five biennial Mitchell Prizes to be awarded at the international conference on "Alternatives to Growth '77" to be held at The Woodlands, Texas, October 2-4, 1977. The Mitchell Prize Contest is to encourage international research and debate on new and alternative approaches to the purposes and processes of growth.

It is becoming increasingly apparent that growth in itself does not proffer solutions to the manifold social and economic problems confronting humanity at large. Moreover, because of such factors as ecological imperatives, shifts in social preferences, stagnating employment opportunities and rising resource prices, current growth patterns need to be earnestly examined. Humanity is at a turning point. Alternative social and economic systems must be explored.

A sustainable society in equilibrium with the finite nature of our Planet and aware of environmental constraints, could offer viable alternatives to present continuous growth-oriented systems. To change society and industrial systems harbours profound implications and ramifications. The Mitchell Prize has been established in collaboration with the Club of Rome to encourage international analysis and solution of problems resulting from such social and economic change.

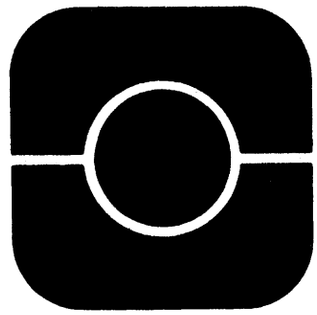
The Contest entries need not necessarily be in the form of papers. They could also be presented in the form of, for example, a film, an engineering drawing, a town design, or operative models of a proposed sustainable state—or innovative recycling systems. Such entries must be relevant to a sustainable society. *All* entries must be verbalized in a maximum 10-page summary. Five broad substantive areas have been identified to which contestants are invited to address themselves: 1) management of natural and human resources; 2) institutional innovation for a changing world; 3) how to meet rising expectations when certain limits are being reached; 4) how should the world's physical, financial and human resources be used to meet 'basic human needs' in sustainable ways; and 5) what economic mechanisms and technologies are needed to move toward a sustainable society? Concentrating on one of five categories each paper* must take into account the element of policy making and must proffer recommendations to alleviate the effects of current growth patterns; and bring about desirable change.

The awards will be made at the international conference, "Alternatives to Growth '77," to be held at The Woodlands, Texas, October 2-4, 1977. The Conference is being sponsored by The Club of Rome, the University of Houston, and Mitchell Energy and Development Corp.; and organized by the Society for International Development. The awards are being sponsored by George and Cynthia Mitchell of Houston, Texas.

* All interested persons must request application materials no later than November 12, 1976. For further information write to:

Alternatives to Growth '77

Alternatives to Growth '77
c/o Society for International Development
1346 Connecticut Avenue, N.W.
Room 1131
Washington, D.C. 20036 USA



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Volume 193, No. 4257

SCIENCE

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COVER

Close-up of exterior view of corner window, Pueblo Bonito, Chaco Canyon, New Mexico. See page 957. [Jonathan Reyman, Illinois State University, Normal, Illinois]

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A revised edition by Irene Tinker, Priscilla Reining, Warren Swidler, and William Cousins. Preface by Margaret Mead.
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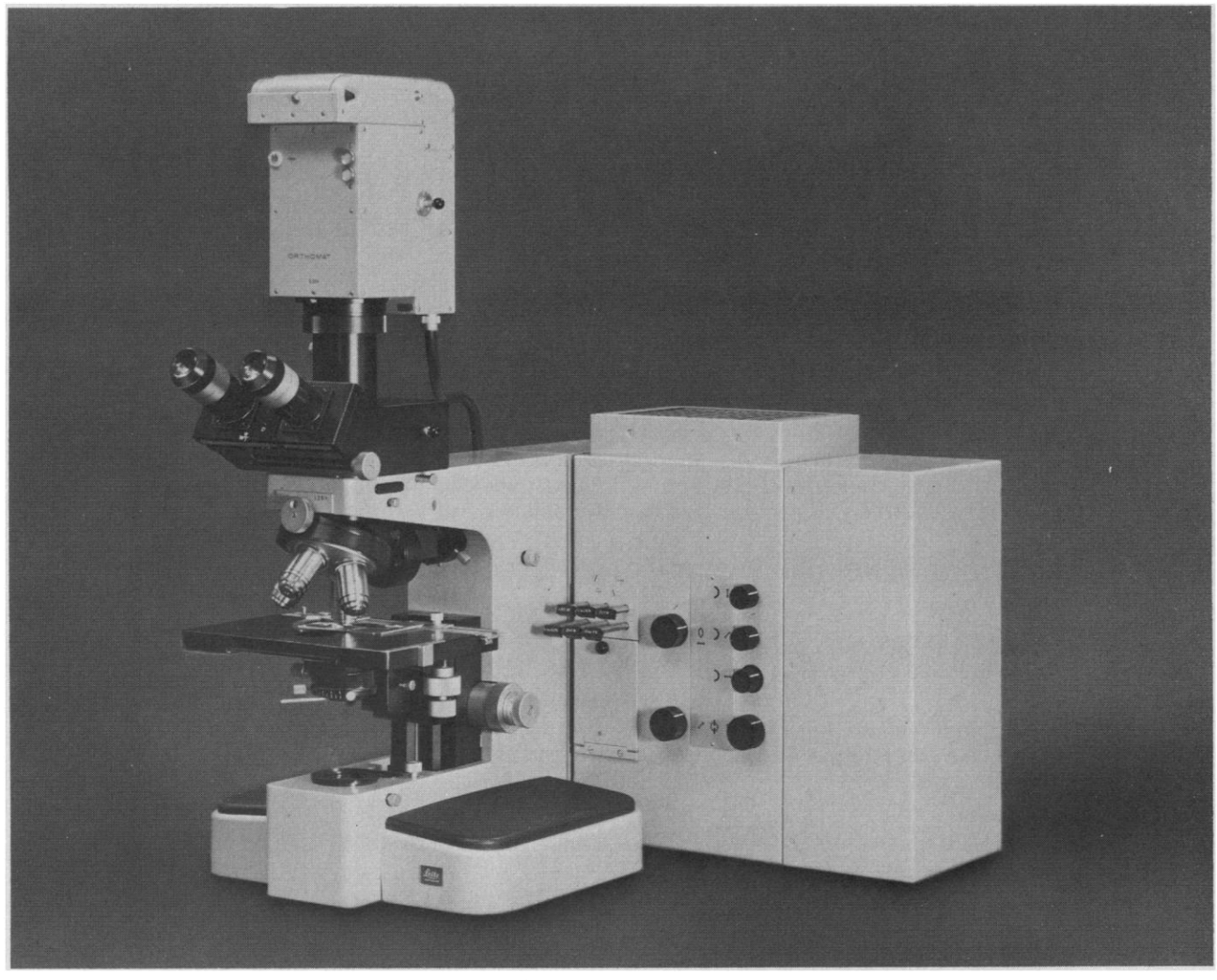

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4. Cold room operation. All components are stabilized for continuous cold room operation. (**All** these compatibles are designed for cold room use if desired.)

5. Event marker. For peak delineation.

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7. Range. A 7 position range selector gives the Model 1300 tremendous flexibility.

8. No high voltage in connecting cables.

Reader service no. 106

Model 1320 Fraction Collector

The Model 1320 has all the features Bio-Rad has looked for in fraction collectors, but never found before in one instrument. Look what $795 can buy.

1. Indexing. (Includes automatic digital counting.)
Timed (standard)
1 to 999 seconds
1 to 999 minutes
Volume (optional)
1 to 999 drops

2. Turntables. With the standard and optional turntables you can run one, two or three columns simultaneously, run a preparative column or collect directly into scintillation vials.
Standard (shown in photo)
Single 136 x 10 ml test tubes

Optional
Double 136 x 10 ml
Preparative — 50 x 75 ml test tubes
Spot Collection
Single 160 x 1 ml
Double 160 x 1 ml
Triple 160 x 1 ml
Scintillation Vial Turntable
50 x 20 ml vials

3. Dual event marker.
Switch closure
5-volt pulse

4. Three powered outlets. For use with accessories such as pumps, recorders, etc.
Power — activated whenever master switch is on.
Run — activated only while collection is in progress. Turns off at conclusion of run.
Finish — activated after last collection.

5. Overflow protection.

6. Manual advance button.

7. Cold room compatible.

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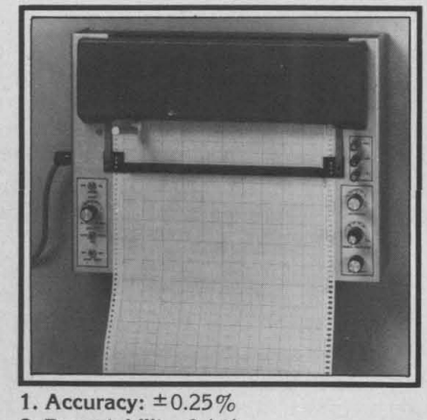
Model 1310 Strip Chart Recorder

The Model 1310 has strip chart features rarely found at $695. It can be wall mounted or bench mounted and has all the other attractions shown below.



1. Accuracy: ±0.25%

2. Repeatability: 0.1%

3. Linearity: ±0.5% full scale

4. 12 chart speeds
0.5, 1.0, 2.0, 5.0, 10.0 and 20.0 inches/minute
0.5, 1.0, 2.0, 5.0, 10.0 and 20.0 inches/hour

5. Accessory power outlet. Lets you run other apparatus in conjunction with the recorder.

6. Ranges. 16 calibrated full scale ranges from 1 mV to 100V.

7. Scale expansion. Up to 3X on all ranges. Any input from 1 mV to 300V can be accepted for full scale reading.

8. Zero adjust. Twice full scale reading.

9. Automatic pen lift.

10. Cold room compatible.

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Western Electric Reports:

Rumpelstiltskin lives!

Rumpelstiltskin found his niche in fairy tales by spinning straw into gold. That once seemed only a little more challenging than the host of engineering problems the Bell System faced in developing a practical lightwave communications system. Problems like spinning "wires" of glass.

In lightwave communications, pulses of laser light are used to transmit millions of bits of information through hair-thin glass fibers. A bundle of such fibers not much thicker than a lamp cord can carry as many telephone conversations as a copper cable the thickness of your arm.

Bell Labs researchers came up with a recipe for glass fibers so transparent a light beam passing through 500 feet of the material would lose less intensity than in passing through a window pane. So repeaters could be economically spaced—about four miles apart.

But a way also had to be found to make the fiber at mass production speeds without deviating more than 1% in diameter.

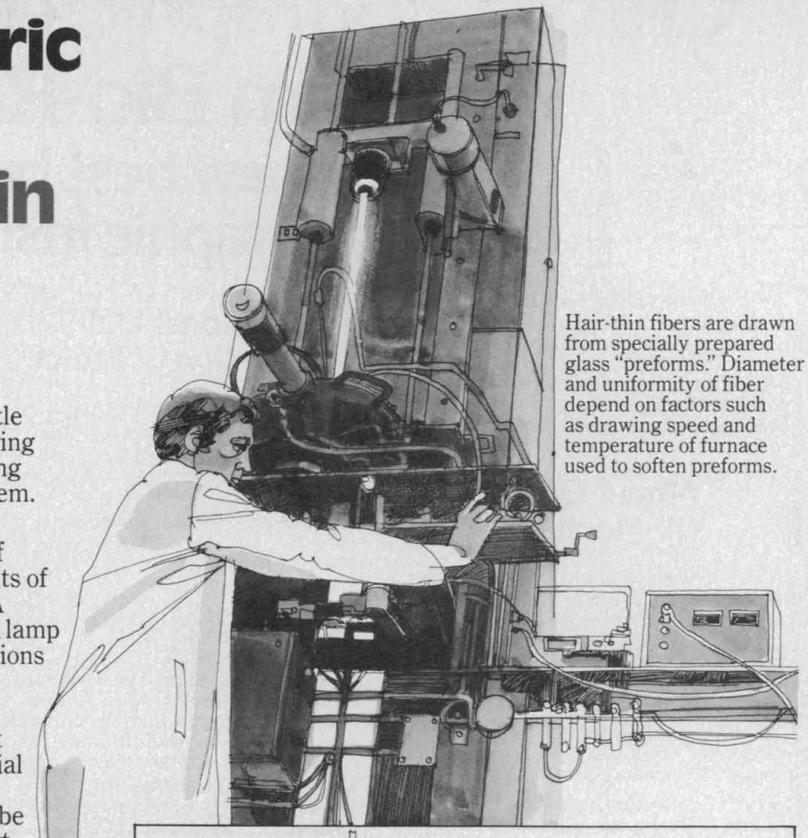
The people at Western Electric's Engineering Research Center in Princeton, N.J., tackled the problem while lightwave development continued at Bell Labs.

They discovered that laser light, shined on an optical fiber at an angle perpendicular to its axis, casts a characteristic light pattern. They were able to correlate this pattern to changes in the fiber's diameter. And to build an automatic feedback system into existing fiber drawing machines to control it.

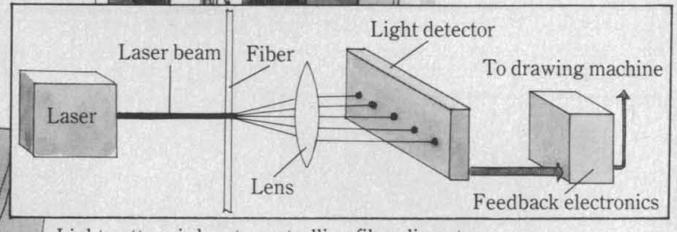
The result is ultrasmooth glass fiber with a diameter varying no more than thirty-millionths of an inch.

Bell System engineers have found practical ways to fashion the fibers into cables that can be pulled through underground ducts, and to splice them with negligible light loss in the real world of manholes and city streets.

Benefit: Today, an experimental lightwave system is being tested at a Bell Labs-Western Electric facility in Atlanta. In the early 1980's, lightwave communications will probably be used to relieve cable congestion between major telephone switching centers. And as it proves competitive with other technology, it will spread throughout the telephone network.



Hair-thin fibers are drawn from specially prepared glass "preforms." Diameter and uniformity of fiber depend on factors such as drawing speed and temperature of furnace used to soften preforms.

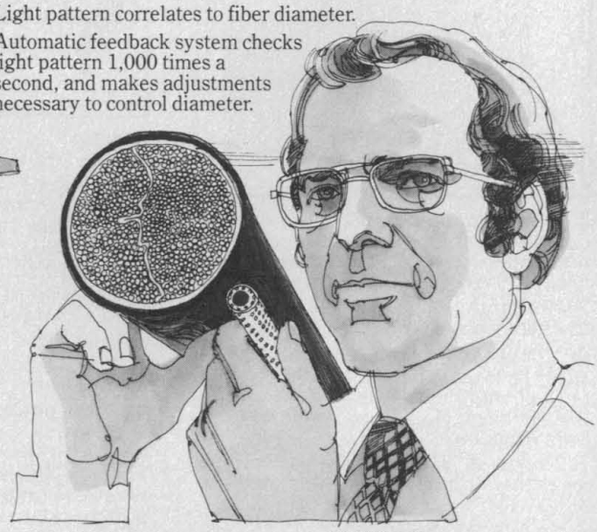


Light pattern is key to controlling fiber diameter.

a) Laser light is shined perpendicular to fiber.

b) Light pattern correlates to fiber diameter.

c) Automatic feedback system checks light pattern 1,000 times a second, and makes adjustments necessary to control diameter.



Lightguide cable can carry nearly 50,000 calls—many more than larger copper cable. Imagine the space that saves underground.

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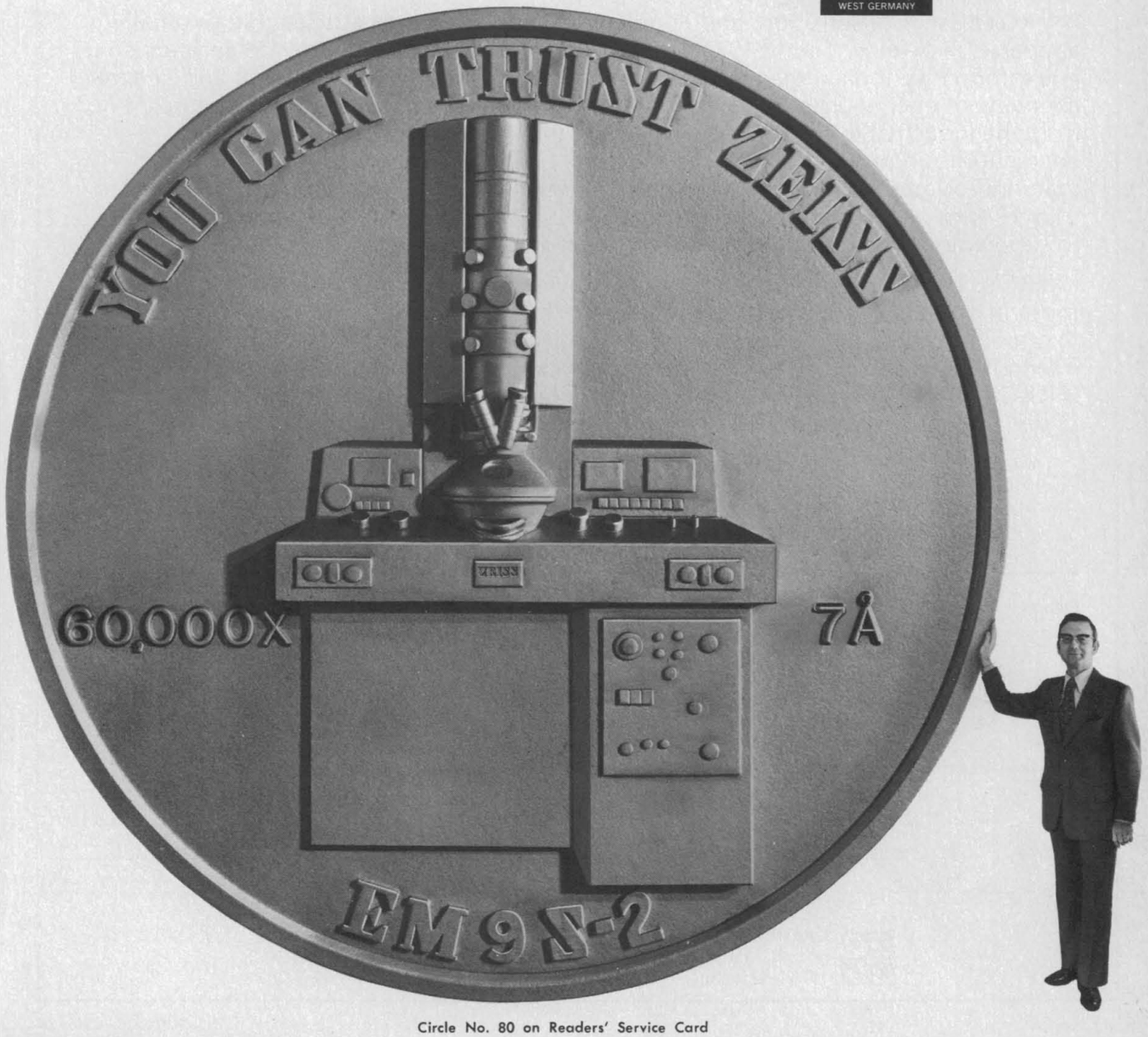

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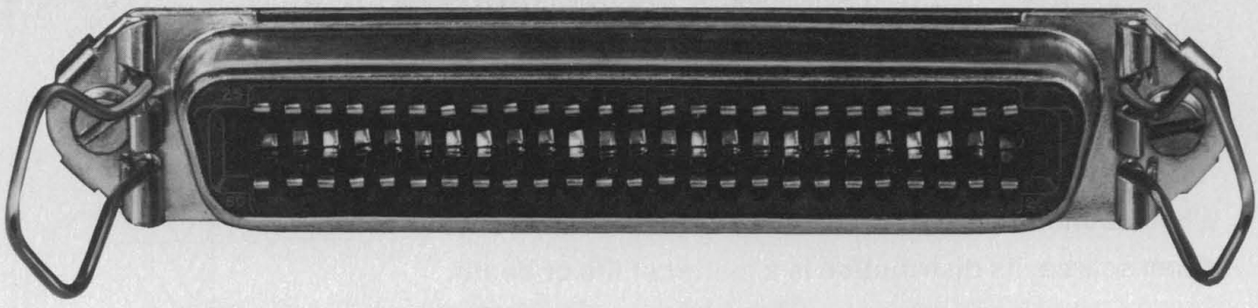

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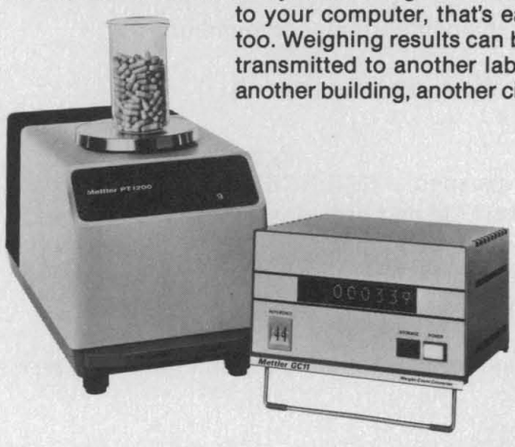

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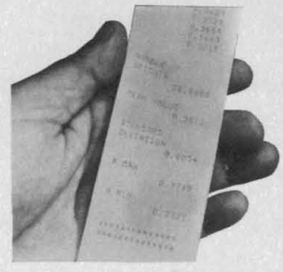

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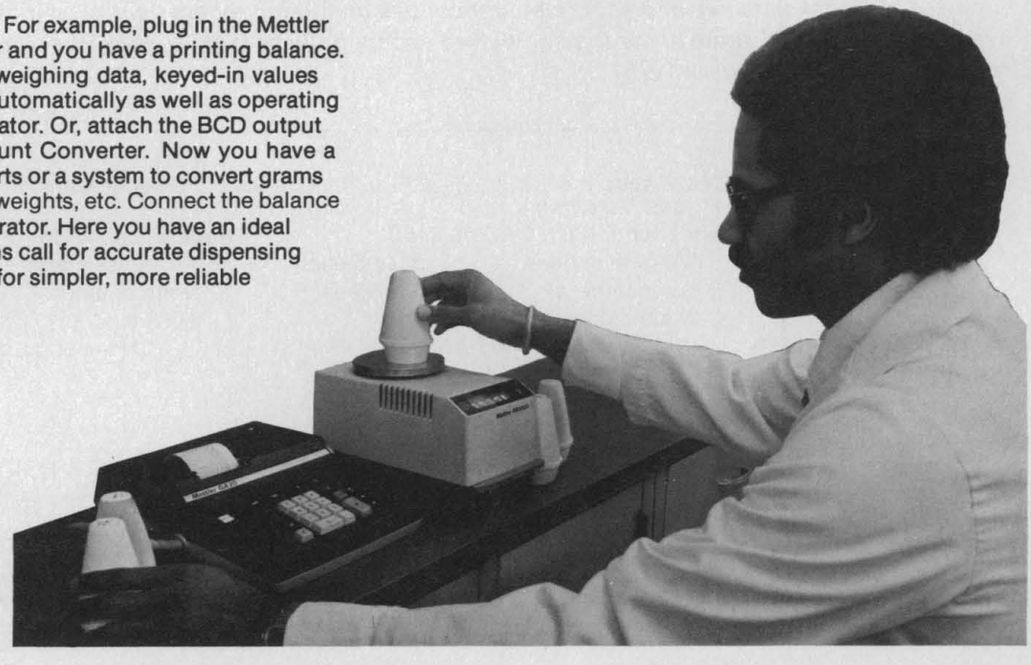

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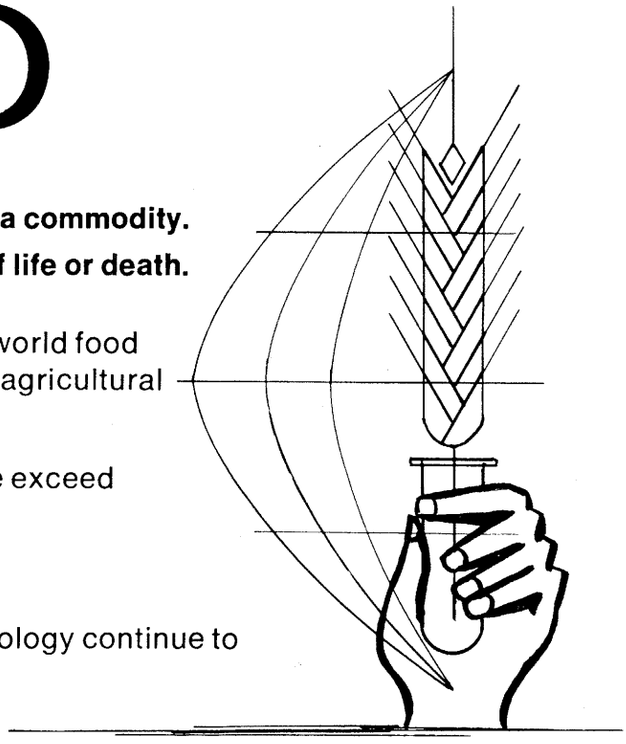

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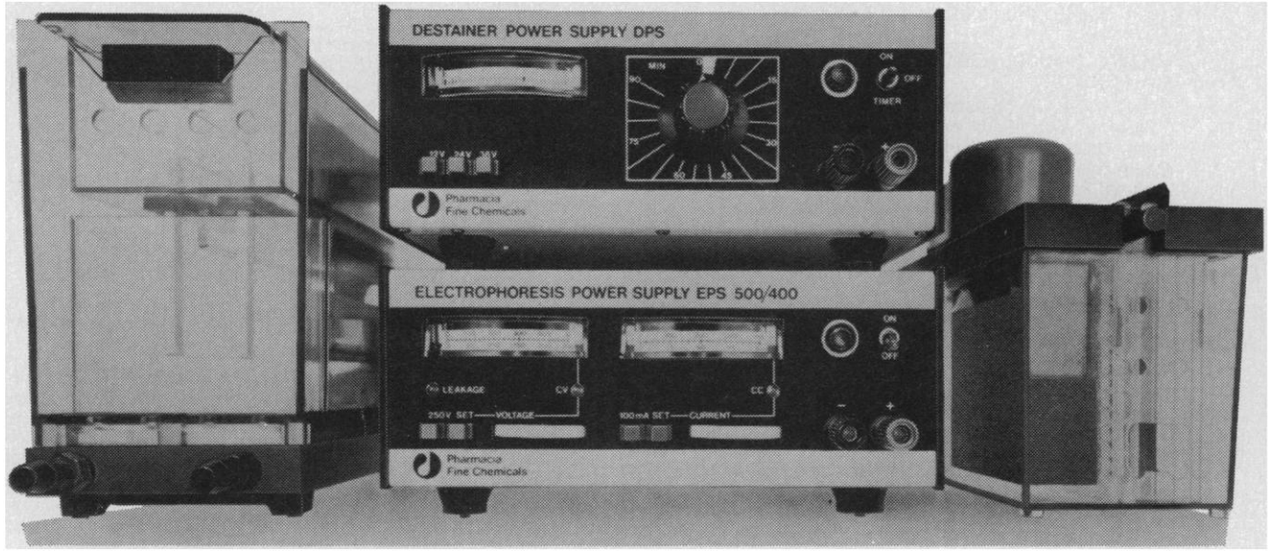

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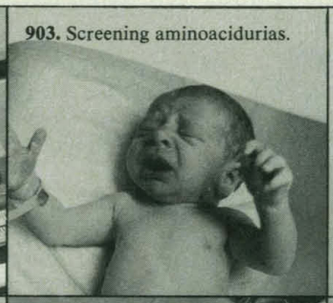

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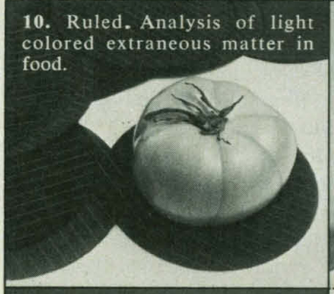

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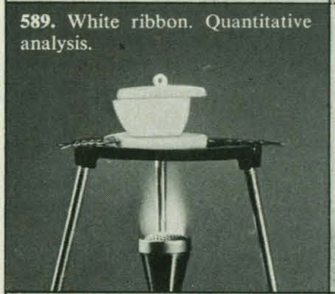

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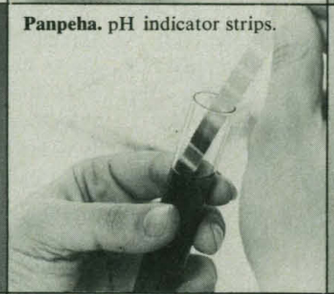

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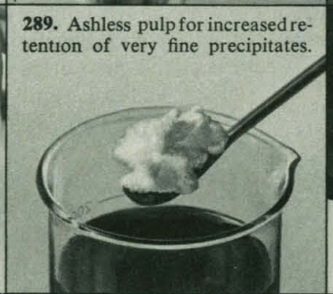

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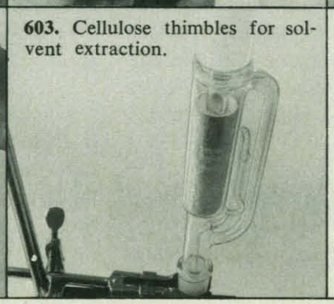

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LETTERS

Carter's Engineering Background

While it is a heady thought that we may have a scientist-engineer as our next U.S. president, namely Jimmy Carter, it seems rather unfair to an earlier chief executive to say that Carter "will become the first American president, at least in recent times, who can lay claim to any significant degree of scientific and technical knowledge" (News and Comment, 6 Aug., p. 462).

Although Herbert Hoover's administration of 1928–32 may not qualify as "recent" in the eyes of author Nicholas Wade, it doesn't seem so very long ago to many of us. In an earlier issue of *Science* (8 Jan. 1965, p. 125), Hoover's scientific and engineering talents were discussed at some length.

Hoover was the only U.S. president ever to hold membership in the National Academy of Sciences. Educated as a mining engineer at Stanford University, he was a fellow of the AAAS, as well as of the Royal Geographical Society of London.

Hoover's early application of scientific mining principles and techniques throughout the world were spectacularly successful and made his fortune, enabling him to retire at 34 and later to devote himself to public service. As Secretary of Commerce he made over the Bureau of Standards into a first-class research institution and brought infusions of scientific methods to the Bureau of Fisheries, the Bureau of Mines, and the Census Bureau with similar benefits to each. And at Stanford University he established the Food Research Institute to bring scientific principles to the study of mass food problems.

Although science and technology may have seemed less vital to the nation during Hoover's presidency, he unquestionably had great faith in their efficacy for improving the condition of humanity.

ROBERT E. LAMAR
News and Publications Service, Stanford University, Stanford, California 94305

Nicholas Wade makes the statement that "A professional engineer is often understood to be someone who has undergone a 4-year course in a particular engineering specialty, such as electrical, mechanical, or civil." To call oneself a "professional engineer" in any of the 50 states or the District of Columbia, a person must complete an 8-year training program, the first 4 years of which include earning a baccalaureate in an engineering specialty, followed by a 4-year internship *and* a professional-level examination lasting 2 days. The use of the term "professional engineer" is restricted in most of these states to the person who has completed this program and has passed the examination so that he has been registered as a Professional Engineer by the state in which he intends to practice.

Whereas the scientist is in the pursuit of truth, he can and should deliver his hypotheses only after he has ascertained that he is in possession of all the available facts. He should not be under any time or financial pressures, and he certainly should be under no political pressures. The professional engineer, on the other hand, is most frequently working against a time, dollar, and political deadline. He must make value judgments weighing cost against performance, performance against political expediency, political expediency against his inbred ethics. He is on the firing line of technology; he must develop methods to make technology useful. He must also very frequently justify his every move to those who are not adequately prepared to understand them.

It is unfortunate that in this country the credentials of those who call themselves engineers are not very carefully examined. Since the mid-1950's there has been a proliferation of people calling themselves engineers, yet today it is doubtful that 10 percent of them are legally, mentally, or ethically qualified to do so. All too frequently we find the applied mathematician calling himself an engineer because he knows a certain amount of engineering theory, or the graduate of a technical school calling himself an engineer because he can get a better job that way, or the electronics technician recently discharged from the armed forces calling himself an engineer because he can get away with it.

In the long run, this downgrading of the engineering profession can serve only to hurt science. Although the engineer must perform in a different manner than the scientist, they both serve science.

WILLIAM B. JARZEMBSKI
Department of Biomedical Engineering and Computer Medicine, School of Medicine, Texas Tech University Health Sciences Centers, Lubbock 79409

Nicholas Wade's article is somewhat misleading in describing my connection with the early phases of the U.S. Navy Nuclear Power Training Program and thus, by implication, my possible views on the scientific or engineering credentials of Jimmy Carter.

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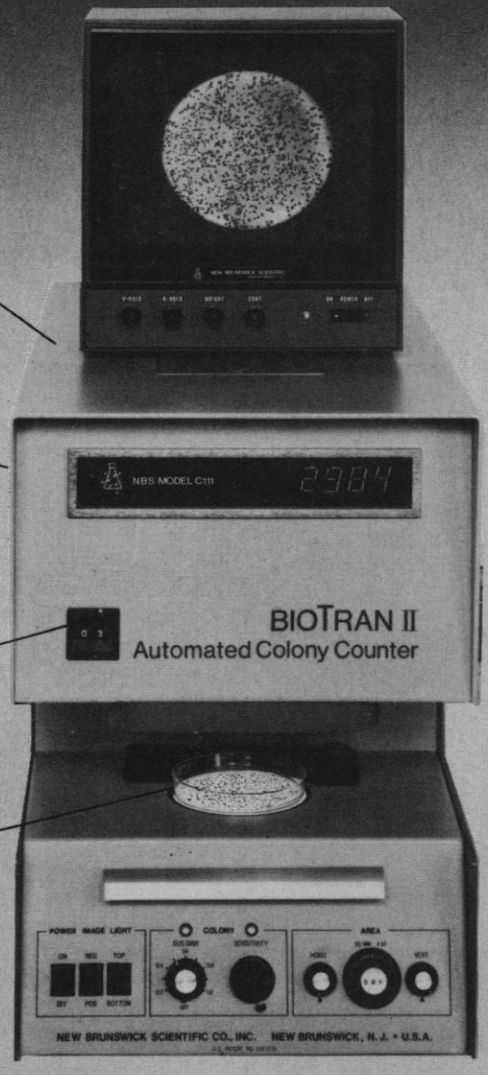

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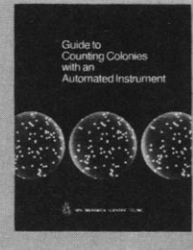

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My experience with this program began in 1958 and terminated in 1961, as Wade states. The program was initiated in 1956, under the direction of Commander William Behrens, at New London, Connecticut. The nuclear physics curriculum, which I taught primarily, was developed at New London by Austin Frye, who had been chairman of the physics department at the U.S. Navy Postgraduate School, and was extended by others, including myself. While the New London program was based upon previous experience in training in nuclear technology at the Bureau of Ships and at the prototype sites near Pittsburgh and Schenectady, it was not, specifically, the program that Carter attended. The mode of operation in the early days of the nuclear program is, however, well documented (*1*). My remarks should at most be construed as generic comments on the nature of that program and reflect no direct evaluation of Carter's credentials.

Further, Wade follows a statement describing enthusiasm for Carter in the scientific and technical community with a correctly stated quote from me that "it would be unusual to see a president who knows a Bessel function from a Fourier series." My statement was intended to be factual only. It would be quite inappropriate for a public servant such as myself to voice preferences in the presidential contest; such preferences were neither expressed nor implied in my conversation with Wade.

JOEL A. SNOW

Division of Policy Research and Analysis, National Science Foundation, Washington, D.C. 20550

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The Science Court

Philip Boffey's excellent article on the science court (News and Comment, 9 July, p. 129) reports that the "only outright opposition to emerge from the scientific community thus far has been voiced by leaders of the Scientists Institute for Public Information."

At the American Physical Society (APS) Washington meeting last April, the Forum on Physics and Society organized a public session on the science court. Among the panelists was Arthur Kantrowitz, principal advocate of the court. I think it is fair to say that most of the audience came to the session interested in the idea, or at least neutral, and ended up leary of it. It struck me, at least, as an attempt to institute a Plato's Republic of scientists. Not since the time of the trial of Galileo have we had a canon court issuing pronouncements of scientific Truth. At the conclusion of the APS forum session the audience (and the panelists) by a show of hands resolved overwhelmingly that "before an experiment on the Science Court be conducted, much further discussion is needed, not merely among scientists, but in the American community at large, which will be powerfully affected by the conclusions reached in any Science Court." The Forum on Physics and Society is now endeavoring to stimulate its 2000 members to think about the issue and hopes to encourage the broad public discussion which has so far been lacking.

There are important differences between the plan now being considered by the Consumer Product Safety Commission and the general proposals of Kantrowitz and the White House advisory group on science and technology. Commissioner Lawrence Kushner, who spoke at the forum session, views the court as a kind of Robert's Rules for scientific controversy, a way of forcing opposing sides to confront each other's facts and arguments. The court would have no life of its own. From time to time a court would be impaneled by the Commission and dissolved upon the issuance of a report to the Commission.

The more ambitious plans of Kantrowitz and the White House group seem to me both simplistic and dangerous. Implicit in the argument for a science court is the assumption that value-free questions of fact can be separated from political questions of policy. The science court, it is argued, will resolve controversies as to the facts. But which facts? The answers you get depend upon the questions you ask. In those recent matters of public controversy with a heavy technological component—the ABM, the SST, the B1 bomber, reactor safety—the two sides have been stressing different questions. What the important questions are is a political judgment.

Furthermore, since the answers to whatever questions one considers important are not known, but can only be estimated, the two sides quite properly assign different weights. Judgments on the complex questions of public policy rest not upon one fact, or one lemma, but on a rich foliage of argument, each branch of which is reached only after logical branching at previous stages in the argument. Assigning different probabilistic estimates of "the truth" at each

step can lead to qualitatively different conclusions (*1*). In social policy questions it is impossible to separate facts from values. A democratic consensus can be achieved only by a democratic process, even with respect to scientific "facts," when those facts have heavy political import. No elite group—the National Academy of Sciences, Nobel laureates, or anyone else—can decide for the U.S. public what are the right questions and the right answers.

The science court will stifle public debate. It will encourage the public to believe that objective answers have been measured incontrovertibly in the laboratory. This select court will select the issues, select the judges, select the questions, select the protagonists, and give its imprimatur to its answers. Perhaps the science court will establish once and for all that the sun revolves around the earth.

EARL CALLEN
Department of Physics, American University, Washington, D.C. 20016

Notes

1. As a simple linear illustration, suppose there are six steps in an argument and at each step the spread in estimates is from 0.75 to 0.95, which is maybe as close to agreement as one is likely to come in a real controversy. Whereas $(0.95)^6 \cong 0.66$, $(0.75)^6 \cong 0.1$, a two-thirds probability in one case and a mere 10 percent chance in the other.

Clean Air Litigation

In his article on the social impact of pollution control (14 May, p. 631), Wallace Johnson makes a critical factual error. In the current round of litigation of the Environmental Protection Agency's (EPA's) regulations on the preservation of air quality in clean air regions, New Mexico (and a number of other clean air states which have joined in its brief) is not siding against the Sierra Club, but with it—against EPA and major polluters. New Mexico and the Sierra Club share a common perspective that strong and effective national regulation on the preservation of air quality is the only way to protect clean air states against threats by industry that they will go elsewhere if tough air quality standards are enforced. Also, the notion represented in Wallace's subhead that we are talking about "Cleaner than clean air" is misleading; the national ambient air quality standards do not represent "clean air"; they represent air quality just clean enough that damaging health and property consequences have not yet been demonstrated. Even the toughest of the proposed significant deterioration classifications,

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for example, represents a loss of over 100 miles of visibility in the Southwest; the national ambient standards are so lax that they would permit a loss of visibility sufficient that visitors to the Grand Canyon could not see the other side.

CARL POPE
Sierra Club, 530 Bush Street, San Francisco, California 94108

Johnson's statement that nondeterioration regulations promulgated by the Environmental Protection Agency (EPA) are "presently being challenged in the court by the Sierra Club and other environmental groups on the one hand and by the American Petroleum Institute, various oil companies, and the state of New Mexico on the other hand" is misleading at best.

While it is true that New Mexico, specifically the New Mexico Environmental Improvement Agency, is involved in the litigation dealing with the nondeterioration regulations, we are not on the side of the American Petroleum Institute or of the various oil companies.

The position of the oil companies is that EPA's regulations are too restrictive. Both the Sierra Club and New Mexico feel the regulations are not restrictive enough and do not in fact prevent significant deterioration (*1*).

Nor do I agree with Johnson's assertion that the imposition of nondeterioration principles could operate so as to prevent industrial development in the western states. The best way to ensure full and environmentally compatible development is through the imposition of a uniform Class II ceiling (*2*) under a nondeterioration designation (*3*).

New Mexico and other states in the Rocky Mountain West are at the focus of much of the projected energy development occurring in this country. As such, we see daily examples of industries' wanting to develop coal, uranium, and other resources, not by using the best available control technology, but by acting in the same heedless manner that developers have most often employed elsewhere.

Additionally, New Mexico is a state with chronic unemployment and underemployment problems. Given a situation where there are natural resources available for development and strong socioeconomic pressures to promote that development, the historical tendency has been to welcome industry on a first-come, first-served basis without requiring much in the way of pollution controls. In areas of little development, there is correspondingly little pollution, and environmental quality is thus too often viewed as the tool with which to bargain.

The difficulty, apart from environmental degradation, is that this approach fails to consider the reality of air quality as a natural resource which is as depletable as any other. Whether one agrees philosophically with national air quality standards, they do exist, and their existence means the end of the age-old concept of an unlimited air resource. Hence using that resource as an inducement to promote development is as short-sighted as would be the reckless use of any other resource.

The imposition of a uniform, nationally designated Class II ceiling rather than limiting development actually ensures more development than would otherwise occur. This is because (i) those states that desire to use air quality as an inducement to development will not be allowed to develop at the expense of neighbors who are interested in maintaining as much of a quality environment as possible, and (ii) a tighter ceiling than that imposed by national standards will help impress on everyone that air is a depletable resource and that new industry must be required to utilize the best control technology in developing new energy supplies.

The question of available technology is the crux of the problem. Existing industry faced with the problems of the retrofit of control devices is finding the job difficult and expensive. In many cases, the result has been an unwillingness to accept the fact that the job of control is even possible. But a difficult job is not synonymous with an impossible one, particularly in the case of new industry where controls can be made an integral part of plant design.

The end result is that, rather than having an air shed used up by three or four inadequately controlled industries, more industry can be accommodated. If done properly, this would ensure that the limitation to development in an area such as New Mexico would be the lack of water—the naturally limiting factor, and not an artificial air pollution limitation.

CUBIA L. CLAYTON
New Mexico Environmental Improvement Agency, Post Office Box 2348, Santa Fe 87503

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10 September 1976, Volume 193, Number 4257 **SCIENCE**

Universities and National Research Policy

The postwar ebullience and national prosperity has given way to austerity and national insecurity. This new environment poses special dangers for the research university. Our political system naturally produces pressures to satisfy the majority and spread resources evenly over a large number of claimants. If there is too little money to satisfy all claims, the needs of institutions of special quality are readily dismissed as elitist and unnecessary. A period of national insecurity also reinforces the tendency to concentrate on immediate problems and ignore or defer long-term needs. Finally, a period of austerity impels public officials to insist that every expenditure be justified as objectively as possible. Such accountability is not kind to the intangible values that characterize so much of the work of universities.

These pressures have already left their mark on the nation's research effort. Federal support for R & D and basic research has steadily declined in real dollars, and other nations are beginning to surpass us in the share of the gross national product that they devote to these purposes. Applied research is targeted heavily at urgent domestic problems, such as cancer and energy, to the neglect of longer-range international needs in such fields as basic biological research devoted to agriculture and tropical disease. Funds for equipment and facilities have fallen off to such a point that experimental science is threatened in many private universities. Investigators are hampered by instability in federal funding and by increasing red tape in the administration of contracts. Financial stringency has limited the career opportunities of younger university scientists and threatens to drive promising investigators into other, less productive environments.

These developments call for greater efforts from universities to press the case for research support. This task has been largely left to individual scientists, who have worked effectively with their counterparts in the National Science Foundation and Health, Education, and Welfare. But scientists cannot fully appreciate the needs of the university as a whole. They have little contact with members of Congress or with the Office of Management and Budget or with other key officials in the Executive Branch. And they lack the capacity to attract support from representatives of business and other sectors with a stake in a vigorous science program.

What can be done to improve the situation? To begin with, university organizations—especially the Association of American Universities—must make a sustained effort to develop an effective policy for the support of research and to create an effective forum in Congress and the Executive Branch where they can discuss this policy not only at budget time but on a more informal, long-term basis.

University presidents must also do more to help formulate an adequate research policy. Presidents cannot impose their opinions in matters beyond their competence. But they must see to it that all the interests of the institution are identified, that conflicting needs are reconciled, and that these needs are presented in convincing form to those who make the ultimate decisions in Washington. And they must make efforts to enlist the aid of allies outside the universities who share an interest in the progress of science.

Above all, a much more forceful case must be made for the importance of research universities to the nation's welfare. It has become fashionable today to belittle the value of education and to question the contributions of knowledge. We are doing very little to counter these arguments. Perhaps we have lost our nerve, or perhaps we have grown too accustomed to having our importance taken for granted. Whatever the reason, we run the risk of having our needs quietly ignored in favor of all the other urgent claims being made on the government. We will do a disservice to ourselves and to the public interest if we allow this situation to continue.—DEREK C. BOK, *President, Harvard University, Cambridge, Massachusetts 02138*

This editorial is adapted from an address delivered at the annual meeting of the American Association for the Advancement of Science in Boston, Massachusetts, 18 February 1976.

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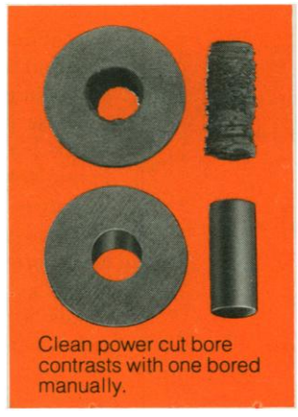

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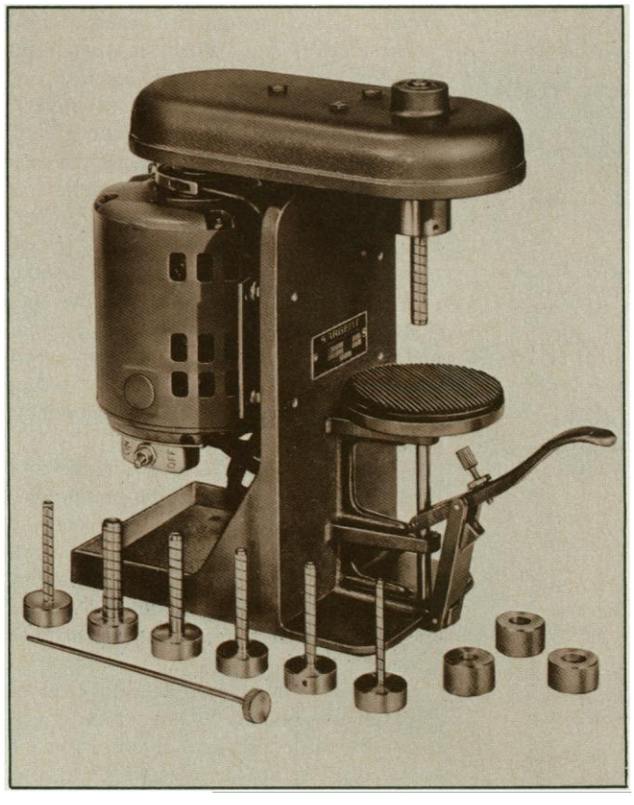

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—ARTHUR HERSCHMAN

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—RICHARD G. SOMMER

BOOKS RECEIVED

(Continued from page 996)

Food, Foreign Policy, and Raw Materials Cartels. William Schneider. Crane, Russak, New York, 1976. x, 122 pp. Cloth, $5.95; paper, $2.95. National Strategy Information Center Strategy Papers, No. 28.

Fundamental Aspects of Metastasis. Papers from a symposium, Buffalo, N.Y., July 1975. Leonard Weiss, Ed. North-Holland, Amsterdam, and Elsevier, New York, 1976. xx, 444 pp., illus. $53.95.

Fundamental Skills in Serology. Agglutination Tests, Syphilis Serology, Fluorescent Staining. Leila J. Walker and Howard Tabu. Seba Kolb, Ed. Thomas, Springfield, Ill., 1976. xiv, 474 pp., illus. Spiral bound, $14.95.

Further Sudies on the Tasaday. D. E. Yen and John Nance, Eds. Panamin Foundation, Makati, Rizal, Philippines, 1976. xiv, 192 pp., illus. Paper, $3. Panamin Foundation Research Series, No. 2.

Geologia. In Prezent şi în Viitor. Nestor Lupei. Editura Technică, Bucharest, Romania, 1975. 264 pp., illus. Lei 17.50.

Gifts from Lake Cowichan. Patricia Baumgardner. **Legacy from Fritz.** Fritz Perls. Science and Behavior Books, Palo Alto, Calif., 1975. viii, 218 pp. $7.95.

Group-Analytic Psychotherapy. Method and Principles. S. H. Foulkes. Interface (Gordon and Breach), New York, 1975. xii, 178 pp., illus. $13.50.

HB_S Antigen Subtypes. Proceedings of a workshop, Paris, Apr. 1975. A. M. Couroucé, P. V. Holland, and J. Y. Muller, Eds. Karger, Basel, 1976. viii, 158 pp., illus. Paper, $30.50. Bibliotheca Haematologica, No. 42.

Heresies. Thomas Szasz. Anchor/Doubleday, Garden City, N.Y., 1976. xiv, 186 pp. Paper, $2.95.

Histogenesis and Morphogenesis in Planarian Regeneration. Rosine Chandebois. Karger, Basel, 1976. viii, 182 pp., illus. Paper, $36.50. Monographs in Developmental Biology, vol. 11.

A History of Engineering and Science in the Bell System. The Early Years (1875–1925). M. D. Fagen, Ed. Bell Telephone Laboratories, Murray Hill, N.J., 1975. xiv, 1074 pp., illus. $15.

Human Anatomy. Ruth Ashley in consultation with James A. McNamara. Wiley, New York, 1976. xiv, 274 pp., illus. Paper, $5.95. Self-Teaching Guides.

Human Learning. David L. Horton and Thomas W. Trunage. Prentice-Hall, Englewood Cliffs, N.J., 1976. x, 502 pp., illus. $12.95. Prentice-Hall Series in Experimental Psychology.

Hyperactive Children. Diagnosis and Management. Daniel J. Safer and Richard P. Allen. University Park Press, Baltimore, 1976. xvi, 240 pp., illus. Paper, $8.50.

Illustrated Guide to the Seaweeds and Sea Grasses in the Vicinity of Port Aransas, Texas. Peter Edwards. University of Texas Press, Austin, 1976. iv, 132 pp. Paper, $6.95.

Infections in Cancer Chemotherapy. Proceedings of a symposium, Brussels, Jan. 1975. J. Klastersky, Ed. Pergamon, New York, 1976. vi, 102 pp. $15. Reprinted from *European Journal of Cancer*, vol. 11.

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Insects That Feed on Trees and Shrubs. An Illustrated Practical Guide. Warren T. Johnson and Howard H. Lyon with the collaboration of C. S. Koehler, N. E. Johnson, and J. A. Weidhaas. Comstock (Cornell University Press), Ithaca, N.Y., 1976. 464 pp. $35.

Introduction to Combustion Phenomena. A. Murty Kantury. Gordon and Breach, New York, 1975. xviii, 412 pp., illus. $34.50. Combustion Science and Technology Book Series, vol. 2.

Introduction to Metascience. An Information Science Approach to Methodology of Scientific Research. Thomas J. Hickey. Published by the author, P.O. Box 590, Oak Park, Ill. 60303, 1976. x, 74 pp. Paper, $4.

Introduction to Modern Sheet Metal. Edward R. Kratfel. Reston (Prentice-Hall), Reston, Va., 1976. xiv, 242 pp., illus. $12.95.

Lies, Damn Lies, and Statistics. The Manipulation of Public Opinion in America. Michael Wheeler. Liveright, New York, 1976. xx, 300 pp. $9.95.

The Making of Psychology. Discussions with Creative Contributors. Richard I. Evans. Knopf, New York, 1976. xviii, 382 pp., illus. Paper, $5.95.

Marketing Models and Econometric Research. Leonard J. Parsons and Randall L. Schultz. North-Holland, Amsterdam, 1976 (U.S. distributor, Elsevier, New York). xiv, 300 pp., illus. $22.50.

Medical Pharmacology. Principles and Concepts. Andres Goth. Mosby, St. Louis, ed. 8, 1976. xii, 754 pp., illus. $18.50.

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Microbiology and Human Disease. George A. Wistreich and Max D. Lechtman. Glencoe Press, Beverly Hills, Calif., and Collier Macmillan, London, ed. 2, 1976. xx, 906 pp., illus. $15.95. Laboratory Exercises in Microbiology (ed. 3). George A. Wistreich and Max D. Lechtman. xiv, 310 pp., illus. Paper, $6.95.

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Organ Culture in Biomedical Research. Festschrift for Dame Honor Fell, FRS. Papers from a meeting, Norwich, England, Apr. 1975. Michael Balls and Marjorie A. Monnickendam, Eds. Cambridge University Press, New York, 1976. x, 570 pp., illus. $58. British Society for Cell Biology Symposium 1.

People and Predicaments. Milton Mazer. Harvard University Press, Cambridge, Mass., 1976. xiv, 280 pp. $12.50.

The Principles of Physiology. David Jensen. Illustrated by Barbara Jensen. Appleton-Century-Crofts (Prentice-Hall), New York, 1976. xvi, 1328 pp. $24.75.

Probability. Peter Whittle. Wiley, New York, 1976. 240 pp., illus. Paper, $7.50.

Problems in Physical Chemistry. I. M. Ritchie, R. A. Craig, and P. J. Thistlethwaite.

Wiley, New York, 1976. vi, 170 pp., illus. Paper, $7.95.

Progress in Differentiation Research. Proceedings of a conference, Copenhagen, Sept. 1975. N. Müller-Bérat, C. Rosenfeld, D. Tarin, and D. Viza, Eds. North-Holland, Amsterdam, and Elsevier, New York, 1976. x, 588 pp., illus. $46.25.

Public Utility Productivity. Management and Measurement. Proceedings of a symposium, Albany, N.Y., Aug. 1975. Walter L. Balk and Jay M. Shafritz, Eds. New York State Department of Public Service, Albany, 1975. xvi, 256 pp., illus. Paper.

Rational Methods in Lie Algebras. George B. Seligman. Dekker, New York, 1976. viii, 346 pp. $29.50. Lecture Notes in Pure and Applied Mathematics, vol. 17.

Readings in Human Sexuality. Contemporary Perspectives. 1976–77 Edition. Chad Gordon and Gayle Johnson, Eds. Harper and Row, New York, 1976. xvi, 318 pp., illus. Paper, $5.95. Contemporary Perspectives Reader Series.

The Role of Immunological Factors in Infectious, Allergic, and Autoimmune Processes. Papers from a symposium, Baltimore and London. Roland F. Beers, Jr., and Edward Basset, Eds. Raven, New York, 1976. xvi, 540 pp., illus. $32. Miles International Symposium Series, No. 8.

Rudolf Bultmann. Morris Ashcraft. Word Books, Waco, Tex., 1975. 124 pp. $3.95. Makers of the Modern Theological Mind. Reprint of the 1972 edition.

Sensation and Perception. An Integrated Approach. Harvey Richard Schiffman. Wiley, New York, 1976. x, 434 pp., illus. $14.95.

Soviet Science, Technology, Design. Interaction and Convergence. Raymond Hutchings. Published for the Royal Institute of International Affairs by Oxford University Press, New York, 1976. xiv, 320 pp. + plates. $27.50.

Symposia and Symposium Publications. A Guide for Organizers, Lecturers and Editors of Scientific Meetings. A. A. Manten. Elsevier, New York, 1976. x, 156 pp., illus. Paper, $14.50.

Thermodynamique de l'Atmosphère. L. Dufour and J. Van Mieghem. Institut Royal Météorologique de Belgique, Bruxelles, 1975. 278 pp. 800 BF.

Tropical Soils. Classification, Fertility and Management. F. S. C. P. Kalpagé. St. Martin, New York, 1976. xii, 284 pp., illus. $17.95.

Turbulent Jets. N. Rajaratnam. Elsevier, New York, 1976. x, 304 pp., illus. $37.75. Developments in Water Science, 5.

The University. The Anatomy of Academe. Murray G. Ross. McGraw-Hill, New York, 1976. xiv, 310 pp. $11.95.

Using Statistics in Teaching Physical Education. A Linear Programmed Presentation. Kenneth A. Penman. Wiley, New York, 1976. xvi, 270 pp. $5.95.

War in Ecological Perspective. Persistence, Change and Adaptive Processes in Three Oceanian Societies. Andrew P. Vayda. Plenum, New York, 1976. xiv, 130 pp., illus. $14.95.

Wear of Metals. A. D. Sarkar. Pergamon, New York, 1976. xvi, 164 pp., illus. Cloth, $12.50; paper, $6.50. International Series in Materials Science and Technology, vol. 18. Pergamon International Library.

World Guide to Tropical Drift Seeds and Fruits. Charles R. Gunn and John V. Dennis. Illustrations by Pamela J. Paradine. Quadrangle (New York Times), New York, 1976. xiv, 240 pp. $17.50. A Demeter Press Book.

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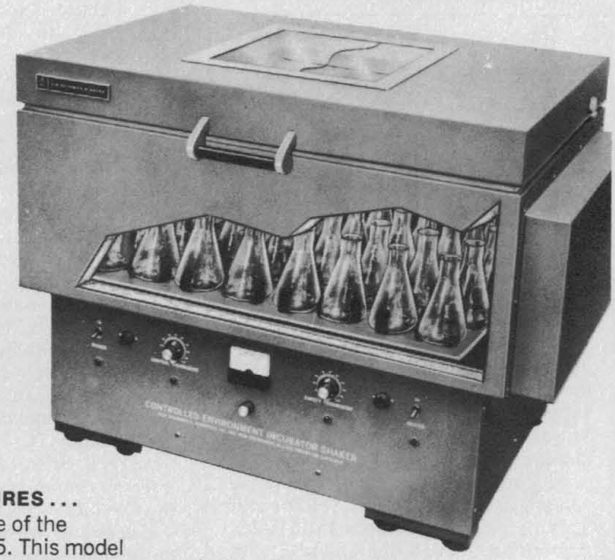

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Advances in Organometallic Chemistry. Vol. 14. F. G. A. Stone and Robert West, Eds. Academic Press, New York, 1976. xiv, 414 pp., illus. $38.50. *To order this book circle No. 386 on Readers' Service Card*

Beam-Foil Spectroscopy. Vol. 1, Atomic Structure and Lifetimes. Proceedings of a conference, Gatlinburg, Tenn., Sept. 1975. Ivan A. Sellin and David J. Pegg, Eds. Plenum, New York, 1976. xx, 460 pp., illus. + index. $45. *To order this book circle No. 387 on Readers' Service Card*

Benefits in Medical Care Programs. Avedis Donabedian. Harvard University Press, Cambridge, Mass., 1976. xvi, 436 pp. $16.50. *To order this book circle No. 397 on Readers' Service Card*

The Benthic Boundary Layer. Proceedings of a conference, Les Arcs, France, Nov. 1974. I. N. McCave, Ed. Plenum, New York, 1976. x, 324 pp., illus. $27.50. *To order this book circle No. 388 on Readers' Service Card*

Biochemistry and Neurology. Proceedings of a conference, Nottingham, England, Apr. 1975. H. F. Bradford and C. D. Marsden, Eds. Academic Press, New York, 1976. x, 298 pp., illus. Paper, $16.75. *To order this book circle No. 384 on Readers' Service Card*

Biological Membranes. Vol. 3. Dennis Chapman and Donald F. H. Wallach, Eds. Academic Press, New York, 1976. x, 362 pp., illus. $27.75. *To order this book circle No. 412 on Readers' Service Card*

Birth Defects. Risks and Consequences. Proceedings of a symposium, Albany, N.Y., Nov. 1974. Sally Kelly, Ernest B. Hook, Dwight T. Janerich, and Ian H. Porter, Eds. Academic Press, New York, 1976. xii, 392 pp., illus. $16.50. Birth Defects Institute Symposia. *To order this book circle No. 389 on Readers' Service Card*

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