SCIENCE

12 November 1976

Volume 194, No. 4266

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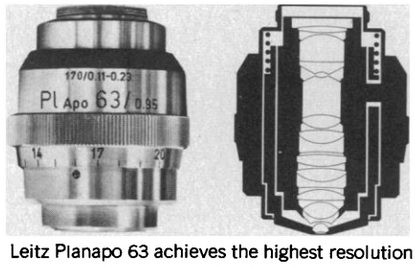

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COVER

Adam and Eve sleeping in the Garden of Eden. In these idyllic circumstances they would be expected to sleep a great deal. If the innocent creature at left were a real predator of man, they would sleep less and their paradoxical or "dreaming" sleep would be especially decreased. See page 732. [Detail of drawing by Josef Scharl, from *Funfzig Zeichnungen zum Alten und Neuen Testament*, Econ-Verlag, Dusseldorf, 1967, permission of A. Greither and M. B. Iceland]

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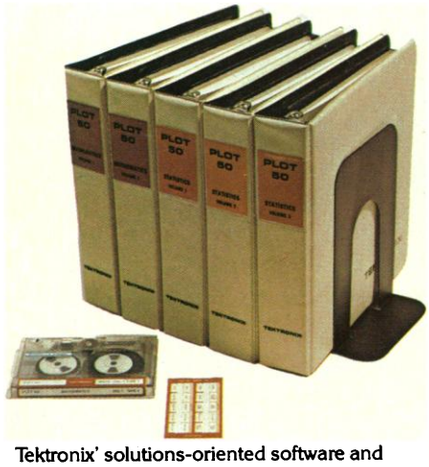

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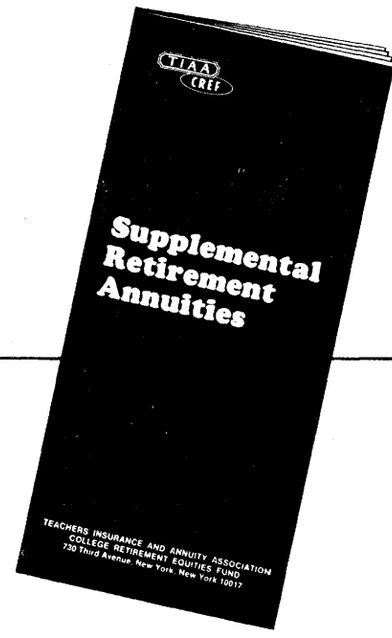

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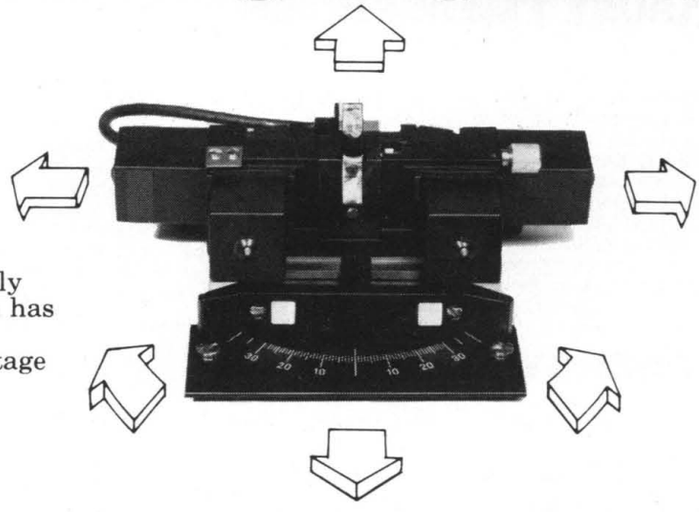

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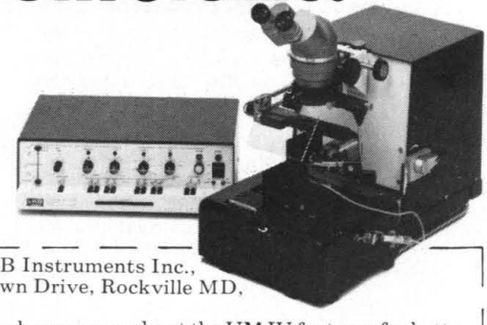

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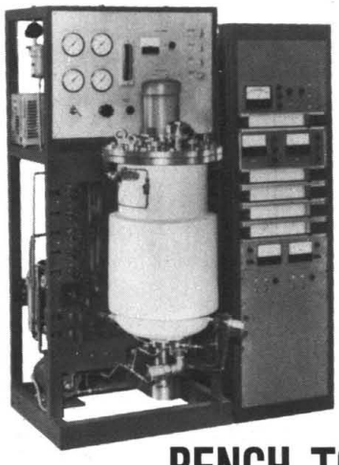

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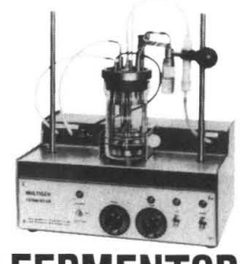

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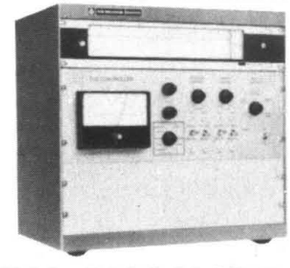

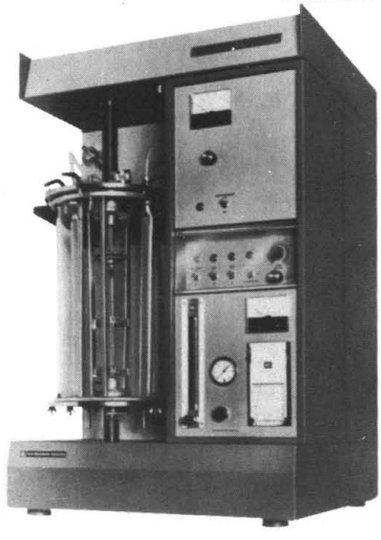

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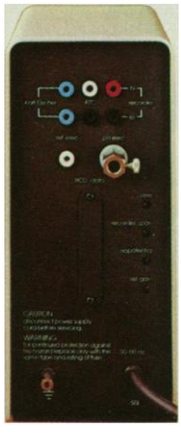

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LETTERS

Public Involvement in Scientific Decision-Making

Philip H. Abelson is certainly right that, "Part of the difficulty in gearing up to meet future energy needs is that few people seem to grasp the magnitude of the problem" (Editorial, 15 Oct., p. 261). I would go further and say that ignorance is the major part of the problem, especially if we include our ignorance of the magnitude of health effects from nuclear fuel reprocessing for the proposed "plutonium economy."

Three articles in the issue of 15 October (News and Comment, pp. 301, 303, and 306) serve to bring into perspective the perilous heights to which rapidly advancing science and technology have inadvertently brought our civilization. Balancing somewhat dizzily on this high place, we are trying to weigh the short-term, obvious, and proven benefits of nuclear power, Mirex pesticide for fire ants, and recombinant DNA research against the long-term suspected but unproven dangers from these to future generations. The dangers might include cancer, genetic diseases, new pathogens, and other "potentially grievous risks" that Robert Sinsheimer fears may result from genetic engineering.

Philip M. Boffey's article in the same issue (News and Comment, p. 306) describes the "Science for Citizens" program of the National Science Foundation (NSF) and points out the real issue. Just as climbers on Mount Everest must continually question their own judgment and keep in communication with their supporting camps at lower levels regarding whether or not it would be safe to continue climbing, so also we scientists, eager to keep pushing higher, should question our judgment and keep in communication with the public who support our efforts. It is they and future generations who will have to suffer the consequences if our sins of hubris (overweaning pride and arrogance) result in having to pay up on the Faustian bargain. I fully agree with the letter to this effect from Philip Siekevitz (15 Oct., p. 256).

Crucial value decisions have to be made, and they should not be made only by involved scientists closeted with financially interested industrialists and governmental authorities. They should be made by unbiased and informed members of the general public after hearing all sides of the questions, with balanced input from scientists, humanists, historians, philosophers, theologians and, most of all, from ordinary citizens. For this we need the public education of the NSF "Science for Citizens" program, and we need much more.

We need new ways of getting an informed public consensus on issues of vital importance; some methods have been suggested (*1*) that would be more effective and quicker than our present haphazard approaches. We also have to have checks and balances on public education programs to ensure that they are truly presenting all sides of the questions.

The "Science Court" idea is perhaps useful, as far as it goes, for establishing questions of scientific fact. But for decisions involving value judgments, we need more diversified input and a more representative and adequately informed jury. Our criminal courts utilize the trial-by-jury process whereby a group of peers, after hearing both sides, decide the fate of a man accused of a capital offense. Could some development of this process help in deciding life and death issues for society?

JOHN C. COBB
Department of Preventive Medicine and Comprehensive Health Care, University of Colorado Medical Center, Denver 80262

References

1. J. C. Cobb and L. Kaiser in *Interdisciplinary Environmental Approaches*, A. E. Utton and D. H. Henning, Eds. (Educational Media Press, Costa Mesa, Calif., 1974); C. Holden, *Science* **190**, 862 (1976); E. Leonard, A. Etzioni, H. A. Hornstein, P. Abrams, T. Stephens, N. Tichy, *Bull. At. Sci.* **27**, 4 (November 1971).

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Panasonic Company, Video Systems Division, Dept. 402
One Panasonic Way, Secaucus, N.J. 07094.

☐ Send me technical information on the NV-8030.

☐ Have a Panasonic video specialist call to demonstrate how the NV-8030 can be used in my company.

Name _____ Title _____
Please Print

Company _____

Address _____

City _____ State _____ Zip _____

Area Code _____ Phone Number _____

Panasonic®
just slightly ahead of our time.

In Canada, contact Panasonic Video Systems Department, 40 Ronson Drive, Rexdale, Ontario M9W 1B5.

Circle No. 125 on Readers' Service Card

figurations in accord with postal regulations that are intended to facilitate sorting and delivery by post office personnel.

One postal regulation tells us where to place labels: "Individually addressed, unfolded periodicals mailed in bundles without separate wrappers should have the addresses placed upside down in the lower right corner of the front cover page. An alternate position on periodicals is lengthwise along the bound edge, near the top of the publication." This regulation is not rigorously or consistently enforced by local postmasters where publications are mailed.

A second postal regulation makes weekly and more frequent second-class publications of general interest eligible for "newspaper treatment" in the Postal Service—that is, speedier handling than that given to monthlies and quarterlies, or to third-class mail such as advertising circulars. *Science*, however, has not yet achieved sufficient recognition as a weekly to obtain the same treatment accorded the national weeklies of far greater circulation. We believe we can achieve better recognition by placing our labels on the same side as the logo than we can by placing them on the back, which would tend to make *Science* indistinguishable from an advertising circular among those whose main concern is delivery to an address.

Magazines may be fed into a mailing machine lengthwise or sidewise. Labels are usually applied on the leading edge by a mailing head, which cuts the labels apart and pastes them down. Efficiency appears to be greatest when the mailing head does not have to be repositioned for different magazines and when copies are fed bound edge first. Feeding by the bound edge also helps avoid the delays that occur when a leaf of one copy catches the edge of the label on the copy beneath as the copies move along a belt, labels exposed, for zip-code sorting. If labels are put on the back, all copies must be turned over before they are fed to the mailer. This entails extra hand work (to prevent scrambles, magazines are stored face up in the printing plant) and increases the risk that a mixup among magazines will not be detected before or after the labels are pasted down.

We have considered other alternatives. We could mail *Science* in wrappers on a slower machine and at a cost of 4.5 cents per copy instead of 0.9 cent, but with every wrapper stamped "newspaper." We could avoid allowing the cover pictures to run to the fold, thus decreasing flexibility of design. We could offer reprints of cover pictures, or even loose-leaf collections of reprints. (We do send

Cancer Research

We don't make every suspected cancer-causing agent in the world, but we make some nobody else does.

NEC-528	**Acetyl-2-aminofluorene, *N*-**[9-^{14}C]-
NEC-656	**Benzidine,** [^{14}C(U)]-
NET-412	**Dibenz [a,h]anthracene, 1,2,5,6-**[^{3}H(G)]-
NEC-639	**Dimethylbenz[a]anthracene, 7,12-**[*dimethyl*-^{14}C]-
NEC-700	**Dinitrosopiperazine, *N,N'*-**[^{14}C(U)]-
NEC-694	**Ethyl-*N*-nitrosourea, *N*-**[*ethyl*-1-^{14}C]-
NEC-198	**Methylcholanthrene, 3-**[6-^{14}C]-
NEC-705	**Methyl-*N'*-nitro-*N*-nitrosoguanidine, *N*-**[*methyl*-^{14}C]-
NEC-282	**Methyl-*N*-nitroso-*p*-toluenesulfonamide, *N*-**[*methyl*-^{14}C]-
NEC-693	**Methyl-*N*-nitrosourea, *N*-**[*methyl*-^{14}C]-
NET-408	**Methyl-*N*-nitrosourea, *N*-**[*methyl*-^{3}H]-
NEC-702	**Nitrosodiethylamine, *N*-**[*ethyl*-1-^{14}C]-
NEC-631	**Nitrosodimethylamine, *N*-**[*methyl*-^{14}C]-
NET-527	**Nitroso-di-*n*-propylamine, *N*-**[2,3-^{3}H]-
NEC-703	**Nitrosoethylmethylamine, *N*-**[*ethyl*-1-^{14}C]-
NEC-701	**Nitrosonornicotine, *N'*-**[*pyrrolidine*-2-^{14}C]-
NEC-698	**Nitrosopiperidine, *N*-**[2,6-^{14}C]-
NET-526	**Nitrosopiperidine, *N*-**[3,4-^{3}H]-
NET-525	**Nitrosoproline, *N*-**[3,4-^{3}H(N)]-
NEC-697	**Nitrosopyrrolidine, *N*-**[2,5-^{14}C]-
NET-524	**Nitrosopyrrolidine, *N*-**[3,4-^{3}H]-

Caution: Not for use in humans or clinical diagnosis.

NEN New England Nuclear

549 Albany Street, Boston, Massachusetts 02118
Customer Service 617-482-9595

Canada: NEN Canada Ltd., 2453 46th Avenue, Lachine, Quebec, H7T 3C9, Tel: 514-636-4971, Telex: 05-821808
Europe: NEN Chemicals GmbH, D-6072 Dreieichenhain, W. Germany, Daimlerstrasse 23, Postfach 1240. Tel: (06103) 85034.

Circle No. 104 on Readers' Service Card

tear sheets to those who ask for them until supplies run out.)

We hope we are taking the best course that is allowed by a number of different, changing, and sometimes conflicting pressures.—EDS.

New York Bight Project

The Marine EcoSystems Analysis (MESA) Program of the National Oceanic and Atmospheric Administration is establishing a panel to designate the 20 or so most serious chemical contaminants (or classes of contaminants) in the New York Bight and to rank these contaminants, on the basis of current information, according to their existing or projected threat. Emphasis will be placed on adapting existing ranking schemes or devising a new one for coastal marine ecosystems, in general, and for the New York Bight, in particular.

Information is being sought by the panel from all possible sources to guide its study. Reports on recent work dealing with ideas or approaches, as well as applicable data, would be of great assistance. Published reports will be readily utilized. However, the panel would also appreciate knowing about unpublished work. Reports describing such work can be sent to the undersigned for transmittal to the panel.

HAROLD M. STANFORD
JOEL S. O'CONNOR
MESA New York Bight Project,
State University of New York,
Stony Brook 11794

"Petroleum Plants"

The Research News article of 1 October (p. 46) by Thomas H. Maugh II on the possibility of growing some little-known species of plants to produce a substitute for petroleum is interesting and may prove to be significant. By all means, let us explore and test new and untried methods and approaches to supplying our energy needs.

But let us not neglect or downgrade proven, economically practical paths to the same end. The existing forests of the United States can be made to produce vastly more wood than they now do. After setting aside liberal acreages for conservation, recreation, watershed, wilderness, and other forest uses and for outputs other than wood, there still remain many millions of acres of highly productive forests, from which wood, especially softwoods, can be produced as cheaply and as permanently as anywhere in the world. In my judgment, the gap between what is and what might be is wider for timber than for any other natural resource in the United States today. In a recent report (*1*), the National Research Council estimated that the annual production of wood could be doubled in this country.

Direct conversion of this wood into energy is not necessary, and probably not economical. But the export market for United States wood products—notably paper and notably to the developed countries of the world—is growing rapidly and will almost surely continue to grow. Exported wood produces foreign exchange, with which we can buy oil; thus indirectly wood can supply needed energy. Everyone genuinely interested in energy supply at the least environmental cost should focus his or her attention on the potentials of our forests.

MARION CLAWSON
Resources for the Future,
1755 Massachusetts Avenue, NW,
Washington, D.C. 20036

References

1. Committee on Renewable Resources for Industrial Materials, Board of Agriculture and Renewable Resources, Commission on National Resources, *Renewable Resources for Industrial Materials* (National Academy of Sciences–National Research Council, Washington, D.C., 1976).

Maugh reports on the proposal of Melvin Calvin that plants in the genus *Euphorbia* be grown to produce a hydrocarbon substance similar to gasoline. Calvin need not look far for *Euphorbia tirucalli*. It has been grown in California for many years as an ornamental, "in any soil, irrigated or not, requiring no attention whatever" (*1*). Unfortunately it is common in south Florida, where it is not infrequently a cause of acute injury, especially severe keratoconjunctivitis when the sap has come into contact with an eye (*2*).

Both *Euphorbia tirucalli*, the pencil tree or spurge tree, and *Euphorbia lathyris*, the caper spurge, are noted for the acridity of their milky sap. Exploitation of these species as sources of energy might expose workers to serious hazards in harvesting, transporting, and crushing operations.

JULIA F. MORTON
Morton Collectanea,
University of Miami,
Coral Gables, Florida 33124

References

1. R. S. Hoyt, *Check Lists for Ornamental Plants of Subtropical Regions* (Livingston, San Diego, Calif., 1958), p. 295.
2. J. F. Morton, *Plants Poisonous to People in Florida and Other Warm Areas* (Trend House, Tampa, Fla., 1971), pp. 70–72; J. I. Crowder and R. R. Sexton, *Arch. Ophthalmol.* **72**, 476 (1964).

SAFETY INFORMATION

How to minimize the danger of laboratory chemical spills.

Now a totally new way to protect against serious hazards.

How serious is the problem of chemical spills?

Current data indicate that, in laboratories using chemicals, 30% of the *serious* injuries result from spills of hazardous chemicals.

But we *have* been coping with spills.

Yes, but obviously not without serious hazard. To cope with a spill safely, one needs information, materials, a cool head, and skillful hands. Inevitably, the response to a spill is a hurried improvisation, sometimes skillful, sometimes not. And the necessary materials are usually just not available. Most importantly, a panic response to a chemical spill can itself often lead to injuries.

Specifically, what's wrong with the usual remedies, home or otherwise?

We've carefully analyzed the common approaches to spill control and have found many major, potentially hazardous inadequacies. Each of the usual remedies suffers from one or more of the following problems. *Acid spills:* insufficient neutralization (or none at all); no indicator; no control over amount of heat generated; no cleanup or disposal equipment. *Caustic spills:* spill absorbed, not neutralized; no cleanup or disposal equipment. *Flammable solvent spills:* solvent absorbed and still flammable; increased fire and explosion hazards by increasing amount of solvent in air; no cleanup or disposal equipment. *Mercury spills:* no provision for microdroplet *or* large droplet pickup; no provision for absorbing mercury vapor. *Cyanide spills:* ineffective; potentially very dangerous; no cleanup or disposal equipment. *Hydrofluoric acid spills:* Fluoride ion ineffectively neutralized; no cleanup or disposal equipment,

How can these risks be minimized?

J.T. Baker has now developed a totally new system that provides a "programmed" response plus all the materials needed to control the common dangerous spills outlined above. This system is a Spill Control Center that typically hangs on the laboratory wall like a fire extinguisher, fire blanket, or first aid kit.

PATENTS PENDING

What's in the Spill Control Center?

The Spill Control Center can contain any combination of six separate spill cleanup kits for the management of these most common laboratory chemical spills: acid, caustic, flammable solvent, mercury, cyanide, and hydrofluoric acid. Each kit is a complete unit for coping with a spill, e.g.: neutralizing agents, safety equipment, cleanup and disposal equipment, and instructions. Totally self-contained.

What principles governed the design of these kits?

The criteria for these kits included the following: (1) Must be based on sound chemical and physical principles, (2) Must provide necessary materials promptly, (3) Must be complete and self-contained, (4) Must have unambiguous, easy-to-understand instructions to systematize response, (5) Must not introduce hazards, and, finally, (6) Must allow for safe disposal. These kits effectively meet these stringent criteria and this proven system is in place and in use in major industrial, governmental, and academic laboratories.

How about price?

It depends upon the specific makeup of Centers chosen. In any case, it's very inexpensive when balanced against the cost of disabling injuries and property damage which might be avoided.

How do I order the Spill Control Center?

Just contact your nearby J.T. Baker distributor. (For a distributor list, write to address below.)

I'd like more information.

Write or call Baker now. Super Service assures next day shipment even if your dealer is temporarily out of stock.

Chemical spills... no time for improvising.

J.T.Baker® CHEMICALS

J.T. Baker Chemical Company
Phillipsburg, New Jersey 08865
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Circle No. 6 on Readers' Service Card

12 November 1976, Volume 194, Number 4266 SCIENCE

Oil and the World's Future

During the period 1960 to 1973 oil became the principal energy source of the developed and many of the less developed countries. Unlimited amounts of inexpensive energy permitted more than a decade of unprecedented rapid annual increases in gross national products (GNP's). This era ended abruptly in 1973 and 1974 with the quadrupling of the price of oil. The world faces a long period of adjustment, including relative economic stagnation and unpleasant developments affecting the world's financial structure. Thus far the United States has been relatively unscathed and has lulled others into inactivity while preparing the way for further price increases by expanding its imports of oil.

After World War II imported oil came to have an increasing role in the energy balances of major countries. The trend accelerated after 1960. From 1960 to 1973, oil imports of many countries rose at fast exponential rates; some of the average annual increases were: France, 12.8 percent; Germany, 13.2; Italy, 12.5; Japan, 18.1; and Spain, 15.1. Between 1960 and 1972, Europe's dependence on energy imports of all kinds grew from 33 to 65 percent; Japan's from 43 to 90 percent.

Annual increases of this magnitude could not be sustained even if the oil producers were complacent. Sooner or later a sharp slowing of rate of expansion was inevitable; the arithmetic of exponentials dictated it. Given full exploitation, the maximum output attainable by the Organization of Petroleum Exporting Countries (OPEC)—and that for only a short period—is of the order of 90 million barrels (13 million tons) a day. In 1973, output was about 30 million barrels a day. Nine years of a 12 percent or 11 years of a 10 percent increase would have brought the Western world to the downhill road with respect to oil.

The 1973–1974 and subsequent price increases for oil will probably prove most deleterious to a group of developing countries having a total population of 900 million and GNP's of $200 and more per capita. Some of these countries, such as Brazil, were rapidly increasing their use of cheap oil and experiencing annual growth of GNP in the neighborhood of 10 percent. During the past 3 years growth has slowed in some and stopped in others, while their total current account deficits have increased from $6 billion in 1973 to $31 billion in 1975. Much of the debt is owed to private investors, including U.S. banks. How long can such deficits be increased before credit worthiness is destroyed? What happens then?

The advanced countries are engaged in tough competition to sell enough goods to pay for their oil. In the competition, France, Italy, and the United Kingdom have not fared well. The two champions have been Germany and Japan. The United States, which has been losing its position in high-technology goods, has stayed in the game by selling agricultural products and military weapons. But even so, this year it has incurred a big deficit in its balance of payments.

All in all, the performance of the United States has been mediocre and its credibility in energy matters is questionable. The highest government officials have made great promises to the world that have proved repeatedly to be only idle words. A conspicuous example was "Project Independence." In addition, there was talk of the impending collapse of the OPEC cartel, statements about the enormous amounts of oil to be discovered and produced by 1985, a goal of reducing oil imports by 1 million barrels per day (in the past year they have increased by more than that). Instead of working for conservation, Congress encouraged consumption by rolling back the price of oil. The United States has engineered an international agreement to share oil in an emergency, but it is the one major country with the smallest ratio of inventory over daily consumption. Legislation was passed to establish a strategic reserve of oil, but not one barrel has been stored. Neither by deed nor by example has the United States provided the world with any alternative but to go nuclear.—PHILIP H. ABELSON

Do it all with a UA-5

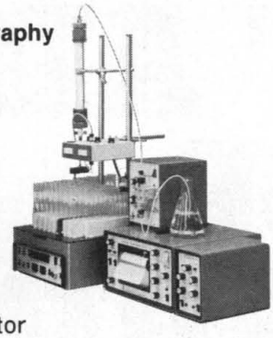
Do it all

Primarily, the UA-5 is a sensitive and stable multi-wavelength detector for conventional and high performance LC. But if you're a life scientist, it's much more than that - it's the key part of an integrated system, able to perform many functions in your lab.

Even if you don't need the other applications today, remember a UA-5 is still the best all-around column monitor, and it costs no more than single-purpose LC monitors. If you have a UA-5 now, you can always add the electrophoresis and other accessories when you need them. Send for an ISCO catalog, and see how you can do it all. We'll even enclose a **DO IT ALL** button to give your lab coat some class.

Do it all

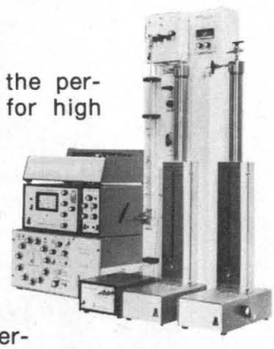
Open Column Liquid Chromatography



The UA-5 has the wide absorbance ranges, easy-to-use flow cells, and cold room reliability important for conventional chromatography. It operates at 13 wavelengths from 254 nm to 660 nm (two at a time), has a built-in 10 cm recorder, automatic scale expansion, and the exclusive ISCO Peak Separator which deposits different peaks into corresponding test tubes of an ISCO fraction collector. To satisfy your specific LC requirements, ISCO also makes a variety of pumps, columns and accessories.

Do it all

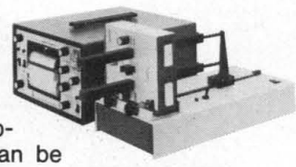
HPLC



The UA-5 delivers the performance you need for high performance LC. It is capable of recording at 0.005 Abs full scale; drift seldom exceeds 0.0002 Abs/hr; and the time constant (time for 63% response) is typically less than 1/4 second. 2 mm, 5 mm, or 10 mm high pressure micro flow cells can be easily interchanged. Linearity (photometric accuracy) is an important specification often exaggerated or omitted by others because it is hard to check. We specify 1% maximum error, but it's typically less than 1/2%.

Do it all

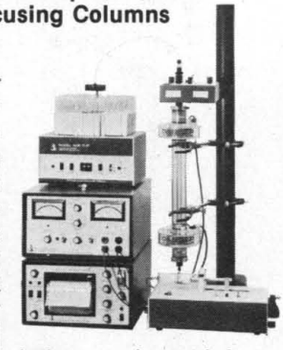
Gel Scanning



A low cost accessory turns the UA-5 into a dual beam gel scanner. Gels electrophoresed in quartz tubes can be UV-scanned during separation. After electrophoresis, they may be stained and scanned at visible wavelengths with sensitivity and resolution comparable to popular gel-scanning spectrophotometers. Isoelectrically focused gels may be simultaneously scanned with a blank to remove background ampholyte absorbance.

Do it all

Density Gradient Electrophoresis and Isoelectric Focusing Columns

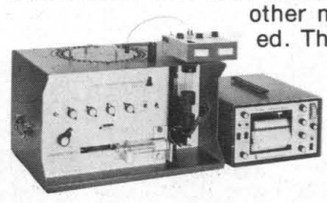


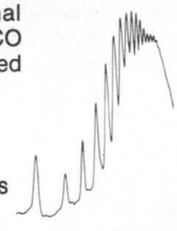
The UA-5 mounts right on the electrophoresis column, periodically scanning the gradient as it is passed through a 1cm bore cell. Repeated scanning is an important advantage for isoelectric focusing: the curves tell you what's happening in the column, and provide a separation history useful for identifying components and distinguishing them from ampholyte and precipitate peaks. You can even run preparative gels in the same column with a simple accessory, and of course the UA-5 will also monitor eluents from the UltraPhor® or other preparative electrophoresis apparatus.

Do it all

Scanning Centrifuged Density Gradients

With an accessory gradient fractionator, the UA-5 produces a continuous profile of the centrifuged gradient as it is automatically fractionated into test tubes. Zones undetectable by other methods are easily resolved. The gradient is carried in bulk flow through a large bore cell, a configuration demonstrated to provide superior resolution, location, and quantitation of peaks than can be obtained by any other apparatus. Zonal rotors can be fractionated with an ISCO fraction collector and the UA-5 equipped with a special zonal rotor flow cell.

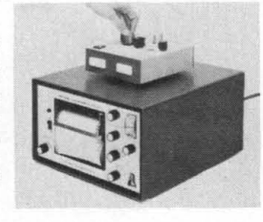




This scan shows 16 pea polyribosomes separated on a 5 ml gradient.

Do it all

Absorbance Recording of Stationary Samples



Drop-in cuvettes allow recording of many reactions and take the load off your spectrophotometer for many routine jobs. You'll find it really handy for enzyme assays.

Let the UA-5 do it all for you.

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FIRST AID FOR YOUR SYRINGE

If you have a sick syringe, let us fix it up as good as new. Whatever your problem... a bent plunger, a broken needle, worn Teflon tips, or in some cases broken glass barrels... we can probably repair your syringe and recondition it for a lot less than the cost of a new syringe.

Just send us your syringe. We'll inspect it to determine the extent of repair necessary to bring it back to "first class" working order. If you'd like, you may request a quotation before we start the work. But, just for a rough idea, here are some typical repair costs: a new plunger for a 700 syringe –$6.00, a new needle for a 700 syringe – $6.00, a new plunger wire for a 7000 syringe – $2.50.

And, there are several repairs you can make in the field. The repair parts are listed in our catalog.

You can also get a Needle Cleaning Kit with special wires and cleaning solution to keep the inside of your needles clean, insuring their accuracy and prolonging the life of your syringe. The kit has 50 pieces of tungsten wire, 70 cc of concentrated cleaning solution, complete instructions, and sells for only $21.00.

If you want to have us restore your damaged syringe, just send it to Repair Department, Hamilton Company, P.O. Box 10030, Reno, Nevada 89510 (via parcel post) or 4960 Energy Way, Reno, Nevada 89510 (via UPS or other surface or air freight). Please indicate if a quotation is required. Syringes contaminated by radioactive materials, infectious agents, or other materials constituting a health hazard to our employees may not be returned.

Who knows, maybe a 50¢ Teflon ferrule will bring your precision back to life, or $2.50 plunger wire for your 7000 syringe will make it work like new again, or we can refit a new plunger to your 700 syringe barrel for only $6.00. It's worth a try.

HAMILTON

REPAIR SERVICE

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Membrane Filter

The Ultra Filtration System will accommodate any of the smaller sizes of Spectrapor membranes or ordinary dialysis tubing available. The lower end of a tube is closed with a small Spectrapor closure and the upper end is slipped over a glass funnel extension. A vacuum source of up to 150 millimeters of mercury is then adequate. Each system comes with 10 meters of 10-millimeter flat-width tubing and two closures. Spectrum Medical Industries. Circle 678.

Petri Dish Filler

The Tecnomat can fill up to 700 dishes per hour with an average of 15 milliliters of medium per dish. If a smaller tube is used, up to 1200 dishes may be filled in an hour with as little as 1 milliliter per dish. Ultraviolet radiation maintains sterility during filling. The Stacomat feeds dishes from the filler to a receiving table. The table will accommodate up to 20 stacks of dishes. The filler and stacker are automated but they may be operated manually as for checking quantity or quality. The two devices will fill and stack conventional disposable petri dishes. Manostat. Circle 741.

Safety Goggles

A new type of eye protection eliminates the "blue haze" effect of long-wavelength ultraviolet light. This tends to reduce fatigue. Transmission of light in the range of 254 to 365 nanometers is less than 10^{-5} with the UVC-503 safety goggle. Ultra-Violet Products. Circle 742.

Newly offered instrumentation, apparatus, and laboratory materials of interest to researchers in all disciplines in academic, industrial, and government organizations are featured in this space. Emphasis is given to purpose, chief characteristics, and availability of products and materials. Endorsement by *Science* or AAAS is not implied. Additional information may be obtained from the manufacturers or suppliers named by circling the appropriate number on the Readers' Service Card (on pages 674A and 754A) and placing it in the mailbox. Postage is free.

—RICHARD G. SOMMER

Gel Electrophoresis Apparatus

A system is available with a horizontal configuration that facilitates well forming and sample application and renders the gel more stable. A greater range of gel concentrations may be employed without risk of slippage or collapse of the gel matrix. The migration chamber is a 160 by 160 millimeter plate with a 12-millimeter wall on its perimeter. The gel slab may be poured to any thickness up to 10 millimeters. Water flow through a channeled plate below the slab controls the temperature. The chamber is removable for cleaning. Ten uniformly spaced wells, 10 by 3 millimeters, are made by a well former which is removed once the gel solidifies. No capping gel is required and the sample is not in direct contact with buffer. Dickinson Instrument. Circle 666.

Chromatography Timer

A new timer allows liquid chromatographs to switch buffers or solvents at selected intervals between two, three, or four developing solvents. Timing changes are made with switches. Four independent outputs, usually controlling a motor-driven valve positioner, are activated sequentially. Three different timing intervals are set with a thumb wheel and there is a manual reset from position four to position one. The timing device is adaptable to various chromatographic setups. Hamilton. Circle 743.

Pipetting Mouthpiece

SAFE is a device that eliminates hazards of mouth pipetting. A barrier allows passage of air but blocks passage of the liquid being transferred. The protective component is a center disk that contains a microporous membrane. The membrane is a submicron hydrophobic, 0.2-micrometer filter made of an acrylic copolymer reinforced with nylon. Gelman Instrument. Circle 665.

Anaerobic Chamber

A compact chamber is equipped with comfortable, airtight sleeves which seal around the operator's arms to prevent oxygen from entering the chamber. Pressure control is automatic, but the operator can alter it. This eliminates the tendency to "fight back." The chamber is made of clear acrylic to facilitate visibility. The design allows the use of plates or tubes. Material may be introduced to the chamber through a pass box with a 50-plate capacity (large enough for a test-tube rack) or by means of an adaptor to a Gas Pak jar. Optional equipment includes an incubator. Clinical Analysis Products. Circle 667.

Electron Microscope

The H-700 is a 200-kilovolt transmission electron microscope with a resolution of 2.8 angstroms (crystal lattice). Accelerating voltages range from 75 to 200 kilovolts in five steps. Magnification ranges from 200 to 300,000 power and a patented zoom lens maintains focus when magnification is changed. An optional range of 50 to 2000 power may be selected. The objective lens yoke accepts either top- or side-entry specimen stages. Features include a beam-detecting exposure meter, an automatic camera system, a pneumatically driven specimen holder, and an automated evacuation system. Accessories will convert the H-700 to a scanning or scanning-transmission microscope and will adapt the device for x-ray analysis. Hitachi/Perkin-Elmer. Circle 668.

Freeze Drier

A miniature freeze drier is available for small quantities of fluid. The drier will accommodate either 50 or 10 milliliters in vials in a spinner assembly. There is also a carrier for standard ampoules that measure 12 to 7.5 millimeters in diameter by 200 millimeters long. The drier includes two carriers, a cold trap, and a desiccant tray. The ampoule spinner assembly is optional. Variable Volumetrics. Circle 677.

Sulfur Analyzer

The SA285 sulfur analyzer features a flame photometric detector with a lower limit of 0.5 parts per billion. There are four sensitivity ranges: 0 to 50, 0 to 100, 0 to 500, and 0 to 1000 parts per billion.

Available scrubbers make the device specific for sulfur dioxide, hydrogen sulfide, or reduced sulfur compounds. Rise and fall times are less than 30 seconds. Outputs for recorders make the device as useful for unattended monitoring as for research purposes. Meloy Laboratories. Circle 669.

Homogenizer for Soft Specimens

The Potter S is a self-monitoring Potter-Elvehjem homogenizer that gently disintegrates soft specimens. Speed of rotation is monitored electronically and it adjusts automatically to compensate for drag on the pestle. Overload conditions are flagged. Speed of rotation may be varied from 150 to 1500 revolutions per minute. Pestles are available for vessels of 5-, 15-, 30-, and 60-milliliter capacities. The device is compatible with automatic temperature regulators. B. Braun Instruments. Circle 670.

Literature

Data Acquisition and Control Systems are described in an illustrated 16-page brochure. Everything from computers to connectors is included. Data General. Circle 671.

Soluble Coal is devoted to a new product with a low sulfur and ash content. Polygulf Associates. Circle 672.

Spectrum Analysis includes design and operational features of a complete line of spectrum analyzers. Ailtech/Cutler-Hammer. Circle 673.

Mini and Microcomputer Bargains lists used hardware for data processing for sale, trade, or lease. Newman Computer Exchange. Circle 674.

Scanning Microdensitometer is devoted to the Scandig 3, a high-speed, computer-controlled image analysis system. Marco Scientific. Circle 675.

Dissolved Oxygen Probe features an oxygen probe for use with any *p*H meter. Extech International. Circle 676.

Gas Chromatographs describes the 3700 Series of dual column devices. Varian Instrument Division. Circle 678.

The 360/370 Plotting System introduces an electrostatic plotting device including hardware and software. Versatec. Circle 679.

Vortecnology Applications Notes describes uses of vortex tubes and airflow amplifiers. Vortec. Circle 680.

The Application of Filters to Analog and Digital Signal Processing is a 24-page illustrated handbook. Rockland Systems. Circle 681.

RESEARCH NEWS

(Continued from page 714)

12 patients at least did not progress; that of three patients showed definite improvement; and that of two additional patients may have improved.

This was not a controlled study but the NHLBI is now sponsoring a more extensive clinical trial, involving several clinical centers, to confirm that the surgical technique can cause improvement of atherosclerotic lesions in patients with coronary artery disease. The trial will ultimately include 1000 patients; 500 will undergo the surgery and 500 will be treated conventionally.

A sensitive technique for observing what is happening within the arteries before atherosclerotic lesions become large enough to actually block the vessels and cause symptoms could help to provide information about whether or not early lesions will regress. David Blankenhorn and his colleagues at the University of Southern California have applied computer technology originally developed for analysis of photographic images taken by spacecraft to the analysis of angiograms of the femoral artery of the thigh. With their technique they can visualize the plaques and determine whether they change in size over a period of time.

The investigators have performed a series of angiograms on 25 men who have high concentrations of lipids, including cholesterol, in their blood. Before therapy to reduce the blood lipids and also high blood pressure, where required, the men all had moderately severe atherosclerosis of the femoral artery but did not yet have symptoms of obstruction. Blankenhorn is using a variety of drug and diet therapies on the men. After 13 months of treatment, nine of the 25 patients experienced regression of the lesions, whereas the lesions of 13 got worse and those of three did not change.

Blankenhorn says that the patients whose lesions regressed showed significant declines in blood cholesterol concentration; these decreases did not occur in individuals whose disease progressed. Statistical analysis of the data indicated that decreases in blood pressure made an independent contribution to the rate of change of the atherosclerosis, with a decrease favoring regression. Blankenhorn thinks that the changes in the femoral artery are representative of those that may occur in early lesions of the coronary arteries, but confirmation of this hypothesis will require the development of a similar technique for examining the coronary arteries.—JEAN L. MARX

BOOKS RECEIVED

(Continued from page 718)

A Conference on Key Factor Analysis. A Logic Leading to Social Accountability. Papers from a conference. Irwin M. Jarett and Patricia A. Brady, Eds. Published for the Illinois Regional Medical Program and the Southern Illinois University School of Medicine by Southern Illinois University Press, Carbondale, and Feffer and Simons, London, 1976. xii, 438 pp. Cloth, $10; paper, $4.95.

Contributions to Anthropology. Selected Papers of A. Irving Hallowell. With introductions by Raymond D. Fogelson and five others. University of Chicago Press, Chicago, 1976. xviii, 534 pp. $24.

Controversies in American Voting Behavior. Richard G. Niemi and Herbert F. Weisberg, Eds. Freeman, San Francisco, 1976. xvi, 544 pp., illus. Cloth, $12.95; paper, $6.95.

Electron-Solvent and Anion-Solvent Interactions. Larry Kevan and Brian C. Webster, Eds. Elsevier, New York, 1976, xiv, 360 pp., illus. $57.50.

Elementary Heat Transfer Analysis. Stephen Whitaker. Pergamon, New York, 1976. xviii, 370 pp., illus. Paper, $22.50. Pergamon Unified Engineering Series. Pergamon International Library.

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Encyclopedia of Chemical Processing and Design. Vol. 1, Abrasives to Acrylonitrile. John J. McKetta and William A. Cunningham, Eds. Dekker, New York. xvi, 472 pp., illus. $95.

Energy and Conflict. The Life and Times of Edward Teller. Stanley A. Blumberg and Gwinn Owens. Putnam, New York. 1976. xviii, 492 pp. + plates. $9.95.

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Eye Color, Sex, and Children's Behavior. A. L. Gary and John Glover. Nelson-Hall, Chicago, 1976. xiv, 172 pp., illus. $10.

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Flora of Guatemala. Dorothy L. Nash and Louis O. Williams. Field Museum of Natural History, Chicago, 1976. x, 604 pp., illus. Paper, $18. Fieldiana: Botany, vol. 24, part. 12.

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Advances in Psychobiology. Vol. 3. Austin H. Riesen and Richard F. Thompson, Eds. Wiley-Interscience, New York, 1976. xx, 490 pp., illus. $15.95. *To order this book Circle No. 351 on Readers' Service Card*

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Control Systems of Variable Structure. U. Itkis. Halsted (Wiley), New York, and Israel Universities Press, Jerusalem, 1976. x, 214 pp., illus. $29.50. *To order this book Circle No. 354 on Readers' Service Card*

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The Determination of Sulphur-Containing Groups. Vol. 2, Analytical Methods for Thiol Groups. M. R. F. Ashworth. Academic Press, New York, 1976. xii, 288 pp., illus. $21.50. The Analysis of Organic Materials, No. 2. *To order this book Circle No. 357 on Readers' Service Card*

Dynamics of Gas-Surface Scattering. Frank O. Goodman and Harold Y. Wachman. Academic Press, New York, 1976. xxiv, 328 pp., illus. $29.50. *To order this book Circle No. 358 on Readers' Service Card*

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Facets of Hydrology. John C. Rodda, Ed. Wiley-Interscience, New York, 1976. xvi, 368 pp., illus. $39.50. *To order this book Circle No. 360 on Readers' Service Card*

The Filamentous Fungi. Vol. 2, Biosynthesis and Metabolism. John E. Smith and David R. Berry, Eds. Halsted (Wiley), New York, 1976. xiv, 520 pp., illus. $47.50. *To order this book Circle No. 361 on Readers' Service Card*

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