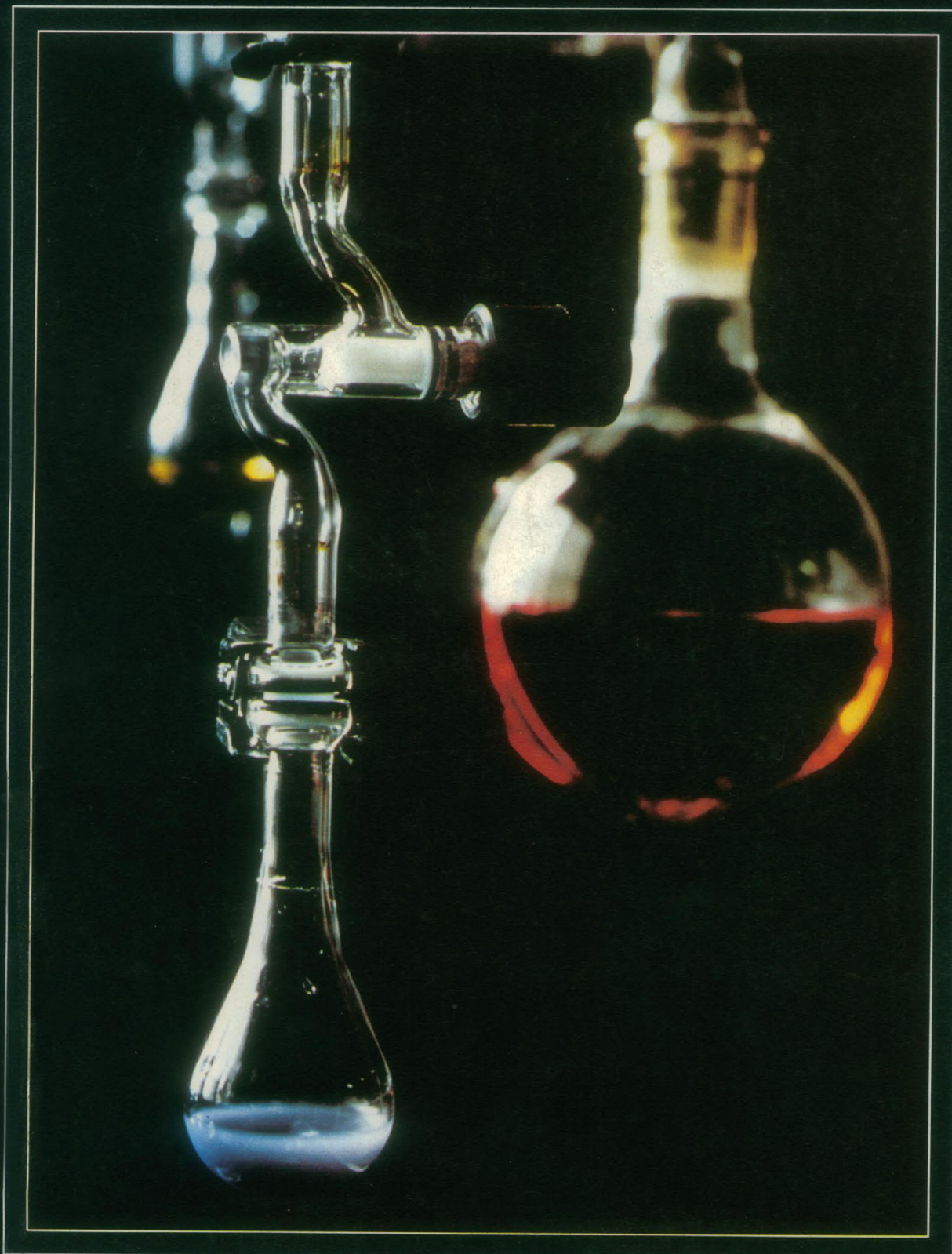


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# SCIENCE





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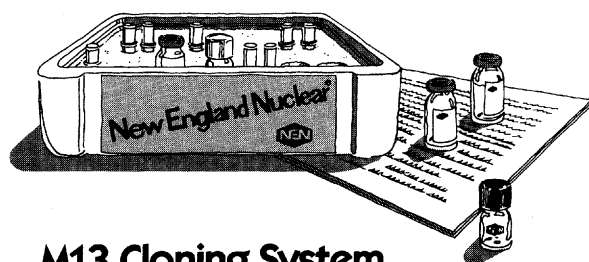
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## COVER

Inert atmosphere apparatus used for the synthesis of thorium and uranium organometallic compounds. See page 989. [Jackie Kalmes, Department of Chemistry, Northwestern University, Evanston, Illinois 60201]

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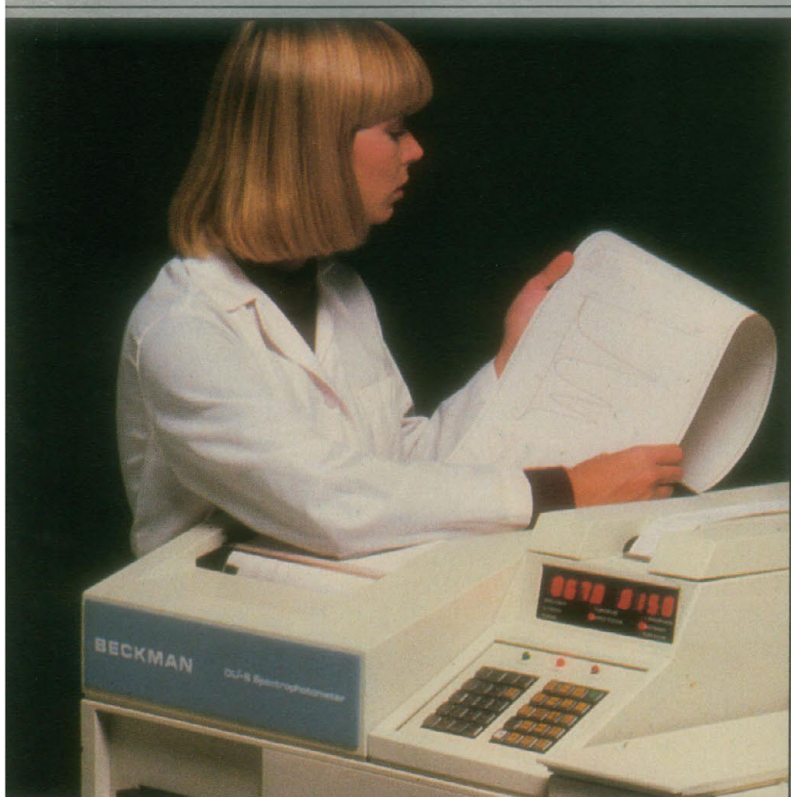
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## The new MICRO-ISOLATOR™ System:

**A remarkably simple caging system that has the microbiological integrity of a complex isolator...**

**without its high cost or the awkward limitations on the movement of people and animals.**

### What's different about the MICRO-ISOLATOR System?

At first glance, it looks as though we've just put a polycarbonate cage on top of a standard mouse cage with the "roof" of the top cage vented. Right... but there's more. The recessed roof functions as a static filter by virtue of a special filter material that's protected by a perforated aluminum sheet. And, most importantly, the top cage overlaps the bottom cage and effectively forms a giant Petri dish-like structure. Result: There is a substantial interchange of gases and an effective microbiological barrier.

### How effective is all this?

This system, when incorporated into most existing facilities (with only minor facility modification), can maintain axenic mice in the gnotobiotic state. The static filter and the cage overlapping effectively keep dust particles—which are the "microbiological taxis"—out of the system. Accordingly, this is really a miniature isolator, an "island," a protected microenvironment within any macroenvironment.

Does it really work? Even immune-suppressed mice have been successfully maintained in this system adjacent to mice contaminated with *Pseudomonas*, *Pasteurella*, *Citrobacter*, *Aerobacter*, *Klebsiella*, and *Staphylococcus aureus* without any transfer of organisms.

### What are the applications of the MICRO-ISOLATOR System?

It's ideal for the maintenance of a stable limited defined-flora mouse colony... for either animal production or research. It is also a first-rate quarantine housing system because animals from different sources with differing microbiological profiles can be quarantined in the same room without cross-contamination. (The barrier works in both directions: keeps contaminants in or out.)

### What are the other advantages?

This caging system is rigid, durable, easy to handle, uses minimal rack space, is easy to sterilize, and because the top fits snugly on a standard 29.2 x 19 x 12.7 cm mouse cage, it doesn't dislodge when cages are pushed together (the way other filter caps sometimes do).

The system eliminates the expense and inconvenience of starting or maintaining a complex SPF barrier type facility. Simple, inexpensive, and no time-consuming "entry" procedures.

Finally, the colony odor is significantly minimized; allergic responses are substantially reduced through containment of animal dander.



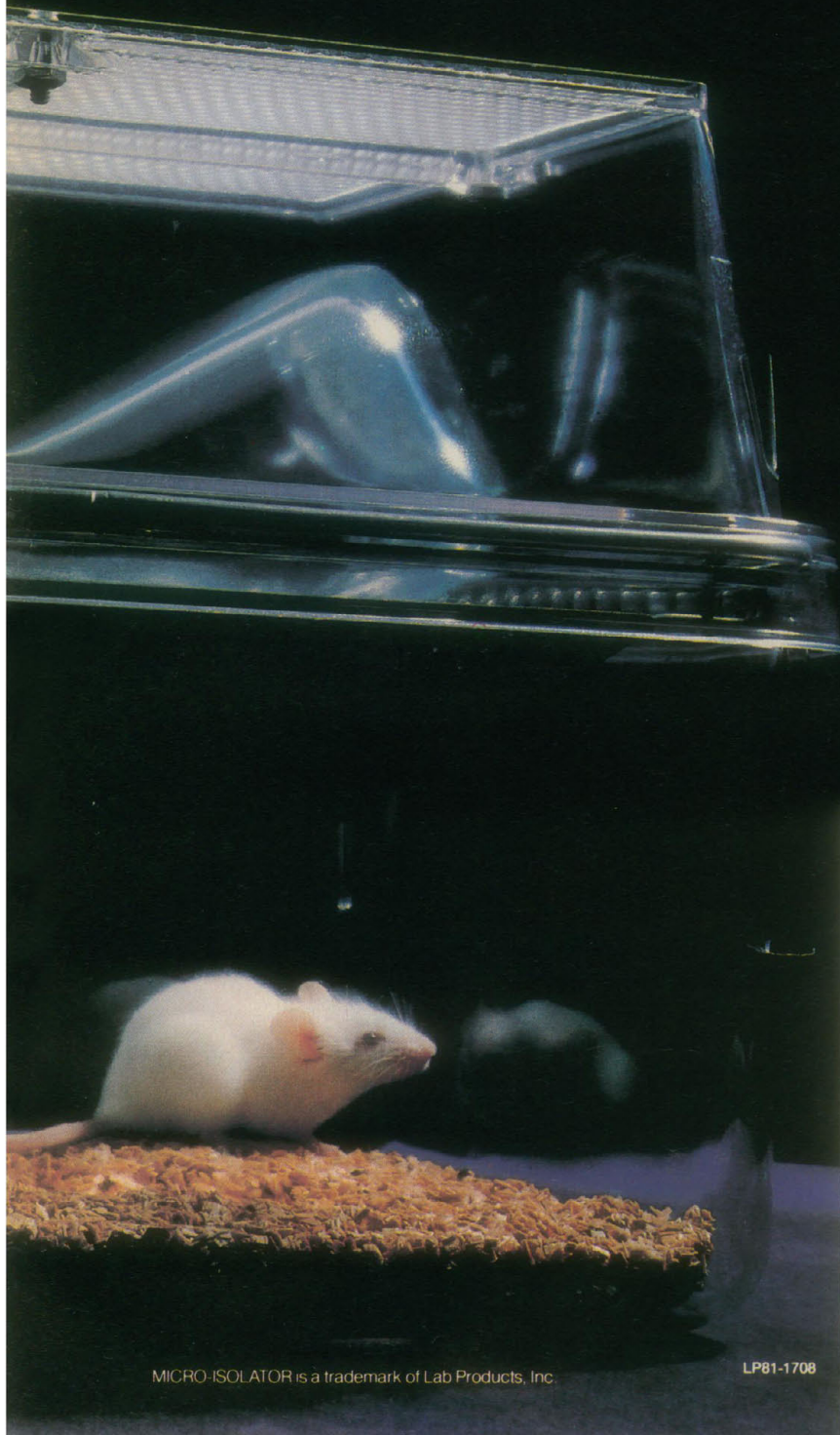


## But is the air interchange really adequate?

Institutions now using this system report that hypoxia is not a problem. Additionally, ammonia level is not a problem if the population density per cage is kept at three to four mice and bedding changed every three or four days... especially when relative humidity can not be well controlled. (Ammonia can be totally eliminated from the colony if defined-flora mice without urease-positive aerobic bacteria are used.)

## What else do I need to make the MICRO-ISOLATOR System work?

To effectively maintain the isolation of the animals at all times, cages must be opened and serviced within a Class II Biohazard Hood and aseptically supplied with sterile feed, bedding, and water. (For additional guidance on the use of this system, please consult the references below.)



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Lab Products now offers the widest selection of systems for environmental protection: the new MICRO-ISOLATOR System; the VR-1 Ventilated Animal Rack; five Stay-Clean™ laminar flow systems; Isosystem™ housing system consisting of a disposable filter cap, cage cover, and plastic cage; Enviro-Gard™ filter system with permanent filter bonnets; and See-Through™ suspended cage systems with a special filtering system. We are now likely to have at hand solutions to virtually all of your environmental problems.

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To order the new MICRO-ISOLATOR System, please refer to the following catalog number:

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    - 10272—Polycarbonate cage 29.2 x 19 x 12.7 cm
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### References

R. S. Sedlacek, H. D. Suit, K. A. Mason, and E. R. Rose, 7th ICLAS Symp., Utrecht, 1979; Gustav Fischer Verlag, Stuttgart, Germany, 1980; New York, 1980.

See also: abstracts of papers Nos. 32 and 35 of papers presented by R. S. Sedlacek and R. P. Orcutt at 32nd Annual Session AALAS, Salt Lake City, Sept. 20-25, 1981.

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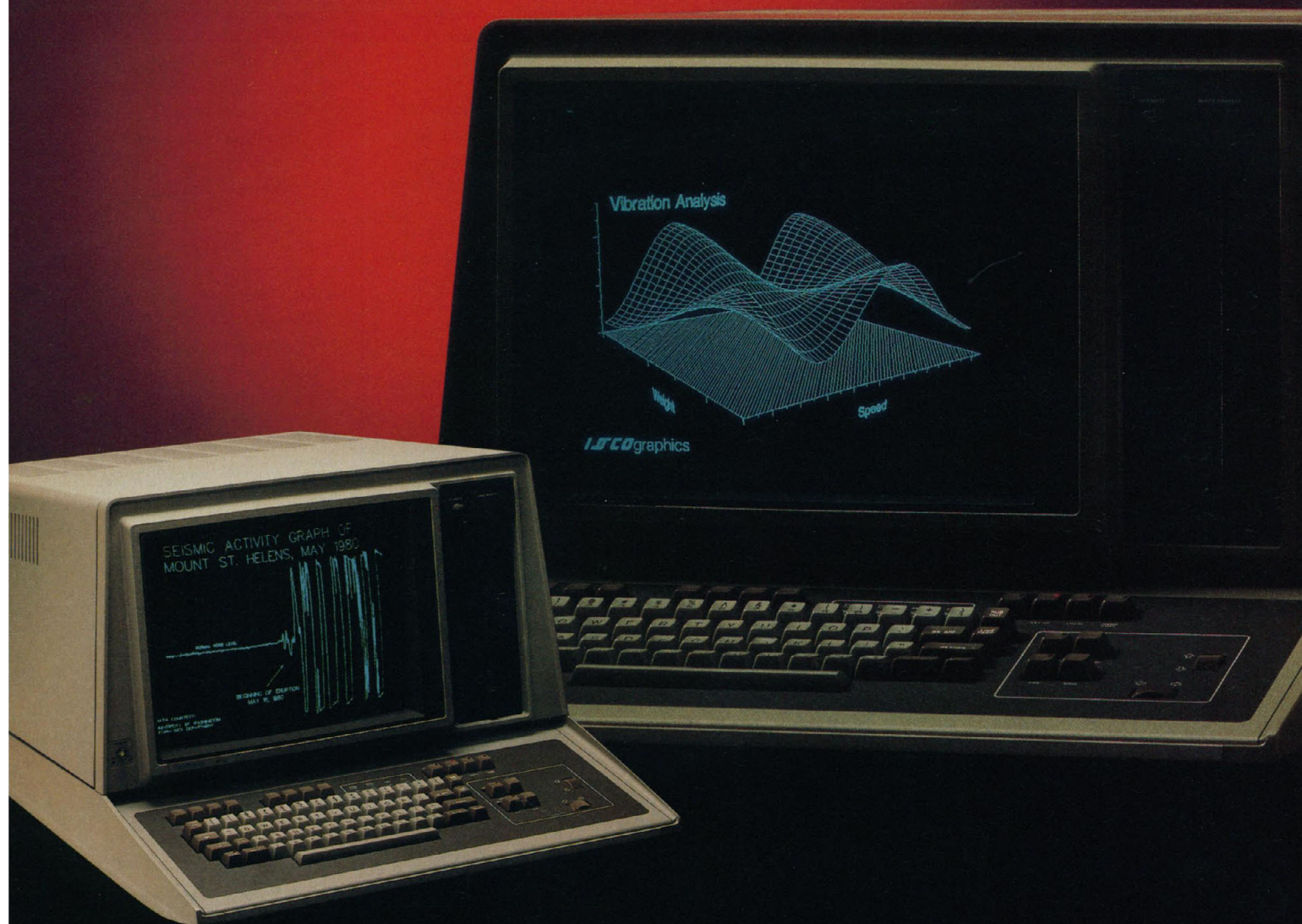
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Readers are invited to submit photos that help the viewer to better see how the world works. Or that stimulate curiosity about those workings. We're

looking for pictures that are not only artful but informative or inquisitive. The subject matter may be as broad as that of science itself—plants and animals, rocks and rivers, planets and people, molecules and machines—everything and anything that scientists study or do. The view may be microscopic, telescopic, or normal. The main thing is that the photograph catch the eye and engage the mind.

First prize in each category will be \$1,000 for color and \$500 for black and white. The winning entries and those awarded honorable mention will be exhibited at the annual meeting of the AAAS in Detroit in May 1983. Winning entries may also be published in the July/August issue of *Science 83*.

*Entries will be judged in three categories:*

1. Life sciences
2. Physical sciences
3. Technology

## Rules:

- Competition is open to everyone except employees of the AAAS and their relatives.
- Competitors may submit no more than five entries. A sequence will be considered one entry.
- Entries may be either black-and-white prints (no larger than eight by ten inches) or color transparencies. Each entry must bear the photographer's name and address. Do not submit glass-mounted entries.
- Complete and enclose the official entry form printed here or a photocopy.
- Include a self-addressed, stamped envelope for the return of your entries.
- Entries must be postmarked no later than

January 15, 1983. Late entries will be returned unopened.

- AAAS assumes no responsibility for photographs entered.
- AAAS reserves the right to publish, exhibit, and use for promotional purposes any winning photographs.

*Send all entries to:*

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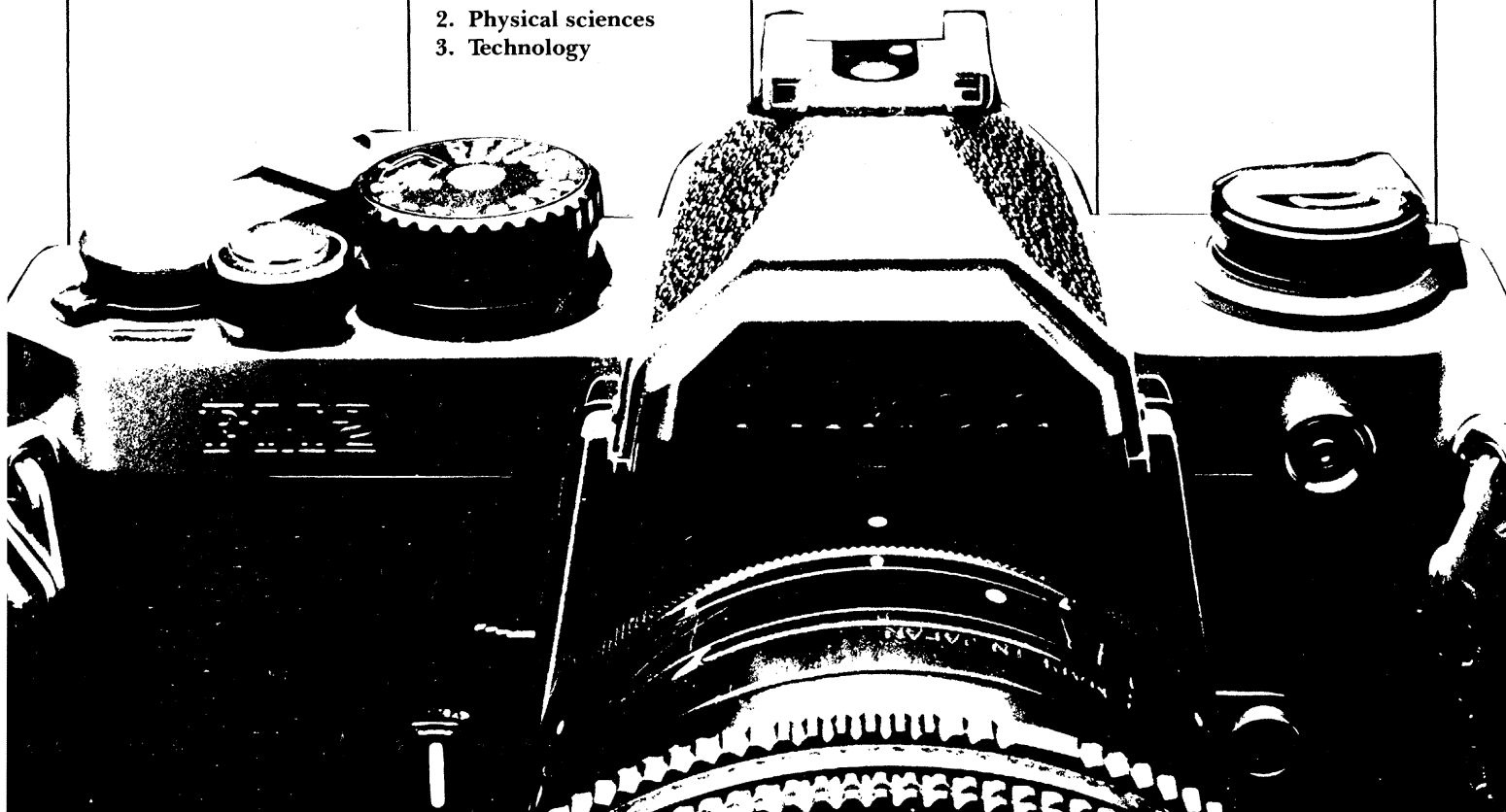
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Category \_\_\_\_\_





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15-(4'-aminobenzyl)-1-carazolol, [125]-  
15-(4'-azidobenzyl)-1-carazolol, [125]-  
Cyclohexyadenosine,  
N<sup>6</sup>-[adenine-2,8-<sup>3</sup>H]-  
Diethyl-8-phenylxanthine,  
1,3-[phenyl-4-<sup>3</sup>H]-  
Methyl-2-phenylethyladenosine,  
L-N<sup>6</sup>-1-[adenine-2,8-<sup>3</sup>H, ethyl-2-<sup>3</sup>H]-  
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## α-ADRENERGIC

Aminoclonidine, p-[3,5-<sup>3</sup>H]-  
Clonidine · HCl, [4-<sup>3</sup>H]-  
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9,10-[9,10-<sup>3</sup>H(N)]-  
WB-4101  
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aminomethyl-1, 4-benzodioxane,  
2-[phenoxy-3-<sup>3</sup>H(N)]-  
Epinephrine, *levo*-[N-methyl-<sup>3</sup>H]- or  
[N-methyl, ring-2,5,6-<sup>3</sup>H]-  
2-[β-(4-Hydroxy-3-iodophenyl)  
ethylaminomethyl] tetralone, [125]-  
Norepinephrine, *levo*-[7,8-<sup>3</sup>H(N)]- or  
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Yohimbine, [methyl-<sup>3</sup>H]-  
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Epinephrine, *levo*-[N-methyl-<sup>3</sup>H]- or  
[N-methyl, ring-2,5,6-<sup>3</sup>H]-  
Hydroxybenzylisoproterenol, p-[7-<sup>3</sup>H]-  
Iodocyanopindolol, [125]-  
Iodohydroxybenzylpindolol, [125]-  
Isoproterenol, DL-[7-<sup>3</sup>H(N)]-  
Norepinephrine, *levo*-[7,8-<sup>3</sup>H(N)]- or  
[ring-2,5,6-<sup>3</sup>H]-  
Propranolol, L-[4-<sup>3</sup>H]-

## ALANINE

Alanine, β-[3-<sup>3</sup>H(N)]-

## ASPARTATE

Aspartic acid, D-[2,3-<sup>3</sup>H]-  
Aspartic acid, L-[2,3-<sup>3</sup>H]-

## BENZODIAZEPINE

Diazepam, [methyl-<sup>3</sup>H]-  
Ethyl β-carboline-3-carboxylate,  
[ethyl-2-<sup>3</sup>H]-  
Flunitrazepam, [methyl-<sup>3</sup>H]-  
Flurazepam, [ethylene-<sup>3</sup>H]-  
Methyl β-carboline-3-carboxylate,  
[methyl-<sup>3</sup>H]-  
Propyl β-carboline-3-carboxylate,  
[propyl-2,3-<sup>3</sup>H]-  
RO5-4864, [N-methyl-<sup>3</sup>H]-  
RO15-1788, [N-methyl-<sup>3</sup>H]-

## CALCIUM

Nitrendipine, [5-methyl-<sup>3</sup>H]-

## CHOLINERGIC

Acetylcholine iodide, [N-methyl-<sup>3</sup>H]-

## Muscarinic

Choline chloride, [methyl-<sup>3</sup>H]-  
Dioxolane, L-(+)-*cis*-[2-methyl-<sup>3</sup>H]-  
Oxotremorine-M acetate, [methyl-<sup>3</sup>H]-  
Propylbenzylcholine mustard,  
[propyl-2,3-<sup>3</sup>H]-  
Quinuclidinyl benzilate,  
L-[benzyl-4,4'-<sup>3</sup>H(N)]-  
Scopolamine methyl chloride,  
[N-methyl-<sup>3</sup>H]-

## Nicotinic

Amino-4-guanidobutane,  
1-[1,2-<sup>3</sup>H(N)]- (Agmatine)  
Bungarotoxin, α-[125]-  
Choline chloride, [methyl-<sup>3</sup>H]-  
Nicotine, DL-[N-methyl-<sup>3</sup>H]-  
Tubocurarine chloride,  
*dextro*-[13-<sup>3</sup>H(N)]-  
Maleimidobenzyltrimethylammonium  
iodide, 4-N-[methyl-<sup>3</sup>H]- (MBTA)

## DOPAMINERGIC

ADTN (Amino-6,7-dihydroxy-  
1,2,3,4-tetrahydronaphthalene, 2-),  
[5,8-<sup>3</sup>H]-  
Apomorphine, L-(-)-[8,9-<sup>3</sup>H]-  
Dihydro-α-ergocryptine,  
9,10-[9,10-<sup>3</sup>H]-  
Dihydroxyphenylethylamine, 3,4-  
[ring-2,5,6-<sup>3</sup>H]-  
Domperidone, [benzene ring-<sup>3</sup>H]-  
Flupenthixol, *cis*-[ring-<sup>3</sup>H]-  
Haloperidol, [3H(G)]-  
Propylorapomorphine, L-(-)-  
[N-propyl-<sup>3</sup>H(N)]-  
Spiperone, [benzene ring-<sup>3</sup>H]-  
Sulpiride, (-)-[methoxy-<sup>3</sup>H]-

## GABA

Aminobutyric acid, γ-[2,3-<sup>3</sup>H(N)]-  
Baclofen, DL-[butyl-4-<sup>3</sup>H(N)]-  
Dihydropicrotoxinin, α-[8,10-<sup>3</sup>H]-  
DMBB, (+)-[butyl-2,3,4-<sup>3</sup>H]-  
DMBB, (-)-[butyl-2,3,4-<sup>3</sup>H]-  
Muscimol, [methylene-<sup>3</sup>H(N)]- or  
[4-<sup>3</sup>H]-  
Nipecotic acid, [ring-<sup>3</sup>H]-  
Piperidine-4-sulfonic acid, [ring-<sup>3</sup>H]-  
Tetrahydroisoxazolo (5,4-c)  
pyridin-3-ol, 4,5,6,7-[5,7-<sup>3</sup>H]- (THIP)

## GLUTAMATE

Glutamic acid, L-[3,4-<sup>3</sup>H]-  
Methyl-D-aspartic acid, N-[methyl-<sup>3</sup>H]-

## GLYCINE

Dihydrostrychnine, [21,22-<sup>3</sup>H]-  
Glycine, [2-<sup>3</sup>H]-  
Strychnine, [benzene ring-<sup>3</sup>H]-

## HISTAMINE

H<sub>1</sub>  
Doxepin, [methyl-<sup>3</sup>H]-  
Histamine · 2HCl,  
[ring, methylenes-<sup>3</sup>H(N)]-  
Mianserin · HCl, [N-methyl-<sup>3</sup>H]-  
Pyramine, [pyridinyl-5-<sup>3</sup>H]-  
(Mepyramine)  
H<sub>2</sub>  
Histamine · 2HCl,  
[ring, methylenes-<sup>3</sup>H(N)]-  
Tiotidine, [methyl-<sup>3</sup>H]- (ICI 125, 211)

## OPIATE

Dihydromorphine, [N-methyl-<sup>3</sup>H]-  
Enkephalin (5-L-leucine),  
[tyrosyl-3,5-<sup>3</sup>H(N)]-  
Enkephalin (5-L-methionine),  
[tyrosyl-3,5-<sup>3</sup>H(N)]-  
Enkephalin (2-D-alanine-5-  
L-methionine), [tyrosyl-3,5-<sup>3</sup>H]-  
Enkephalin (5-L-leucine), [tyrosyl-125]-  
Enkephalin (5-L-methionine),  
[tyrosyl-125]-  
Enkephalinamide (2-D-alanine-5-  
L-methionine), [tyrosyl-3,5-<sup>3</sup>H]-  
Ethylketocyclazocine, [9-<sup>3</sup>H]-  
Morphine, [N-methyl-<sup>3</sup>H]-  
Naloxone, [N-allyl-2,3-<sup>3</sup>H]-  
Phencyclidine, [piperidyl-3,4-<sup>3</sup>H(N)]-  
SKF-10,047, [N-allyl-2,3-<sup>3</sup>H]-

## SEROTONIN

Dihydro-α-ergocryptine,  
9,10-[9,10-<sup>3</sup>H(N)]-  
Hydroxytryptamine binolate,  
5-[1,2-<sup>3</sup>H(N)]-  
Hydroxytryptamine creatinine  
sulfate, 5-[1,2-<sup>3</sup>H(N)]-  
Lysergic acid diethylamide,  
[N-methyl-<sup>3</sup>H]-  
Mianserin · HCl, [N-methyl-<sup>3</sup>H]-  
Spiperone, [benzene ring-<sup>3</sup>H]-

## PEPTIDE LIGANDS

Angiotensin II (5-L-isoleucine),  
[tyrosyl-3,5-<sup>3</sup>H(N)]- or [tyrosyl-125]-  
Bradykinin, [2,3-prolyl-3,4-<sup>3</sup>H(N)]- or  
(8-tyrosine)-triacetate,  
[8-tyrosyl-125]-  
Formyl-methionyl-L-leucyl-L-  
phenylalanine, N-[phenylalanine-  
ring-2,6-<sup>3</sup>H(N)]-  
Formyl-L-norleucyl-L-leucyl-L-  
phenylalanine, N-[phenylalanine-  
ring-2,6-<sup>3</sup>H(N)]-

Luteinizing hormone, [125]-  
Melanotropin release inhibiting  
hormone, [L-prolyl-2,3,4,5-<sup>3</sup>H(N)]-  
Substance P, [2-prolyl-3,4-<sup>3</sup>H(N)]- or  
(8-tyrosine), [125]-

Thyrotropin releasing hormone

[L-prolyl-2,3,4,5-<sup>3</sup>H(N)]- or [125]-

Thyrotropin releasing hormone

(3-methyl-histidine<sup>2</sup>),

[L-histidyl-4-<sup>3</sup>H(N)]-

L-prolyl-3,4-<sup>3</sup>H(N)]-

## RELEASE-UPTAKE

### AGENTS

Amino-4-guanidobutane,  
1-[1,2-<sup>3</sup>H(N)]- (Agmatine)  
Amphetamine sulfate, D-[3H(G)]-  
Chlorpromazine hydrochloride,  
[benzene ring-<sup>3</sup>H]-  
Desmethylimipramine hydrochloride,  
[2,4,6,8-<sup>3</sup>H]-  
Dihydrocapsaicin,  
[nonanamide-6,7,9-<sup>3</sup>H(N)]-  
Imipramine hydrochloride,  
[N-methyl-<sup>3</sup>H]-  
Nitroimipramine hydrochloride,  
2-[N-methyl-<sup>3</sup>H]-  
Reserpine, [benzoyl-<sup>3</sup>H(G)]-

## STEROID

### Androgen

Dihydrotestosterone,  
[1,2,4,5,6,7,16,17-<sup>3</sup>H(N)]-  
Hydroxyandrost-4-ene-3,17-dione,  
19-[6,7-<sup>3</sup>H(N)]-  
Methyltrienolone, [17α-methyl-<sup>3</sup>H]-  
Testosterone, [1,2,6,7,16,17-<sup>3</sup>H(N)]-  
Testosterone, Δ<sup>6</sup>-[3H]-

### Estrogen

Estradiol, [2,4,6,7,16,17-<sup>3</sup>H(N)]-  
Iodo-3, 17β-estradiol, 16α-[125]-  
Moxestrol, [11β-methoxy-<sup>3</sup>H]-  
Tamoxifen, [N-methyl-<sup>3</sup>H]-

### Glucocorticoid

Dexamethasone, [6,7-<sup>3</sup>H(N)]-  
Dexamethasone mesylate, [6,7-<sup>3</sup>H]-  
and unlabeled

Hydrocortisone, [1,2,6,7-<sup>3</sup>H]-  
Triamcinolone acetate, [6,7-<sup>3</sup>H(N)]-

### Mineralocorticoid

Aldosterone, D-[1,2,6,7-<sup>3</sup>H(N)]-

### Progesterone

Dihydroprogesterone, [1,2-<sup>3</sup>H(N)]-  
Nor-17α-ethynyltestosterone,  
19-[6,7-<sup>3</sup>H(N)]-  
Progesterone, [1,2,6,7-<sup>3</sup>H(N)]-  
Promegestone, [17α-methyl-<sup>3</sup>H]-

### VITAMIN D<sub>3</sub>

Dihydroxyvitamin D<sub>3</sub>,  
1α,25-[26,27-<sup>3</sup>H]-  
Hydroxyvitamin D<sub>3</sub>, 25-[26,27-<sup>3</sup>H]-  
Vitamin D<sub>3</sub>, [1,2-<sup>3</sup>H(N)]-

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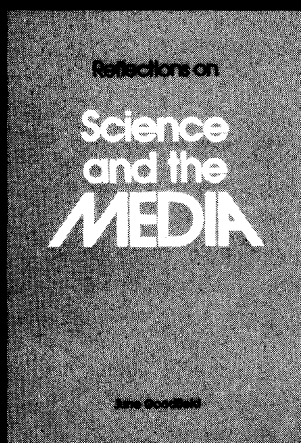
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## LETTERS

### Information Services

In his letter (13 Aug., p. 586), Robert S. Willard of the Information Industry Association describes Philip H. Abelson's editorial "Essential federal information services" (28 May, p. 937) as being one-sided. Willard alleges that the National Library of Medicine (NLM) does not recover full costs of its online MEDLINE system and that NLM has in fact subsidized commercial organizations by \$1 million over the period from January 1980 to June 1981. My purpose is to provide correct information on the pricing practices of NLM.

First, a General Accounting Office (GAO) audit of NLM charges released on 14 May 1982 found that NLM was recovering 96 percent of the costs of access to MEDLINE in its current price structure and that it was in conformance with guidelines in the Office of Management and Budget circular A-25 for charges to both profit and nonprofit organizations.

With respect to the allegation of a \$1-million subsidy of commercial users by NLM, the list of 20 commercial users includes two who have been under contract with federal agencies that ultimately pay the bill. A third has established a special free information service for research investigators and clinicians among its clients and accounts for about 90 percent of the use by that company. If these "commercial" users are excluded, it reduces by one-third the commercial use referred to by Willard as being subsidized.

Also, it appears that Willard has not used the current pricing structure of NLM, which has been in effect since October 1981. The data he refers to go back 2½ years.

The so-called private sector charges which he uses for comparison are based on a hypothetical average of the maximum charges without considering discounts of up to 50 percent that could and would accrue to these users. If the lowest (rather than the highest) charge for obtaining similar services from the private sector were used, charges would be reduced by a factor of 4 and the difference between charges made by NLM and those made by the private sector would be only a small fraction of those alleged.

Regarding subsidizing charges for MEDLINE searches to foreign users, NLM does not provide these services. They are provided by foreign agencies,

selected by their respective governments, or by U.S. commercial vendors. These organizations pay for use of NLM tapes or for access to our computers. The fee schedule for users is set by the agencies providing the service. A search for which the NLM domestic charge would be \$7.28 exclusive of telecommunication charges would translate to a charge for foreign users that could range from \$9 to \$25. This does not support Willard's allegation that NLM is also subsidizing information services to private foreign health professionals.

Willard's complaints are similar to those raised by a foreign commercial company that is seeking to force higher NLM charges. Physicians and scientists may legitimately ask whether NLM charges are too low or whether the charges of some commercial information services are too high.

JOSEPH LEITER

National Library of Medicine,  
Bethesda, Maryland 20209

### Solar Gel Ponds

We read with interest Thomas H. Maugh II's article "Solar with a grain of salt" (Research News, 11 June, p. 1213). Solar ponds have the potential for providing domestic and low-grade process heat and electric power in a remarkably cost-effective manner.

As Maugh indicates, salt gradient ponds and the more recent concepts involving liquid layers of any kind suffer from a number of disadvantages. These include (but are not limited to) loss of stratification because of diffusion and convective mixing; the large environmental hazard posed to many locations by the tons of salt required; the need to maintain the gradient (requiring external processing of saline); and the development of turbidity, color, and optical opacity due to suspended dirt, debris, and occasionally algal and fungal growth. Mixing can also result from boiling, encroachment of the bottom (convective) zone onto the top (nonconvective) zone, withdrawal (surface evaporation) and injection of fluids, and even large falling bodies.

The gel pond concept was recently developed (1) at the University of New Mexico in an attempt to negate many of these difficulties. The gel solar pond consists basically of two zones. The bottom (convective) zone is homogeneous and nearly saturated saline. The top (nonconvective) zone consists of a very viscous

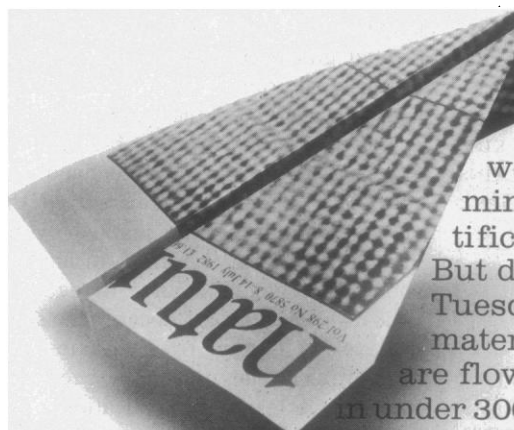


or even solid, elastic, optically transparent polymer gel, with density less than the saline. This top gel layer acts as thermal insulation yet passes solar radiation to be trapped in the underlying saline. It prevents any dirt or debris from entering, providing control of opacity, turbidity, and other related factors. Loss of stratification due to mixing is no longer a consideration, and no external saline processing is required to maintain the salt gradient. A layer of a few inches of fresh water is circulated over the top of the gel to prevent drying and to flush off surface dust and debris.

Selection of the appropriate polymer gel was a major problem. A suitable gel must satisfy many stringent requirements: it must be highly transparent to solar radiation, stable under ultraviolet light and in the operating temperature range, nonbiodegradable and nontoxic, less dense than saline, viscous enough to prevent convection, and easily preparable from readily available components at low cost. During development of the gel pond at the University of New Mexico, hundreds of polymer materials were evaluated, and a few dozen of those were tested. We have developed a low-cost polymer that meets or exceeds all the stringent requirements. Our experimental gel pond has been in operation for a year, and stability of the polymer has been demonstrated for this time period. Work to date has focused on preliminary efficiency determinations and optional gel thickness. We are beginning heat extraction and plan to demonstrate electric power generation contingent on further funding. The gel pond is adjacent to Bryant's salt gradient ponds, so we can compare performance of the two approaches at one location (for example, the gel pond has shown itself to be roughly twice as efficient on a unit area basis as the salt pond as a collector of solar radiation). The exact composition and manufacture of the polymer gel is proprietary at present, as a patent has been filed. The patent covers not only the specific polymer we use but also the concept of the gel pond in some generality. An industrial gel pond of some 70 square meters is being constructed near Las Cruces, New Mexico, to provide process heat for animal feed manufacture.

As Maugh points out, solar ponds are site-specific, and much remains to be discovered. For example, scaling rules and correlations useful for practical designs are lacking. Construction of a heavily instrumented, larger gel pond (perhaps 50 feet in diameter and 8 feet

10 SEPTEMBER 1982



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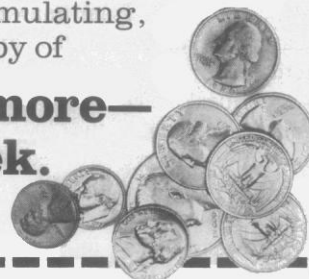
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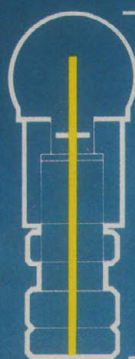
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# Policy Research in an International Setting

The International Institute for Applied Systems Analysis (IIASA), only 10 years old, is in trouble. Several months ago the United States gave notice of withdrawal, and now Britain is following suit. The United States and the Soviet Union had founded the Institute, each underwriting a quarter of the budget and providing leadership: the director, until recently, was American, and the chairman of the council is a high-ranking Soviet science policy official. Most East and West European countries, as well as Japan and Canada, joined the institute and shared the other half of the cost. Even if IIASA survives, possibly with the help of private funding, the original design will not. At a time when another international experiment in policy research—a "European Brookings Institution," to be located in Brussels and funded, in large part, by the Ford Foundation—is getting under way, the reasons for IIASA's precarious condition should be spelled out.

IIASA was created by politicians eager to advance détente and by scientists bent on demonstrating the usefulness of new methods in policy analysis. An international research center came into being where scientists from industrialized countries in the East and West studied common policy issues. Three purposes were to be served simultaneously: cooperation among scientists from different political systems, advances in systems analysis, and usable policy research.

Given enough time and a supportive environment, the experiment could have succeeded. However, renewed tensions between Washington and Moscow deprived IIASA of its political support. An espionage incident, involving a Soviet administrator, did much damage, although it was not related to research at the institute. When the National Science Foundation's budget for international activities was cut, IIASA lost out against bilateral cooperative agreements. The White House and its science policy office gladly endorsed the decision.

Nor did the scientists overseeing American participation in IIASA lend much support. The National Science Board had often voiced concerns about the quality and cost of the work done at IIASA. The National Academy of Sciences, representing the United States in the IIASA council, was mostly interested in the scientific aspects of the work. The Royal Society, too, explained its decision to withdraw on the grounds of questionable scientific quality.

Several evaluations, however, found that IIASA's work held real promise. Having participated in one, I submit that the scientists overseeing the institute failed to understand the nature and requirements of policy research. Such research must take into account the legal, social, and economic dimensions of policy issues. It also must operate under conditions of uncertainty and time constraints. The IIASA directors—Howard Raiffa, Roger Levien, and C. S. Holling—pioneered approaches to policy research that were relevant to the needs of decision-makers, scientifically responsible, and doable in a sensitive international setting. But they found it difficult to convince their various constituencies of the validity of, and the need for, this kind of work.

There are many international scientific institutions, but IIASA is the only one devoted to policy analysis. If IIASA survives, new forms for American participation should be sought. Should it go down, and with it much American leadership, the lesson will be that the design was too complex and the goals too ambitious. In the difficult international environment, a Brookings-like approach to policy research may have a better chance—with less cumbersome arrangements for administrative and scientific oversight, interactions with policy-makers that enrich the work without threatening its independence, and a better mix between social and natural scientists. Whatever IIASA's future, its unique role in East-West relations will be lost once its American and British members pull out—on the eve of 1984.—JURGEN SCHMANDT, *Lyndon B. Johnson School of Public Affairs, University of Texas, Austin 78712*



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