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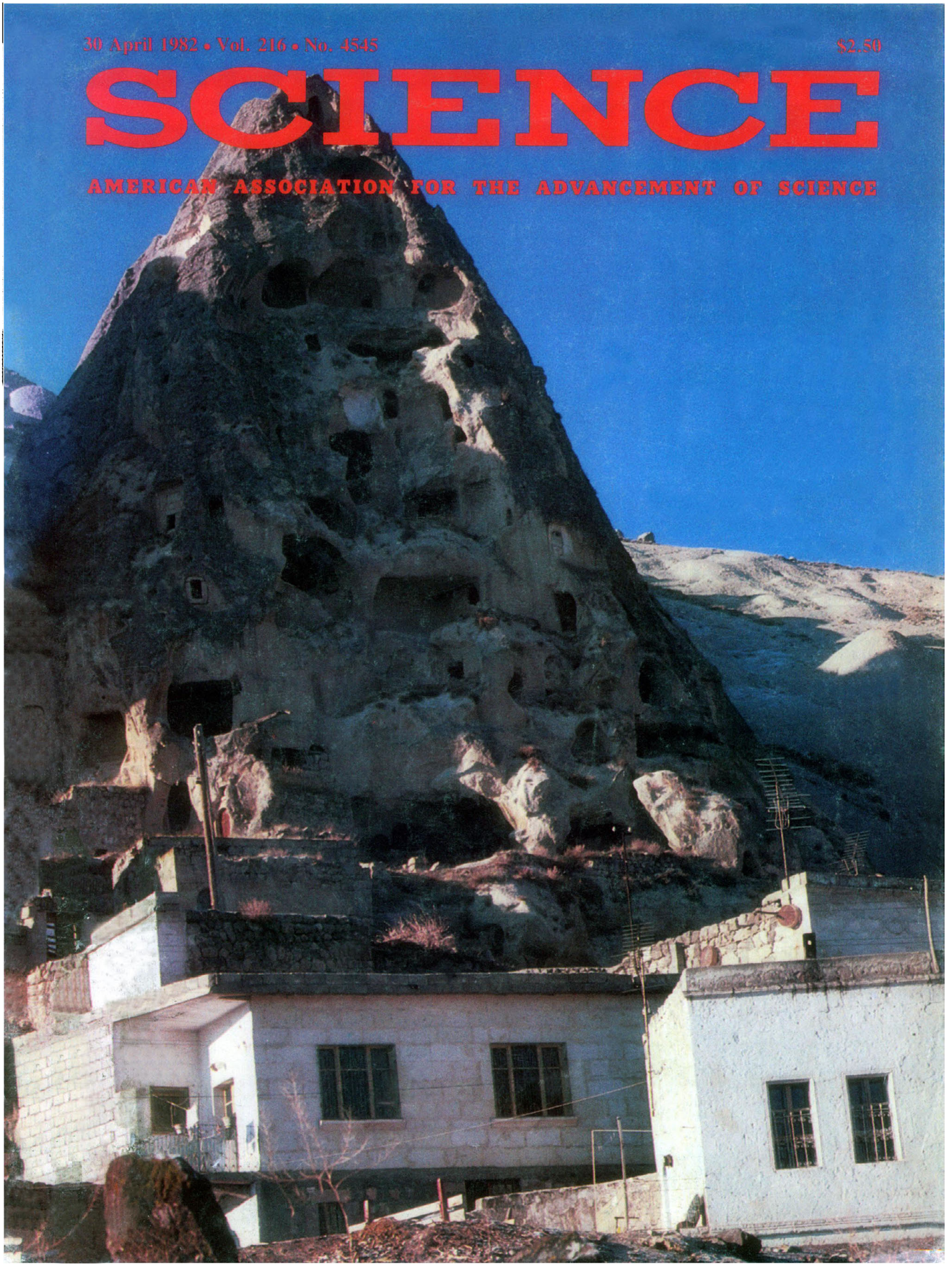
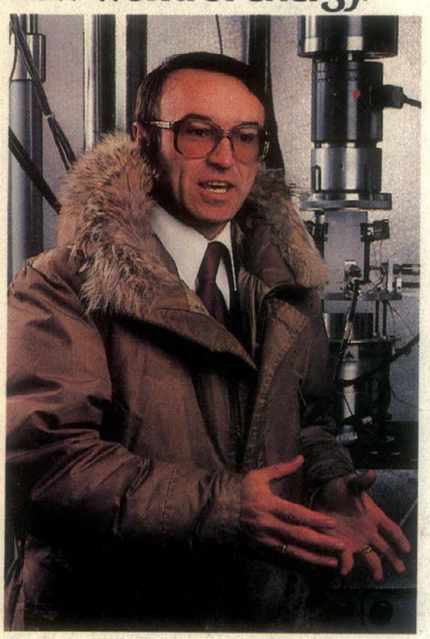
SCIENCE

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



Offshore Arctic oil Until Exxon learned

Dr. Anton Prodanovic is designing Arctic drilling islands that open a new world of energy.



Conventional offshore oil-drilling techniques simply won't work in Alaska's Beaufort Sea. Forces generated by Arctic ice could endanger the most rugged platforms now being built. But, America needs the Beaufort's oil. And Dr. Anton Prodanovic, Senior Research Specialist of Exxon Production Research Company, is helping us reach it. Dr. Prodanovic and a team of Exxon civil engineers are designing man-made islands which allow us to drill safely in the ice-covered waters of the Beaufort.

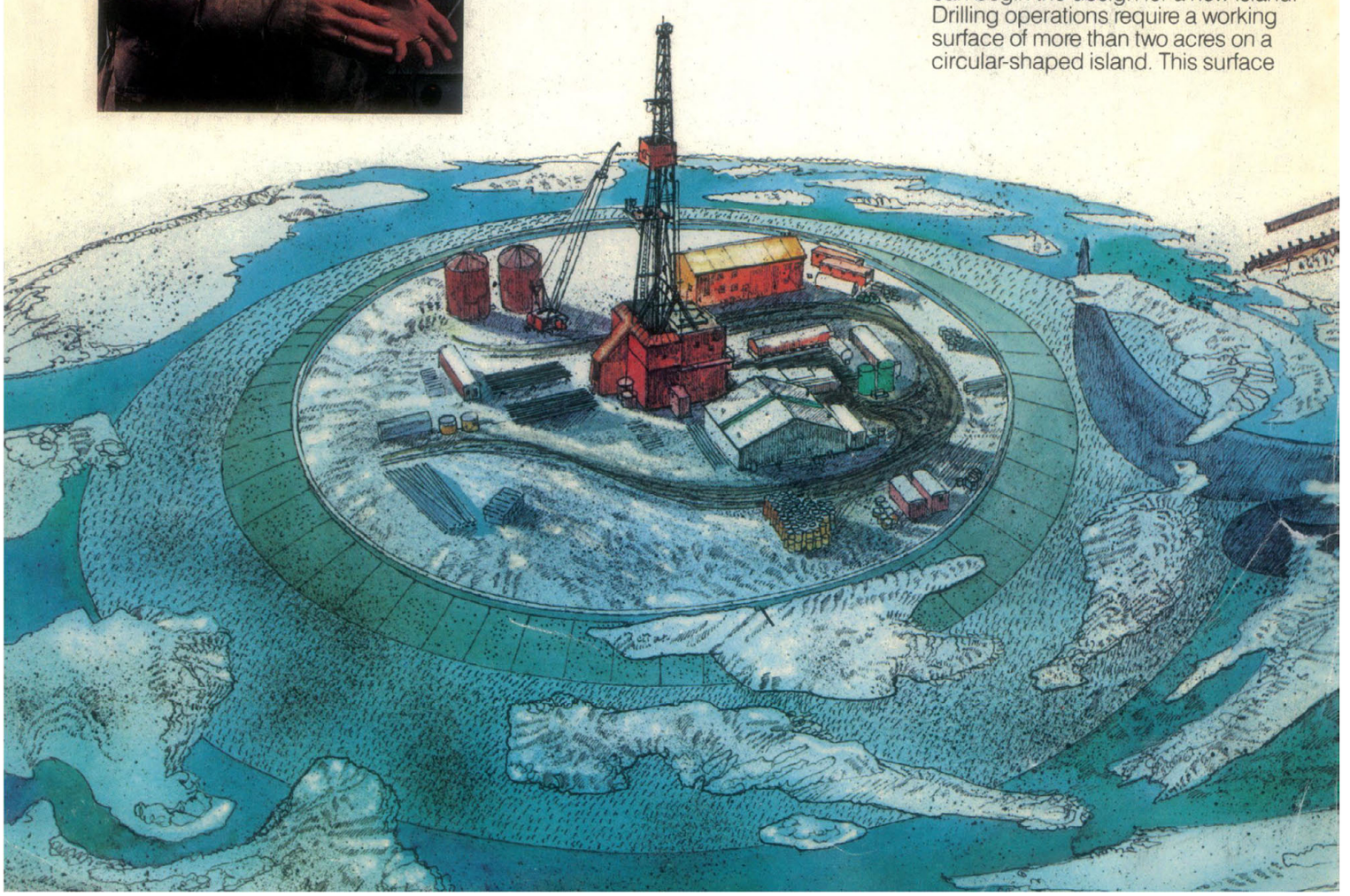
Developing an I.Q. for ice

Key to determining the design of these islands (establishing such criteria as slope angles, freeboard elevations and berm heights) is getting to know the ice that will surround them. Since 1968 Exxon has pioneered in learning how Arctic ice grows, moves and behaves, and the forces it can exert.

Much of Exxon's Arctic ice research actually happens at −25°F in, of all places, Houston, Texas. Here, Dr. Prodanovic and other "island" engineers work closely with Exxon "ice" scientists. By studying, analyzing and testing core samples of ice flown down from the Beaufort Sea, a specific island design can be planned, taking into account a multitude of sea ice factors: sea ice structure (is it granular, columnar, or leached?); sea ice strength (compressive, tensile, shear or flexural); sea ice loads, pressure and movement in winter and summer; and whether the ice is multiyear or annual.

Island design and construction

Once the ice environment, oceanographic and geotechnical aspects of a particular site have been studied, Dr. Prodanovic and his team can begin the design for a new island. Drilling operations require a working surface of more than two acres on a circular-shaped island. This surface



was unreachable. how to break the ice.

also provides sufficient space for a crest-raising berm and a buffer zone behind the berm to accommodate potential ice-override pileups.

Island construction can be accomplished during the winter. Trucks carry gravel to the island site over an 8-foot-thick ice road constructed on top of the sea ice. The fill must be carefully placed and gradually built up from the sea floor to a safe freeboard elevation. The slope angle of gravel island beaches is 1:3, shallow enough to minimize fill erosion and give the island a design resistance greater than potential ice forces.

Island safety and defense

For a few brief weeks each summer, the ice along the Beaufort coastline melts. To prevent slope erosion and protect the island from wave attack, a layer of hydraulic filter cloth is used to stop fill washout and the buildup of hydrostatic pressure in the underlying fill. On top of this, a cover layer of sandbags holds the filter cloth in place and further minimizes erosion.

While the island's mass is its first defense against winter ice attack, a secondary defense is ice slotting or trenching. An earth-trenching machine is used to cut a circumferential slot approximately 8 inches wide in the ice sheet. This defensive slot weakens the ice so that it collapses before ice loads become too large.

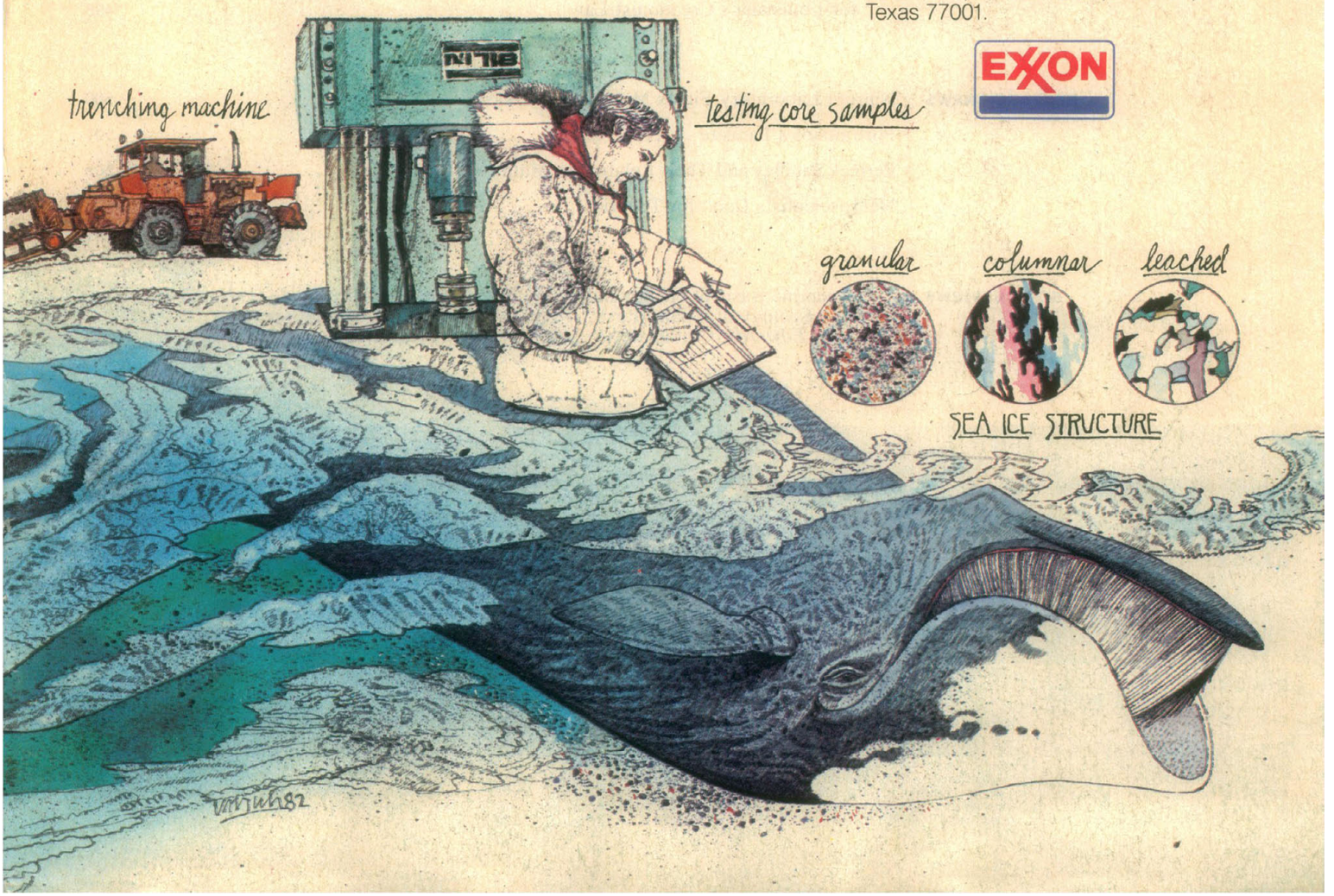
In addition to these defensive measures, monitoring stations and pressure sensors placed near the island provide continuous surveillance of ice movement and behavior.

Over the past 4 winters, Exxon has built and drilled on 3 islands in the shallow, close-to-shore areas of the Alaskan Beaufort Sea. They have proven to be an efficient, effective way to tap energy that was once unreachable.

Exxon Production Research Company

Offshore drilling systems and ice research are just two of the activities at EPRCo. A wholly owned subsidiary of Exxon Corporation, the company employs over 1000 scientists and engineers working in the fields of petroleum exploration and production, aimed at finding, producing and improving the recovery of worldwide energy sources.

If you would like more information about Dr. Prodanovic's work and EPRCo, write J. A. Rickard, Exxon Production Research Company, Room 603, P.O. Box 2189, Houston, Texas 77001.



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SCIENCE

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AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

COVER

Village of Karain, Cappadocia, Turkey, showing "fairy castles," landforms of tuff which are excavated and used for dwellings, food, and fodder storage. Freestanding dwellings are also built of tuff dimension stone. See page 518. [A. N. Rohl, Mount Sinai School of Medicine, New York 10029]

Call for Symposia Proposals
DETROIT MEETING—26-31 May 1983

AAAS members are invited to submit symposium proposals for the next Annual Meeting in Detroit, 26-31 May 1983. Please complete the form below, attach a "Synopsis of Objectives" (about 200 words), and send it to us **not later than 1 August 1982.**

We are particularly interested in symposia dealing with the latest developments in science and technology, and the implications of these developments for society.

All symposium proposals are subject to review. If the information submitted is inadequate for reviewing, the proposal will be returned. Endorsement (sponsorship) by a AAAS Section Committee expedites the review process. It is therefore in the interest of the proposer to send a *copy* of the proposal to the appropriate Section Secretary (see table of contents page of *Science* for names) for endorsement at the same time the *original* is sent to the AAAS Meetings Office.

Speakers should *not* be confirmed at this time; however, sufficient information about probable speakers and their topics should be provided to allow for evaluation of the proposal.

Some Deadlines

Early October: You will be notified about acceptance, conditional acceptance, or non-acceptance of your proposal. Further information will be provided at that time.

Early November: Preliminary programs with confirmed speakers are due.

Mid January: Final program copy, suitable for publication, is due.

Annual Meeting **Detroit** 26-31 May 1983	**PROPOSED SYMPOSIUM** Submit not later than 1 August 1982	**Return this form to:** AAAS Meetings Office 1101 Vermont Ave., N.W. Washington, D.C. 20005 Telephone: (202) 842-9530

PRINCIPAL ARRANGER (who will receive correspondence): TELEPHONE _____ (Area Code) (Number)

NAME _____ AFFILIATION _____

MAILING ADDRESS _____ (Street) (City & State) (Zip Code)

CO-ARRANGER (if applicable): TELEPHONE _____ (Area Code) (Number)

NAME _____ AFFILIATION _____

MAILING ADDRESS _____ (Street) (City & State) (Zip Code)

TITLE OF SYMPOSIUM _____

SPONSORSHIP (AAAS Section, Office, or Affiliate **only**) _____ No. of 3-hr. Sessions _____

1. Speaker _____
   Affiliation _____
   Topic _____
2. Speaker _____
   Affiliation _____
   Topic _____
3. Speaker _____
   Affiliation _____
   Topic _____
4. Speaker _____
   Affiliation _____
   Topic _____
5. Speaker _____
   Affiliation _____
   Topic _____
6. Speaker _____
   Affiliation _____
   Topic _____

PLEASE ATTACH SYNOPSIS OF OBJECTIVES OF PROPOSED SYMPOSIUM (APPROXIMATELY 200 WORDS).

nals. In fact 11 are not in any scientific journals.

The 1982 AAAS annual meeting program shows that the all-day session included a speaker from the Department of Radiology of the Harvard Medical School and the former director of research of the Radiation Effects Research Foundation in Hiroshima, the principal source of data used to contradict the Mancuso study.

What appears to be at issue is the fact that the AAAS provided a forum for "dissident" scientists. Since the early fallout debate, the AAAS, despite pressure from proponents of nuclear weapons and nuclear power, has allowed for discussion on radiation effects to include views which are at variance with official risk estimates. In following this practice, the AAAS has performed a service to both sides of the debate.

ROBERT ALVAREZ
Environmental Policy Institute,
317 Pennsylvania Avenue, SE,
Washington, D.C. 20003

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Columbia Journalism Review: Editorial Policy

In *Reflections on Science and the Media*, published by the American Association for the Advancement of Science (1981), the author, June Goodfield, makes the following statement:

> The *Columbia Journalism Review* has been a highly regarded critical forum of the written word, although it has recently undergone a change of editorial policy which may reduce its critical role, to the detriment of the profession.

At the time Goodfield was writing (1980) there had indeed been a change of editors at the *Review*, but this did not signal any reduction of the *Review*'s role as an independent critic of American journalism. There has been no such reduction, and Goodfield, conceding that her fears for the *Review* have proved to be unwarranted, has agreed to "bring things up to date" when and if there is another printing of her book. In the meantime, this letter may help to correct an erroneous impression that the *Review* has hung up its gloves.

SPENCER KLAW
Columbia Journalism Review,
700 Journalism Building,
Columbia University,
New York 10027

Omitted Reference

In our recent article (5 Feb., p. 619), a reference to previous pioneering work of C. B. Bratton, A. L. Hopkins, and J. W. Weinberg was inadvertently omitted from reference 56. The first quantitative measurements of nuclear magnetic resonance relaxation times for protons in excised, but functioning, living muscle appeared in a Ph.D. dissertation by C. B. Bratton of Western Reserve University in 1964; the earliest publication appeared in *Science* [**147**, 738 (1965)] and was by the investigators named above.

GORDON L. BROWNELL
Department of Nuclear Engineering, Massachusetts Institute of Technology, Cambridge 02139, and
Physics Research Laboratory, Massachusetts General Hospital, Boston 02114
THOMAS F. BUDINGER
Donner Laboratory and
Department of Electrical Engineering and Computer Sciences, University of California, Berkeley 94720
PAUL C. LAUTERBUR
Departments of Chemistry and *Radiology, State University of New York, Stony Brook 11794*
PATRICK L. MCGEER
Department of Neurosciences, University of British Columbia, Vancouver, Canada V6T 1W5

Corrections

In the Research News article "Molecular biology of brain hormones" (5 Mar., p. 1223) by Gina Kolata, it was stated that the enkephalin precursor codes for ACTH. Rather, ACTH is derived from pro-opiomelanocortin, a different precursor. In addition, Joel Habener's name was misspelled.

In the Research News article "New theory of hormones proposed" (12 Mar., p. 1383) by Gina Kolata, glycyrrhetinic acid and tetrahydrocannabinol were incorrectly identified as alkaloids. This misidentification in no way changes the conclusions about these plant substances.

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National Engineering Action Conference

The time for action to deal with the precarious state of engineering education in the United States has come. With that conviction, some 50 university presidents, chief executive officers of major corporations, heads of engineering societies, government leaders, and members of their staffs braved the snows of the great spring blizzard of 1982 to attend the National Engineering Action Conference (NEAC) in New York on 7 April.

These leaders did not come as representatives of individual institutions, but as representatives of more than 20 key national associations directly concerned with engineering education. They knew that the economic strength and security of the United States depend critically on the quality of the training received by the cohort of young engineers who will enter industry and government in the coming years. And they recognized that if present trends continue—with more than 1600 engineering faculty positions now vacant and deteriorating engineering laboratories on campus—these young men and women will not receive the education that they want, that they deserve, and that the times require.

The conference participants issued a "call to action," advocating initiatives appropriate to local circumstances and institutions. They also produced a "suggested action agenda" and "action examples" illustrating the agenda, which they are taking back to their organizations for consideration. Not a few organizations have already taken some of the actions described in these documents. A chief goal of the conference was to inspire others to join in—to preserve and increase the momentum of efforts already under way. Suggestions in the action agenda include:

For higher education: Increase incentives, rewards, and recognition for undergraduate teaching of engineers. Set engineering faculty compensation at a level that realistically reflects the market for such talent in industry.

For industry: Provide direct financial support to U.S. resident master's and doctoral candidates in the form of traineeships, scholarships, and awards. Create opportunities for junior faculty to increase their income through consulting, summer employment, tutorials, and grants.

For academic and professional societies: Expand scholarship and fellowship aid to engineering doctoral students and make direct grants to the schools. Encourage the memberships of these societies to make financial contributions in support of engineering education and, where possible, take advantage of corporate matching grant programs.

For state and federal government: Encourage reexamination of policies, especially at the state level, which may preclude making the pay of engineering faculty and the educational environment competitive. Encourage engineering doctoral study by providing additional fellowships and other aid under the aegis of the National Science Foundation, the mission agencies, and other government organizations.

While NEAC will have no organizational afterlife, the American Society for Engineering Education, through its offices in Washington, D.C., will continue its recently inaugurated program to act as a clearinghouse for information on the engineering faculty crisis. We who attended the conference have pledged our efforts to find and apply the remedies. We urge our colleagues to join with us. In the words of Massachusetts Institute of Technology president Paul Gray, who conceived NEAC and asked me to chair it, "The nation must begin now to make stronger efforts . . . to avoid future substantial declines in either the quantity or quality of engineering graduates on which so much of our future national well-being must depend."—E. E. DAVID, JR., *President, Exxon Research and Engineering Company, Florham Park, New Jersey 07932*