

447 This Week in *Science*

Editorial

449 Global Change

Letters

451 Hansen and the Greenhouse Effect: W. S. BROECKER; M. E. SCHLESINGER; J. RISBEY; R. A. KERR ■ NASA's Objectives: G. M. WOODWELL ■ Elephant Management: R. W. KASTEN, JR.

News & Comment

461 Soul-Searching After China Crackdown ■ Stories of Repression from China
463 Alaskan Oil Spill: Health Risks Uncovered
464 Fetal Tissue Transplants Win U.K. Approval ■ Germany to Ban Embryo Use
465 Funding Fight Over Facilities
466 Should States Regulate Biotechnology?

Research News

467 Big First Scored with Nerve Diseases
468 Deep Holes Yielding Geoscience Surprises ■ Drilling Has Its Rewards
470 Circumcision May Protect Against the AIDS Virus
472 *Briefings*: Layoffs Ahead at Brookhaven? ■ Scientists as Brainy as MBAs ■ Free NIH ■ Animal Activists Get Stony Brook Files ■ Worm Bites Dad ■ Hipparcos on the Launch Pad

Articles

477 Translocation as a Species Conservation Tool: Status and Strategy: B. GRIFFITH, J. M. SCOTT, J. W. CARPENTER, C. REED
480 What Has Caused the Secular Increase in Solar Nitrogen-15?: J. F. KERRIDGE
486 Drugs from Emasculated Hormones: The Principle of Syntopic Antagonism: J. BLACK

Research Articles

494 Lutropin-Choriogonadotropin Receptor: An Unusual Member of the G Protein-Coupled Receptor Family: K. C. MCFARLAND, R. SPRENGEL, H. S. PHILLIPS, M. KÖHLER, N. ROSEMBLIT, K. NIKOLICS, D. L. SEGALOFF, P. H. SEEBURG
500 Neptune's Story: P. GOLDREICH, N. MURRAY, P. Y. LONGARETTI, D. BANFIELD

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COVER C3H10T1/2 cells transfected with a MyoD1 expression vehicle. Nuclear expression of transfected MyoD1 was localized by antisera to MyoD1 and a rhodamine-conjugated secondary antibody (red). Expression of MyoD1 converted this fibroblast to a muscle cell, as shown by the expression of myosin heavy chain [visualized with a fluorescein-conjugated secondary antibody (green)]. DAPI staining shows the nuclei of untransfected cells (blue). See page 532. [Photograph by Stephen J. Tapscott]

Reports

- 505 Melting Inhibition and Superheating of Ice by an Antifreeze Glycopeptide: C. A. KNIGHT AND A. L. DEVRIES
- 507 Disorder-to-Order Transition in Settling Suspensions of Colloidal Silica: X-ray Measurements: K. E. DAVIS, W. B. RUSSEL, W. J. GLANTSCHNIG
- 510 Hydrophobic Organization of Membrane Proteins: D. C. REES, L. DEANTONIO, D. EISENBERG
- 513 Interpretation of Cloud-Climate Feedback as Produced by 14 Atmospheric General Circulation Models: R. D. CESS, G. L. POTTER, J. P. BLANCHET, G. J. BOER, S. J. GHAN, J. T. KIEHL, H. LE TREUT, Z.-X. LI, X.-Z. LIANG *et al.*
- 516 β -Adrenergic Inhibition of Cardiac Sodium Channels by Dual G-Protein Pathways: B. SCHUBERT, A. M. J. VANDONGEN, G. E. KIRSCH, A. M. BROWN
- 519 The Effect of Deprenyl (Selegiline) on the Natural History of Parkinson's Disease: J. W. TETRUD AND J. W. LANGSTON
- 522 Triggering of Allostery in an Enzyme by a Point Mutation: Ornithine Transcarbamoylase: L. C. KUO, I. ZAMBIDIS, C. CARON
- 525 Cloning and Sequencing of Porcine LH-hCG Receptor cDNA: Variants Lacking Transmembrane Domain: H. LOOSFELT, M. MISRAHI, M. ATGER, R. SALESSE, M. T. V. H.-L. THI, A. JOLIVET, A. GUIOCHON-MANTEL, S. SAR *et al.*
- 528 Domain Separation in the Activation of Glycogen Phosphorylase *a*: E. J. GOLDSMITH, S. R. SPRANG, R. HAMLIN, N.-H. XUONG, R. J. FLETTERICK
- 532 5-Bromo-2'-Deoxyuridine Blocks Myogenesis by Extinguishing Expression of MyoD1: S. J. TAPSCOTT, A. B. LASSAR, R. L. DAVIS, H. WEINTRAUB

Inside AAAS

- 538 Providing Journals: L. A. LEVEY ■ Electronic Networking: B. GOLD ■ Sri Lanka Bound? ■ Repairing Equipment: S. BURNS ■ Seen Any Good TV Lately?: J. WRATHER

Book Reviews

- 541 Models of Nature, *reviewed by* D. JORAVSKY ■ Disenchanted Night, N. HARRIS ■ Some Other Books of Interest ■ Books Received

Products & Materials

- 546 3-D Molecular Simulation and Modeling ■ Blotting Apparatus ■ Numeric Computation Software ■ Portable Computer with Desktop Features ■ Object-Oriented Pascal ■ Literature

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Global Change

For more than 150 years a major activity of geologists has been to elucidate the great episodes of global change that have been wrought by natural processes. Today the challenge has expanded, for humans have become agents for environmental degradation with effects comparable to, and in some instances more profound than, those of nature. In assessing what is happening and in formulating remedial measures, earth scientists will have at their disposal a great array of instrumentation, data storage, and computational capabilities. In addition, geologists are accustomed to engage in cooperative international efforts.

The vitality, broad capabilities, and enthusiasm for tasks ahead was showcased at the International Geological Congress held 9 to 19 July in Washington, D.C. About 5900 registrants from more than 80 countries attended the meeting. Presentations were made by scientists from more than 73 countries. Among them were geologists from Vietnam, Cuba, Iran, Iraq, Israel, Yemen, and South Africa. All the Eastern Bloc countries sent representatives, including 207 from the Soviet Union. This was one of the few instances in which the Russians arrived as promised, and in which passport problems were largely nonexistent. The People's Republic of China sent 127. In the three decades previous to the 1980 and 1984 International Geological Congresses, the PRC was conspicuous by its absence.

A large number of activities were conducted in connection with the Congress, including field trips, committee meetings, short courses, and workshops. A major transfer of information occurred in 13 sessions involving 20 to 25 simultaneous 15-minute talks plus a total of about 650 posters. A feature worthy of copying by other scientific groups was a set of extended abstracts for each presentation: no abstract, no place on the program. There were about 3500 abstracts, and these occupied 1858 pages. The average length was more than 800 words. From these it is possible to gain an impression of the status of earth science in the respective countries. As might be expected, geologists of the Third World were preoccupied with applied studies, for example, those relating to fossil fuels and minerals. Presentations from the developed world touched on a wide variety of additional topics, including radioactive wastes, ground-water contamination, soil erosion, seismic tomography, continental deep drilling, high-pressure studies, isotope geochemistry, and comparative planetology. At one time, the typical geologist strolled to rock outcrops and with pick and hammer obtained a hand specimen. Examination with a hand lens followed. Today, the most advanced equipment of the physical sciences is employed as well as supercomputers. Storage of information in databases and extracting information from them are now effective aids to progress in earth science. Cooperation between biochemists and paleontologists using DNA techniques is producing new understanding of phylogenetic relationships between living and extinct taxa.

This was the 28th International Geological Congress. The first was held in Paris in 1878. The President of the current Congress was Charles Drake of Dartmouth, with Bruce Hanshaw of the U.S. Geological Survey as Secretary General. They were excellent organizers. The next Congress will be held in Japan in 1992 with the Japanese in charge. Collaborating closely with the successive congresses is the International Union of Geological Sciences. It serves to foster international cooperation in the years between and during the congresses. The current President of the IUGS is Umberto Cordani of the University of São Paulo, Brazil. In a speech to the Congress he surveyed the many current successful research activities of earth scientists. He also pointed to an expanded role for geoscience in cooperation with other sciences in a worldwide effort to achieve sustainable development. He further noted:

Damage to the environment and the many problems related to it are now a major worldwide concern. The challenges cut across the divides of national jurisdiction, and political decisions on the management of resources and land-use planning are crucial. Sustainable development will give rise to an unprecedented demand for information, advice, and technologies that only an integrated approach can satisfy. In many countries, the focus of the challenge ahead is shifting from protection and restoration to planning and prevention. Possible solutions to environmental issues are becoming more and more complex and dependent on the cooperation of a multitude of sectors—but first and foremost, that of science.

—PHILIP H. ABELSON