239 This Week in Science

Editorial

241 Effects of Electric and Magnetic Fields

Letters


News & Comment

245 A Transatlantic Mexican Standoff ■ Can Europe Survive on Chips?
247 Science Adviser Gets First Formal Look
248 Benveniste Criticism Is Diluted Microfilm Thieves Hit University Libraries
249 Agent Orange: Congress Impatient for Answers
250 NSF Peer Review Under Fire from Nader Group
251 Top Talent Leaving NASA . . . . . . . . New Recruits Hard to Find

Research News

252 The Cell Cycle Coming Under Control ■ The Oncogene Connection
255 Good News for Volcano Watchers
256 Cold Fusion Still in State of Confusion ■ Some Companies Keep a Foot in the Door

Articles

263 The Applications of Closure Phase to Astronomical Imaging: T. J. Cornwell
269 The Rat as an Experimental Animal: T. J. Gill III, G. J. Smith, R. W. Wissler, H. W. Kunz

Research Articles

276 Defining the Inside and Outside of a Catalytic RNA Molecule: J. A. Latham and T. R. Cech

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Reports

283 Triton: Do We See to the Surface?: D. P. CRUIKSHANK, R. H. BROWN, L. P. GIVER, A. T. TOKUNAGA


293 Pulmonary Blood Flow Regulation in an Aquatic Snake: H. B. LILLYWHITE AND J. A. DONALD

295 Localization of the Pancreatic Beta Cell Glucose Transporter to Specific Plasma Membrane Domains: L. ORCI, B. THORENS, M. RAVAZZOLA, H. F. LODISH


308 Antibody to Interleukin-5 Inhibits Helminth-Induced Eosinophilia in Mice: R. L. COFFMAN, B. W. P. SEYMOUR, S. HUDAK, J. JACKSON, D. RENNICK

Book Reviews

312 Social Science in Court, reviewed by V. P. HANS The Genetics of Social Evolution, R. H. CROZIER Platelet Immunobiology, S. A. SANTORO Some Other Books of Interest Books Received

Products & Materials

318 Scientific Graphics Software DNA Synthesizer for PCR Carbon Dioxide Incubator Custom Precast Gels HPLC of Biomolecules Cytochromes P-450 Proteins and Antibodies Zoom Stereo Microscopes Literature

Cover Fresh pahoehoe lava on Kilauea volcano, Hawaii. The interplay between structure and dynamics in the glassy surface layer of the flow and in its mixed crystal plus liquid interior are reflected in the complex forms developed on cooling. Nuclear magnetic resonance spectroscopy is becoming increasingly useful in elucidating both local atomic structure and motion in geological materials. See page 257. [Photograph by J. F. Stebbins]