3 July 1981 • Vol 213 • No. 4503

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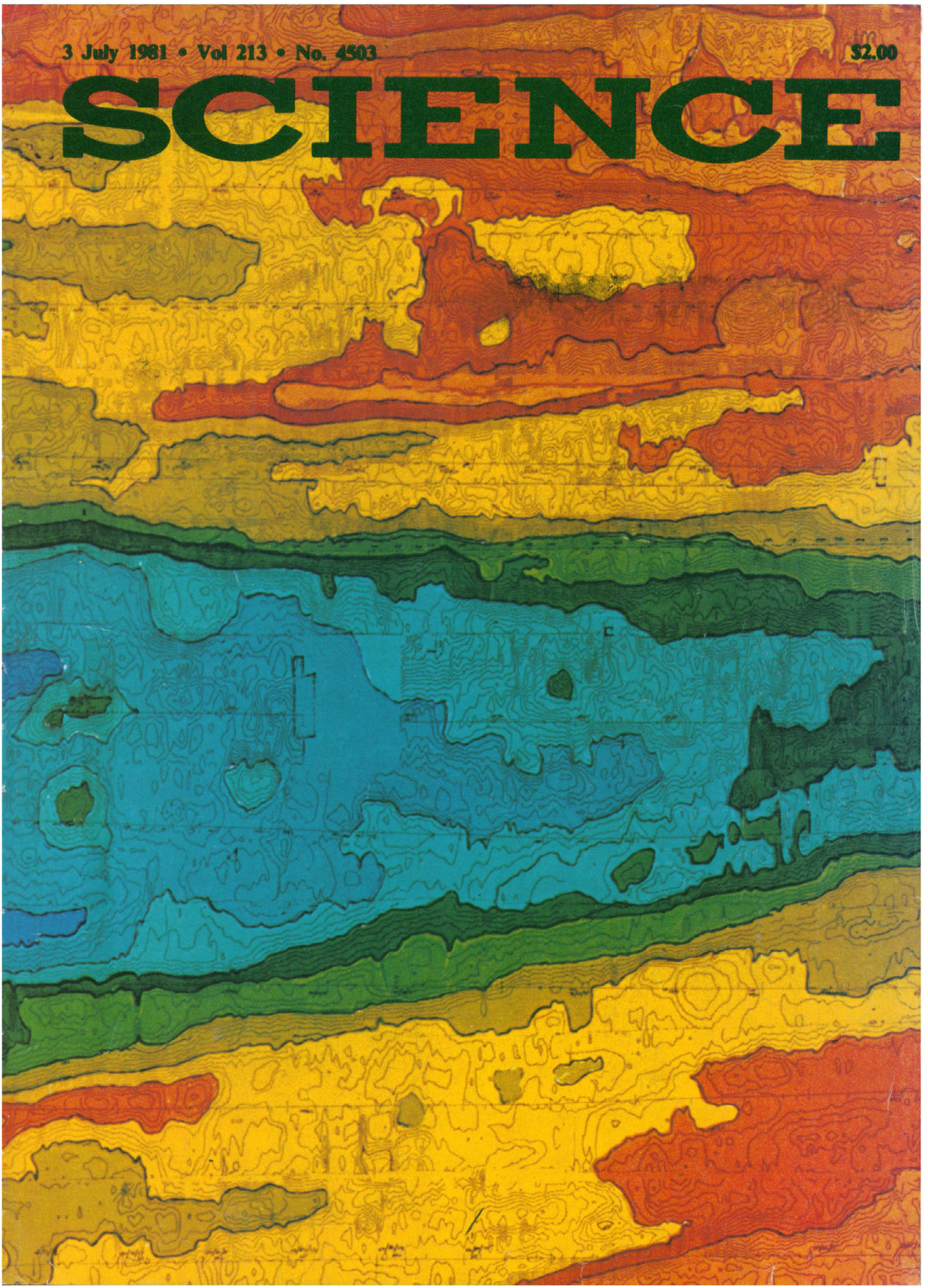
SCIENCE



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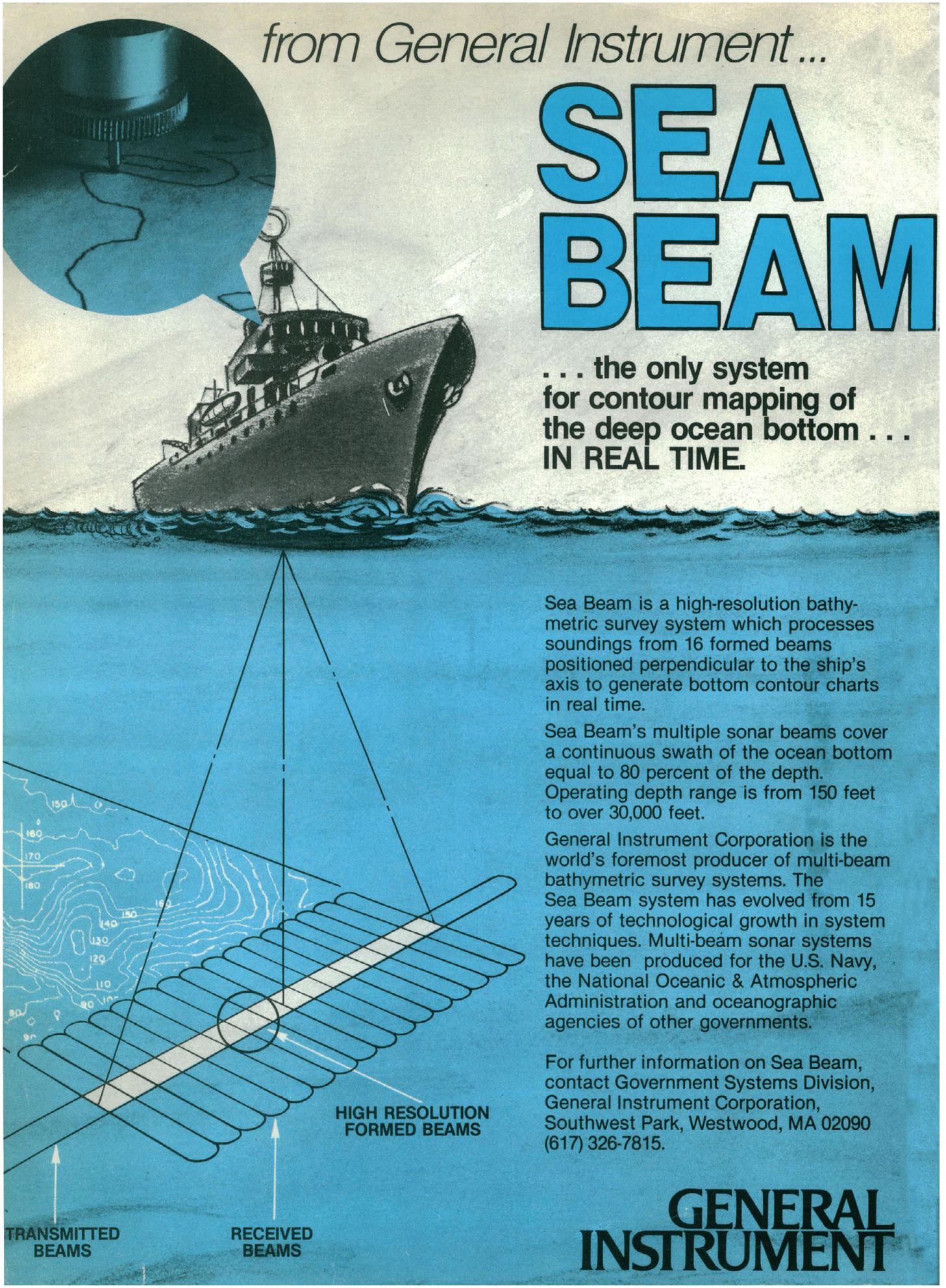

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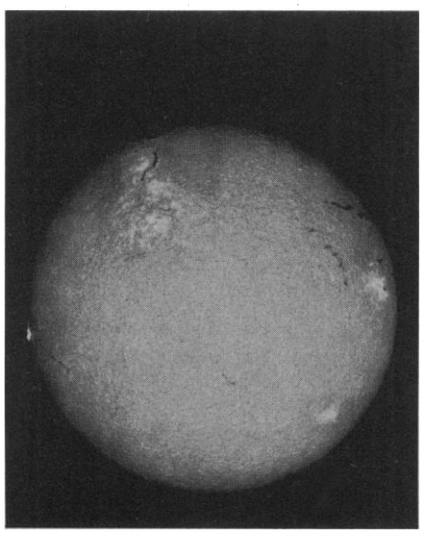
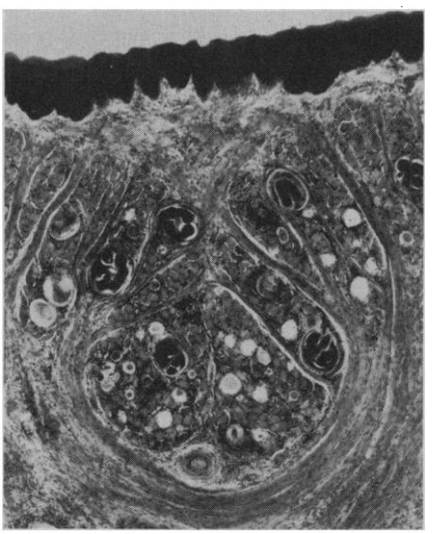
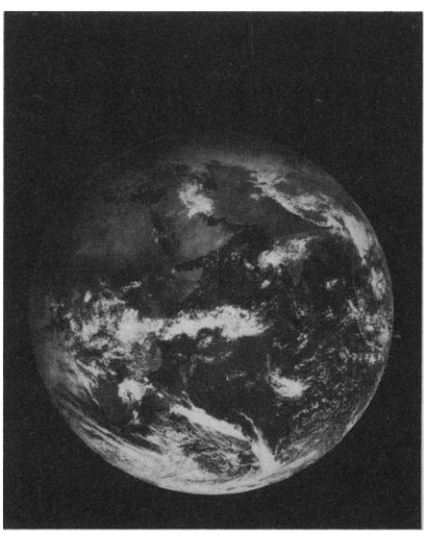


Hydrogen-alpha photograph of solar flares. Sacramento Peak Observatory, Sunspot, N.M.



Photomicrograph of *trichinella spiralis* in muscle, 175×. Tungsten-halogen source (3200 K) with KODAK WRATTEN Filter No. 58.



Meteorological imagery from geostationary satellite. VIZIR laser-beam recording by Société Européenne de Propulsion (France).

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SCIENCE

Solid Earth

Edited by Charles L. Drake and Lois E. Schmitt

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AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

COVER

First high-resolution, real-time, machine-contoured bathymetric map produced in the United States using the SEABEAM, swath sonar system aboard the NOAA ship *Surveyor*. The map shows the geological details of the actively spreading rift valley (blue color) of the Gorda Ridge located 107 kilometers off the coast of Oregon. The Gorda Rift is terminated at its northwestern end by the Blanco Fracture Zone (red color) striking at 300 degrees along the edge of the page. A color change occurs at every 100 meters in a chromatic scale. Violet indicates a depth of 3700 meters and red a depth of 2200 meters. Scale of map is 1 centimeter to 816 meters. See page 15. [Data for the map were taken in 1980 aboard the *Surveyor*, Captain Bruce Williams, commanding officer; color overlay on the machine-contoured map was prepared by Cathy Connelly.] See also page 110.

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Support for DeVita

The following letter to Richard H. Schweiker, Secretary of Health and Human Services, was written in support of Vincent DeVita, Director of the National Cancer Institute, in response to recent press reports. It was signed by 90 physicians and scientists.

We, the undersigned directors and heads of the research laboratories and clinics of the National Cancer Institute with sustained professional contact with Dr. Vincent DeVita, the Director of the National Cancer Institute, are dismayed by the impressions reflected in the press following the recent hearings of the Senate Committee on Labor and Human Resources.

Dr. DeVita served as Acting Director from January 1980 until July 1980, when he was appointed Director of the National Cancer Institute. In this short period of time he has already managed to reorganize ongoing research programs by strengthening those which were most innovative, dismantling those with less promise, and redistributing personnel and resources to take best advantage of promising avenues of research. These changes restored a sense of purpose, boosted morale, and created an environment more conducive to research and clinical progress than has been evident in many, many years.

He has proved to be an excellent manager of scientists and scientific resources, and above all, a dynamic leader. We feel confident that the national scientific community in the areas of cancer research and treatment view Dr. DeVita with the same high regard. Dr. DeVita's personal contributions in the area of cancer treatment can hardly be overstated. He was one of the pioneers in developing protocols which can now be credited with saving thousands of lives.

He understands and effectively implements the needs of basic cancer research and its clinical applications, and has the conviction and motivation to recognize and move programs of greatest promise for the cancer patient. He is, in our opinion, an extremely effective director of the National Cancer Institute.

CHIEFS OF LABORATORIES AND CLINICS
Division of Cancer and Prevention, Division of Cancer Treatment, and *Division of Cancer Biology and Diagnosis, National Cancer Institute, Bethesda, Maryland 20014*

Erratum: The description of the cable-stayed bridge design by Willard Bascom (Letters, 19 June, p. 1339) should have read "the cables were suspended from a series of aluminum towers mounted on tension-leg platforms in water to *2200*-foot depths. Some *30* towers would have been required. . . .

Erratum: In "New A-bomb data shown to radiation experts" (News and Comment, 19 June, p. 1365), the reference to reduced gamma ray doses due to building shielding should have read "by a factor of 1.6," not "by a little more than 60 percent."

Erratum: In the report "Induction of hemoglobin accumulation in human K562 cells by hemin is reversible" by A. Dean *et al.* (24 Apr., p. 459), the second sentence in the legend for figure 1 should have read: "A stock solution of 600 μ*M* hemin was prepared by adding 0.3 ml of 1*N* NaOH to 19.56 mg of hemin, and then adding 0.3 ml of 0.5*M* tris base, 2.5 ml of cell growth medium, and 0.35 ml of 1*N* HCl, and then diluting to a final volume of 50 ml with cell growth medium."

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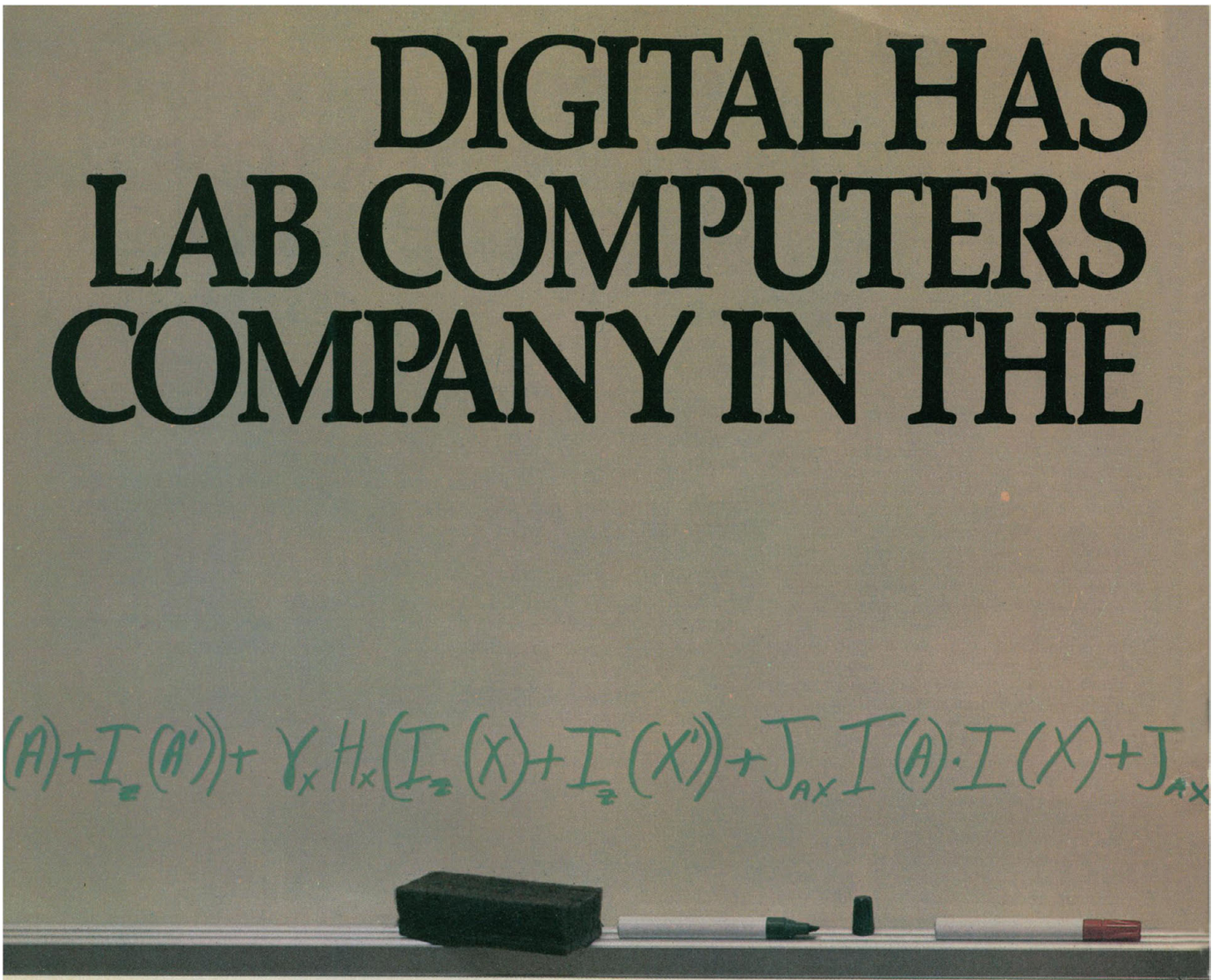

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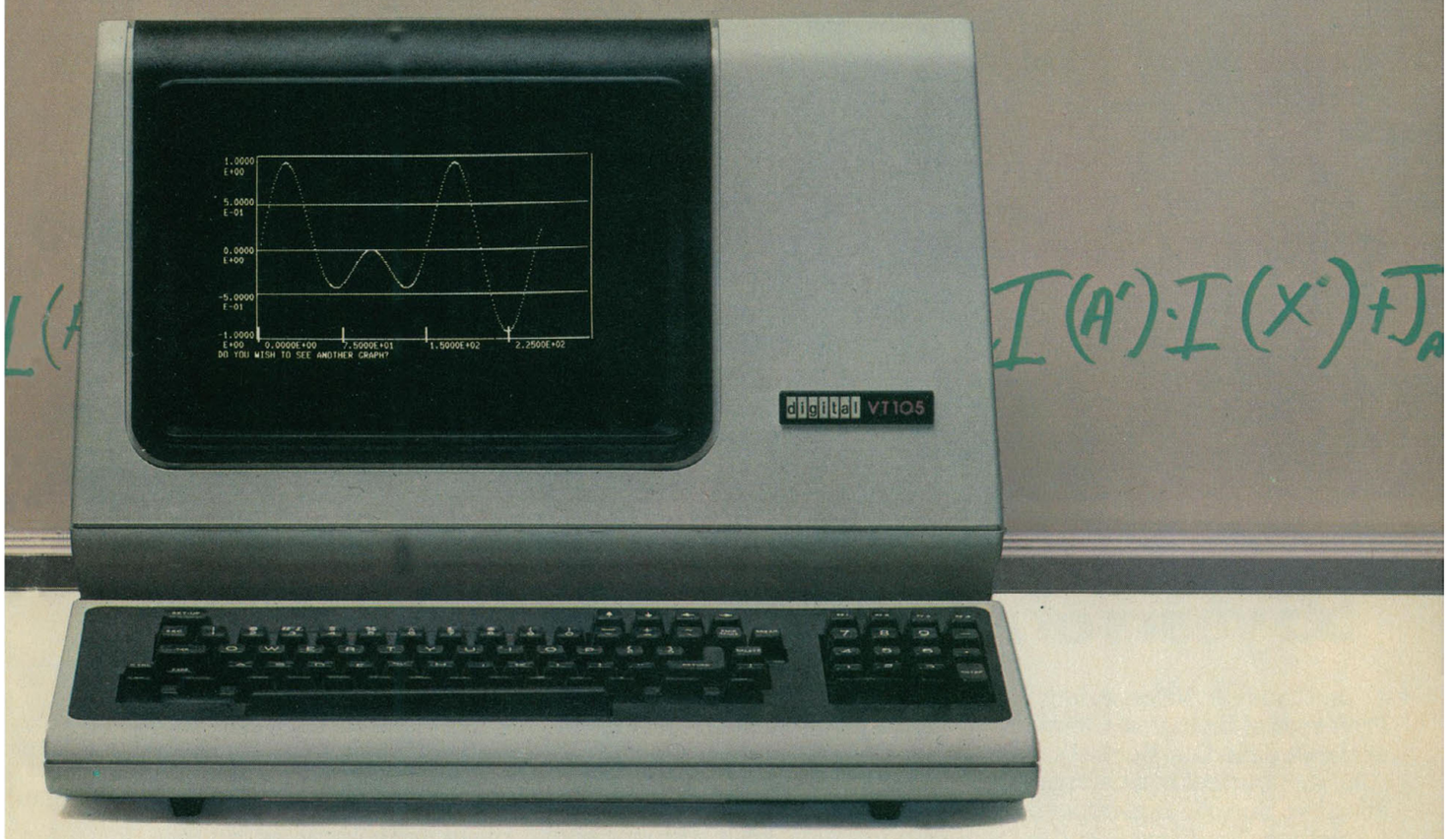

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3 July 1981, Volume 213, Number 4503 **SCIENCE**

Restless Earth

We live on a restless planet. Few weeks go by when there are not earthquakes or volcanic activity. A great heat engine, fueled at least in part by radioactive decays deep in the earth, relentlessly moves pieces of crust the size of continents. Motions of tectonic plates relative to each other averaging 2 to 10 centimeters per year are common. Such motions persist and their cumulative effects are drastic changes in oceans and land.

New crust is being formed under the oceans at the mid-ocean ridges, and the ages of the oldest rocks on the sea bottom are only about 200 million years. In contrast, the age of the earth is about 4600 million years, and that of the oldest rocks found on the continents is about 3800 million years. Accompanying the movements of the plates have been collisions of land masses, mountain building, and repeated hot and cold geochemical and biological processing of enormous amounts of material. While most of the continental areas have been tremendously deformed, parts of them have been miraculously left little changed from the distant past.

Employing careful observations and the concepts of uniformitarianism, geologists and paleontologists made great progress in deciphering Earth and biological history. During this century, and especially within the last 30 years, simple observation has been supplemented by tools derived from the physical sciences. In the United States in the 1950's a small minority of earth scientists believed that the continents had moved great distances. It was after geophysical exploration of the oceans, including measurements of magnetization of bottom rocks and deep-sea drilling, that the concept of moving tectonic plates won acceptance.

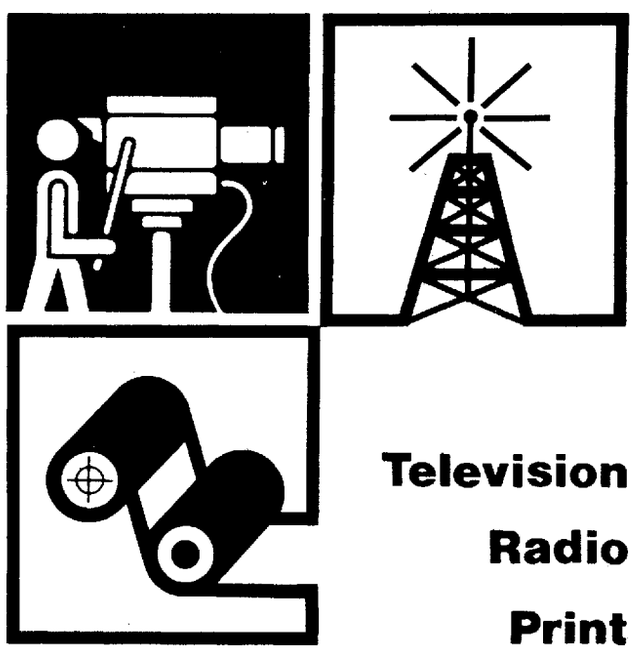
Analysis has shown that the composition of the magma reaching the earth's surface has changed since earliest times. For this and other reasons, the concept of uniformitarianism must be qualified. How and to what extent are questions to be studied further? Of special interest is the history of the movement of the earth's crust. Earlier, radioactive heat was released at four times the present rate. Surely in the past the earth's engine was more violently active, but in what ways?

To answer questions about events that occurred before 200 million years ago, one must seek testimony preserved on the continents. There one can find evidence of both great lateral and vertical motions and of collisions of tectonic plates. Additional knowledge about the complex structure of the continental crust is being accumulated with new tools. For example, the Consortium for Continental Reflection Profiling has discovered that ancient crystalline rocks of the Appalachian Piedmont and Blue Ridge appear to have been thrust 260 kilometers westward over younger, sedimentary rocks. The data also suggest that the thrusting was related to multiple opening and closing of a proto–Atlantic Ocean.

The articles in this issue are designed to portray the current status of geodynamics and opportunities for further research. The group was selected by Charles Drake, who is an international leader in the field. In an introductory essay prepared jointly by Drake and John Maxwell, highlights of the other articles are discussed and relevant international arrangements in geology and geophysics are described. Close worldwide cooperation is essential if the past is to be deciphered. At best, evidence is scattered and fragmentary. For example, in this country there are only limited outcrops of early Precambrian rocks. Good occurrences are seen in Greenland, Zimbabwe, and Brazil. Similarly, while California experiences some earthquakes, a better place to study them is Japan, where the frequency is an order of magnitude greater.

Most of the work described in this issue was stimulated by the International Geodynamics Project, which ended in July 1980. A new Inter-Union Lithosphere Program has been organized which will emphasize studies of the continents and their margins. Out of this project will come better understanding of the past, better knowledge of earthquakes and allied natural hazards, and an improved basis for discovery of mineral and petroleum concentrations.—PHILIP H. ABELSON

1981 AAAS Westinghouse Science Journalism Awards



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The aim of this competition is to encourage and recognize outstanding reporting on the sciences and their engineering and technological applications in newspapers, general circulation magazines, radio, and television. The following categories are not eligible: items on the field of medicine, items published originally in AAAS publications or produced by AAAS; reports by employees of the AAAS or Westinghouse Electric Corporation.

- Each entrant may submit three entries for any one category.

Print

- An entry for a newspaper competition may be any of the following: a single story; a series of articles; or a group of three unrelated stories, articles, editorials, or columns published during the contest year. A magazine entry may be a single story or series published during the contest year.
- A completed entry blank must be submitted together with seven copies of each entry in the form of tear sheets, clippings, reprints, or syndicate copy (not over 8½" x 11"), showing name and date of the publication. **ENTRIES MUST NOT BE ELABORATE!**

Broadcast

- An entry for the radio or television competition may be an individual news story, feature, or a series, regardless of length, broadcast during the contest year on either public or commercial stations. Entries must be comprised of scripted material. Interviews are not eligible.
- A completed entry blank must be submitted together with a cassette in the case of radio and copy of the script or a ¾" videocassette in the case of television and copy of the script.
- Each entry must have been published or broadcast within the United States during the contest year—1 October 1980 through 30 September 1981. (In case of a series, more than half of the items comprising it must have been published or broadcast during the contest year.) The date on the issue in which an article appeared will be considered as the date of publication. All entries must be postmarked on or before midnight, 15 October 1981.
- Persons other than the author may submit entries in accordance with these rules. Entries will not be returned.
- Winners of the 1980 Awards are not eligible for the 1981 awards. Persons winning three times are no longer eligible.
- The Judging Committee, whose decisions are final, will choose the winners. There are five awards of $1,000: for the winning entry in the over 100,000 daily circulation newspapers competition; for the winning entry in the under 100,000 circulation newspapers competition; for the winning entry in the general circulation magazine competition; for the winning entry in the radio competition; and for the winning entry in the television competition. For award purposes, newspaper circulation will be sworn ABC daily circulation as of 30 September 1981. The Judging Committee may cite other entries for honorable mention.
- The awards will be presented at the dinner meeting of the National Association of Science Writers during the Annual Meeting of the American Association for the Advancement of Science in January 1982. Travel and hotel expenses of the awards winners will be paid. Entrants agree that, if they win, they will be present to receive their awards, unless prevented by circumstances beyond their control.

Grayce A. Finger

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