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1. Lundberg, K.S., et al. (1991) Gene 108, 1-6

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Fax: (619) 535-0045

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Stratagene GmbH
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Telefax: (06221) 400639

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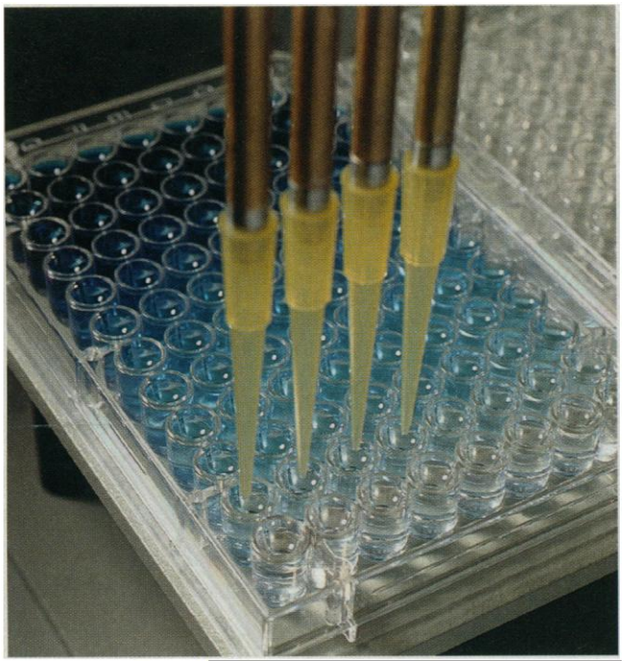

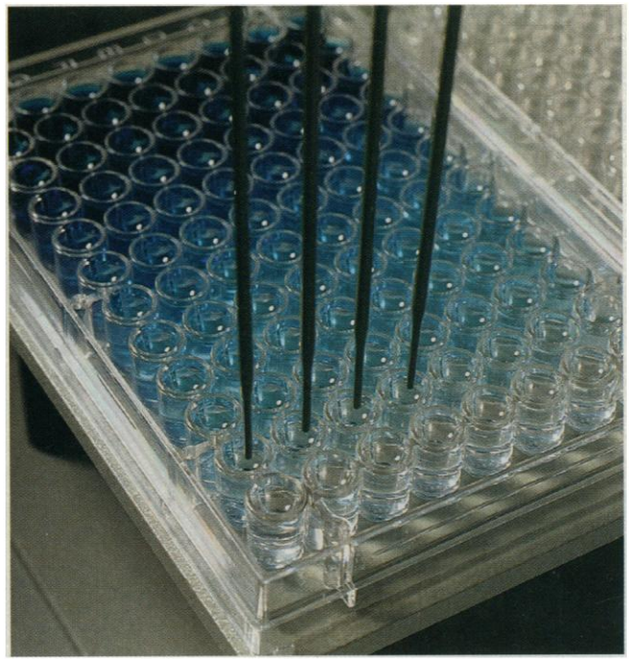

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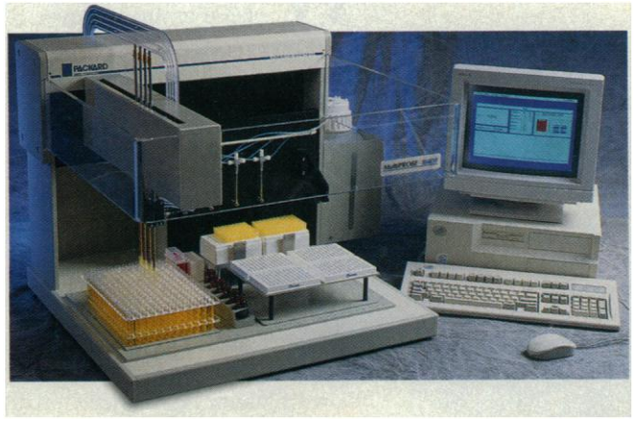

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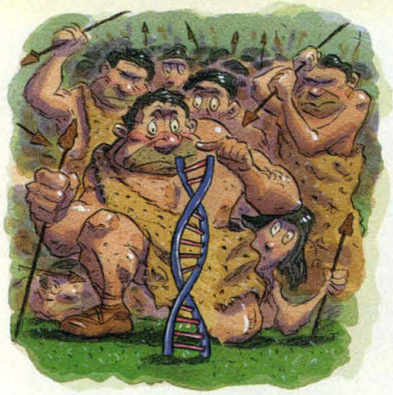

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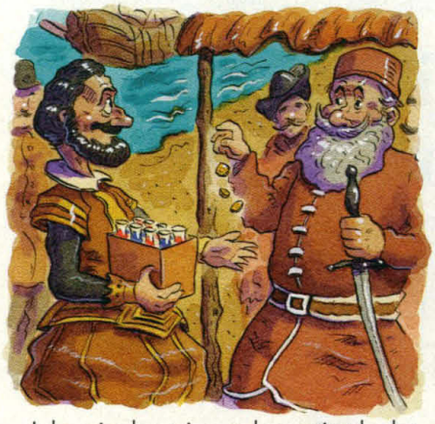

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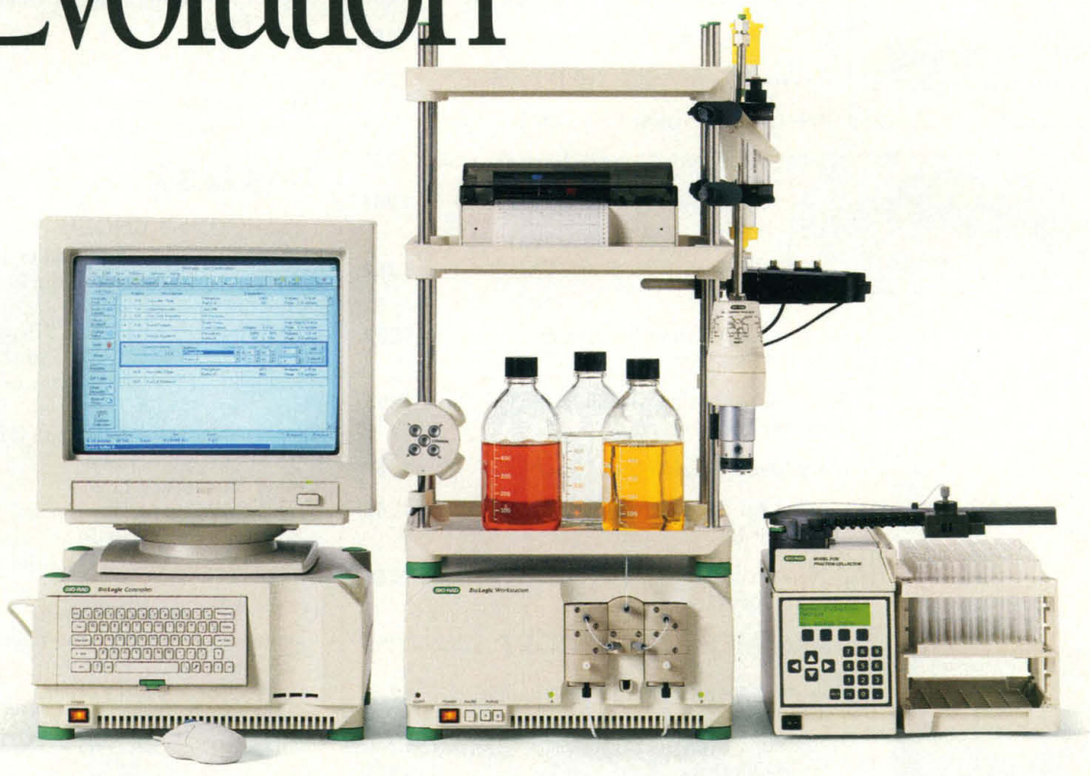

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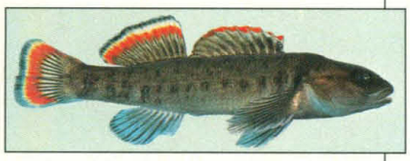
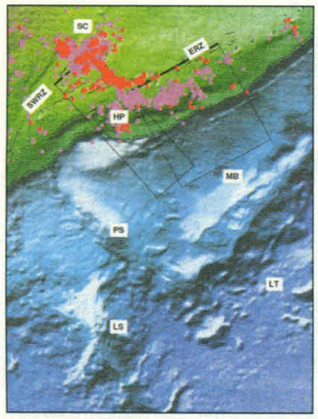


1256
Will the Endangered Species Act save them?



1328
Rates of rifting in Hawaii

NEWS

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PERSPECTIVES

ARTICLES

COMET SHOEMAKER-LEVY 9

DEPARTMENTS

COVER

Four Hubble Space Telescope (HST) images of Jupiter showing (left to right) the plume visible 5 minutes after the impact of fragment G of comet Shoemaker-Levy 9 on 18 July 1994 and the development of the impact site after 1.5 hours, 3 days, and 5 days. The impact sites of fragments L and S appear in the third and fourth images. See Articles beginning on page 1277. [Images: R. Evans, J. Trauger, H. Hammel, and the HST Comet Science Team and NASA]

REPORTS

1356
Coral reef pathogen

Indicates accompanying feature

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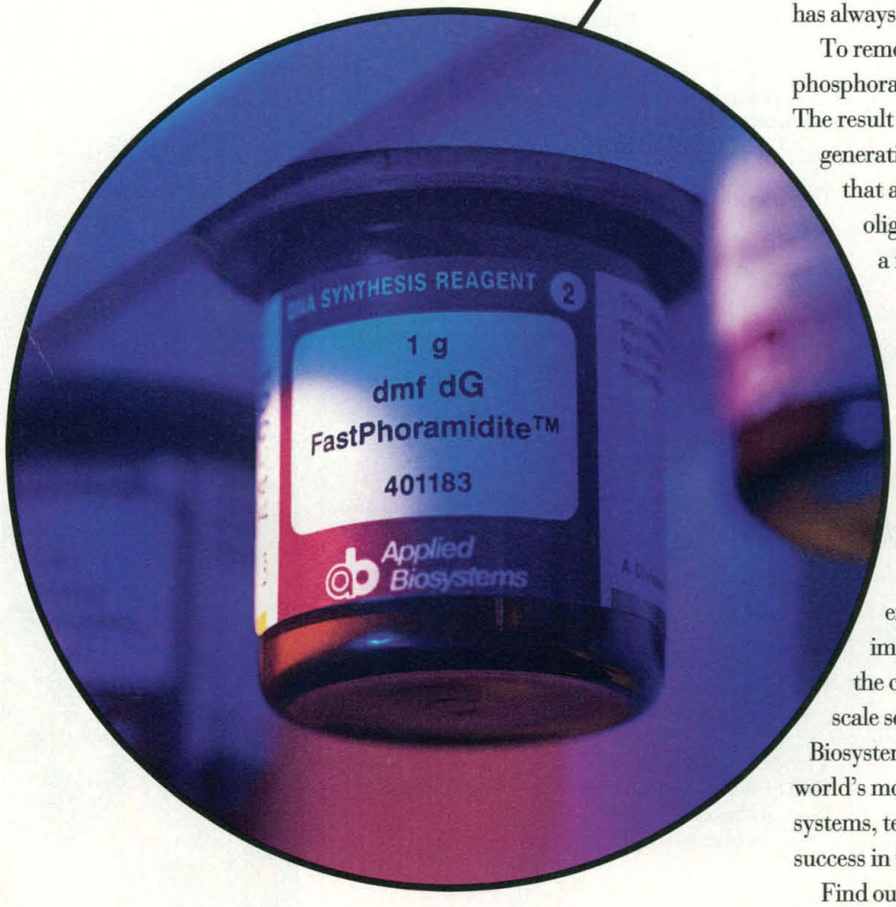

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THIS WEEK IN SCIENCE

edited by DAVID LINDLEY

Starving plankton

Surveys since 1951 over a large region off the coast of southern California indicate that the biomass of zooplankton has decreased by about 80 percent while temperatures at the sea surface have increased. Putting these data together, Roemmich and McGowan (p. 1324) suggest that the changes reflect an increase in stratification of the waters, which has decreased wind-driven upwelling and reduced the supply of essential nutrients to the surface layers.

Disks for discs?

Higher densities in magnetic recording devices could be achieved by reducing the size of the magnetic grains that store data. Gibson and Putzer (p. 1338) used sonication to synthesize highly anisotropic cobalt nanoclusters from basic solutions of Co^{2+} and hydrazine. These disks, typically 100 nanometers wide and 15 nanometers thick, are ferromagnetic, and Lorentz microscopy showed them to be single magnetic domains, making them potentially usable in high-density magnetic devices.

Telltale traces

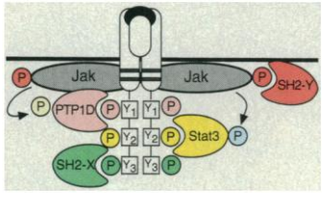
Measurement of the isotopic composition of mammalian bones and teeth has been suggested as a means of reconstructing paleodiets and migration patterns, and has also been proposed as a way of identifying the geographical origin of ivory from poached elephants. To understand better how diet and range are manifested in the preserved isotopic contents, Koch *et al.* (p. 1340; see also news by Culotta, p. 1264) measured carbon, nitrogen, and strontium isotopes in bones (which reflect some average of the diet) and teeth (which retain a subannual history) of elephants in Amboseli Park, Kenya. Samples of teeth showed high isotopic variability, making it hard to reconstruct ecology or monitor poaching. One complicating factor was that elephants selectively fed on trees even as trees were becoming more scarce in the Park.

The crash of '94

During the week of 16 July 1994, the fragments of Comet Shoemaker-Levy 9 plunged into Jupiter's atmosphere, with consequences ranging from impact plumes that lasted a few minutes to atmospheric disturbances that remained visible a month later. Observations of these phenomena by three telescopes are described in this week's issue. Orton *et al.* (p. 1277) used spectroscopy and imagery from the NASA Infrared Telescope Facility on Mauna Kea, Hawaii, to characterize the thermal development of the impact sites and to follow changes in chemistry and dust composition. The light-gathering power of the 10-meter W. M. Keck Telescope, also atop Mauna Kea, allowed the impact of fragment R of the comet to be captured in a series of short-exposure snapshots (Graham *et al.*, p. 1320). Seven articles (Weaver *et al.*, p. 1282, *et seq.*) describe how the high-resolution and multi-wavelength capabilities of the Hubble Space Telescope were used to track the fragments, assess the magnitude of the impacts, and follow the magnetospheric and atmospheric response to the collisions.

Take your partners

Binding of various cytokines (such as interferons, erythropoietin, and ciliary neurotrophic factor) to their receptors enhances tyrosine phosphorylation and results in activation of transcription factors known as STATs. Heim *et al.* (p. 1347) and Stahl *et al.* (p. 1349) explore the mechanism by which such receptors can induce phosphorylation of particular STATs and thus produce a variety of biological responses. The STATs are phosphorylated by tyrosine kinases (known as Jaks) that associate with the cytokine receptors and appear to be relatively nonspecific. Rather, the crucial determinants of which STAT or STATs are phosphorylated appear to be interactions of specific Src homology 2 (SH2) domains on the STATs with particular phosphotyrosine-containing motifs on the receptors.



Checkpoint evaded

Faithful copying of DNA in dividing cells is safeguarded by a number of checkpoints in the normal cell cycle, and there is evidence that the tumor suppressor p53 is involved with some of them. Cross *et al.* (p. 1353) show that fibroblasts from p53-deficient mice undergo many rounds of DNA replication even in the presence of spindle-inhibiting agents, leading to the formation of tetraploid and octaploid cells. Furthermore, mice in which p53 is deficient or inactivated show a large and increasing fraction of tetraploid cells in the pancreas. The failure of a p53-dependent mitotic checkpoint may help explain why p53-deficient mice are predisposed to cancers.

Ravaged reefs

Coralline algae play a crucial role in building coral reefs; they secrete calcium carbonate that helps cement together sand, dead coral, and debris to form a reef substrate able to withstand wave action and protect the outer reef rim. Littler and Littler (p. 1356) have characterized a rapidly spreading pathogen that is killing coralline algae in reefs across thousands of kilometers of the South Pacific. This pathogen, named coralline lethal orange disease (CLOD), is caused by a previously uncharacterized bacterium, and at many sites has progressed from absence to ubiquity in the space of a year.

Neuronal nay-sayer

The neuron-specific gene *SCG10* contains an active region and a region that works as a silencer: when it is bound with the appropriate protein, known as neuron-restrictive silencer factor (NRSF), gene transcription is suppressed. Schoenherr and Anderson (p. 1360) have cloned a novel protein that is a functional fragment of NRSF, and by means of hybridization experiments with mouse embryos show that NRSF is widely expressed in developing nonneuronal cells but is absent in neuronal cells. NRSF appears to function as a universal negative regulator, allowing neuronal cells to develop only when its role as a suppressor is turned off.

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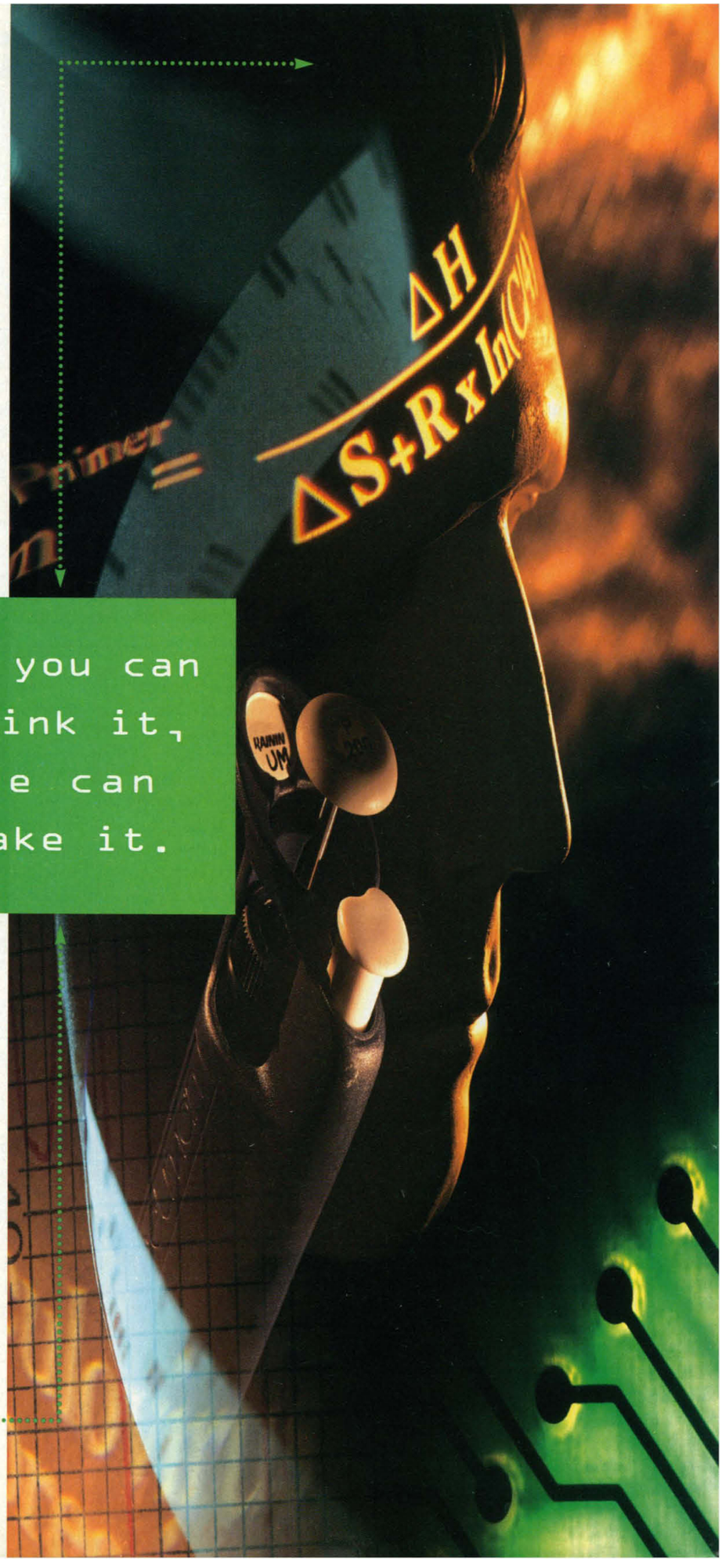

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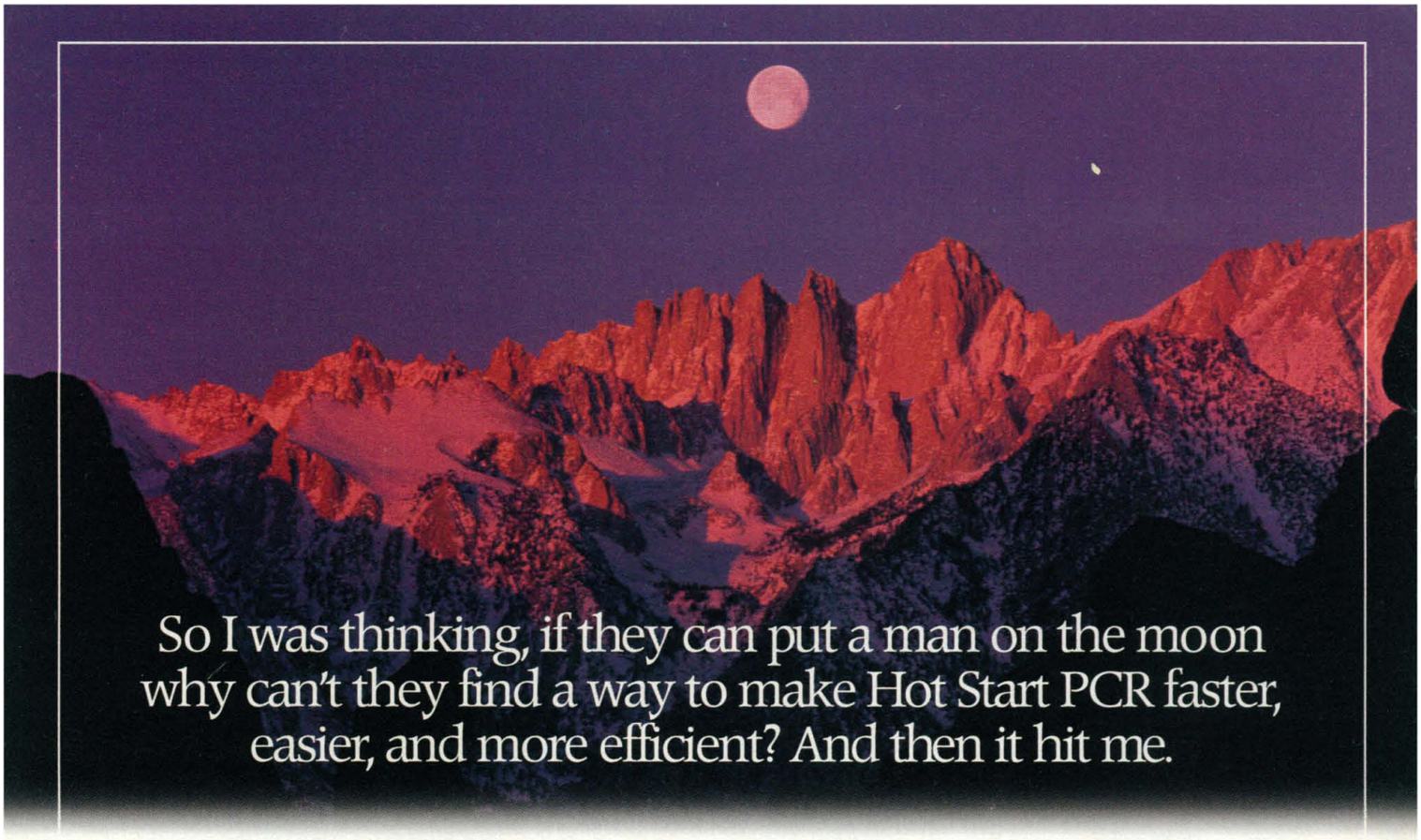

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