Drug Administration. Scientists at the University of California at San Francisco already have managed to make beta-endorphin with recombinant DNA techniques, promising that it can eventually be manufactured economically (SN: 5/17/80, p. 309). More immediately, the findings might lead to more effective psychotherapy for arthritis patients, notably improving their outlooks on life, thus raising their beta-endorphin levels and improving their health. There are reasons to believe that such psychotherapy might be in the offing. First, preliminary findings from Denko and his colleagues show that persons have higher beta-endorphin levels on those days when they feel good about life than on those days when they are pessimistic. Second, some studies by other scientists have shown that rheumatoid patients with a more positive self-image and outlook on life have a better prognosis than do those with a more negative view. "It is the power of the mind over the body," Denko says, "and we now think it may be mediated by endorphins." □

Sea seeps: It's a gas

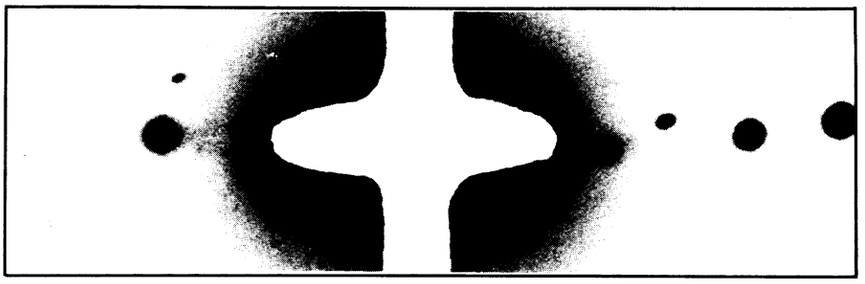
The research ship *Melville* recently came into port with more evidence that methane gas is escaping from seafloor vents on the East Pacific Rise — a region where the ocean floor is drawing apart and molten rock is rising to fill the gap.

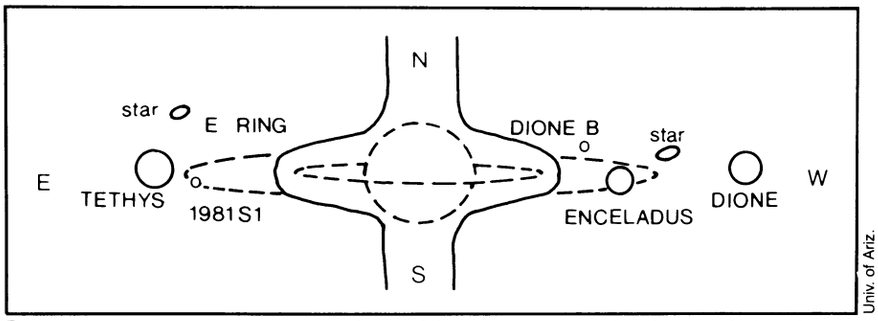
The latest methane discovery was reported by Harmon Craig of Scripps Institution of Oceanography in La Jolla, Calif., who was co-chief scientist for research during the *Melville*'s nine-month voyage. The methane was found in water samples collected above the East Pacific Rise near Latitude 20 degrees South, off the coast of Bolivia. An earlier methane discovery was reported in 1979 by Scripps's John A. Welhan and Craig after the deep-diving submarine *Alvin* (SN: 1/12/80, p. 28) collected water samples directly from seafloor vents near Latitude 21 degrees North on the Rise. While conventional petroleum wisdom holds that most naturally occurring gas is organic in origin — formed when the complex mixture of subsurface organic matter called kerogen decomposes first to heavy oil, then to light oil and finally to gas — researchers say the methane in the seafloor seeps is nonbiological in origin.

Welhan says it could form from high-temperature chemical reactions within the rising molten rock near the seafloor surface. Others support the theory of Cornell University's Thomas Gold, which states there is a sizeable portion of abiogenetic methane gas that was trapped deep within the earth at its birth that is released through certain escape routes (SN: 4/25/81, p. 267).

Welhan's conclusion: "It is premature now to say whether the gas is coming from deep within the earth or coming from near-surface reactions." □

Saturn's crowded satellites





Univ. of Ariz.

Recent studies have found at least three of Saturn's moons to be sharing their orbits with other satellites (SN: 5/30/81, p. 341). This remarkable photo, a negative print of an image made with the 1.54-meter telescope at the University of Arizona's Catalina Observatory, shows two of the planet's established satellites along with one each of their co-orbital companions. At left is Tethys, and the faint spot about a quarter-inch from it at about 4 o'clock is 1981 S1, current designation for a tiny moon that precedes Tethys by about 60° in its motion around Saturn. (Another satellite, not shown, trails Tethys by a similar amount.) At far right is Dione, preceded in its own orbit by a single known companion, dubbed Dione B, which appears as the dim spot just above and to the left of Enceladus. Also shown is Saturn's faint E-ring, which one research team has suggested may be populated by ice particles generated from Enceladus by meteorite impacts (Enceladus orbits almost exactly at — or even within — the E-ring's outer edge). The photo was taken April 1 by S. M. Larson and J. W. Fountain.

Would EMPs induce nuclear meltdowns?

There are some who probably view Demetrios L. Basdekas as a rabble rouser. He is a Nuclear Regulatory Commission safety engineer who worries that electromagnetic pulses (SN: 5/9/81, p. 300) from nuclear weapons — especially those detonated in the upper atmosphere — spell a significant and potential hazard to nuclear-power plants across the nation. And in his worst-case scenario he envisions a nuclear meltdown — the potentially catastrophic melting of a nuclear-reactor's fuel, which could lead to a breaching of its containment vessel and the eventual venting of lethal quantities of radioactive gases into the atmosphere.

This is a problem that has concerned Basdekas since 1976, when he testified about it before Congress. "But nothing happened," he says, "not visibly, anyway." So in 1979, despite a lack of obvious support from inside his agency, "I decided to stick [out] my neck still further," he says, "and I wrote the President." That got results. Among them were interviews with representatives of the National Security Council and independent consultants hired by the government to review his claims. Last year NRC decided to study the problem.

A dictum prohibiting NRC from requiring power plants to withstand the effects of nuclear war had posed a stumbling block to NRC's considering whether to even review a potential need for hardening, or protecting against, EMP, explains Bill Morris, director of NRC's current EMP study. But he says there is a growing concern that potentially hazardous EMP's might occur outside the nuclear-war theater where other radiation effects would predominate. This means NRC may, in the future, make nuclear-plant owners build in some EMP hardening. And whether it does could depend on results of the study now underway by Sandia Laboratory and Boeing Aerospace Corp. The study is trying to anticipate how a typical nuclear plant would respond to EMP and whether it would have difficulty safely shutting down.

If all backup power for a nuclear plant were killed by EMP, core-cooling might be impossible — leading to a meltdown. A 1977 government study found that unlikely. Basdekas doesn't. By year's end, the NRC study will try to decide. □