

The excitement of the success was conveyed in a cablegram received at Scripps from co-chief scientists David G. Moore and Joseph Curry: "The ability to routinely recover undisturbed samples of the upper one to two hundred meters of sediments at DSDP sites is a major technological achievement which will provide previously unattainable and immensely valuable information on the properties of nonlithified [soft] ocean sediments."

The 152-meter core represents 300,000 to 500,000 years and is a significant step over the 30- to 40-meter cores obtained by conventional piston coring methods. Piston cores, as implied by the name, are taken when a hollow cylinder is driven or dropped through a sediment. In previous piston core techniques, the corer was lowered on a wire line from the ship and allowed to "free fall" into the sediments. Thus, relying on the force of gravity, only short cores could be retrieved.

The new device, developed in a 28-week crash program by Scripps engineers Stan Serocki, Mike Storms and Don Cameron, operates from the end of the drill string, or pipe, used for routine drilling. Hydraulic pressure, borrowed from the high pressure pumps used to circulate fluids in the pipe during drilling, punches the barrel rapidly into the sediments. A 5-meter sample is then withdrawn up the drill pipe by a wire line. The device can be repeatedly dropped down the drill string and retrieved, stopping only when it hits hard rock. According to Moore, the hydraulic piston corer will become a standard tool to complement routine DSDP drilling, which manages to churn up the sediments so much that they are useless for stratigraphy studies.

The coring was scientifically as well as technologically successful. The diatomaceous samples are distinctly laminated—the layers are undisturbed by bottom crawlers because of the anoxic conditions in the Gulf—and varved—showing annual layers. A varve, for example, might consist of a set of sediments formed by eroded material carried from the land by summer winds and by diatoms which bloom when winter upwelling carries nutrients to the surface. Comparing the content and properties of varves may allow researchers to infer yearly climatic changes. Knowing they might be able to recover varved samples, Scripps scientists pushed completion of the corer for Leg 64.

Not to be slighted, other parts of Leg 64 also scored successes. Because the Gulf of California is a young (3½-million-year-old) ocean basin, it can serve as a model to understand the earlier stages of formation of the Atlantic Ocean. For example, the Guaymas Basin between Baja California and Mexico offers a unique chance to examine zero age crust. Although, theoretically, zero age crust could be drilled at the Mid-Atlantic Ridge, practically it is not possible because of the lack of sediments necessary to stabilize the drill pipe. In the

Guaymas Basin, however, the Sonora rivers which drain Mexico dump an abundance of sediments into the Gulf. Drilling at the spreading center recovered zero age crust and encountered high geothermal activity. Researchers also found sheet-like basalts which intrude into the sediments and which seem characteristic of young spreading centers instead of the pillow basalts found at older spreading centers.

Leg 64 also gave researchers a chance to sample the ocean crust flanking the continental slope. In the Atlantic, the continental margins are smothered beneath sediments; the underlying ocean crust lies out of the *Challenger's* reach. But the margins of the Gulf of California haven't been around long enough to build that sediment barrier. The drilling during Leg 64 provided a transect of samples of the ocean crust up to the point where it hits continental crust. Such samples will provide detailed history of the subsidence of the continental margin, says Moore. □

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## Third World drugs: Dollars and sense

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The severity of health problems in developing countries was the only noncontroversial item at the conference on pharmaceuticals for developing countries held by the National Academy of Sciences last week. Speaker after speaker listed the major diseases of the tropics and recited the statistics. Reported cases of malaria increased from 3.2 million in 1972 to 7.5 million in 1976. The vast numbers of "semi-urbanized" squatters who have migrated to the periphery of tropical cities have transformed rural diseases to urban epidemics. And millions of unvaccinated children in underdeveloped countries die each year of common, preventable diseases.

A history of conflict between government and drug industry attitudes toward international health actions shadowed the meeting. Yet on some actions government, industry and academia seemed to be approaching a workable agreement.

A major complaint of U.S. drug companies is the legal requirement that new drugs may be exported for commercial use only if they have met Food and Drug Administration standards. Unapproved drugs may be produced at manufacturing facilities outside the country, but the U.S. Agency for International Development, the federal agency with the clearest mandate for foreign health assistance, will not provide funds for drugs not approved in the United States.

Besides the difficulties in testing drugs designed for foreign diseases, the drug companies argue that a drug considered unsafe under some conditions may still be desirable under others. Frank T. Perkins of the World Health Organization pointed out, "It is most important to appreciate

that these drugs or vaccines are urgently needed for infections that are causing millions of deaths each year. The price of efficacy, therefore, may be side reactions in a small proportion of those needing the drug or vaccine and the level of acceptability must be assessed in those communities in most need of the products."

Donald Kennedy, U.S. Commissioner of Food and Drugs, argued that the law should be a balance between the prohibition of U.S. companies dumping inferior or even dangerous substances in countries poorly equipped to evaluate potential risks and the right of foreign countries to use products that, "for often rather special reasons" have been deemed unsuitable for use by U.S. citizens. Kennedy said that the FDA last year submitted to Congress significant amendments to the export provisions. According to the proposed new law, drugs not in compliance with domestic requirements could be exported, under special approval, if the importing government assented after being informed of the basis of the drug's U.S. unapproved status. This is essentially the same policy already adopted by Congress for export of medical devices.

While standards for new pharmaceuticals remain controversial, the economics of getting current pharmaceuticals to developing countries appears on the brink of important advances. V. Fattorusso of the World Health Organization told the meeting that WHO is encouraging regional groups to make a list of essential drugs for governments to purchase in bulk. The South Pacific countries have already made such a list of priority medicines. Fattorusso says that coordinated purchasing would provide markets for effective drugs not in widespread use and provide an incentive for further research and development. He reports that the reactions of European drug companies have been encouraging, as long as the drugs are packaged so that they could not be sold privately or re-exported.

Present vaccine-producing facilities can be scaled up to meet global requirements, Perkins reports on the basis of a recent meeting in Geneva with major vaccine manufacturers. WHO proposes to increase the profitability of vaccine production by realistically estimating future demands, placing advance orders and accepting a research and development component in the price. WHO suggests that developing nations considering their own production of vaccines should first establish a quality control facility, then build a vaccine blending, filling and packaging operation and finally, perhaps, begin vaccine production. Perkins points out that most countries would be best off stopping with the packaging facility, which could save a sizable fraction of the cost, because the amount of vaccine a single country requires is generally too small to justify economically a separate vaccine-producing facility.

Problems of distributing drugs and vaccines within developing countries are a major concern, exemplified by the 80 million children born each year who do not receive immunizations. The conference participants deplored the lack in many countries of health "infrastructure" to provide care to the majority of the people. Fattorusso said that in many developing countries, health services are "Western-styled," based on city hospitals that, with 80 percent of the health budget, cater to only 20 percent of the population. However, Fattorusso believes that new ideas in health care, beginning in the villages and city slums, are breaking the "logjam" in extending health care. Similarly, Perkins reported that 42 countries are currently developing infrastructures for vaccine delivery.

The purpose of the conference was to guide the Institute of Medicine in recommending an international health policy for the United States. Senator Richard S. Schweiker (R-Pa.) spoke of the moral and humanitarian obligation of this country, as well as the need to act in enlightened self-interest on health matters. Schweiker said he plans to sponsor a bill that will call for development of international health expertise in U.S. academic health science centers, and he proposes that an office of international health be created within HEW. Both Senators Jacob K. Javits (R-N.Y.) and Edward M. Kennedy (D-Mass.) said they were introducing international health bills to Congress this session. Gilbert S. Omenn reviewed President Carter's commitment to United States participation in worldwide health efforts and pointed out that Carter included funds in the recent budget for a new federal agency, the Foundation for International Technological Cooperation, to mobilize science and technology for the needs of developing countries. Currently more than 20 separate federal agencies deal with international health problems.

The most basic question, raised several times at the conference, but not discussed extensively on the main agenda, was what should be the priority of providing drugs and vaccines to people whose problems are rooted in poverty, malnutrition and lack of sanitation. In concluding the meeting, Schweiker cautioned that the United States must assess its own strengths and weaknesses in deciding how to provide aid. He said there is no question of the country having a great deal to offer in health technology and scientific expertise. However he says, "I believe it would be fair to conclude that a nation that has traded the health problems of infectious diseases for those of environmental degradation and such unhealthy behavior patterns as overeating, over-drinking and stress, may not be in the best position to offer solutions to complex social and environmental problems in other countries." Schweiker challenges, "We must share our expertise, and not export our mistakes." □

## Infectious arthritis in the Midwest

Although several kinds of infectious arthritis are known to occur in Africa, infectious arthritis was not identified in the United States until the mid-1970s, when a clustering of the disease was discovered in persons living in Lyme, Conn. (SN: 6/19/76, p. 389). Hence it was dubbed "Lyme arthritis."

Since then, sporadic cases of the disease have also been found in other areas of Connecticut than Lyme, and in western Rhode Island, Cape Cod, Mass., and Long Island, N.Y. And now three cases of Lyme arthritis have surfaced in the Midwest as well — in Wisconsin — according to a report in the Feb. 2 *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION* by Randall F. Dryer, Paul G. Goellner and Alexander S. Carney of the University of Iowa Hospitals and Clinics, Iowa City, Iowa.

The three Wisconsin cases, like those in the East, were characterized by severe, but self-limiting systemic symptoms and subsequent periodic episodes of arthritis that grew milder with time and that eventually disappeared. These cases, like the nearly 100 already diagnosed in the East, likewise appear to be transmitted by a tick (SN: 6/10/78, p. 375). All three victims had been camping in northwest Wisconsin, and all three had been bitten by ticks prior to acquiring their symptoms. One of the patients, in fact, was found to have numerous ticks in his hair and skin when he saw a physician about his condition.

Although a tick carries Lyme arthritis, the actual infectious agent that causes the disease must be some organism present in or on the tick. Scientists suspect a virus. □

## Shuttle: Named and aimed

The first orbital flight of the space shuttle is now being aimed for a target date of Nov. 9, according to the National Aeronautics and Space Administration. This is not claimed to be a hard and fast launch date, but a tentative one against which to schedule remaining milestones such as tests and delivery deadlines — assuming that no further mishaps befall the repeatedly delayed program. The vehicle making the flight has been named *Columbia*, after various historical vessels of exploration including one of the first world-circling U.S. Navy ships and the Apollo 11 command module, which circled the moon during the first manned lunar landing in 1969. Subsequent shuttles will be named *Challenger*, *Discovery* and *Atlantis*. The shuttle *Enterprise* (named for the starship of television's "Star Trek"), which got off the ground several times with the aid of a 747 jet, is now considered likely to spend its remaining career as an earthbound testbed. □

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**THE SHROUD OF TURIN: The Burial Cloth of Jesus Christ?** — Ian Wilson — Doubleday, 1978, 272 p., illus., \$10. New research on the Shroud — the recently published findings of the Italian Commission of 1973, the pollen analysis by Max Frei, the author's work on the problems of the history of the Shroud before the 14th century and the research by Drs. Jackson and Jumper of the USAF Academy (See SN: 12/30/78, p. 442).

**SOLAR ENERGY IN AMERICA** — William D. Metz and Allen L. Hammond — AAAS, 1978, 239 p., illus., \$18.50, paper, \$8.50. Examines the diverse technologies that depend upon the sun for their energy source, evaluates the potential and problems of each and discusses their short-term and long-range prospects.

**SOLVE IT!: A Perplexing Profusion of Puzzles** — James F. Fixx — Doubleday, 1978, 94 p., illus., \$5.95. Written specifically with young people of above-average intelligence in mind. Most of the problems require an interesting logical leap of one sort or another; they call into play an ability to perform mental gymnastics.

**SPONGES** — Patricia R. Bergquist — U of Cal Pr, 1978, 268 p., illus., \$25. Sponge organization represents, according to the author, a peculiar, specialized evolutionary strategy and Bergquist takes, whenever possible, a functional approach in describing and interpreting the interactions within the sponge and between the sponge and its environment.

**TELEVISION AND HUMAN BEHAVIOR** — George Comstock et al — Columbia U Pr, 1978, 581 p., charts & graphs, \$16.95, paper, \$9.95. Sets forth what social and behavioral scientists have to say about the effects of television on human behavior from a survey of 2,500 sources.

**THE TORY ISLANDERS: A People of the Celtic Fringe** — Robin Fox — Cambridge U Pr, 1978, 210 p., illus., \$16.95, paper, \$5.95. Features of the social structure, such as kinship, land inheritance, marriage, genealogy, are analyzed and their relationships to each other are examined.

**WHO GOES THERE?: The Search for Intelligent Life in the Universe** — Edward Edelson — Doubleday, 1979, 196 p., illus., \$8.95. What has been done, the current research and the possibilities for the future in the search for intelligent life in the universe.

**WIND IN THE ROCK** — Ann Zwinger — Harrow, 1978, 258 p., drawings by the author, \$15. The author-naturalist explores, mostly on foot, the five canyons of the Grand Gulch Plateau, which empty into the San Juan River in southeastern Utah. The book tells the area's history, describes the moon-like landscape, the plants and the animals of this inhospitable land.

**YOU CAN HAVE A BABY: New Hope for the Childless, Including the Facts about Test Tube Births & Other New Techniques** — Sherwin A. Kaufman — Nelson, 1978, 206 p., \$8.95. A gynecologist/obstetrician surveys the causes of infertility and presents many new techniques that have been developed to combat it.