

sults in the May 20 NATURE. They found that a protein factor (or factors) in the blood plasmas of the Eastern and Western diamondback rattlesnakes will neutralize the lethal toxic effects of venom on mice and rabbits better and faster than commercial antivenom. The diamondbacks' protein factors also prevent blood and tissue damage more completely and will counteract the venoms of many species.

Although rattlesnake bites are not a large problem in the United States (about

1,000 bites are reported per year and cause about 30 deaths) they are a major clinical problem in parts of India and Africa. Besides this, Straight says, thousands of persons handle venomous reptiles as pets, zoo specimens and in research and "of course want the best treatment they can get if and when they need it." The team is not developing a substitute antivenom from snake blood right now, but welcomes interest from others with developmental facilities, Straight says. □

Solomon's mines: End of the search?

Solomon, famous for his wisdom and wealth, was wise enough not to reveal the source of his wealth, but now the secret is out. Without giving a clue to its location, the Bible cites Ophir, a land fabulously rich in gold, as the site of Solomon's mines. And after a four-year detailed geologic, geochemical and geophysical investigation, researchers have located the probable site of Ophir and Solomon's mines in the mountains of Saudi Arabia.

In 1931, K.S. Twitchell, a mining engineer from the United States, visited a mine called Mahd adh Dhahab (Cradle of Gold) located midway between Mecca and Medina. Twitchell concluded that "the workings of Mahd adh Dhahab are the largest I ever saw in Arabia. . . . It is reasonable to guess that this might have been the source of King Solomon's gold." Mining engineers who worked the Mahd adh Dhahab gold-silver mine between 1939 and 1954 also suspected that it was the site of Biblical Ophir. A joint project of the U.S. Geological Survey and the Saudi Arabian Directorate General of Mineral Resources has confirmed these guesses and suspicions. Robert W. Luce, a USGS geologist, says, "Our investigations have now confirmed that the old mine could have been as rich as described in Biblical accounts and, indeed, is a logical candidate to be the lost Ophir."

Confirming evidence comes from several sources. For one thing, the mine is located near a natural north-south trade route that has been used for more than 4,000 years and could have been used by Solomon's people 3,000 years ago. Also, the slopes around the mine are littered with thousands of stone hammers and grindstones that could possibly date from Solomon's time. The most conclusive evidence comes from estimates of the mine's possible output. The Bible says that kings Hiram and Solomon brought a total of 1,086 talents of gold (nearly 31 metric tons) from Ophir to Jerusalem. A million tons of waste mine dumps and rocks left by ancient miners have been examined and found to contain an average of 0.6 ounces of gold per ton. This indicates that the ore mined must have been much richer



Grindstone and trough for crushing gold, possibly from the time of King Solomon.

and could have provided Solomon with his estimated half the known gold supply of the ancient world.

While the district around Mahd adh Dhahab still contains workable deposits of gold and silver, it is not likely that the rediscovered Ophir will produce another Solomon. □

Bones of Buddha

Gautama Buddha, founder of one of the world's major religions, died in the 6th century B.C., and his cremated remains were distributed among eight communities closely associated with the events of his life. An Indian government archaeological team now reports finding a portion of the remains of the founder of Buddhism. Since 1971, excavation has been underway in Piprahwa, a small village in the Uttar Pradesh state. The village is believed to be the site of the ancient city of Kapilvastu where Prince Siddhartha, who became Gautama Buddha, spent the first 29 years of his life before renouncing his parents and his possessions. In 1973, a soapstone casket was unearthed with an inscription on the lid saying it contained the mortal remains of Prince Siddhartha. The inscription, written in ancient Buddhist script, has since been examined, and the Indian archaeologists are convinced of its authenticity. □

Handler: NRC needs guaranteed funding

As the principal operating agency of the National Academy of Sciences, the National Academy of Engineering and the Institute of Medicine, the National Research Council conducts advisory studies for federal agencies by mobilizing the services of some 7,500 scientists from all over the country. But Philip Handler, president of the National Academy of Sciences and chairman of the NRC Governing Board, says that to conduct long-term research a more permanent funding arrangement is needed.

The NRC, he says, has fallen into a "somewhat precarious existence" by receiving funds only for specific projects (now about \$50 million a year). As a result, it has had to operate "largely in a responsive mode, undertaking studies on the request of the government; only rarely has a committee been able to undertake, on its own initiative, a large, comprehensive study of a major question."

Handler's proposed solution is to institute a somewhat awkwardly phrased "assured subvention analogous to endowment income." In other words, the government would annually set aside a substantial block of money for the NRC's discretionary use, free from interference. Academies of science in several European countries enjoy this sort of relationship with their government sponsors. □

Mathematician wins Waterman Award

Princeton University mathematician Charles L. Fefferman has won the National Science Foundation's first annual Alan T. Waterman Award for outstanding accomplishment and promise as a young researcher. The award was established by Congress last year on the occasion of NSF's 25th anniversary and is named after the first director of the Foundation.

Fefferman, who is 27 years old, was selected from among 232 nominees by an award panel headed by Nobel laureate Melvin Calvin. He was cited "for his researches in Fourier analysis, partial differential equations and several complex variables, which have brought fresh insight and renewed vigor to the classical areas of mathematics and contributed significantly to the advancement of modern mathematical analysis." The award includes a medal and a grant of \$50,000 a year for three years of research and study at an institution of the recipient's choice.

The award is designed to recognize and encourage promising researchers while they are still young (many Nobel prizes are awarded years after the scientist involved has passed his prime), but by any

standards Fefferman is a prodigy. He received his doctorate in mathematics at age 20 and two years later became the youngest full professor at any U.S. college, when he was appointed to the position at the University of Chicago. His colleagues

have described his rapid rise to prominence in his field "spectacular," but he is equally recognized by his students as an accomplished teacher with an ability to clarify the complex recesses of mathematics. □

U.S. and France share ocean plans



Illustrations: NOAA

German "Helgoland" habitat will be home for U.S. and French divers this summer.

A variety of topics ranging from the effects of thermal effluents of nuclear power plants to living and working on the seafloor are included in a U.S.-French cooperative agreement on ocean studies, announced this month by officials from both countries. The agreement is an expansion of a research relationship that has its roots as far back as 1969, now grown to encompass aquaculture, pollution studies, mineralogy, instrumentation development and coastal-zone research.

A highlight of the newly expanded program will be a month-long experiment this

summer in the Baltic Sea near Travermunde, West Germany, using a four-person German undersea habitat called Helgoland. Operated by a German crew, Helgoland will be home for four teams of U.S., French and German divers living for a week each at a depth of about 16 meters. Physical and chemical ocean-bottom studies will be concerned with sedimentation, nutrients, oxygenation and exploration of shallow, sub-bottom layers. Considerably enlarged from a related program in 1974, also in the Baltic, the experiment will also involve studies of diver safety telemetry, physiological evaluations of human tolerance to cold, high-pressure environments and evaluation of an experimental U.S. Navy decompression computer.

Under the agreement, U.S. and French oceanographic and geophysical researchers also plan to exchange information and conduct joint investigations into the formation of manganese nodules, increasingly prominent as a valuable seafloor resource. Officials of the U.S. National Oceanic and Atmospheric Administration emphasize, however, that the work will be strictly a scientific study—not a resource-mapping survey, which is a hot potato in France as well as in the U.S., as mineral-mining companies impatiently await the establishment of some kind of open-sea legislation to regulate resources far from national boundaries.

French researchers will also become involved in CEPEX, the U.S. Controlled Ecosystem Pollution Experiment, in which 10-by-30-meter "balloons" are used beneath the ocean surface to provide controlled habitats for a variety of biolog-

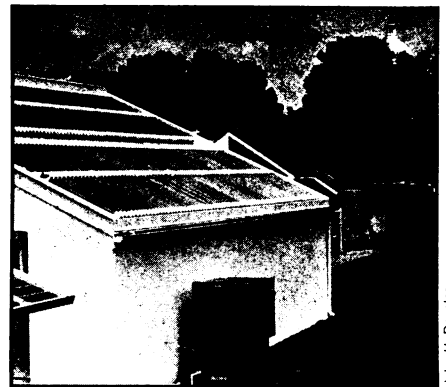
ical and other studies. A similar study has been underway in France.

Ocean pollution has been a part of U.S.-French sea studies almost since their inception. They have grown until they now include three major areas: prevention and control of oil spills, remote sensing in the marine environment, and pollution prevention equipment for ships as required by international agreements. U.S. researchers have already found success in modifications of French oil-spill cleanup techniques, and the two nations have combined their research buoys in joint monitoring tasks. Under the new agreement, researchers will try out each other's oil-spill containment barriers and oil-skimming systems, including testing in the United States of the French Cyclonet oil-recovery device and the Caiman system for storing recovered oil.

A number of aquaculture experiments are planned, including the exchange of data and techniques in the commercial rearing of oysters, coho salmon (using eggs supplied to France by the U.S.) and shrimp. U.S. researchers are interested, for example, in France's successful rearing of a species of tropical shrimp that has so far defied American efforts at forced maturation.

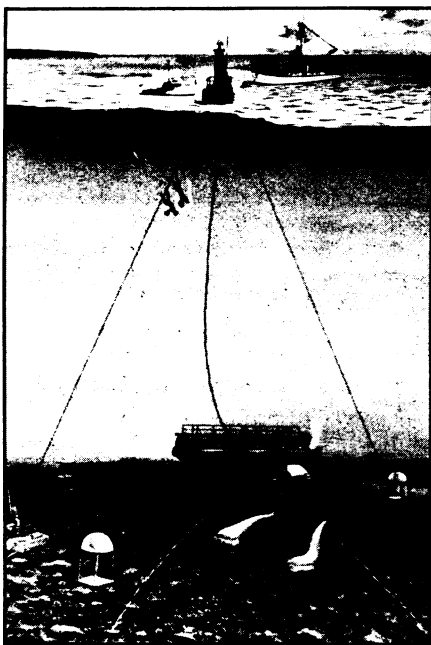
Besides NOAA and the Navy, U.S. agencies involved in the agreement include the Coast Guard, National Science Foundation and Energy Research and Development Administration. □

Energy exhibit



John H. Douglas

Within site of the U.S. Capitol, a new Solar House (closest) and a Conservation House have been built as part of a unique energy exhibition on the Mall for Bicentennial tourists. The exhibit is a cooperative project of the Energy Research and Development Administration, the Federal Energy Administration, the Department of Housing and Urban Development and Concern, Inc. Robert Hirsch, ERDA's assistant administrator for solar, geothermal and advanced energy systems, says one aim of the exhibit is to increase public awareness that the success of solar and conservation programs depends on what individuals do in their own homes. □



Helgoland at work with surface support.