plify "evolution in progress," says Elaine Hoagland, executive director of the Association of Systematics Collections, a Washington, D.C.-based organization representing 80 North American botanical gardens and natural history museums. Although the association primarily seeks to preserve individual species, it is also considering lobbying for the protection of plant hybrids. "You can go overboard in trying to freeze what exists now," Hoagland explains. "You can't outlaw evolution."

Hoagland represents her association on the Endangered Species Act Reauthorization Committee, a coalition of environmental groups drawing up changes to the 1973 Endangered Species Act for congressional consideration. The law will cease to exist if it does not gain reauthorization during the current congressional session, which will end in 1992.

David Blockstein of the American Ornithologists' Union in Washington, D.C., is a member of the reauthorization committee's working group to formulate conservation measures for all endangered hybrids, plant or animal. Recently, critics have assailed captive breeding programs for the extinct-in-the-wild red wolf, arguing that the animal is a hybrid between the gray wolf and the coyote (SN: 6/15/91, p.374). "We're looking to see if there's a need to incorporate a legal remedy [into the Endangered Species Act to protect hybrids]," Blockstein says.

In the meantime, the U.S. Fish and Wildlife Service may loosen its strictures against hybrid preservation. Larry Shannon, chief of the agency's division of endangered species, says it will propose new regulations this fall to protect hybrids with parent species listed as endangered. — *C. Ezzell*

Organs spread hepatitis C

Transplanted organs, the gift of life for many, can cause a potentially fatal liver disease if they come from donors infected with hepatitis C, warn researchers who have identified 12 such cases.

Their study confirms earlier hints that the virus responsible for hepatitis C can spread via transplanted organs, as is the case with hepatitis B. This finding may compel organ banks to begin screening donor tissues for evidence of the hepatitis C virus, says Andrew S. Levey of the New England Organ Bank in Brookline, Mass.

Levey and his colleagues tested frozen blood serum obtained from 716 organ donors whose tissues were transplanted from 1986 through 1990. The analysis identified 13 donors who had antibodies to the hepatitis C virus — a microorganism first identified in 1988. Kidneys, hearts and livers from the infected donors went to 29 recipients, the team reports in the Aug. 15 New England Journal of Medicine.

When the researchers contacted the physicians of the 29 transplant recipients, they learned that 14 of these patients (48 percent) developed some form of hepatitis within about four months after the transplantation. All 14 cases were severe; two of the patients later died of the disease.

Levey's team analyzed blood samples from 13 of the 14 hepatitis-afflicted recipients, using a recently developed test that detects antibodies to the hepatitis C virus (SN: 1/6/90, p.7). Evidence of the virus turned up in 12 of the samples, strongly suggesting that it caused their liver disease.

Levey says the New England Organ Bank now includes the hepatitis C test in routine donor screens. It does not allow transplants of C-infected organs unless the recipient is near death and has no alternative. □

Buried rock, bacteria yield deep-sea feast

It took seven long years, but oceanographers believe they have finally identified the kitchen, the raw ingredients and the cooks that prepare one of the more intriguing feasts on Earth.

Nearly every food web on the planet is supported by photosynthetic organisms, which use solar energy to produce carbohydrates. The 1984 discovery of groups of animals thriving at extreme depths in the Gulf of Mexico — well beyond the reach of the sun's rays and far from any seafloor hot springs — left scientists wondering what energy source sustained those communities. Analyses soon revealed that the animals exist in symbiosis with bacteria that produce carbohydrates by consuming energy-rich compounds. However, researchers could not tell where these compounds — primarily methane and sulfide — originated.

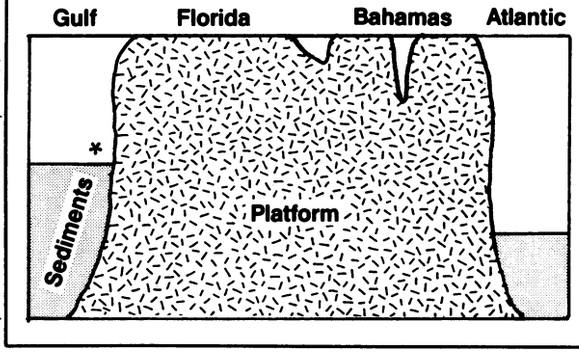
New work suggests that the compounds are produced in rock lying several kilometers beneath Florida's continental platform, report Christopher S. Martens and Charles K. Paull of the University of North Carolina in Chapel Hill and Jeffrey P. Chanton at Florida State University in Tallahassee.

During an expedition in the deep submersible *Alvin* in 1984, Martens and his colleagues found communities of mussels, tube worms, crabs, fish and other animals living on the cold seafloor at the base of the Florida escarpment — a 1,500-meter-high cliff that rises to the carbonate platform that holds Florida and the Bahamas. Paull says the cliff is about as tall as and steeper than a one-sided Grand Canyon. Studies by other researchers have suggested that the mussels derive their energy from bacteria that consume methane, while the tube worms draw their sustenance from bacteria that eat hydrogen sulfide.

Methane, the chief component of natural gas, can form through many processes, including the type of chemical reactions that produce petroleum. For this reason, scientists suspected that the methane on the seafloor might come from buried petroleum reservoirs. But Martens and his colleagues, who have examined the ratios of various carbon isotopes in the deep-sea methane, now suggest that it does not seep out of petroleum traps beneath the seafloor. Instead, they say, the methane has a biological source.

In the August Geology, the researchers propose that bacteria living in porous rock deep within the Florida platform produce the methane by consuming ancient organic matter stuck in the rock. Other bacteria in the rock convert seawater sulfate into the energy-rich sulfide, they suggest. Seawater circulating through the platform then transports the methane and sulfide to the hungry animals living by the foot of the cliff. In effect, the deep rock provides the kitchen and some of the raw materials, and the bacteria play the role of cooks.

These findings help scientists get to "the bottom of biology," Paull says. "We certainly know there are things that live in the ground, but how far down do they live?" The new evidence suggests for the first time that extremely active bacteria can exist beneath several kilometers of overlying rock, he says. — *R. Monastersky*



Adapted from Paull and Neumann/Geology

Bacteria living in porous rock deep within the Florida platform may produce energy-rich compounds that seep out of the platform edge, sustaining biological communities living at the base of the Florida escarpment (asterisk).