## A closer view of midocean fauna

Compared to the hefty tomes of information about aquatic animals that dwell either near the ocean surface or floor, knowledge of the many soft-bodied animals that populate midwater depths would scarcely fill a slim volume. This disparity will narrow, researchers hope, with the initiation this week of a one-year pilot project in the Santa Barbara Channel, ten miles from the mainland.

The project, sponsored by a $256,000 grant from the National Science Foundation, is named Wasp after the one-person motorized diving suit that will enable researchers to observe midocean animals. The suit originally was developed for applications related to oil rigs. It is equipped with electrically driven propellers that allow the researcher to manuever, and with flexible arms for grasping and for manipulating specially designed sampling devices. If the project succeeds, the researchers not only will obtain unharmed specimens, but will demonstrate that for some applications the diving suit is a versatile alternative to submersibles such as the Alvin. Total cost per day for the Wasp—$6,270 — is about half that for Alvin, researchers estimate. The diving suit can be operated with a three-person crew, compared with Alvin's 18-person crew.

Most samples of midocean animals are caught in nets, which often destroy the animals' gelatinous, soft bodies. "We have no idea how many of those animals exist down there, or if they are important parts of the ecosystem or not," says Alice Alldredge of the University of California at Santa Barbara. She is co-principal investigator of the Wasp project, along with Bruce Robison, also of UC Santa Barbara. Scientists onboard the Alvin during its descent to the ocean floor suggest that there are "enormous numbers of predators of a gelatinous type," she says. Such predators include the jellyfish and Portuguese man-of-war. In one part of her research she will assess population densities, and will compare her figures to the numbers of midocean animals collected in nets towed simultaneously nearby.

In another project, Robison and James Case, a neurobiologist at UC Santa Barbara, will test the hypothesis that the midocean animals respond to light levels, migrating toward the ocean surface as the sun sets, and away from the surface in the morning. They also will study ways that the animals use bioluminescence in courtship displays or other forms of communication. The scientists will illumine the dark ocean waters with an instrument called a night vision scope. The tool projects red light, which is invisible to many animals at depth. The scientist encased in the aluminum diving suit will be relatively unobtrusive.

The Wasp will be deployed to depths of 600 meters, and will provide the first opportunity for scientists to observe the soft-bodied animals throughout the water column. "It's a means of putting man in the ocean in a more natural way than he's ever been able to go before," Alldredge says. "It's sort of like extending scuba into the deep sea." She also will study "marine snow," particles that resemble snowflakes raining down to the seafloor. The varied bacteria, algae and phytoplankton that live on the particles may be important to recycling of nutrients in the oceans.

*—C. Simon*

## Cadmium and high blood pressure

High blood pressure in humans might be caused in part by eating or inhaling small amounts of cadmium, a metal sometimes found in the environment, according to a newly released study.

Not much is known about what causes essential hypertension — chronic high blood pressure — but it is estimated to affect 23 million Americans and is responsible for almost 70 percent of all first heart attacks and strokes. Up until now, cadmium was thought to be biologically harmless in amounts that humans were likely to encounter even by eating foods or breathing industrially polluted air high in cadmium. But research published in the Aug. 27 SCIENCE indicates that cadmium at environmental levels may have a pronounced effect on the cardiovascular system in mammals. "What we are suggesting is that cadmium may play a part in essential human hypertension. And if it does, it's obviously prudent that we don't let our environment become more contaminated than it already is." says H. Mitchell Perry Jr. at the Veterans Administration Medical Center in St. Louis.

Perry's group, with colleagues Stephen J. Kopp and Thomas Glonek at the Nuclear Magnetic Resonance Laboratory in Chicago, recorded blood pressure in 520 rats fed different amounts of cadmium. They found that a specific amount of cadmium, 10 micrograms per day, induced a maximum increase in blood pressure. Rats in this group showed a 20 percent increase in blood pressure as compared to control rats. Rats fed less than 10 micrograms of cadmium as well as rats fed more than 10 $\mu$g had lower blood pressure readings but blood pressure was still higher than controls. Rats fed very high doses showed blood pressure readings that were lower than controls.

Perry says, "One of the things that happens, certainly with rats and apparently with human beings, is that there is a small dose effect that is very real. As you go to higher doses this effect disappears." The results indicate that hypertension in mammals might be triggered by a specific, small amount of cadmium. Beyond the critical amount — at higher doses of cadmium — Perry says cadmium's toxic or poisonous effect starts to predominate; animals become very sick and the symptoms of hypertension may be masked. Edward Ohanian, an Environmental Protection Agency toxicologist, suggests that high levels of cadmium might poison or inactivate an underlying mechanism by which hypertension occurs.

Humans are exposed to cadmium in the environment in various ways. Certain foods like liver, shellfish and oysters in particular have unusually high amounts of cadmium, Perry says. According to Perry, cigarette smokers inhale almost twice as much cadmium as non-smokers. And, he says, persons living near zinc-cadmium mines or cadmium battery factories might be inhaling cadmium-contaminated air.

But Perry says his results are preliminary because while they indicate rats given a low dose of cadmium developed hypertension, no one has shown cadmium's effect on human beings. Perry says doses given to rats were slightly higher than comparable amounts that the average American ingests or inhales. But, he adds, a significant number of people do ingest or inhale cadmium in amounts that are comparable to those shown to cause high blood pressure in rats.

*—K.A. Fackelmann*

## The second spacewoman

The second woman ever to fly in space was launched on Aug. 19 by the Soviet Union. Cosmonaut Svetlana Savitskaya, a 34-year-old aerobatic pilot and parachutist also described as a "researcher-engineer," journeyed with two male colleagues (cosmonauts Leonid Popov and Alexander Serebrov) in the Soyuz T-7 spacecraft, which rendezvoused a day later with the waiting Salyut 7 space station. The only other spacewoman was also a Russian, Valentina Tereshkova, who orbited the earth 48 times aboard Vostok 6 in June of 1963 (SN: 6/29/63, p. 408). The decision to launch a second female cosmonaut was not unexpected, as the Soviet news agency Tass had announced on June 30 that two Soviet women were undergoing spaceflight training.

While the United States has not yet sent a woman into space, eight are now in training as mission specialists for the space shuttle. The first scheduled for a specific mission is Sally K. Ride, a 31-year-old physicist from Encino, Calif., who was selected with five other female astronauts in 1978 (two more have since joined the list). Ride is now training to go on the seventh shuttle flight, targeted for next April with a payload of communications satellites for Indonesia and Canada as well as a pallet of scientific instruments for NASA's Office of Space and Terrestrial Applications. □