lites. This period coincided with a severe ionospheric storm caused by a "solar bullet" of charged particles emitted by the sun.

"We predicted this event 3 or 4 months before it took place, so we scheduled our experiment to bracket it," Foster says. "We needed ionospheric structure — a real storm — to really test the method, and we got it."

Using computers, researchers created tomographic images of the ionosphere, which they compared with radar measurements made at the same time as the radio observations (see illustration). In general, the best mathematical algorithms presently available picked up the same ionospheric features seen in the radar data, though not the details.

"The tomographic algorithms developed by Kunitsyn and the Moscow group are the most sophisticated and most accurate I've seen," Foster contends. He and his colleagues describe the RATE project in the recently released Summer 1994 INTERNATIONAL JOURNAL OF IMAGING SYSTEMS AND TECHNOLOGY.

Several groups in the United States and elsewhere are working to develop computerized radio tomography into a viable method of mapping the ionosphere. At the same time, scientists studying the ionosphere have an unusually well documented storm to ponder.

— *I. Peterson*

New mixture takes the ache out of aspirin

Researchers may have found a new way to prevent the stomach pain many people get from aspirin — and to make the drug work better as well. Their solution, tested in rats, is not for the squeamish, however: They used aspirin mixed with a component of intestinal mucus.

Aspirin falls into a class of pain relievers called nonsteroidal anti-inflammatory drugs (NSAIDs). All tend to irritate the stomach or intestine, says physiologist Lenard M. Lichtenberger of the University of Texas Medical School at Houston. Buffered or coated tablets go down more easily, but they don't work as well.

Lichtenberger found in earlier work that NSAIDs seem to affect the slippery coating that protects the gastrointestinal tract lining from gastric acid. The coating, secreted by mucous cells, is topped off with a detergentlike molecule called a phospholipid.

In the February NATURE MEDICINE, Lichtenberger and his colleagues report that in the test tube, NSAIDs combine with this phospholipid. In the body, that could make the intestinal coating less resistant to water and acid.

To prevent this action, the researchers tried mixing the phospholipid and aspirin *before* they reach the stomach. Compared to rats given plain aspirin, rats fed this complex experienced much less gastrointestinal bleeding. The complex also proved "significantly more effective" at reducing fever and inflammation in the rats, the group reports.

Tests with other NSAIDs yielded similar results. "The activity of these complexes was at least as good as, and in almost all cases better than, the NSAID alone," Lichtenberger says. "The reason, we feel, is that the complexed NSAID is more lipid-soluble, so it can get across the [cell] membrane faster."

The phospholipid produced naturally in the body isn't cheap. But the Texas group got the same effect with a less expensive — and less revolting — phospholipid: soy lecithin, commonly sold in health food stores. Adding lecithin to aspirin "wouldn't prohibitively increase" its cost, Lichtenberger says.

Gastroenterologist Dennis McCarthy of the University of New Mexico School of Medicine calls the study "quite an important paper scientifically." But he cautions that the question remains whether the new preparation inhibits blood platelet clotting, a widespread use of aspirin.

Lichtenberger's group has already begun platelet clotting tests in rats. Next, they hope to try their tamed-down aspirin in humans.

— *J. Kaiser*

Deep-sea sponge reaches out, devours

Most people think sponges spend their days quietly sucking in and spitting out water, hoping to trap a few bacteria or some organic matter in their filters for dinner. A newly identified sponge may send this picture of passivity down the drain.

Jean Vacelet and Nicole Boury-Esnault of the Université d' Aix-Marseille II in Marseille, France, discovered a sponge that has evolved some, shall we say, unique characteristics in response to the scarcity of food in the relatively still waters of the deep sea, they report in the Jan. 26 NATURE.

"This remarkable sponge is effectively a carnivore," Michelle Kelly-Borges of the Natural History Museum in London notes in an accompanying editorial.

The sponge has developed filaments to capture small crustaceans. Minute, hook-shaped, pointy structures called spicules cover the moveable filaments and provide "a Velcro-like adhesiveness," the authors say.

Crustaceans, usually less than 1 millimeter wide, get trapped on the spicules. They struggle for hours to free themselves. Then new filaments grow over the prey, covering it completely in a day. Within a few days, the sponge digests its catch.

Most of this food is broken down within the sponge's body, but the filaments can digest little nibbles, Vacelet explains.

The as-yet-unnamed sponge belongs to the genus *Asbestopluma,* which normally resides in the North Pacific and North Atlantic at least 100 meters below sea level. Indeed, members of this genus live as far down as 8,840 meters. However, Vacelet and Boury-Esnault found their specimen a mere 17 meters below sea level, in a Mediterranean cave.

No one knows for certain how the sponge got there. Perhaps strong currents carried it from a deep-sea canyon. In any case, the cave had all the attributes of the deep sea: cold water, limited nutrients, and darkness, Kelly-Borges notes.

Researchers had suspected that deep-sea and shallow-water sponges had different systems for capturing their dinner. Scientists had even seen sponges with spicules. However, they knew little about the deep-sea dwellers or what the spicules did.

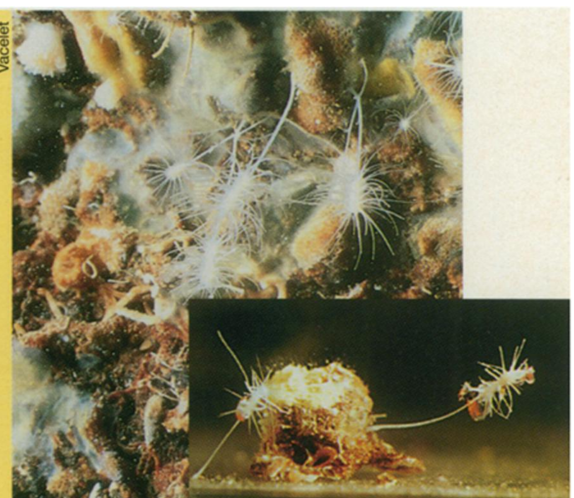
The cave discovery "made it possible to observe for the first time how sponges feed in such extreme environments," the French scientists report.

Normal sponges "are filter feeders *par excellence.* Their entire body is organized for filtering water, which is moved inside an aquiferous system by choanocytes," or pumping cells.

The new sponge has neither choanocytes nor a system for filtering water. "The definition of the phylum, based on the aquiferous system and . . . choanocytes, is now inadequate," Vacelet says.

— *T. Adler*

Vacelet



A carnivorous sponge in a cave in the Mediterranean Sea and (inset) in an aquarium engulfing crustaceans.