owned shipyards or among employees of government contractors. In fact, Parker proposed a revolving superfund scheme — like the one Congress enacted to clean up abandoned hazardous-waste dumps — during his testimony.

Manville is also among nine current or former asbestos manufacturers that make up the Asbestos Compensation Coalition. The coalition is seeking congressional sponsors for a bill that would fund such a program with the federal government matching, on a dollar-for-dollar basis, the combined contribution of asbestos defendants and their insurers.

Assistant U.S. Attorney General J. Paul McGrath reported at the Sept. 9 hearing, however, that the federal government has in this administration's eyes, "No... liability to the victims of asbestos-related diseases" who were not directly employed by the government. But Rep. George Miller (D-Calif.), who chaired the hearing, has an alternate asbestos-compensation proposed plan. It would have the government administer funds paid out solely by industry and responsible employers.

Interestingly, Manville has carried insurance against potential asbestos-disease claims continuously for the past 40 years. However, says Manville's John Lonnquist, "Except for one company, all are essentialy withholding payments." Either the firms claim Manville's policies are void because Manville withheld health-effects data (something Manville vigorously denies) or they challenge when a specific victim contracted the disease for which compensation is sought. Does disease begin when the victim is first exposed or when the symptoms first appear — perhaps 40 years later? Manville's early insurers subscribe to the latter concept while its more recent insurers believe in disease onset with first exposure. For its part, Manville is suing all its insurers, asking for $5 million in punitive damages while the debate is settled. —*J. Raloff*

Polynas surrounded by ice and mystery

Last year, a team of Soviet and American scientists boarded the Soviet icebreaker *Mikhail Somov* and penetrated 300 miles into the ice of Antarctica's Weddell Sea. Their goal was to reach a transient ice-free lake, or polyna, that they hoped would form that year in the Southern Ocean ice surrounding Antarctica. Satellite images had indicated a slight thinning of the ice near that location, but a polyna did not form. The most recent polyna was first observed in the Weddell Sea in 1973 by satellites and did not freeze over until 1976.

The expedition was successful in its quest to gather a base of information about the region's chemistry and biology, and about processes that may lead to a polyna, but the stimulus for polyna formation is still unknown. "There is no way of predicting them, no way of understanding them at this time," says Arnold L. Gordon of Lamont Doherty Geological Observatory in Palisades, N.Y.

A polyna in the open ocean differs from coastal polynas, which may be only one percent as large and are caused by strong winds that literally blow the ice away. Until the *Somov* voyage, there were few direct observations from within the frozen ocean; most data are collected during the Austral summer when the sea is ice free. Polynas form as the sea freezes with winter's approach. For some reason, occasionally areas as large as 300,000 square kilometers do not freeze. "Polyna" is a Russian word that roughly translated means "an enclosed area of unfrozen water surrounded by ice."

"We've discounted the idea that polynas are maintained by strong winds," Gordon says, though winds may be important in a polyna's initiation. Theodore Foster of the University of California at Santa Cruz explains that the winds around the Weddell Sea move in a clockwise gyre. The wind movement and forces caused by the earth's rotation deflect surface currents away from the middle of the sea toward its edges. Then, the warm sea water present at depths of about 200 meters rises, setting up a huge convection current — a possible cue for a polyna. The wind circulation also occurs in the numerous years when there is no polyna.

The two layers of water — the cold upper layer and the warmer layer beneath — are stable, Gordon says, "but the stability is very marginal. All you have to do is increase density of the surface layer a little bit and it will overturn. That's what we feel caused the polyna. Warm water came up and melted the ice, or never allowed it to form in that particular region."

He suggests three general processes that could spur the convection associated with a polyna: a change in the circulation in the Weddell Sea, which would raise the interface between the layers to shallower depths, initiating convection; stronger winds that could blow the ice away and speed up ice formation, which also would destabilize the surface layer; and colder winters, which would cause more ice to form. Ice forms only from fresh water, thereby increasing salinity of the remaining water, and also disrupting the stability between the two layers.

Observations made during the recent trip revealed unexpected "bumps," high points on the interface between the two layers, he says. These features are warm and salty, raising the temperature and salinity of the surface layer.

Gordon coordinated the expedition with the Arctic and Antarctic Research Institute in Leningrad. The American participants were funded by the National Science Foundation. —*C. Simon*

Kitchen ecology: Cukes, spice, bugs

When Clifton E. Meloan first heard that cucumber skins can keep cockroaches away, he was sure the notion was nothing more than a "wild ... old wive's tale." A similar tale already had prompted him to begin studies of the apparent cockroach-repelling ability of bay leaves; but the cucumber idea just seemed too farfetched to pursue. Then, Meloan mentioned it to a colleague who related that he had once seen a hotel chef place cucumber slices at the corners of the kitchen's food preparation table and commented that the hotel had quite a chef, one who "even garnishes the table." Meloan's colleague was told the kitchen was expecting a visit from the city's health and sanitation department; the chef was merely using the cucumbers to keep cockroaches out of the food.

After hearing of his friend's experience, Meloan, of Kansas State University in Manhattan, decided the seemingly cockamamy cockroach-and-cucumber tale was probably worth checking out after all. Cucumber skins joined the bay leaves in the tank of about 600 cockroaches in his analytical lab. Last week, at the American Chemical Society meeting in Kansas City, Mo., Meloan reported that industry already has shown interest in the data gathered with this strange combination of laboratory tools.

First, Meloan reported, he and colleagues have shown that, at least in a laboratory test chamber, chemicals in bay leaves and cucumber skins do indeed repel cockroaches. Second, analyses have shown that the most active cockroach-repelling compound in bay leaves is "cineole," a two-ringed structure also known as "eucalyptol" in certain cough drop formulations; the most active ingredient in cucumber skins is "trans-2-noneal," a chain of nine carbons. Finally, Meloan has isolated the most active portions of each of the two compounds and now is trying to synthesize super-repellants composed of those chemical units. Some of these formulations now are being tested in the field by Aeroxon of New Rochelle, N.Y., a company that manufactures flypaper strips.

Should a particular formulation prove to be a successful cockroach repellant outside of the laboratory, it eventually could be enclosed in time-released capsules that could be attached to strips of tape, which in turn could be placed in pantries, near kitchen counters — even on the bottoms of grocery bags — to keep cockroaches away.

A repellant based on "two compounds that we eat" has obvious advantages, says Meloan. For one, it avoids the problem of spraying pesticides around food. It may also prove a more long-lasting solution than pesticides, which invoke resistant cockroach strains. —*L. Garmon*