ENVIRONMENT

Gunk in the Skagerrak

Swedish fishermen, trawling on the Skagerrak between Norway and Denmark, are bringing up more in their nets than fish. Invariably, says Swedish chemist Arne Holmstrom in the June 19 NATURE, they dredge up sheets of plastic, half-chewed and encrusted with marine plants and animals. And this, he says, is both surprising and serious.

Polyethlyene plastics, in the form of plastic bags and cargo wrappings, often are tossed overboard from ships at sea. Many expect that, since the filmy plastic is less dense than water and normally floats, it eventually will wash up on shore and leave the aquatic ecosystem undisturbed. Finding it in large quantities at depths of 180 to 400 meters, therefore, is disturbing.

Holmstrom, of Chalmers University of Technology and the University of Gothenburg, suggests a possible chronology of events leading the plastic to its deep resting place and to the "eating traces" found in it. Layers of calcareous bryozoans (crusty colonies of tiny marine animals) are found on the films along with traces of brown algae. What happens, most likely, is that bryozoans begin to colonize the plastic near the surface, and weight it down. At depths of perhaps 15 to 25 meters, brown algae begin to grow and weight it down to the bottom. There, plant-eating molluscs graze on the algae and consume hunks of the plastic.

The effects of injecting plastic films into a deep sea aquatic ecosystem are not known. Throwing plastic films overboard, Holmstrom says, must be considered a source of pollution.

Gunk in the New York Bight

The National Oceanic and Atmospheric Administration has just released its report of an 18-month study of environmental damage created by dumping urban and industrial wastes in the stretch of ocean between Long Island and the Continental Shelf called the New York Bight. Nearly half a billion cubic feet of sewage sludge, dredging spoils, waste acid and other gunk is dumped there each year—the refuse of an urban complex of nearly 20 million people.

Concludes the report: Ocean disposal has caused "some ecological damage," but so far appears to pose "no immediate threat to the public health or to Long Island beaches." Signs of environmental damage include concentrations of coliform (intestinal) bacteria in shellfish beds in the area, higher incidence of fin rot among fish and shell deformities among crabs and other crustaceans.

The scientists also found a subtler, and perhaps even more ominous, biological effect that NOAA says will be studied in the next stage of the Bight investigation. This is the transmission of "R-factor" among bacteria in the water—a genetic change that produces antibiotic-resistance in the bacteria.

E Pluribus Unum to Eh? Whadya Say?

The average American adult spends about two thirds of his time in two places—at work and in bed. The latter, one hopes, is quiet and restful. The former definitely isn't for several million workers. A new study reports noise levels in 19 major industries are so high that one third of the nation's production workers are likely to suffer impaired hearing by middle age. Unless, of course, the work environment is hushed up—and that would cost a staggering sum.

The study was done by Bolt Baranek and Newman, Inc., of Cambridge, Mass., for the U.S. Occupational Safety and Health Administration. They state that 36 percent of the production workers are likely to suffer hearing losses of greater than 25 decibels by the age of 55 to 59. If the current standards of 90 decibels per eight hour day were strictly enforced, 700,000 would be spared hearing loss. If an 85 decibel standard were adopted, hearing loss could be avoided by 1.47 million workers. This noise reduction would cost, however, between $13.5 billion and $31.6 billion respectively, the report states.

EPA sets radiation standards

Under new authority granted during reorganization of the Atomic Energy Commission, the Environmental Protection Agency has set new limits for the maximum annual radiation dose a person can receive from the environment—lower by a factor of 20 than the old AEC regulations. New standards covering the entire uranium fuel cycle were also announced.

Each year the average person absorbs about 100 millirems of natural radiation from cosmic rays and minute traces of radioactive materials in everyday objects. The old limit for an annual "whole body dose" of artificial radiation was 500 millirems, excluding medical treatment (a single X-ray examination may involve several hundred millirems). EPA has set a new annual limit of 25 millirems—the lowest level judged compatible with further development of nuclear power. No "minimum threshold" level could be established since *any* amount of radiation does some damage (a million persons exposed to 1,000 millirems of radiation will develop about 400 additional cases of cancer).

Emission of radioactive isotopes to the environment at any time after uranium leaves the mine until its wastes are finally stored will also be subjected to new standards. The requirements vary among the isotopes, depending on their half-lives and chemical properties. Most reactors already meet the proposed standards, but some upgrading of fuel processing may be required. Additional standards for radiation release during mining and waste disposal may come later.

At a press conference announcing the regulations, EPA Administrator Russell E. Train called nuclear energy an "environmentally acceptable method for producing electrical power," and said the new regulations should not inhibit either the further development of reactors or their clustering into "nuclear parks." He added, however, that thermal pollution may later be found to play a limiting role in such parks.

Turtle grass to the rescue

A University of Miami biologist has developed a technique she says can restore vegetation to denuded bay bottoms a dozen times faster than natural processes. Utilizing funds from the National Oceanic and Atmospheric Administration's Sea Grant program, Anitra Thorhaug recently applied her technique to restoring turtle grass *(Thalassium testudinum)* to the floor of a bay in Florida whose vegetation had been killed by heated water and silt from a power plant.

Ordinarily, sprigs would be cut from established stands of the common seagrass, but for so large a project, such a method would be very time-consuming and might possibly damage the beds from which the sprigs were taken. As an alternative, Thorhaug took a diving crew to the Bahamas where they harvested large numbers of seeds from *Thalassia* stands. These were treated with a root-growth hormone and suspended in running water until they could be planted.

After planting, the seeds quickly took root. After nine months, more than two-thirds of the plants were still thriving. The replanting has helped restore the fish population of the bay, and the technique may be helpful in other underwater areas damaged by siltation and sewage. But more research is needed. In particular, Thorhaug says, the effects of changing temperature and salinity on the young plants must be determined.