

## The Final Empire

### CHAPTER 6

#### THE DYING OCEANS

During the first part of the twentieth century, as ocean fishing increased in intensity, stocks of in-demand fish began to be "fished out." Their populations were driven so low that they were unable to repopulate. Other species occupied their food chain niches. Recent historical crashes of fish stocks include: 1935, the Antarctic Blue Whale; 1945, the East Asian Sardines; 1946, the California Sardines that fed John Steinbeck's Cannery Row; 1950, the Northwest Pacific Salmon which is one of the many species of migrating salmon on the West Coast of North America; 1961, the Atlantic-Scandian Herring; 1962, the Barents Sea Cod; 1962, the Antarctic Fin Whales; and in 1972, the Peruvian Anchovy stocks. The annual world fish catch rose from 2 million tons in 1900 to 18 million tons in 1950.<sup>1</sup> From 1950 to 1970 the catch rose an average of 6 per cent per year to 66 million tons. In 1970 it leveled off to a 1 per cent per year increase, an average rate of growth which continued until 1982 when it leveled off at 76.8 million tons. Since 1984, the world fish catch has begun to shrink, even though investment in fishing equipment has risen substantially.<sup>2</sup> In the northwest Atlantic, catches of cod, haddock, halibut, herring and other major human food species peaked in the late sixties. The catch of these species has dropped sharply since then, with declines ranging from 40 per cent for herring to over 90 per cent for halibut.<sup>3</sup> Today massive factory fishing fleets of the industrial nations scour the world looking for protein, yet investment in fishing brings a smaller and smaller return. The catch continues to fall, especially for choice table fish. Still investment continues because the exploding populations will pay higher prices for food and the bankers who continually finance new equipment must be paid off.

Thirty-two percent of the world fish catch is now "trash" fish that are processed into fishmeal, fertilizer, livestock food and fish oil.<sup>4</sup> This means that even though humans are finding ways to use more kinds of fish, the total catch, now including "trash fish," does not increase. As humans destroy the upper links of the ocean food chain, we will focus more heavily on plankton and krill, the tiny organisms that are the base of much of the ocean life. Japanese and Russian factory fleets are already taking 100 tons per day of krill from Antarctic waters, destroying the food chain for the entire ecology of beings dependent upon krill in that area.<sup>5</sup> The phytoplankton of the oceans produce some 70 per cent of the earth's oxygen. As these populations of phytoplankton decline because of pollution and ozone layer weakening, the oxygen available for life on Earth will be impaired. The ocean food chain will weaken further as well. As the ocean fish stock declines more pressure will be put on the decreasing amount of arable land. This is because one-third of the ocean fish catch goes into agriculture as livestock food and fertilizer. The energy pathways of fish protein, to agricultural fertilizer and livestock food, will wither, adding further pressure on the soil and oil-based, artificial fertilizer supplies. Meanwhile population increases.

## Ocean Pollution

The waters of the oceans continually flow. Jacques Cousteau notes, for example, that all of the water of the Mediterranean will be exchanged with the surrounding bodies of water within 90 years. Cousteau points out that there is already DDT in the livers of the penguins of Antarctica and that while rivers and semi-enclosed seas are in worse shape than the oceans today, that will not long remain the case.<sup>6</sup>

The open oceans are considered, "biological deserts." It is the continental shelves that produce the basic populations of life in the sea and it is the bays, wetlands, estuaries, mangrove swamps, coral reefs and other coastline sanctuaries that incubate that life. As garbage, sewage, chemical poisons and oil spills flow with the currents, they concentrate near coastlines and eliminate the basis of ocean life. What New York City and surrounding municipalities are doing is similar to the stories of injury to ocean ecology worldwide. Since 1987, barges carrying all of the sewage sludge from New York City, two adjoining New York counties and six New Jersey counties have dumped about 24,250 tons of wastes every day—that's eight million tons a year—into the last place in the U.S. where ocean dumping is still allowed, a 100-square-mile area of ocean located 106 miles offshore of Cape May, New Jersey, called the 106 Deepwater Municipal Sludge Site. The wastes include substantial amounts of industrial and household toxic chemicals. A 1983 report by the U.S. National Oceanic and Atmospheric Administration estimates the "area of influence" of toxic wastes deposited at this dumpsite at 46,000 square miles. The area is a spawning ground for about 200 species of fish, and is frequented by dolphins, whales and turtles, some species of which are already considered to be endangered.<sup>7</sup>

Fishermen off the New England coast report that the 1988 lobster catch was down between 70 and 90 per cent, while the lobsters that are caught often have black holes burned into their shells from contamination. That year, Debbie Wynn, a Rhode Island fisherman's wife, told *In These Times* newspaper:

"My husband has been lobstering 17 years and we've never seen anything like this. A year ago, fishermen were returning more short lobsters than they'd seen for years. Not a single one has been seen since the fall. We're fishing with 20 per cent more gear and catching 70 per cent less lobsters. And the red crabs look like somebody's taken a blowtorch to them.

"There's a yellow scum floating on the surface 150 to 175 miles away from the dumpsite itself, and all the shellfish have burn spots from exposure to heavy metals. I'm so scared. The meat isn't contaminated [sic?] but these creatures can't survive without their shells. And the pollution affects crabs and lobsters first, then clams and scallops, then goes into the fish. That's when consumers will have cause to worry, and we may all be out of business."<sup>8</sup>

Tilefish caught off New Jersey in 1988 were suffering epidemics of fin rot and lesions. In the summer of 1987, an unexplained virus killed over 1,000 (a conservative estimate) of the 6,000 to 8,000 dolphins believed to inhabit the waters north of Cape Hatteras, North Carolina. In November and December of that year, about two dozen whales were found beached, mostly near Cape Cod, Massachusetts.<sup>9</sup> Eighty-five percent of ocean pollution originates on land. The run-off of heavy metals from the

continents into the oceans now averages two and one half times the natural background level for mercury, 4x for manganese, 12x for zinc, 12x for copper, 12x for lead, 30x for antimony, and 80 times the background level for phosphorus.<sup>10</sup> Toxic wastes have been found in the deepest part of the ocean and in most ocean habitats.<sup>11</sup>

The United States has the largest industrial production and one of the worst ocean polluting records in the world. By the 1970's the U.S. alone was discharging over 100 million tons of waste per year into the oceans. The U.S. as well as European countries, Japan, and others have dumped radioactive waste into the ocean. The former U.S.S.R. dumped reactors into the Arctic Ocean and has radioactive rivers flowing north into that ocean.

It has recently been discovered that acid rain is also significantly impacting the life of the coastlines. In a 1988 study done for the Environmental Defense Fund, investigators found that atmospheric sources account for 25 per cent of the nitrogen pouring into Chesapeake Bay. (The additional nitrogen came from water run-off. Thirty-four per cent was from farm fertilizers, 23 per cent was from sewage and industrial discharges, and 18 per cent was from animal manure runoff, according to the study.)<sup>12</sup>

Petroleum spills will continue to increase as oil is extracted from increasingly remote, difficult-to-reach areas of the planet. An estimated 6.61-7.71 million tons of petroleum now reach the ocean each year from sources such as leaks in refineries, runoff from land, dumping from ships, leaks from drilling platforms, blowouts and the actual breaking up of tankers.<sup>13</sup> The spills destroy huge numbers of birds, mammals, and marine organisms. The oil is toxic when spilled into the sea and may become more toxic over time through processes of chemical breakdown. Oil residues can remain in sea sediments for as long as a century.<sup>14</sup>

In the United States it is predicted that, given present migration rates, 75 per cent of the human population will live within 50 miles of the coast by the year 2000. Already 8 billion gallons of municipal sewage is dumped into coastal waters per day off the U.S. coast.<sup>15</sup> One-third of the shellfishing areas of the U.S. are closed because of toxic contamination.<sup>16</sup>

Coastal and island "development" often includes the draining of wetlands and filling in of beach areas. The building of dams, diversion of river flows and irrigation all destroy the life-generating ability of coastlines. In California's San Francisco Bay, for example, 65 per cent of the inflow of fresh water has been stopped.<sup>17</sup> In Louisiana, one acre of coastal wetlands is lost to development every 14 minutes.<sup>18</sup> More than one million hectares [2,417,000 acres] of mangrove swamp has been cleared in the Indo-Pacific region for fish farming.<sup>(19)</sup> Diego Garcia Island, in the Indian Ocean, an example of the wide-spread coral reef destruction, was once the fertile tropical home of large coral reefs and 2,000 native people. It is now covered with the concrete of a U.S. military base, its biology destroyed.<sup>20</sup>

The massive topsoil runoffs that the land masses are now experiencing would normally fertilize the ecosystems of the coasts, lending some kind of saving grace. (An example of where this does happen is the relative fish abundance in the South China Sea, which benefits from the eroding topsoil of China.) The elimination of

estuaries by development and the direct kill of coastal life by pollution have obviated the possibility of topsoil erosion increasing the fertility of continental shelves.

The National Academy of Science estimates that commercial fishing fleets dump 52 million pounds of plastic packing material and 298 million pounds of plastic fishing gear, nets, lines and buoys into the ocean every year. An estimated 270-640 miles of monofilament netting is lost each year by the huge Japanese fishing fleet alone. Shoreline garbage accounts for more millions of pounds of plastic. (Plastic six-pack holder rings will last 450 years.) One hundred thousand marine mammals die each year from entanglement and ingestion of plastics. It is estimated that 15 per cent of sea birds eat plastic, confusing it with their natural food. Sea turtles often eat plastic bags which they think are jellyfish. This plastic causes havoc with digestive systems and often plugs the intestines, killing sea creatures and birds.<sup>21</sup>

### **Ecological Sinks are the Sores of the Earth**

Ecological sinks are areas where the life function has broken down completely. In these dead areas, the interlocking energy flows, the food chains and the chemistry of life, are so disrupted or destroyed that they fail to function even in a rudimentary fashion. Some continental examples of ecological sinks include extremely desertified areas, bodies of water where eutrophication has used up the oxygen, and lakes killed by acid rain. Ecological sinks are now being created within the oceans, particularly along coastlines and in enclosed seas. Huge algae blooms and the dead fish, seals and dolphins washing ashore in many areas signal the approaching death of the oceans. The Golden Horn estuary of Turkey, areas all through the Mediterranean, and portions of the coast of Europe and North America are already "dead." A band of oxygen-starved, dead water which can support neither shrimp nor fish life, now extends from the Mississippi River delta off the Louisiana coast across the Gulf of Mexico nearly to Texas, a "dead zone" 300 miles long and ten miles wide.<sup>22</sup>

The largest die-off of seals to occur to date (as of spring, 1989) took place in Europe's North Sea during the summer months of 1988. A mysterious virus killed some 12,000 of the region's 18,000 seals. Scientists believe that the reason why the seals succumbed in such great numbers is because their immune systems were weakened by exposure to pollutants in North Sea waters. Up to 30 per cent of the waters of Europe's Baltic Sea are permanently deprived of oxygen. Some reports state that 80 per cent of female Grey seals in that body of water are known to be sterile, while approximately three-fourths of Baltic Seals that have been examined show pathological changes in some organs and in their skins. The species is not expected to outlast this century.<sup>23</sup>

The toxic pollution of ocean waters is heaviest in the most heavily industrialized countries but this does not mean that other areas are not ecologically damaged. The mangrove swamps of coastal areas for example are being decimated worldwide. When we learn that Eskimos are poisoned with PCB's and that penguins in Antarctica contain DDT, we know that the problem of ocean death is planet-wide.

## NOTES

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3 *Building A Sustainable Society*. Lester R. Brown. W.W. Norton Co. New York. 1981. pp.36,37.

4 *Gaia: An Atlas Of Planet Management*. Norman Myers, editor. Anchor Books. Garden City, New York. 1984. p.82.

5 *ibid.* p.81.

6 *U. S. News & World Report*. January 23, 1985. p. 68.

7 *In These Times*. "They're Killing Our Oceans." Dick Russell. April 27-May 3, 1988. p. 12.

8 *ibid.* p. 22.

9 *ibid.* pp. 12,22.

10 Myers. *Gaia*. (atlas). op. cit. p.85.

11 *ibid.* p.79.

12 Associated Press. 250790 New York. 3:36 am. 4/25/88.

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14 Simon. *Neptune's Revenge*. op. cit. p.57.

15 *ibid.* p.87.

16 *ibid.* p.87.

17 "In Order to Save the Fisheries We Must Rescue Our Estuaries." M. L. Edwards, Field Editor. *National Fisherman*. January, 1988. p.22.

18 *ibid.* p.21.

19 Myers. *Gaia*. (atlas) op. cit. p.87.

20 *ibid.* p.87.

21 "We're Choking the Ocean With Plastics." Kris Freeman. *National Fisherman*. January, 1987. pp.4,5,32.

22 *Time*. "The Dirty Seas." August 1, 1988 p.46. and M.L. Edwards. *National Fisherman*. op. cit. p.20.

23 *ibid.* pp. 6-7.