covery in 1962 that large areas of the reef were infested with coral-eating crown-of-thorns starfish *(Acanthaster planci)*.

Although little was known about either reef ecology or the starfish, some scientific authorities hypothesized that the starfish infestation was something new, abnormal, and probably caused by human tampering with the environment. Subsequent surveys, which were inadequately financed and hampered by the extent and remoteness of the rich coral cover, did little to discourage speculation by the news media and environmentalists that the Great Barrier Reef would eventually collapse, exposing the entire Queensland coast to the erosive force of the Pacific Ocean.

In the absence of effective means of dealing with the menace (hand collecting and chemical treatment proved either impractical or dangerous to other marine life), the Australian government opted for further study and delay. By 1970 it was apparent that predictions of impending doom were unwarranted; even where the starfish's ravages had been great, the coral soon regenerated itself.

Further studies showed that the *A. planci* population explosion was a relatively short-lived phenomenom resulting from temporary changes in ocean salinity and temperature that had nothing to do with the hand of man. Analysis of reef sediments more than 3,000 years old demonstrated the recurring nature of starfish infestations, Kenchington writes, and showed that they were "natural but infrequent episodes in the long-term ecological balance of the Great Barrier Reef."

The Porpoise Success Story

"The Tuna/Porpoise Problem: Behavioral Aspects" by Karen Pryor and Kenneth S. Norris, in *Oceanus* (Spring 1978), 1172 Commonwealth Ave., Boston, Mass. 02134.

For many years, fishermen have capitalized on the tendency of yellowfin tuna to swim beneath schools of "spotted" and "spinner" porpoises (genus *Stenella*) in the tropical eastern Pacific. The *Stenella* schools usually travel and feed within 20 meters of the ocean surface and are easily spotted by fishing boats.

By using speedboats to herd the porpoises into a milling group, the tag-along tuna school may be efficiently encircled by huge nets. In the process, however, the air-breathing porpoises may easily become entangled in the nets and suffocate. All this has provoked widespread public concern.

However, since the early 1960s, according to Pryor, a marine biologist, and Norris, professor of natural history at the University of California, Santa Cruz, fishermen have used a variety of new equipment and techniques to release the encircled porpoises. To reduce entanglement, today's nets are required by federal law to have fine, 1¼-inch mesh at points where the *Stenella* are allowed to escape. Other gear improvements have minimized "canopies" or bulges in the net in

which porpoises may become trapped.

Such refinements have reduced porpoise mortality from an average 3.8 deaths per ton of tuna caught in 1971 by the U.S. fleet to 0.26 per ton in 1977. This death toll is low enough to permit porpoise populations to increase, and, while the matter may continue to be debated in emotional terms, the authors cautiously conclude that porpoise deaths are "perhaps no longer a major ecological problem."

A Plea for Conservation

"The Real Meaning of the Energy Crunch" by Daniel Yergin, in *The New York Times Magazine* (June 4, 1978), 229 W. 43rd St., New York, N.Y. 10036.

A serious real energy crisis—avoidable only if Americans drastically cut their consumption of oil—will arrive in the middle or late 1980s. It will be marked by astronomical prices for OPEC oil caused by an increase in world demand from the current 28–31 million barrels per day to an estimated 45 million barrels per day, the uppermost limit of OPEC production.

A dramatic rise in oil prices (double or triple present levels), continues Yergin, a member of the Harvard Business School's Energy Research Project, will bring about a resurgence of hyperinflation, reduced investment and purchasing power in the industrial nations, severe balance-of-payments problems, widespread unemployment, and, perhaps, "a major recession, even a world depression." The political effects, he adds, will be just as severe; nations will fight each other for oil, and the Soviets may feel compelled to "take bold risks" to extend their influence over the Persian Gulf oil-producing states.

Global dependence on Saudi Arabia, which controls one-fourth of the world's oil and therefore controls OPEC, will make the Saudis the linchpin of the world economy. A natural disaster, a terrorist attack, or a coup d'état in Saudi Arabia could have a shattering impact on world events.

Yergin discounts the importance of new oil from Alaska and the North Sea (Alaska will only make up for declining oil production in the lower 48 states, and North Sea production will peak at 5 or 6 million barrels per day in 1985). He says the development of nuclear power is stalemated by "cost, technical problems, environmental risks, doubts about safety, and, most recently, the dispute over nuclear proliferation." Coal and solar energy are inadequate alternatives.

Americans, Yergin concludes, must stop assuming that "big technology" and alternative energy sources will fill the gap and must begin to recognize the importance of reducing world demand for oil through conservation. The United States, he contends, can cut its energy use by at least 30 percent without significant changes in the American standard of living by "an adroit mixture" of incentives, regulation, public education, and energy-pricing policies. Reduced energy consumption may be difficult to achieve politically, but it is essential.