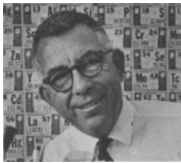




PERNICIOUS POLLUTION PERCEIVED



Last month, in a burst of self-confidence, we triumphantly announced that in this issue we would “consider some subtle causes that are drastically altering our environment and some forms of pollution that are seldom regarded as such.” However, after a further look at this complicated topic, we decided that the better part of valor requires limiting this commentary to a simple message: “Subtle changes in environment can have far-reaching effects.”

We refer not to things like photochemical smog, smoke, SO_2 , and sewage of high phosphorus content, for at long last the public has become aroused to the need to prevent this kind of pollution, and real action is finally being taken to control this part of the problem. Rather, we refer to other additions to the environment that, although seemingly innocent, are potentially just as harmful.

For example, we have already alluded¹ to the “greenhouse effect” produced by the gradual accumulation of carbon dioxide in the atmosphere. This product of the complete combustion of any carbon-containing material absorbs reflected solar radiation in much the same way as the glass in a greenhouse, producing a measurable increase in the average temperature of the atmosphere, which must ultimately accelerate the melting of the polar ice caps, which, in turn, will mean the eventual inundation of the night-time editorial office of *Nuclear Applications* (present elevation ~10 ft above mean sea level). To say that the journal will not last that long is only avoiding the question. This problem should be capable of virtual elimination through the use of nuclear energy as the source of all power.

More recently, we have noticed a form of oceanic pollution that has really been occurring for a long time. The recent shipwrecks involving the discharge of great quantities of petroleum, the obvious mess on nearby beaches, and the frantic efforts to stave off ensuing local economic disaster serve to point up the fact that for years ships have been purging themselves at sea by flushing out bunker fuel, which, in the frigid north Atlantic in winter becomes sufficiently viscous to trap unwary sea birds. The annual toll is millions of such birds, and, aside from the humane aspects, this represents a significant loss in a basic input (guano) to the life cycle that produces commercial fish stocks. Although we do not imply that nuclear power is for the birds, one must admit that its exclusive use would eliminate this particular problem also.

Two recent press releases have drawn our attention to a third form of potential pollution to which, however, nuclear energy can (but need not) contribute, *viz.*, heat. It turns out that the mere heating up of a body of water can drastically alter the marine life in it. Increasing the temperature increases metabolism, which increases the demand for oxygen, which is less soluble (and hence less available) at the higher water temperatures. When the “thermal death point” is reached marine life ceases.

However, that unhappy state need not be reached, for research^a has shown that beneficial effects can be achieved through proper planning so as to produce only a moderate increase in the temperature of a river or bay. Properly applied, such mild conditions can extend the growing season of Long Island oysters and are expected to produce similar benefits for New England lobsters and Florida shrimp and pompano. Cautious application of waste heat might also keep certain navigable waters unfrozen for a longer season without detriment to marine life.

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¹“Problems from the Breakfast Table,” *Nucl. Appl.* 3, 202 (1967).

^aResearch has been done by the Japanese and, in the U.S., by Batelle Northwest, Westinghouse, and Geo. H. VanderBorgh & Son (in cooperation with the Long Island Lighting Co.); others are doubtless working on the problem also.