LETTERS

The *Argo Merchant* Oil Spill

It is unfortunate that Philip H. Abelson's message "Journalists might have provided a better perspective on the event" in his editorial "Oil spills" (14 Jan., p. 137) also applies to several paragraphs of the editorial. As contributors to the National Academy of Sciences report *Petroleum in the Marine Environment* (*1*), to which Abelson refers, we are concerned that his editorial gives an incorrect representation of the conclusions of that report. For example, he compares the estimated annual biosynthetic production of hydrocarbons with annual inputs of petroleum hydrocarbons. However, he fails to point out that there are important compositional differences between petroleum hydrocarbons and biosynthesized hydrocarbons: many of the toxic components of petroleum are not biosynthesized to an appreciable extent, if at all.

When describing processes dissipating oil, Abelson states that substances with a molecular weight less than 300 are "volatilized quickly." How quickly? We analyzed samples of surface oil on 27 December 1976 (R.V. *Oceanus* Cruise 20), 7 miles east of the *Argo Merchant* wreck, and found that 18 percent of the wet weight of the tar was the "aromatic" fraction. Major components of this fraction were C_1 and C_2 alkylated naphthalenes with molecular weights of 142 and 156, respectively. These compounds have been shown to be toxic to some marine organisms and to cause shifts in the species composition of phytoplankton at concentrations of 100 parts per billion in controlled experimental ecosystems. Whether they did in the case of the *Argo Merchant* spill is at present unknown and may never be known.

Abelson discusses mechanisms by which tar balls are removed from surface waters—including sinking as a result of increasing density by various means and because of incorporation into zooplankton fecal pellets. That discussion has a disturbing ring of the "out of sight, out of mind" philosophy regarding pollution. Although sunken tar is out of sight it is not mysteriously lost from the ecosystem. Some may be deposited to sediments, where it may be eaten by benthic animals and introduced into the food web. In the George's Bank area the sediments, as a whole, are an integral part of the benthic ecosystem supporting one of the world's richest fisheries. There is adequate evidence to demonstrate a need for concern should toxic components of the oil become incorporated into the benthic ecosystem. Whether there are short-term (months) and long-term (years) effects on the fisheries can only be documented by adequate study of the area surrounding the *Argo Merchant* spill. This area should be studied to provide a better data base for evaluating and predicting the environmental impact of future spills and the chronic discharge of oil resulting from petroleum exploration and production in the George's Bank area.

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References

1. Ocean Affairs Board, *Petroleum in the Marine Environment* (National Academy of Sciences, Washington, D.C., 1975).

Interference with Radio Astronomy

The plight of optical astronomers who have been forced by city lights to retreat to remote, uninhabited areas is well understood. Until recently it appeared that radio astronomers could also avoid most man-made interference by locating their observatories away from populated regions. The advent of artificial satellites has meant that no region on earth is free from transmissions in the very high frequency, ultrahigh frequency, and microwave bands which, a few years ago, were almost entirely devoid of interfering signals at sites that had been carefully chosen for radio astronomical observatories.

Recognizing the importance of radio astronomy, the International Telecommunications Union (ITU) has allocated specific bands for radio astronomy. In addition, because of the detrimental effect of space transmissions, radio astronomers are continuing their efforts to have bands adjacent to the radio astronomy bands allocated to terrestrial services only. The 1400- to 1427-Mhz band at the hydrogen line which has been allocated exclusively to radio astronomy is of course of particular importance. The anticipated value of this allocation has been increased by the absence of assignments in adjacent bands to services using transmitters in space.

We must report a case of nonconformance with this international allocation. At our observatory near Penticton, British Columbia, Canada, a spectroscopic rotation synthesis telescope has been operating successfully for several years, mapping supernova remnants, external galaxies, x-ray sources, and other