the International Atomic Energy Association, held in Copenhagen on 16 December 1982.

The Board agreed with the views expressed in Mossel's paper (*1*, appendix C) on the "Health hazards of microbiological nature inherent to foods irradiated at a level below 10 KGy." The Board noted that there "was no cause for concern . . . and in the Board's opinion there would be no qualitative difference between the kind of mutation [genetic mutation of pathogens] induced by ionizing irradiation and that by any other pasteurization/partial preservation methods such as heat treatment or vacuum drying."

The question of stable radiolytic products has been addressed in numerous recent publications and is discussed in considerable detail in volume 2 of a series of books on food irradiation edited by Josephson and Peterson (*2*).

Two other studies worth noting are those by Kampelmacher (*3*), giving an indication of the widespread increase in food-related diseases resulting from increased world food trade and high levels of contaminating microorganisms, and an extensive review by Ingram and Farkas (*4*).

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Soluble Lectins

Samuel H. Barondes, in his article "Soluble lectins: A new class of extracellular proteins" (23 Mar., p. 1259), discusses soluble lectins from cellular slime molds and vertebrates and the functions of lectins derived from plants. Readers, however, should be aware that extracellular soluble lectins of enormous importance have also been identified and isolated from the hemolymph and coelomic fluid of many invertebrate species (*1*), not just plants, slime molds, and vertebrates. Invertebrate lectins have functions similar to those described by Barondes and have been recently classified into two major categories: those associated with immunity (agglutination, opsonization, perivitelline protection, and histocompatibility) and those associated with development (sugar and divalent cation transport, mitogenicity, cell integration, and feeding) (*2*).

Soluble lectins have been known since the time of Noguchi (*3*) who called attention to the erythrocyte agglutinins (now known as lectins) present in horseshoe crab and lobster hemolymph. In addition to agglutinating erythrocytes, lectins from the snail *Helix pomatia* bind specifically to neuraminidase-treated rat, mouse, bovine, and human T lymphocytes and to lymphocytes from patients with chronic lymphocytic leukemia, which means that *Helix* lectin are useful for immunological studies and for following the clinical progress of leukemia patients (*4*). *Helix* and scorpion (*Androctonus australis*) lectins can also stimulate human lymphocytes to undergo blast transformation (*5, 6*). Horseshoe crab (*Limulus polyphemus*) lectin has been used in isolating and separating murine spleen T-helper lymphocytes (*7*). Many invertebrate lectins show specificity for sialo conjugates, important constituents of cell surface receptors involved in cell differentiation (*8*). The only plant lectin known to bind to sialic acid, wheat germ agglutinin, lacks specificity to sialic acid (*9*). Like the plant lectins, several invertebrate lectins from molluscs (*5*), earthworms (*10*), crustaceans (*11*), and tunicates (*12*) are now commercially available.

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Soluble lectins from both plants and invertebrates have been extensively described and fruitfully applied as reagents for many years in ways like those enumerated by Cooper *et al.* These matters were the subject of a classic review article in 1972 (*1*) and have been widely considered since then (*2*). Recently, attention has turned to the role that lectins play in the organisms that synthesize them. The purpose of my article was to discuss such *endogenous* functions of lectins and of their natural glycoconjugate ligands.

My major point was that soluble lectins sometimes function by interacting with endogenous extracellular glycoconjugates, thereby influencing the molecular organization of extracellular environments. This point is at present best supported by studies with vertebrates and cellular slime molds, but would be expected to hold true throughout nature. Soluble lectins may, of course, have other functions. Indeed, most biological studies of plant and invertebrate lectins emphasize binding to microorganisms rather than to endogenous ligands. For example, there is considerable evidence that lectins in some plant roots bind specific symbiotic bacteria coated with complementary glycoconjugates (*3*). Invertebrate serum lectins can bind glycoconjugates on pathogens, conferring what Cooper *et al.* designate as "immunity." Although such interactions may prove to be highly significant, they are distinct from those to which I wished to call attention.

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Erratum: In the article "NIMH faces renewed uncertainties" by Jeffrey L. Fox (News and Comment, 13 July, p. 148), the first sentence of the first full paragraph of column 2 on page 149 was incorrectly printed. The sentence should have begun, "The 1985 budget for research calls for a modest increase. . . ."