An Overture

We Cannot Be Apolitical

Human existence allows no apolitical options. Narrowly defined, politics refers to guiding or influencing government policy. Broadly defined, politics refers to the total complexity of relations among humans in society. As professional biologists, we are obligated to use our expertise to guide government policies on matters pertaining to the life sciences and life science education. As human beings, we are involved in the complexity of human relations so that we cannot avoid making political decisions.

To do nothing is as much a political decision as to take action. At best, ignoring an issue says we don't care; at worst, it allows those who act to guide policy in ways we should have opposed. Neither as individuals nor as members of the National Association of Biology Teachers can we avoid involvement in political issues. Thus, as individuals and as members of an association, we must become consciously involved, and we must make informed decisions. As biology teachers, we must help our students to understand biopolitical issues and to become informed, involved citizens.

The pressure for political involvement of biologists has not always been as great as it is now. When NABT was created, neither its leadership nor its members could have anticipated the magnitude of current biopolitical issues. Population growth had not led to serious pollution problems or crises regarding the allocation of natural resources and energy supplies as it has today. Biology teachers had less need to be concerned about the implications of genetic engineering or the allocation of scarce medical resources than they have today.

Now we find ourselves ill-prepared to deal with these issues. Our professional training, satisfactory in many areas, has failed to equip us to participate effectively in the political process or to deal adequately with biopolitical issues in the classroom. Our association has yet to respond to these needs to the extent that it might. No association is any stronger than its members, so it is our responsibility to make our needs known and to participate in developing programs to meet these needs.

What We Can Do

Each time we are planning how we will teach a particular unit of biology, we must consider the social, ethical, and biopolitical implications of the biological information and concepts in the unit. For example, in a unit on genetics, we might introduce the concept of recessive genes and supply information about several human genetic defects that are inherited as recessive characteristics. We might also discuss the following questions: What are the social consequences of these defects for the affected individuals, for the families, and for society? Do these consequences warrant the expenditure of funds to develop a screening program to detect carriers of the gene? If so, should the programs receive government funding? If and when effective tests become available, who should be screened?

In that same genetics unit, we might discuss the factors that determine the sex of an individual. Once we have transmitted such information, we might discuss the following questions: What are the social consequences of being a female, of being a male? What biological factors, besides genetic factors, contribute to femaleness or maleness? Do these factors account for the social differences between the sexes? Are these differences consistent with the protection of the human rights of all individuals—regardless of sex?

In a unit on population, we might present a list of factors that control population size in nonhuman populations. We might ask the following questions: How does the growth of human population differ from that of other populations? What are the consequences of this growth for individuals and for society? What factors regulate human population size? How should human population size be regulated and who should do the regulating? Can we protect the rights of individuals and the rights of society in dealing with population growth?

These questions are political. Regardless of how we answer them, actions based on any answers, including ignoring the question, are political actions. As biologists, once we have information about

(Concluded on p. 418)

associated with fungi in various forms of mutualism. Unfortunately, biologists have spent a great deal of time and textbook space describing lichens, the most primitive example of these associations. Mycorrhizae are the most common example of symbiosis, and appear to be the rule rather than the exception throughout the plant kingdom.

References

BERGSTROM, D. 1976. An underground boost for seedlings. Forest Research. *What's new in the West.* Washington, D.C.: U.S. Department of Agriculture.

BJORKMAN, E. 1944. The effect of strangulation on the mycorrhiza in pine. *Svensk. Bot. Tidski. 38:1.*

_____. 1960 *Monotropa hypopitys* L.—an epiparasite on tree roots. *Physiol. Plantarum,* 13:308.

GERDEMANN, J. 1968. Vesicular-arbuscular mycorrhiza and plant growth. *Ann. Rev. Pl. Path.,* 6:397.

GRAY, L. and GERDEMANN, J. 1969. Uptake of P-32 by vesicular-arbuscular mycorrhizae. *Plant Soil* 30:415.

HACSKAYLO, E. 1965. *Thelephora terrestris* and mycorrhizae of Virginia pine. *For. Sci.* 11:401.

_____1972. Mycorrhiza: The ultimate in reciprocal parasitism? *BioScience* 22(10):577.

HATCH, A. 1937. The physical basis of mycotrophy in the genus *Pinus. Black Rock For. Bull. 6.*

KHAN, A. 1972. The effect of vesicular arbuscular mycorrhizal associations on growth of cereals. I. Effects on maize growth. *New Phytol.* 71:613.

_____. 1975. The effect of vesicular arbuscular mycorrhizal associations on growth of cereals. II. Effects on wheat growth. *Ann. Appl. Biol., 80:27.*

MARX, D. 1975. Mycorrhizae and establishment of trees on strip-mined land. *Ohio J. Sci.* 75(6):288.

_____and DAVEY, C. 1969. The influence of ectotrophic mycorrhizal fungi on the resistance of pine roots to pathogenic infection. III. Resistance of aseptically formed mycorrhizae to infection by *Phytophtora cinnamomi. Phytopathology* 59:549.

MEDVE, R., HOFFMAN, F. and GAITHER, T. 1976. The effects of mycorrhizae on the survival and growth of trees planted on stripmine spoils. *Fourth Symposium on Surface Mining and Reclamation* 4:184.

MELIN, E. and NILSSON, H. 1957. Transport of C^{14} labelled photosynthate to the fungal associate of pine mycorrhiza. *Svensk. Bot. Tidskr.* 51:166.

PURVES, S. and HADLEY, G. 1975. Movement of carbon compounds between the partners in orchid mycorrhiza. *In* F. Sanders. B. Mosse, and P. Tinker, *Endomycorrhizae.* New York: Academic Press.

SCHENK, N., KINLOCH, R. and DICKSON, D. 1975. Interaction of endomycorrhizal fungi and root-knot nematode in soybean. *In* F. Sanders, B. Mosse, and P. Tinker, *Endomycorrhizas.* New York: Academic Press.

SCHOKNECHT, J. and HATTINGH, M. 1976. X-ray microanalysis of elements in cells of VA mycorrhizal and non-mycorrhizal onions. *Mycologia* 68(2):296.

SLANKIS, V. 1967. Renewed growth of ectotrophic mycorrhizae as an indication of an unstable symbiotic relationship. *XIV IUFRO Kongr. Sect. 24, Munchen.* 84.

SMITH, R. 1977. *Elements of ecology and field biology.* New York: Harper and Row.

THEODOROU, C. and BOWEN, G. 1973. Inoculation of seeds and soil with basidiospores of mycorrhizal fungi. *Soil Biol. Biochem.* 5:765.

TRAPPE, J. 1962. Fungus associates of ectotrophic mycorrhizae. *Bot. Rev.* 28:538.,

VOZZO, J. HACKSKAYLO, E. 1971. Inoculation of *Pinus caribaea* with ectomycorrhizal fungi in Puerto Rico. *For. Sci.* 17(2):239.

WENT, F. and STARK, N. 1968. The biological and mechanical role of soil fungi. *Proc. Nat. Acad. Sci.* 60(2):497.

WILDE, S. 1968. Mycorrhizae: their role in tree nutrition and timber production. *Res. Bull.* 27, University of Wisconsin.

Apolitical

. . . from p. 405

recessive genes, sex determination, population dynamics, or any other socially relevant information, we must participate responsibly in political decisions surrounding the use of that information. As biology teachers, once we transmit biological information, we are obliged to help our students deal with the implications of that information.

What NABT Can Do

With the support and participation of its members, NABT can improve communication on biopolitical issues in a number of ways. It can increase the number of articles published in its journal that focus on biopolitical issues. (Manuscripts on this topic will be carefully considered for publication.) It can seek funds to offer regional workshops to provide professional training in participating effectively in the political process and in classroom techniques for disseminating information on biopolitical issues. It can develop and distribute to biologists, teachers, political representatives, and interested citizens position papers presenting biological perspectives on various issues. These papers would be intended to foster informed and responsible decision-making on biopolitical questions.

What You Can Do

You can submit your ideas and views to an officer of the NABT or express them in a letter to the editor. Together we can learn to deal effectively with biopolitical questions, and we will. We cannot be apolitical.

Joan G. Creager, *editor*

Most of the luxuries, and many of the so-called comforts, of life are not only not indispensable, but positive hindrances to the elevation of mankind.

Books must be read as deliberately and reservedly as they were written.

Some circumstantial evidence is very strong, as when you find a trout in the milk.

Henry David Thoreau