Letters

A Quantified Environment

Recent correspondence about the effectiveness of the National Environmental Policy Act (NEPA) (Letters, 8 Dec. 1978, p. 1034) concentrates almost entirely on environmental impact statements (EIS's). These are mandated by section 102 (C) (*1*), which merely spells out procedures. Little attention is paid, however, to section 102 (B) of NEPA, which deals with substantive matters:

> All agencies of the Federal government shall: (B) identify and develop methods and procedures, in consultation with the Council on Environmental Quality established by Title II of this Act, which will insure that *presently unquantified* environmental amenities and values may be given appropriate consideration in decision making *along with economic and technical considerations* [emphasis added].

A plain reading of the text leads to the following conclusion. In making any kind of decision, whether it concerns an investment or a project, the decision-maker considers economic and technical aspects. Usually he will make a rate-of-return calculation or, equivalently, a cost-benefit analysis. Congress is now saying that this is still a primary consideration, but let us be sure we include environmental costs and benefits, which have up until now not been included because they have not been quantified, that is, because they have not been expressed in the same units, namely dollars. What Congress is therefore asking is that we develop methods and procedures which will assign dollar values to environmental amenities so that these can be considered on the same terms and *along with* other economic returns and benefits.

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Notes

1. Although the text of 102 (C) clearly encompasses "every recommendation or report on proposals for legislation and other major federal actions," Congress has implicitly exempted itself from these provisions of NEPA. Subsequent legislative history has interpreted the requirement of filing an EIS as not applying to the Environmental Protection Agency. As far as I know, there has not been a proper legal test of this matter.

Television for Children: Effects on Learning

As researchers investigating the effects of television on children, we were naturally delighted to read about the important effort to develop a TV science show for children (News and Comment, 17 Nov. 1978, p. 730). There is such a paucity of thoughtful programming directed at children on television, particularly on commercial networks, that any serious effort in this respect is to be commended.

We were also pleased that the developers of the program are carrying on continuing research establishing children's reactions to the material rather than relying on adults' estimates of what such reactions are likely to be. We were somewhat concerned, however, about the reference to "concocting a hit" in the last paragraph of the article. We think it would be a mistake to attempt to bring programming down to the lowest common denominator in order to get a huge audience. The danger here is one of continuing what is already an unfortunate practice on television—speeded-up presentations, heavy emphasis on humor, and quick "blackout sketches." Cognitive psychology research suggests that extremely rapidly paced material, even if capable of holding one's attention, may not lead to effective learning. It would be a shame to continue some of the practices of other children's programming, in which maximizing the "orienting reflex" in order to hold attention precludes allowing time for the observers' thoughtful reactions. A kind of "savouring" of the material through mental replay can occur if the action moves along at a more normal pace. Good programming with serious intent will find its audience without having to sacrifice genuine comprehension and an active interest on the part of the viewer.

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Antibody Gene Structure

In the articles "Antibodies I: New information about gene structure" (Research News, 20 Oct. 1978, p. 298) and "Antibodies II: Another look at the diversity problem" (Research News, 27 Oct. 1978, p. 412), Jean L. Marx separates her discussion of Tonegawa's J gene from her discussion of our minigene hypothesis. Actually they are quite closely related.

We have shown (*1*) that the four framework segments of the variable region assort independently. Specifically the framework (FR) sequences of the light chain variable regions FR1, FR2, FR3, and FR4 represent amino acid residues 1 to 23, 35 to 49, 57 to 88, and 98 to 107. Each framework segment for human, mouse, or rabbit light chains was grouped into sets with identical sequences. Sets contained 1 to 18 members. When each variable region was traced, it was seen that members of the same set in FR1 could be associated with the same or with different sets of FR2, FR3, and FR4. This assortment led us to propose that the variable region was assembled somatically during embryonic development from sets of minigenes coding for each framework segment.

We believe that Tonegawa has confirmed both our minigene and somatic assembly concepts for the fourth framework segment—his J gene—showing that it is separated by an intervening sequence in the 12-day-old embryo and is added to residue 97 after the 12th day of embryonic life. Not all investigators use the same system of numbering, and Tonegawa's clones were from the variable region of mouse λ chains, while our analysis was based on the variable regions of human, mouse, and rabbit κ chains; but if residues are aligned for maximum homology, FR4 and the J segments generally correspond. The J segments comprise all of FR4 and may contain one or two residues preceding it.

The differences between Tonegawa and ourselves concern only whether our minigene concept applies to residues 1 to 98. Further studies will be needed to resolve this question.

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References

1. E. A. Kabat, T. T. Wu, H. Bilofsky, *Proc. Natl. Acad. Sci. U.S.A.* **75**, 2429 (1978).