Mixed Messages from the Distant Past?

THE STRIKING 16TH-CENTURY COVER illustration of the Algonquian fishermen on Pamlico Sound (special issue on Ecology Through Time, 27 Jul.) looked vaguely familiar. Casting about, I soon found the Summer 1981 issue of *Oceanus*. *Science*'s illustration, credited to John White (1585), is so similar to that on the *Oceanus* cover, credited to Theodor de Bry (1590), that there can be little doubt that one is parent to the other (see the figure). If we accept the dates, then de Bry has embellished and possibly corrected White's portrayal of these early fishing practices.

The oddly constructed holding pen in White's illustration has become an elaborate (and more likely) fish trap. Both versions of the scene teem with sea life, but de Bry's much the more so, in seeming contradistinction to the fact that he also has added considerably to the fishing effort. The fish traps line the distant shore in de Bry's version, and many more canoes and spear fishers dot the scene.

The point made in *Science*'s cover caption is that the vision of natural abundance revealed in this long-ago moment in time stands in contrast to contemporary perspectives in which humans are an increasingly dominant and worrisome element. But perhaps de Bry's embellishments hold a deeper message as to why overfishing is the powerful agent of ecological extinction that it has become (*1*). The more we perceive our fellow humans to be benefiting from freely available natural abundance, the more we want to believe that the world is constructed so as to invite us to do it too—in short, Hardin's "tragedy of the commons" (*2*). To my eye, therefore, the real message of both illustrations is allegorical, embodied in the most obvious element they have in common—the curious image, dead center, of two humans seemingly intent upon burning a hole directly through the bottom of their canoe.

Cover comparison. The *Science* cover from 27 July (left) and the *Oceanus* cover from Summer 1981 (right).

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References and Notes
1. J. B. C. Jackson *et al.*, *Science* **293**, 629 (2001).
2. G. Hardin, *Science* **162**, 1243 (1968).

Letters to the Editor

Letters (~300 words) discuss material published in *Science* in the previous 6 months or issues of general interest. They can be submitted by e-mail (science_letters@aaas.org), the Web (www.letter2science.org), or regular mail (1200 New York Ave., NW, Washington, DC 20005, USA). Letters are not acknowledged upon receipt, nor are authors generally consulted before publication. Whether published in full or in part, letters are subject to editing for clarity and space.

The Two Faces of Vitamin C

S. H. LEE AND CO-AUTHORS SUGGEST ON THE basis of their research findings that high doses of vitamin C could potentially promote DNA damage that could lead to cancer (Reports, "Vitamin C–induced decomposition of lipid hydroperoxides to endogenous genotoxins," 15 Jun., p. 2083). Their report could leave the impression that no human studies have been performed to address this question.

In fact, five human studies have been conducted that do not confirm Lee *et al.*'s speculation (*1*–*5*). For example, researchers at Johns Hopkins University could not find evidence of a "significant main effect or interaction effect on oxidative DNA damage in non-smoking adults" with 500 mg per day of vitamin C supplementation (*1*). In a German study, researchers found that 1000 mg of vitamin C consumed by smokers and nonsmokers for 7 days did not produce DNA damage, as measured by the number of micronuclei in blood lymphocytes (*2*). And in yet another study conducted by Immunosciences Laboratory in California, 20 healthy volunteers were divided into four groups and given either placebo or daily doses of 500, 1000, or 5000 mg of vitamin C (ascorbic acid) for 2 weeks. The researchers concluded that "ascorbic acid is an antioxidant and that doses up to 5000 mg neither induce mutagenic lesions nor have negative effects on natural killer cell activity, apoptosis, or cell cycle" (*3*).

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1. H. Y. Huang, K. H. J. Helzlsouer, L. J. Appel, *Cancer Epid. Biomark. Prev.* **9**, 647 (2000).
2. M. Schneider *et al.*, *Free Rad. Res.* **34**, 209 (2001).
3. A. Vojdani *et al.*, *Can. Detect. Prevent.* **24**, 508 (2000).
4. A. R. Proteggente *et al.*, *Biochem. Biophys. Res. Commun.* **277**, 535 (2000).
5. L. A. Brennan *et al.*, *Br. J. Nutr.* **84**, 195 (2000).

THE INDICTMENT OF VITAMIN C AS A POSSIBLE in vivo producer of genotoxins (molecules that damage DNA) by Lee and colleagues is based on a test-tube reaction that does not adequately represent the cellular environment. Cells have many ways of quenching free radical chains that include peroxidases, superoxide dismutases, and catalase, as well as other proton donors like glutathione and vitamin E, which can be maintained in the reduced state by vitamin C.

The authors cite a study showing that supplementary vitamin C (200 mg daily) can produce intracellular concentrations of 1.4 to 3.4 mm, implying that this level might be harmful. However, rats have about

CREDIT: (LEFT) *SCIENCE* 293 (27 JULY 2001). ILLUSTRATION BY JOHN WHITE (1585)/COPYRIGHT, BRITISH MUSEUM PRESS; (RIGHT) *OCEANUS* 24 (NO. 2) (1981). ILLUSTRATION BY THEODOR DE BRY (1590)