Letters

Of Doomsday and the Lower Mississippi

Stuart A. Umpleby (Letters, 25 Sept., p. 1555) warns us that doomsday is approaching even more rapidly than was predicted by von Foerster *et al.* (*1*) in 1960. Extrapolating a rectangular hyperbola and justifying the assumption that the rate of population growth will continue to accelerate exponentially, von Foerster *et al.* found that infinitely rapid growth would occur on 13 November 2026. This mathematically hermetic reasoning attracted nationwide attention (citations in Umpleby's letter). Uneasy journalists looked in vain for the disclaimer of O. W. Holmes *père*, in the last line of "The Deacon's Masterpiece" (*2*): "logic is logic, that's all I say."

Umpleby's warning is nothing if not timely. It comes only 12 years after the 1975 repetition by Serrin (*3*). Some 13 years elapsed between the 1961–1962 flurry of correspondence in *Science* (*4, 5*) and Serrin's reminder. The frequency of warnings is therefore accelerating, although not so rapidly as the human reproductive rate was thought to be by von Foerster *et al.*

In 1960, when I had some credentials as a paleodemographer (*6*), I read the *jeu d'esprit* of von Foerster *et al.* with deep enjoyment. I noticed with amusement that their world (5.27×10^7 square miles) is considerably smaller than mine (36.1×10^7 square kilometers) and that in their short time perspective (about 2000 years) their selection of data was disingenuous. "The missile has left the pad and is heading out of sight," was the way I put their argument; "who cares whether there were a million or a hundred million people around when Babylon was founded?" Being no mathematician, I hesitated to warn *Science's* readers that population doubling times are unlikely to be shorter than 9 months, however logical the extrapolation. When von Foerster *et al.* called Coale's objections "demographic numerology" (*5*), I was glad I had stayed out of the argument.

I have savored the irony in all the subsequent correspondence, including Umpleby's. Twenty-seven years after the "Engineer's Masterpiece," though, the spoof is beginning to lose its charm. Umpleby and his "small group of scholars" are certainly in on the joke, and so are most other scholars. Unfortunately, modern governments (names on request) are noted neither for scholarship nor for keen appreciation of irony. Intellectual games that reduce serious arguments to absurdities are dangerous; some humorless official may be listening.

Hyperbolic extrapolation was Mark Twain's literary stock in trade. The following passage (*7*) deserves close study by scholars who practice humorous exaggeration. Perhaps because the master ironist had so often felt the edge of his own favorite weapon, Twain leaves no doubt of the distance between his tongue and his cheek.

> In the space of one hundred and seventy-six years the Lower Mississippi has shortened itself two hundred and forty-two miles. That is an average of a trifle over one mile and a third per year. Therefore, any calm person, who is not blind or idiotic, can see that in the Old Oölitic Siluran Period, just a million years ago next November, the Lower Mississippi River was upward of one million three hundred thousand miles long, and stuck out over the Gulf of Mexico like a fishing-rod. And by the same token any person can see that seven hundred and forty-two years from now the Lower Mississippi will be only a mile and three-quarters long, and Cairo and New Orleans will have joined their streets together, and be plodding comfortably along under a single mayor and a mutual board of aldermen. There is something fascinating about science. One gets such wholesome returns of conjecture out of such a trifling investment of fact.

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REFERENCES AND NOTES

1. H. von Foerster, P. M. Mora, L. W. Amiot, *Science* **132**, 1291 (1960).
2. Also known as "The Wonderful One Hoss Shay."
3. J. Serrin, *Science* **189**, 86 (1975).
4. J. S. Robertson, V. P. Bond, E. P. Cronkite; W. E. Hutton; W. E. Howland; M. Shinbrot; H. von Foerster, P. M. Mora, L. W. Amiot, *ibid.* **133**, 936 (1961); H. F. Dorn, *ibid.* **135**, 283 (1962); H. von Foerster, P. M. Mora, L. W. Amiot, *ibid.* **136**, 173 (1962).
5. A. J. Coale; H. von Foerster, P. M. Mora, L. W. Amiot, *ibid.* **133**, 1931 (1961).
6. E. S. Deevey, *Sci. Amer.* **203**, 194 (September 1960).
7. S. L. Clemens, *Life on the Mississippi* (Harper, New York, 1896); cited from Bantam Classic edition (New York, 1981), p. 93.

GenBank Information

On 30 September 1987, the National Institute of General Medical Sciences of the National Institutes of Health awarded a new contract for GenBank, the nucleotide sequence database, to IntelliGenetics, Inc., of Mountain View, California. The Los Alamos National Laboratory (LANL) will remain the site of data collection; IntelliGenetics will be responsible for data distribution. Data collection will continue to be shared with the European Molecular Biology Laboratory Data Library in Heidelberg, West Germany, and a new partner, the DNA Data Bank of Japan. The project is supported by a consortium of government agencies, including the National Institutes of Health (National Institute of General Medical Sciences; National Cancer Institute; National Library of Medicine; National Heart, Lung and Blood Institute; Division of Research Resources; National Institute of Allergy and Infectious Diseases; National Institute of Diabetes and Digestive and Kidney Diseases; National Institute of Dental Research; and National Eye Institute), the Department of Energy, the National Science Foundation, and the U.S. Department of Agriculture.

General information about GenBank releases may be obtained from IntelliGenetics at 415-962-7364 or by electronic mail at genbank@bionet-20.arpa. Authors of DNA sequence data interested in submitting their data should continue to contact LANL at 505-665-2177 or genbank@lanl.gov for further information regarding submission of their sequences. Because of the increase in the number of DNA sequences being determined, it is essential for authors to take an active role in the submission of their data. Several journals, including *Science*, are providing data entry forms to their authors; and NIH is actively encouraging its grantees to submit their sequences directly to the database. GenBank will be developing software to facilitate this process.

All of us involved in the GenBank project look forward to a challenging and productive period. We encourage the scientific community to help us build GenBank into the tool needed to meet the research challenges of the future.

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Interpretation of the ABM Treaty

As reported by Colin Norman (News & Comment, 9 Oct., p. 147), supporters of the traditional interpretation of the Antiballistic Missile (ABM) Treaty (that would prohibit Strategic Defense Initiative testing in space) maintain "that ABM systems and components were carefully defined in Article II of the treaty to include those based on future technologies. . . ." The treaty text, however, contradicts this interpretation. The box accompanying Norman's article (p. 148) omits the crucial operational paragraph of Article II, which defines ABM systems and components "for the purpose of this treaty." According to that paragraph, the systems "include those which are (a) operational; (b) under construction; (c) undergoing testing; (d) undergoing overhaul, repair, or conversion; or (e) mothballed." No other catego-