product development, the CHTN will aid investigators in developing protocols for collection, proper tissue handling, and shipping. The division of the CHTN responsible for the investigator's geographical location will also provide investigators developing new grant proposals with documentation that tissues will be available through this service. Further information can be obtained from us at the regional centers listed below.

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Water Quality

In their article "Water-quality trends in the nation's rivers" (27 Mar., p. 1607), Richard A. Smith *et al.* make a basic assumption and draw a major conclusion that are not supported by our experience in North Carolina. They assume (p. 1607) that data from the approximately 300 National Stream Quality Accounting Network (NASQAN) and National Water Quality Surveillance System stations "permit a more detailed and objective assessment of the effects on water quality of point-source pollution controls." In North Carolina the eight NASQAN station sites are generally located at the downstream ends of U.S. Geological Survey hydrologic accounting units (*1*), a placement that has no consistent relation with municipal wastewater treatment plant (WWTP) outfalls and the oxygen sags they create.

The conclusion drawn by Smith *et al.* about the causes of the increase in total nitrate (p. 1612) may overlook a mechanism that seems important in North Carolina. The improvement in water quality caused by municipal WWTP improvements since 1972 has reduced the extent of reducing zones in North Carolina streams. Less instream nitrogen from all sources seems to be lost to the atmosphere through denitrification in reducing zones. This mechanism could explain the association between WWTP effluent improvements (as measured by dissolved oxygen deficit and fecal coliform bacteria) and increased total nitrate found by Smith *et al.* The mechanism may be obscured in the Midwest by the greater nonpoint-source runoff of nitrate from agriculture. It would be interesting to look for trends in total nitrogen.

Increased instream nitrification could also account for the increased delivery of nitrate to estuaries, as seen in North Carolina's Albemarle and Pamlico sounds (*2, 3*). We might also note that our analysis of North Carolina data has indicated an increase in total phosphorus loading to the Albemarle Sound system during the 1970s (*2*).

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REFERENCES

1. *Water Resources Data Water Year 1985 North Carolina* (USGS Report NC-85-1, U.S. Geological Survey, Raleigh, NC, 1985).
2. Division of Environmental Management, *Chowan/Albemarle Action Plan* (DEM Report 82-02, North Carolina Department of Natural Resources and Community Development, Raleigh, NC, 1982).
3. Division of Environmental Management, *Nutrient Management Strategy for the Neuse River Basin* (DEM Report 83-05, North Carolina Department of Natural Resources and Community Development, Raleigh, NC, 1983).

Response: Smith and Kreutzberger are correct in saying the locations of NASQAN stations in North Carolina (and elsewhere) have "no consistent relation with municipal wastewater treatment plant (WWTP) outfalls and the oxygen sags they create." As we point out in our article, NASQAN stations were sited to provide broad geographic coverage of conditions in the nation's rivers and streams and do not focus on specific sources of pollution. We also note that a number of case studies (*1*) conducted over the past decade have clearly demonstrated beneficial effects of WWTP upgrading in the vicinity of point sources. The lingering question has been, How far do observable effects of improved treatment extend when expressed as a fraction of the total mileage of rivers in the nation? Our results suggest that with respect to dissolved oxygen concentrations (in contrast with effects on bacteria counts) the spatial extent of beneficial effects is probably less than 2 percent of total river miles, and considerably less than previous estimates based on surveys of pollution control officials (*2*).

We appreciate the suggestion that nitrate increases may have resulted from a decline in nitrate reduction stemming from WWTP upgrading. There was a modest association between nitrate trends and WWTP improvements, and changes in nitrate reduction may help explain this relation. However, nitrate increases were extremely frequent nationwide, and were most strongly associated statistically with nitrogen inputs from agriculture and from the atmosphere. Since these inputs occur in the form of ammonia as well as nitrate, they would likely result in increased instream nitrification. As Smith and Kreutzberger suggest, total nitrogen data would help quantify this effect.

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1. W. M. Leo, R. V. Thomann, T. W. Gallagher, *Before and After Case Studies: Comparisons of Water Quality Following Municipal Treatment Plant Improvements* (EPA-430/9-007, Environmental Protection Agency, Washington, DC, 1984).
2. *America's Clean Water: The State's Evaluation of Progress: 1972–1982* (Association of State and Interstate Water Pollution Control Administrators, Washington, DC, 1984).

Erratum: Reference 25 (p. 1080) in the article "Freezing" by A. D. J. Haymet (29 May, p. 1076) contains an incorrect date. This reference is to an article by W. Sutherland that appeared in the *Philosophical Magazine* in 1890, not 1980, as printed. In particular, this early report shows that the subject of melting and freezing is one that has puzzled scientists for almost 100 years.

Erratum: Louis Lanzerotti, a researcher in electromagnetic phenomena at AT&T Bell Laboratories, was incorrectly identified as a company vice president in "Science and the space station" by Eliot Marshall (News & Comment, 5 June, p. 1176).

Erratum: In Mark Crawford's News & Comment article "Ozone plan splits Administration" (29 May, p. 1052), the last two sentences of the third-to-the-last paragraph were printed incorrectly. They should have read, "Increased exposure to ultraviolet light poses risks for visitors to the country's national parks, he says. And, because Interior leases offshore oil resources, the department is concerned about the availability of Halon gases to extinguish oil-rig fires, Smith adds."

Erratum: The article by Jean L. Marx on "Human trials of new cancer therapy begin" (Research News, 15 May, p. 778) should have noted that the Sloan-Kettering group collaborated with Ronald Breslow of Columbia University on the discovery that the drug hexamethylene bisacetamide induces the differentiation of mouse leukemia cells, and that it is Breslow who is currently trying to redesign the drug to decrease its side effects in human patients without diminishing its effectiveness.