house and home," he says. And that, in turn, means that the zebra mussel will probably reach huge numbers only in the very productive parts of the Great Lakes, where there is enough food to sustain them, such as Lake St. Clair, Lake Erie, and probably Green Bay and Saginaw Bay.

Food shortages, disease, and a host of other factors may also cause the population of mussels to fluctuate wildly in heavily infested areas over the next few years. Biological invaders typically build up a huge population and then crash, often repeating the cycle several times before settling into an equilibrium. Gannon, for one, expects a population crash in Lake Erie sooner rather than later. "The big unknown for Lake Erie," he says, "is at what level they reestablish themselves after the crash."

Again, Europe is little guide. Despite extensive study, European biologists are still at a loss to explain why the zebra mussel crashed and then came back in force in Sweden but never quite recovered in mainland Europe. And in Great Britain, the zebra mussel never reached the high population densities of mainland Europe.

Prospects for the Mississippi River are mixed. On the bright side, while still a nuisance, the zebra mussel stayed at relatively low levels in European rivers. But it could still wreak tremendous ecological havoc in the Mississippi, which has the highest diversity of clams in the world, many of them already endangered. And what gives everyone pause, with the recent sightings in Tennessee, is that the zebra mussel reached its highest levels in European reservoirs.

For all the uncertainties about the zebra mussel invasion, two things are abundantly clear: Great Lakes biologists should have seen it coming, and more intruders are on the way. Indeed, scientists actually did sound the alarm about ballast water almost 10 years ago. In a 1981 study for Environment Canada, researchers examined the ballast water of 55 cargo ships entering the Great Lakes. About 17 species arrived alive in each ship, and the number of individuals per species ranged from 10,000 to a whopping 8 billion. Although no zebra mussels turned up, the authors warned that they, too, were likely stowaways.

Like so many government reports, this one was promptly shelved and was dusted off only after the zebra mussel and other ballast water stowaways, like the ruffe and spiny water flea, had announced their presence in the Great Lakes. Says Gannon: "We're kicking ourselves." The report's ominous findings have been buttressed by a recent survey by Leach and Ed Mills of Cornell University, who found that of the more than 120 exotic species in the Great Lakes, about one-third came in via ballast water. And this year, Carlton of Mystic College and his colleagues at the University of Oregon counted 300 species of living animals and plants in the first 100 ships they sampled from the Western Pacific.

Prompted by the zebra mussel invasion, Congress is now considering a bill that would require ships entering the Great Lakes to exchange their ballast water on the open seas, as the Canadian Coast Guard already does in its voluntary program. (Any organisms picked up in mid-ocean would be unlikely to survive in freshwater or brackish ports.) Citing California's intruders as well, the American Fisheries Society is lobbying Congress to broaden the bill to all U.S. ports. Prospects for passage of the bill, which would also provide about $15 million for research and control, are said to be good.

Meanwhile, the door is still wide open. Just this summer, biologists spotted the tube-nose goby, a small bottom-dwelling fish, in the St. Clair River, just arrived in ballast water from the Caspian and Black seas. ■ LESLIE ROBERTS

Massey Named to Head NSF

It's official: Walter E. Massey is President Bush's choice to be the next director of the National Science Foundation. The White House announced his nomination last Friday, 14 September. As first reported in *Science* (17 August, p. 737), Massey had been strongly supported by Bush's science adviser, D. Allan Bromley.

Massey is likely to be a popular choice among researchers to head the science foundation. He is from an academic background, having been on the physics faculty of both Brown University and the University of Illinois at Urbana. In 1979 he left Brown to become director of Argonne National Laboratory, a post he held until 1984 when he moved to his present position as University of Chicago vice president for research and for the Argonne laboratory. Massey was president of the American Association for the Advancement of Science in 1989.

W. Massey

Robert M. Rosenzweig, president of the Association of American Universities, says, "It would be hard to find a better person for the job." "Massey has great respect in the scientific community and the university community in general," says Rosenzweig. "I think it's terrific for NSF," adds Alan Schreisheim, current director of Argonne who served as Massey's deputy at the laboratory.

In recent years, most of Massey's published work has been on science policy—primarily science education and opportunities for minorities in science. In the 1970s he coauthored numerous articles on condensed matter physics.

Reached in his office in Chicago, Massey said he was pleased by his selection but would offer no specifics about his plans for the agency. Massey is presently on sabbatical leave from the University of Chicago, studying how European countries are transferring technology from universities to industry. Massey says he intends to complete his sabbatical project, which is based in Paris and is scheduled to end in January, "unless it proves impossible." In any event, Massey's nomination must be confirmed by the Senate, and hearings are unlikely to be held in this year's session of Congress. ■ JOSEPH PALCA

Gene Therapy Begins

The NIH researchers who have been working for years to be the first human gene therapists were ready and waiting when the last of a series of approvals was handed down last week. At 8:52 a.m. on Friday, 14 September, the Food and Drug Administration signed off on the last of the paperwork for a test in which the gene for adenosine deaminase (ADA) would be given to an ADA-deficient child with a compromised immune system (*Science*, 31 August, p. 975).

Four hours later, at exactly 12:52 p.m. the test began. The patient, a 4-year-old girl whose identity has not been disclosed, took the therapy sitting up in bed while her own white blood cells, carrying a foreign ADA gene, dripped into her arm.

R. Michael Blaese and Kenneth W. Culver of the National Cancer Institute, with W. French Anderson of the National Heart, Lung, and Blood Institute, are principal investigators for the test. Said Culver, "Everything about the study has gone well—from obtaining the patient's cells to growing the gene-corrected cells in culture."

The patient has already gone home from the hospital. Solid results about whether the new ADA gene will restore her immune system may be as long as a year away.

■ BARBARA J. CULLITON