The problem at the MBL is that the cure many seek for its problems might destroy its unique value. From its beginnings and into the early 1980s, the MBL was the premier independent biological laboratory with marine facilities. Never with more than a moderately good research plant, the MBL proved that its importance arose from its independence. Governed by its membership, it welcomed any investigator with an interesting project and funds to pay the MBL's then-modest fees. The resulting powerful intellectual ferment was frequently noted, most elegantly by Lewis Thomas (*1*). Without the fetters of administrative channeling, wonderful science emerged from summer-long interactions of a remarkable mixture of minds of diverse training and interests, from undergraduates through the occasional Nobelist, in lectures, courses, laboratory, dining hall, and at the beach.

The danger of growth emphasizing year-round programs is that each addition of a major year-round research unit, no matter how high its quality, tends to erode the MBL's availability to its "summer" scientists of the type that built its reputation. If the MBL is to restore itself to its previous status, it must enhance its ability to service research by established investigators from other institutions. In particular, it must recognize the danger of focusing on any three subject areas in a buildup of permanent programs with permanent staff to support when funding runs dry. This is because the MBL should be able to reinvent itself rapidly to keep up with and even lead, as it formerly has, the advance of many aspects of biology. It can do this economically only if it emphasizes the ideas and efforts of its established workers with home bases in the colleges, universities, and research institutions throughout the country.

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References

1. L. Thomas, *The Lives of a Cell* (Viking Penguin, New York, 1978).

Using a combination of unattributed negative comments along with quotes taken out of context, Roush paints an inaccurate picture of the MBL as an institution in crisis. The facts are as follows: When John Burris took the job as CEO and director, he inherited an institution that was hemorrhaging both endowment and resources. In the space of his 5-year tenure, he single-handedly led the MBL through much-needed reforms in governmental structure, recruited a top-notch Board of Trustees that has the ability to secure the institution's financial future, and increased the endowment by 73%, all while significantly expanding the institution's most valuable asset: its world-class science. There are many of us who are more concerned with the long-term stability of the science at America's oldest and still most prestigious marine laboratory than with purported rustic qualities of the summer investigators' cabins.

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The Extinction of Paleontology?

The recent discussion of the demographic crisis in paleontology (R. Stone, News & Comment, 10 Oct., p. 219) makes sobering reading for me and my colleagues. Over the last 15 years, the proportion of paleontologists approaching retirement has increased dramatically, while the number of younger

workers has dropped steeply. If this trend continues, the entire discipline will dwindle rapidly to extinction. The same article proposes a way to help rejuvenate the discipline: an international program to support 20 up-and-coming young paleontologists a year, at an estimated annual cost of $1 million. I note with irony that according to the article on the facing page (News & Comment, 10 Oct., p. 218), McDonald's Corporation has just donated funds for a fossil-preparation lab at the Field Museum of Chicago, where Sue, an exceptionally well-preserved *Tyrannosaurus rex*, will be readied for display. The price the museum paid for Sue—$7.6 million—could have provided the entire discipline of paleontology with a much-needed shot in the arm for almost a decade. The message of this juxtaposition of articles rings clear. There are potentially huge sources of funding out there. It is up to us to convince them that their money is better spent, not on the rocks, but on the people who find them, interpret them, and give them their scientific and cultural value.

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Estimates of Coastal Populations

The excellent article by Peter M. Vitousek *et al.* (25 July, p. 495) states: "The human population is concentrated near coasts—about 60% within 100 km [kilometers]. . . ." This assertion comes from a recent World Resources Institute report (*1*, p. 254): "An estimated 60 percent of the global population lives within roughly 100 kilometers of the shore." This statement comes from a 1990 book (*2*, p. 7): "Probably 60 percent of humanity, or nearly 3 billion people, live on or within 100 km of a sea coast." The author of the latter book, Don Hinrichsen, an environmental journalist, informed one of us (J.E.C.) (*3*) that this statement was his "own assessment based on extensive back-of-the-envelope estimates using the best available data at the time."

More recently, Hinrichsen reported (*4*, p. 39): "Nearly two-thirds of the world's people make their homes within 150 kilometers of the shore."

To our knowledge, the first public digital map of the world's human population appeared in 1995 (*5*). The data are freely available on the World Wide Web (*6*). These data make it possible to obtain more precise estimates of coastal populations as of 1994. As part of larger research programs, two groups with interests in the interactions between the earth sciences and the social sciences have independently co-registered the global digital population map on digital maps of coastlines. Using the digital World Vector Shoreline (*7*), two of us (C.S. and J.E.C.) estimate that approximately 37% (2.07 billion) of the 1994 population (5.62 billion) lived within 100 km of a coastline, and approximately 44% (2.45 billion) within 150 km of a coastline. These percentages are lower than those of Hinrichsen. In addition, C.S. and J.E.C. estimate that 49% of the 1994 population lived within 200 km of a coastline, and 66% within 400 km.

Using the boundaries (compounded from various sources) provided by the gridded population of the world (*6*) and a different algorithm for computing distance to coastline, three of us (A.M., J.G., and J.S.) estimate that 37% lived within 100 km of a coastline. This estimate agrees with that of C.S. and J.E.C. Both groups anticipate that these estimates could be refined by the use of better data and methods.

While our estimates of coastal population size are considerably smaller than Hinrichsen's, we agree that very large numbers of people affect and are affected by coastal zones.