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Needed: Conviction to Match Our Science

The quality of technology actually used in U.S. industrial production is best mirrored by looking at productivity figures. There the U.S. economy demonstrates a miserable performance overall, with a productivity growth rate that lags that of most of our foreign industrial competitors. Yet much of this poor performance is not a reflection on the technology of which our engineers are capable, and certainly not on our science. Instead, it reflects the failure of our society to give priority to savings and to capital formation, plus a great variety of social and political barriers to the replacement of antiquated plant facilities by more productive new ones.

While there are no quantitative data that can be used to assess the comparative states of technology here and abroad, I am convinced that even where our industrial technology lags that of competition, our capability does not. American engineers are capable of accomplishing more than what is actually built and made in many of our factories. It is not that our technology is weak or lagging. It is that we are failing to push as rapidly ahead as we could as a nation.

On the scientific scene, our science is still the envy of the world. Only last year our spacecraft took the most extraordinary pictures and measurements of the planet Jupiter and its moons, and made in one mission more extraordinary observations in planetary science than had been made since Galileo. The preeminence of our microbiology is unchallenged and the beginnings of its industrial potential are now in sight. The combination of our solid-state science with our industrial electronics engineering has done much to create the most spectacular growth industry the world has seen. Geological sciences have not only brought us understanding of the dynamics of the earth's crust that have shaped our continents, but have also contributed much to U.S. world leadership in the scientific search for oil and other minerals.

Despite this record, the energies of our best scientists seem too much devoted to debates over the shutting down of major research facilities and the choice between going abroad for the best facilities or facing a long, drawn-out effort to acquire them here, stretched out not by technical challenge but by financial restraint. American scientists admire and applaud the new leadership achievements of European nations in providing first-rate new facilities for their scientists, and envy the Japanese scientists and engineers their nation's wholehearted support and admiration. We would not have it otherwise. But we are in a serious, if friendly, global competition with our allies. America no longer can take technical strength for granted.

We have entered an ambivalent period. The press reports our scientists still winning Nobel Prizes from a foreign government, along with "Golden Fleece Awards" from their own. Scientists are concerned that their energies are increasingly diverted by administrative encrustations, such as faculty time recording under OMB circular A-21. They remain committed to the most rigorous competition to ensure that the best ideas receive funding support, and they are understandably confused by persistent questions about the legitimacy of peer review as the mechanism for that competition.

Thus, the picture of American science and technology today is one of great strengths yet deep doubts, of strong foundations and timid commitment, of critical importance to the economy and uncertain political priority. If indeed our domestic and our foreign trade performance are poor, is lagging technology the symptom or the cause? And if technology lags, is this because the steam has gone out of our science? Or because of a failure of economic policy and industrial will?

There is plenty of room for debate, but there is an obvious conclusion: whatever the cause and effect relation between scientific, technological, and industrial performance, our nation should commit itself to excellence in all three areas. No less a goal is worthy of us.—LEWIS M. BRANSCOMB, *IBM Corporation, Armonk, New York 10504*

Excerpted from a commencement address at the Polytechnic Institute of New York, Brooklyn, 29 May 1980.