

It's been said that in this century, carbohydrates will replace hydrocarbons, and biology will supplant physics as the innovation-producing science. As science fiction becomes science fact, and with science-based firms presenting unique challenges for managers, HBS is examining how, in its teaching and research, it can best contribute to what will be a major new force in the American economy.

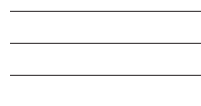
A Binary Formula

Leadership for Science-Based Companies

by GARRY EMMONS

For several decades, the view from the HBS campus across Western Avenue has been decidedly “old economy.” But now, creative destruction has come to the neighborhood, and change is in the air. While trucks continue to rumble in and out of the container-cargo rail yard opposite the HBS parking lot, the depot’s days are numbered. Adjacent to it, several blocks of low-rise commercial buildings are already history, demolished and carted away, seemingly overnight. Spiking skyward above the flattened landscape left behind, giant construction cranes, clustered over the site’s several acres, accentuate its emptiness. It is here that Harvard University is putting down a big bet on the future — and on a dramatically new, emerging economy. From the rubble will rise the 530,000-square-foot Allston Science Complex — four multi-story buildings, due for completion in 2011 — the centerpiece of the initial phase of Harvard’s 300-acre development on the Boston side of the Charles River.

Both in the scale and scope of Harvard’s ambitions and in the proximity of these new buildings, this emphasis on science will affect HBS. The unique challenges of managing and leading science-based businesses — certain to be a driver of this century’s new economy — demand new management paradigms. For a core group of HBS professors, that has meant some soul-searching in terms of how and what the



ILLUSTRATIONS BY JAMES STEINBERG





School teaches, and to whom. How can HBS best complement and contribute to the work of the University's world-renowned laboratories as well as to cutting-edge, science-based firms in Boston and beyond? Can the School itself learn from the labs' inspirational (but results-oriented) dedication to finding solutions to huge challenges? For example, should blocks of the HBS curriculum focus on big, multidisciplinary problems — such as the world's water shortage — and how to solve them? How about increasing the number of MBA students who have science backgrounds and the number of Executive Education offerings that teach scientists business and organizational fundamentals? What about joint MBA/Ph.D. programs? How about science/business seminars, more science-based cases, and more science-savvy faculty to teach them?

AT A MID-MARCH HBS CENTENNIAL colloquium titled "Science-Based Business and the Business of Science," these and other ideas were batted back and forth by academics and scientists from across Harvard University, along with HBS

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alumni and other business practitioners. Much of the science discussed will unfold in the Allston complex's four buildings, which will house Harvard's initiatives in stem cells, bio-inspired engineering, systems biology, chemical biology, and innovative computing. The colloquium featured a number of case studies about academic labs as well as private-sector firms that are setting operational and best-practice standards for converting scientific knowledge into commercial applications. For HBS participants, an overriding goal was to gain a better understanding of how the School might best contribute to this effort.

"To maintain a leadership position globally, the United States needs high value-added products and services to be the engine of its economy," says HBS professor Kent Bowen, organizer of the colloquium. "One way to do that is through science and technology, but we need to know how to get those discoveries into the economy." To achieve that goal, Bowen and others believe that science-based companies require a different kind of leadership. "Since the investment and R&D decisions you make today are often not easily quantifiable and not coming to fruition for

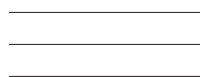
HBS Creates Life Sciences Fellowship Fund

NEXT FALL'S ENTERING MBA Class of 2010 will include up to ten students who have received \$20,000 fellowships based on their academic or professional excellence in the field of life sciences. Financial support from the Life Sciences Fellowship Fund will be awarded to recipients regardless of need (unlike all other HBS financial-aid offerings), and recipients will still be eligible to receive need-based assistance over and above their fellowships.

Possible candidates for the fellowships would include physicians, lab scientists, and biotech professionals, as well as individuals with strong undergraduate science backgrounds. Preference will be given to students planning careers in science-based businesses and organizations.

The new fellowships reflect the growing emphasis at HBS on preparing leaders for the life-sciences and health-care industries, a goal that gave rise to the creation of the MD/MBA joint degree program with

Harvard Medical School in 2005. "We're proud of this new fellowship program and its focus on students interested in science-related careers," says Deirdre Leopold (MBA '80), managing director of MBA Admissions and Financial Aid at HBS. "It builds on the unique academic strengths and extraordinary resources of the School and helps address the increasing need for management and leadership skills in the life-sciences professions."



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high technology, science-based businesses — especially biotech and pharmaceuticals, nanotechnology, and materials science — are not just users of advanced science, they are direct participants in the creation of science. They straddle two worlds with very different expectations, time horizons, risks, and norms. New management skills, new organizational forms, new institutional and financial arrangements, and a new breed of leadership are all essential.” Adds Pisano, whose case “The Science Economy: Creating Leaders for a New Breed of Business” examined these issues: “At HBS, we should be the ones trying to figure these things out and teaching them to the next generation.”

Pisano notes that despite the hundreds of billions of dollars invested in biotech in recent decades, most biotech companies do not turn a profit. He suggests that the industry needs a new “anatomy,” one that can better cope with risk and uncertainty and increase collaborative problem-solving and sharing of knowledge throughout the sector. Pisano proposes more vertical integration, fewer but closer long-term collaborations, and quasi-public corporations. In academia he calls for more cross-disciplinary research and for universities to strive to disseminate new knowledge and liberate it from unnecessarily restrictive patents and licensing.

Indeed, many of the ideas Pisano has advanced over the years are being adopted by the biotech industry. It is precisely this sort of real-world research and analysis, resulting in value-added intellectual capital, that has helped define HBS’s role as a key institution in enabling and influencing business and industry over the decades. It is a role the School aspires to play prominently again in the area of science-based business.

Pisano observes that at its founding, HBS was occupied with understanding — and imparting the skills to manage — the challenges posed by the emergence of large, complex business enterprises, particularly railroads. One hundred years later, Pisano argues, another transformational force, the rise of science-based business, similarly demands new kinds of management leadership, organizational forms, and institutional arrangements. Once again, HBS is in a position to prepare its students for the challenges and rewards of leading companies whose products can truly change the world. But perhaps for the first time, the products of tomorrow’s transformative companies will have their greatest impact not in the material world but on the most basic elements of the human experience of life — health, physical well-being, and mortality. For HBS students who want to make a difference in the world, could anything be more rewarding than leading such an enterprise? And for HBS, what could be more rewarding than giving its students the tools to achieve just that? □



WATCHING THE BRAIN THINK AND THE SURPRISES OF SCIENCE

One unstated objective of science is to make a *difference*: to learn something, or make something, that changes the way people think or behave. Many of the biggest discoveries — the most important scientifically and the most consequential socially — are surprises, and their consequences are unimaginable at the time they are made. Who would have predicted the changes in society that have come from classification of the elements into the periodic table, or from quantum mechanics, or the World Wide Web? Who would have guessed that the first NMR spectrum of ethanol would grow into the ability to watch the brain think? The unpredictability of these big surprises makes us timid in our speculations: It is embarrassing to be publicly wrong, and big surprises make dunces of us all. But avoiding speculation makes science dreary and neglects our responsibility to society to warn of change even as we cause it.”

— Harvard professor George Whitesides, as quoted in the HBS case “The Whitesides Lab” by HBS professor Kent Bowen and former Lecturer/Postdoctoral Fellow Francesca Gino

