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which one may perform through a cell phone, regardless of one's momentary social and physical environment.

Perhaps the time is now ripe for a detailed historical analysis of mobile telephony, to trace some of these changes in language, meaning, and purpose.

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Managing Path-Breaking Innovations: CERN-ATLAS, Airbus, and Stem Cell Research.

By Shantha Liyanage, Rüdiger Wink, and Markus Nordberg. Westport, Conn.: Praeger, 2007. Pp. xx+328. \$160.

Three management scholars—Shantha Liyanage (a New Zealand–based biologist), Rüdiger Wink (an economist in Germany), and Markus Nordberg (a theoretical physicist at the Swiss/French CERN [European Center for Nuclear Research] facility)—wrote this book to explore the difficulties of unwieldy, multidisciplinary, international collaborations. Unfortunately, the result exemplifies those difficulties more than it elucidates them.

As the title indicates, the book highlights three cases of “path-breaking innovation”: the ATLAS particle detector at CERN; the European Airbus consortium, focusing somewhat on the woes of the A380 jumbo jet; and the mostly academic community of stem cell researchers. Liyanage, Wink, and Nordberg also throw in references to other cases—the video-game industry, Mittal Steel in India, Lenovo in China—but these detract from, rather than add to, the argument.

The authors make a reasonable case that there is something analytically worthwhile about lumping biotech, high-energy physics, and aviation together. These are all large-scale, multidisciplinary endeavors that span very different national political and economic systems. Each has its own public-relations “problem”: ATLAS must be seen to “spin off” useful technologies; Airbus must (eventually) make a profit while benefiting each participating region; and stem cell researchers must answer to the varying laws and ethical concerns of different polities while erasing the taint of fraud from the Hwang Woo-Suk case.

Where the three cases differ, the authors argue that they line up along an analytically useful spectrum. At one end, however many spin-offs it produces, ATLAS is not meant to turn a profit (the authors worry whether this means it is a “market failure”). In the middle, stem cells are currently commercialized at very low levels, but researchers promise wonder therapies eventually. And at the other end, Airbus is all about profit and economic competition, even if all the government subsidies and defense spin-offs make the consortium's bottom line difficult to calculate. Unfortunately, none of the three

cases is ever explained in great detail for more than three or four pages at a time. Instead, the authors seem to assume that readers already know the basics and they can therefore skip straight to spinning arguments at an abstract level. Worse, those arguments seem to have been constructed by the authors taking turns paragraph-by-paragraph. Indeed, some *sentences* are composed of fragments apparently authored by different people, and the tortured prose consistently reflects poorly on Praeger's copyeditors.

Beyond the stylistic chaos, the book suffers from significant intellectual contradictions. On page 272, for example, we are told that "Scientific knowledge is profoundly central to human civilization. This is because science creates path-breaking innovations that change value systems, beliefs, and our ways of doing things. . . . In recent years the organized Western knowledge system, known as scientific knowledge, has taken the center stage of economic and social development." Did you get that? Scientific knowledge = Western knowledge = central to human civilization. And yet, on the opposite page, we are told that science "is not the only mechanism and source of useful knowledge available to human beings. . . . [M]any wise people in the past accumulated knowledge through undertaking empirical observations into engagement in art, crafts, agriculture, hunting and gathering, and revelation and contemplation."

Well, which is it? Is science necessary for "human civilization," all of which will eventually look monolithically Western? Or are there other value systems which contribute something worthwhile that Western science cannot? Caveats (such as the second quote) aside, the book leans to the first interpretation. After all, "science has proven beyond any doubt as the most profound knowledge system that can advance the progress of mankind" (p. 10). Sustaining that faith, though, requires giving credit to science for inventions that are dubiously scientific in origin: "the best examples of innovations that changed the world's social and political landscapes and structures are the invention of steam engines, electricity and the printing press" (p. 11). At the same time, the authors go to odd extremes to paint science as under siege by dark forces of irrationality: "most others who made contributions to radical science and innovations, such as Einstein, Darwin and Wallace, were not recognized for their ingenuity" (p. 7). Darwin and Einstein not recognized?

Chapter 7—"Funding and Commodification"—is well worth reading, but overall the book is not aimed at a *T&C* audience. Each of the individual authors has done interesting work, but their collaboration "provides a perfect example of the increasing complexity of integrating knowledge from different scientific and technological disciplines into an original product with a new cognitive vision" (p. 277).

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