

dominant market position rather than to encourage the creation of revolutionary products and services. But innovation was a much different affair at AT&T, which espoused a corporate ethos of universal service—and especially at Bell Labs, which adhered to a management philosophy calculated to attract some of the world's best scientists and engineers to work in an industrial lab. A healthy percentage of the costs of R&D were built right into the calling-rate base. Thus assured of steady financing, lab managers could afford to take the long view and pursue breakthrough technologies that might not pay off for a dozen years or more but might ultimately be of enormous value to society. AT&T's patient capital and secure cash flows allowed the company to take the substantial risks involved in attempting *sustained* innovation across a broad technology front.

The transistor is perhaps the best example of that process. AT&T's managers recognized the long-range need for a solid-state amplifier and switch during the 1930s, but it wasn't until 1947 that John Bardeen, Walter Brattain, and William Shockley invented the device. And it took another 15 years or so of technology development before transistors began to assume their modern form. Bell Labs and Western Electric fostered almost all the subsequent innovations this transformation required: purifying silicon, growing large crystals of this semiconductor material, diffusing layers of impurities into the crystals, patterning the layers using a protective oxide surface layer, and so on.

During the 1960s, Fairchild Semiconductor and Texas Instruments adapted many of these technologies to develop the microchip, whose manufacture now adds more than a trillion dollars per decade to the global economy. These smaller, less-robust companies could never have pursued the many different innovations that made their core product possible. But they were exquisitely

poised to drink from the rich technology stream flowing from Bell Labs and Western Electric.

Only a large corporation such as AT&T—or others like General Electric and IBM—could ever afford to support the sustained, multidisciplinary, mission-oriented R&D efforts needed for these innovations without worrying too much

about the short-term impact on the bottom line. And it was crucial that this work be accomplished in a pragmatic industrial setting, with a long-range goal of delivering better goods and services—an ethos that hardly exists in government or university laboratories.

Such farsighted institutions, performing basic research and development

STUDIES SHOW

Those Who Can't, Don't Know It

by MARC ABRAHAMS

The ancient phrase “A fish rots from the head down” describes the pernicious effects that incompetent managers have on those below them. But such managers are hard to correct or criticize because they don't recognize there's a problem.

Psychologists David Dunning of Cornell University and Justin Kruger, now at New York University's Stern School of Business, supplied scientific evidence that incompetence is bliss—bliss, that is, for the incompetent person. Their study, “Unskilled and Unaware of It: How Difficulties in Recognizing One's Own Incompetence Lead to Inflated Self-Assessments,” appeared in 1999 in the *Journal of Personality and Social Psychology*.

To explore the breadth and depth of human incompetence, Dunning and Kruger staged a series of experiments. In one, they asked 65 test subjects to rate the funniness of certain jokes. They then compared each test subject's ratings with those of eight professional comedians. Some of the participants repeatedly couldn't predict what others would find funny—yet described themselves as excellent judges of humor (rather like the character David Brent in the British version of the TV series *The Office*). Although less colorful, Dunning and Kruger's other experiments—involving grammar and logic—yielded similar results.

Incompetence, the study demonstrated, represents a dismaying troika of cluelessness: Incompetent people don't perform up to speed, don't recognize their lack of competence, and don't recognize the competence of others. “The skills that engender competence in a particular domain are often the very same skills necessary to evaluate competence in that domain,” the researchers conclude. In other words, if incompetents have people reporting to them, their poor judgment may damage careers besides their own. “Unskilled and Unaware of It” is online at www.apa.org/journals/features/psp7761121.pdf.

MARC ABRAHAMS is the editor and cofounder of the scientific humor magazine *Annals of Improbable Research* (www.improb.com). In this regular *Forethought* column, he unearths studies that shed the oblique light of multidisciplinary research on the science of management.

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