First Words, Last Words

Douglas K. McCormick

"Don't let it end like this. Tell them I said something."
— reputed last words of Pancho Villa

Douglas McCormick was editor of Bio/Technology *from 1984 through 1993.*

When *Bio/Technology* began publishing opinions in March 1983, the field was full of questions. The memory of Asilomar and the voluntary moratorium on recombinant research was still fresh. Regulation of biotechnologies seemed imminent.

My first First Word was a painfully earnest homily on "Understanding the Media," aimed at biotechnology executives who complained about the way the press was sensationalizing the field. The Last Word in that issue (contributed by an academic sociologist) argued that ties between academic researchers and commercial organizations threatened the fabric of scholarly research.

Today, academic-industrial agreements are part of that fabric. While individual arrangements can still raise eyebrows, we have discovered the benefits that collaboration can bring to both sides—not to mention that increasing industrial funding for academic research has been vital to offset a steady decline in government science spending.

The cover story in that first issue of *Bio/Technology* described how ICI, the chemical giant, had poured $150 million into an unsuccessful effort to make and market protein food supplements made by a Mephistophelean microbe, *Methylophilus methylotrophus*. We offered an two-part analysis of biotechnology in the Soviet Union, which seemed threatening at the time. There was an ambitious blueprint for "Formulating a Manufacturing Strategy," all in two pages. And we published a tally of "Initial Public Offerings of Biotechnology Companies 1980-1983," covering the 14 quarters following Genentech's 1980 IPO (offered at $35 and climbing within minutes to $89). I haven't done a detailed necrology, but of the 24 Wall Street darlings that appeared on author James Murray's list, only one—possibly two—remains today extant, independent, and profitable.

Neville Fish and Malcolm Lilly reviewed "Interactions Between Fermentation and Protein Recovery," concluding (in what would become a recurrent theme of the journal) that researchers should consider process design and recovery unit operations from the inception of their research. The lead research paper reported the discovery of kidney plasminogen activator.

The point is that things were different then, and yet the same. In general, we expected that each new protein would be a wonder-drug like interferon. Biotechnology was monoclonal antibodies and recombinant cytokines—proteins that would be made in fermentors the size of houses, race through regulatory approvals in record time (offering prospectuses routinely predicted product revenue in four or five years), and burst onto the market saving millions from incurable diseases and making millionaires of an entire generation of starving post-docs.

The naiveté of youth. We can only shake our heads as we run a finger down the roll of biotechnology companies absorbed, in whole or in part, by the big companies that own the market knowledge, the distribution muscle, and the product development know-how. We measure the startups' burn rates against their cash reserves and mutter. We scan the list of approved protein therapeutics and marvel at its brevity.

Yet biotechnology has won its revolution.

I used to start my public talks on the industry like this: "There is no such thing as biotechnology, there are biotechnologies. There is no biotechnology industry; there are industries that depend on biotechnology for new products and competitive advantage."

By that standard, the biotechnology revolution is unstoppable. For a host of reasons, the recombinant proteins we dreamed about will never dominate health care. But recombinant proteins are not the measure of biotechnology. (Though cytokines, chemokines, antigens, and antibodies are on the market, as free to succeed or fail as any conventional treatment. Given the odds facing any new therapeutic, this is great success.)

More important is this: Today, molecular biology is an indispensable foundation of drug development. The companies that can isolate, clone, and produce new proteins—from antibodies to transcription factors—have prospered. Those that clung to the tools of the past have become fodder for their faster-moving brethren. New tools—new biotechnologies—have sprung up. We race now for encyclopedic technologies like genomics and combinatorial chemistry and bioinformatics and directed evolution that distill knowledge out of the information-like properties of living processes.

No doubt, still more powerful tools will emerge as the new century unfolds, and these, too, will be part of the evolving revolution of biotechnology, and of *Nature Biotechnology*. ///