Pure Genius: It's Great If You Have It--But It's Not A Prerequisite To Success In Science

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Two recent articles--one in the New York Times Magazine, the other in Nature--set me to thinking about the role pure genius plays in stimulating and sustaining the scientific enterprise. On one hand, individual displays of awesome intellect can certainly be inspiring; but I suspect they can also be discouraging for budding researchers who realize that their grasp on things will never equal that of an Einstein, Fermi, or Feynman. And that's truly unfortunate.

In the Times Magazine piece ("Murray Gell-Mann: The Man Who Knows Everything," May 8, 1994, page 24), writer David Berreby reports on the man who won the 1969 Nobel Prize in physics for his classification of elementary particles. Berreby makes no secret of his reverence for Gell-Mann and his vast erudition--a scope of interest and knowledge that extends far beyond physics. The superscientist who discovered the quark, Berreby points out, is also, among other things, an accomplished linguist, ornithologist, and entomologist--knowledgeable on subjects as diverse as tropical diseases, kissing bugs, and the writings of James Joyce. Fifteen years ago, by the way, I noted in an essay the etymology of "quark," which Gell-Mann had come across in Joyce's Finnegans Wake (Current Contents, Issue #4, Jan. 23, 1978; reprinted in Essays of an Information Scientist, Vol.3, Philadelphia, ISI Press, 1980, pages 393-9).

In the Nature article ("Intellectual Mastery Over Nature," 368:109, 1994), writer Peter Harman--a historian at England's University of Lancaster--discusses a recently published collection of essays on the life and work of German scientist Hermann von Helmholtz (1821-1894), whom Harman calls "a scientific polymath of extraordinary accomplishment." The book, titled Hermann von Helmholtz and the Foundations of Nineteenth-Century Science (David Cahan, ed., Berkeley, University of California Press, 1994) explores the contributions of this verifiable genius, whose intellectual excursions extended over many fields: mathematics, physics, physiology, hydrodynamics, and the philosophy of science. He even developed a theory of music, Harman points out.

Of course, accounts of Gell-Mann, von Helmholtz, and other such remarkable scientists make fascinating reading. And studying the lives of the "giants" should not in any way deter others from aspiring to careers that, while offering

little in the way of legendary achievement, are just as important to scientific progress.

I've devoted much of my life as an information scientist to monitoring, analyzing, and reporting on the contributions of scientists--from Nobelists like Gell-Mann to bench researchers whose publishing rec-ords are qualitatively and quantitatively minuscule by comparison. I have concluded that all who strive to unlock the mysteries of nature participate as equals in keeping the great machine of science in motion--no matter how great or small their success.

Moreover, I believe that the scientific enterprise would be neither complete nor fruitful if the work of all researchers were not monitored, described, defined, and otherwise put into intelligible form. Every bit as important to science is the work of the librarians, encyclopedists, historians, journalists, and information scientists like me. We are inclined by nature and intellect to spend our days not toiling at a lab bench, but reflecting on the past, assessing the present, and, one hopes, helping to shape the future of research. One must not be humbled, then, in learning about a Gell-Mann or a working at the core or on the periphery of scientific discovery, share in fostering von Helmholtz. All of us, whether progress. Doing science--seeking and measuring relationships among science phenomena--is, for the most part, an a priori process. Mapping the world of is a distinctly different, a posteriori process. Both are necessary.

Today, many aspiring scientists are attempting to build careers in a world where, owing to a precarious national economy, research positions are becoming less available. Young men and women who may once have dreamed of winning a Nobel Prize will find themselves having to apply their scientific training instead to jobs in such fields as law, publishing, and information science. For these people, mental agility, readiness to adapt, intellectual honesty, and an open mind will be of great value. And since most of the "giants" of science have embodied these qualities, studying their lives and achievements should serve to instruct and inspire.
