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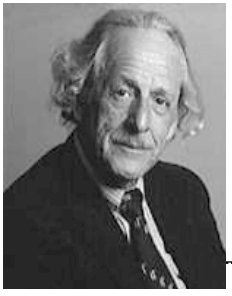

Fast Science vs. Slow Science, Or Slow and Steady Wins the Race

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Today, more than ever, scientists are finding themselves immersed in "hot" fields—highly publicized, hyperdramatized research areas in which pursuit of funding is wildly competitive and change is quick. The media, ever in pursuit of the big story, the banner headline, stoke the fire, seizing every opportunity to trumpet sudden breakthroughs. Thus perpetuated is the public's widely held misapprehension that scientific progress is achieved primarily in sudden flashes of genius or serendipity by scientists shouting, "Eureka!"

Most working scientists, of course, are aware of a less glamorous reality: The unexpected discovery is the rare exception; most scientific advances depend on long-term, persistent, methodical research. It's not the stuff of headlines or television docudramas, but it's the way most science gets done. Research citation analysis clearly bears this out. Indeed, the publishing records of Nobel-class scientists demonstrate that some of the most important discoveries have resulted from decades of work. Rather than being the product of dumb luck or happy accident, important discoveries generally are made by those who doggedly plug along in a field that is ripe for discovery and who are intellectually prepared to recognize and exploit unexpected results. For example, in the 40 years since James Watson and Frances Crick began their quest to elucidate the structure of DNA, there have been well over 10 million scientific papers published. That's the kind of massive scientific foundation and slow but gradual building necessary to yield the kind of progress that the press tends to dramatize as a breakthrough.

Of course, there are occasions when scientists themselves show impatience at the pace of certain research endeavors. Supporters of the Human Genome Project, for instance, point to the ways in which, in time, that undertaking will revolutionize biology and lead to cures for thousands of diseases. Yet some of those who oppose the project point out that the amount of time—not to mention the massive funding—it will require may supersede other valuable research projects that are more specifically targeted and promise results in a nearer future.

Compared with the scientifically sophisticated level of debate going on over the genome project, the

public's starry-eyed fascination with dramatic signs of scientific progress seems naive and harmless enoughbut it, in fact, isn't benign when it begins to affect political agendas and expectations among those who control the purse strings of science. Public pressure on the scientific community in the battle against AIDS is a good example. Just as a belief in the scientific quick fix stimulated President Richard Nixon's War on Cancer—the success of which continues as a subject of heated debate—public expectation of constant breakthroughs on the AIDS front is today stimulating unreasonable demands for ever-faster progress. (These demands are intensified no doubt by the very nature of AIDS: While diseases like cancer and multiple sclerosis stir widespread sympathy—and hence a patient attitude—the association of AIDS with socially unpopular sexual and criminal behavior has excited even further the impatience for its eradication, fueling the perception that scientists have been slow in finding a cure.)

At this point, it appears that no sudden breakthrough in the fight against AIDS is in sight and that the ultimate cure will arrive, if ever, as the result of a slow-and-steady approach by the international science community. Rather than impatience for the announcement of a miracle cure, what is most needed right now is the development of a durable infrastructure for long-term education and basic research on AIDS.

This, of course, will require steady funding, which in turn requires public understanding and support. To gain this, the science community should do everything it can to change the public's perceptions and expectations about how science in general is done; about what, in relation to AIDS, science is and is not capable of achieving; and about the time that may be required for science to "win the race." ■