

A crisis in scientific morale

Scientists who work in biomedical fields cannot be objective observers of processes that go on in their own bodies. What is the rational solution to this dilemma?

Robert Pollack

So long as individual scientists believe, and behave according to the belief, that the essence of success in science is the freedom to discover the right experiment and then to do it according to one's own lights, all the social structures that connect scientists to one another will be based solely on each scientist's latest piece of individual work: a hobbesian world of each against all. Such a world is intrinsically unhappy, and profoundly unbiological as well, in the sense that no scientist's life, or work, can possibly go on indefinitely, as this sort of world demands.

This wilful miscalculation of the trajectory of a life can, paradoxically, lead to sudden demoralization in those scientists who have been around long enough to know better. As they reach an age and situation where 'peer review' means being judged by colleagues younger than their children, the absence of social structures that would validate anything about these researchers beyond their latest papers, makes for a reproducibly sad moment of isolation that often leads to bitterness and weird or obstructive behaviour.

These considerations feed a deeper malaise in the life sciences. In its disciplined way of looking at the natural world, any branch of science requires its practitioners to act as if they were observers, not participants. In all sciences, the first and last scientific instrument, the one that must be used in every experiment, is the scientist's brain. Scientists who choose human biology as their playing-field cannot fully meet the requirement that they observe their systems dispassionately, without dislodging themselves from their own bodies and minds.

The strain of trying to meet a standard of cool curiosity without flying apart into pieces imposes an unbearable distance between the biologist and his or her own biology. To relieve this strain, medical scientists have created the myth that their instruments and procedures somehow free them from the boundaries of their minds and bodies. This is the myth of absolute rational control of the scientist over her or his material, the notion that the metaphor of scientist as sculptor will not break down even when the sculptor and the sculpture are one and the same.

The conscious expression of this unconscious dilemma is a novel transformation of every scientist's dream of winning. Medical science, like any other science, is profoundly respectful of the score-card, allocating

recognition only for precedence in demonstrating the correctness of a new model for how a piece of nature works. The dream of winning takes on an obsessive quality in the medical sciences once the subject of scientific study becomes the mind and body, and the reality of bodily mortality becomes unavoidable. The obsessive response to the certainty of biological death is the promise that a big enough win in the game of science will beat death itself, by conferring a form of immortality on the winner.

Discoveries that set the agenda for the future work of many other scientists do this after a fashion, permanently associating a lower-case version of a scientist's name with an aspect of nature: think of darwinian evolution or the watson-crick model of DNA. But in the medical sciences, belief in winning immortality of any sort is problematic, as it denies the biological reality only too plain from the data, that the eventual loss of self is inevitable.

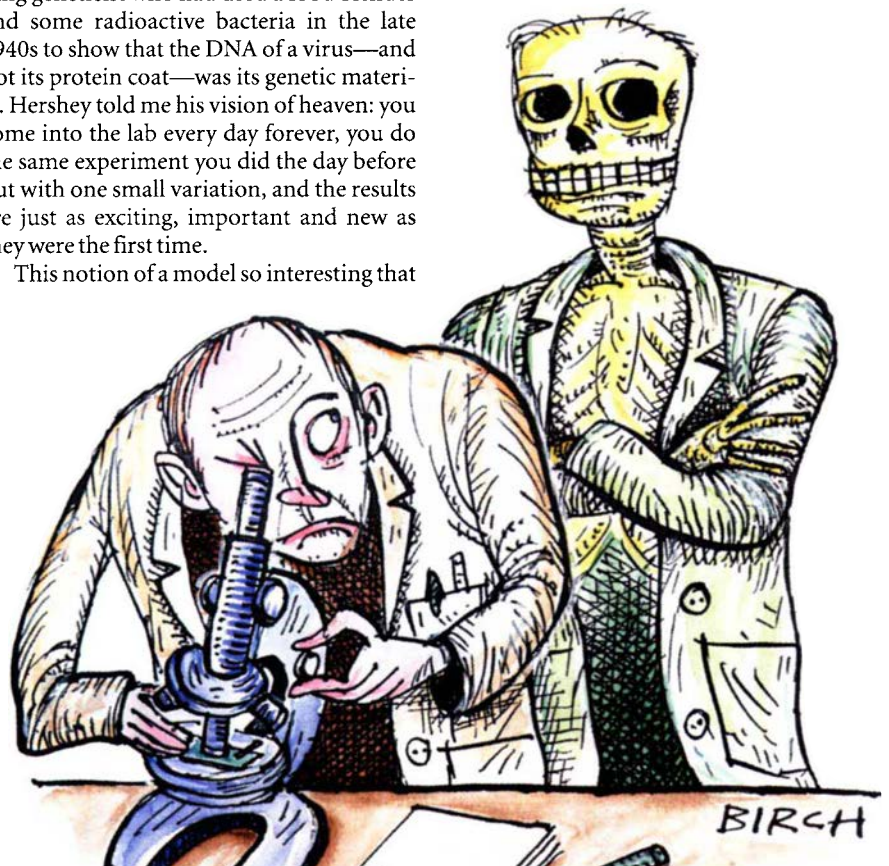
I first saw how the life sciences could be driven by a fantasy of institutional scientific immortality quite early in my career, about 25 years ago, in a formative, odd conversation with Al Hershey, the Nobel prizewinning geneticist who had used a food blender and some radioactive bacteria in the late 1940s to show that the DNA of a virus—and not its protein coat—was its genetic material. Hershey told me his vision of heaven: you come into the lab every day forever, you do the same experiment you did the day before but with one small variation, and the results are just as exciting, important and new as they were the first time.

This notion of a model so interesting that

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testing it over and over again wins the game without any further creative thought, is also a product of the root fantasy of the biomedical sciences. Hershey's heaven cannot exist for students of life because they must deal with the facts of life: the first of these is the inevitability of death, the personal mortality of the experimenter. Hershey's myth serves the same function for those biologists who believe in it, as other myths about death serve in other religions: to keep their believers from having to confront this irrational, unbearable reality.

Only faith or obsession — if they are not the same — can expect a method of observation of nature and the knowledge it yields, to



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set a person apart from the passage of time with its inevitable instant of personal ending. The underlying fantasy, that omnipotence of thought will bring immortality, is a notion inadmissible to rational analysis. This is why the conscious, operational, agenda of the life sciences masks the fantasy in the metaphorical cloak of institutional immortality.

The thinnest membrane of denial separates the notion of scientific immortality through priority of discovery from the deeper, older and wholly non-scientific dream of escaping one's own inevitable death. Personal mortality puts biologists in a quandary every time denial fails: to play the game well, they must never stop asking questions about our mortal bodies, but to play it with their own lives is to be sure that the answers—their own answers, their own models—are sometimes going to be truly frightening. Denial of the fear of nature's terrible power of mortality; projection of the suppressed wish not to be subject to nature, into a vision of nature as capable of bestowing immortality: these are the marks of a masked unconscious operating to create a biomedical science at war with its own stated purposes.

Visions like Hershey's heaven can have unexpected power when they are believed by the people who set the priorities of basic biomedical research. For example, many excellent scientists—their eyes fixed on their place in Hershey's heavens—have become completely averse to the idea that their work should be directed towards any goal beyond their own need to know the answer to their next experiment. Filled with this conviction, and thereby sustained in their faith that they have avoided the fact of mortality, they are easy prey to the habit of making promises to themselves, and to the rest of us, that they cannot keep, promises that hint that death itself may be put off indefinitely. It is not that science and medicine wish to avoid finding cures for diseases, it is that they are too strongly motivated by an irrational, unconscious need to cure death, to be fully motivated by the lesser task of preventing and curing disease simply to delay for a while the inevitable end of their patients' lives and, by extension, their own inevitable end.

About five years ago I decided to act on these observations: I resigned from my laboratory, which had been funded without interruption by the US National Institutes of Health and other government agencies for many years. I continue to write about the medical sciences, to teach the subject to undergraduates and graduate students, and to review manuscripts and grants. Instead of directing the work of a laboratory of my own, I am a consultant in the private sector, helping the research programme of AMBI Inc., a biopharmaceutical corporation.

Making this transition successfully is like crossing a highway on foot: oncoming dri-

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vers cannot afford to stop, unless they get into an accident themselves, and have to join you walking. Worse than being invisible (when I won a Guggenheim fellowship for my writing, one of my colleagues asked me, what's a Guggenheim?) is being condescended to: I recall the concerned, whispered attempt by a colleague to put me at ease by assuring me that I had simply entered scientific menopause.

Eventually, I learned what smart women already know: menopause has its new freedoms, and even its pleasures. In terms of scientific morale, perhaps the most important of these is the discovery that it is possible to remain a scientist without running a laboratory. The mix that works for me involves writing, teaching, consulting and advising. My first book on science for the general public, *Signs of Life* (Houghton Mifflin, 1994), takes as its argument the notion that DNA is not merely an informational molecule, but is also a form of text, and that therefore it is best

understood by analytical ways of thinking commonly applied to other forms of text, for example, books.

I am now completing my second book, on the difference between the outward, stable, inexorable time of science, and the inward, multiple, flexible time of consciousness, and the consequent problems science has in making sense of consciousness, and of that nasty diamond at its centre, each conscious person's knowledge of inevitable, personal mortality. These books have both been exercises in seeing patterns from insufficient data, and in that sense they are much like the science I used to do; the main differences are that I now write for the public rather than for a star panel of secret reviewers, and that I get paid by a publisher who pays taxes, rather than by a government agency spending tax money.

Having assembled this life for myself in the absence of any structures within the scientific community, I firmly believe that the crisis in morale among today's scientists—in my field, at least—stems not from money problems, nor from the stage of development the field is in, but from a failure by the scientists concerned to form themselves into proper, humane communities. It is never too late to begin the task of forming these communities, to introduce social structures that ameliorate the morale-puncturing competitiveness and anomic individualism of today's basic science, without in any way diminishing the intellectual rigour of the science itself.

No matter how porous the boundaries get between university-based and commercial-sector science, universities are likely to remain the main, if not the sole, source of new generations of scientists for a long time to come. For that reason alone, any changes in the social structure of science will need to take place among university professors in their departments, or else they will not have any lasting effect. We professors might as well begin our reforms in the most conservative way, by rediscovering and rededicating ourselves to the meaning of the title we hold. To 'profess' means openly to affirm. Affirmations are matters of the heart. Professors do not deserve the title, unless they are willing to take the time and make the effort openly to affirm something beyond their data, as data speak for themselves and need no affirmation. To be a professor, it seems to me, one must first have something of importance to oneself that needs affirming, and then one must affirm it. I affirm, for instance, that unconscious desires and fears, as well as data sets, drive the agendas of modern molecular biology. □

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