

What You Don't Know Can't Hurt You. . . .

Hanging on the wall of my office is a reproduction of a work by the wonderful graphic artist Ben Shahn that rather fancifully depicts the 12th century physician and philosopher Moses Maimonides. Incorporated in stylized calligraphy at the base of his portrait is one of his sayings that strikes me as remarkably prescient and apt advice for a 21st century scientist. The words of Maimonides counsel, "Teach thy tongue to say 'I do not know' and thou shalt progress."

It seems to me that we live in an era when scientists are rarely afforded the luxury to say "I do not know." Like the digital technology that drives it, our information age society is binary. Our popular culture tends to believe that every question has a single correct answer and that each of the investigators who seeks the answers to those questions is either right or wrong. All of the constituencies that depend on and judge today's scientists expect the scientific community to provide them with solutions that are devoid of uncertainty or confusing nuance.

Much of the general public understandably derives its conceptions of science and scientists from rather skewed media caricatures. Whether one's childhood image of the scientist was shaped by the immortal character of the Professor on "Gilligan's Island" or by the more hip and sleek sleuths depicted in the profusion of "CSIs," the overwhelming impression that these fictitious practitioners of science create is one of self confidence, cold logic, and clear vision. Given the proper tools and a clue or two, any

one of them can definitely solve any problem, no matter how complex or improbable. (Although it must be noted that my argument is somewhat weakened by the fact that, despite his creativity and erudition, the Professor never did succeed in freeing the intrepid seven from that uncharted desert isle.) The popular media rarely leaves scientists the room to doubt, to disagree, or to recognize the possibility of several equally valid conclusions. It is perhaps not surprising, therefore, that the general public, who are fed these media images and whose scientific literacy is frequently less sophisticated than might be hoped, have limited patience for the qualifiers that leaven scientific debate. The public consumes its science largely in the form of declarative headlines. It has come to be interested only in the immediate product of science and has little tolerance for its lengthy process.

Of even greater concern is that the leaders of some government institutions, who at least in theory might be expected to depend on science to make informed and delicate policy decisions, have recently seemed to be more interested in identifying and promulgating as certainties only those subsets of scientific thought that are consistent with or confirmatory of their pre-determined policy objectives. Not only do these individuals turn their backs on the possibility of scientific complexity and uncertainty, they reject or ignore well founded scientific conclusions that run counter to their principles or

predilections. They trumpet those scientific insights that fit their purposes as absolute and inviolable truth, while attacking or negating inconvenient inconsistencies. It goes without saying that the consequences of such "cherry picking" of science can be dire indeed.

Perhaps of greatest concern for science is the possibility that the scientific community and its institutions are themselves becoming equally guilty of harboring limited patience for uncertainty. The complaint is often heard that in order to be fundable or publishable, a body of work must be able to fit cleanly into a neat and well defined conceptual box. The pressure to publish and to obtain research support creates an enormous temptation to overlook stray facts and observations that are at odds with the saleable central story. A comparison of the style and depth of some of the classic papers that form the physiology canon with those of papers of the present day is informative in this regard. Word and space limitations have all but eliminated complete and meaningful experimental methods sections from the primary texts of papers in many journals, and there is limited space to explore an observation's context and caveats. This trend is perhaps not surprising, since scientists live in the modern world, and we are shaped by and susceptible to its tides and trends. It is unfortunate and worrisome, however, since it is the inconsistencies and unruly details that tend to guide the way to scientific revolutions. As scientists, we need to remember, and to help the rest of the world to see, that the honestly uttered words "I do not know" do not connote weakness or ignorance but are instead the very heart of the search for truth. ■