

CULTIVATING SCIENCE



IN 2004 THE GENETICS AND PUBLIC POLICY CENTER fielded a survey of more than 4,000 U.S. residents about new genetic technologies, and more than 40 percent said they did not trust scientists “to put society’s interest above their personal goals.” The roots of this uneasy relationship lie in the reliance that the science and technology community places in various “deficit models” of interaction with the public. The basic assumption behind these models is that there is a linear progression from public education to public understanding to public support, and that this progression—if followed—inevitably cultivates a public wildly enthusiastic about research. But this model of scientific engagement with the public obviously isn’t working.

Lately, all manner of ways to “involve” the public in science policy and practice have cropped up, mostly around oversight of emerging technologies like synthetic biology, nanotechnology, and human genetics. Scientific associations are developing centers devoted to public engagement in science, funding agencies have created sweeping mandates for collecting public input on research, and research-performing institutions are hosting community meetings and science cafes about their work. But one might wonder—are these new organizations going to truly “engage” the public?

In a nutshell, an erosion of public trust that began as a trickle of doubt about radiation safety and pesticides has grown to program-threatening uprisings against emerging new technologies, from genetically altered “Frankenfoods” to concern over “grey goo” in nanotechnology.

Initially, the “deficit” in question was framed as an “information deficit”—if only lay people knew what scientists did, goes this line of thought, they too would support the agendas of the scientific establishment. Since World War II, the science community has been operating under this information-deficit model, built on one-way flow of information from the expert to the public with very little information flowing back the other way. This model drove communication of science and technology for the last half of the 20th century, despite its very obvious shortcoming: Neither public support for research nor scientific literacy increased significantly in all that time.

More recently, however, the information deficit model increasingly has been reframed as an “attitudinal deficit”—to know us is to love us, runs the mantra of this public-understanding school of science–society interaction. Having realized the practical futility—if not the ethical challenge—of making every lay person a lay scientist, the public-understanding model contents itself with pursuing public appreciation, emphasizing the benefits of science to society without worrying unduly about how much science the public actually understands.

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The end goal hasn’t changed—increased public support of science and technology—even if the methods used to get there and the metrics used to define success are different. The direction of information flow remains the same as well: top-down from the scientist or engineer to the public.

The asymmetric communications practices embodied by both the scientific literacy and public understanding movements cultivate scientists who resist ceding any level of control of the science policy agenda to non-scientists, a view neatly encapsulated by a quote from a series of scientist interviews we conducted at the Genetics and Public Policy Center a few years ago: “I don’t think that the general uninformed public should have a say, because I think there’s a danger. There tends to be a huge amount of information you need in order to understand. It sounds really paternalistic, but I think this process should not be influenced too much by just the plain general uninformed public.”

This wariness is reciprocal in the 21st century, as U.K.-based communications researcher Martin Bauer and his colleagues noted in the journal *Public Understanding of Science* last year: “Mistrust on the part of scientific actors is returned in kind by the public.” Negative public attitudes, they say, as revealed in large-scale surveys, are viewed by scientists as proof that “a deficient public is not to be trusted” to provide uncritical support for the scientific enterprise.

Clearly, something needs to change in the science–public landscape. Writing in *Science* in 2003, the CEO of the American Association for

the Advancement of Science, Alan Leshner, summarized the problem eloquently: “Simply trying to educate the public about specific science-based issues is not working... We need to move beyond what too often has been seen as a paternalistic stance. We need to engage the public in a more open and honest bidirectional dialogue about science and technology.”

Indeed, research-performing institutions increasingly say they have traded in their old, top-down models of science literacy and public understanding for the new buzzwords of “public consultation” and “public engagement.” But the philosophy behind consultation and engagement seems, on closer inspection, not to have changed much at all. Many scientists expect consultation and engagement to cultivate a public more supportive of science as planned by, performed by, and promoted by scientists—despite the fact that neither consultation nor engagement have been rigorously evaluated to see if these goals are reasonable or even possible. And even if they turn out to be measurably effective in meeting some articulated goal, are they affordable enough to deploy? Neither consultation nor engagement can be done on the cheap.

What, then, can consultation or engagement do for us? This “participatory turn” in science–society relations, as Harvard scholar Sheila Jasanoff terms it, ostensibly focuses on regular dialogue (two-way, symmetrical communication), transparency of the decision- and policy-making process, and meaningful incorporation of public input into that process. On paper, the goal of these two-way, participatory models is mutual satisfaction of both parties, the research enterprise and the public, with the relationships that exist between them. Key dimensions of this dialogue are negotiation, compromise, and mutual accommodation. It places a premium on long-term relationship building with all of the strategic publics: research participants, certainly, but also media, regulators, community leaders, policymakers, and others. These emerging models offer promise for scientists

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and the public to engage each other more fully and productively—although the promise is as yet only tantalizing, and not yet tempered by much scrutiny from social science research.

The dearth of evaluative research on engagement stems partly from the fact that very little is being done. In practice, much communication currently passed off as public consultation and engagement is still one-way, expert-to-layperson information delivery, albeit in different settings like cafes, scientific, public meetings, and town halls. Research organizations have been quite adept at putting together well-rehearsed, tightly scripted opportunities for “public input”—but with no institutionalized mechanisms for reflecting the public’s input in deliberation or policy construction. In fact, one gets the not-so-subtle impression that these engagement events are being held with the hope of staving off public dissatisfaction, or providing just enough semblance of listening to public concerns that the natives don’t get so restless they revolt.

In our view, the end game of public engagement should be empowerment: creating a real and meaningful mechanism for public input to be heard far enough upstream in science and technology policy making and program development to influence decisions. It is not about making a decision among a scientific elite, and then staging public events to move the public toward agreeing with that desired outcome. It is about empowering lay citizens to learn all they want about pending program or policy issues (not what scientists believe they need to know to weigh in), and then giving them access to deliberative processes where that knowledge can be questioned,

applied, and incorporated with knowledge or questions gleaned from outside the scientific process.

And it is about agreeing up front to accommodate public input politically, not just to listen and nod politely. Unlike the unidirectional and hierarchical communication that characterizes scientific literacy and public understanding models of science-society relations, public engagement practiced as iterative dialogue does result in demonstrable shifts in knowledge and attitudes among participants. At GPPC, we have documented and measured these shifts during town hall and online deliberations. But the shift is not always in the direction scientists might expect or prefer. Public engagement is not about getting the policy you want; it's about getting the public input you need to craft sustainable policy that enjoys public confidence.

Public engagement is also about agreeing up front to accommodate public input personally. Pub-

lic engagement changes people. The public gains knowledge, shares expertise, and reflects on how much risk society is willing to accept to realize the promise of emerging technologies. Less appreciated, but perhaps even more significant, is the expectation that scientists who enter into public engagement should see their knowledge and attitudes change, too. This is the real mark of successful public engagement: Rather than insisting upon the public's deeper appreciation and understanding of science, its primary goal is scientists' deeper understanding of the public's preferences and values. [sp](#)

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