Letters to the Editor of *Dædalus*

On scientists as professionals

February 20, 2006

To the Editor:

An egregious example of the ongoing misunderstanding between scientists and society is on view in the Summer 2005 issue of *Dædalus*, devoted to the professions, in which scientists are not even mentioned. The introductory article by Howard Gardner, a distinguished Harvard professor known for his work on 'multiple intelligences,' and Lee S. Shulman, emeritus professor of education at Stanford (currently president of the Carnegie Foundation), lists physicians, lawyers, and accountants; architects and engineers; journalists and educators as 'professionals.' They do not include scientists in the list and – it is interesting to note – they do not include creative artists, like Picasso or Beethoven. These authors define professionals as "individuals who are given a certain amount of prestige and autonomy in exchange for performing for society a set of services in a disinterested way."

The primary orientation of both scientists and artists, of course, is not to serve society but to an impersonal goal – to seek some form of truth. Let us not overlook the possibility that Gardner and Shulman simply wished to perpetuate the 'two cultures' distinction made famous by C. P. Snow a half-century ago. The implication would be that scientists are simply technicians, incapable of participating in the higher culture. In Harris polls, on the other hand, the nonacademically oriented public lists scientists as the 'most admired' profession.

In reality, scientists serve society in many ways, and this service is, for the most part, disinterested. One distinguishes 'fundamental (basic)' scientists, who try to find explanations for the phenomena of the natural world and work for the most part in academic institutions, from 'applied' scientists, who address such practical problems as developing a vaccine against SARS or flu or building a better airplane and who find a home in industrial laboratories. 'Inventors' use existing knowledge to create commercially useful products or processes, which, in most cases, can be patented. The same scientific approaches and rules of evidence, even the same methods, govern the search for fundamental facts and relationships and the solving of practical problems.

Doctors and engineers, as professionals, use the findings of basic science in the practice of medicine and the solution of architectural and environmental problems. In the process, however, they also make significant discoveries. Doctors used clinical knowledge as a basis for the fundamental discovery that a major form of diabetes is driven by an 'autoimmune' response in genetically predisposed individuals. Examples abound of engineering accomplishments leading to, rather than following, scientific discovery: the invention of the steam engine, prompting the development of thermodynamics; the successful

flight of the Wright brothers, driving knowledge of aerodynamics.

The role of scientists in advising both governmental and nongovernmental bodies, which involves essentially the entire community of established scientists, may be seen as another disinterested service to society. The American public simply has no idea of the vast advisory network that provides continuous input to the executive and legislative branches of government and their many subdivisions, as well as to nongovernmental organizations and the private sector. The National Institutes of Health (NIH) alone has some 270 'study sections' (panels of scientists), which advise on applications for research grants, each meeting two or three times a year for several days at a time. 'Congressional Fellows,' supported by various scientific societies, provide another channel of scientific input to legislators (and now to most agencies of the executive branch). More than 1,600 Science and Technology Fellows of the American Association for the Advancement of Science have worked, since the program was started in 1973, as 'special legislative assistants,' in legislative and policy areas requiring scientific and technical input, on the staff of members of Congress or congressional committees. The program has been highly commended by senators and representatives from both Democratic and Republican sides of the aisle.

One of the most important rewards of science is the satisfaction of getting answers to difficult and potentially important problems. The contemporary public does not understand this and thinks of high-profile awards, such as the Nobel Prize, mainly in terms of the large sum of money that changes hands. Yet a recent study, published in *Science*, showed that two-thirds of science and engineering researchers at universities, ranging from Harvard to Texas A&M, evinced little interest in patenting their discoveries (over the period 1983 – 1999), although they might have made a good deal of money by doing so.

Let me close by noting that research, in fact, has an artistic side. Nature is complex, but the scientist finds a piece of Nature's jigsaw puzzle – and it has its own beauty. If he keeps working on the same problem, he may find additional pieces, which fit together to create a beautiful whole.

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On Social Security & the aging of America

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To the Editor:

In "Measuring Social Security's financial outlook within an aging society" (*Dædalus*, Winter 2006), Jagadeesh Gokhale and Kent Smetters set forth a concise and clear account of the standard financial framework for understanding Social Security's financial problems that is generally subscribed to by academic experts and the Social Security Administration's actuaries. Gokhale and Smetters criticize this formulation and offer a refinement from which to better assess reform proposals. I contend that the standard formulation, as well as their refined version of it, is deeply flawed from the perspective of social justice. Basically, this formulation has led to all of the reform proposals requiring that a large