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## A Hippocratic Oath for Scientists

Sir Joseph Rotblat

The tremendous advances in pure science made during the 20th century have completely changed the relation between science and society. Through its technological applications, science has become a dominant element in our lives. It has enormously improved the quality of life. It has also created great perils, threatening the very existence of the human species. Scientists can no longer claim that their work has nothing to do with the welfare of the individual or with state policies.

However, many scientists still cling to an ivory tower mentality founded on precepts such as "science should be done for its own sake," "science is neutral," and "science cannot be blamed for its misapplication." Their logic rests on the distinction between pure and applied science. It is only the application of science that can be harmful, they allege. As for pure science, they say that the scientist's only obligation is to make the results of research known to the public. What the public does with them is its business, not that of the scientist. This amoral attitude is in my opinion actually immoral, because it eschews personal responsibility for the likely consequences of one's actions.

Nowadays there is much talk about human rights but much less about human responsibilities. The ever-growing interdependence of the world community (largely arising from the applications of science) offers great benefits to individuals, but by the same token it imposes responsibilities on them. Every citizen must be accountable for his or her deeds. This applies particularly to scientists, for the reasons I have outlined. It is also in their own interest, because the public holds scientists responsible for any misuse of science. Even the advocates of a laissez-faire attitude in science must realize the importance of a good public image. The public has the means to control science by withholding the purse or by imposing restrictive regulations. It is far better that scientists themselves take appropriate steps to ensure responsible application of their work.

National academies of science should explicitly include ethical issues in their terms of reference. Such issues must become an integral part of the scientist's ethos. Professional organizations of scientists should work out ethical codes of conduct for their members, including the monitoring of research projects for possible harm to society. It is particularly important to ensure that new entrants into the scientific profession are made aware of their social and moral responsibilities. One way would be to initiate a pledge for scientists, a sort of Hippocratic oath, to be taken at graduation. As in the medical profession, the main value of such an oath might be symbolic, but I believe it would also stimulate young scientists to reflect on the wider consequences of their intended field of work before embarking on a career in academia or industry. This process of reflection would be much enhanced if courses on the ethical aspects of science were introduced into university curricula for science students.

Various formulations of oaths have been proposed, and there is a considerable literature on this. There is no need for a single formulation, however. I like the pledge initiated by the Student Pugwash Group in the United States, which has already been signed by thousands of students from many countries. It reads: "I promise to work for a better world, where science and technology are used in socially responsible ways. I will not use my education for any purpose intended to harm human beings or the environment. Throughout my career, I will consider the ethical implications of my work before I take action. While the demands placed upon me may be great, I sign this declaration because I recognize that individual responsibility is the first step on the path to peace."

The author is emeritus professor of physics at the University of London and a 1995 Nobel Peace Prize laureate.

**"Scientists can no longer claim that their work has nothing to do with the welfare of the individual or with state policies."**