Notices

of the American Mathematical Society

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Mathematicians and Social Responsibility

Joseph Rotblat is a nuclear physicist who left the Manhattan Project in December 1944 when it was discovered that the Germans were not working on an atomic bomb. For a number of Manhattan Project physicists, fear that the Nazis might be building an atomic weapon had been a motivating factor in developing an American one. By 1944 over a thousand physicists were employed at the mesa above Santa Fe. In November of that year, an Allied intelligence mission determined that the German atomic effort was unsuccessful. (There had never been any real danger of a Japanese bomb.) Rotblat was the only one to leave Los Alamos when there was still time to write a different history for the century.

When the war ended, Rotblat transformed his scientific research to medical physics, and he began to pursue nuclear disarmament. In December 1995 Rotblat and Pugwash, an organization he helped found, were jointly awarded the Nobel Peace Prize for their efforts to eliminate nuclear weapons. Pugwash is a movement that seeks to involve scientists, *representing only themselves, and meeting and talking as scientists*, in the issues of our day. Pugwash scientists shaped the partial test ban treaty, facilitated international treaties on chemical and biological warfare, and aided the transition to the peacetime economy that the end of the Cold War has made possible.

When I heard of Rotblat's award, I thought to write about mathematicians' social responsibility. At first I found the issue elusive. It is clear why physicists, chemists, biologists, should be concerned with the social consequences of their work. It is much less clear how questions of social responsibility apply to mathematicians. Some of us, it is true, work in applied areas, and there, whether the problems are reliability of telephone networks, or fluid flow over airplane wings, issues of social responsibility are clear. But many of the AMS membership are pure mathematicians employed in universities. Where does social responsibility lie when the output is a theorem about an abstraction?

As it so often does, the solution to the conundrum lies in its very center. As mathematicians we revel in abstraction. Many of us argue that unlike the situation with physicists, chemists, biologists, geologists, what we do has little to do with the real world. Yet in the same breath, almost all of us would argue that mathematicians are scientists.

It doesn't cut both ways. If we are scientists, if we view our work as important to the world, then we have obligations too. Our obligations extend beyond teaching calculus to freshmen.

They include responding to *The Bell Curve*[1] *as mathematicians*, and unraveling the arguments behind the statistical claims in the book. Our obligations include examining the mathematics of Star Wars, and explaining, as David Parnas did, the complexities of establishing the correctness of millions of lines of computer code. Our responsibilities extend to preparing the biology students for the work they will actually do (rather than giving them a standard calculus course with the odd population biology example thrown in). Our obligations include providing programs, as Uri Triesman and others have done, that enable members of underrepresented groups to succeed in mathematics, and in science.

We can't pretend on the one hand to be protected from the mundane day-to-day, and on the other, argue that mathematics is fundamental and deserves wide support. Without doubt, these broadening efforts distract from the business of proving theorems; there are only twenty-four hours in a day. But as mathematicians, as scientists, we have an obligation to give back. Society has given us a marvelous freedom to pursue flights of fancy and call it work. Mathematicians are in a unique position of being able to understand and critique many complex social problems and solutions, from Lani Gunier's proposals about voting, to Ronald Reagan's Star Wars. We have a responsibility to do so.

—Susan Landau

[1] *A recent popular book that argues class structure in the United States is based on intelligence, and that racial differences in IQ measurement are determined largely by genetics.*