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**Abraham Pais Prize Lecture: Understanding the Impacts of Global Warming: a History**

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The idea that fossil fuel emissions might cause global warming was first proposed around the end of the 19th century, and for the following half century it sounded like a good thing. In the 1950s, confirmation that warming really might be coming led to more varied speculations. Scientists could only state possible problems in vague terms. First on the list were sea-level rise and a threat to food supplies. New items were added through the 1960s and 1970s, ranging from the degradation of natural ecosystems to threats to human health. Experts in fields from forestry to economics, even national security, pitched in to assess a variety of possible consequences. It turned out to be impossible to make solid predictions, given the differences from one region to another and the ways human society itself might try to adapt to the changes. In the 1990s, lengthy technical studies abandoned specific predictions of impacts to address “vulnerabilities” under different likely “scenarios.” Researchers also began to explore the risks and consequences of extreme weather events like droughts and floods. By around 2000 the major likely impacts were well understood. Now the task was to pin down the specific risks in each of the many different regions, ecosystems, and human systems. Meanwhile actual impacts began to appear, such as changes in species ranges and unprecedented deadly heat waves. Nearly all experts now understood that civilization faced a monumental challenge.