

Paul J. Crutzen

Anthropocene man

Paul J. Crutzen shared the Nobel Prize in Chemistry 1995 with Mario J. Molina and F. Sherwood Rowland for their work on formation and decomposition of ozone.

How important is an interdisciplinary approach in addressing urgent scientific questions, and how can we foster such collaborations?

Interdisciplinary research has always played a major role in my career. In my earliest papers I proposed that NO and NO₂ could act as catalysts to destroy ozone in the stratosphere or to produce ozone in the troposphere, yet I

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had no formal education in chemistry. In fact, I was trained as civil engineer; I shifted to working as a computer specialist at the University of Stockholm to run meteorological models and, while helping to develop a program for classical

Are scientists under-represented in politics? And do established scientists, especially Nobel laureates, have a duty to become active in politics and science policy?

There is, in fact, a dearth of scientists and scientifically educated representatives in politics, which is a worthwhile subject for analysis. I am only aware of three national leaders who have had scientific backgrounds: Margaret Thatcher, Angela Merkel and Gro Harlem Brundtland of Norway; interestingly, all women.

I don't think that Nobel laureates have a special duty to become more active in politics, except if their research could lead to problems for society. In the first place, they should remain scientists. However, the general public expects Nobelists to have an above average interest in social issues and the increased participation of scientists here should be applauded, as is the case under President Obama.

To establish closer contact between politicians and scientists, the German parliament has created

commissions consisting of equal numbers of politicians and scientists to study and highlight problems of general importance, such as climate change and stratospheric ozone depletion. The advice of these commissions has been very successful in the political process.

How can the public be convinced of the importance of fundamental research with no applications in sight?

By pointing to the examples of great scientists like Einstein, Newton, Darwin, Faraday and others. In my own, much more modest, case, when I wrote the article about the potential effects of NO_x on ozone, I had not the slightest idea about its relevance.

Things changed in the fall of 1970 when I read a report of a major international conference in the US, which mentioned NO_x emissions but denied their importance.



PROFILE

- Scientific Member, Max Planck Institute for Chemistry, Department for Atmospheric Chemistry (since 1980)
- Born in Amsterdam on 3 December 1933
- Survived the Dutch ‘hongerwinter’ of 1944–1945
- Married Terttu Soininen in February, 1958. The couple has two daughters
- Moved to Stockholm in July 1959 to work as computer programmer in the Department of Meteorology of Stockholm Högskola (later Stockholm University)
- Previously director of research at the National Center of Atmospheric Research (NCAR) in Boulder, Colorado (1977–1980)

Independently, Harold Johnston and I drew attention to the problem of NO_x emissions from super sonic aircraft destroying stratospheric ozone. The same happened in the case of chlorofluorocarbon emissions: the societal relevance was initially not recognized.

You must have experienced a lull at some point in your research career. What kept you going?

After my first research successes I lived in a constant fear of running out of problems to work on: it would have been terrible for a well-funded research director. That did not happen. The main reason is that my research field is highly multi-faceted and interdisciplinary. There is room for many projects.

What advice would you give all young researchers who are starting their research life so as to become a good scientist?

Stay away from big science in which the resulting papers have many authors. And choose a professor who gives you a lot of freedom. I was lucky to find Bert Bolin.

Aside from as a Nobel laureate, how do you want to be remembered?

As the person, who significantly increased knowledge about the processes that determine the distribution of ozone in the atmosphere.

And as the scientist who coined the term ‘Anthropocene’: A new geologic epoch dominated by human activities, actually first published in *Nature*.

And as one of the scientists who drew attention to the potentially devastating climatic consequences of a nuclear war, the so-called ‘nuclear winter’. More people would die of the indirect consequences of mass starvation and disease than would be killed by the nuclear bombs.