Editorial Introduction: Ethical Case Studies of Chemistry, Part III

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Chemists and chemistry students, if they engage in dialogues with relatives, friends, or acquaintances about their field, are frequently confronted with strong opinions. Isn't it chemistry that has produced poison gases, caused devastating disasters such as in Bhopal, India, and has regularly polluted the environment, and all that? How could you get interested in such a field? And how can you work for that?

You might want to respond that all this happened in the past, and that today's chemistry is doing much better, actually helping to build a safer environment, even trying to avoid climate change. But then your counterpart goes into detail and tries to educate you, based on the latest media reports, about the harmful effects of chemistry in numerous cases. As it happens, the average consumer of public media reports frequently seems to have more detailed information about chemical wrong-doings in the past than the average chemist based on university education. When the chemist wants to escape to chemical formulas, the opponent might even have a point in asking what, if any, ethical values have changed such one could now better trust chemists.

Our series of 'Ethical Case Studies of Chemistry' is meant to overcome the speechlessness of chemists in moral matters. The aim is two-fold. On the one hand, chemists should, based on the best available academic knowledge, know better about the historical cases that have shaped the public image of their field. To that end, our collection comprises a canonical set of cases that every chemists should be acquainted with in our view. On the other, we want to define the scope of ethics of chemistry, which in the past has very narrowly, and tellingly, been confined to intra-scientific issues such as plagiarism and data fabrication, by focusing instead on the main ethical issues of societal concern. There are many important lessons to learn from these cases by the help of philosophical ethics, which through the long-term distance between chemistry and philosophy have been ignored. Only once chemists are versed in ethics of their field and understand both the mistakes of the past and the challenges of the future on general ethical grounds, their efforts at improving the world will be trusted by larger parts of society.

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In this issue we present two of the worst cases that have perhaps shaped the public image of chemistry more than anything else in the 20th century, poison gas in WWI and the Bhopal disaster. The two cases from the past are followed by a discussion of a major challenge of the future, climate change and chemistry's possible counteracting efforts by engineering the climate. The fourth case study looks at how chemical societies have responded to societal challenges in their own codes of conduct.

In the first case study, Joachim Schummer narrates the history of chemical weapons research, development, and deployment in WWI. The case shows how for the first time in history scientists engaged on a large scale in weapons research, established an academic-industrial-military-governmental complex, and created an unprecedented arms race. In his ethical analysis, he argues that chemical weapons research, which is widely conducted up to the present day, is morally wrong according to all major ethical theories. The questions then arise as to why chemical societies do not condemn it in their codes of conduct, and why they instead still consider the main weapons researchers of WWI role models for a younger generation.

The second case study deals with the worst chemical industrial disaster ever since, the leakage of methyl isocyanate in Bhopal, India in 1984, which killed thousands of people and injured hundreds of thousands. Based on a detailed analysis of the historical events, Ingrid Eckerman and Tom Børsen scrutinize the responsibilities of the various actors, including the company Union Carbide Corporation and the governments of India and the local state of Madhya Pradesh. They argue that fundamental ethical values were violated and draw lessons on how future industrial catastrophes can be avoided.

As scientific evidence for global warming through the large scale emission of carbon dioxide had grown and international politics appeared unable to cope with that, meteorological chemist Paul Crutzen in 2006 first broke a taboo by suggesting a chemical method for engineering the climate. Crutzen's suggestion prompted a vivid, but largely isolated, debate by ethicists that failed to address chemists. Dane Scott provides a balanced assessment of the various pros and cons of climate engineering with a focus on chemical methods of atmospheric carbon dioxide removal and answers the questions if today's chemists ought to engage in climate engineering research and which ethical conditions should be considered.

Finally, Jeffrey Kovac analyses the codes of conduct by the American Chemical Society (ACS), from the 1965 'The Chemist's Creed' to the current version of 'The Chemical Professional's Code of Conduct' and various supplementary guidelines including on publication ethics. By looking at the underlying ethical values, he compares the ACS codes with those by the British and German chemical societies and the more recent international codes, the 'Hague Ethical Guidelines' and the 'Global Chemists' Code of Ethics'.

He argues that a revision of the ACS code should put more emphasis on research integrity and on societal and environmental issues.

We will continue this project with a final set of ethical cases to be published in 2019, including studies on 'Crystal Meth' in WWII, the prediction of the ozone hole, intergenerational justice in the consumption of scarce materials, global justice in the trade of hazardous chemicals, and patenting DNA. For a complete and structured overview of our project, visit:

http://www.hyle.org/journal/issues/special/ethical-cases.html

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