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ETHICS IN THE CHEMICAL SCIENCES - THE ROLE OF LEARNED SOCIETIES

For many years researchers, including chemists, did not feel a special responsibility of what happened with their scientific results. They claimed a neutrality of their work; their part was the scientific discovery but not the consequences that this discovery could develop in its applications. As a consequence, scientists decoupled themselves from the societal responsibility and lived in, what could be called a “parallel universe”. This thinking experienced a significant turning point after the Manhattan Project, i.e. the development of the atomic bomb when suddenly the physicists and chemists involved realized the frightening consequences of their work and science lost its innocence.

Since then, the importance and relevance of the ethical dimension in what we as scientists do has increased to a large extent. But not only those active in science, also the general public nowadays expects that scientists base their work on a solid ethical fundament.

Chemical societies, as the organizations where the chemists bundle their interest and which therefore are the voice of the chemical communities, have a very special responsibility here. In the past, this responsibility was only recognized indirectly. There were no explicit rules, nevertheless the members of the societies shared a certain catalog of values. However, these implicit rules were not binding and did

not prevent some of the chemical societies to cross ethical borders. Among those which certainly behaved unethical because of the political pressure were the learned societies in Germany during the Nazi regime, including the predecessor organizations of the Gesellschaft Deutscher Chemiker (GDCh, German Chemical Society, which was founded in 1947, i.e. after the World War II), namely the Deutsche Chemische Gesellschaft (DChG, founded in 1867 in Berlin by August Wilhelm von Hofmann which represented mostly chemists from academia) and the Verein Deutscher Chemiker (VDCh, founded in 1887 in Frankfurt a.M., which primarily consisted of members from industry). Both organizations submitted to the Nazi regime and, for example, did not accept Jewish members anymore after 1938. Actually, the GDCh is right now in the process to investigate the behavior of the DChG and the VDCh in that time by an independent historian and we expect his final report - which will be publicized publicly - next year. A first direct consequence of this looking back employing ethical standards was the decision of the GDCh Board a few years ago to discontinue the Richard Kuhn Medal, an award named after the chemistry Nobel laureate from 1938 and last president of the DChG (and later also president of GDCh) Richard Kuhn. It turned out that Kuhn, while not a member of the Nazi party was nevertheless a supporter of the sys-

tem and hence not suited as a role model for today's chemists. While on the one hand it is important to analyze our past it is certainly even more important to address the question of ethical behavior in our daily work. To underline this commitment to high ethical standards a number of chemical societies have established a code of conduct, among those also the Gesellschaft Deutscher Chemiker. In its code of conduct, which was introduced in 1994 and which is obligatory for all members the GDCh "commits itself and its members to uphold freedom, tolerance and truth in science". A special section mentions the responsibility that GDCh members as scientists have for the effects of their work on humanity and the environment, an issue of particular importance in the chemical and molecular sciences (the full text of the code of conduct in English can be found at www.gdch.de/gdch/satzung_e.htm).

In a time when our planet's population is expected to surpass 9 billion people within the next 40 years and global challenges, such as an environmentally benign energy, supply from renewable sources, access to enough and healthy food and clean water or fighting the man-made climate change are becoming more and more important, high ethical standards will be even more necessary. As chemical societies we need on the one hand to encourage our members to address these global challenges and on the other hand to communicate to the public at large the important role the chemical sciences play. By this we can demonstrate that we are aware of our responsibility - as chemists - for shaping a sustainable future of our world. A sustainable development will crucially depend on innovations from chemistry: new materials for organic photovoltaic cells, catalysts to enable artificial photosynthesis or innovative approaches for more efficient batteries are only a few examples where innovations from chemistry are needed. In addition and as a side effect these research activities will also help to improve the public image of chemistry. There are already many activities along these lines. The two most recent technical sections in the GDCh are the Division for Sustainable Chemistry and the Working Party on Chemistry and Energy, both of which are dedicated to the "big questions". Their membership grows significantly which shows that also our members are interested to engage in research focusing on the contributions of chemistry to a sustainable development and new and renewable energy supplies. The new ChemPubSoc Europe journal *ChemSusChem*, dedicated to sustainable chemistry and co-founded by the Società Chimica Italiana together with the Gesellschaft Deutscher Chemiker is another example of the ever increasing importance of these issues.

A very important aspect is to communicate this new role of chemistry as a solution provider rather than as a problem maker to children. On the one hand we make chemistry attractive, because children and highschool students get excited when

they realize that chemistry is a science that can help "to make the world a better place". On the other hand, we can also use this as a vehicle to teach to our children (and their parents!) the importance of ethical responsibility in the sciences in general and chemistry in particular. The central message needs to be: We are not only aware of our responsibility but we take this very seriously and behave accordingly! But when we address the role of ethics there are more aspects to think about. Another dimension of ethical behavior is the way how we perform our research and that we adhere to the common rules of good scientific practice. For example, in Germany we recently had a number of cases where prominent politicians were proved guilty of plagiarism in their doctoral thesis and as a consequence were deprived of their doctor degree. Plagiarism and data manipulation are severe violations against the scientific ethical code but probably happen more often than we think. Also here the learned societies have an important role to keep up the scientific integrity and to consequently sanction unethical behavior. They must be very clear that being dishonest in research is not a peccadillo but hurts the sciences at its very heart. If the former German minister of defense Theodor zu Guttenberg, who had to resign from his post because of his "faked" doctoral thesis, would have been a member of the GDCh (but he is a lawyer, not a chemist), according to our code of conduct we would have expelled him from the society!

To conclude, the chemical societies do have a strong responsibility in order to safeguard high ethical standards in our communities. We must establish rules which show to our colleagues as well as to the public at large that we are aware of this ethical responsibility in all its dimensions. To this end, we need to create more fora within our community to address this issue. Conferences such as the recent meeting on "The Culture of Responsibility: Ethics, Chemistry and the Environment" held in Modena, to which the author had the pleasure and honor to participate, are important examples for this.

