COMEST: Ethical Advice across Scientific and Geographic Borders

by Leiv K. Sydnes

COMEST, an acronym for the French name of the World Commission on the Ethics of Scientific Knowledge and Technology [1], is an advisory body within United Nations Educational, Scientific and Cultural Organization (UNESCO) and a forum of reflection, “mandated to formulate ethical principles that could provide decision-makers with criteria that extend beyond purely economic considerations.” [2] Over the years, the Commission has addressed ethical issues in many areas where science and technology have an impact on people, nature, and society. The deliberations result in reports, which are put forward to the biannual General Conference of UNESCO for discussion and adoption. The outcome has often been ethical recommendations and guidelines to consider and hopefully abide to so that science can interact with society in a responsible way and without adverse consequences.

Formation

The United Nations Charter, signed 16 November 1945 [3], contained references to several specialized agencies, which, according to paragraph 57, were envisaged to deal with “economic, social, cultural, educational, health, and related fields” as would be decided by intergovernmental agreements. It is interesting to note that the original listing did not include science, but when the planning of the agencies started, not only science, but also the ethics of science were inserted and paved the way for the establishment of UNESCO.

Initially, the focus of the organization was mainly on rebuilding schools, libraries, and other cultural institutions that had been destroyed during World War II, but as the years passed, first education at various levels and then the impact of scientific and technological developments on society received increasing attention. An indication of the shift of focus to the latter was the publication of Recommendation on the Status of Scientific Researchers in 1974 [4], which outlined a framework for putting science into service of society in a fair way. In the following decades, tremendous progress in science and significant technological innovations transformed the world considerably and changed the way we live and how we work. Many changes were indeed beneficial, but other developments raised concerns about ethical aspects associated with “science and technology and the principles on which a knowledge society might be built.”[5] As a result, UNESCO acknowledged the need to pay more attention to “possible adverse consequences of scientific development in general and certain scientific advances in particular. If left unattended, this concern could undermine popular support for, and trust in, the whole enterprise of modern science.”[5] After thorough consultations, UNESCO decided to establish COMEST in 1997 with a mandate to advise on ethical principles and guidelines related to science and technology and the consequences of their applications in society (see Box) [6]. The commission was set up with 18 appointed members, with very different professional backgrounds and coming from all parts of the world, and 10 ex-officio members from major international scientific organizations.

Code of Conduct

The first major assignment was to undertake studies, in collaboration with the International Council for Science (ICSU, now ISC), into the possibility of creating a code of conduct for scientists. The work led to a two-tier approach: Codes should be disciplinary and be worked out by disciplinary scientific organizations, whereas UNESCO should develop the ethical framework, on which the codes should be based. This solution had direct consequences for IUPAC, because

The COMEST tasks according to the commission’s homepage. [6]

- To advise the Organization [UNESCO] on its programme concerning the ethics of scientific knowledge and technology;
- To be an intellectual forum for the exchange of ideas and experience;
- To detect on that basis the early signs of risk situations;
- To perform the role of advisor to decision-makers in this respect;
- To promote dialogue between scientific communities, decision-makers and the public at large;
- Finally. It aims at applying such standards into the scientific and policy communities, creating awareness of the ethical issues and building capacities to deal with them appropriately.
When the memorandum of understanding (MoU) between UNESCO and IUPAC was signed, the Union was challenged to develop a code of conduct for chemists. This inspired a group within IUPAC to take on the task, and they went at it with a will. A draft of a code was ready by 2008, and this document became the basis for CHEMRAWN XVIII Conference: Ethics, Science, and Development, which was held during the IUPAC World Chemistry Congress in Glasgow, UK, in 2009. However, the IUPAC leadership at that time was not in favour of a traditional code of conduct, so the working group modified the proposal and came up with a Living Code of Conduct for chemists. However, attempts to have the final version approved as a formal IUPAC recommendation failed, but the working group was allowed to publish the Living Code in an article in Chemistry International in 2011 [7].

Societal impact

When the two-tier solution had been adopted, COMEST broadened the scope and started to work on ethics in areas where many ethical issues emerged from the interplay between scientific disciplines and technologies on one hand and society on the other. The result of the work has always been published in well-referenced reports, which are available on the UNESCO homepage (unesco.org). Some of the themes addressed have been quite general and have had implications for science and technology at large; such topics include the clarification of the precautionary principle [8], the teaching of ethics [9], and Recommendation on Science and Scientific Researchers [10]. However, other topics have been more concrete and closer to the natural sciences; among the topics are the nanotechnologies and ethics [11], water ethics [12], the ethics of energy [13], and the ethics of land use, which is a study currently in its final stage. Particularly in the more concrete cases, discipline-specific issues frequently become quite relevant, and in this context, chemistry has a special position because chemicals are everywhere and impact the environment and the society in important ways. Elements of the IUPAC Living Code of Conduct can be recognized in many of the study reports, but the impact is amplified by the wider perspective and the synergy with ethical thinking from other disciplines.

During the last three to four years, COMEST has worked extensively with ethical aspects related to integration of digital technologies in society. By interconnecting electronic devices such as computers, sensors, and control systems, enabling technologies (Internet of Things; IoT [14]) are almost invading us and already surround us and make it possible to use artificial intelligence (AI) [15] to handle intricate situations and complex systems quickly and predictably “without human error.” Such technologies have already started to transform the health-care landscape in many parts of the world and have the potential to do the same with all sorts of monitoring, including environmental monitoring, which often is based on automated chemical analyses. This development has raised the need to establish “international and national policies and regulatory frameworks to ensure that these emerging technologies benefit humanity as a whole.” [16] Important parts of these policies are related to chemistry. There are two main reasons for that: many parts of the devices used in IoT and AI systems have a complex chemical composition, and many of the components applied contain elements that are available in limited quantities. The chemical complexity issue makes the recycling of IoT devices challenging, and such pieces of equipment already contribute significantly to the stream of E-waste. Although the recycling of such waste is steadily improving, its handling is a global problem, [17-19] which will be addressed at CHEMRAWN XXII Conference E-waste in Africa in Lagos, Nigeria, in
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November this year [20]. The other chemical aspect is related to element depletion because many advanced devices integrated in IoT and AI systems contain parts made of elements that are predicted to be in short supply in foreseeable future [21]. Most of these elements, termed Critical Materials, are rare-earth elements, but even an element as common and technologically important as lithium may run the risk of becoming scarce [22]. It is therefore crucial to assess if the supply of critical materials is sufficiently large to maintain IoT systems and technologies in a sustainable way for years to come. If the answer is no, the introduction of such systems should be postponed and undergo serious ethical considerations.

The future

Proposals for new topics to be studied by COMEST are coming from commission members, other UNESCO bodies, and international organizations. So far, no suggestions have come from IUPAC despite the level of ethical reflection the Living Code of Conduct suggests chemists should be engaged in. But that may change if the IUPAC Council approves the proposal to form a standing Committee on Ethics, Diversity, Equity, and Inclusion (CEDEI) and if the committee becomes more extrovert than the terms of reference indicate it might become. With conspiracy theories blowing in the wind and gaining support, it is increasingly important that science, technology, and ethics move forward hand in hand. In this movement the scientific unions should support COMEST wholeheartedly and pay attention to the reports published by the commission.

References and notes

1. The acronym comes from the French name ‘Commission mondiale d’éthique des connaissances scientifiques et des technologies’.
7. Pearson, G. S.; Becker, E. D.; Sydnes, L. K. “Why Codes of Conduct Matter”, Chem. Int. 2011, 33(6), pp. 7-11. The lukewarm reception within the Union probably explains why the Living Code has barely been promoted by IUPAC. However, the code has received attention outside the Union and played a role in the work leading up to The Hague Ethical Guidelines, which IUPAC has signed. Interestingly, The Hague Ethical Guidelines is the only result that shows up when Code of Conduct is searched on the IUPAC website.
8. https://unesdoc.unesco.org/ark:/48223/pf0000139578
9. https://unesdoc.unesco.org/ark:/48223/pf0000134552
10. https://unesdoc.unesco.org/ark:/48223/pf0000263618
11. https://unesdoc.unesco.org/ark:/48223/pf0000152146
12. https://unesdoc.unesco.org/ark:/48223/pf0000265449
13. https://unesdoc.unesco.org/ark:/48223/pf0000135311

* all web references were accessed 1 May 2021

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