Ethical aspects of scientific progress

André Oosterlinck
University of Leuven, Belgium

Key words: ethics, link between science and society, scientific progress, scientific responsibility, scientific policy

Abstract

Ethics and science are much more closely connected than some people assume. Erroneous perceptions of the nature of ethics are the probable cause of this. Ethics is an intrinsic and productive component of scientific work, not some external or retrospective obstruction of “real” scientific research. The ethical component is positively influenced by a thorough knowledge of the discipline it belongs to. Science thrives in a climate of freedom, but this must not be used as an alibi to circumvent social responsibility and ethical concern. Ethical science has a direct bearing on science policy. Giving due attention to the ethical aspect of scientific work leads to several tangible results. It increases interdisciplinary openness, it promotes the communicability of science, and, ideally, it demonstrates the difference between knowledge and wisdom.

1. A matter of confidence

Our country and our society have been badly shaken during the past couple of years. Painful and shameful events caused a widespread demand for in-depth reforms. The press raised the question of the university’s contribution to this discussion. That question was very appropriate, and the conclusion must be that this contribution could have been more impressive and more visible, although it was definitely present. The university community, and scientists in general, clearly face a task. This task encompasses much more than what is commonly understood by traditional scientific work, in the lab or the library.

Science not only studies reality, but also changes it. It has achieved truly remarkable successes in both respects. When modern science was born, some 300 years ago, it soon rose to impressive heights. Descartes promoted rational reasoning as the very foundation of being itself, and Newton demonstrated that nature functions according to a set of relatively simple and understandable laws. This initiated a period of great scientific success – and presumption. The idea was that science was able to master anything. Nature could be understood as well as manipulated. Nature was a machine, which could be steered by the human will, who just needed sufficient knowledge. Modern science experienced the ecstasy of power over nature, which would reach its apex in 20th century control over the atom, life and space – this last one in a rather symbolic sense, of course. In the 19th century, the awareness of this awesome power was the background of scientism, which assumed that scientific method could be successfully applied to all areas of reality and of society.

Obviously, we no longer hold this blind optimism to be true. Instead, the awareness has grown that scientific progress might not be that unilaterally positive after all, and that its power is not endless. One of the things science does not handle well, is providing a correct estimate of the consequences of its own creations. From an unlimited optimism regarding science and technology, some have switched to a gloomy pessimism – which is equally pointless, of course. Let us just say that scientific progress is characterized by ambivalence, to put it mildly.

2. The ethical component

Science is a mix of creativity and of goal-oriented effort, on the basis of our natural urge to know. On the way to its goal, science obeys certain laws, the rules of logic and rational reasoning being the most important ones. But science is more than just rational activity. By having an impact on reality, scientists automatically and inevitably acquire a responsibility. Our work will have consequences, which we are not to ignore. Reflecting on our activities is the main target of ethics. Therefore, ethical reflection is related to science and to scientific progress.

Not everybody shares the same views on this connection. This disagreement is mainly due to an erroneous perception of what ethics actually is and what it can do. Some consider ethics as an annoyance and as an irritating know-it-all, which stands in the way of “true” scientific work. This is, of course, a heritage from the Age of Enlightenment. But the initial unlimited optimism of those days has waned. Instead, an awareness has grown concerning the complexity of reality as well as of science. Science without the ethical component may result in a rational construction, but not necessarily in true progress – as a matter of fact, sometimes even the opposite is true.
What is this ethical component? First, let us get rid of two things it definitely is not.

- Ethics is often misunderstood as some sort of ‘soft’ speculation on hard topics. This is nonsense. Good ethics is as rational as any other part of the scientific process.
- Others consider ethics as something which can only result in two possible answers: “yes, it is allowed”, or “no, it is not allowed”. This too is a caricature of what ethics really is. A mature ethical result is always balanced. Ethics reflects the complexity of the context in which our actions take place.

3. The ethical component’s main characteristics

So, the ethical component of science is not “soft”, and it is not simplistic. But where is this component located, and what are its characteristics?

- It is clear that scientific activity always presupposes a minimum of ethical conduct. This is a rather superficial remark, but not an irrelevant one. Scientific conduct is impossible without truthfulness, honesty, refusing to plagiarize, behaving like good colleagues etc. To summarize it with a rather old-fashioned term: a scientist must be a virtuous and therefore an ethical person.
- But there is more, of course. Modern scientists are aware of the fact that their work itself raises ethical questions. In other words – and this is the gist of this text – ethics and science are intrinsically intertwined. Ethics is firmly rooted in science. It not only deals with questions in retrospect, or with questions by an external bystander, but also, or even primarily, with questions of the scientist himself, as engaged in the actual scientific work. This refutes the objection of those who claim that ethical questions are a form of meddling, or even of limitations.

The intrinsic link between science and ethical reflection also refutes the prejudice that ethical reflection does not require scientific or technical knowledge, or that ethical reflection would not belong to the area of the technical specialist. That is totally false. On the contrary, ethical questions are nourished by technical and scientific insights, and the other way round. There is a productive cross-pollination between them. In a discussion on genetic manipulation in plants, to name but one example, the professional ethicist will most likely not be aware of all the possibilities which this technique enables. These techniques themselves will, however, influence and correct or modify ethical conclusions. A blunt “no” against genetic technology is as totalitarian and blind as an unequivocal “yes”. A mature ethical conclusion on genetic technology presupposes a good understanding of the actual possibilities and perspectives, but also of the inherent dangers.

- Science has an impact on reality, on our physical environment as well as on our society. Therefore, scientific work can never be neutral. It does not stand all by itself, but has consequences for others and for society at large. The link between science and society is a very complex one, and it has not been exempt of misunderstandings. Society should learn that science is a value in its own right, and that it is more than just a supermarket of answers to whatever imaginable question. But on the other hand, it won’t harm any scientist to wonder what actually is his or her contribution to society. This is no denial of the importance of “science because of science”, which has an undeniable reason to exist. From a strictly scientific point of view, the proof of Fermat’s final theorem and cancer research are equally relevant. From the point of view of society, however, there is a clear difference – although relevance may change in the course of time. Society must not dictate what a scientist should do. But for the scientist to refuse to show any interest in social and public relevance would be equally reprehensible.

Society should not expect science to solve all problems. That would re-establish the way the Enlightenment pictured science. Because of the complexity of society and its problems, some turn in despair to science, hoping to get the ultimate answer from there. As Einstein put it: “Science tells us what is, not what should be”. Therefore, science cannot be an alibi to evade difficult ethical and political questions. This, of course, does not mean that society should close its ears to what science has to say.

As an activity with its roots firmly within society – and paid by it – science has certain social responsibilities. But the scientist should not use this as an excuse to evade his or her own moral responsibility. Sometimes this may lead to a conflict between the scientist’s independence and what the ‘master’ wants.

4. Consequences

Free and independent research is what most scientists consider as their ideal. No matter how just and essential this principle may be, practice often shows something else. This has valid reasons, but it also is the basis for justified concern. A certain degree of external supervision is inevitable, because we are not doing our research with just our own means, but with tax money, or with money provided by external sponsors. This can lead to obvious conflicts between the private interest of the sponsor and the public nature of scientific knowledge. It is understandable that a private sponsor will want to keep the research results to himself, possibly to commercialize them. But it is equally understandable that a scientist will want to publish his results, thereby contributing to the publicly accessible domain of knowledge, and submitting one’s own findings to international scrutiny.

The problem becomes even more complex when the nature of the research topic itself causes ethical concern. At that moment, there is a friction between the justified interests of the sponsor, the scientist and society. For instance, what about the patentability of the findings of biotechnology? Is it at all possible to get a patent on a genetically engineered plant or animal, and in doing so obtaining a monopoly? And what about possible genetic manipulations in humans? Sim-