

Daniela Kováčová
Faculty of Arts
Matej Bel University (Slovakia)
Email: Daniela.Kovacova@umb.sk

ETHICAL LIMITS IN RESEARCH AND DEVELOPMENT

Summary: Twentieth century was characteristic for dynamic development spurred also by the advances in research and science. However, the events of the twentieth century also showed the other side of science as a discipline able of compromising the values of our civilisation in the name of progress. The question posed in the paper may appear banal, even if far from being such: Is science and the scientific progress possible without ethical limits or, in other words, is everything which is possible also permitted? The paper outlines ethical limitations on research and science and points out the possible consequences of a science ignoring moral dilemmas implied by the research work.

Keywords: Ethics of science, ethics of technics, progress, science, risks

GRANICE ETYCZNE W BADANIACH I ROZWOJU

Streszczenie: Wiek XX był pełen dynamicznego postępu w wyniku rozwoju nauki i badań. Wydarzenia XX wieku jednak pokazały ciemną stronę nauki, która w imię postępu i wiedzy dewaluuje wartości, na których budowana była nasza cywilizacja przez stulecia. Pytanie, które stawiamy w artykule, może brzmieć banalnie, ale takie nie jest: „Czy nauka i postęp naukowy jest możliwy bez ograniczeń etycznych lub, innymi słowy, czy wszystko, co jest możliwe, jest także dozwolone? W artykule przedstawiono ograniczenia etyczne dotyczące badań i nauki oraz wskazano na możliwe konsekwencje nauki związane z ignorowaniem problemów i dylematów moralnych prac badawczych.

Słowa kluczowe: etyka nauki, etyka techniki, postępu, nauka, ryzyko.

The 20th century certainly was a revolutionary era for the mankind as such, particularly owing to the political decisions resulting in two world conflicts. Our role is not to trace the causes, or social phenomena standing behind these unfortunate events. Neither will this paper focus on the analysis of the then-current situation and its comparison to the present time. It is,

however, undisputable that the armed conflicts of the 20th century resulted in tremendous development of various scientific disciplines. We can currently see a turbulent development of science particularly in the area of biomedical technologies and biomedical research. It is evident that: "The scientific and technical success of genetic engineering and biotechnologies also calls for the reflection of new social phenomena taking the shape of bioterrorism or building of eugenics programs. It is natural that the society has higher expectations of science and scientists themselves, since these negative phenomena have both social and ethical/moral implications¹". But it is not just the biomedical research with its possibilities and consequences which shows us the necessity of ethical parametrization of the research work. Just recall the Stanford Prison Experiment or the Milgram experiment on obedience (to authority). It is not only these experiments which clearly call for ethical parametrization in the context of humanities research.

The growing importance of ethical reflection of science is demonstrated by the abundance of foreign publications treating this topic, such as *Ethics of Science and Technology*; *Explorations of the Frontiers of Science and Ethics* published in 2006 and featuring such renowned scholars as Margaret Somerville, Peter A. Singer or Abdallah S. Daar. *Ethics and Etiquette in Scientific Research* by David S. Touretzky or *Ethics in Science, Basic Principles* by Galen Gisler are worth noting as well. The theme of ethical parametrization of science is also regularly treated by the European Commission /European Research Area/Science in Society in the European Textbook on Ethics and Research.

However, publications dealing with the ethical dimension of science within Slovakia are not that frequent. In spite of that, we have seen growing interest in this issue and this is also demonstrated by the 2008 conference organised by the Slovak Research and Development Agency (SRDA) in cooperation with the Slovak Academy of Sciences (SAV), European Science Foundation, the European Commission, The Slovak Rectors' Conference, and the Slovak Medical Association. Its core topic focused on the *Ethics in Research and Science*. Lecturers and the political representatives of then ruling government called for ethical education of research and development workers many times in this event. Specifically, Dušan Čaplovič Deputy Chairman said: "No laws or regulations are of any help here. This is the space for university teachers who should instruct their students also in ethical issues to make themselves role models for the young."² But the question is who is going to instruct the teachers if we look at the fact that: "The essence of human behaviour has changed to a great extent. This is also connected with the new role of knowledge in ethics. In order for the behaviour to be moral these days, we also need some knowledge; we cannot do only with the

¹ Lešková Blahová A.: Etika vedecko-výskumných pracovníkov so zameraním na oblasť prírodných vied alebo reflexia o potrebe (profesijnej) etiky vo vede. In: Aplikovaná etika a profesionálna prax (eds. Fobelová. D.). FHV UMB v Banskej Bystrici. Banská Bystrica 2011, p. 57.

² Tisovič F.: 2008. Etické princípy platia aj pre vedu. http://www.sav.sk/?lang=sk&charset=&doc=services-news&news_no=2337.

perception of the acting subject anymore.³" This question has resulted in the establishment of departments of applied ethics in Slovakia throughout the last few years.

This declaration of the former Deputy Chairman feels a bit sadder after some time when this and similar claims have frequently been proved to be nothing but empty words. In the context of the ethics of science, the lecture of Dušan Gálik who was one of the presenters of the SAV Board was of much interest to us. He emphasised the fact that: "theoretical discipline which examines the rules of behaviour of individuals engaged in research and science, the method of their formation and application constitutes a set of binding rules (norms) which should be observed by all players of the game, irrespective of whether such rules are put down in writing (codes of conduct) or otherwise (tradition developed by culture, passed on in rearing, education, exchange)."⁴

In his speech, he did not forget to mention the relatively frequent research practice in Slovakia which is based on direct or indirect violation of its rules: "The purpose of rules is to reduce undesirable behaviour in relation to others and prevent infringement of personal and proprietary rights and dignity of other people. But it is true that each system of rules (whatever the human activity) is violated for various reasons and based on various motives and examples can be found in all areas of research work."⁵ The motivation leading to the violation of these rules comes from all kinds of sources and the situation when the system settings for the evaluation and funding of research work sow the seeds of such failures of research authorities is maybe the worst example of such misconduct.

Dušan Gálik sees the basic remedial mechanisms in the education of students in high schools or as early as in the elementary schools, which we definitely agree with. It is not possible to automatically move the responsibility for moral maturity of students to the shoulders of teachers whose education rarely predestines them to becoming moral role models for their students.

Gálik believes that it is important to: "raise the quality and transparency of oppositions, transparency of the work of research institutions and their components where research boards would play a key role. This also includes individual approach to the resolution of every single case of violation, correctness and transparency, respect for the rights and dignity of the alleged wrongdoer, adequacy of punishment."⁶

Of course, this key topic of our time is not dealt with by this single conference only, as we believe. Slovak universities started to include *Ethics in Science and Research* or similar courses in the curricula of *Applied Ethics* as well as other study programs or even in the PhD study programs just like at the Department of Philosophy of Matej Bel University in Banská

³ Kiepas A.: Človek a dilemy filozofie techniky. APRINT s.r.o. Žiar nad Hronom 2000, p. 73.

⁴ Tisovič F.: Etické princípy platia aj pre vedu. 2008.

http://www.sav.sk/?lang=sk&charset=&doc=services-news&news_no=2337.

⁵ Ibidem.

⁶ Tisovič F.: Etické princípy platia aj pre vedu. 2008.

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Bystrica mainly thanks to the consistent work of the Department of Ethics and Applied Ethics of this university. The work of this department has contributed significantly to the promotion of ethics in science by way of their publications, such as the works by Andrzej Kiepas (*Man and the Dilemmas of the Philosophy of Technology*) or the research work of Gerhart Banse, his long-lasting colleague. Neither should we forget the texts by Hrehová or Fabián which are clear proof of the growing interest of our scholars in the ethical reflection of research work.

It is, hence, possible to agree with Lešková Blahová that: "Society realises the need of a more consistent regulation of biomedicine." (Lešková Blahová, 2011, p. 57) And not just of this discipline, we may add. Of course, this key topic of our time is not dealt with by this single conference only, as we believe. Slovak universities started to include *Ethics in Science and Research* or similar courses in the curricula of *Applied Ethics* as well as other study programs or even in the PhD study programs just like at the Department of Philosophy of Matej Bel University in Banská Bystrica mainly thanks to the consistent work of the Department of Ethics and Applied Ethics of this university. The work of this department has contributed significantly to the promotion of ethics in science by way of their publications, such as the works by Andrzej Kiepas (*Man and the Dilemmas of the Philosophy of Technology*) or the research work of Gerhart Banse, his long-lasting colleague. Neither should we forget the texts by Hrehová or Fabián which are clear proof of the growing interest of our scholars in the ethical reflection of research work.

And not only in this area, we should add. We equally agree with Hrehová's assertion that: "ethics has a privileged position in interpersonal relations. It deals with judgements differentiating between good and evil. In this sense, ethics is superior to every human activity including science."⁷

Hrehová professes the theological view of the ethics in science which is less known in Slovakia and relies in her thought on the triad of God - Earth - Men and considers the capability of intellectual activity that the science is based on to be the consequence of the God's act of creation.⁸ And she continues that traditional ethics cannot keep up with the contemporary society and the science developing in it anymore: "Traditional ethics with its judgements and differentiations between good and evil is not able to resolve some of the very complex issues anymore which came up with the rapid development of modern technologies and consumer culture, including the issues of personal nature connected with self-identity and self-identification."⁹ All of this corresponds to the acute need for a more rapid development of applied ethics which would overcome the "defects" of the traditional ethics, in this case the ethics in science. The scientific and research activity is currently regulated by both the national and international legislation. Besides legal regulation of science, we also speak of its

⁷ Hrehová H.: Veda a etika vo vede. In: Viera a život. Dobrá kniha, roč. XIII, n. 2, Trnava 2003, p. 50.

⁸ Hrehová H.: Veda a etika vo vede. In: Viera a život. Dobrá kniha, roč. XIII, n. 2, Trnava 2003,.

⁹ Ibidem, p. 50.

moral or ethical regulation. Before we get to the ethical dimension of research and science, we should take a look at a general definition of science.

In a broader sense of the word, science denotes a set of all activities and results of such activities which are connected with acquisition, formulation and application of information understood as knowledge. Such knowledge is systematic and systematized, and explanation acts as the basic means of such systematisation. This means that this definition also includes the conditions created to gain knowledge, such as various institutions, scientific methods, terminology, and the like. In the narrower sense of the word, science only means a system of sentences meeting certain requirements. These requirements are identical with the requirements laid on a formal system in formal sciences. In empirical science, these requirements are then connected with an informative function of these branches of science and are expressed by postulates meeting of which results in an ideal type of science.

Such postulates include:

- logical consistency
- intersubjective testability
- verifiability and falsifiability
- structurality
- nomologicality
- prediction
- possibility of evolution

Meeting these postulates helps us distinguish science from fiction, religion or myth. Unlike fiction, science contains nomological statements as the means of explanation. Compared to religion or myth, science is a system of falsifiable assertions (in the narrower sense of the word) disposing of an explanatory function and high degree of generalisation. Unlike arts or religion and myth, science is considered to be the product of human reasoning and is viewed by many as an indicator of the evolution of the mankind as such. The results of science and scientific knowledge are often automatically taken as true, because scientists and the results of their work receive unprecedented confidence. Or, in other words: "People often tend to nearly glorify scientific data and knowledge..."¹⁰ But the question is whether science and the scientific knowledge rightfully deserve to be viewed as true or whether there are certain circumstances which question its status of a carrier of objectivity and the right knowledge.

In this context, the thought of Karl Popper which automatically connects the scientific activity with ethical reflection is of great interest: "The principles that form the basis of every rational discussion, that is, of every discussion undertaken in the search for truth, are in the main ethical principles. I should like to state three such principles.

¹⁰ Lešková Blahová A.: Etika vedecko-výskumných pracovníkov so zameraním na oblasť prírodných vied alebo reflexia o potrebe (profesijnej) etiky vo vede. In: Aplikovaná etika a profesionálna prax (eds. Fobelová D.). FHV UMB v Banskej Bystrici. Banská Bystrica 2011, p. 57.

1. The principle of fallibility: perhaps I am wrong and perhaps you are right. But we could easily both be wrong.

2. The principle of rational discussion: we want to try, as impersonally as possible, to weigh up our reasons for and against a theory: a theory that is definite and criticizable.

3. The principle of approximation to the truth: we can nearly always come closer to the truth in a discussion which avoids personal attacks. It can help us to achieve a better understanding; even in those cases where we do not reach an agreement."¹¹ Moreover: "Science, if really wanting to keep its rational-critical status, presupposes ethics whose subject is a rational, free, responsible, dialogic, and self-critical individual open to cooperation with others. "Only if these preconditions are met can we speak of someone as of a scientific authority who works hard to attain the ideal of truth."¹²

Thomas Kuhn's *The Structure of Scientific Revolutions* claiming that the development of science is not smooth or unambiguous definitely rocked the boat. Kuhn claimed that this development was not evolutionary, but revolutionary. This theory is based on the notion of normal science which Kuhn understands as the state when the theories and achievements of the preceding generation of scientists are accepted without any significant doubts and are further developed by certain community of scientists. Kuhn calls such accepted knowledge, achievements a paradigm. The theories which are not a part of a specific paradigm are ignored. Important is that also the methods of the relevant scientific disciplines are adapted to the valid paradigm.¹³

The paradigm becomes troublesome when scientists encounter such anomaly which makes it necessary to adapt the categories of the valid paradigm. Of course, the old paradigm is resisting and this resistance calls for examination of the anomaly encountered. The tension between the anomaly and the paradigm results in several theories. Assertion of these theories throws science into a state of crisis which may result in the establishment of the anomaly making it a common phenomenon and to the change of the paradigm or, in other words, to the scientific revolution including a change of terminology and methods. However, crucial is that the conflict of paradigms is never about the truth itself but, as Kuhn believes, about the internal consistency of the accepted paradigm (Kuhn...). How should we then treat progress, objectivity or independence of science? What are the consequences of its conventionalism? Is science trustworthy? Is Feyerabend right when he claims that the validity of any piece of scientific knowledge may not be measured by how true, objective or progressive it is, but only against the authoritative acceptance within certain paradigm?¹⁴ Could then any idea, including a myth or art, gain scientific value?

¹¹ Popper K.R.: Duldsamkeit und intellektuelle Verantwortlichkeit, in: Auf der Suche nach einer besseren Welt, Piper, Munchen 1984, p. 225.

¹² Hrehová H.: Veda a etika vo vede. In: Viera a život. Dobrá kniha, roč. XIII, n. 2. Trnava 2003, p. 53.

¹³ Kuhn T.S.: Struktura vědeckých revolucí, OIKOYMENH, 2003.

¹⁴ Feyerabend P.K.: Rozprava proti metodě. Aurora, 2001.

The scientists themselves do not dare say that science is neutral as Rotblat put it: We should not insist anymore that science is neutral, objective and unbiased, and therefore morality and ethics (with their judging approaches) have no place in it. It is not true that the primary obligation of a scientist is to publish research results without regard to the context of the social and moral responsibility of the scientist and researcher for the application of the scientific knowledge.¹⁵ Scientists and researchers should thus reflect in their work also the ethical and social aspects of their work, particularly because the modern science has a significant impact on the evolution of the society.

We may concur with Iaccarino that there has been some trend of ethical discussions concerning the central risk areas of the scientific and research activity. From 1950 to 1960, the main discussions revolved around the options of using and developing new weapons, and particularly the nuclear weapons. From 1970 to 1980, the environment gets to the centre of such discussions. And, as has already been mentioned in the introduction, present-day discussions focus on the issue of biomedical research, its options, limits and direction.¹⁶

It is undisputable that the value of human dignity is the central ethical parameter of science in all the three development stages. This value is also obvious in the conclusions of the World Conference of Science containing the following observations:

- ethics should form a part of the preparation of all scientists
- research institutes should also include studies of ethical aspects of the research work
- the international community of scientists should support the environmental ethics
- research institutions should meet ethical norms
- governments and civil societies should organise discussions concerning ethical implications of the research work
- governments and civil societies should found ethical committees or boards
- UNESCO should strengthen the Bioethics Committee and the World Commission on the Ethics of Scientific Knowledge and Technology.¹⁷

The ethical issues of science are also detailed in the Iaccarino's *Science and Ethics* and may be summed up as follows:

- possible misuse of public resources for personal purposes and interests
- too influential private sector in the setup of the public research priorities
- differences of opinion in the use of public structures between scientists cooperating with the industry or private sectors and those who only work with public resources problems of students, and particularly of the PhD students, who may be used by their tutors as labour force rather than as students.¹⁸

¹⁵ Rotblat J. A.: Hippocratic oath for scientists. In: Science, (New York) 1999.

¹⁶ Iaccarino M.: Science and ethics. 2001 DOI 10.1093/embo-reports/kve191, EMBO reports (2001) 2, 747-750. Available: <http://embor.embopress.org/content/2/9/747.full>.

¹⁷ Ibidem.

¹⁸ Ibidem.

.It is out of question that the scientific and research activity needs to be viewed in a broader social, economic and political context. One of the cardinal questions of ethical reflection of science is the question asked by many authors, including Fabian: "Is everything which is possible also allowed? The scientific and technological revolution and rapid development in the world has resulted in recent centuries in the belief that everything that is possible is allowed, and also good, ethical. This principle could be legitimate a hundred years ago. When people invented automobiles and airplanes, it was both beneficial and ethical. Discoveries of new medications in the pharmaceutical industry was both useful and ethically right. The belief that everything which is physically, naturally possible is also allowed and right seemed to be generally true. But on 6 August 1945, the American bomber dropped atomic bomb on Hiroshima and Nagasaki. The bomb could be constructed. But did it automatically mean that it was allowed?"¹⁹ And Fabian replies right away: "Any rational man must apparently conclude that the development of science and technology without the development of ethics of those who are engaged in the development leads to mayhem, and not to progress. It does not help, but sets back. It may seem successful, but is not sustainable on a long-term basis. It is therefore important to speak of ethics in research, because it can turn against man."²⁰ And it is the ethics of science and research which should set the limits for science.

We are getting closer to the conclusion, but before we get there, we cannot but comment on a crucial issue of the contemporary science and academic circles, as we see it. Komenda (2004) speaks of three basic areas of ethical reflection of research activity, namely the ethics of work with the participants in research, ethics of work with information, and ethics of responsibility to the society. We do not want to decrease the importance of any of these dimensions, but considering the state of the Slovak higher education system and especially considering the requirements laid on university teachers, we would like to comment briefly on the issues connected with the publishing ethics. Using Fabian's words: "The publishing ethics is a separate issue. Striving to meet the criteria defined by the *Ministry of Education*, the so-called "co-operating teams" have been established, meaning that researchers who have never worked on a particular research project are signed under the published results employing the "you help me, I help you" principle, or "citation teams" are created within which authors agree to cite each other... Clientelism works well anywhere. What kind of ethics this is when acquaintances make science?"²¹ And this is not the only ill our science suffers from. We have noted growing number of the so-called predator magazines which have not received definite and clearly identifiable feedback from the Slovak academic circles. We expect to see revision

¹⁹ Fabian A.: Etika vo výskume. In: Výskum v sociálnej práci.(Zborník príspevkov z II. doktorandskej konferencie konanej dňa 04. novembra 2011 na Filozofickej fakulte Prešovskej univerzity v Prešove). eds. Beáta Balogová, Ivana Lyócsa, Alena Moravčíková. Prešovská univerzita v Prešove 2012, p. 6.

²⁰ Ibidem.

²¹ Ibidem, p. 10.

of publication outputs in several years aiming to eliminate texts published on purpose or even publications published without proper review procedure.

It is indisputable that the development of science poses new challenges to ethics and to the scientists themselves. We often read or hear of the crisis of our society and cannot resist the question whether the crisis of our science, a fact which no one dares to dispute, is not an economic crisis but, as is the case of the economic crisis, a moral crisis? Isn't Slovak science reflecting the state of the Slovak society? Can it be that the Slovak science, just like the Slovak society, suffers predominantly from clientelism, corruption and non-transparency?

Our aim here was not to go into detailed analysis of the state and need for implementation of ethics in the scientific and research practice at all levels. We wanted to point out the need for ethical parametrization of science and those troublesome areas of science and research which openly call for ethics.

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Bibliography

1. Fabian. A.: Etika vo výskume. In: Výskum v sociálnej práci.(Zborník príspevkov z II. doktorandskej konferencie konanej dňa 04. novembra 2011 na Filozofickej fakulte Prešovskej univerzity v Prešove). eds. Beáta Balogová, Ivana Lyócsa, Alena Moravčíková. Prešovská univerzita v Prešove. 2012, p. 6-12.
2. Feyerabend P.K.: Rozprava proti metodě. Aurora, 2001, p. 432.
3. Hrehová H.: Veda a etika vo vede. In: Viera a život. Dobrá kniha, roč. XIII, n. 2, Trnava 2003, p. 104-114.
4. Kiepas A.: Človek a dilemy filozofie techniky. APRINt s.r.o.. Žiar nad Hronom, 2002, p. 118.
5. Komenda S.: Etika výzkumu. In Ivanová K., Klos R.: Vybrané kapitoly z lékařské etiky. 2. upravené a rozšířené vyd. VUP, Olomouc 2004, p. 97-109.
6. Kuhn T.S.: Struktura vědeckých revolucí, OIKOYMENH, 2003, p. 206.
7. Lakatoš I.: The Social Responsibility of Science, in: Philosophical Papers, vol. 2. Cambridge 1978.
8. Lešková Blahová A.: Bioetika v kontextoch etiky sociálnych dôsledkov (Aplikácia zvolenej paradigmy na vybrané bioetické problémy. FFPU, Prešov 2010, p. 195.
9. Lešková Blahová A.: Etika vedecko-výskumných pracovníkov so zameraním na oblasť prírodných vied alebo reflexia o potrebe (profesijnej) etiky vo vede. In: Aplikovaná etika a profesionálna prax (eds. Fobelová D.). FHV UMB v Banskej Bystrici, Banská Bystrica: p. 56-63.

10. Popper K.R.: Duldsamkeit und intellektuelle Verantwortlichkeit, in: Auf der Suche nach einer besseren Welt, Piper, Munchen 1984.
11. Rotblat J.: A Hippocratic oath for scientists. In: Science, New York, 19.11.1999, r. 286, n. 5444, 1475 p.
12. Iaccarino M.: Science and ethics. 2001. DOI 10.1093/embo-reports/kve191, EMBO reports (2001) 2, 747-750. Available: <http://embor.embopress.org/content/2/9/747.full>
13. Tisovič F.: Etické princípy platia aj pre vedu. 2008, http://www.sav.sk/?lang=sk&charset=&doc=services-news&news_no=2337

Omówienie

Wiek XX był pełen dynamicznego postępu w wyniku rozwoju nauki i badań. Wydarzenia XX wieku jednak pokazały ciemną stronę nauki, która w imię postępu i wiedzy dewaluuje wartości, na których budowana była nasza cywilizacja przez stulecia. Pytanie, które stawiamy w artykule, może brzmieć banalnie, ale takie nie jest: „Czy nauka i postęp naukowy jest możliwy bez ograniczeń etycznych lub, innymi słowy, czy wszystko, co jest możliwe, jest także dozwolone? W artykule przedstawiono ograniczenia etyczne dotyczące badań i nauki oraz wskazano na możliwe konsekwencje nauki związane z ignorowaniem problemów i dylematów moralnych prac badawczych.