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Introduction: Ethical challenges for the life sciences

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The rise of ethics for the life sciences: Why?

Since World War II many feel the necessity of reflecting upon the values that are at stake when doing scientific and technological work in the field of the life sciences. In doing experiments with animals, plants or humans the welfare of these living beings can be hampered; in publishing articles issues of private and public concern can be harmed (patents!); in being a member of a research group issues of human rights (like discriminatory behaviour) can become prominent; individual and collective forms of responsibility because of controversial types of research can become urgent; funding organizations can confront scientists and engineers with new ethical issues; the public at large or, as is the case with sustainability, future generations can challenge existing ways of doing research and educating and teaching can confront scientists with new ethical issues.

In all these dimensions problems have emerged, and scientists and technologists are sometimes confronted with even undeserving negative criticisms. However, often something or someone was damaged by scientific and technological activities; in other cases there were at least lots of uncertainties about proper ways to act. So, in those cases, it is not necessary to draw a red line between the do's and don'ts, but rather to explore the uncertainties.

In journals like *Business & Professional Ethics Journal*, the *Journal of Business and Professional Ethics* and *Journal of Academic Ethics* exclusive attention is paid to these topics, and prominent societies of scientists and engineers have departments, study groups or networks devoted to discussing them. Several universities have established departments for conducting research and teaching in professional ethics, like the Illinois Institute of Technology, MIT or Carnegie Mellon University.

Science objective and ethics subjective?

However, can ethics be helpful in reflecting on these compelling problems with which the life sciences are confronted? It is often said that science is impersonal, objective and without values, and ethics is often seen as the counterpart of science, as something personal and subjective. If these characteristics are valid, ethics can only be helpful by giving some psychic relief to the individual scientist who feels now and then the pangs of his conscience. However, it is simply untrue that science is not committed to values, or that values are not functioning in science. In the process of doing scientific research lots of values are at stake: think about the values that govern the interaction with scientific colleagues, funding institutions or employers, and

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clients and users. Or think about the values that govern your answers in how far you can use animals or human beings in scientific experiments. Moreover, the products of science can have fundamental influence in the daily lives of many, like now is the case with medicine, genetics and agricultural sciences. Here the list is endless, and later on we will discuss the intricacies of these relationships between scientifically produced objects and societal aspects. Even the methods of science can have *prima facie* damaging effects on human and nonhuman beings, like in the case of certain ways of environmental accounting in cost–benefit analysis (Shrader-Frechette 1994).

Anyhow, all these examples show that between science and ethics there is a very complex, fundamental, problematic, ambivalent and sometimes even dilemmatic relationship that is absolute worthwhile to study (Keulartz et al. 2002).

Why do ethics?

Even if it the case that there is a complex relationship between ethics and science, for many it is still unclear what ethics (as a discipline) can contribute to these issues. Is ethics only dependent on personal insights? Can ethics be learned? First, it is very clear that lots of children learn ethical concepts (Van Haaften, Korthals and Wren 1997). With their birth, they do not have any ethical insight or intuition or competence in ethics, but more and more they acquire the competence to speak with their peers and relatives on rather simple ethical issues like dividing a birthday cake or sharing movie tickets even if there is not enough for everyone. So, during these years children learn new concepts enormously fast and get ethical skills in using them. Adults as well learn (in the sense of making qualitative new steps in their ethical performance) during maturing processes. Even organizations and other collectives can learn in an ethical way: take the way in the United States people have learned to eliminate more and more the most deeply controversial elements of the race-segregation system. Indeed, even nowadays there is a lot to be improved, but the improvements as compared with the situation of the nineteen fifties, when a large part of the majority was completely ostracized, are still encouraging for anyone who doubts that people can improve their interaction with others in an ethically sound way.

So, ethical education is possible and necessary and ethics can be learned, and ethical arguments can play a role in this learning process. Speaking about ethical arguments means saying that an ethical decision can be proven just like in science. More than in science, proof and argumentation on ethics are indeed dependent on personal and social contexts. Whereas in science repeating an experiment is a type of ultimate proof, in ethics, time elapsed is important and past events (actions) cannot be repeated in the same way: once you have lied to someone, you have done it, and only with the utmost effort (like apologizing) you can restore trust. Indeed in ethics we can have proof and certainty, but in a way different from science. Because learning ethics means acquiring attitudes, concepts, methods and heuristics, social contexts play a pivotal role. Social structures create many of our norms and values, and facilitate or prevent people's access to some norms and values and not to other ones. Indeed, ethics is socially and culturally dependent, but still something one can learn, by transgressing one's own context. An ethics course can help with this process.

What kind of ethics?

If ethics is indeed becoming more important than ever for the life sciences, the next issue is, what type of ethics do we need to tackle these problems? Given the

innumerable different approaches in ethics, the large controversies and the lack of consensus on main issues, this looks like an unsolvable problem. One very fundamental question is, do we need an ethics that first formulates general principles and norms for everyone, than detail these for individual branches and professions, and finally spell out what this means for the professionals? Or do we need an ethics that is sensitive to the diversity of ethical problems, the wide variety of moral dilemmas and the most urgent ethical problems in the field, and then tries to elucidate the intuitions at hand, analyses the most common solutions and explicates what heuristics or guidelines could improve the ethical situation? In other words, if ethics can be helpful in tackling ethical problems of the life sciences, are we in need of a more deductive perspective or a more narrative and inductive perspective? Final answers to ethical problems in accordance with one of these broad perspectives need not differ much, although the reasoning and practices do as a matter of fact. For example, both perspectives can end up in underwriting a professional code for life scientists; however the function of this code can be seen differently. In this book this issue is dealt with from various angles and is subject to several considerations. Consensus can be found, but is sometimes difficult to reach and not always recommendable, because it is a barrier for improving the debate. Moreover, the life sciences are not a united field where the same types of problems pop up. In some case a more principled approach may really be fruitful, whereas in others a more inductive and narrative approach may be recommendable.

A last, but not least, fundamental issue concerns the value of non-scientists' opinions and preferences. Because of the large societal impact of the life scientists, it is as least worthwhile to consider consultations with the public at large, in particular on the issues already mentioned (Korthals forthcoming). The qualities of the process of ethical improvement could be enormously enhanced by, in one way or another, involving the concerns of consumers with respect to animal welfare, human health, the environment (like sustainability and biodiversity), fair trade and fair treatment of farmers in developing countries, food diversity and transparency and accountability of these sciences. In this book several ways of public consultations are vetted and assessed.

Topics of this book

In this book we will first discuss broader issues of ethics of the life sciences, which enable us later on to focus on the more specific issues. Therefore, we begin with two contributions on the ethical issues of working in organizations. A fruitful side effect of this start is that it gives a good insight into business ethics, a branch of applied ethics that until now is far ahead of ethics for life scientists. In the second part, ethics of activities directly connected with doing scientific research are discussed, like experimenting with animals and human beings, publishing, patenting, getting funds and selecting one's research theme. Thirdly, we discuss the topic of animal ethics, which in the life sciences in particular requires discussion on the use of animals in experiments. Fourthly, several authors present their view on the relationship between science and society, i.e., the societal impact of the life sciences, like genetic, agricultural and food research. Fifthly, we discuss the issue of the impact of this applied field of ethics for academic ethics in general. We will finish with some new problems with which the life sciences are confronted.

More in detail, the kick-off is Ronald Jeurissen's chapter on *Moral complexity in organizations*, which deals with problems of ethics management. The aim of his

chapter is to bring the discussion on ethics management a few steps further, starting from the received and dominant view in ethics management at this moment, that there are basically two approaches to ethics management, namely a rules-based and a values-based approach. Jeurissen presents a contingency model of ethics management that enlarges this dominant view, by bridging a kind of divide that presently exists between ethics management and stakeholder management. Stakeholder management is generally seen as a tool of corporate social responsibility (CSR), and CSR is often seen as something distinct from ethics management. CSR is supposed to deal more with the external relations of the organization (the impact on stakeholders), whereas ethics management allegedly has more to do with internal relationships (employee conduct). Jeurissen believes that this is a fruitless distinction that actually blocks further progress in ethics management. He argues that instruments of ethics management can instead be ordered along a continuum of increased moral complexity. This continuum blurs the existing artificial boundaries between ethics management and CSR. The chapter, therefore, can be understood as an attempt to integrate ethics management and CSR, and to contribute to a more unified theory and practice in the field of applied ethics in organizational contexts.

In his comments Hugo Letiche concentrates on the concept of 'moral complexity' to describe the interactions between the four types of ethics in organizations that Jeurissen distinguishes. Complexity in the sense of complexity theory is at odds with any regime of fixed positions or 'rules', has to deny change to remain valid. This denial of complexity vitiates the 'rules' of lived authenticity. Complexity means emergence and self-organizing. Human institutions evolve and change from a dynamism that is outside human understanding or control. Emergence is a guarantee of change and activity – it ensures that there will be indeterminate situations to examine and possibilities for multiple courses of action.

The second chapter, written by Johan Wempe and Thomas Donaldson, addresses the ethical behaviour of organizations and their agents. They criticize a reaction to perceived unethical behaviour in organizations, called by the authors the 'compliance/market picture', which they claim is based on a too simplistic analysis of ethical misconduct in organizations. The authors argue that many cases of alleged organizational misconduct occur in situations characterized by a 'plurality of values', and they present a strategy for dealing with value conflicts arising from this. This strategy they call 'integrity'.

In his comments to Wempe and Donaldson, Henk Zandvoort first addresses the 'compliance/market picture' and what the authors say on that. He presents his own analysis of the nature of a very large class of alleged misconduct of business organizations, namely those cases having to do with environmental damage and all kinds of harm and nuisances which are commonly called negative externalities in the science of economics. Secondly, he discusses the authors' ideas regarding 'integrity' of business organizations.

In the next section communication with the public and with peers (written or in another form) is discussed. Ethical issues like what is an author, who is responsible for the publication and several other ones are discussed in depth.

Ruth Ellen Bulger identifies several areas in this field. They are as follows: acquisition, management, sharing and ownership of data; mentor/trainee relationships; responsible authorship and publication practices; peer review and the use of privileged information; collaborative science; research involving human volunteers; humane care and use of animals; research misconduct; and conflicts of interest and commitments.

The process of establishing norms for ethical conduct of research in these areas is far from complete. However, momentum is gained when the members of various disciplines form consensus groups such as the International Committee of Medical Journal Editors. In addition, the extensive availability of internet communication resources among scientists around the world is forcing re-evaluation of the traditional expensive method of publication with limited distribution of material published in the print media only to subscribers.

In his comments Henk van den Belt poses some sceptical questions. He argues that from the late 1970s on, the science journals and the mass media have been reporting an unending series of affairs involving fraud, deceit, plagiarism and other forms of 'misconduct', especially in the biomedical sciences. In fact this trend has also been the main factor behind the rise of research ethics, at first in the USA and later elsewhere. He is doubtful on the question in how far research ethics can offer useful solutions to do something about the problem.

Prof. Dr. Hub Zwart addresses the history of scholarly expressions, and in particular the second last stage where a new type of professional scientific activity (systematic observation, using sophisticated equipment, and notably experimentation) entailed the emergence of a new scientific genre: the research paper (as well as the scientific journal: a periodical compilation of research papers). In the last stage we experience now, commercialization and intellectual autonomy get a new impact. Moreover, the impact of the informational revolution, pluralism of ethical styles and the fairness or unfairness of citation practices requires something like the Vancouver Guidelines (a topic also discussed by Bulger). He concludes that nevertheless science is a powerful tool developed by man to educate and discipline him and that scientific training is basically training in self-control. Virtues involved in practicing a science, such as unprejudiced open-mindedness, patience, precision and reliability, are moral values.

The commentator, Tjard de Cock Buning, disagrees with Zwart on several points but the bone of contention is in how far ethics of life sciences should orient themselves to principles that are firmly established in academic ethics, like those of Rawls, or be sensitive to the special ethical issues and dilemmas that play a role in the field of professional ethics. De Cock Buning regards the principles of Integrity, Responsibility and Competence the main principles that can solve these special problems.

In *Some recent challenges to openness and freedom in scientific publications*, David B. Resnik argues that openness and freedom are two important ethical values that apply to scientific inquiry. This chapter discusses some recent problems arising from industry-sponsored research and the danger of bioterrorism, which threaten openness and freedom in scientific publication. Resnik also discusses some possible solutions to these problems of openness and freedom and the problem of data sharing.

In his comments, Tiny van Boekel wants to draw attention to the opportunities of involving industry in the research, resulting in a fruitful interaction between science and society in pre-competitive areas.

The next section is dedicated to animal-research ethics. Paul Thompson concentrates upon the experimentations with animals in the case of biotechnology. He sticks to the still very relevant, but often neglected, ethical question of Rollins: what are researchers' responsibilities with respect to the animals they use in research? From a pragmatic bioethical perspective, he argues that the key research-ethics questions demand a scientifically informed approach to animal welfare, which in turn demands

an understanding of the interpenetration between ethics and animal-welfare science. He concludes with a discussion of how research-ethics committees can approach the evaluation of animal biotechnology in a more ethically satisfactory manner.

In her comment, Mieke Boon compares the functioning of DECs (DierExperimentenCommissies, animal-experiments committees) in The Netherlands, with the functioning of Animal Care and Use Committees (IACUC) in the United States as described by Paul Thompson. She argues that besides governmental rules, there are also local rules effective.

In the following section we discuss the role of the life sciences in society, and the responsibilities for both science and scientists that are connected with this role.

Michiel Korthals explains that in the next decades life scientists will become more than ever involved in public and private life of patients–consumers, because of the shifts towards individualized (instead of collective), preventive (instead of curative) and desire-driven (instead of technology-driven) health and food sciences. This means that the relationship between doing research, giving advice to industry, governments and patients–consumers, consulting the public and prescribing products, be they patents, products, information or advice, is getting blurred. Traditional concepts of individual, role, task and collective responsibility have to be revised. Korthals argues from a pragmatist point of view that the concept of public responsibility can help a lot in delineating new grey zones between doing research for governments or industry, giving advice, prescribing and selling products, and doing public consultation. The main issues are where new Chinese Walls (not Berlin Walls) have to be built between these activities to improve trust between life scientists and the public at large and how to organize research agendas and to decide upon research topics.

Jan H. Koeman moderates some of the main trends Korthals delineates; genomics is just one step in the development of the life sciences and it remains to be seen in how far it can mean something substantial for the individual consumer. However, he illustrates with new data the problems of the role-responsibility theory of scientists and pleas for a better, more reasonable crossing of the areas of doing research, giving advice and consulting the public. He concludes that integrity of the individual scientists is still the most important feature in crossing these areas.

Ruth Chadwick also addresses the purported current crisis of confidence in science. She explains this, first, in terms of not only often undesirable but also unpredictable effects of scientific developments; and, second, in terms of the commercialization of science. It has led to calls for greater accountability of scientists to the public. The question arises, however, as to whether professional ethics provides an appropriate framework within which to address the issues. In particular she argues that the debate in professional ethics concerning internal and external values needs to be explored in relation to science, with particular reference to the context in which scientific research is conducted.

Matti Häyry examines the idea that bioscientists should somehow participate in ethical decision-making in their field. He states that they have ample reason to do so, and although it is sometimes difficult to see how they could actually contribute to the assessment of their own work, he gives some hints for their task.

In his comment on the contribution of Matti Häyry, Robert Heeger focuses on Häyri's three criteria for moral acceptability, his caring about the definition of their key concepts, and his reference to ethical principles of a professional code. Heeger

tries to show that such principles can play the hoped-for guiding role only if they are firmly rooted in the professionals' power of moral judgment.

In the next section we discuss the relationship of this type of applied ethics to ethics in general. Ethics in general can learn a lot from ethics of life sciences and the other way round, but in what sense? Bernard Gert explains his ideas on common morality, which should provide a framework on which all of the disputing parties can agree, making clear who is responsible for the disagreements, and what might be done to manage that disagreement. Not every moral problem will have a single best solution, that is, one that all equally informed impartial rational persons would prefer to every other solution. Common morality recognizes both the vulnerability and the fallibility of people. It includes (1) rules prohibiting acting, or attempting to act, in ways that cause, or significantly increase the probability of causing, any of the five harms that all rational persons want to avoid, and (2) ideals encouraging the prevention of any of these harms. It also includes (3) a two-step procedure for deciding when it is justified to violate a moral rule. This common morality can be applied to scientists as well as to accountants and lawyers who are employed by a company. They cannot remain silent if the company is doing something that is contrary to the standards that their profession is committed to and with regard to which they have special expertise.

In his comments, Keulartz brings some sceptical comments to the fore that Gert's neo-foundationalism triggers, i.e. his emphasis on one common morality. Keulartz argues that even if we assume that there is only one moral reality, it is highly unlikely that there is only one unique description of this universe possible. The rule-consequentialist orientation of Gert can do no more justice to moral judgments that are considered significant than all other consequentialist theories. The most important of these judgments are judgments about distributive justice and judgments about respect for autonomy.

Marcus Düwell argues that one central implication of the ethical issues of life-science research concerns the normative framework of free and informed consent that now is so dominant. Exclusively paying attention to autonomous decision-making leaves out central questions like what the respect is that we owe to each other, and what implications this has for new scientific developments in view. The range of moral rights has not to be restricted to negative rights, meaning that not only those measures are necessary that protect everyone against direct interference in the freedom of his acting. He suggests that there could also be positive rights, like that we owe to each other the support we need in order to be enabled to live a good life. The complexity of the impact that research has on our society and existence forces us to open the discussion about the normative framework of such an evaluation.

Commentator A.J. van der Zijpp also points to the difficulties with the liberal position, both in terms of the room for making decisions predetermined by the scientific community and in terms of ethical attitudes like virtue, perfectionism and care. She emphasizes that somehow the rights and obligations humans have towards others (humans and animals and nature for example) are to be to taken into account. This implies a holistic approach in science, which requires social interaction for decisions about trade-offs between unequal issues regarding planet, profit and people.

In the last section David B. Resnik raises some new issues connected with the recent analysis of the human genome and the ethical issues that emerge with the regulation of intellectual property and patenting. One of the influential arguments against patenting human DNA is that the human genome is the common heritage of mankind.

This essay argues that the human genome is not literally the common heritage of mankind, but that it is a common resource. Since the genome is a common resource, the patenting of DNA is morally acceptable, provided that we honour our moral duties related to the genome, which include duties of stewardship and justice. This essay also explores different aspects of the debate over benefit-sharing in genetics research.

In his conclusion, Michiel Korthals summarizes main issues, sketches some ways out and poses some future questions and challenges.

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