

CHAPTER TWO

MORAL RESPONSIBILITY IN SCIENCE

1. RESEARCH ETHICS

What does moral responsibility in science mean? Are experienced scientists more responsible than junior scientists? What responsibility lies with the scientific community? For what are scientists responsible? Do scientists have a responsibility for the applications of their findings? To whom are scientists responsible? Do scientists have a responsibility to future generations and to animals used in research? Is there a 'real' moral responsibility in distinction to the responsibility ascribed to scientists by different social groups? What light does the proposed modified social model of moral responsibility shed on the social activity of science? How can the approach of imaginative casuistry be used by scientists? These are some of the questions to be discussed in this chapter.

There are two different traditions in research ethics. The most influential has focused primarily on 'internal' issues such as scientific misconduct and the treatment of human subjects. A clear example is the *Helsinki Declaration*.¹ To the extent that 'external' issues such as the social responsibility of the scientific community are explicitly addressed, they are stated only in general terms: 'science should aim at the public good.' Often, it is implicitly assumed that science in and of itself is for the good of society.² However, there is another tradition in research ethics focusing more directly on science as a part of society and on social responsibility. Often this kind of research ethics has taken a partly critical view of the role of science in society: 'science is sometimes used to legitimize established class and gender structures.'³ Examples can be found not only in socialist and feminist writings, but also in liberal ones.

The time is ripe for connecting these two traditions in research ethics. Actually, the responsibility of scientists doing human genetics research raises both 'internal' and 'external' questions. The internal issues include the question of maintaining

¹ See, for instance, Annas, Grodin, 1992, p. 331-336. See also URL: www.wma.net.

² In this tradition can also be included the 'CUDOS norms' articulated by Robert Merton (1973 (1942)): Communism, Universalism, Disinterestedness, and Organized Scepticism.

³ This tradition is not as homogeneous as the dominating one. It includes, for example, socialist and feminist critiques of science. Two books clearly illustrating this tradition are Rose, Lewontin, Kamin, 1984, and Hubbard, Wald, 1993.

high scientific quality and avoiding ideological bias and overinterpretation in genetics research regarding issues that are politically heavily charged, and the question of the responsibility to human subjects and animals participating in genetics research. The external issues include the question of what should constitute socially and morally responsible choices of subjects (topics) and the question of the responsibility of scientists for the social uses of their findings. In the end, however, the distinction between internal and external issues can hardly be maintained. They are intimately connected.

Different Kinds of Responsibility in Science

There are many different kinds of responsibility in human genetics research. There is a purely scientific responsibility, which can be understood as a responsibility to observe certain minimum quality standards in all aspects of scientific work. Another kind of responsibility is legal. Like other citizens, scientists are obliged to follow the general laws of the country in which they work. There might also be other laws exclusively regulating scientific work, although these may not be so common. We may also talk about an economic responsibility—research facilities often cost a great deal of money. With this comes an obligation for responsible management. There is also a social responsibility: scientists have a responsibility to society for their professional activities. This is particularly true when their activities are paid for by taxes. Finally, scientists have a moral responsibility. This kind of responsibility is commonly understood as more fundamental than the other kinds. However, according to the proposed modified social model of moral responsibility, I do not make a distinction between socially attributed moral responsibility and a ‘real’ moral responsibility. Social practices of blame and praise is all we have. There is no ‘real’ moral responsibility beyond the one ascribed by the community. Moreover, it should be noted that moral responsibility in science is not only a matter of personal ethics but also of governmental and professional policy.

I shall focus primarily on moral responsibility. However, it is obvious that it interacts with other kinds of responsibility. Morality may, for instance, support the demand for high scientific quality. It may also back up legal regulations as well as demand criticism of existing laws.

An Analytical Model: Responsibility ‘of’, ‘for’, and ‘to’

In order to give the analysis of moral responsibility in science a useful structure, I shall take as a starting point the distinctions made in the previous chapter between the aspects of responsibility *to*, responsibility *for*, and responsibility *of*. As I use the word ‘for’, it only applies to actions and their consequences, not to people, animals, etc. ‘To’, on the other hand, applies to people, animals, etc. The aspect of responsibility ‘of’ refers to those who are responsible such as individuals and

groups. When applied to science, the three aspects can be caught in the following three questions:

- Who is responsible in science? (responsibility *of*)
- For what are scientists responsible? (responsibility *for*)
- To whom and to what are scientists responsible? (responsibility *to*)

With regard to the first aspect we are talking about the responsibility of scientists, but do all scientists have the same responsibility? For instance, is there a difference in responsibility between researchers high in the scientific hierarchy and junior researchers? Is there a difference in responsibility between scientists doing basic research and those doing applied research? Is there a difference in responsibility between scientists working in universities and those working in private companies?

The second aspect is responsibility *for*. Scientists are responsible for their actions and their consequences. Here I find it useful to focus on the different stages of research and its application: choice of subject (topic), the research process in the narrow sense (empirical and theoretical work), publication, and application (use). It is uncontroversial to argue that scientists are responsible for their choice of subject, the research process in the narrow sense and the publication of their results, although there are many specific ethical problems raised by each of these stages. However, the view that they are responsible for the application of their findings is more controversial. Do scientists truly have responsibility for applications of their results that other people make?

The third aspect—responsibility *to*—is also important to discuss in relation science. Scientific research affects many different parties, e.g. human subjects, funding agencies, and the general public. Conversely, these parties affect the scientists. Exactly which parties are the scientists responsible to? How should they respond? What do they owe to different parties? And to what extent are different kinds of scientists responsible to different parties?

Below I shall apply this analytical model to science in general and to human genetics in particular.

Domain, Content, and Form of Responsibility

I call the linkage of a stage of research (*for* which scientists are responsible) with a party (*to* whom scientists are responsible) a ‘domain of responsibility’. An example of such a domain of responsibility is the responsibility to human participants in the research process. Another example is the responsibility to the general public to the extent that it is affected by the applications (uses) of research.

It is important to distinguish the domain of responsibility from the content of responsibility. By the ‘content of responsibility’ I mean views concerning what scientists should do. Different ethical positions might imply diverging suggestions regarding this normative content. Two people might agree about a certain domain of

responsibility but disagree about the specific content of the responsibility. For instance, they might agree that scientists have a responsibility to human subjects or animals used in the research process but disagree about how the human subjects or animals should be treated. Furthermore, to take an example from human genetics, two persons might agree that geneticists should assume responsibility for the applications of genome research but disagree about what this means more specifically. For instance, many geneticists in the beginning of this century obviously saw themselves as taking responsibility by promoting eugenics. However, critical voices today say that eugenics is something that should be strongly rejected as a part of responsibility.

Moreover, to be distinguished from the domain of responsibility as well as the content of responsibility is the 'form of responsibility'. By this I mean the level at which the normative content should be implemented in action and the means of doing this. For instance, avoidance of scientific misconduct can be approached at the level of government, at the level of the scientific community, and at the individual level. The means of achieving this could be legislation by the government, cultivation of good 'morals', i.e. good manners and customs, within the scientific community, or development of personal virtues of individual scientists. There can be disagreement about level of implementation and means among those who agree about the content of responsibility.

2. RESPONSIBILITY 'OF'

I shall begin with the issue of moral 'responsibility of' scientists. I view this moral responsibility from a social perspective: the moral responsibility of the scientists is a matter of social practice and social role. This raises a number of fundamental questions. How should the interaction between science, technology and society be understood? Is the development of science and technology and its application in society a matter of choice, and if so, to what extent? Are there important differences in responsibility between scientists doing basic research and those doing applied research? What responsibility lies with the individual scientists, the research groups, and the scientific community at large? What implications does the distinction between 'holding responsible' and 'assuming responsibility' have in this context? Are there differences in responsibility between researchers at different levels in the scientific hierarchy? What different roles may individuals assume within the scientific community and what responsibilities do these roles imply? What is the relation between political control of research and moral responsibility? Let us take a closer look at these questions and their different answers.

It is not too uncommon a view that technological development has a momentum of its own, which makes it virtually impossible to affect. Sometimes this argument is also applied to the development of gene technology. Knowledge of the human genome—it is maintained—will drive society in a certain direction whether we want it or not. Certain applications will emerge with necessity and it will be impossible to stop them. In this study, I hold that this ‘technological determinism’ is inadequate. I hold that decisions made by individuals and small groups can affect the course of technological development, at least to some extent. Moreover, I maintain that this is true of the development of society as well. These assumptions are practically necessary. Without them there is no reason to try to affect future developments and without them it is also meaningless to talk about moral responsibility. However, this ‘voluntarism’ has certain limits. Our expectations have to be realistic. Our ability to control the future is limited. The extent to which we can affect future developments can only be discovered in practice.

On the basis of these assumptions, the consequences—or applications—of science in society become not just a matter of anticipation but also, at least to some extent, a matter of choice. When we talk about, for instance, the place of genetics in the future of society, we do not talk about something that is predetermined but about something that we, at least to some extent, may choose.

These assumptions cannot be demonstrated beyond doubt. However, in my opinion, some good reasons can be offered and I will try to do so below.

A Dynamic Systems Approach Combined with a Limited Voluntarism

What is the relation between scientific, technological and social development? What driving forces are primary? Can decisions made by individuals and groups determine the course of development? These questions are, of course, very difficult to answer. One reason is that all the concepts—science, technology, society—are very difficult to define. For my purposes, however, it does not seem necessary to give any strict definitions of science and technology. In this book, I focus primarily on human genetics and gene technology, and these phenomena fall, to be sure, under any concept of science and technology. Society, on the other hand, is a more unclear concept, and I will come back to it below. Let us first take a brief look at three major models of the driving forces in scientific, technological and social development (cf. Barbour, 1992, pp. 20-21).

According to the first view, science is the primary cause. Technology is an application of science but affects the scientific development only to a limited extent. On the other hand, it does affect social development. Society in its turn hardly affects science and technology. This position can be called ‘the primacy of science’ view. It is a linear view where science generates technology which in its turn affects society. Examples from the history of science and technology that could be put

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