ABSTRACT. In reference to the different approaches in philosophy (of medicine) of the nature of (medical) technology, this article introduces the topic of this special issue of *Theoretical Medicine and Bioethics*, that is, the way the different forms of medical technology function in everyday medical practice. The authors elaborate on the active role technology plays in shaping our views on disease, illness, and the body, whence in shaping our world.

KEY WORDS: Philosophy of technology, technology, medical practice, ontology, disease concept, normality, autonomy, risk and trust, health technology assessment

Technology governs our world. It pervades our lives nowadays and it has achieved a central role in the knowledge and information society in most Western countries. This dominating role of technology has occurred in medicine as well. Hospital wards, emergency departments, rehabilitation centres, and general practitioners’ consultation rooms are filled with a wide range of technologies. In between these medical centres are laboratories and medical physics departments which support medical work with all sorts of diagnostic and therapeutic procedures. Throughout history physicians and other health care workers have used many different – i.e. spiritual, physical, astrological, and psychological – techniques, using all the ingredients which were offered by nature and human culture. However, the role of technology in medicine is nowadays unique. Never have medical techniques been used at such a large scale, in such a complex way, and over such a long time, not seldom spanning a patient’s life from birth to death.

This intruding nature of medical technology has been accompanied by philosophical arguments pointing at the ‘external’ and ‘disruptive’ character of medical technology with respect to the order of medical work and health care. Indeed, medical technology is developing at a rapid pace and largely unravelling behind the closed doors of laboratories and research departments. Many examples can now be found in the field of genetic engineering, where an accumulation of new developments opens up new avenues in genetic profiling of people and patients. Hence, the feeling
emerges that technology is coming from ‘within’ science and ‘outside’ medical practice, simultaneously upsetting the order of medical practice and health care. Admittedly, many hover between fear and hope. Hope, because medical technology may improve medical cure and health care delivery. Fear, since technology threatens fixed positions and may be beset with undesirable social, ethical and political consequences. Thus, philosophical debates have pointed at the ambiguous nature of (medical) technology: continuity versus change, determinism versus free will, normality versus abnormality, facts versus values, objectivity versus subjectivity, etc.

In recent years, however, philosophers, sociologists, and historians of technology have shown that there is nothing strange and uncommon in technology. Technology is embedded in and intertwined with social, economic and cultural developments. This is even the case to the extent that technology and medicine, or more broadly, technology and society are two sides of the same coin. Our society is technological and technology is societal. We are living in a technological culture.

Philosophy, especially European philosophy, has, for at least four decades now, been addressing questions concerning technology. Philosophy of technology is only recently emerging as a separate discipline of philosophy, and is associated with a number of scholars, some of whom the reader will meet more extensively in the papers. Until now, the discipline-in-the-making has been working mainly on technology as a way of dealing with, or dominating, the environment people live in, and much less with technologies that humans use (or, as some of the papers will suggest, that ‘use’ humans) to deal with themselves. Thus, quite surprisingly, medical technology is ‘core business’ in ethics, while being quite marginal in the philosophical study of technology (with the exception of the work of Stanley Reiser). The peculiar relationship between technology and its users is what makes the study of medical technology an interesting area for the philosophy of technology.

This issue of *Theoretical Medicine* and *Bioethics* explores this area. Technology has been defined in various ways throughout the history of philosophy. We want to keep clear of a discussion of definitions, because what technology exactly is, cannot be determined beforehand – it emerges from empirical study. We can at best outline the area that the papers in this issue work in: it is an area where one finds devices and machines, but also procedures, communication patterns, guidelines and protocols. In this issue, the focus is on the way these forms of medical technology function in everyday medical practice.

Central questions are then: How does medical technology transform disease concepts and the way the body is conceptualised in modern medi-
cine? How does the (daily) use of medical technology by patients shape their views on disease, illness, and the body? What are the relationships between technology and care (especially in chronic diseases)? What implications should answers on these questions, albeit in a provisional way, have for the evaluation of medical technology?

In order to position the papers in this issue, if only in a sketchy way, the picture might be drawn as follows. The work of Ivan Illich (one of the few scholars who worked on the area of medicine) may be characterised as critical of the allegedly indomitable course of technology that tends to engulf the life-world – medicine being one of the most outspoken and, according to Illich, dangerous examples. The papers of this issue, although many of their authors may owe their initial drive from Illich, do not lay the same emphasis on the restraining and overwhelming character of technology. On the contrary, they all seem closer to Foucault in the sense that he, while analysing the power relationships associated with science and technology, very much stressed the productive character of technology. Foucault conceived of science and technology as producers of new types of humans, and new types of relationships.

Most of the papers in this issue also distinguish themselves from the phenomenological approach to technology that can be found in the work of authors such as Merleau-Ponty and Gadamer. Their focus is mainly on the role technology plays in constituting our ‘being in the world’, thus on the way humans conceptualize the world and live in it. The same holds true for ethical or anthropological approaches of (medical) technology. In contrast, the approach of many of the papers here is to elaborate on the active role technology plays in shaping the world – both the somatic and the psychological spheres.

In this respect, they seem closer to what has been called by the Dutch philosopher, Hans Achterhuis, in following Hannah Ahrendt, the metaphysical approach to technology as exemplified in the work of Heidegger. Heidegger questions the kind of Being (Sein) that is emerging in the technological age we are living in. Although less grandiose and more down to earth perhaps, some of the papers in this issue address questions of ontology through the analysis of medical technology.

The clearest distinction, however, may be in the method: all papers in this issue attach great value to the empirical side of the matter. The approaches chosen may differ substantially. Some of the papers are clearly linked to recent developments in the area of social studies of science and technology, where – especially in Paris – a sort of philosophical ethnography of technological practices has been developed. Others adopt a more classical ethical or conceptual approach to the empirical data they
have. One way or another they derive their philosophical arguments from a meticulous analysis of what they see happen in practice.

Annemarie Mol undertakes a conceptual analysis of what diagnostic devices do in the case of patients with diabetes mellitus. Medical techniques such as the finger prick test for the measurement of blood sugar levels are not merely registering the facts about the patient’s situation. On the contrary, such diagnostic devices acquire medical knowledge by actively intervening in the situations in which they are put to usage. Accordingly, what counts as ‘normal’ blood sugar levels and the ‘target’ of medical treatment is reshaped through the use of these diagnostic devices. In fact, these changes are the result of the ways these techniques interact with the doctor, the diabetes nurse, the patient, friends and relatives, the note book, the food habits and so on. Thus, Mol draws our attention to the peculiar character of medical technology. Medical techniques are not a set of clear-cut and well delineated devices. Rather these form a large and complex conglomerate, intertwined in various ways with note books, doctor – patient conversations, moralities, and training courses, which shifts in subtle but sometimes surprising ways the meaning of treatment goals, normality, self, autonomy, and control.

Dick Willems examines the implications of technology in medicine from the perspective of self-management by patients with chronic diseases, in particular asthma and chronic obstructive pulmonary diseases (COPD). Patient-tailored medical technology plays a central role in self-management, both in the sense of self-monitoring through regular measurements of physiological functions in the patient’s body and self-treatment through adaptations of treatment regimes. Willems specifically addresses the question to what extent body techniques in self-management are comparable to other body techniques such as those described by the French anthropologist Marcel Mauss and the French philosopher Michel Foucault. The concepts of self, care of oneself, patient empowerment, medical expertise and autonomy are not the starting point of Willems’ analysis. Instead he focuses on the specific ways medical devices shape the activities of and reconfigure the expertise and competence of asthma and COPD patients and their physicians. Body techniques such as the peak-flow apparatus, diary booklets and inhaler devices are not intruding the body, it seems, in contrast that the body is transgressing itself into technical devices.

Klasien Horstman investigates the intricacies of life insurance medicine, an area of medicine largely neglected in the philosophy of medicine. Life insurance medicine provides a contrasting case to what is considered essential to medical practice: patients and physicians maintain a relation-
ship of confidentiality and mutually help each other to establish a correct
diagnosis and an adequate therapy. In life insurance medicine, however,
candidates in need of an insurance are supposed to twist and to hide
their ‘sickness’ or ‘increased risk’. Not trust, but distrust, is distinctive
to the assessment of the healthy person. Thus, medical techniques are
called upon to support the reliability and objectivity of medical examin-
ations and risk assessments by medical doctors. Medical techniques such
as urine-analysis, life and death statistics and medical registration forms
are intended to intrude as well as to objectify the patient’s body, yet simul-
taneously to expel patients’ notions of autonomy, self and control from
medical practice. To understand the evolution of predictive medicine and
the way trust is created, it is necessary, as Horstman claims, to redefine our
notion of medical technology and to broaden the scope of the meaning of
technology.

Bernike Pasveer and Madeleine Akrich analyse the practice of obstet-
rics from the perspective of the use of medical techniques. Their point of
development is the analysis put forward by Arny, presented in Power and
the Profession of Obstetrics. Through a series of technical innovations such
as fetal monitoring, ultrasound, etc. the foetus has been actually constituted
as a patient for the obstetrician, who henceforth gained authority upon the
other actors involved in the process, i.e. midwives and parents. In this
way the exclusive relationship between the woman and the midwife in
traditional midwifery has been replaced in modern obstetrical practice by
at least a triangular relationship between obstetrician, parents and foetus.
Hence, techniques, expertise and authority are responsible for the fact that
women cannot do without the mediation of medical professionals to get
access to their own body and to their child. Pasveer and Akrich question
Arny’s claim in three ways: is there only one model of modern obstetrics;
how is the foetus and the respective relationships between parents and
professionals constituted by obstetrical practice; and how is the role of
medical technology in this process to be understood? The authors try to
seek the answers to these questions by a comparative analysis of obstetric
practice in France and The Netherlands. In this way it is shown that the
foetus is constituted differently, while medical techniques are differently
embedded in relationships between the parents, midwives and medical
professionals.

Kenneth Schaffner examines the question whether information tech-
nologies, as applied in the area of medicine and health care, have or
are likely to change fundamental concepts regarding health and disease.
Although different definitions of medical informatics reign the field,
Schaffner argues that the practice of implementing information techno-
ologies in medicine and health care essentially follow received views of medical knowledge. However, one major exception seems to exist in the way medical information technologies are designed to fine-tune a disease definition to avoid diagnostic errors due to overlaps and linkages with related diseases. An example of this ‘fine-tuning’ problem is provided by Schaffner in his analysis of the way the profile of the disease beriberi is represented in Internist-1, a representative model for modern decision supporting systems in medical diagnosis, treatment and counselling. The question will be whether new developments in health care technologies, such as neural networks and other connectionist tools, fundamentally shift the concepts of health and disease.

Gert-Jan van der Wilt, Rob Reuzel, and David Banta approach the ethics of assessing health technologies from the perspective of the field of medical technology assessment. The explicit objective of the assessment of a health technology is to judge the value or merit of the technology or a group of technologies. The social-ethical implications of technology are difficult to evaluate, particularly so because very often fundamental norms and values are disputed or antagonistic. Such norms and values are embedded in the cultural and historical circumstances of the groups involved. This is demonstrated with the help of the introduction of the cochlea implants to help patients with deafness to engage normal activities in daily life. The introduction of cochlea implants has provoked a heated debate within the deaf people communities, laying bare the potentially conflicting nature of the relationships to be newly developed between medical technology and life and culture of patient groups which are supposed to benefit from these technologies. Such cases with a lack of broad consensus on the underlying values are helpful to understand the nature of health technology assessment. Intriguingly, the authors depart from the four principles of beneficence, non-maleficence, respect for autonomy, and (distributive) justice, well-known in medical ethics. Yet these principles are taken up as ingredients in an interactive procedure, not as a matter of application, but as a way of specifying the norms, values and supposed effects of the technology involved against the background of a specific cultural and historical context. In this way the meaning of technology, effectiveness, and assessment is itself specified.

NOTES AND REFERENCES


REIN VOS
Department of Health Ethics and Philosophy
University of Maastricht
PO Box 616
6200 MD Maastricht
The Netherlands

DICK L. WILLEMS
Department of Social Medicine
Academic Medical Centre
Free University of Amsterdam
Van der Boechorststraat 7
1081 BT Amsterdam
The Netherlands
E-mail: d.l.willems@amc.uva.nl