Ethical Expertise in Policy

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Glossary

ELSA Research into the ethical, legal, and social aspects of particular scientific research fields in a more or less embedded and integrated manner; in other words, a form of social science and humanities research that is conducted in close contact with the technoscientific research fields in question.

Ethical expertise The idea that experts in ethics have developed bodies of knowledge and methods of analysis that go beyond the ''knowledge of right and wrong'' that is part of common, everyday knowledge. This expertise can reside either in intellectual abilities related to conceptual analysis or in the ability to adequately interpret and assess moral situations on the basis of experience or erudition.

Paternalism The idea that experts – such as physicians – should be granted the privilege of making difficult decisions in the best interest of lay persons – such as patients – on the basis of their experience, responsibility, and expertise.

Professionalization The tendency for individuals to become specialists and experts in particular practices or types of activity and to turn them into a source of income and into a form of expertise that is publicly acknowledged.

Technological determinism The belief that the structures, dynamics, and values of society are driven by technological developments.

Technoscience A concept coined to indicate first of all that particular forms of research have become highly dependent on and interwoven with advances in technology, but also to see science as a practice that is socially embedded rather than as an activity that is undertaken in splendid isolation.

Introduction

Stephen Toulmin (1982) has argued that "medicine saved the life of ethics." In response to the plethora of moral dilemmas and quandaries produced by the biomedical sciences from the 1950s onward, ethics was transformed from a rather dull and marginal academic subspecialty into a prominent arena of deliberation and research. Besides medical issues, other developments and debates also revivified ethics as a field, such as the environmental crisis (triggering the emergence of environmental ethics in the 1970s), as well as the debate over genetically modified crops (GM food) and the dispute over the use of animals for research. As to the latter, although the anti-vivisection movement had already emerged in the nineteenth century, the era of Claude Bernard, and is therefore about as old as biomedical science as such, in the 1970s the field experienced a resurgence, with publications by Singer and others. In this article, the focus will be on (bio)-medical ethics, as the most extended domain within the landscape of applied ethics, a domain moreover that has had a significant impact on policy development over the years. Furthermore, it was within this domain that the notion of ethical expertise came to be articulated and discussed more explicitly than elsewhere. I will take a historical perspective and outline a series of stages during which bioethics (or biomedical ethics) not only assumed a particular profile and developed a particular methodological stance, but also established a particular relationship with practitioners and with policy. From there I will subsequently outline some major developments in other ethics fields with high policy relevance and impact. I will indicate that the concept of ethical expertise can best be understood when seen as part of a 'quadruple helix' consisting of four interacting strands: (a) the technosciences (notably the contemporary life sciences), (b) policy (governance), (c) the social sphere ('publics' and 'practices'), and (d) (bio)ethics.

Prelude

In 1935 the philosopher Edmund Husserl gave his famous lecture concerning the "crisis of the European sciences," surely a somewhat remarkable title at the time, given the fact that the technosciences at that point, notably physics, had experienced decades of astonishing growth and bloom, of groundbreaking developments, exemplified by the emergence of quantum (or elementary particle) physics and the theory of relativity. How could Husserl, reflecting on such an era of scientific revolution, earnestly speak about a scientific 'crisis'? As

the author himself explained, the term crisis did not refer to the achievements of the technosciences as such, which were quite remarkable and impressive indeed, but rather to their meaning and significance for the life-world, for human life and existence. Science had always been a progressive and emancipatory force in human history, Husserl argued, but now, technology and scientific rationality had evolved into mere instruments that could be used for benevolent purposes as easily as for highly problematic ones. An unprecedented technological power had fallen into human hands, but how were we to use this new power? This question was especially urgent given the fact that the crises in the sciences coincided with a political crisis, about to develop into a catastrophe, the rise of totalitarianism across Europe. An uncanny correspondence could be discerned between on the one hand the prospect of humankind gaining 'total' sway over nature, down to the most elementary levels, and on the other hand the ambitions of totalitarianism directed at achieving total power, not only on the macro-level of national governments, but also on the micro-level, intent upon permeating society and human life down to the most minute and detailed aspects of individual existence. When 10 years later the first nuclear bombs exploded, it became clear what moral message Husserl in his laborious language had been trying to convey concerning the unprecedented powers of technology. Moreover, in the course of the twentieth century, the focus of attention (the center of the revolution) shifted from physics to the life sciences, notably the biomedical sciences and biotechnology. In these domains, the basic question raised by Husserl in 1935 presented itself once again. Building on groundbreaking scientific discoveries, the technosciences acquired unprecedented power over matter and life, notably over our own body. But have we also developed the moral principles and policy mechanisms that allow us to 'domesticate' and 'govern' this new power in a democratic way, for the benefit of humankind? How to govern the proliferating 'bombs' of biotechnology? Rereading Husserl from the 'quadruple helix' perspective outlined above, the distance between the various strands involved is rather striking. Although discussing science and society, Husserl clearly addresses an audience of fellow philosophers, relying on an intricate, if not idiosyncratic and abstruse, vocabulary. Moreover, the crisis he envisions is framed and assessed in the most general of terms, and the author is remarkably reluctant when it comes to using concrete examples or references to real-life situations. No interaction whatsoever with science, politics, or the public at large seems to take place and no policy recommendations can be distilled from his lecture. Ethics emerges as hands-off reflection from a very great distance before an audience of erudite peers.

The Era of Paternalism

In the 1950s and 1960s, the biomedical sciences were rapidly changing. A rather visible exemplification of this transformation process was the rise of transplantation medicine – kidney transplants in the 1950s and heart and liver transplants in the 1960s. Initially, the moral debates incited by these developments predominantly took place in professional and academic circles, with hardly any impact on policy development. Moral deliberation was basically seen as a professional discourse in which physicians and a limited number of other experts (such as theologians) were involved. In other words, medical ethics, insofar as it was existent at all, reflected a 'paternalistic' perspective, not only in terms of content (the ethical vocabularies and principles used), but also in terms of the limited circle of participants involved in the debate. Moreover, it was, to a large extent, a 'Hippocratic' ethic. One of its key concepts was the concept of 'discretion.' This not only meant that a physician could be entrusted with a secret (that is, with highly sensitive, personal forms of information concerning his or her patients). The concept also implied that, when faced with patients suffering from an incurable disease, it was immoral to inform them about their condition. In other words, secrecy was important, not just with regard to the outside world, as even the relationship between physician and patient as such was a relationship of silence, dependency, and trust. Although two strands of the quadruple helix started to become much more entangled than before, namely, the biomedical technosciences and societal practices such as health care, the quandaries that thus emerged tended to be addressed by the professionals themselves, without much explicit involvement from the other two strands, that is, from other actors such as academic philosophers or patients and other societal stakeholders.

The Era of Single-Author Perspectives

In the 1970s and 1980s, it had become apparent that moral quandaries involved in the new biomedical sciences entailed severe challenges to established policy systems and social practices and therefore merited a more open and critical debate. The power over life, notably over the beginning of life (artificial reproduction, prenatal diagnosis, etc.) as well as over the end of life (life-sustaining technologies, the emerging of euthanasia as an issue, etc.), made this unavoidable. Besides biomedical experts and physicians, theologians and philosophers began to join the debate, but patient organizations also began to take the floor.

During this stage, individual authors who as a rule took a more or less critical stance toward biomedical progress, addressed ethical and societal issues in monographs with a relatively broad scope. These monographs addressed their topics on a general level: They articulated a broad diagnosis of our culture and our view on health, disease, and bodily existence, and took a critical stance toward the way in which medicine would affect our thoughts and feelings about health, our body, our society, and our future. Examples are Ivan Illich's *Medical Nemesis* (1976) and Daniel Callahan's *Setting Limits* (1987). The recommendations for policy formulated by these authors were as a rule far-reaching and would often involve substantial transformations of our societies both on the cultural and on the policy level. In the Netherlands, this transition was exemplified by Jan Hendrik van den Berg, who in his book *Medical Ethics and Medical Power* (1969/1978) described how the meaning of death had evolved from a 'natural' into a 'technological' phenomenon, and from a natural event into a technology-based decision. His objective was to bring out into the open all the questions and doubts that professionals had been trying to deal with among themselves. In these single-author monographs, broad philosophical views on health, death, and technology were fleshed out. Thus, not only physicians, but also outsiders such as philosophers were now raising their voices in order to address the issues that until then had only been discussed by the medical professionals on professional podiums, while physicians themselves began to address broader audiences in their more extravert reflections.

Encouraged by these publications, a new medical ethics began to take shape around 1970. Autonomy replaced discretion as its key concept. From now on, the physician–patient relationship was to be structured by the concept of informed consent. It was no coincidence, moreover, that the new medical ethics focused on not only issues emerging around beginning-of-life decisions (e.g., through a combination of prenatal diagnosis and informed consent, where biomedical technologies were meant to inform and parents were meant to decide) and end-of-life decisions, such as euthanasia, but also the dispute over the brain death criterion. The ethical agenda clearly responded to scientific and technological changes. The brain-death discussion, for instance, was an evident response to the emergence of transplantation medicine in the 1950s (kidney transplantation) and 1960s (heart and liver transplantation). During the 1950s and 1960s, the technological power of biomedicine had dramatically increased, notably the sway of technology over birth and death. In the 1980s, this development led to the famous euthanasia debate in the Netherlands, for instance. It is clear, moreover, that the sudden transformation of medical ethical discourse was not an isolated event. On the contrary, it was closely connected with coinciding changes in other cultural and political levels. Autonomy speak was in the air, not only in the biomedical realm, but also much more broadly in the social sphere.

This apparent shift in power from physicians and other professionals to patients, parents, and citizens triggered another type of concern as well: Is everything that is technically possible also morally admissible? Some critics subscribed to the theory of technological determinism, propounded by Ellul and others, claiming that in the end technological possibilities will determine quasi-autonomous individual choices. Moreover, another question emerged on the macro-level, namely, the concern that the availability of these new (expensive) technologies, in combination with the logic of patient autonomy, would make health care in the end unaffordable for society at large. Could certain limits to growth be applied to decisions concerning human health? Should we not accept that there are natural limits (for instance, in the form of a natural life span) that constrain (or should constrain) technological malleability and modifiability of bodily life? In other words, challenges for policy emerged on two levels: on the micro-level of autonomous choice (should all options that are technically possible be open to individual decision making?) and on the macro-level (the affordability of the expenses entailed in the new technological options in combination with the new freedom of choice they seemed to afford to individuals).

In this new situation, the four strands distinguished earlier were now explicitly interacting and challenging one another. Former outsiders, from the social sphere as well as from the humanities, were much more eager to join the debate, while ethics clearly responded to co-evolving developments and trends both in the technosciences and in society at large. The agenda of this debate was dominated, however, by an interest in relatively broad and comprehensive issues: the significance of emerging technosciences not only for life, health, and the body, but also for cultural life and society at large. Concrete case studies were seen as exemplifications of these larger issues. Solutions for emerging problems often involved dramatic changes of the ways in which both sciences and societies were governed.

Professionalization of Ethical Deliberation

During the 1980s and 1990s, ethics experienced a process of professionalization. Journals were established (first and foremost, the journal *Bioethics* in 1986), research institutes were founded, ethics courses and curriculums were developed, and ethical experts began to join local ethics

committees (notably in the fields of medical ethics, animal ethics, and research ethics) as well as national policy advisory boards such as the Health Council of the Netherlands (Gezondheidsraad) and similar bodies in other countries. Pioneer initiatives such as the Hastings Center (established in upstate New York in 1969) and the Kennedy Institute of Ethics (founded at Georgetown University in 1971) served as models that began to spread to various other countries. Ethics became interdisciplinary teamwork. Collaborations developed between biomedical and ethical experts. The focus was on concrete issues and quandaries. How should questions raised by particular therapies for particular afflictions be dealt with? In other words, ethical deliberation often involved a conscious decision to refrain from more general (philosophical, sociological, or religious) reflections on technological or cultural developments. Ethical tools were developed for case study analysis, notably addressing aspects such as informed consent, exposure to risks, and infliction of harm. The focus was on handling particular cases and, on the more general level, on policy development. Broader cultural issues, addressed by authors in monographs during the previous stage, were now more or less 'de-listed' from the agenda. This decision was based on a conceptual distinction between 'narrow' and 'broad' morality, as introduced, for instance, by Mackie in the 1970s. It was argued that, in the context of moral deliberation, especially when dealing with 'moral strangers,' a concept coined by Engelhardt, it would be less difficult to reach consensus if participants were prepared to focus on the concrete problems and the actual arguments pertaining to them, instead of reflecting on the broader views behind them. As a rule, these broader views would prove much more difficult to reconcile. And for practical purposes, it was not necessary to do so. It was not the objective of an ethics committee or a policy advisory board to engage in ideological or religious debate or to assess the world views of participating experts, but rather to come up with viable solutions that would prove morally acceptable to stakeholders directly involved, regardless of cultural backgrounds.

Thus, the professional ethicist emerged as an expert in dealing with complicated questions engendered by biomedicine. Ethical issues arising in biomedical practices were addressed by trained academics who developed a conceptual and methodological toolbox for assessing concrete cases on the basis of ethical principles (such as the famous Georgetown principles). Indeed, in the 1980s, ethics was 'in vogue': Ethical journals, centers, courses, and conferences proliferated. Scholars coming from various disciplines (philosophy, theology, psychology) were drawn into this new discipline, were re-educated into a new profession, learning new vocabularies and skills. They were expected to address these complicated issues in a rational, systematic, impartial, and professional way. From the very outset, however, medical ethics (later to evolve into bioethics) was a controversial occupation. Bioethicists were under siege and criticized, not only by their more academically oriented colleagues, who accused them of vulgarizing the language of philosophy, but also by researchers and physicians. The debate focused on the concept of ethical expertise. What special methodologies or reservoirs of knowledge, more or less beyond the reach of lay persons or policy makers, could professional ethicists rely on when they presented themselves as 'experts' in policy settings? Although various competencies have been put forward as a basis for ethical expertise, such as analytical power (skills for conceptual analysis) or familiarity with the long and complicated files that constitute the history of moral debate, the dispute was never settled for good and still continues.

The emerging model (the ethicist as an expert and the ethics committee as a tool for consensus formation) had important benefits, but a number of drawbacks could be identified as well. In terms of benefits it was important that ethics committees brought together experts from various fields (biomedical, ethics, legal) engaged in a more or less rational process of deliberation, avoiding as much as possible controversial considerations based on 'deep views' (religious, metaphysical) that would prove difficult to reconcile, while being rather reluctant to allow political doctrines and public emotions to interfere with the deliberation process. The goal was to reach a viable consensus over relatively new and therefore unstructured problems among well-informed professional experts.

In terms of drawbacks it could be argued that the decision of ethics committees or ethics experts to refrain from taking broader considerations into account (such as world views or the dynamics of social, cultural, and technological change), and to 'de-list' them from the agenda, left a number of issues unaddressed that often played a substantial role in public uneasiness toward biomedical developments. In other words, public concern over biomedical and biotechnological innovation was often connected with the broader cultural impact of the technologies involved that were likely to become visible in the longer run – the very issues that were more or less kept out of the professional debate that focused on concrete issues and a limited set of rational arguments. For example, whereas one might argue that individuals may always choose or refuse to use certain therapeutic possibilities, the general acceptance of these possibilities may affect our moral culture and may make an individual choice to refuse a particular available option increasingly difficult. At a certain point, for example, the introduction of contraceptives or prenatal diagnostics will change the way we think about sexuality and sexual relationships or about reproductive choices, and although such broader cultural developments will in the end affect individual choices, they are difficult to influence, at least from an

individual perspective, as they transcend the level of individual choice. Likewise, the introduction of gene tests based on medical genetics may have a broader cultural impact, affecting our views on health and responsibility, besides their impact on the individual level (ideally providing useful information and options for choice to individuals).

Moreover, in the professional ethics model, the deliberations tended to focus on the present, the near future, and the recent past. This meant that the casuistry was realistic, which was an obvious benefit, but also that the agenda of the debate was determined by the current developments of technology, whereas it should perhaps be the other way around: Perhaps moral deliberations with a broader temporal horizon should guide and shape, to some extent at least, the future agenda of technology. This is still a controversial matter among ethicists. Another risk of the professional ethics model was that the debate was often 'behind schedule,' reflecting on what had already happened, on what (technologically or biomedically speaking) was already is a '*fait accompli*' to which the social realm simply had to adapt, and this implied the risk of ethics becoming the handmaiden of the technosciences.

Finally, a question that emerged during the 1990s was whether and to what extent members of advisory boards and committees (notably ethics experts) could be regarded as representatives of the broader public. Did they speak on behalf of the nonprofessionals (patients, research subjects, the public at large), or did they rather function as a special kind of expert? And if so, what precisely did their expertise consist of? The basic message of ethics is that, up to a certain point at least, all reasonable human beings should be able to make out for themselves, as autonomous individuals, what is right and wrong. If we take the principle of autonomy, the key principle of contemporary ethics and the basic message of ethics experts, seriously, why do we need ethical experts and ethical discourse? If autonomy is the most fundamental principle of bioethics, this seems to imply that individuals have to be treated as responsible moral agents who make their own decisions and manage their own life. To the extent that this is true, bioethics might be regarded as a superfluous profession. If all individuals really are to be regarded as autonomous decision makers, then what are ethicists for? To this question, a series of answers can be and has been given. First of all, bioethicists have to determine whether the conditions for autonomous decision making by individuals are in place. Secondly, because of their experience and methodological toolboxes, bioethicists may assess and improve the decision-making process, both on the individual and on the policy level, by bringing to the fore neglected aspects or options, for example, while still respecting and in fact even strengthening the autonomy of the participants and stakeholders involved. They provide individuals with useful input, empower them as it were, without endangering their right to self-determination. Diffuse intuitions may be more clearly articulated with the help of tested concepts. Professional ethicists are likely to be well-informed concerning recent scientific and technological developments, moreover, and may therefore discern possible issues in a timely manner, as part of their job.

In terms of the four strands model, it is clear that at least three of the four strands had entered a process of interaction. Technological and societal trends co-evolved more intimately than before, as new technologies clearly began to permeate everyday life and the physical condition of individuals, but also in the sense that ethics had evolved into a field characterized by alertness to the significance for society and everyday life of new technologies, articulating important societal values such as autonomy (on the level of individual decision making) and fairness (on the level of policy), but the 'fourth strand,' the broader 'publics,' or even the public at large, was still more or less in a passive role. This final consideration led to the development of more interactive forms of moral deliberations: techniques for public participation in moral and policy debate, with ethicists in the role of facilitators and mediators ascertaining conditions for a transparent debate rather than as experts in right and wrong.

Public Participation

To what extent can ethics experts and ethics committees be said to represent the outside world, the public view? In the 'classical' view, the ethical expert is someone who has a toolbox available for analyzing in a rational way complex problem cases. He or she will critically review the arguments brought forward in the public realm. Do they stand the test of critical assessment? During recent years, an alternative view has been brought forward: the ethicist as a facilitator of a debate between various stakeholders. Rather than putting forward his or her own tools or expertise, the ethicist will create optimal conditions for communication and exchange. This goes not only for concrete problem cases (moral conflict management), but also for discussion on the broader level (policy level). On this broader level, the idea is to organize large-scale public consultations.

Thus, as a response to these forms of criticism directed toward the 'ethical expert' model, an alternative model began to gain impetus in the 1990s, namely, the model of public involvement or public participation. If there was a role for bioethicists at all, it would be the role of a mediator, allowing individuals to voice their concerns, improving conditions for fair deliberations, rather than producing expert views of their own. Again, this idea did not emerge from nowhere. This idea was closely

connected with the way in which societal debates over new technologies in the bio-sphere evolved, with new types of responses to emerging technoscientific developments, inciting new forms of debate over novel issues, such as genetic modification, cloning, and xenotransplantation. Another typical feature of the moral climate in the 1990s was the relatively large amount of mass media interest for bioethical and biotechnological issues. The cloning of the sheep Dolly, for example, was front-page news. Ethicists were invited to present their views, and various forms of public deliberation were organized. But this media interest also had its drawbacks, as the mass media (television, newspapers, etc.) tended to frame the debate in a certain manner, namely, in terms of clearly opposing views. Thus, the media were in constant need of outspoken protagonists and antagonists of innovations, debaters who were willing to state their 'for' or 'against' in one-liners. This framing of the debate by mass media was difficult to bring into agreement with the academic standards of ethical deliberation. Moreover, public debates framed in this manner tended to be highly vulnerable to what professional bioethicists would regard as rhetoric and emotional views. Therefore, the 1990s were heydays for NGOs and their representatives, rather than for the professional ethicists.

Besides obvious benefits, such as the prospect of guiding technological development in a direction that will gain public support, some dangers are involved as well. One danger of such a 'public participation' strategy is that moral debate becomes more open to emotional and rhetorical input. Another difficult question is how to implement the results of such a debate in the context of policy development – results of such debates are often of a rather general nature. Indeed, as critics point out, in terms of content, the outcomes of such procedures are often rather general, superficial, and predictable.

Adjacent Fields

Besides the ethics of biomedicine, other subdomains displayed similar trends. Environmental ethics was already mentioned. After Rachel Carson and others signaled the environmental drawbacks of the science-based 'green revolution' that boosted food production, based on a policy devoted to the normative goal of diminishing hunger worldwide but involving the widespread use of artificial fertilizers and pesticides, the emergence of environmental ethics around 1970 coincided with the rise of the new bioethics described above. Whereas initially much conceptual work was done (in journals such as *Environmental Ethics*) on key ideas such as the intrinsic value of nature and ecocentrism, in publications that developed a relatively broad scope, the focus gradually shifted to concrete and local issues and causes involving various stakeholders and policy implications (value conflict management). There was a shift from deep ecology to a more pragmatic and policy-oriented approach. The focus shifted from broad theoretical considerations to a more pragmatic approach, using conceptual tools to mediate between conflicting moral views on nature management.

Another interesting case is food ethics. In ancient Greek and Roman philosophy, food was a important issue of concern, with temperance as a key principle or virtue. In modern ethics, that is, in the writings of prominent mainstream authors from Immanuel Kant to John Rawls, food had all but disappeared from the ethical agenda. This has clearly changed, however. Food ethics has emerged as a field in its own right with a relatively broad agenda, not only encompassing issues such as genetic modification, risk assessment, temperance and lifestyle, sustainable agriculture, and obesity, but also involving a broad range of tools ranging from ethical analysis to public participation.

The Era of ELSA or Integrated Research

The overall trend in these developments is one of increased interaction between the various strands involved (research, policy, society, and ethics). This trend is intensified even further in the context of latest developments in the area at hand. As the second millennium came to its close, many ethics experts turned their attention to genetic engineering and biotechnology. They were seen as the technologies "most likely to change our lives, for better or worse ... Indeed it may turn out to have as profound an influence on the development of society as all previous technologies put together" (Wheale et al., 1998: xvi). Yet, this same volume just cited, addressing the social management of biotechnology, indicated a shift of attention of ethics experts toward subsequent developments, notably the emergence of genomics and the Human Genome Project (HGP), launched in 1990, to which half of the volume's contributions are devoted. While biotechnology focused on animals and plants, the HGP focused on the core of human life itself. The HGP has been of crucial importance not only for biomedical and life science research, but also for the way ethical expertise evolved, notably because of the emergence of ELSA research, or integrated research. Actually, it was James Watson himself who, as the first director of the HGP, decided that a percentage of the budget of the HGP's research efforts should be devoted to studying the ethical, legal, and social issues related to genetic research and applications (ELSI research). At the press conference organized to announce his appointment as director, Watson suddenly and somewhat unexpectedly declared that the ethical and social implications of genome research

warranted a special effort and should be funded directly by the National Institutes of Health, the funding agency that was responsible for financing the larger part of the human genome sequencing effort. Watson argued that, in the face of unprecedented challenges, the 'contract' between science and society was bound to be revisited by the large-scale application of genomics results. Thus, besides discovering (together with Francis Crick) the structure of DNA, Watson can also be credited with 'inventing' ELSI or ELSA research (research into the ethical, legal, and social issues or aspects), thus providing the impetus for what came to be called 'elsification': the integration of societal research in large-scale technoscience programs. Ethical, legal, and social aspects of emerging technosciences such as genomics are addressed in an anticipatory and interactive manner. Rather than using a traditional top-down expert model, the ethicists involved interact in their projects with various stakeholders: experts not only from the technosciences (such as genomics researchers), but also 'societal experts' (representatives of societal organization and public audiences), in a process aimed at producing insights and recommendations that are valuable and relevant for a variety of stakeholders (researchers, policy makers, professional organizations, teachers, etc.).

Ideally, this new type of expertise, combining ethics and philosophy with social science research, is active during the whole knowledge production chain, from the early pilot stages of laboratory research, reflecting on possible societal implication in dialogue with researchers involved and in a prospective fashion, at times even contributing to the directions taken in the process of agenda setting for research (co-production), and finally empowering various stakeholders to adequately address societal and ethical issues in a timely fashion and formulating recommendations for policy and management. A recent series of EMBO reports on 'convergence research' in the science and society field provides an interesting overview of current approaches. Proximity to groundbreaking and innovative research programs, in combination with interdisciplinary and an anticipatory stance, are among the strengths of this new style of ethical reflection. They further provide timely assessment of moral issues as well as relevance for research and policy agendas. Possible weaknesses or pitfalls are the reduction of ethics to mediation (merely facilitating debate among stakeholders, at the expense of developing conceptual frameworks and theoretical expertise), or a focus on micro-issues, possibly at the expense of a broader diagnosis of the dynamical interwovenness of technosciences, society, and policy.

See also: Applied Ethics, Overview; Autonomy; Bioethics, Overview; Public Engagement in Science and Technology.

Further Reading

Berg van den JH (1978) *Medical Power and Medical Ethics*. New York: Norton.
Callahan D (1987) *Setting Limits: Medical Goals in an Aging Society*. New York: Simon and Schuster.
Cook-Deegan R (1994/1995) *The Gene Wars. Science, Politics and the Human Genome*. NewYork/London: Norton.
Engelhardt Jr.HT (1996) *The Foundations of Bioethics*. Oxford/New York: Oxford University Press.
Harvard Ad Hoc Committee (1968) Definition of irreversible coma: Report of the Ad Hoc Committee of the Harvard Medical School to Examine the Definition of Brain Death. *Journal of the American Medical Association* 205: 337–340.
Illich I (1977) *Limits to Medicine. Medical Nemesis: The Expropriation of Health*. Harmondsworth: Pelican Books.
Keulartz J (1998) *Struggle for Nature: A Critique of Radical Ecology*. London: Routledge.
Keulartz J, Schermer M, Korthals M, and Swierstra T (2004) Ethics in technological culture. A programmatic proposal for a pragmatist approach. *Science, Technology and Human Values* 29(1): 3–30.
Korthals M (2004) *Before Dinner. Philosophy and Ethics of Food*. Dordrecht: Kluwer.
Mepham B (1996) *Food Ethics*. London: Routledge.
Singer P (1975) *Animal Liberation: A New Ethics for our Treatment of Animals*. New York: Random House.
Singer P (2006) *The Way We Eat: Why Our Food Choices Matter/The Ethics of What We Eat*. Rodale Press.
Starzl T (1967) Ethical problems in organ transplantation. In: J.R. Elkinton (ed.) The Changing Mores of Biomedical Research: A Colloquium on Ethical Dilemmas from Medical Advances. *Annals of Internal Medicine* 67(suppl): 32–36.
Toulmin S (1982) How medicine saved the life of ethics. *Perspectives in Biology and Medicine* 25: 736–750.
Wheale P, von Schomberg R, and Glasner P (eds.) (1998) *The Social Management of Genetic Engineering*. Aldershot: Ashgate.
Zwart H and Nelis A (2009) What is ELSA genomics? *EMBO Reports* 10: 540–544.

Relevant Websites

http://en.wikipedia.org/wiki/Bioethics – Bioethics.
http://www.wiley.com/bw/journal.asp?ref=0269-9702 – *Bioethics* (journal).
http://www.society-genomics.nl/ – Centre for Society & Genomics.
http://www.genomicsnetwork.ac.uk/ – ESRC Genomics Network.
http://www.gspjournal.com/ – Genomics, Society & Policy.
http://www.thehastingscenter.org/ – Hastings Centre.
http://www.hugo-international.org/comm_hugoethicscommittee.php – HUGO Ethics Committee.
http://www.springer.com/medicine/journal/11673 – *Journal of Bioethical Inquiry.*

Biographical Sketch

Hub Zwart (1960) studied philosophy and psychology at Radboud University Nijmegen, the Netherlands. He worked as research associate at the Centre for Bioethics (Maastricht, 1988–92), was a visiting scholar at the Hastings Centre in 1989, and defended his thesis on consensus formation in a pluralistic society in 1993 (cum laude). He was appointed as research director of the Centre for Ethics (Nijmegen, 1992–2000) and acted as editor-in-chief of the Dutch Journal *Tijdschrift voor Geneeskunde en Ethiek.*

In 2000 he became full professor of philosophy at the Faculty of Science. He was European lead of the EU Canada exchange program Coastal Values (1999–2003), and in 2004 he became director of the Centre for Society & Genomics, funded by the Netherlands Genomics Initiative and established at his department. In 2005 he was also appointed as Director of the Institute for Science, Innovation & Society, one of six research institutes of the Faculty of Science.

The focus of his research is on epistemological and ethical issues in the life sciences: biomedicine (1988–96), research with animals (1996–2003), environmental research (1998–2003), and genomics (2003–present). His current research concerns the epistemological profile of genomics; philosophical implications of the Human Genome Project; epistemological profile of ecogenomics; challenges of macro-ethics (the ethics of bio-information); and scientific authorship and comparative epistemology (literary imagination as a research tool). In 2008 he published his book *Understanding Nature: Case Studies in Comparative Epistemology* (Springer). More information is available at http://www.filosofie.science.ru.nl/.