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# Ethics in Technological Culture: A Programmatic Proposal for a Pragmatist Approach

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*Neither traditional philosophy nor current applied ethics seem able to cope adequately with the highly dynamic character of our modern technological culture. This is because they have insufficient insight into the moral significance of technological artifacts and systems. Here, much can be learned from recent science and technology studies (STS). They have opened up the black box of technological developments and have revealed the intimate intertwinement of technology and society in minute detail. However, while applied ethics is characterized by a certain “technology blindness,” the most influential approaches within STS show a “normative deficit” and display an agnostic or even antagonistic attitude toward ethics. To repair the blind spots of both applied ethics and STS, the authors sketch the contours of a pragmatist approach. They will explore the tasks and tools of a pragmatist ethics and pay special attention to the exploration of future worlds disclosed and shaped by technology and the management of deep value conflicts inherent to a pluralist society.*

**Keywords:** *applied ethics; pragmatism; STS; philosophy of science and technology; normativity*

Pragmatist ethics . . . is not only interested in the application of pre-given normative rules, but in the construction of new possibilities for moral action . . . [in] the creative character of the solution of moral problems.

—Joas (1993, 253)

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In *The Public and its Problems* (1927), the pragmatist John Dewey described the rise of technological culture. Columbus may have discovered a new world in the geographical sense, but in reality, Dewey says, the new world was created only during the past century. “Steam and electricity have done more to alter the conditions under which men associate together than all the agencies which affected human relationships before our time” (Dewey 1954, 323). Dewey argues that these new technologies have contributed more to the establishment of modern democratic forms of government than the political theories of Locke and the utilitarians did. “The transition from family and dynastic government supported by the loyalties of tradition to popular government was the outcome primarily of technological discoveries and inventions working a change in the customs by which men had been bound together. It was not due to the doctrines of doctrinaires” (p. 326).

Dewey (1954) remarks further that the value of technological advances is seldom fairly assessed. These advances are generally held responsible for all the misery of modern existence, a widespread tendency that he dismisses as lazy thinking. “It is always convenient to have a devil as well as a savior to bear the responsibilities of humanity. In reality, the trouble springs rather from the ideas and absence of ideas in connection with which technological factors operate” (p. 323).

There seems to have been little change in this problematic situation since Dewey’s time. In a recent article, in which he posed himself the question of “how to live” in a technological culture, the Dutch philosopher Gerard de Vries concluded that the customary philosophical and ethical vocabulary is not properly equipped to formulate an appropriate answer to this question. This vocabulary is more of a hindrance than a help to a proper understanding of the technological culture (De Vries, 1999).

The problem we will be tackling in this article can be formulated in similar terms. On one hand, it is safe to say that the technological culture has a strongly dynamic character: old ways of life are continually being replaced by new ones, norms and values are continually being put up for discussion, and we regularly find ourselves confronted with new moral problems. On the other hand, however, neither philosophy nor ethics seem to possess a vocabulary that can accommodate this dynamic character adequately. In this article, we will first elaborate on the claim that the traditional ethical vocabulary falls short in view of the technological culture. Next, we will show that science and technology studies (STS) can make some contribution to ethical evalu-

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ation of technological developments but that this contribution is currently limited due to the “normative deficit” of STS. We will then discuss how pragmatism can be useful in developing an ethical approach that is better equipped to deal with technology than current ethics. What we propose is not a complete alternative for other forms of applied ethics but rather a complement. To develop a new perspective on the moral and social problems and conflicts that are typical for a technological culture, we will thus bring together insights from applied ethics, STS, and pragmatist philosophy. Although, due to our programmatic intent, we will not be able to do full justice to each of these three disciplines; we hope to avoid sketching caricatures and erecting straw men.

### The “Technology Blindness” of Ethics

Modern philosophy builds upon two traditions: an empirical one and a rational one. The foundation for the empirical tradition is formed by the work of Francis Bacon, in which a utopian program is launched, aimed at achieving social progress through scientific and technological means. The leading proponent of the rationalistic tradition was René Descartes. He regarded consciousness as the one and only unshakeable foundation upon which knowledge could systematically be constructed. The image of man that arises from modern philosophy is one of a completely autonomous subject who uses science and technology in a sovereign way to achieve his or her aims.

This humanistic and heroic self-image is still to a large extent characteristic of applied ethics. This discipline centers completely on people, their actions, and the regulation thereof. “Depending on the sort of ethical theory one supports, attention will be focused either on the presuppositions underlying actions or on the consequences of actions. In the former case, the question to be answered is whether the principle underlying the action satisfies ethical criteria, particularly whether it can be universalized. In the latter case, one asks whether the action contributes to the aggregated individual welfare” (De Vries 1999, 19).

As a result of this conceptual restriction, ethicists limit their search for the cement holding society together to the values, principles, norms, and rules by which people attune their actions to each other. However, society’s social and moral order is not only determined by symbolic constructions such as these, but just as much by material objects: “Fire, food, money, steam engines, dikes and polders, sewage pipes, viruses and computer systems have just as strong a binding effect as symbolic constructions, if not more so” (Harbers and Koenis 1999, 4).

As a result of its humanistic and anthropocentric self-image, applied ethics has been unable to move on from its technology blindness. If one were to look up the subject of “technology” in the most recent edition of Beauchamp and Childress’s famous handbook, *Principles of Biomedical Ethics*, one would search in vain. Nevertheless, it is obvious that technological advances in the very field of medicine and health care are an important source of moral problems and conflicts. Applied ethics seems to view technology mainly in instrumental terms; it can be used for good or for bad but does not form a subject of consideration in its own right. Apart from the view of technology as a neutral resource, technology is also often depicted as a threat, or as the polar opposite of good care. This negative view first appeared in Dutch discourse in a book by Jan Hendrik van den Berg titled *Medische Macht en Medische Ethiek* (Medical Power and Medical Ethics 1969), which played an important part in the rise of “principlism” in this country.<sup>1</sup>

To put it briefly, (medical) ethics is dominated by either a neutral or a negative vision of technology. In modern philosophy, both visions are now considered to be outdated. While classical philosophy of technology has given short shrift to the idea that technology is no more than an innocent resource, modern technology research has in turn raised doubts as to the utterly apocalyptic view classical philosophy of technology adopted to replace the instrumentalist vision.

### *Classical Philosophy of Technology*

Classical philosophers of technology, among whom Martin Heidegger and Jaques Ellul were the most prominent, hold a substantive rather than an instrumentalist vision. According to this view, technology is anything but neutral. It opens as if it were a specific window on the world and determines to a large extent how we observe and assess reality. This is the case for every form of technology, from the most primitive to the most advanced. However, while technology was previously no more than one of many windows on reality, in “the atomic age,” it has infiltrated every part of our culture and established absolute domination. As a result, science, art, religion, politics, and philosophy have lost their own independent ability to unlock reality and create sense.

Heidegger argues that under the reign of modern technology, reality manifests itself as raw material for production and exploitation. The present environmental crisis illustrates where unbounded subjugation of nature to man’s quest for power leads. However, not only the environment but also people themselves are victims of the “anthropocentric violence” that seems inextricably bound up with the humanistic discourse of modernity. As the develop-

ment of biotechnology has shown, man's control over nature is not limited to the external environment but extends deep into the inner structure of the human being. Back in the 1930s, Heidegger had already predicted that the human being would be relegated to a mere "technicized animal," once he became the main resource for technological control.

This conjures up an image with unmistakably apocalyptic characteristics. In the "age of his technological reproducibility," the once all-powerful human being seems condemned to absolute insignificance. Technology has not brought about liberation but instead a new form of slavery, which casts all forms of slavery throughout history in the shade. This is also the theme of *The Dialectic of the Enlightenment*, by Max Horkheimer and Theodor W. Adorno. Far from being an innocent tool that can be used for both good and bad, technology seems to be emerging as an independent life form, which humans no longer control. Or to put it another way, not man but technology is in reality autonomous. It follows its own logic and knows only one course: that laid down imperatively by the drive toward maximum efficiency. This view, powerfully expounded by Ellul in particular and also known as "technological determinism," has no place for the normative assessment and democratic control of technological innovation. Any attempt to offer resistance to these processes is doomed to failure from the start. Society can offer only one possible reaction to the unavoidable course of technological development: resignation, adjustment, and abstention.

In classical philosophy of technology, technology and culture form each other's opposites and the idea of a technological culture could only be an oxymoron. Modern technology studies have abandoned this dualistic, in fact, absolutely Manichean way of thinking. In contrast, they now place the interplay of technology and culture at their center.

### *Modern Technology Studies*

Modern technology studies have replaced the substantive vision of classical philosophy of technology with a pluralist one.<sup>2</sup> They have made a resolute break with the gloomy view of technology as a Moloch, to the gluttony of which every expression of an authentic culture falls victim, and which leaves behind only a one-dimensional world. Modern technology studies split this monolithic concept of technology into a variety of specific technologies, each of which requires separate analysis. The focus thereby is less upon the finished product and more upon the processes and practices through which these products take shape. This explains the trend toward studying "science in action" on site in the laboratory.

Modern technology studies have opened up the “black box” of technological development and revealed the intimate intertwinement of technology and society. Both scientific facts and technological artifacts appear to be the outcome of negotiations, in which many diverse actors are involved. Technology does not therefore operate upon society as an external influence but actually forms an integral part of it. Furthermore, there is rarely one single path of development but rather a number of potentially viable alternatives, which fall by the wayside when they are unable to obtain sufficient social backing. Technological developments are not completely autonomous at all. They do not so much follow their own patterns but rather are a fairly random result of social interactions. Modern technology studies have abandoned the doctrine of technological determinism and for the most part replaced it with a constructivist approach. Constructivism does not view culture as unilaterally subject to technological imperatives, but argues that there is a coevolution of technology and society. To be able to introduce technological artifacts successfully into society, one must change certain aspects of society, while one can also say that the development and design of these artifacts takes place in a social field of influence, with many different players, each with diverse interests, aims, resources, and means of power.

It is of great importance for our argument that constructivism has vigorously exposed the normative significance of technological artifacts. According to the sociologist of technology Madeleine Akrich (1992), these artifacts carry a script or scenario within them. They require particular role patterns and lay down a specific “geography of responsibilities.”

### *The Scenario of the Pill*

Modern contraceptive technology offers a good illustration of this idea of a normative scenario (see Oudshoorn 1995). The pill can be classed as a technology that largely delegates the responsibility for its use to the consumer. She or he may still be dependent on a doctor for access to this medication but is otherwise free to decide whether to keep taking it. One problem with this product is that it demands a great deal of self-discipline from the user. To remedy this, an implantable contraceptive was developed with a working life of up to five years and brought onto the market under the brand name “Norplant.” It consists of six small silicone rods, which are implanted under the skin of the upper arm and which gradually release a hormone. Norplant implies a different geography of responsibilities than the pill. Responsibility is partly delegated to the health care professionals; after all, a surgical procedure is involved, preceded by a gynecological examination, and followed by regular checkups. Responsibility is also partly delegated to the artifact itself.

“To compensate for the assumed lack of self-discipline on the part of the consumer, this new contraceptive was developed in such a way that it contains an in-built guarantee for continual use. The requirements formulated by researchers for the use of contraceptives were no longer delegated to the user but to the artifact. In this way, artifacts become ‘technical delegates’, to use Latour’s well-chosen term. They are designed to compensate for assumed ‘moral deficiencies’ on the part of the user and to bring discipline to the behavior of people” (Oudshoorn 1995, 281). Well-known examples of such “technical delegates” are door-springs, seat belts, speed limiters, and “sleeping policemen” (see also Latour 1993).

As with all new postwar contraceptives, the pill implies a gender-specific geography of responsibilities. The pill is meant for women, not men. This unequal division of responsibilities has prompted criticism from feminists. The female pill may have given women more autonomy over their own bodies, but on the other hand, they are also the ones exposed to all of the associated health risks. The development of a male pill, which is currently underway, would enable a more equal division of responsibilities and risks between men and women. Male interest groups have also made the case for a male pill. This is not so surprising, because the female pill not only makes women less dependent upon health care professionals, but it also gives them more power over family planning in comparison with men than was previously the case. “The script of the male pill is thus double-edged. While there is a more equal division of health risks and responsibilities between men and women, there is also a shift in who has authority over whether or not contraceptives are used” (Oudshoorn 1995, 286).

The example of the pill makes clear that technological artifacts provide people with certain social roles and power relationships, in accordance with their script or scenario. However, their influence extends still further. More indirectly than directly, they can bring about profound changes in our mentality and morals over a broad social front. To illustrate this, the pill can be taken as an example again.

Thanks to its high level of reliability, the pill created the possibility of separating sexuality from reproduction. This has had far-reaching consequences for sexual behavior and morals. The pill played a large role in the sexual revolution because it enabled people to experiment “unpunished” with their sexuality from an early age, with all of the consequences this has had for marriage.

The introduction of the pill was also accompanied by a shift in society’s perception of reproduction. Under the influence of the pill, a “birth regulation mentality” gradually developed. “This does not only mean that every child ought to be a wanted child, but also that people are planning their lives around the proviso that a child should only come—and then must also



come—once the desired social and economic space has been created” (Ketting 2000, 285). This new mentality has had repercussions for the practice of abortion. There may well be much fewer unintended pregnancies now than before the pill was introduced, but the few that still occur are, as a result of this mentality, much less readily accepted than previously. If a pregnancy occurs before the set conditions have been met, then a request for an abortion will often follow. The annual number of abortions has therefore not actually decreased since the introduction of the pill. Whereas previously, the option of abortion came up for discussion only when a pregnancy was completely unwanted, it now comes up even if the pregnancy was just unplanned. “The interesting thing is that the simple fact of the pregnancy being unplanned, almost always renders that pregnancy completely unwanted too” (Ketting 2000, 285).

The example of the pill makes it clear that technological artifacts embody particular options and restrictions: they invite certain kinds of action or behavior and discourage other ones, and thus reinforce or alter existing role divisions and power structures. The normative ramifications of technological artifacts are rarely limited to the practice for which they are intended but often also filter through into associated or adjacent practices (in the case of the pill, into marriage and abortion). The significance of these insights for ethics has until now not been acknowledged sufficiently. Perhaps as a result of the anthropocentrism of traditional ethics, applied ethics has not yet opened up the black box of technological development. Though it does pay some attention to the moral problems invoked by the use of new technologies, it remains blind to the moral significance of the technology *itself*. This condemns applied ethics to be left running to catch up with the facts. More and more attention may be devoted to the everyday functioning of laboratories, hospital departments, and nursing homes, and there may be more awareness of the importance of negotiation and decision-making processes in the workplace, but this mostly remains limited to the actions of people, thereby ignoring the normative significance of technological artifacts.

As long as it clings to its “anthropocentric prejudice,” ethics will not be able to accommodate adequately the dynamic character of the present technological culture. Of further importance is that foundationalism, which has dominated ethics for a long time, is mainly aimed at underpinning moral rules and judgments on the basis of one or more universal starting points or principles. Consequently, little attention is paid to *change* of norms and morals over time, influenced by technological and other developments. The idea of change plays no significant role in ethical theory building. In the previously mentioned handbook by Beauchamp and Childress, this notion is also conspicuous by its absence. A search in the Philosophers Index or the

Bioethicsline using the keyword *moral change* produces very few references. In as far as change is discussed at all in ethics, it is usually in an extremely limited way, either in terms of continuity or of the “slippery slope.” This can be illustrated by the debate surrounding biotechnology and cloning.

### *The Example of Biotechnology and Cloning*

Supporters of biotechnology are often the first to argue that this technology is not actually as new as people think but rather just a small step in a long line of development. Biotechnology does not differ essentially from breeding technologies long accepted and applied on a large scale in livestock farming, agriculture, and horticulture. In the same way, objections to the reproductive cloning of humans are usually brushed aside with the argument that this is just “business as usual.” Ask whether we are not playing God, and therefore playing with fire, in practicing cloning, and you will receive the following answer from the American philosopher Ronald Dworkin: “But that is what we mortals have done ever since Prometheus, the patron saint of dangerous discoveries. We play with fire and accept the consequences, because the alternative is an irresponsible cowardice in the face of the unknown” (Dworkin 1999).

In the debate on cloning, the argument that there is nothing new under the sun recurs time and again. The argument that the transplantation of a relatively “old” cell nucleus could lead to a shortened life expectancy is met by the answer that we accepted such “irresponsible” risks when in vitro fertilization (IVF) was being developed. After all, no one knew back then how the first test-tube baby would get on. To counter the objection that the psychological well-being of the clone could be harmed by pressure to live up to the original, it can be argued that even children in “normal” family circumstances are continually confronted with a range of expectations. To counter the objection that we are coming to see children as products in which no defects of any kind are permitted, it could be argued that we already have such a view as a result of a range of existing technologies, such as prenatal genetic diagnostics or preimplantation diagnostics (see De Beaufort 1998).

By relying upon *continuity arguments* such as these, one denies that there is actually anything new involved. The new element is traced back to something that already exists, thereby rendering it harmless as it were. This is often an immunization strategy, with which people want to shield themselves from criticism and to prevent an extensive debate on the pros and cons of technological innovations.

The *slippery slope argument* is usually used by opponents of new developments. According to this argument, taking a first step on a particular road

will inevitably and irreversibly lead to a whole series of steps, which in turn will lead ultimately into the moral abyss. This argument has also arisen regularly in the debate on cloning: "Straight from 'Dolly from Scotland' to 'the Boys from Brazil'; no stopping in between" (De Beaufort 1998, 110). While the continuity argument trivializes the new element, the slippery slope argument demonizes it. This argument does not help move the debate further on either, which Inez de Beaufort argues is not unintentional. "The intention (of this argument) is actually to stop the debate. And often: to stop the practice" (De Beaufort 1998, 111).

The empirical version of the slippery slope argument is only plausible if one takes the view that technological developments have only one course, upon which society cannot exercise any influence at all once the first step has been taken. The logical version of the slippery slope argument is in fact a continuity argument.<sup>3</sup> It goes as follows: once we regard a practice as morally acceptable, we will logically also have to accept other (undesirable) practices, as there is no essential difference between these practices. Here, by the way, the continuity argument shows itself to be a double-edged sword, which can be used retroactively by opponents of a particular new technology to question the existing, already established, and accepted practice.

What all these arguments have in common is that they judge new developments from within the existing moral framework. The new is traced back to the old, or it is demonized, but this does not prompt any change in the moral vocabulary itself.

### **The Normative Deficit of STS**

As a result of its technology blindness and foundationalist tendencies, ethics is barely able to cope with the change and renewal that is an everyday affair in a technological culture in a creative or innovative way. In this respect, ethics has much to learn from modern technology studies, in which the intimate intertwinement of technology and society is exposed in minute detail. As a result, modern technology studies seem to offer the necessary scope for the democratic control and normative assessment of technological developments. On the other hand, most constructivists have an agnostic or even antagonistic attitude toward ethics.

Within STS, two broad varieties of constructivism can be distinguished: moderate constructivism and radical constructivism (see Hagendijk 1996). Prime examples of moderate constructivism are the Strong Programme (SP) of Barnes and Bloor and the Empirical Programme of Relativism (EPOR) of Harry Collins. The insights of EPOR with respect to "interpretative flexibil-

ity” and “closure mechanisms” were transplanted from the sociology of science to the sociology of technology by Pinch and Bijker (1987) in particular. They developed an approach called the Social Construction of Technology (SCOT). Moderate forms of constructivism share the assumption that scientific and technological developments can be explained by social factors like dominant group interests or existing power structures. Radical constructivists profoundly challenge this assumption. The most important varieties of radical constructivism that nowadays are highly influential in the field of technology studies are the Actor-Network Theory (ANT), by Bruno Latour (1987) and Michel Callon (1987), and the reflexive approach to science (“reflexive ethnography”), by Steve Woolgar and Malcolm Ashmore (1988), among others.

Radical constructivists accuse moderate constructivists of substituting one form of determinism—technological determinism—with just another form—social determinism (e.g., Woolgar 1991). Instead of explaining technology on the basis of society and its structures, radical constructivists look at both technology and society as fabrications. They oppose the idea, forcefully put forward by Langdon Winner (1980), that artifacts have politics “built into” them. The discussion of Winner’s by-now-classic example of Robert Moses’s low bridges has made it clear that the politics of artifacts should not be interpreted as intrinsic and invariable features and that the kind of script that artifacts display depends on the specific context in which they are designed, developed, and used.<sup>4</sup> Radical constructivists will subscribe to the first conclusion but not to the second one because they insist that we cannot determine what the specific context looks like apart from the interpretations of relevant actors or “actants.” Here, we run up against what could be called the normative deficit of the constructivist approaches to science and technology.

It is certainly true that moderate constructivism is already lacking in normative respect,<sup>5</sup> but with the turn from moderate to radical constructivism, normative reflexivity became nearly absent (see Radder 1992, 1998). Radical constructivists are committed to a “methodological agnosticism,” not only about what kinds of societal influences shape technology but also about what kinds of social, political, and moral impacts technology has (see Winner 1993). For the normative evaluation of emerging technologies, their favorite motto “follow the actors of science and technology without taking sides” means that we are totally dependent on the various interpretations of the different relevant groups involved, unable to choose between them or to come up with an interpretation from the “outside.” What counts as the capacity and effect of a technology is socially structured and is consequently contingent and open to renegotiation (Grint and Woolgar 1995, 298). But, as Radder

(1992) rightly observed, such a “judgmental relativism” according to which any interpretation is as valid or as invalid as any other is impossible in practice. In view of this fact, two reactions can be observed. On one hand, some constructivists argue that symmetrical social analysis should favor the weaker side or “underdog” in scientific and technological controversies like women or lay people.<sup>6</sup> But this partisanship is not only inconsistent with the methodological agnosticism that most constructivists endorse, but it is also quite arbitrary—a kind of a “crypto-normativism.”

On the other hand, especially within the actor-network approach, there is the opposite tendency or danger to analyze the process of network or system building exclusively from the winner’s point of view rather than from the loser’s point of view. According to Radder, the “winners-losers” terminology is suggested quite strongly by the military metaphors of the actor-network theory. According to Latour (1993), the constitution of norms and values should be described and analyzed in the same way as the emergence of facts and artifacts: not in terms of consciousness, cognitive power, method, fundamentals, and rationality, but in terms of allies and opponents, strategic negotiations, and tactical maneuvers. Regardless of how effective such metaphors, derived from war and power struggles, may be for questioning the standard view of science and technology, their use is difficult to reconcile with ethical deliberation, in which justified norms and values are sought in order to evaluate the development of technologies.

In his 1992 article, Radder argued that STS should overcome its fear of becoming explicitly normative. He concluded that one should “try to combine the achievements of the empirical approach—their more adequate views on the practice of science and technology—with normative insights concerning the problematic aspects of our technoscientific world” (p. 143).<sup>7</sup> It is exactly this combination we have in mind with our proposal for a pragmatist approach to ethics in a technological culture.

### **The Pragmatist Alternative**

So, while applied ethics has to a large extent remained stuck in its technology blindness and devotes insufficient attention to the normative significance and effects of technological artifacts and systems, modern technology studies are characterized by a certain hostility toward ethics.<sup>8</sup> The impasse that has arisen from this can, we believe, be broken by a reevaluation of pragmatism. Pragmatism shares with constructivism its central insight in the co-evolution of technology and society but differs from constructivism in that it gives serious consideration to the associated normative implications.

During the past few decades, pragmatism has made a remarkable comeback as a broad philosophical movement, not only in America but also much further afield. In Europe, even in the heyday of pragmatism, there was little enthusiasm for the works of “the classical quartet”: Charles Sanders Peirce, William James, John Dewey, and George Herbert Mead. The history of the continental reception of this American philosophy was a “history of misunderstanding” (Joas 1993). Due to its supposed utilitarianism and meliorism, this philosophy “from the land of the dollar” was dismissed on the eastern side of the Atlantic as superficial and opportunistic. But even in America itself, pragmatism lost much of its original appeal following the Great Depression. After the Second World War, it even seemed that pragmatism had had its day, and its place was taken by analytical philosophy.

However, in the 1960s already there was evidence of a turnaround in the appreciation of pragmatism. Remarkably enough, the first signs of this were observed in Germany, where, from 1963, Karl-Otto Apel and Jürgen Habermas gave lectures and wrote articles on Peirce and his pupil Charles Morris, and later on Mead too. Both expressly positioned themselves in the pragmatist tradition, describing their philosophy as “transcendental pragmatism” and “formal pragmatism,” respectively. Another important spur toward the reevaluation of pragmatism came from analytical philosophy itself, which began to show increasing signs of exhaustion in the 1960s and 1970s. The names of Wilfrid Sellars, W. V. Quine, and Hillary Putnam marked the main stages in the transition from a more analytical to a more pragmatist approach to philosophy. The final stage was reached with the work of Richard Rorty, the “Trojan horse of analytical philosophy,” who contributed as no other had to the current revival of pragmatism. Rorty has added Wittgenstein and Heidegger to the canon of pragmatism and, together with Dewey, declared them to be the greatest philosophers of the twentieth century. Furthermore, he has worked vigorously to lay bare certain “family resemblances” between pragmatism and postmodernism, as Derrida represents it in particular.

### *The Three Pragmatist “Antis”*

Given this wide diversity of philosophers, it is clear that pragmatism must not be understood as a systematic theory in the usual sense but rather as a particular series of theses, “theses which can be and were argued very differently by different philosophers with different concerns” (Putnam 1994, 152). As Rorty continually emphasizes, these theses are in fact antitheses, that is to say, theses aimed against particular basic philosophical principles that form

obstacles to a productive solution of problems and a satisfactory settlement of conflicts.

*Antifoundationalism.* Pragmatists reject every form of foundationalism and instead adhere to a distinct fallibilism. The “quest for certainty,” which philosophy has celebrated since Descartes, ought to be given up for good as illusory. All our convictions, without exception, are of a provisional nature and are in principle susceptible to repeal or review.

*Antidualism.* As well as foundationalism, pragmatists also reject essentialism. The dualism of essence and appearance is however only one of the many dualisms with which philosophical jargon has been punctuated since time immemorial. Other well-known examples are the dualism of theory and practice, of consciousness and external reality, of duty and inclination, and of fact and value. As we have already established, applied ethics and classical philosophy of technology also have a strongly dualistic character. They assume that there is a sharp dividing line between scientific facts and technological artifacts, on one hand, and moral norms and cultural values on the other. Traditional philosophy provides these distinctions with an ontological status and makes them a favored subject of metaphysical speculation. Pragmatists deny such an elevated status to these distinctions and give them only a functional significance, in accordance with their potential usefulness for problem solving. In other words, these distinctions do not precede research but are formed or construed only during the research itself, with a view to practice. The dividing lines between opposing concepts are not clear and fixed forever from the start but rather display a changing and fluid character.<sup>9</sup>

*Antiskepticism.* According to pragmatists, fallibilism should not be equated with skepticism. If absolute certainty is not achievable due to a lack of metaphysical guarantees, this does not mean that people are left at the mercy of universal doubt. According to Peirce, there is a world of difference between fallible knowledge and no knowledge at all. There is only more and less reliable knowledge. The Cartesian doctrine that philosophy must begin with universal doubt to finally obtain absolute certainty is not tenable.

We cannot begin with complete doubt. We must begin with all the prejudices which we actually have when we enter upon the study of philosophy. These prejudices are not to be dispelled by a maxim, for they are things which it does not occur to us *can* be questioned. Hence the initial skepticism will be a mere self-deception, and not real doubt. . . . A person may, it is true, in the course of his studies, find reason to doubt what he began by believing; but in that case he



doubts because he has a positive reason for it, and not on account of the Cartesian maxim. Let us not pretend to doubt in philosophy what we do not doubt in our hearts. (in Stuhr 2000, 55)

Peirce distinguishes in this passage between real doubt and philosophical doubt, and argues for a symmetrical treatment of doubt and belief, with the understanding that the entertainment of either must be justified. One must have reasons to doubt, as well as to believe.<sup>10</sup>

### *Living and Working Together*

These pragmatic antitheses are of importance for a pragmatist approach to ethics. The moral core intuitions of pragmatism revolve around the possibilities for living and working together. While consequentialists take collective happiness to be the moral touchstone and deontologists, the obliging character of moral norms, peaceful cohabitation and fruitful cooperation serve as the moral touchstone for pragmatism.<sup>11</sup>

This normative perspective sheds a specific light on the central (anti)theses of pragmatism. These can be seen as being directed against certain philosophical assumptions that often become, in practice, obstacles for fruitful cooperation. Because of their preoccupation with general and abstract truths, foundationalism and essentialism are often counterproductive—they distract attention from concrete problems and conflicts tied to particular times and places, which actually call for a measure of flexibility, hermeneutic tact, and context sensitivity. Dualism is counterproductive because it encourages “black-and-white” thinking, which brings conflicts to a head and leads debates to degenerate into unproductive boundary disputes or to get stuck in childish “does not”–“does too” exchanges. Skepticism, which cultivates philosophical doubt at the expense of real doubt, also forms an obstacle to a creative tackling of problems. Anyone who puts everything up for discussion will simply have no time left for the real problems of the moment.

### *Two “Progressive Problemshifts”*

The moral point of reference of fruitful cooperation and peaceful cohabitation does not only shed light on the pragmatic antitheses and their internal relationship, but it also reinforces two progressive problemshifts that are characteristic for pragmatism. Because of its attention to the settlement of conflicts for the sake of further cooperation, pragmatism has always been interested as much in the *process* of (moral) inquiry as in its ready-made *products* (see Caspary 2000, 153). To promote the fairness and quality of the



process of inquiry and deliberation, it is essential that all those concerned can have their say and that decisions are made on the basis of a careful consideration of all relevant conflicting moral claims and arguments.

A second shift to which the standard of fruitful cooperation and peaceful cohabitation gives rise is a shift in emphasis from the *context of justification* to the *context of discovery* (Caspary 2000, 161). Pragmatists attach as much importance to the justification of moral judgments as they do to heuristics, to the “art of invention.” Pragmatism emphasizes the importance of novel constructs and hypotheses with which emergent problems can be tackled, while in more traditional ethics the entire emphasis still lies upon justification of moral judgments.

The distinction between the context of justification and the context of discovery is related to what has been called the *split personality* of pragmatism, a term referring to the distinction between the rationalist and the romantic side of pragmatism (see Westbrook 1998). That pragmatism has shown both rationalist and romantic traits from the very outset was already noticed in 1911 by René Berthelot, who dedicated a critical study on the pragmatist movement (see Rorty 1998). Berthelot traced the rationalist roots of pragmatism to the influence of Charles Darwin and Herbert Spencer, and the romantic roots back behind Ralph Waldo Emerson to Schelling and Hölderlin. The rationalist side of pragmatism is concerned with the cognitive capacity for argumentative problem solving and justification, while the romantic side is concerned with the creative capacity for the innovation and invention of vocabularies which provide new meanings and open new perspectives.

### Tasks and Tools for Pragmatist Ethics

If we combine the distinction between rationalist and romantic aspects of pragmatism with the distinction between product-oriented and process-oriented approaches, this results in the following matrix of tasks for a pragmatist ethics (see Table 1). Some of these tasks are well known to prevailing forms of applied ethics, but others constitute supplements that we believe are necessary to make ethics better geared to dealing with moral problems in a technological culture. We propose that depending upon the moral problem at hand, pragmatists will switch between these different tasks and their corresponding methods or tools.

The tasks in box (a) are the traditional tasks of applied ethics. Here, the role of the ethicist is that of the lawyer or the moral engineer. The main

**Table 1. Tasks for a Pragmatist Ethics**

	<i>Product</i>	<i>Process</i>
Rationalist ("context of justification")	(a) Traditional ethics Providing arguments and justifications for or against courses of action	(b) Discourse ethics Structuring and safeguarding fair public deliberation and decision making
Romantic ("context of discovery")	(c) Dramatic rehearsal Criticizing and renewing vocabularies, exploring possible future worlds	(d) Conflict management Aiding an open confrontation of heterogeneous moral vocabularies and worldviews

activities include providing, clarifying, and explicating various arguments, constructing moral arguments and justifying moral rules for (or against) specific courses of action. Common methods in applied ethics are principlism, casuistry, cost-benefit analysis, and so on.

The tasks in box (b) form the domain of the so-called discourse ethics, especially as it was developed by Apel (1988) and Habermas (1991). The goal of discourse ethics is the improvement of the rationality of public debate and decision making. Therefore, one should help to develop procedures and institutions that guarantee equal access to public deliberation and fair representation of all relevant arguments to ensure that moral decisions are based on the "force of the better argument" rather than on the forces of power, money, and the like. The methods of discourse ethics include stakeholder analysis (who has a stake in the matter in question and should consequently have a say in the debate?) and institutional analysis (to what extent is the institutional setting of the debate in line with the "ideal discourse situation," as characterized in Habermas's theory of communicative action?).

For more "common" and familiar types of problems for which the relevant ethical considerations are in principle known,<sup>12</sup> the prevailing rationalist tools of applied ethics and discourse ethics usually suffice, while for new problems for which existing rules and routines are not adequate, it will be necessary to resort to the romantic side of pragmatism. In this final section, we will concentrate on this romantic side, since the rationalist side is already relatively well known. First, we will discuss some tasks and tools belonging to dramatic rehearsal and next some tasks and tools pertaining to conflict management.

### *Dramatic Rehearsal*

The romantic side of pragmatism comes preeminently to the fore in what Dewey calls “dramatic rehearsal,” the imagining of a plurality of possible futures and the ways that lead to their realization. This involves thick descriptions of complex scenarios, of various competing possible lines of action and courses of conduct. According to Dewey, creative deliberation is dramatic in three senses: in its concern with character, which mirrors our dominant interest in the manifestation and interaction of personalities; in its concern for plot, for creative redescriptions and new narratives; and in its suspenseful and open-ended nature (see Caspary 2000, 113-14).

Dramatic rehearsal is similar to what Gustafson (1990) once termed the “prophetic discourse” in ethics.<sup>13</sup> Gustafson distinguishes two varieties: the apocalyptic and the utopian. In addition to this distinction, another important distinction should be mentioned here: the distinction between future scenarios pertaining to technological culture as a whole and scenarios concerning separate technologies. The first type of future scenario takes on the character of cultural criticism and ideology critique pursued by authors such as Nietzsche and Foucault or by movements such as feminism or Marxism. Whole vocabularies, discourses, or broad technological developments can be criticized or put up for revision. Classical philosophy of technology in the tradition of Heidegger and Ellul that sketches a rather apocalyptic image of the future provides another example of this type.

For future scenarios concerning separate technologies, STS can provide useful tools—for example, the “material hermeneutics” of Don Ihde (1998). Material hermeneutics aims at the exploration of possible future worlds that are disclosed and shaped by new technologies and investigates the question whether our common moral vocabularies and our current institutional arrangements are still suitable or have to be revised or replaced in the light of these possible future worlds.

An example of material hermeneutics can be found in Schermer and Keulartz (2002). They take the case of IVF to explore the consequences and ramifications a new technique can have on society. IVF has increased the number of parties involved in the creation of a child. Not only commissioning parents, donors, and surrogates but also physicians, lab technicians, lawyers, institutions like sperm and embryo banks, infertility centers, laboratories, and surrogacy agencies are involved. A complex network is thus created, a network in which the embryo or child-to-be is the central knot. Schermer and Keulartz focus on the novel character of IVF and show the emergence of a new entity (“the embryo”), of a new medical practice (productive in stead of curative), and of new (family) relationships. They map the accompanying

shifts in moral responsibilities and social roles and argue that these shifts have not always been adequately noticed and accounted for in bioethics.

Perhaps the greatest novelty of IVF was that it separated the embryo from the body of its mother. In doing so, it actually created a new distinct entity, the “early human embryo.” The embryo as a new subject has been discussed at length in bioethics. This was not the case, however, with respect to two other main issues that were raised by IVF.

The first issue concerns the division of biological motherhood. With IVF, it became possible to have one woman’s fertilized egg carried by a second woman. Thus biological motherhood (which could already be opposed to social motherhood) was broken up into genetic and gestational motherhood. It became possible for a child to have five parents: two genetic parents, two social or rearing parents, and a surrogate or gestational mother. Different combinations of gametes, wombs, and rearing parents render many different parenting arrangements. The possibilities for creating new family relationships, living arrangements, and forms of parenthood seem sheer endless. They signal the need to rethink the social, moral, and legal basis of family relationships and the meaning of concepts like family and kinship. However, these questions have received rather fragmented and one-sided attention in bioethics. Schermer and Keulartz (2002) claim that a pragmatist ethics would argue for an open and creative view on new family constructions and arrangements. A pragmatist ethics could argue for an understanding of the family in functional terms as suggested by Hickman (1999); it might explore a notion of “multiple parenthood”; or it might explore possibilities to understand “parenthood” in a more gradual way, with different degrees of involvement and responsibilities.

The second key question that is raised by IVF concerns the shift from private procreation to public reproduction. With IVF, Schermer and Keulartz (2002) notice, reproductive medicine literally became *productive*, for it created new life. The emergence of a new “practice” within medicine has gone largely unmentioned, whereas it makes it necessary to create new concepts or a new vocabulary, to define new (social) roles and responsibilities, and to develop new rules guiding this practice. This new practice can be characterized by the fact that it treats people’s desires and not their diseases. It includes not only a number of reproductive techniques but also, for example, elective cosmetic surgery. Both reproductive medicine and cosmetic surgery are productive rather than curative and they create a different relationship between client and physician than the traditional one. This has been recognized insufficiently by traditional bioethics—a pragmatist ethics would emphasize the emergence of a new practice and explore possible arrangements for the new rules, relations, and responsibilities to go with that new practice.

### *Conflict Management*

Assessment and evaluation of technological developments often bring to light deep-seated and fundamental value conflicts. Handling such value conflicts forms one of the main challenges for a pragmatist ethics because the problems that threaten cooperation and cohabitation are most pregnant and manifest here. Antifoundationalism and antiessentialism are important starting points here, since pragmatists will look for solutions in a more practical direction instead of looking for ultimate moral truths or foundations for the “only right answer” as traditional ethics tends to do. It is also important to recognize that the traditional liberal solution of making a split between the public and the private is more difficult to maintain where technological developments are concerned. Such developments often have a private as well as a public side that cannot be simply or clearly separated, as the case of IVF illustrated.

Like traditional ethics, discourse ethics is not always able to handle fundamental differences and disagreements in a satisfactory way.

Discourse ethics is mainly concerned with what Habermas has called “moral discourses.” Such discourses evolve around issues of justice, in which the question of “what is equally good for all” is central. In contrast, “ethical discourses” turn on the issue of the good life and on the question of “what is good for us” as members of a specific nation, members of a local community, inhabitants of a region, and so on. In ethical discourses, the attempt is made to reveal, through critical reflection, the deeper consonances in a common form of life that can bridge differences of opinion. Unlike a moral consensus such an ethical consensus is not (and cannot be) entirely rationally motivated. Participants in an ethical discussion can, after all, never work themselves free from the place- and time-bound perspective of the cultural form of life that is the subject of their deliberations. An ethical consensus can exist only *within* a single community. In modern pluralistic societies, however, discussions take place primarily *between* different communities, which often hold competing views of the good life. In that situation, an ethical consensus is impossible, and because ethical convictions differ from negotiable interests, a fair compromise is not suitable either; in ethical matters, one cannot bargain nor make concessions without compromising oneself and one’s integrity (Bohman 1996).

So the question becomes how to handle deep-seated value conflicts if the possibilities for consensus and compromise are eliminated. The answer we would suggest is that we should aspire to an “equal coexistence” of different ethical convictions.<sup>14</sup> The ideal of equal coexistence requires a certain attitude of the conflicting parties. They have to appreciate the fact that they are

competing for primacy within the same universe of discourse with others who cannot beforehand be branded as unreasonable. Such reflexive awareness rejects the naivety of dogmatic beliefs, recognizes its own fallibility, and leaves room for “reasonable dissensus.”

Pragmatists aim to develop different tools of “conflict management” to enhance mutual respect and to promote the ideal of equal coexistence. One method to make persistent conflicts manageable is breaking up dualisms and relativizing rigid dichotomies. This can be done through gradualization: thinking in terms of degrees instead of boundaries.<sup>15</sup>

One example of this is the debate between animal protectionists and nature conservationists about the moral problems associated with the introduction of large herbivores in newly developed nature areas in the Netherlands (Klaver et al. 2002; Keulartz et al. forthcoming). The herbivores released are basically domesticated species that are derived from hoofed animals that were once wild, such as cattle, horses, sheep, and goats. Konik horses and Heck oxen represent a special subcategory in this group, since they are meant to “function” as semiwild surrogates for such extinct species as the tarpan and the auroch. Most of them come from farms, zoos, or small parks, in short, from quite domesticated backgrounds; when introduced into relatively wild areas, they will be subject to a process of, what Klaver et al. call, “de-domestication,” that is, they have to learn to fend for themselves. The management policies of dedomestication, which entail minimizing supplementary feeding and veterinary assistance, have been most controversial. Most controversies revolve around the “domestication status” of the animals: should they be seen as (still) domesticated or as (already) wild? While the majority of the animal protectionists, farmers, and visitors view the released horses and cattle as domesticated animals to be cared for as individuals, most park rangers, herd managers, and ecologists prefer to treat them, ethologically and ethically, the same as wild animals in the areas at stake. Unfortunately, environmental philosophy is in no position to offer a way out of this stalemate, because within this branch of philosophy, there is an ongoing debate between individualistically oriented animal-welfare ethicists and holistically oriented ecoethicists that strongly reflects the polarized debate between animal protectionists and nature conservationists. As a result of this discord, people exhaust themselves in unproductive boundary disputes in which both sides claim an exclusive “moral jurisdiction” over large herbivores.

According to Klaver et al. (2002), this impasse can be broken if we replace the notion of a clear-cut borderline between nature and culture by the idea of a broad continuum, a hybrid middle ground, in which it is no longer a question of “either-or” but of “less or more.” Herbivores introduced in nature

areas do not simply cross a distinct dividing line between culture and nature; they do not walk from domestication into the wild, that is, from a moral domain of individual care to one of concern for the ecological whole. They gradually move from a thoroughly cultural context to one that is increasingly natural.

To do justice to the gradual character of dedomestication, Klaver et al. (2002) introduce a new ethical notion with regard to the treatment of large herbivores in newly developed nature areas: the principle of “respect for potential wildness.” Emphasizing the *potential* aspect of wildness concedes a capacity for wildness, and at the same time, it acknowledges that dedomestication is a dynamic process with an uncertain and unpredictable outcome. In such a process, both animal welfare ethicists and ecoethicists will be indispensable. Klaver et al. launched this new ethical concept explicitly with the pragmatic intention to overcome the deadlock in the debate between advocates and opponents of the Dutch herbivores introduction program.

But often such a strategy of gradualization does not work well enough or at all, as is evident from the discussion over the status of the embryo in connection with abortion or medical experimentation. In this case, an attempt was made to break the impasse by redefining the embryo as a “potential person.” From the ensuing debate, it is clear how rigid thinking in terms of dichotomies is: while some say that we have no obligations to embryos because a potential person is not a real person, others think that we do have obligations, even to human eggs, because these are potential persons too. In this case, the concept of the potential person is once again seen as a question of “either-or” and not as one of “less or more.” If making the change from boundaries to degrees does not work sufficiently or at all, one will have to look for other ways to obtain an equal coexistence between rival vocabularies. A particularly promising way seems to be the so-called common-ground dialogue.<sup>16</sup> Common-ground groups find it more constructive to leave core commitments off the table and to search for areas and issues where some kind of agreement is within reach. William Caspary (2000) describes as an example of this strategy the efforts to create a common-ground dialogue between pro-life and pro-choice representatives in the abortion debate. These efforts were motivated by dismay at the escalating incivility in clinic protests and public debates, and they also reflected a perceived stalemate in the courts and legislatures. Pro-life and pro-choice representatives met and discovered shared concerns about, for example, the expediency to reduce abortion by preventing unwanted pregnancies—teaching young people to resist peer pressure for early sexual activity proved to be acceptable to both sides.

Looking for common ground is in our opinion a promising way to combine two central tenets of pragmatism: the candid acknowledgment of the

inevitable plurality of moral vocabularies on one hand and the commitment to work at finding solutions for the problems of human cooperation and cohabitation on the other.

## Conclusion

In this programmatic article, we have intended to show that applied ethics has insufficient insight into the moral significance of technological artifacts and systems and that it therefore cannot cope adequately with the dynamic character of our technological culture. Analyses of this technological culture and of technological developments as are performed within STS are useful, but they fall short in normative respect. To repair the blind spots of both applied ethics and STS, we have sketched the contours of a pragmatist approach that does not represent a radical break with the current practice of ethics but rather is complementary in character. In the light of the central concern of pragmatism, cooperation and cohabitation, we have explored the tasks and tools of a pragmatist ethics. We have paid special attention to the exploration of future worlds disclosed and shaped by technology and the management of deep value conflicts inherent to a pluralist society. To develop an ethics that is well equipped for our technological culture, further theoretical analysis of the tasks we have suggested and practical experimentation with the corresponding tools are required.

## Notes

1. The term *principlism* was coined by Clouser and Gert (1990).
2. The distinction between instrumentalist, substantive, and pluralist views of technology is derived from Albert Borgmann (1984).
3. See Van der Burg (1991) for the distinction between the empirical and the logical versions of the slippery slope argument. Van der Burg distinguishes two different logical versions, but it would go beyond the scope of this article to go into more detail on this.
4. Two discussions should be mentioned here: (1) the discussion in *Science, Technology, and Human Values* between Keith Grint and Steve Woolgar (1995, 1996) and Rosalind Gill (1996); and (2) the discussion in *Social Studies of Science* between Bernward Joerges (1999a, 1999b) and Steve Woolgar and Geoff Cooper (1999).
5. For a critique of the Strong Programme's neglect of normative questions, see, for example, Lynch and Fuhrman (1991).
6. See the special issue on "The Politics of SKK: Neutrality, Commitment and Beyond." *Social Studies of Science* (May 1996).
7. In a recent article on the debate about the normative relevance of constructivism, in which he argues that the criticisms of Winner, Radder, and others are fundamentally accurate, Patrick W. Hamlett (2003) comes to a similar conclusion: "It may be time for constructivist analyses to



move beyond the descriptive examination of the social dynamics of technology to a more proactive approach on the larger issues critics identify" (p. 114).

8. Vicky Singleton (1996) expressively phrases the constructivist aversion to ethics. In her contribution to the May 1996 special issue of *Social Studies of Science* on "The Politics of SSK," she suggests "that to engage in a 'should' discourse is to engage in an oppressive and exclusionary discourse" (p. 461). The should discourse is a guild-inducing discourse, "which seems to be based in a discourse of oppression and domination" (p. 462). In his comment on Singleton and others, Radder (1998) finds that "a normative approach appears to be simply an undesirable, authoritarian enterprise" (p. 327).

9. This view explains much of the appeal of pragmatism for feminist philosophers (such as Charlene Haddock Seigfried) and for Afro-American philosophers (such as Cornel West), who resist the drawing of strict demarcation lines between "male" and "female" and "black" and "white."

10. Putman (1994) says that the unique insight of pragmatism is that one can be antifoundationalist and antiscepticist at one and the same time. This is one of the ways in which pragmatism distinguishes itself from postmodernism, which may be antifoundationalist but is certainly not antiscepticist. Referring to this difference, Rorty said, in the laconic way so characteristic of him: "One difference between Derrideans and Deweyans is that Derrida likes to put things in question, whereas Dewey insisted on asking 'What's the problem?' Our attitude is: if it isn't broken, don't fix it. . . . Derrideans tend to think that the more questioning, problematizing and *mettant-en-abîme* you can squeeze into the day's work, the better. Deweyans, on the other hand, think that you should only question when you find yourself in what Dewey called a 'problematic situation'—a situation in which you are no longer sure of what you are doing. . . . Unless you suffer from some such uncertainty, you should save problematizing for weekends" (Rorty 1996, 44).

11. To avoid the impression of being overly idealistic, we want to stress the *regulative* character of the ideal of peaceful cohabitation and fruitful cooperation. We are surely aware of the real-world constraints of time and finite resources (money, energy, intelligence) on problem solving, consensus building, and so on.

12. In engineering ethics, for example, the most familiar topics are research- and publication-ethics and professional codes of conduct. Here, traditional rationalist methods of ethical inquiry prevail. We do not claim that these methods are wrong or mistaken—we merely want to emphasize that they fail to incorporate the lessons of science and technology studies concerning the interplay of science, technology, and society. See also Schermer and Keulartz (2003).

13. The work of Cornel West (1989), who is a proponent of a "prophetic pragmatism" that is characterized by cultural criticism and political engagement, can also be situated here.

14. This suggestion is derived from Habermas (1997), who has introduced the notion of "equal coexistence" but who has not further developed this notion in the context of his discourse ethics.

15. Another way of breaking up dualisms is "decomposition," as has been proposed by Yrjö Haila. Haila aims to show that certain boundaries, for example, the boundary between nature and culture, are drawn differently in different practices. "Different practices connect to different elements of nature. Aqua/culture is different from agri/culture is different from silvi/culture. Although each one of these 'cultures' is practiced in the same social context, specific rules and norms of dealing with their respective natural realms vary. For instance, farming and forestry everywhere are based on different social structures and networks, and their mutual relationship varies across countries. An analysis of such differences might reveal important general features in how the conception of nature is shaped within social practices" (Haila 2000, 167).

16. Still another possibility is a redefinition that would "tilt" the perspective on the problem in question. An example is the proposal by Den Hartogh (1997) to give embryos a relational

value. This would mean that the status of an embryo would no more be (exclusively) connected to whether it is a person, but instead to the significance that parents and other concerned parties attach to its life.

## References

- Akrich, M. 1992. The de-scription of technical objects. In *Shaping technology/building society*, edited by W. E. Bijker and J. Law, 205-24. Cambridge, MA: MIT Press.
- Apel, K.-O. 1988. *Diskurs und Verantwortung*. Frankfurt a/M: Suhrkamp.
- Bohman, J. 1996. *Public deliberation. Pluralism, complexity, and democracy*. Cambridge, MA: MIT Press.
- Borgmann, A. 1984. *Technology and the character of contemporary life*. Chicago: University of Chicago Press.
- Callon, M. 1987. Society in the making: The study of technology as a tool for sociological analysis. In *The social construction of technological systems*, edited by W.E. Bijker, T.P. Hughes, and T.J. Pinch, 83-103. Cambridge, MA: MIT Press.
- Casparly, W. R. 2000. *Dewey on democracy*. Ithaca, NY: Cornell University Press.
- Clouser, K. D., and B. Gert. 1990. A critique of principlism. *The Journal of Medicine and Philosophy* 15:251-66.
- De Beaufort, I. 1998. Als twee druppels water? In *Allemaal klonen*, edited by H. Bout, 91-119. Amsterdam and The Hague: Boom/Rathenau Instituut.
- De Vries, G. 1999. *Zeppelins: Over filosofie, technologie en cultuur*. Amsterdam: Van Genneep.
- Den Hartogh, G. 1997. The values of life. *Bioethics* 11 (1): 43-66.
- Dewey, J. 1954. *The later works*. Athens, OH: Swallow Press Books.
- Dworkin, R. 1999. Playing God. *Prospect Magazine* May.
- Gill, R. 1996. Power, social transformation, and the new determinism: A comment on Grint and Woolgar. *Science, Technology, & Human Values* 21 (3): 347-53.
- Grint, K., and S. Woolgar. 1995. On some failures of nerve in constructivist and feminist analyses of technology. *Science, Technology, & Human Values* 30 (3): 286-310.
- Gustafson, J. M. 1990. Moral discourse about medicine: A variety of forms. *The Journal of Medicine and Philosophy* 15:125-42.
- Habermas, J. 1991. *Erläuterungen zur Diskursethik*. Frankfurt a/M: Suhrkamp.
- Habermas, J. 1997. *Between facts and norms*. Cambridge: Polity.
- Hagedijk, R. 1996. Wetenschap, constructivisme en cultuur. Ph.D. diss., University of Amsterdam.
- Haila, Y. 2000. Beyond the nature-culture dualism. *Biology and Philosophy* 15:155-75.
- Hamlett, P. W. 2003. Technology theory and deliberative democracy. *Science, Technology, & Human Values* 28 (1): 112-40.
- Harbers, H., and S. Koenis. 1999. De bindkracht der dingen. *K&M, tijdschrift voor empirische filosofie* 23 (1): 3-10.
- Hickman, L. A. 1999. Making the family functional: The case for legalized same-sex domestic partnerships. *Philosophy of the Social Sciences* 29 (2): 231-47.
- Ihde, D. 1998. *Expanding hermeneutics*. Evanston, IL: Northwestern University Press.
- Joas, H. 1993. *Pragmatism and social theory*. Chicago: University of Chicago Press.
- Joerges, B. 1999a. Do politics have artefacts? *Social Studies of Science* 29 (3): 411-31.
- . 1999b. Scams cannot be busted: Reply to Woolgar & Cooper. *Social Studies of Science* 29 (3): 450-57.

- Ketting, E. 2000. De invloed van orale anticonceptie op de maatschappij. *Nederlands Tijdschrift voor geneeskunde* 144 (6): 283-86.
- Keulartz J., H. van der Windt, and J. Swart. Concepts of nature as communicative devices. (forthcoming in *Environmental Values*).
- Klaver, I., J. Keulartz, H. van den Belt, and B. Gremmen. 2002. Born to be wild: A pluralist ethics concerning introduced large herbivores in the Netherlands. *Environmental Ethics* 24 (1): 3-21.
- Latour, B. 1987. *Science in action*. Cambridge, MA: Harvard University Press.
- Latour, B. 1993. *La clef de Berlin*. Paris: Editions La Découverte.
- Lynch, W. T., and E. R. Fuhrman. 1991. Recovering and expanding the normative: Marx and the new sociology of scientific knowledge. *Science, Technology, & Human Values* 16:233-48.
- Oudshoorn, N. 1995. Technologie en zorg: Vrienden en vijanden. Het voorbeeld van nieuwe anticonceptiemiddelen voor vrouwen en mannen. *Gezondheid* 3 (3): 278-89.
- Pinch, P., and W. E. Bijker. 1987. The social construction of facts and artifacts. In *New directions in the sociology and history of technology*, edited by W.E. Bijker, T.P. Hughes, and T. Pinch, 17-50. Cambridge: MIT Press.
- Putnam, H. 1994. *Words and life*. Cambridge, MA: Harvard University Press.
- Radder, H. 1992. Normative reflexions on constructivist approaches to science and technology. *Social Studies of Science* 22 (1): 141-73.
- . 1998. The politics of STS. *Social Studies of Science* 28 (2): 325-31.
- Rorty, R. 1996. Response to Simon Critchley. In *Deconstruction and pragmatism*, edited by C. Mouffe, 41-47. New York: Routledge.
- . 1998. Pragmatism as romantic polytheism. In *The revival of pragmatism*, edited by M. Dickstein, 21-37. Durham, NC: Duke University Press.
- Schermer, M., and J. Keulartz. 2002. How pragmatic is bioethics? The case of in vitro fertilization. In *Pragmatist ethics for a technological culture*, edited by J. Keulartz, M. Korthals, M. Schermer, and T. Swierstra, 41-68. Dordrecht, the Netherlands: Kluwer Academic Press.
- . 2003. Pragmatisme as a research program—A reply to Arras. *Theoretical Medicine and Bioethics* 24:19-29.
- Singleton, V. 1996. Feminism, sociology of scientific knowledge and postmodernism: politics, theory and me. *Social Studies of Science* 26 (2): 445-68.
- Stuhr, J. J., ed. 2000. *Pragmatism and classical American philosophy: Essential readings & interpretive essays*. 2nd ed. Oxford: Oxford University Press.
- Van den Berg, J.H. 1969. *Medische macht en medische ethiek*. Nijkerk: Callenbach.
- Van der Burg, W. 1991. The slippery slope argument. *Ethics* 102:42-65.
- West, C. 1989. *The American evasion of philosophy*. Madison: University of Wisconsin Press.
- Westbrook, R. B. 1998. Pragmatism and democracy: Reconstructing the logic of John Dewey's faith. In *The revival of pragmatism*, edited by M. Dickstein, 128-41. Durham, NC: Duke University Press.
- Winner, L. 1980. Do artifacts have politics? *Daedalus* 109 (1): 121-36.
- . 1993. Upon opening the black box and finding it empty: Social constructivism and the philosophy of technology. *Science, Technology, & Human Values* 18 (3): 362-78.
- Woolgar, S. 1991. The turn to technology in social studies of science. *Science, Technology, & Human Values* 16 (1): 20-50.
- Woolgar, S., and M. Ashmore. 1988. The next step: An introduction to the reflexive project. In *Knowledge and Reflexivity*, edited by S. Woolgar, 1-11. London: Sage.
- Woolgar, S., and G. Cooper. 1999. Do artefacts have ambivalence? *Social Studies of Science* 29 (3): 433-49.

Woolgar, S., and K. Grint. 1996. A further refutation of the assumption that political action depends on the "truth" and a suggestion that we need to go beyond this level of debate: A reply to Rosalind Gill. *Science, Technology, & Human Values* 21 (3): 354-57.

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