

Chapter 19

Dutch Schools

Pieter Tijmes of Twente University, in a survey for *Techné* 3:1 (Fall 1997), provides the following summary of Dutch philosophy of technology: "In the past, Holland brought forth one great philosopher, Benedictus de Spinoza (1632–1677). At this moment there are many philosophers of technology, judging from the significant (quantitative) contribution to the Duesseldorf conference of the Society for Philosophy and Technology in the Fall of 1997. To be honest, today's Dutch philosophers do not have the stature of Spinoza. He had philosophy as an avocation; he earned his living as a technician by grinding and polishing lenses. His Dutch descendants make philosophy their business today even a concern of the Dutch government. It is the difference between avocation and occupation. The Duesseldorf attendance was predominantly connected to the philosophy departments at the Dutch *technological* universities. A common characteristic of these departments is their claim of a mission to do research in philosophy of technology. In my endeavor to characterize their research for American ears I became aware of the particularities of the general educational system in Holland, and in addition to this of the specific local situation of the respective faculties: how big is the staff, who contributes to the philosophical research program, does the faculty offer a major in philosophy, and other issues of that kind. I shall pass over these relevant details and differences, but I shall mention the e-mail address of the program leaders who would be willing to inform readers who want more detail.

"At the University of Delft, philosophy of technology is close to what Carl Mitcham would call engineering philosophy. With the flourish of trumpets they insist on designing as the quintessence of engineering activity. Design and the development of technological products are considered their *pièce de résistance*. They like to follow Friedrich Rapp (1974) saying that "a methodological and even an epistemological analysis of the theoretical structure and the specific methods of procedure characteristic of modern technology" is to be emphasized. Philosophical reflection on designing activities is, in their view, also of utmost importance for discussions of the consequences of technology. Ethics appears within the context of the design and development of products. In other words, engineering praxis is central to their research. This philosophy of design means a critical evaluation of conditions and assumptions with regard to determinism or to social constructivist interpretations of technology. The prominence attached to

the phase of design is a specialty at Delft. Design is cherished as the key to contributing to the real-world problems of controlling and steering technology. Staff: 4 members; e-mail address: p.a.kroes@wtm.tudelft.nl.

“Let us next look at Eindhoven, where the engineering activity of design is also written in capitals. Their philosophical interest, however, is not to be confused with that of their colleagues at Delft. In Eindhoven, "philosophy and methodology of the technological sciences" are centered on the methodological analysis of the processes that create products. In this methodological analysis, they deal with the interplay of scientific, technical, economic, political, legal, and aesthetic factors in the engineering process of decision-making (S, T, E, P, L, and A factors). This design methodology—interdisciplinary in character—is in a developing stage; concrete projects with respect to specific products are their inspiring examples of the way ahead: e.g., refrigeration apparatus as based on the Stirling cycle, packaging machines, etc. Quality Function Deployment is a specific topic of interest. Research on this topic should be a means for finding concordances between technical realizations and social desirabilities. Again, concrete case studies are done as precursors of a successful and helpful theory on choices within the production process. Staff: 3 members; e-mail address: m.j.d.vries@tm.tue.nl.

“An agricultural university is the stage for philosophical reflection in Wageningen. There, agricultural and environmental sciences are the point of departure. Four themes are on the agenda. At Wageningen, the sciences contribute to practices as agricultural ways of living, with references to types of farmers, specific landscapes, and consumer behavior. Given the fact that technologists are in a sense undercover revolutionaries, the Wageningen people want to open the black box of science and technology. Philosophical analysis of the concept of sustainability is their second theme of attention. In their view, sustainability is a matter of the remoralizing of agricultural technology with all its ambivalent problems. A third philosophical topic concerns technological knowledge. In modern society knowledge is not limited to the traditional labs of universities and big corporations like Philips and Shell, but is also generated outside. And, fourth, the dimension of *political participation* in the complex networks controlling and steering technology is the crown of this program. It is a characteristic feature of the Wageningen philosophy that, starting their reflection from a broader analysis of society, they use it as a departure point for the analysis of the interrelation of technological and ethical aspects in practices and institutions. Staff: 11 members; e-mail address: michiel.korthals@alg. tf.wau.nl.

“The University of Twente is the youngest university. All sorts of philosophical disciplines are collected in a department of systematic philosophy that is doing research under the heading, Philosophy of Technological Culture. The program focuses on a ‘current affairs’ analysis aimed at clarifying our technological culture, and deals with problems and dilemmas—on both individual and collective levels—that result from recently introduced technologies. These questions range from social relations and ways of life, human possibilities and desires, to experiences of body and nature. In a permanent discussion with and a cautious opposition to the classical philosophy of technology, they want to give more context to their findings. Concepts such as the ‘megamachine’ (Mumford), *technotope* (Ellul), *Gestell* (Heidegger) are only used heuristically and not as *a priori* concepts. In this sense the Twente philosophers like to speak about an empirical turn within the philosophy of technology. From a philosophical point of view one can distinguish two main lines: hermeneutics of the technical experience, and social philosophy of technology. Under the hermeneutical heading, attention is paid to the mediating role of artifacts and to metaphors and representations generated by technology. Under the social philosophy heading the relationships between technology and politics are investigated. Scarcity as a constitutive feature of technological culture plays a privileged role. Recently there has been a convergence of interest on medical technology, sustainable technology, and information technology. Staff: 9 members; e-mail address: h.j.achterhuis@wmw.utwente.nl.”

Up to this point, Tijmes had not related his survey to North American philosophy of technology. So I will intersperse here another contribution from Tijmes's University of Twente. Hans Achterhuis's *American Philosophy of Technology: The Empirical Turn* details the work of his and Tijmes's colleagues at Twente (including the two themselves). The material here is taken from a review (for *Metaphilosophy*, July 2004) that I did of that book.

Achterhuis begins his book—a collection of profiles of American philosophers by Dutch colleagues in the philosophy department of Twente University in the Netherlands—with an introduction in which he attempts to justify his subtitle, “The Empirical Turn.” About that introduction, series editor Don Ihde (one of the philosophers profiled in the book) says this:

“The reader should take careful note of the introduction, which lays out the differences . . . between the high-altitude and ‘transcendental’ perspectives of our

acknowledged ‘god-fathers’ [for example, Martin Heidegger, Hans Jonas, and Jacques Ellul] and the lower-altitude, more particular and pragmatic looks at technologies of the Americans included here” (p. viii).

The Americans, discussed in alphabetical order, are Albert Borgmann of the University of Montana, Hubert Dreyfus of the University of California at Berkeley, Andrew Feenberg of San Diego State University, Donna Haraway of the History of Consciousness Program at the University of California at Santa Cruz, Don Ihde of the State University of New York at Stony Brook (where the book’s translator, Robert P. Crease, also teaches), and Langdon Winner of the Department of Science and Technology Studies at Rennselaer Polytechnic Institute. (The Dutch authors make much of the personal careers and affiliations of the American philosophers.)

Only a snippet from each Dutch author’s presentation and critique of one of the six Americans can be presented here, but I will try to give the flavor of each review.

Pieter Tijmes provides the discussion of the thought of Albert Borgmann, and here is his introduction: “I shall discuss how Borgmann diagnoses the ills of contemporary life, what his concept of the device paradigm of technology is, and what its implications are . . . in showing that technology is indeed a revolutionary factor in society” [today] (p. 11).

Tijmes thinks that Borgmann’s device paradigm, as a tool for diagnosing the ills (and potential promise) of our contemporary technologized society, “has a great advantage over Heidegger’s own method” (p. 14), which Tijmes views as too deterministic. Borgmann’s characterization, on the other hand (Tijmes says) “can help us understand how attractive technology has become in our society, and why” (p. 14). However, in the end, Tijmes is also critical: “Borgmann, I think, . . . speaks far too uncritically about natural [as opposed to cultural and technological] information, and is far too accepting of religious declarations about reality. . . [even when] borrowed from different religions” (p. 35).

In general, Tijmes seems fair to Borgmann, even when (in the end) he is critical; and he is extremely generous in showing how Borgmann’s analytical/phenomenological approach is an advance over Heidegger’s “ontological” characterization of Technology (capital T).

Even though he participated in the conference that gave rise to a Borgmann festschrift—Higgs, Light, and Strong, eds., *Technology and the Good Life?* (2000)—Tijmes makes no reference to that book or the editors' idea of making it the basis of a new academic specialty.

Philip Brey (who works in many fields associated with computers and information systems) provides the chapter on Hubert Dreyfus as the American critic of the set of computer-related technologies that have come collectively to be called Artificial Intelligence (AI). The basic issue here with respect to Dreyfus has to do with his relationship to philosophy of technology. There is no question that his work touches on technology—of all the technologies that have led people to call ours a “technological culture,” computer technologies in the broadest sense certainly are in the forefront—and Dreyfus is extremely well known, not only in American philosophical circles but worldwide. But many critics of philosophy of technology over the past twenty-five years have complained that it is overly abstract, concerned only with the vague notion of Technology with a capital T; which means that these critics often do not consider the philosophy of computers and AI to be part of the field. The criticism seems to me unfair, at least for the Society for Philosophy and Technology; every one of our conferences beginning with the second (1983) has had programs and papers on computers, and frequently on AI in particular. So since the society has always defined its scope as including any philosophical approach to any technological issue, we have always thought of Dreyfus, along with all others concerned with philosophy and computers, as part of the field.

That said, Dreyfus does not need as much of an introduction, for an American audience, as other philosophers of technology. Brey sums up Dreyfus's well-known themes this way: “Ever since his earliest work on the subject, Dreyfus has progressively honed and extended his philosophical critique of AI by broadening his use of the work of phenomenologists such as Heidegger, Merleau-Ponty, and Husserl, and by making use of the insights of other philosophers, including Michel Foucault and Soren Kierkegaard. One of Dreyfus's principal concerns, which appears with regularity throughout his writings, is to articulate the various ways in which human beings experience the world” (p. 39).

Brey's next point (equally well known) makes the link to AI: “Another regularly recurring concern is his critique of Cartesian rationalism. . . . Rationalism, as it crops up in AI and elsewhere, knows nothing of these original structures of reality and fails to do justice to the role of intuitive knowledge and skills” (pp.

39–40).

Brey later on turns this into an account of Dreyfus's "most important criticism" of AI: "Dreyfus's most important criticism . . . is directed against the epistemological assumption, underlying all forms of classical AI, that intelligent behavior can be reproduced by formalizing human knowledge (i.e., codifying it in rules). The application of formalized, rule-given knowledge, however, appears to run up against an important problem. . . . If one sought to make rules sensitive to context, all possible contexts would have to be formulated, or separate rules of application would have to be formulated. Both solutions appear to be without an end" (pp. 45–46).

And here is Brey's summary of Dreyfus's conclusion: "Human beings, Dreyfus observes, are able to interpret elements effortlessly from the context. Thus if they encounter a misspelled word in a text, they automatically fill in the right meaning, while computers grind to a halt. Human beings, Dreyfus concludes, have 'common sense' . . . [which] computers lack" (p. 46).

Probably the most interesting aspect of Brey's summary of Dreyfus's contributions to philosophy of technology is his conclusion: "Much of the inspiration for the development of [recent] work [in AI] can be traced back to the work of Dreyfus himself. Dreyfus was the one who introduced the ideas of thinkers like Heidegger and Merleau-Ponty into the AI world. The work of such AI researchers as [Terry] Winograd and [Fernando] Flores, and [Philip] Agre and [David] Chapman, was explicitly inspired by his ideas. Many other AI researchers, even including . . . [opponents Marvin] Minsky and John McCarthy, admit that Dreyfus's critiques have influenced their own research" (p. 61).

And here is Brey's last sentence: "Dreyfus is living proof that philosophers can indeed play a major role as critics of, and commentators on, science and technology in practice" (p. 61). They can, Brey is saying, even have a positive impact on the way science and technology—in this case, computer science and technology—are practiced.

The editor of this volume, Hans Achterhuis, also provides a chapter on the philosophy of technology of Andrew Feenberg. In this case, all the critiques come upfront, where Achterhuis dismisses Feenberg's early books: "Many passages [in Feenberg's first book, on Lukacs and critical theory] practice the kind of fastidious exegesis of sacred texts and indulgence in polemics with other

interpreters [of Marxism] who are deemed to be insufficiently orthodox that was popular some decades ago but has not worn well” (p. 66). And even when Feenberg turned to technology in his second book—Achterhuis says—“The persistence of a rigid (neo)marxist framework . . . makes it difficult to fully appreciate the very interesting ideas of Feenberg himself” (p. 66). These criticisms out of the way, Achterhuis almost uncritically accepts the theses of Feenberg’s later books, *Alternative Modernity* (1995) and *Questioning Technology* (1999). For Achterhuis, the key to understanding Feenberg’s innovative approach to philosophy of technology is a distinction between “primary and secondary instrumentalization.”

Here is Achterhuis on the first: “The first level of instrumentalization corresponds to the perspective of the classical philosophy of technology on modern technology, but also to the common sense conception of technology and the conception of technical experts themselves. This level concerns what Feenberg calls the “functional constitution of technical objects and subjects,” and addresses the meaning of modern technology apart from all the social meanings that it might receive” (p. 88).

But both Achterhuis and Feenberg are interested in a different picture: “More recent and empirically directed studies of technology, Feenberg points out, have allowed us to see that primary instrumentalization is only part of the story of modern technology. . . . In order for there to be an actual technological system or device, a second level of instrumentalization is necessary. ‘Technique must be integrated with the natural, technical, and social environments that support its functioning’” (p. 90).

After noting in passing, with inadequate justification, that “Feenberg regards the environmental movement as ‘the single most important domain of democratic intervention into technology’” (p. 91; Achterhuis should have spelled this out at greater length if he felt it is so central to understanding the recent Feenberg)—Achterhuis draws this conclusion: “The practical relevance of Feenberg’s theoretical distinction between the two levels of instrumentalization is that it suggests the possibility of a future in which, according to the apt last line of his book [*Questioning Technology*, 1999], “technology is not a fate one must choose for or against, but a challenge to political and social creativity” (p. 92).

Unfortunately, neither Feenberg nor Achterhuis says much about what kinds of social and political activity are called for. At one point in their younger days,

probably both would have endorsed some sort of Marxist (most likely neo-Marxist) rebellion, but since the demise of Soviet Communism it is important at least to hint at one's political program. Beyond theorizing "new possibilities," neither Feenberg nor Achterhuis does so.

In the Achterhuis collection, Donna Haraway's "socialist, feminist, and anti-racist" (p. 107) political philosophy is presented by Rene Munnik. Or, "Rather, her cyborg thesis is a description of an anthropological condition in which political issues are at stake" (p. 107).

Exactly what this means, even for Munnik, is a little unclear. But Munnik makes this attempt to clarify: "The cyborg is our ontology. . . . [Or, rather it] marks a fundamental turning point in philosophical anthropology . . . [which] is generally conceived as anthropo-ontology. . . . But at the end of the twentieth century these ways of being [of humans] are inextricably involved with technology: anthropoontology is cyborgontology" (p. 102).

Munnik had earlier noted that, at one stage in her career, Haraway had been a primatologist, but she later joined an interdisciplinary—Munnik says even "antidisciplinary" (p. 100)—program at the University of California at Santa Cruz, where she developed her interest in the concept of a cyborg.

"Philosophical anthropology" is a strange sort of creature in American philosophy—generally popular only among philosophers with an interest in European ontology. And "cyborg" must be taken, at least minimally, as a metaphor. But Munnik ends his account in a curious way: he concretizes cyborgs in terms of "the half-alive, half-dead occupants" of intensive-care units in hospitals and says it would not be "surprising if it turned out that cyborgs make very poor coalition partners" (p. 116) in the kind of radical politics Haraway wants her philosophical anthropology to prepare for. This seems unfair to Haraway, no matter how fuzzy the cyborg concept may seem to be in its various "antidisciplinary" formulations.

The Achterhuis collection next turns to a philosopher who has unquestioned credentials in academia—Don Ihde, long-time professor and chair of the philosophy department of the State University of New York at Stony Brook. [I used this material in Chapter 10 above, so will skip most of it here.]

Here is how Verbeek begins his account: "Ihde . . . is a pioneer in two respects.

First, he was one of the earliest philosophers in the United States to make technology the subject of philosophical reflection. . . . He published his first book on the philosophy of technology, *Technics and Praxis*, in 1979, [and this was just] the first of over half a dozen books he has written in the field”. . . . (p. 119). (The rest is already in Chapter 10 on Ihde above.)

But there is one last philosopher discussed in the book, Langdon Winner, whose views are summarized and, to a limited extent, critiqued by Martijntje Smits. Smits focuses mainly on Winner’s key idea, that all “artifacts have politics,” that there are, ultimately, no politically neutral technologies. Along the way, she notes Winner’s “love-hate relationship with Ellul” (p. 154); “the empty box of social constructivism” (p. 163); and Winner’s (she thinks mostly implicit) commitment to a kind of democracy inconsistent with the politics embodied in most large-scale technological systems (p.165).

Smits’s main critique of Winner is that this last commitment, to a kind of democracy at odds with large technological systems, is left vague and abstract (p. 166). Here is her main conclusion: “Winner’s work searches to work out a middle path between the philosophy of technology . . . and social constructivism. . . . One might remark . . . that Winner has performed an important service in pointing out clearly how imperative it is to find a middle path. But the weaknesses of his ‘Artifacts/Ideas’ [1991] article also indicate how tricky it is to actually walk this middle path” (p. 166).

And later: “In assuming that direct democracy is an unproblematic norm, Winner implies that political power exercised in this way is ipso facto beneficent, and ignores the question of how power is actually exercised in those practices” (p. 167).

This may be unfair to Winner (see Chapter 12). In “Techné and Politeia” (1986), Winner calls for a kind of constitutional convention each time a new large-scale technological enterprise is considered. This does not say that direct democracy is “ipso facto beneficent”; only that ordinary citizens are to be trusted more than undemocratic technological elites. And this brings us back to John Dewey (rarely mentioned by Winner, and then mostly negatively), whose similar appeal to a sort of direct democracy does not assure a beneficial outcome in every exercise of democracy—though every social problem (here, sociotechnical problem) is still better entrusted to the people than to technical elites.

To sum up with respect to the Achterhuis volume: it clearly represents, in an only

mildly critical way, some of the most interesting philosophical work related to technologies that has been done in the USA in recent decades. It thus shows Dutch philosophy of technology (at least at Twente) to be heavily involved with American work, but also admirably diverse. As Tijmes notes, however, the other Dutch schools may in some sense be more original; and many observers think Tijmes's last example—science, technology, and society as perhaps best represented by Wiebe Bijker—is the most significant. (See Chapter 25 below.)

I now return to Tijmes's survey: "In this survey I have so far confined myself to the technological universities, where philosophers explicitly claim to do philosophy of technology. This is a limitation because there is also philosophy of technology outside these departments although more on an individual basis. On the other hand, I have also passed over those who are doing research in the field of Science, Technology, and Society. They do not claim to do philosophy, but their work could be of utmost importance to the programs mentioned.

"I certainly agree that members of the Society for Philosophy and Technology ought to be less narrow and more ecumenical. What is on parade as philosophy of technology might turn out really to be STS; or vice versa. Among the non-technical universities philosophy of technology is most heavily represented at the University of Maastricht, where it is part of an interdisciplinary STS program.

"The Netherlands Graduate School of Science, Technology, and Modern Culture (WTMC) is a formal collaboration of Dutch researchers, who study the development of science, technology, and modern culture. The school has a total of 48 affiliated researchers, who represent a variety of disciplines: philosophy, literature, history, psychology, and sociology. A considerable number of these researchers have been educated in the natural and technical sciences. The principal researchers in the WTMC program are affiliated with the University of Maastricht, the University of Amsterdam, and the University of Twente. However, agreements have also been reached with the University of Groningen, the University of Leiden, and the Agricultural University of Wageningen, which enable researchers from those institutions to participate in the graduate school. The institutes involved in the graduate school conduct the vast majority of the research in this area in the Netherlands.

"The increasing interpenetration of science, technology, and modern culture and society implicates five core questions, the answer to which can contribute to a diagnosis of the ills of modern society and culture: (1) What roles do science and

technology play in the transformation process in which societies are entangled, and how are these roles to be empirically researched and theoretically clarified? (2) How are science and technology influenced, substantively and organizationally, by the societal and cultural processes in which they are interwoven? (3) How are the boundaries to be drawn between science, technology, and the culture in which they are produced and reproduced, and how are these boundaries made visible or invisible? (4) How are normative questions concerning science and technology taking shape, and what does this imply about the way in which these questions are treated? And finally, the reflexive question, (5) how are analyses of the development of modern culture, and especially the position of science and technology, to be legitimated, without appealing to the prevailing epistemological paradigm which itself is a characteristic result of the rationalistic process?

STS or philosophy? Never mind. Ask the scientific director of the school: w.bijker@TSS.Unimaas.nl.”

The papers presented after this introduction in Tijmes's *Techné* survey—Tijmes continues—do not represent all of these perspectives. They are, simply, about half of almost a dozen Dutch contributions to SPT's tenth international conference, held at the University of Dusseldorf in September 1997. For another collection of Dutch contributions to the philosophy of technology, Tijmes adds that the interested reader can consult a volume he guest-edited in the *Research in Philosophy and Technology* series, published in 1998.

I might also mention in passing Egbert Schuurman, a Dutch engineer/philosopher and Senator, who attended a few SPT conferences; his perspective is religious, Dutch Reformed, and he is strongly influenced by Ellul, who has also influenced others in that denomination. I mention him just to complete the picture of Dutch philosophy of technology as I know it.

A second aside: in July 2005, the Technical University of Delft hosted the 14th international conference of SPT. Much in evidence, alongside a truly international gathering of philosophers from all over the world, was the Delft school's particular approach, as sketched above by Tijmes. But a philosopher from Twente, Peter-Paul Verbeek, had published a booklength version of his own take on philosophy of technology: *What Things Do: Philosophical Reflections on Technology, Agency, and Design* (2005). Verbeek has many views in common with the Delft group. Conveniently for my purposes here, Albert Borgmann did

a review almost as soon as the book was published.

Borgmann first provides a faithful summary of the book: “The three parts of *What Things Do* reflect the three phases of philosophy of technology. The first is defined by the founding fathers of the discipline, Martin Heidegger and Jacques Ellul, and extends roughly from 1925 to 1955. It was followed by a fallow period of some twenty years. In the United States, philosophy of technology began as a self-conscious discipline in the early seventies, largely through the organizing efforts of Paul Durbin and Carl Mitcham. The most influential philosophers of this group have been Langdon Winner, Don Ihde, Kristin Shrader-Frechette, and Andrew Feenberg.

“The second phase took philosophy of technology beyond its preparadigmatic jumble and established something like schools of thought and canonical texts. More broadly, it established 'technology' as the, or at least as one, defining term of contemporary culture. This phase is now reaching its end and has been overlapping with the third generation that includes Verbeek.

“His book is a careful and critical discussion of his predecessors, and it develops an original program on the basis of those discussions. . . .

“In the concluding part, Verbeek employs the positions and concepts he has elaborated in the first two parts to sketch an original relation of humans and technological artifacts. He does so by examining rival proposals, and he finds that they lose the material and sensible presence of technological devices by concentrating on their functions or their significations. In either case there are functional equivalents (and in fact improved versions) that can serve as signs or perform functions so that the particular technological realization is incidental and temporary. The criteria a properly designed device has to meet are transparency (so the device can be understood) and engaging capacity (so its presence in our lives will be vigorous).”

Borgmann then provides his neo-Heideggerian critique: “As for shortcomings, there are two I want to mention briefly. Neither is damaging to the central concern of *What Things Do*.

“The first concerns Verbeek's postphenomenological ontology. That humanity and reality interact and shape one another is a truism. Verbeek wants to get beyond that commonplace to a 'more radical phenomenological perspective in

which subject and object are not merely intertwined with each other but constitute each other' (p. 112). That position either comes to a fairly straightforward realism or it is incoherent. For assume the constitution of a person is resolvable into its constituents, i.e., into its subjective and objective elements. Then we are back in some sort of realism. Or assume the constitution is not analyzable into its elements. Then it is invisible as a constitution and no longer properly so-called.

“Verbeek tends toward the former interpretation, and to avoid a more or less naive perspective he resorts to Kantian things-in-themselves as the anchors to objects and subjects (pp. 112 and 164). But there is nothing new or radical in this. Verbeek could simply drop what he himself calls 'a transcendental construction' (p. 164) without any loss to his critiques or proposals.”

In this chapter on Dutch schools of thought in philosophy of technology, it would not be appropriate to get into the details of this disagreement. Enough to say that Verbeek is what I would call "Delftian," whereas Borgmann thinks he ought to move toward neo-Heideggerianism. Nonetheless, this disagreement allows me to bring this somewhat different chapter to a close.

Partly because the Dutch tend to set out their differences in close parallel to American differences, but partly also on their own terms, the Dutch schools seem to me to offer a fair parallel of the variety of *controversial viewpoints* that we have seen show up repeatedly in earlier chapters:

Wageningen school and Brey (not on Dreyfus, but his social democracy)

Tijmes (Heidegger)

Achterhuis (on Feenberg)

Delft and Eindhoven ("technical")

This leaves out Bijker and STS, but Chapter 25 below will include that as an anti-academic view.

Perhaps my inclusion of the Twente reflections on American philosophy of technology makes it too easy to say that the Dutch schools fairly closely mirror USA quadrants, but as we have seen in Chapter 13, the pattern also seems to hold

in Germany and Spain, so it does not seem out of step for the same to occur in the Netherlands. And by now the astute reader can see where this is heading. Contrary to many misrepresentations—including misrepresentations by some SPT authors—the philosophers affiliated with SPT, as well as those who have collaborated with them in Germany, Spain, and the Netherlands, are dealing and have from the beginning dealt with important traditional philosophical issues. These issues would often be said to cover the entire philosophical spectrum. I prefer to say—in order to underscore completeness—that they come from all the quadrants in the world of philosophy. See the essay at the end of this book.

Still, we need to stop and think here for a moment about the next several chapters: Chapter 20, on engineering and computer ethics; Chapter 21, on technology and the problems dealt with in environmental ethics and politics; Chapter 22, on biotechnology; and Chapter 23, on agricultural technologies. In some sense, these are all issues that have been around since the beginning, both within SPT and in developments alongside it. But it could be said—indeed, defenders of the “new discipline” in fact do say—that these can now be considered subdisciplines within the *new* philosophy of technology. In that respect, the core claim is that these areas require a level of professionalism that one should expect from an academic field; but, what is more, they require—for instance on the part of a young scholar entering any of the subfields—a high degree of specialized knowledge in some chosen area within the academic disciplines broadly speaking. You can't do engineering ethics without some knowledge of engineering, or environmental ethics without a grounding in ecology, and so on.

Chapter 24 will extend this broadening to still more features of the contemporary technological world, but I will save comments about that until we get there.