Chapter 1

# What Is Postphenomenology?

This book provides, in four chapters, a perspective on a very contemporary development stemming from my background in phenomenology and hermeneutics as directed toward science and technology. I have coined a special terminology, reflected in the title, *postphenomenology and technoscience*. And while a *post*phenomenology clearly owes its roots to phenomenology, it is a deliberate adaptation or change in phenomenology that reflects historical changes in the twenty-first century. And, in parallel fashion, *techno*science also reflects historical changes that respond to contemporary science and technology studies. It is my deep conviction that the twentieth century marked radical changes with respect to philosophies, the sciences, and technologies. And this is clearly the case regarding the *interpretations* of these three phenomena. I illustrate this by referring to what has been called, in Anglophone countries, the "science wars." The American version, some would hold, began with the 1996 publication of the article "Transgressing the Boundaries: Towards a Transformative Hermeneutics of Quantum Gravity" in *Social Text*. The author, Alan Sokal, was a relatively unknown physicist, and the article was a deliberate hoax designed to show the ignorance of literary theorists and humanities academics. *Social Text* is a radical literary theory journal, and its board of editors was fooled into accepting and publishing the spoof. All of this escalated within the academy, in newspapers, and on the Internet. Stated broadly, the "wars" were about whether or not science is a universally valid, privileged mode of knowledge, culture and value free—this was the stance of the "science warriors." The literati, who were the brunt of the hoax and attack, were thought to have attacked science; they were claimed to be relativists, denying universal and absolute truth, for whom all modes of knowledge are simply subjective (the usual targets here were deconstructionists, feminists, and "social constructionists"). The vast popular discussion, of course, made Sokal "rich and famous," and the aftermath included a whole series of books, articles, and television shows.

This was the American version, but as I had already pointed out in my *Technology and the Lifeworld* (1990), a British version had predated this set of battles. In 1987, *Nature*—surely one of the top science magazines—had included an opinion piece, again by two physicists, T. Theocharis and M. Psimopoulos, "Where Science Has Gone Wrong." Their thesis was that the decrease in support and funding, particularly in the Thatcher era, was due to the relativism of *philosophers of science,* and printed mug shots of Paul Feyerabend, Imre Lakotos, Karl Popper, and Thomas Kuhn headed the article. The objection was that these philosophers of science had undermined the belief in the universality, absoluteness, and value-and-culture free knowledge produced by science. And while this debate did not become as popularized as the later Sokal affair, it did continue on the pages of *Nature* for more than a year, until it was cut off by the editors.

In both of these cases, the "war" was over whether science is to be understood as acultural, ahistorical, universal, and absolute in its knowledge, or whether it is embedded in human history and culture and inclusive of the usual human fallibilities of other practices. Permit me now to *reframe* these incidents differently: One can also see these "wars" as *wars of interpretation.* That is, the context in which these events and controversies take shape includes such questions as: *What* is the most adequate intepretation of science? *Who* has the right to make such interpretations? *From what* perspectives do such interpretations take place? My two examples were of physicists playing the role of science expert interpreters. But what of others? The philosophers, historians, and social scientists? In short, I am suggesting that we "hermeneuticize" these phenomena.

I limit myself to the twentieth- and twenty-first-century context I have set here, roughly the period 1900–2006. With respect to early-twentieth-century interpretations of science, most of the best-known interpreters were philosophers who were trained in or practiced as scientists, including Pierre Duhem, Ernst Mach, and Henri Poincare, in the first decade of the century. These thinkers were trained in mathematics and/or physics. In short, this was a kind of *insider,* or, as it is now known, *internalist* interpretation. Similarly, when historians began to be interested in science interpretation, they were sometimes also trained in the sciences, or they looked at the historiography of science as a kind of heroic biography—great men had great ideas and produced great theories. This kind of history is still favored by many scientists as a preferred history of science.

We can now retrospectively recognize the emergence of both *positivist* and *phenomenological* variants on the philosophies of science. The

famous Vienna Circle was formed on the one side, and the Gottingen School, including Husserl, on the other—and recall that Husserl's cognate disciplines remained logic and mathematics! To generalize, virtually all early *internalist* interpreters tended to model their interpretations upon science—and early phenomenology under Husserl conceived of itself as rigorous science. Phenomenology, from its beginnings, was one of the players in the early science interpretation wars.

All of this began to change by mid-century. By the onset of World War II, Husserl had died, and many of the positivists had emigrated to America, where they simply took over most American philosophies of science. Indeed, many emigrant philosophers believed that philosophy itself was equivalent to the philosophy of science. This stance, however, was not unchallenged and I trace its history in briefest form:

- The 1930s through the 1950s remained strongly held by logical positivism or logical empiricism with respect to the philosophy of science. The image of science was that of a sort of "theory-producing machine," which was verified through logical coherence and experiment.
- By the 1950s to the 1960s, a new antipositivist set of the philosophies of science emerged—Thomas Kuhn and kin, those mentioned in the *Nature* controversy—which added both histories and revolutions to the notion of science practice. Antipositivism remained theory centered but added discontinuous phenomena to early logicism. Historical particularity becomes part of interpreted science, "paradigm shifts." This image of science began to be enriched by historical sensitivity. Rather than a linear, cumulative historical trajectory, the antipositivists projected a narrative filled with "paradigm shifts" and punctuated discontinuities.
- The 1970s saw the emergence of new sociologies of scientific knowledge—"social constructionism" and "actor network theory" examined science in its social, political, and constructive dimensions. Science is seen as a particular social practice. Its results were viewed as negotiated and constructed.
- In the 1980s, new philosophies of technology (post-Heideggerian, post-Ellul, post-Marxian) introduced the recognition that science itself is also *technologically embodied*. Without instruments and laboratories, there was no science.

- In the late 1980s and 1990s, feminist philosophies began to locate patriarchal biases in science practice, which in some cases led to new understandings of reproductive strategies in evolution. Science was seen as frequently gendered in cultural practice.

The combined result, decried by the reactions of the science warriors, was that science was now seen as fully acculturated, historical, contingent, fallible, and social, and whatever its results, its knowledge is *produced* out of practices. I contend that by the end of the twentieth century, even those belonging to the analytic versions of the philosophy of science could be seen to have made concessions. For example, Ernan McMullen of the dominantly analytic philosophy of science department at Notre Dame University edited a book called *The Social Dimensions of Science* (1992), clearly acknowledging the now-richer image of science than that of a "theory-producing machine." And Larry Laudan, in his *Science and Relativism* (1990), which is a debate among varieties of analytic philosophies of science, proclaims that all are now "fallibilists."

I take it that this was the consensus at the end of the twentieth century, brought about by a now-widened, more diverse set of interpreters. However, the now enlarged field of interpreters also may be seen retrospectively as a response to the obvious massive changes to both science and technology in the twentieth century. For instance, from 1900 to 2006, one can see that big science, corporate science, and global science are the order of the day. From the Manhattan Project to the Human Genome Project, from physics to biology, there is big science. And the same radical change in technologies should be even more obvious: in 1900, there were no airplanes, no nuclear energy, no computers or Internet, and so on, whereas today these constitute the texture of our very lifeworld. And now my special move: I want to place philosophy, particularly phenomenology, precisely into this scene and interpret it, judge it, through a series of changed interpretations parallel to those used to interpret science and technology. What is philosophy, phenomenology, from a contemporary perspective? Philosophy, too, I hold, changes, or must change with its historical context. This is what produces my attempt to modify classical phenomenology into a contemporary *postphenomenology*. So it is now time to briefly look at phenomenological philosophy, roughly in the same 1900–2006 period relevant here. I do this by first looking at the interrelationship between phenomenology and pragmatism.

## First Step: Pragmatism and Phenomenology:

Phenomenology in Europe and pragmatism in America were historically simultaneously born. Both were new, radical philosophies that placed *experience* in a central role for analysis. Pragmatism was first called so by William James (1898), who credited it to Charles Sanders Peirce; William James also was an early major influence on Husserl, but pragmatism was brought to prominence primarily by John Dewey. Note that Dewey and Husserl were both born in 1859, and although Dewey lived longer than Husserl, their philosophical developments were chronologically parallel. But also note that their birth year was also the same as the publication of Darwin's *Origins of Species*. Or, since 2005 was the centennial of Einstein's golden year, 1905, if we also look at Dewey in 1905, we find him at Columbia University, already famous in the philosophy of education after founding his earlier experimental or laboratory school at the University of Chicago. And, if we look at Husserl in 1905, we find him giving his internal time lectures.

In terms of the historical philosophical context at the turn of the century, there were some similarities but also nuanced differences between the pragmatists and Husserl's phenomenology. This can be subtly illustrated in the term *pragmatism* itself. Dewey, in his "The Development of American Pragmatism," says, "The term "pragmatic," contrary to the opinion of those who regard pragmatism as an exclusively American conception, was suggested to [Peirce] by the study of Kant . . . in the *Metaphysics of Morals* Kant established a distinction between *pragmatic* and the *practical*. [Practical] applies to the moral laws which Kant regards as *a priori* . . . whereas [pragmatic] applies to the rules of art and technique which are *based on experience and are applicable to experience* (emphasis added).[1] Now, as we know, Descartes and Kant also play major roles in Husserl's development of phenomenology—but the roles they play are those of an *epistemological* Descartes and Kant, whereas it is the *moral* but also a "praxical" Kant who is used by Peirce! The pragmatic emphasis is on *practice*, not *representation*. This move to praxis and away from representation later repeats itself in virtually all the late-twentieth-century styles of science interpretation.

This different take on Kant is subtle and nuanced, but I want to make a very bold extrapolation from this difference: By using the epistemological Descartes and Kant, Husserl necessarily had to also use the vocabulary of early modern "subject/object," "internal/external," "body/mind," as well as "ego," "consciousness," and the like. And while it is clear that his attempt was to *invert* these usages through the use

of his various *reductions,* this vocabulary remained embedded in early phenomenology. This attempt to overcome early modern epistemology, while using its terminology, I contend, doomed classical phenomenology to be understood and interpreted as a "subjective" style of philosophy. The pragmatists, by beginning with the vocabulary of practices instead of representations, avoided this problem. Listen to a contemporary pragmatist echoing this idea: Richard Rorty says, "The pragmatists tell us it is the vocabulary of practice rather than theory, of action rather than contemplation, in which one can say something about truth. . . . My first characterization of pragmatism is that it is simply anti-essentialism applied to notions like "truth," "knowledge," "language," "morality," and similar objects of philosophical theorizing. . . . So, pragmatists see the Platonic tradition as having outlived its usefulness. This does not mean that they have a new, non-Platonic set of answers to Platonic questions to offer, but rather they do not think we should ask those questions anymore."[2]

Returning to Dewey, his early writings contain many essays on the new science, *psychology.* This psychology—although for Dewey the outdated philosopher to be transcended was more Locke than Descartes—proposed to analyze *consciousness.* And whereas Husserl, too, had a problem with psychologism, Dewey again seems to cut to the core more quickly. For him, "consciousness" in psychology is an *abstraction,* whereas experience is broader and necessarily related to other dimensions "if the individual of whom psychology treats be, after all, a social individual, any absolute setting off and apart of a sphere of consciousness as, even for scientific purposes, self-sufficient, is *condemned in advance.* (emphasis added).[3] While Husserl's inversion of Descartes includes "all subjectivity is intersubjectivity," Husserl arrives late at such a recognition. I cannot go much farther here, but one clue to pragmatism's quicker take on the problems of early modern epistemology also may lie in its recognition that there is a biological, evolutionary dimension to "psychology." Put simply, Dewey's frequent model or metaphor for his version of transformational practice is that of an organism/environment model rather than a subject/object model. Again, turning to Dewey's early writings, "In the orthodox view, experience is regarded primarily as a knowledge-affair [Locke/Descartes]. But to eyes not looking through ancient spectacles, it assuredly appears as an affair of the intercourse of a living being with its physical and social environment."[4]

This living being/environment model, for Dewey, is also "experimental," and thus less past or present directed than future directed. Experience in its vital form is experimental, an effort to change the given; it is characterized by projection, by reaching forward into the unknown; connection with a future is its salient trait."[5] (Interestingly,

this future emphasis seems closer to Heidegger than to Husserl.) Dewey sees this model as "biological" in some sense, and he imputes this both to one phase of William James's version of psychology, but also to Darwin, whose notion of change-through-time also outlines the points just made. Once again, my contention is that this version of experience short-circuits the "subject/object" detour derived from Descartes—or, in Dewey's case, Locke—and points much more directly to something like a *lifeworld analysis.*

Now, admittedly, I have here the advantage of retrospective vision; I am looking at Dewey and Husserl, pragmatism and phenomenology, from a full century later perspective. But it remains the case that there were resources then contemporarily available from pragmatism, which had Husserl used them would have yielded a *nonsubjectivistic and interrelational phenomenology* along the lines I am now calling *postphenomenology.* This is why I have here paralleled Husserl and Dewey, who were exact contemporaries. This grafting of pragmatism to phenomenology constitutes a first step in a postphenomenological trajectory.

## Second Step: Phenomenology and Pragmatism

In my first step, I suggested that the deconstruction of early modern epistemology made in pragmatism could have enriched the beginnings of phenomenology by avoiding the problems of subjectivism and idealism with which early phenomenology was cast. My second step reverses the process, and I now suggest that phenomenology historically developed a style of rigorous analysis of experience that was potentially *experimental* and thus relevant to pragmatism. Dewey's emphasis on his experience-based philosophy was "experimental," or sometimes called "instrumental," but I contend that Husserl's phenomenology contained methods that, had these been adapted in pragmatism, would have enriched its analysis of the experimental. In this case, however, rather than return to Husserlian observations from his texts, I shall instead take these for granted and draw three elements from phenomenology to show how such a rigorous analysis of the experiential takes shape. These include: *variational theory, embodiment,* and the notion of *lifeworld*. Phenomenologists will recognize that all three may be found in Husserl, although I would claim that embodiment was later highly enriched by Merleau-Ponty, and that what could be called the cultural-historical dimensions of the lifeworld were correspondingly enriched by Heidegger. Each of these notions derives from classical phenomenology, but each now takes their shape and role in a contemporary postphenomenology.

I begin with *variational theory:* In Husserl's earlier use, variations (originally derived from mathematical variational theory) were needed to determine *essential structures,* or "essences." Variations could be used to determine what was variant and what invariant. I also have found this technique invaluable in any phenomenological analysis—but as I used this technique, I discovered something other than Husserlian "essences" as results. What emerged or "showed itself" was the complicated structure of *multistability.* My first systematic demonstration of this phenomenon occurred in *Experimental Phenomenology* (1977). Using so-called visual illusions, I tried to show how the phenomenological notion of variation yielded both deeper and more rigorous analyses of such illusions than mere empirical or psychological methods. To demonstrate this analysis, I draw from three example sets from those studies:

In the first example, stage/pyramid/robot, this configuration, an abstract drawing, can be seen as a stage setting. The plane surface at the bottom of the drawing is the stage, while the other surfaces are the backdrops. Thus an apparent three-dimensionality appears—but it also implies a perspective from which this three-dimensionality takes its shape. The POV, or "point of view," is a sort of balcony position from which the viewer looks slightly downward at the stage setting. Here already, then, *embodiment*, or perspectival perception, is implied. But this is only one variation—the *same* configuration could be seen quite differently. Perhaps it is a Mayan pyramid in Central America! In this case the plane surfaces change appearances: the center, upper surface is

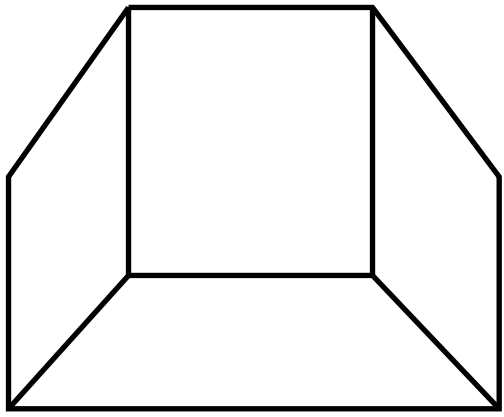

Figure 1.1. Multistable Figure A

now the platform on the top of the pyramid, and the other surfaces are the downward sloping sides. In this appearance, the three-dimensionality is radically reconfigured but remains three-dimensional. And the POV, or perspective, also remains implied—as if we are in a helicopter viewing the pyramid from above. Note too that these two appearances are discrete and different—they are *alternations,* which cannot be combined; they are distinct variations. As an aside to empirical studies, such three-dimensional reversals are well known in psychology—particularly in gestalt psychology, there called "gestalt switches." And while historically the early gestaltists were in fact students of Husserl, we have not left "psychology" quite yet. Now, the first phenomenologically deeper move: I suggest that there is another possible stability here. My story is that this configuration also may be seen as a "headless robot." In this case what was previously the platform of the pyramid now becomes the robot's body. The bottom line is the earth on which the robot is walking, and the other lines are its arms and legs, and—because it has no head—it uses crutches to navigate! In this configuration, three-dimensionality is lost, and the figure is simply two-dimensional. But take careful note: in the two-dimensional appearance, the implied POV, or embodied position, *also changes. Now it is directly before the robot, who is advancing toward the viewer!* This is all fully phenomenological: variant perceptual profiles, examined through variations/implied perceptual-bodily positions, which correlate to and change with the appearances/and, now, more than occur in mere empirical studies.

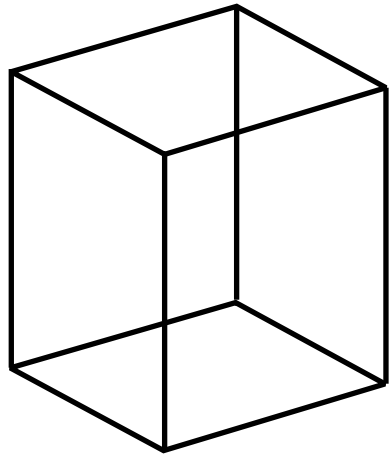

Figure 1.2. Multistable Figure B

My next set of illustrations comes from the famous Necker Cube series. When I was writing my book *Experimental Phenomenology,* I read over 1,000 pages of studies on the Necker Cube phenomenon, all of which recognized the three-dimensional reversal, and a few of which recognized a two-dimensional variant (but usually associated with a "fatigued subject" rather than a noematic possibility within the configuration). Quickly, now, one can easily see that the Necker Cube may be seen as three-dimensional, with a "tilt" switch. Note that there is also a small but detectable switch in the POV, or perspective position, in the switch. To make this into a two-dimensional variation, a new story may be told: I tell you that this is not a cube at all but an insect in a hexagonal hole. The limits of the cube are now the outline of the hole; the central surface is the body of the insect; and the other lines are its legs. Now the figure becomes two-dimensional—and again the POV is directly correlated to the insect. You can easily see that—so far—the Necker Cube has the *same structural set of possibilities as the previous example*, and that the shifts of position, implied embodiment, are all parallel. But since the empirical literature sometimes, though rarely, recognized the two 3-D and one 2-D variations, phenomenology has not yet gotten deeper than gestalt psychology—but it can. Return to the configuration with a new story: what was previously the insect's body now becomes the forward-facing facet of an oddly cut gem. The various surfaces around this central facet are the other facets of this gem—and once you see this, you can immediately tell that this is again three-dimensional in appearance, but in a totally different way than previously as a cube. And, now, if you are learning fast, you can anticipate that a *reversal of this three-dimensionality is also possible*. One is looking from "inside" or from the bottom of the gem and the once-forward facet is not the distant facet. Add quickly, and we have "constituted" *five* variations so far, not three, as in gestalt psychology, and thus once again phenomenological variations go farther than empirical psychology.

My third example set is slightly different than the previous two. In both the stage/pyramid series and the Necker Cube series, the variants were all discrete, distinct, and alternations were not commensurable with each other. Each had multistabilities but discrete stabilities. In this example there is a continuity phenomenon that nevertheless retains its own kind of multistability. This example is the famous Hering Illusion. Here, as one looks at the configuration, the claim is made that the two horizontal lines "appear" to be bent, but in "reality" they are straight. (This appearance/reality distinction, presupposed from modernist metaphysics, is what makes this an "illusion." Phenomenologically, of course,

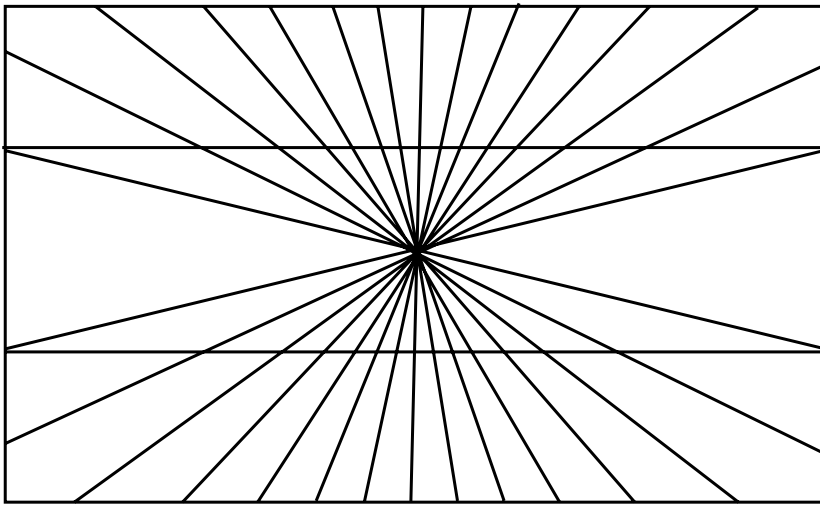

Figure 1.3. Multistable Figure C

reductions eliminate the appearance/reality distinction in favor of what "shows itself.") Now my phenomenological deconstruction of this "illusion" is attainable as follows: focus upon the convergence of lines at the center of the drawing; now "push" this point into distant infinity. As you do this, the horizontal lines *straighten*. Now reverse the process and bring the point that is at infinity back toward your viewing position. You will see the horizontal lines recurve and then straighten out with the three-dimensional reversal. So here again we have multistability, and, as in the other cases, it is related to variations upon two- and three-dimensionality—but also to the context in which straight and curved show a continuous structure. Empirical psychology simply assumed a sedimented and nondepth view, which through deliberate variation shows change. Phenomenologically, perception is not passive but active; holistically, it is bodily interactive with an environment, but while this agrees with both pragmatism and phenomenology, it is the phenomenologically derived *variation* that provides the rigorous demonstration.

We are now partway with step two, the phenomenological enrichment of pragmatism into a postphenomenology. And while I have just made variational theory the central method to give rigor to experiential analysis, the implicit role of embodiment also came into play. Active perceptual engagement, implied in all of the example sets, reveals the situated

and perspectival nature of bodily perception—again, an important point repeated by Husserl in his classical analyses (profiles, latent and manifest presences, sometimes even applied to a solid cube in his examples).

At this point I want to make a large leap to an example set now related to *technologies.* While the use of visual "illusions" has the advantage of initial clarity and ease to demonstrate multistability as a phenomenological result of variational analyses, these illustrations also have the disadvantage of being all too simple and all too abstract. This is particularly the case with respect to the weak sense of embodiment in the illusions set. My POV, or perspective, is clear but weak in the sense that I am in a mere "observer" position vis-à-vis the examples. So my next example set will draw from a very ancient, very simple, and very multicultural set of technologies: *archery* (bows and arrows). Although I have researched, and continue to research, the history of archery, I do not believe anyone knows who or where it was first invented. I did meet someone in XiAn who claimed that the Chinese invented archery—in the history of technology, the usual claim is "the Chinese did it first"—but in this case they did not. Some arrowheads date back to at least 20,000 BP; there is an embedded arrowhead in a skeletal pelvis dated 13,000 BP. And, in this case, some European arrowheads date back to 11,000 BP. Then there is Otzi, the freeze-dried mummy found in the Italian Alps in 1991, carbon dated back to 5300 years ago, who had a full archery set with him, two millennia earlier than the 3,000-year-old Chinese treatises on archery. (There is evidence, however, that the Chinese did first invent the *crossbow,* one of which is displayed in XiAn with the chariots recovered there.) In any case, except for Australia, where boomerangs are used, and parts of equatorial jungles, where blowguns are used—rare cultures in which archery never occurred—virtually all ancient cultures had bows and arrows.

My use here, however, is to show how this practice is also *multistable* in precisely its phenomenological sense developed in the earlier examples. Once again I look for variations, embodiment, and now, more fully, lifeworld dimensions. In an abstract sense, all archery is the "same" technology in which a projectile (arrow) is propelled by the tensile force of a bow and bowstring. But as we shall see, radically different practices fit differently into various contexts:

The first example is the English longbow. One famous battle often referred to in European history is that of the English versus the French at Agincourt. This battle was one not only of nationalities but of technologies—the French preferred the crossbow, the English the longbow. Both were powerful weapons, but while the crossbow was somewhat more powerful, it also was slow compared to the rapid fire capacity of

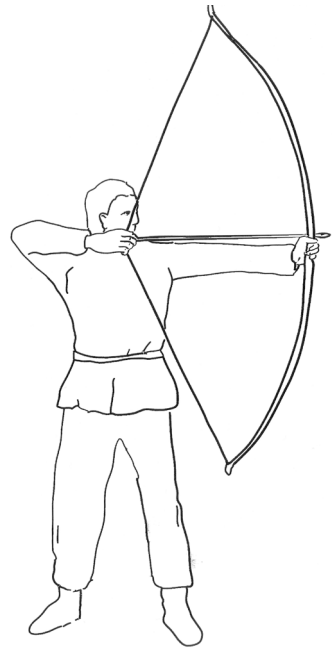

Figure 1.4. English Longbow

the longbow. At this battle, 6,000 bowmen withstood and prevailed over 30,000 infantry and knights. Consider now the material technology, the bodily technique, and the social practice of the longbowmen: the bow was made of yew, usually about six feet or two meters long. It was held by bowmen in a standing position, and the bow was held out in front in a stable position. The bowstring was pulled back toward the eye of the soldier, with four fingers on it, and released when the aim was proper. Arrows were available either in a quiver or stuck in the ground, and firing was fast.

The second example is mounted archery, used by Mongolian horsemen and in the early medieval invasions of Eastern Europe. The horsemen used archery while mounted on speeding horses. While one could say that mounted archers used the "same" bow and arrow technology as weaponry during the Mongol invasions, in another sense there were radical, alternative aspects to horse-mounted archery. First, the bow was short—rarely more than a meter or a little more—made of composite materials (bone, wood, skin and glue), and deeply *recurved*. The power of

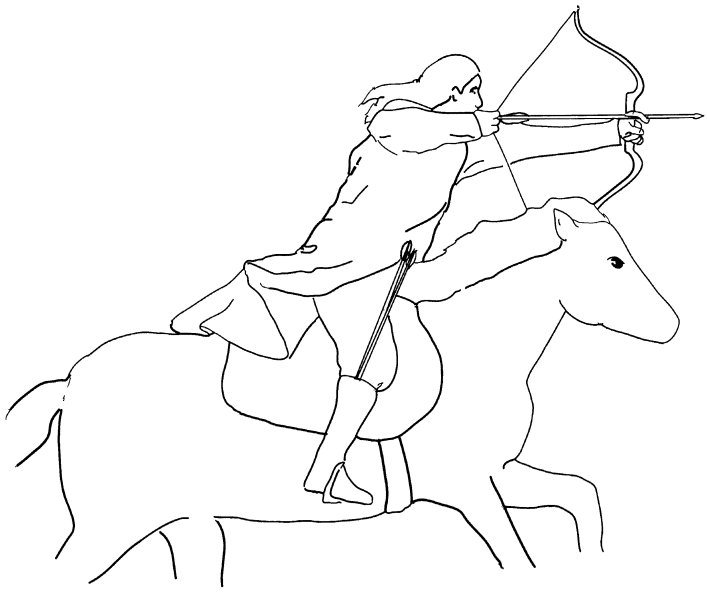

Figure 1.5. Mongolian Horse Bow

the bow was similar to that of the long bow but had less distance-gaining capacity. The bodily technique also was radically different. Used while at a gallop, the archer held the bowstring near his eye and pushed the bow outward for rapid fire. (Although not recurved, American Indians used a similar technique for buffalo hunting.)

The third example is "Artillery archery," what I shall call the ancient Chinese archery that utilized the most powerful of all premodern bows known. The pull needed for these long and partially recurved bows was in the 140-pound range. Here the technique called for a *simultaneous push and pull* to launch the arrow, and a unique use of the thumb, with a thumb ring, was required for the bowstring. (I had learned of this technique before actually visiting XiAn in 2004, but during my visit I was delighted to see the terra-cotta archers precisely positioned for this technique!) So what we see again is another stability in which the actual materiality of the bow, the bodily technique of use, and the cultural-historical role this technology plays as a variant.

I am not claiming here to have exhausted the variations, but these three are enough to show that the phenomenological variations that now include considerations of the materiality of the technologies, the

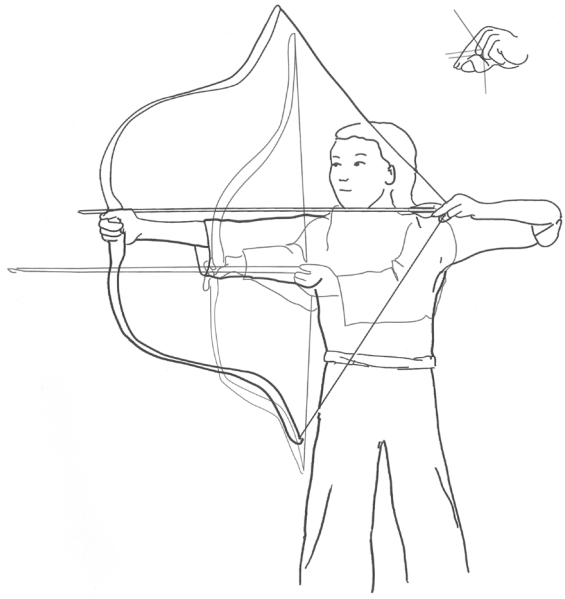

Figure 1.6. Chinese "Artillary" Bow (with Thumb Ring)

bodily techniques of use, and the cultural context of the practice are all taken into account and demonstrate again the importance of variational theory with its outcome in multistability, the role of embodiment, now in trained practice, and the appearance of differently structured lifeworlds relative to historical cultures and environments.

I have now also illustrated the pragmatism to phenomenology and the phenomenology to pragmatism moves needed to outline an initial postphenomenology. The enrichment of pragmatism includes its recognition that "consciousness" is an abstraction, that experience in its deeper and broader sense entails its embeddedness in both the physical or material world and its cultural-social dimensions. Rather than a philosophy of consciousness, pragmatism views experience in a more organism/environment model. The reverse enrichment from phenomenology includes its more rigorous style of analysis that develops variational theory, recognizes the role of embodiment, and situates this in a lifeworld particular to different epochs and locations. There remains one more step to make what I am now calling postphenomenology fully contemporary. That is the inclusion of a "science—better, "technoscience studies" approach to our contemporary lifeworld.

## Third Step: "The Empirical Turn"

I began this chapter with a glance at the "science wars" that grew out of issues of interpretation concerning science, technology, and philosophy for purposes here. My contention is that science, technology, and *philosophy* have all undergone major changes through the twentieth into the twenty-first centuries. And while the next chapter will focus on those changes, before concluding my outline of postphenomenology, I turn to one more episode in its construction. In this case we have to move beyond both classical pragmatism and classical phenomenology and into the realm of the philosophy of technology. Neither Dewey nor Husserl made dealings with material technologies thematic. Dewey recognized that psychological experience was a mere abstraction unless it took into account both the physical world and the social world. And while he did parallel Heidegger with respect to the insight that technologies *precede* science, and that science cannot exist without technologies, he did not engage in analyses that would specifically highlight our experience *of* technologies. In Husserl's case, there are few references to technologies at all. The closest he comes—as I have held elsewhere—is in his recognition of measurement practices lying at the base of the origin of geometry, and his recognition that writing raises consciousness to a higher level.

Martin Heidegger was the exception in classical phenomenology, since by wide agreement he may be considered a major thinker at the origins of the late modern philosophy of technology. I also shall return to Heidegger in the next chapter, but in this setting I will "leapfrog" his work in order to outline the third step constituting postphenomenology. That step is what Dutch philosophers of technology have called "the empirical turn," a phrase that has caught on and is now widely used to describe in particular the very contemporary philosophy of technology.

Here is the context: The Netherlands has had a strong tradition in the philosophy of technology, dating going back to the early twentieth century, and one of its main centers today is at the University of Twente. Hans Achterhuis, himself a leading philosopher of technology, collaborated with his colleagues and published in 1992 the book, *De Matt van de Techniek* [The Measure or Metier of Technics]. This book could be thought of as dealing with the early twentieth-century foundations of the philosophy of technology. It dealt with the first twentieth-century founders of the philosophy of technology, including Martin Heidegger and Jacques Ellul, but also Lewis Mumford and Hans Jonas. But in 1997, again with his colleagues, Achterhuis published a second book,

*Van Stoommachine tot Cyborg: Denken over techniek in de neiuwe wereld*, literally translated as *From Steam Engine to Cyborg: Thinking Technology in the New World*. This book purports to show that a newer generation of philosophers of technology, six chosen from philosophy in America, has shifted the center of gravity by making "an empirical turn." I found this Dutch perspective an interesting one, and thus we had it translated into English (capably done by my colleague, Bob Crease) as *American Philosophy of Technology: The Empirical Turn* (2001).

There are three ways in which Achterhuis sees differences between the classical philosophy of technology and the contemporary philosophy of technology:

- Classical philosophers of technology tended to be concerned with technology overall and not specific technologies. "The classical philosophers of technology occupied themselves more with the historical and *transcendental* conditions that made modern technology possible than with the real changes accompanying the development of a technological culture" (emphasis added).[6]
- Classical philosophers of technology often displayed romantic or nostalgic tastes, thus displaying a dystopian cast to their interpretations of technology. "The issue [now] . . . is to understand this new cultural constellation, rather than to reject it nostalgically in demanding a return to some prior, seemingly more harmonious and idyllic relations assumed to be possible between nature and culture [as in the classical philosophy of technology]."[7]
- Achterhuis notes that the new philosophers of technology took an empirical—or a concrete—turn described thus: "About two decades ago, dissatisfaction with the existing, classical philosophical approach to technology among those who studied new developments in technological culture as well as the design stages of new technologies led to an empirical turn that might roughly be characterized as constructivist. This empirical turn was broader and more diverse than the one that had taken place earlier in the philosophy of science, especially as inspired by the work of Thomas Kuhn, but shared a number of common features with it. First, this new generation of thinkers opened the black box of technological developments. Instead of treating technological artifacts as givens, they analyzed

> their concrete development and formation, a process in which many different actors become implicated. In place of describing technology as autonomous, they brought to light the many social forces that act upon it. Second, just as the earlier, Kuhn-inspired philosophers of science refused to treat "science" as monolithic, but found that it needed to be broken up into many different sciences, each of which needed to be independently analyzed, so the new philosophers of technology found the same had to be done with "technology." Third, just as the earlier philosophers of science found that they had to speak of the co-evolution of science and society, so the new, more empirically oriented philosophers of technology began to speak of the co-evolution of technology and society."[8]

I accept this characterization of the contemporary set of philosophers of technology included in Achterhuis's book. Furthermore, this description is what I am calling the third step toward a postphenomenology. It is the step away from generalizations about *technology uberhaupt* and a step into the examination of *technologies in their particularities.* It is the step away from a high altitude or transcendental perspective and an appreciation of the multidimensionality of technologies as *material cultures* within a *lifeworld*. And it is a step into the style of much "science studies," which deals with case studies.

As Achterhuis correctly recognizes, such a step is not one that occurs in isolation; rather, it reflects precisely the broad front common to most new interpreters of science and technology. The new philosophies of science, the new sociologies of science and feminism, and now the new philosophies of technology all, to some degree, and each in their way, become more concrete in their examinations of what I call *technoscience*.

If this, then, is the contemporary philosophy of technology, then I want to make one final observation about this position compared to both the classical beginnings of pragmatism and phenomenology. As noted earlier, neither Dewey nor Husserl made technologies as such thematic to their philosophies. In Dewey's case, there remained a broad, modernist concern with the natural world and the social world. The experiencer—the human—related to both the physical and the social was thought of as an organism within an environment, in Husserl's case, the "World," or his equivalent of an environment, was also made up of things and of the problematic presence of others, as in the *Cartesian Meditations* and, later, with the historical-cultural-"praxical" world of the *Crisis.* In neither

were relations with technologies as such made thematic or specific. With the arrival of the philosophy of technology, which in its dominant form arose from the *praxis traditions* of philosophy—pragmatism, phenomenology, Marxism—the thematization of human experience in relation to technologies produced a changed philosophical landscape.

Such a thematization, however, includes perhaps the farthest-reaching modification to classical phenomenology. In both pragmatism and phenomenology, one can discern what could be called an *interrelational ontology*. By this I mean that the human experiencer is to be found ontologically related to an environment or a world, but the interrelation is such that both are transformed within this relationality. In the Husserlian context, this is, of course, *intentionality*. In the context of his *Ideas*, and *Cartesian Meditations*, this is the famous "consciousness *of* _____," or all consciousness is consciousness of "something." I contend that the inclusion of technologies introduces something quite different into this relationality. Technologies can be the means by which "consciounsess itself" is *mediated*. Technologies may occupy the "of" and not just be some object domain. This theme recurs later in this book.

## What Is Postphenomenology?

*Postphenomenology* is a modified, hybrid phenomenology. On the one side, it recognizes the role of pragmatism in the overcoming of early modern epistemology and metaphysics. It sees in classical pragmatism a way to avoid the problems and misunderstandings of phenomenology as a subjectivist philosophy, sometimes taken as antiscientific, locked into idealism or solipsism. Pragmatism has never been thought of this way, and I regard this as a positive feature. On the other side, it sees in the history of phenomenology a development of a rigorous style of analysis through the use of variational theory, the deeper phenomenological understanding of embodiment and human active bodily perception, and a dynamic understanding of a lifeworld as a fruitful enrichment of pragmatism. And, finally, with the emergence of the philosophy of technology, it finds a way to probe and analyze the role of technologies in social, personal, and cultural life that it undertakes by concrete—empirical—studies of technologies in the plural. This, then, is a minimal outline of what constitutes *postphenomenology*.