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Hickman On Dewey: Reconstructing A Reconstruction

In *John Dewey's Pragmatic Technology*, we receive Larry Hickman's reconstruction of John Dewey's reconstruction of the history of technology. While such reconstruction is not in itself a bad thing (and is often, in fact, a very useful activity), it does need to be taken for what it is – one man's representation of another man's work. Both men have multiple agendas in their telling of the tale of technology. Given that virtually no human being remains entirely consistent or immutable throughout their entire lifetime (with the possible exceptions of the extremely dogmatic or the unfortunately short-lived), it is important to note that the themes that Hickman extracts from the body of Dewey's work and the greater end toward which he employs them are not Dewey's own systematization of his ideas. *John Dewey's Pragmatic Technology* instead represents Hickman's utilization of the ideas of John Dewey to demonstrate his own conception of technological history.

Chapter two of Hickman's book, "Knowing As A Technological Artifact", attempts to demonstrate that knowledge (and particularly scientific knowledge) is an artifact of technological inquiry. Hickman structures the chapter thematically, rather than argumentatively. His method is to extract relevant passages from John Dewey's work, and

to cobble those together into a coherent picture of how John Dewey might have approached the issue of technological knowledge. Unfortunately, in arranging the chapter roughly thematically, Hickman sacrifices a certain amount of coherence and readability. After reading the chapter, one can mentally reconstruct the broad themes which hold the smaller sections together, but those threads do not always make themselves obvious during the reading. Thus, my own reconstruction of "Knowing As A Technological Artifact" will not follow Hickman's structure. I shall instead attempt to borrow a page from journalistic writing, and to employ the "inverted pyramid" approach, discussing Hickman's themes by order of importance to the question of defining technological knowledge.

To begin, we must understand what Dewey means by "knowledge" -- or, perhaps even more importantly, to understand what he does *not* mean. For Dewey, knowledge does not require certainty, and is not a "mirror of reality." Knowledge is something other than uncovering objective pieces of information about the world. Dewey defines knowledge as the "outcome of successful inquiry." Here we might emphasize the word "outcome": knowledge is the result of having *done* something. This emphasis on "doing" is pervasive throughout Dewey's work, and feeds directly into his conception of what good science should look like. Scientific knowledge cannot be obtained through *a priori* musings about the world; it can only be the result of

experimentation *in* the world. Hickman describes this as not merely passively “seeing new things”, but as actively finding “new ways of seeing.” Additionally, since knowledge is the result of being able to successfully *do* something, it is mutable and deeply situational. A skill or piece of factual information which may help us in one situation may not transfer well to another. It is this mutability and situatedness which prevents Dewey from being able to equate knowledge with certainty. At best, it can be considered a warranted assertion, based upon previous successful action.

If knowledge is the result of successful inquiry, then we next must understand what Dewey means by “inquiry.” Simply put, inquiry is defined as active experience to resolve some cognitive or perceptual tension. For example, a scientist may observe some phenomenon which does not fit into established scientific laws. This causes a certain tension or discomfort in the mind of the scientist, causing her to undertake some action to resolve the tension – i.e., to examine the phenomenon in more detail, to set up an experiment in order to probe its causes, etc. Again, the emphasis is on purposeful *action*. When the scientist succeeds in resolving that tension through experimental inquiry, one of its products is knowledge. Interestingly, knowledge is likely not the *only* artifact of the inquiry – it will probably be one of many artifacts, including new tools, new methods, new institutions, or innumerable other new “ways of seeing.” In fact, these other artifacts

are frequently created even by inquiries which ultimately fail. This leads Hickman and Dewey to conclude that in the creation of technology, inquiry is more critical than knowledge itself.

But what exactly is technology, and what are its characteristics? Under the classification of “technology”, Dewey includes any entity which acts as a tool for inquiry. Technology is the means by which we seek to resolve cognitive tensions; it is the liaison between doubt and its resolution. As mentioned above, it need not be restricted to physical objects. Dewey is quite willing to include government, classification systems, and even human perceptual organs in his definition of technology. Oddly, aesthetics and religion are excluded. Dewey considers these to be non-instrumental, in the sense that they may be expressive or descriptive, but do not seek to provide resolutions to problems. He is willing to admit that religion serves an instrumental role for those in control of it, but considered that role to be hidden from the view of “ordinary” participants. (While I understand the logic of the distinction, it seems to me to be both unnecessary and untenable. I can think of few things that lead more people from uncomfortable doubt about the purpose of human existence to its resolution than organized religious experience. As such, religion seems quite consistent with [and perhaps even exemplary of] Dewey's definition of technology. The case is more difficult to make for art and aesthetics, but I believe that it can be

convincingly done, as well.)

It is of importance to note that the creation of technology is often (and perhaps usually) not the goal of inquiry. New technology created for the purposes of furthering some experimental inquiry is usually something like a by-product of the action of inquiry. But its usage, as Dewey points out, is by no means fixed. He vigorously denies that tools have “essences” or “purposes” in any sense that transcends particular situations. A hammer designed to drive nails might just as well serve as a tool of self-defense. We might even go so far as to say that in a situation in which there are no nails to drive and an assailant is present, the hammer's function is one of self-defense. The point is that whatever function we might wish to assign to a technology, that function must necessarily be bound by some context, and is not something transcendent or inherent to the object (or institution) itself. Hickman draws an analogy with language – words have no “meaning” in and of themselves; they have meaning within a societal and situational framework which gives them meaning. If I shout “Gorilla!” on a crowded city bus, I should expect something different than if the bus were on safari in east Africa. For Hickman and Dewey, “meaning” -- both for language and for technology – is something contextual and instrumental, not something correspondent and intrinsic. Like knowledge, the meanings of words and the usages of a technology are not fixed, but mutable and situational.

Additionally, they multiply as individuals find new uses for a technology. In some cases, the technology itself may relinquish its instrumental role, and instead become an object (rather than a tool) of inquiry. (Witness, for example, the role of the thermometer or the steam piston in the formation of thermodynamics.)

Finally we are prepared to talk about science. If we accept Dewey's definitions of "knowledge" and "technology", then it is impossible to maintain the idea that technology is merely applied science, and that scientific knowledge is knowledge about the laws by which the world functions. Per Dewey's definition, science is just one particular branch of inquiry which deals with one particular domain of tensions. Scientific knowledge does not need to be prior to technology; in fact, without a certain amount of technology, there can be no knowledge, scientific or otherwise. There can also be no scientific "truth" in the strong sense of the word. If knowledge is outcome-based and situational, then the best that we can say of scientific knowledge is that it proceeds from successful action in known situations. If science is to create knowledge, it must be experimental and must resolve problems. Gone is the notion that science discovers objective truth. This is not to say that there isn't an external world, only that the portion of the world with which scientific inquiry deals is partial and subject to change. As Hickman puts it, "things exist prior to perception, but not in the same way." What we observe through

experiment is not the raw “stuff” of the world, but the raw stuff of the world as shaped through our technological apparatus – an apparatus which includes even our own sense organs. To Hickman, the information uncovered by any inquiry is also altered and organized by the tools of that inquiry en route to our cognition. (As a basic example, our ability to distinguish one object from another is contingent upon our having a system of classification in which there is a category called “objects”, and upon our description of what perceptions placed within that category must look like – i.e., they must be distinct from one another. Without such a classification system, we would have no means by which to refer to *that* object rather than the *other* one. Hickman and Dewey consider such a conceptual scheme a tool of perception – a different type of tool than a telescope, but a tool nonetheless.)

In chapter four, “From *Techne* to Technology: Dewey's Reading of the History of Technology”, Hickman undertakes a reconstruction of Dewey's interpretation of the history of technology in light of his views on the nature of technological inquiry as described above. Hickman's method in this chapter is a straightforward chronological overview from “primitive man” to “modern science”. His goal is, in part, to demonstrate how technological progress can be viewed in terms of inquiry, but also to explore the historical symbiotic development of technology and science.

Hickman begins the chapter with what Dewey calls the “primitive” stage of technological development. This stage is characterized by societies presented with few cognitive puzzles, and therefore little motivation for inquiry. The goals of inquiry at this point are short-term goals, and require little tool development to satisfy them. Dewey asserts that technology in primitive inquiry is not object-bound; that is to say, not bound to particular objects. The primitive technician might use a stick as a lever, and then throw it away. Because there is little inquiry and no systematic instrumentation, Dewey argues that there can be no systematic science. Science requires experimentation, and experimentation requires instrumentation.

The second stage of technological development Dewey sees as characterized by the Greeks. In the early (Homeric) stages of Greek history, Dewey argues that there was little inquiry, and therefore little science. He describes the period as one in which man saw his role as fated and beyond control – it is not the place of man to interfere with the will of the gods. Dewey notes that there was tremendous aesthetic and religious development during this period, but of course these have already been ruled out as adequate for “technology.” The turning point (as Dewey describes it) came when man began to assert active control over his environment through the development of tools meant to manipulate it. Artisans began to make more than merely aesthetic

objects, and began to create durable instrumental technologies for altering the world toward purposeful ends. From this, a systematic science began to emerge. But alas, science forsook its technological origins and chose to focus on the world of the mind. Dewey sees the separation of the academic from the artisan as an unfortunate irony; academics used technology as a source of inspiration for inquiry, but failed to identify the transformative and instrumental role played by technology in knowledge-making. While reason and science became serious competitors to religion and divination, they failed to connect back to the world experimentally, and technology was viewed as the rote application of pre-existing knowledge.

In Dewey's reconstruction of the history of technology, this separation continued until the late Renaissance, which Dewey views as the rise of "modern science." Modern science is characterized as becoming properly experimental, with increased attention paid to the role of instrumentation in experiment. Once the role of instrumentation is considered seriously, the production of knowledge grows exponentially, as the process of solving problems experimentally in turn reveals new puzzles which require their own experimental inquiries. Dewey's vision of the future is one in which aesthetics and the social sciences become instrumentalized, as well, and become subsumed beneath the domain of technology.

Obviously, there are vast problems throughout Dewey's reconstruction of history. Nearly every assertion that he makes is easily called into question, if not directly falsifiable. There is little reason to believe that history can be so cleanly divided into three distinct periods, and little evidence to suggest that academic society underappreciated the role of technology until 1685. While the history is whiggish and sloppy by modern academic standards, it nonetheless may accurately describe the popular notion of historical technological progress, even in our current "enlightened" age. And while his vantage point on history seems outdated and trivial, Dewey's accompanying philosophy of technology is quite sophisticated and resonates well with current work in the social history and philosophy of science and technology. To what proportion this can be attributed to Hickman's reconstruction of Dewey I am unqualified to speculate. But taken for what it is (regardless of to whom we should attribute it), the theory of technological development presented in *John Dewey's Pragmatic Technology* is quite fit for modern standards of scholarship.