Dewey's Naturalized Epistemology and the Possibility of Sustainable Knowledge

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IN HIS RECENT TEXT *Sustainable Knowledge*, Robert Frodeman argues that the unchecked proliferation of academic knowledge is unsustainable. While his account provides a basis for more sustainable disciplinary practices, it fails to show how the knowledge produced by such practices is ultimately superior to traditional academic knowledge. This essay provides an epistemic justification for sustainable knowledge. It begins by introducing the maker's knowledge tradition as an alternative to traditional academic knowledge. It then expands and advances this tradition through Dewey's naturalized epistemology. Ultimately, it develops an account of knowledge that is not only of a higher quality than traditional knowledge but is also self-limiting and sustainable.

It is widely acknowledged that the academy is in crisis. In *Sustainable Knowledge*, Robert Frodeman makes the case that this crisis is rooted, in part, in a failure of disciplinary research to meet the needs of culture. Deploying the language of ecology, Frodeman makes the bold (and I believe correct) claim that today the unchecked proliferation of academic knowledge is both irresponsible and unsustainable (6, 62). According to most estimates, over 100,000 academic journals are in print worldwide, and over 100,000 academic books are published each year (Rhode 26, 29). Although more information has been published in the past thirty years than in the previous five thousand (Rhode 29), the vast majority of contemporary scholarship goes without any apparent influence. Slightly less than half of all natural science articles receive citation (Hamilton). This number lowers dramatically in the social sciences and humanities, which both have citation rates averaging under 25% (Baker). Frodeman writes that "the epistemological regime we have been living within, that of infinite, largely *laissez faire* knowledge production, raises a variety of concerns. Additional knowledge can lead to results that

are unhealthy, costly, counterproductive, unethical, and dangerous" (62). As Frodeman argues, the simple fact is that in most cases there is not that much need for additional academic knowledge (62).

To address the problem, Frodeman suggests that a dramatic shift in the aims and cultures of academic knowledge production is required. While the growth of inter- and trans-disciplinary research might serve as an example of such change, these emerging fields are typically designed in the image of traditional disciplines and, as a result, often unwittingly reproduce their unsustainable practices. To revolutionize contemporary research, Frodeman suggests that all disciplinary activities must become *sustainable*, by which he means that they become cooperatively produced with and function in the service of the end-users of academic knowledge. In so doing, disciplinary activities become socially engaged and therefore self-limiting.

While Frodeman's account goes far in providing a practical basis for developing sustainable knowledge, I believe he fails to show how the kind of engaged knowledge he suggests is ultimately superior to traditional academic knowledge. Without such a justification, his proposal underestimates the challenge that the idea of sustainable knowledge poses to the epistemic foundations of the traditional university.

This essay is an attempt to enhance Frodeman's call by providing an adequate epistemic justification for sustainable knowledge. In the first section, I will outline the basic epistemic economy of the contemporary university and show how this economy creates the conditions for unchecked academic knowledge production. I will then introduce the concept of maker's knowledge as an alternative, showing how it can be expanded and advanced through Dewey's naturalized epistemology. In doing so, I will advance three claims I believe are central to providing an adequate epistemic justification for sustainable knowledge: (1) Knowledge improves as it becomes *more* entangled with practice, (2) knowledge gains value through its existential force, and (3) knowing is the capacity for creative action. Ultimately, I will show how maker's knowledge is not only of a higher quality than pure or fundamental knowledge, but also that it is inherently self-limiting and therefore sustainable.

The Epistemic Economy of the University

Like all institutions, the university is grounded in a particular epistemic economy that shapes its organizational hierarchies, central values, and forms of labor. I believe the unsustainability of the contemporary academic research regime can be traced to two aspects of this economy.

The first aspect is the basic epistemic outlook of the disciplines themselves. While pre-disciplinary scholarship took an archival orientation toward its work, Modern research holds a dynamic stance toward knowledge, where production of the "new" is held as its central value and aim (Frodeman 22). Entangled with this optimism for knowledge productivity is also the uncritically accepted belief that knowledge produced in disciplines is an inherently beneficial good that will eventually trickle down to society (Frodeman 23). It is this belief that allows academics to argue that they hold special justification for self-rule: their research is so specialized that the public has no basis for evaluating it, and their research is so necessary that no one outside the discourse itself can question its aims or impacts (Frodeman 23).

Second, despite their radical shift from an archival to a productive stance toward knowledge, the Modern disciplines also retained one of the central and most problematic epistemic beliefs of the Greek tradition: that genuine or "real" knowledge is stable, context-independent, and changeless (LW 4:3–21; Hintikka 58). This belief sits at the center of the Modern valuing of theoretical over practical knowledge and establishes the academy's basic epistemic hierarchy where the ability to quantify or logically order phenomena is assumed to be the highest and most valuable form of knowing and knowledge production (Schön, *Reflective Practitioner* 31–37; "Knowing-in-Action").

These two guiding beliefs result in an overarching epistemic paradigm that holds the unfettered production of theoretical or fundamental knowledge as its central value and creates the initial conditions for unsustainable knowledge practices. This paradigm governs even the most critically minded and community engaged disciplines that, despite their robust critiques of epistemic foundationalism, devote the majority of their labor to the production and publication of academic articles and books.

However, it isn't this paradigm alone that drives unsustainable knowledge production. The great flywheel on which this epistemic economy turns is what historian William Clark, borrowing from Max Weber, calls "academic charisma." Academic charisma is, in brief, the way in which an academic's identity, influence, and authority is established as they work to gain acceptance and esteem inside a closed disciplinary community (Clark 15).

As Clark argues, academic charisma has deep roots in the history of the academy. In the pre-Modern period, academic charisma was obtained through advanced skill in lecturing and evidenced through large numbers of student followers. As the epistemic paradigm of the academy shifted, so did the ways in which academic charisma was cultivated. What began as the Romantic cult of personality was transferred into the Modern university through the

rise of the academic "genius" (Clark 16). It took its Modern form at Johns Hopkins, which was the first American university to adopt the notion that faculty should be recruited, promoted, and granted tenure strictly on the basis of their capacity to produce fundamental knowledge (Schön, "Knowing-in-Action"). Academic charisma was now obtained through research productivity and evidenced through outputting large volumes of new academic information, preferably as its first or sole author.

Frodeman suggests that efforts to create sustainable knowledge practices must originate at the level of production. Research activities must be embedded, contextualized, and focused on concrete problems as a way of delimiting the volume of the work and ensuring its direct, cultural impact. While I agree with Frodeman's claims, it is my contention that because academic activities—and therefore, academics, themselves—gain credibility *only* in relationship to the governing epistemic paradigm previously outlined, creating sustainable knowledge practices also demands that we reconstruct that paradigm itself. If not, scholars who involve themselves in the kinds of practices Frodeman suggests will be considered unproductive at best or, at worst, incapable of producing "real" knowledge as measured from within the calculus of the academy's central epistemic paradigm.

This concern is not merely speculative. There is, in fact, a long history in the academy of privileging disciplines and researchers engaged in theoretical pursuits while systematically marginalizing others. Thorstein Veblen, for example, engaged this very problem in *The Higher Learning in America*. Veblen's book was motivated by a debate over whether the University of Chicago should introduce a business school alongside the traditional liberal disciplines. For Veblen, it was clear that "schools of higher learning" held as their proper aim the production of "pure" knowledge, such as fundamental science and systematics (Schön, "Knowing-in-Action" 4). This was because, as Veblen argued, it was impossible for applied fields to produce knowledge of the same quality as the "pure" disciplines. Veblen also argued that the business and professional school faculty would never be taken seriously in the University of Chicago due to their lower epistemic status. The result was what Donald Schön characterizes as the "Veblenian bargain": the "higher" schools were to produce fundamental and systematic knowledge, while the "lower" schools were to apply that knowledge to the kinds of practical problems students would encounter in the world ("Knowing-in-Action" 4).

This same basic tension remains today in the so-called "hierarchy" of academic knowledge in which a discipline's social status is intertwined with its perceived capacity for producing theoretical or computational knowledge.

This hierarchy continues to influence the relationships and boundaries between traditional disciplines (Gieryn; Lamont and Molnár; O'Meara; Simonton) and between university faculty and academic staff (Green and Little; North; Perry; Whitchurch).

Dewey's Naturalized Epistemology and the Maker's Knowledge Tradition

In the remainder of this essay, I will argue that in order to make the creation of academic knowledge a sustainable practice, the traditional epistemic paradigm of the academy must be dissolved. I will make my case by reclaiming the maker's knowledge tradition that has been largely abandoned in contemporary epistemology, and by showing how Dewey's naturalized epistemology revises and advances many of the core ideas of this tradition. Ultimately, I will argue that sustainable knowledge depends upon all disciplinary research being understood as advancing some form of maker's knowledge.

The maker's knowledge tradition has been most identified with the work of Francis Bacon (Perez-Ramos), Giambattista Vico (Gaukroger; Newstead), and Immanuel Kant's philosophy of mathematics (Hintikka). Bacon, for example, argues that "human knowledge and human power meet in one; for where the cause is not known the effect cannot be produced" (Bacon 259). Vico similarly argues that "the criterion of the true is to have made the thing itself" (quoted in Pompa 59). Kant writes "hitherto it has been assumed that all our knowledge must conform to objects. But all attempts to extend our knowledge by establishing something in regards to them a priori, by means of concepts, have on this assumption ended in failure. *We must therefore make trial* whether we may not have more success in the tasks of metaphysics if we suppose that objects must conform to our knowledge" (Kant, Bxvi; emphasis added). As such, Kant argues that "mathematical knowledge *is construction* from concepts" (A713/B741).

The core of the maker's knowledge tradition is the notion that makers have superior knowledge of the products of their creation. Specifically, as Anne Newstead argues, maker's knowledge "is a kind of knowing why something is that way it is, because one knows intimately how it came about and intimately what it really is, by intention and in reality." Jaakko Hintikka argues that in and through such acts of making, "a double creation as it were seems to be taking place. Besides bringing about [a concrete] result in a purely causal sense (when successful) the agent creates through his knowledge, his beliefs, and his expectations a kind of framework in which the result can be

discussed even when the agent is unsuccessful" (88). The maker not only generates change, but from their activity, new frameworks and concepts emerge that guide future action. This suggests that knowledge is neither found nor foundational, but is instead the product of a process of creative making.

Danilo de Souza Filho argues that these core insights of the maker's knowledge tradition were at the center of the debate in early Modern philosophy to re-define the very notion of science and scientific knowledge (de Souza Filho 231). In particular, the maker's knowledge tradition rejected the conception of science as a corpus of universal, necessary, and eternal truths, and argued in favor of a view of scientific theories as explanatory models, with both probabilism and constructivism at the center (de Souza Filho 231).

The central elements of the maker's knowledge tradition, particularly its emphasis on knowledge as an artifact of a creative process and its embrace of an experimental epistemology, bears a striking resemblance to the pragmatic tradition, and to Dewey's naturalized epistemology in particular. However, as I will show throughout the remainder of this paper, even more than Bacon, Vico, and Kant, Dewey insists that in "the art of knowing," the "operation is one of doing and making in the literal sense" (LW 1:320; Garrison 58).

While Dewey did not identify himself with the maker's knowledge tradition, his naturalized epistemology also begins in a fundamental continuity between making and knowing. For Dewey, naturalism means that "that there is no breach of continuity between operations of inquiry and biological operations and physical operations. . . . *[R]ational operations grow out of organic activities*, without being identical with that from which they emerge" (LW 12:26; emphasis added). A naturalized epistemology is committed to the interrelationship between experimental activity of live creatures in the world (i.e., acts of making) and knowledge, which is an emergent property of such behaviors. It is predicated on the fact that life occurs not simply within an environment but in interaction within that environment. As Dewey writes, "the striving to make stability of meaning prevail over the instability of events is the main task of intelligent human effort" (LW 1:49). The live creature interacts with its environment, it is required for survival to react to the unique conditions of that environment, and it ultimately must recover and adapt to those conditions. Knowledge, then, cannot be understood apart from the lived conditions out of which it arises.

Dewey writes that traditional epistemology—which is the same epistemology that governs the epistemic economy of the contemporary university—is instead grounded on "the assumption that knowledge has a uniquely privileged position as a mode of access to reality in comparison with other

modes of experience, and as such it is superior to practical activity (LW 4:85–86). To the contrary, for Dewey, knowledge *emerges from* embodied action in the world. Dewey writes:

> [K]nowing is literally something which we do. . . . [T]hinking does not mean any transcendent states or acts suddenly introduced into a previously natural scene, but that the operations of knowing are (or are artfully derived from) natural responses of the organism, which constitute knowing in virtue of the uses of inquiry, reconstruction, and control to which they are put. (MW 11:367)

As such, Dewey's naturalized epistemology opposes both idealism and variants of realism: the production of knowledge is a situated process that occurs in and through time and is initiated in response to specific problems in the world (Boyles; Hildebrand). If successful, it results in both the transformation of a situational whole (including the knower herself) and refined, abstract concepts that can be deployed in the future in similar situations. Like the maker's knowledge tradition, for Dewey, there is therefore an intimate and circular relation between objects of cognition and acts of construction (Perez-Ramos).

In the next three sections, I will focus on three overlapping dimensions of Dewey's epistemology and the maker's knowledge tradition that I believe are essential to providing an adequate epistemic justification for sustainable knowledge practices.

Claim 1: Knowledge improves as it becomes more entangled with practice

Donald Schön writes that contemporary academics find themselves caught in a dilemma between *rigor* or *relevance* ("Knowing-in-Action"). In order to be theoretically or mathematically rigorous, academics must keep their work outside of what Schön calls the *swamps of practice* where "problems are messy and confusing and incapable of technical solution" ("Knowing-in-Action" 28). Yet, at the same time, problems that exist within theory alone are largely irrelevant and unimportant to the world at large. Therefore, as Schön argues, the academic "is confronted with a choice. Shall he remain on the high ground where he can solve relatively unimportant problems according to his standards of rigor, or shall he descend to the swamp of important problems where he cannot be rigorous in any way he knows how to describe?" ("Knowing-in-Action" 28). Layered onto this tension between rigor or relevance is the notion of academic charisma. If the academic is to achieve acceptance and esteem, he or she will not find it by engaging in the swamps of practice. To

abandon the high ground of theory is not only an epistemic dilemma for the contemporary academic, but it is also an existential one.

The dilemma of rigor or relevance only occurs, however, if one accepts the traditional epistemic claim that theoretical or fundamental knowledge is somehow more rigorous and therefore of a higher quality than knowledge engaged and entangled in practical situations. Both Dewey and the maker's knowledge tradition reject this traditional epistemic belief and claim the opposite.

The maker's knowledge tradition argues that knowledge is continuous with and emerges from embedded activity in the world. Therefore, theoretical knowledge exists to enrich and support engaged forms of making and *is a sub-function of maker's knowledge*.

The maker's knowledge tradition is not a rejection of theoretical knowledge *per se*, but a recognition that theory exists to support the kind of enriched and engaged knowledge necessary to enable meaningful creative action. Hintikka argues that maker's knowledge "is not exhausted by . . . theoretical knowledge of causal connections which lead up to the desired result, although it may comprise such knowledge as an element" (87). As Hintikka further argues, "the underlying idea of [maker's knowledge] . . . may be said to be the idea that we can obtain and possess certain especially valuable kinds of theoretical knowledge only of what we ourselves have brought about, are bringing about, or can bring about" (80). As such, maker's knowledge is significantly more complex and more difficult to achieve than purely theoretical insights.

Dewey advanced and revised this notion throughout his writings. In *Logic: The Theory of Inquiry*, for example, Dewey reframes that question at the heart of traditional epistemology. Rather than being concerned with the stability of foundational truth claims, Dewey argues instead that philosophy should focus on the *processes of making* by which those claims emerge: actual, live experiences of inquiry. As such, Dewey's epistemology begins with an epistemic subject who knows through (rather than in spite of) being enmeshed in the natural and cultural dimensions of experience (Shuford 88).

For Dewey, knowledge is always entangled with some kind of action and, as such, he refuses the dualism that traditional epistemology makes between "knowing" and "doing" (Shuford 91). Larry Hickman argues that for Dewey even "the construction of theories is a special case of the use of productive skill, that is, a special type of technical production" (18). This is because theory is not developed in isolation and later applied to problems (Schön, *Reflective Practitioner*; "Knowing-in-Action"), but instead meaningful

theoretical knowledge is entangled with and *therefore is always derived from* live situations in the world.

One particularly concrete engagement Dewey had with this idea is found in his presidential address to the American Psychological Association, which he titled "Psychology and Social Practice" (MW 1:131–50). Dewey begins by saying that he was asked to give a talk on the nature of psychology, but that instead he finds the task impossible without beginning inside a social problem—in this case, the problem of education—and working backward to make general claims about the nature of psychological theory. This is because, according to Dewey, it is only inside the complexities of practice that we find the significance and adequacy of any theory.

In the address, Dewey takes up an extended discussion of the relationship between psychological research and teaching practice, arguing that theory is not impurified by the demands of practical situations, but is instead *improved by them*. Dewey argues, for example, that "I have tried to show that it is not *in spite of* its statement of our personal aims and social relations in terms of mechanism that psychology is useful, but *because of* this translation and abstraction" (MW 1:146; emphasis added). For Dewey, the entanglements of practice are absolutely necessary for the development of adequate theory.

Dewey's commitment to the idea that knowledge improves through practice applies not only to psychology, but to all forms of knowledge. Dewey writes that "in outward forms, experimental science is infinitely varied. In principle, it is simple. We know an object when we know how it is made, and we know how it is made in the degree in which we ourselves make it" (LW 1:319). This is the case because knowledge emerges through the process of transforming a situational whole.

Larry Hickman's work on Dewey's illuminates how, when one enters into a situation of inquiry, "there is a search for a tool with which to operate on the unsettled situation. The tool becomes a part of the active productive skill brought to bear on the situation. *The purpose of the tool is to reorganize experience in some way that will overcome its disparity*, its incompatibility, or its inconsistency" (Hickman 21; emphasis added). This idea dissolves the problematic binary between theoretical and practical knowledge, understanding them as two sides of the same coin that are entangled and interdependent inside engaged, creative activity.

Claim 2: Knowledge gains value through its existential force

The emergence of theory from practice also suggests the second major epistemic claim of this paper, which is that the value of knowledge lies in its capacity to produce meaningful effects in the world.

In traditional views, theoretical or fundamental knowledge is set outside the swamps of practice. As such, its value is not tied to its capacity to change or alter reality, but instead is judged by how it adds to a catalog of abstractions or data assumed to reflect what is certain or real (Shuford 91). To the contrary, inside the maker's knowledge tradition, knowledge gains value through its ability to carry what Hintikka calls "power," but what I will call *existential force* (Hintikka 81). Similarly, Dewey argues that knowledge is always aimed at some kind of practical transformation or the solving of some kind of existential problem and therefore, knowledge has no intrinsic value or special status outside of its ability to cause practical effects in the world (Shuford 91–92).

It is important to be clear that the notion of existential force is not an analogue to the predictive power of Modern techno-science. For Dewey, inquiry is not understood simply as the application of methodological procedures to technical problems, but is instead a central vocation of social beings. Knowledge is significantly broader than propositional content and contains a number of dimensions such as aesthetic and moral meanings, as well as tacit and intuitive knowledges. *Existential force, then, is the way in which knowledge carries meaningful reconstructive power for and improves the lives of individuals and communities*. Modern techno-scientific achievements are neither automatically nor inherently valuable simply because of their repeatability and predictability. Art and music, for example, often carry significantly more existential force for communities than many of the achievements of modern techno-science.

This claim not only dissolves the traditional hierarchy of academic knowledge, but it also troubles the traditional balkanization of the disciplines. Understood from the standpoint of maker's knowledge, disciplines can neither be disconnected from one another nor have their value determined outside the context of the concrete situations from which they emerge and in which they are engaged. Hintikka argues, for example, that maker's knowledge depends upon the relationship between knowledge itself and the effects of that knowledge inside a situation of creative action (86–87). Similarly, for Dewey, *situations* stand both as the occasions and conclusions of inquiry (Capps 644). Tools of making (both intellectual and practical) are selected in terms of their applicability to particular situations, and therefore, their quality can be evaluated only on the basis of their success in terms of that situation. This idea not only links knowledge production to the world, but is also a significantly more stringent standard for the evaluation of knowledge disciplinary activities than the traditional modes of conceptualizing disciplinary rigor, such as logical consistency, statistical significance, or mere peer agreement (Capps 647).

Dewey's writings on education go further and directly connect the notion of existential force to disciplinary activities. He writes, for example, that colleges have a unique obligation to culture as a result of their research core (MW 1:48). For Dewey, disciplines are cultures of practice that emerge in response to particular classes of problems in the world. Universities are cultural spaces uniquely situated to catalyze social-self reproduction, both in their pedagogical and research activities. Dewey argues that the "function of the liberal arts college, in my belief, is to use the resources put at our disposal alike by humane literature, by science, by subjects that have a vocational bearing, *so as to secure ability to appraise the needs and issues of the world in which we live*" (LW 15:280; emphasis added). However, for the academy to achieve its reconstructive potential, the aims, concerns, and knowledges of non-specialists must be *directly integrated* into its pedagogical and research activities (Waks; Stoller, "Flipped Curriculum"). Only in so doing does disciplinary knowledge develop existential force and therefore value.

Claim 3: Knowing is the capacity for creative action

Lastly, the maker's knowledge tradition suggests that knowing is not a cognitive acquaintance with objects of knowledge, but a capacity to act creatively in situations to bring about desired and desirable ends (Hintikka 58). As Newstead argues, knowing is "tied to intending, planning, doing and making . . . [therefore] knowledge [is] thus accessible *only from the standpoint of being an agent*."

The idea of knowing as creative agency runs counter to the dominant epistemic paradigm of the academy, which maintains that knowing is the capacity to mentally manipulate and reproduce cognitive objects. This is an epistemic belief with a long history in the Western tradition. Perez-Ramos argues, for example, that ancient epistemology advanced a distinction between knowledge *derived from an object* (i.e., observational knowledge) and knowledge that *determines its object* (i.e., maker's knowledge), such as the way in which a cobbler's knowledge of a shoe determines his capacity in producing one (Perez-Ramos 150).

Plato, for example, argues for the superiority of observational knowledge by distinguishing between the knowledge of a flute player and a flute maker. For Plato, the flute player observes, beholds, and reproduces theoretical knowledge (episteme) of music, while the flute maker simply constructs objects that enable the player to conduct her work. Because Plato understood the flute player as not actively creating, but instead as reflecting and reproducing a musical form, her knowledge was of a higher value. To the

contrary, the flute maker's knowledge—knowledge of how to manipulate material to create objects—simply stands in service to this ideal (*Republic* 601e–602). This same error in thinking is repeated in contemporary aesthetics today, as knowledge of artistic craft is seen as largely irrelevant or of less value than theoretical knowledge of the art object itself (Stoller, "Toward an Aesthetics").

Dewey, in fact, develops a critique of this very position in his philosophy of art. In *Art as Experience*, he inverts the traditional relationship between the observer and maker in order to prioritize the knowledge and perspective of the maker in understanding art. Dewey argues that while the observer of an artwork may undergo a rich experience of feeling, constructing, and integrating meanings, this standpoint is still limited because when the observer participates in an artistic experience, she is doing so from within the context of something that "the artist selected, simplified, clarified, abridged and condensed according to his interest" (LW 10:60). It is clear that there are similarities between the work of perception and the work of creation. In fact, for Dewey, creative action includes perception as a significant phase of its labor. Yet the two standpoints "are not the same in any literal sense" (LW 10:58).

In taking the art object as their starting point, observational stances fail to account for the much deeper process of creative laboring out of which art works are produced. It is in understanding, improving, and expanding the process of creative laboring that Dewey finds the primary aim of philosophy of art. The artist constructs something of significance from disconnected, undefined, and submerged raw materials. It is for this reason that Dewey argues that "it is not so easy in the case of the perceiver and appreciator to understand the intimate union of doing and undergoing as it is in the case of the maker" (LW 10:58).

For Dewey, knowing is cultivated from and expressed through creative activity. This is not simply confined to the arts but is found in the basic relationship between knowledge and inquiry and, specifically, the ways in which inquiry transforms situations and empowers individuals through acts of making. Dewey writes that knowledge "represents objects which have been settled, ordered, disposed of rationally. Thinking, on the other hand, is prospective in reference. It is occasioned by an *un*settlement and it aims at overcoming a disturbance" (MW 11:336). Knowing, then, is not and cannot be the simple mental manipulation of previously cognized objects, but instead it is embodied, active, and future directed. Knowing is the capacity to transform situations and is therefore a form of creative agency.

Conclusion

One of the most enduring and uncritically held beliefs in the academy is that it exists for the purposes of the creation, preservation, and transmission of knowledge. While Frodeman's argument for sustainable knowledge accepts that the university should be grounded in academic research, it poses a provocative question in the face of this assumption: Just what *kind of* knowledge should the university be in the business of producing?

Over the last century and a half, disciplines have developed knowledge cultures that produce and primarily value knowledge that is theoretically driven and removed from the practical entanglements of culture. It has promoted and rewarded scholars largely based on their capacity to proliferate knowledge of this type. Frodeman's work suggests that today our knowledge practices are in desperate need of revision: research activities must be embedded, contextualized, and focused on concrete problems as a way of delimiting the volume of the work and ensuring its direct cultural impact.

I have argued that in order for Frodeman's vision to be implemented, the epistemic paradigm of the academy must undergo a dramatic reconstruction. Specifically, it must abandon its obsession with theoretical knowledge and, instead, embrace maker's knowledge as its primary aim. This includes grounding the epistemic economy of the academy in three central beliefs: (1) Knowledge improves as it becomes *more* entangled with practice, (2) knowledge gains value through its existential force, and (3) knowing is the capacity for creative action. It is ultimately my contention that maker's knowledge is of a higher quality than strictly fundamental knowledge. Because the maker's knowledge tradition recognizes that knowledge is an act of creative construction, it also understands knowledge productivity as a resource entangled with human limits and material constraints. As such, it is also inherently self-limiting and therefore sustainable.

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