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ABSTRACT

The success of contemporary society in producing knowledge serves to highlight the breakdown between knowledge production and its use. New Orleans and Katrina offer one example of this breakdown. All the knowledge necessary for acting beforehand was available; the problem was not one of knowledge but of will. Geoaesthetics -appropriating the erotic nature of our relationship to the land - is offered as an inter- and transdisciplinary means for making disciplinary knowledge more pertinent.

KEYWORDS

aesthetics, environmental philosophy, *eros*, geoaesthetics, geology, New Orleans

1. Introduction

Assaying is a procedure where one measures a property of a system or a system as a whole, such as the concentration of gold in an ore body. It is time for an assay of knowledge not of this or that type of knowledge, but of knowledge itself, in terms of its use, abuse, and disuse for life.

Despite - or better said, because of - the tremendous growth in every sphere of learning, science, and technology, we suffer from a massive incoherence in the current configuration of knowledge. This gap stands out all the more as our learning piles skyward. This failure has two dimensions:

1. horizontal: the lack of integration across the academy and more generally among knowledge producers; and
2. vertical: the lack of communication between knowledge producers and knowledge users in both the public and private sectors.

Both problems are rooted in the disciplinary nature of knowledge production. For while knowledge is structured in terms of disciplines, our problems are not. The societal challenges we face will not turn on developing new knowledge but rather in finding ways to make use of the knowledge we already have. Geology and aesthetics can help alleviate this situation.

'Geology' here does not mean traditional hard rock geology - mapping, mining, or mineralogy - but rather something closer to what has come to be called 'Earth system science' - the new geology that studies the lithosphere, hydrosphere, atmosphere, cryosphere, and biosphere as an integrated whole. In fact, even beyond Earth system science lies an integration that hearkens to the ancient roots of the term - a *logos of Gaia*, an ordered account of all facets of our life on Earth, natural and social. In this sense, a full-bodied philosophy of geology is at the same time an environmental ethics.

As Heidegger noted, science is our definition of the real. We look to scientists, not artists, poets, philosophers, or politicians, for statements about the true nature of things. But ironically, the definition of science that dominates society - what can be called the physics model of science - is itself

irreal. It is irreal because science depends on parameterization, breaking off part of the world so that it can be studied in isolation, repeated over and over again in an experiment. Of course, in the real world nothing is really isolated from anything else.

There is a deep connection between the disciplining of knowledge and the dominance of the scientific method. Both rely on the assumption that it is possible to study things in isolation. One result of this powerful but fundamentally irreal definition of truth has been the breakdown in the relation between knowledge production and use. If you seek a ready example of this, consider Iraq or New Orleans and Katrina.

We need a new philosophy of science, and of knowledge, that puts priority on the connection between knowledge production and its use, one based on geology and aesthetics rather than physics and ethics. What would a philosophy of science and knowledge that took its cue from geoaesthetics look like? It would be based on field truths rather than the laboratory; rooted in the policy concerns of decision-makers; and attentive to the erotic dimension of life.

My thesis, then, is this: The artful combination of aesthetics and geology, taking its cue from the epistemological truths of field geology, and dedicated to cultivating our connection with and love of the natural world, offers the promise of a better marriage of knowledge and relevance.

In the space remaining I will move back and forth between two points, offering some general thoughts on the state of the current relation between science and society, while also providing an example of what a geologically-oriented philosophy of science might look like through a brief consideration of New Orleans and Katrina.

2. Science and the Use of Knowledge

Despite the comments of President Bush, who claimed "I don't think anyone anticipated the breach of the levees," the dangers facing New Orleans were well publicized for decades preceding the events of August and September 2005. For example, in July 2004 the US Federal Emergency Management Agency (FEMA) held a five-day exercise in Louisiana. Using a hypothetical hurricane, the goal was to devise an integrated regional response. Named "Hurricane Pam," the exercise imagined 120-mph winds and rain that overtopped New Orleans area levees, causing the evacuation of more than one million residents and destroying a half million buildings. The local New Orleans newspaper, *The Times-Picayune* followed up with a multi-day series publicizing the effects of a "Hurricane Pam."

But when Katrina hit 15 months later, both government and citizens were woefully unprepared. How are we to explain this breakdown in the use of relevant knowledge? In part, we must acknowledge the importance of factors such as cronyism reaching up to the top levels of the US Government, the history of corruption in New Orleans, and the large number of poor and disenfranchised within the city. But there were also other, deeper, less accidental, more fundamental causes at work.

In the 17th century, Western society invented a distinctive way to address life's problems: through the discovery, development, and application of technical and scientific knowledge. That is, objective knowledge, value-free knowledge. In previous times and cultures, people had placed their trust in god, king, or nature and accepted the

world more or less as it presented itself. Beyond the merely practical, knowledge consisted in identifying one's place in the natural order and moderating one's desires in order to live a good life. What the medievals called *libido scientia* the endless desire to know was viewed with suspicion. Excessive knowledge was thought to lead to folly and self-destruction. Greek tragedy was based upon such themes.

In the modern view, however, knowledge is not a problem but rather a solution, an unalloyed good, and even a panacea. As Descartes says in his *Rules for the Direction of the Mind*, given the scientific method, "there is no need for the mind to be contained within any limits." Within the United States, this attitude has become enshrined within long-term trends of both the public and private funding of science. Over the last fifty years, funding of science and technology has steadily grown with every American administration, Democrat or Republican. In 2005 in the United States, the amount spent on the public funding for science reached \$138 billion. Privately funded research spent triple that amount.

This massive amount of funding for science over decadal time spans now provides data for asking, "How much benefit has come from this massive amount of scientific research?" The question of the possible disparity between our production of new knowledge and the lack of received benefit is now coming to be recognized as a major challenge within knowledge culture. In the United States, somewhat ironically, this question has itself led to a new research program.

In 2007, the US National Science Foundation began a new research program in "the science of science policy." The goal of this program is to improve our understanding of how science can have maximum impact on society.^[1] The program is part of a growing recognition that science cannot be judged solely in terms of scientific criteria. This simple but revolutionary point also led the NSF in 1997 to reorder its criteria for the peer review of proposals, coming up with two: intellectual merit and broader impact.

As one might expect, the research being funded under "the science of science policy" is generally oriented along economic lines. Rather than calling for the development of a general theory of pertinent knowledge or for that matter, the development of an agnatology, a theory of ignorance the NSF has focused on the development of tools for measuring how basic scientific research contributes to economic growth.

It is telling that the NSF calls the program the 'science' of science policy rather than a 'philosophy' of science policy. The modernist positivist patina remains, assuming that what counts can be counted and that what can be counted counts. Of course, knowledge production may indeed be good for economic growth. But this speaks very little to fundamental questions of politics and ecology; for instance, whether scientific discoveries increase tensions between different cultures, or whether further economic growth is ecologically sustainable (see China).

Aestheticians in league with geologists have distinctive skills to bring to the development of a full-bodied philosophy of science policy. Together, they have skills and perspectives that can help society explore the full range of how knowledge production and use can be better connected. For both geology and aesthetics are integrative fields that show the connections between things.

3. *Akrasia* and the Breakdown in Knowledge Use

The connection between the production of knowledge and its use by society takes any number of forms: by intention or accident; personally or anonymously; or across small or great spans of space or time. The disconnection between the discovery of knowledge and its use can happen through the simple failure to listen, improper handoffs between parties, misinterpretations on one side or another, the intercession of extraneous forces (that is, politics), or the rise of unanticipated consequences.

For instance, rather than being measured in terms of economics, the breakdown in the connection between the production and use of knowledge may be characterized in ethical and psychological terms. Chapter 7 of Aristotle's *Nicomachean Ethics* consists of an extended reflection on *akrasia*—incontinence, or failure of the will. Aristotle asks, how is it possible for us to act in ways contrary to the conclusions of our own reason? He divides incontinence into two types, weakness (*astheneia*) and impetuosity (*propeteia*). The weak person follows through the process of reasoning but then fails to act on his or her own conclusion. Reason is overmatched by a passion. In contrast, the impetuous person simply reacts, not engaging in an act of reasoning until after the fact, if at all.

Society has devised different strategies to combat *akrasia*. For instance, in the case of smoking, individual acts of *akrasia* have societal consequences, so society has chosen measures of soft paternalism, like laws banning smoking in restaurants. Analyzing the case of New Orleans, however, raises complications involving questions of *scale* (e.g., individuals who didn't evacuate versus the actions of the mayor or governor, or US Federal Agencies such as the Federal Emergency Management Agency (FEMA)) and *timeline* (e.g., the hourly timeline of evacuation decisions versus the decadal timeline of levee decisions). There are also questions of the lived experience of people that may underlie a failure of will—when the consequences of individual decisions are far removed from daily experience or when consequences result from the aggregation of small decisions.

Akrasia can also be caused by our ontology, the intellectual categories we use to describe experience. Consider the effect of the terms 'facts' and 'values.' While discussed in terms of facts, disputes about whether or how to rebuild New Orleans have mostly turned on questions of differing values. After all, we all know values—ethical, aesthetic, or other types—are subjective.

Prototypically, (scientific) facts are supposed to inform, lead, or even change our values. This is the idea underlying programs such as the US Global Climate Research Program (USGCRP, now CCSP, the Climate Change Science Program). Politicians were to hold off on making decisions concerning climate change until scientists discerned the set of facts sufficient for justifying one or another type of action. This was called science for policymaking. Of course, this is not how it has worked out, in the climate-change debate or elsewhere. It is vastly more common for the values themselves to be assumed rather than argued for. Debates consist in marshalling this or that disciplinary body of knowledge in support of a predetermined set of values. Participants bring a disciplinary perspective to the table and then use it to express their values. Disagreements result more from inter- than from intra-disciplinary discussion: disputes *within* a given disciplinary frame are much less

profound than those *between* disciplinary frames. This is what we would expect, since disciplines are defined largely in terms of a shared set of values about how to best understand things. Nonetheless, the assumption remains that we would all agree on what we should do, if only we knew the (scientifically generated) facts.

The problem, however, lies in this talk of facts and values. These two words evoke the entire architecture of modernity, where science is thought to provide objective facts that inform our subjective value preferences, which are then adjudicated via democratic debate. This architecture is under strain today, as scientific studies have shown that rather than being either objective or subjective, science is an intricate blend of personal and societal perspectives, robust reflection on the nature of things, interpretive leaps, and an *excess* of objectivity (Sarewitz, 2000). Better to say that, rather than objective or subjective, science is *inter-subjective*, as are the social sciences and the humanities.

In terms of their epistemological status, the main difference between the sciences and the humanities is this: under the physics model, science can circumscribe its reasoning so that it can produce well-founded, reproducible, albeit *irreal* results. But as noted above, the conditions of the laboratory are not the conditions of the world. In the real world, conditions are never able to be completely isolated from other effects, nor can we ever truly repeat the same conditions. The 'objectivity' of the laboratory sciences is a construct. That's why philosopher Nancy Cartwright titled her 1983 book "How the Laws of Physics Lie."

Once science enters the real world of the field its results are beset by the same uncertainties that typify the field sciences and the humanities. This is not to diminish the sciences, which are chock full of well-grounded reasoning. It is rather to highlight the fact that, rather than being a poor imitation of what properly happens in the lab, field based sciences like ecology, geology, and anthropology present us with a truer picture of the nature, strengths, and limitations of scientific reasoning.

4. *Eros* and the Pursuit of Knowledge

In Plato, the analogous terms for 'facts' and values' are '*logos*' and '*eros*'. But what a difference the terms make! '*Logos*', richer than 'science' and even 'logic,' includes all the means by which we total up our experience. *Logos*, for instance, includes narrative and moral reasoning as well as science. As has been noted by many (e.g., MacIntyre, 1984), scientific reasoning is itself derivative from an encompassing narrative logic that explains the origins, meaning, and purposes of the research.

But it is '*eros*' that's the crucial term for us here because of its dual connection to overcoming *akrasia* and to the exposition of beauty. In the first instance, of course, *eros* means sexual desire, but for the Greeks it also points to desire in general. And, crucially, for Plato *eros* also includes an element of moral and spiritual development.

For Freud and modernity, desire is polymorphously perverse. It has no goal, inherent meaning, or direction, sexual or otherwise. Attractions are subjective and arbitrary. There is, for instance, no *reason* for us to be holding a meeting at Koli rather than a windowless hotel in Helsinki. If we choose to meet here, it's the expression of our subjective inclinations, nothing more. In contrast, for Plato our desires could and should be educated. So, for instance, questions of beauty are interpretive but also real, grounded in our ability to give

good reasons for our opinions. They also have a natural end the appreciation of the good.

Put differently, for Plato *eros* is an inter- or transdisciplinary force that unifies and directs the disparate threads of knowledge. Education today is overwhelmingly technical in nature; for Plato, education consisted primarily of an education in *eros*. One learned the proper way to comport oneself in the world through cultivating the right kind of desire and desire for the right things. Instruction in music was the single most important part of this self-cultivation, for music tuned and attuned the soul.

Substituting 'eros' for 'value,' then, involves more than simply pouring old wine into older bottles. The term 'value' is *eros* trivialized, subjectified, rendered non-teleological, and stripped of its inherent connections with reason. As a result, disciplinary knowledge today provides order without integration, orientation, or motivation. Integration and orientation is supposed to come from one's values. But since values are solipsistic-felt preferences, our only options are to aggregate them and take the mean, or allow the majority to decide through a vote on discrete choices. The result, often, is intellectual cacophony, whether the question is protecting a natural landscape, New Orleans, or something else. Motivation is supposed to come from self-interest, but self-interest is too frail a reed to sustain either individual decisions or social policy.

For Plato, one can never separate the offering of a rational account of experience from the erotic well-springs that lie at the root of that account. *Logos* can not be logical unless it is erotic as well. While Plato acknowledged that *eros* had a disruptive, even mad element, it also unified the pursuit of knowledge by directing us toward first and last questions, achieving not unity or unanimity but rather a common focus on fundamentals and ends.

Surprisingly, Aristotle did not see the potential for *eros* to help us overcome the problem of *akrasia*. But the question of motivation lies at the heart of the contemporary breakdown between the production of knowledge and its effective use. The question is, how do we awaken *eros*, the desire to act on knowledge? That is, how do we *motivate* people to do what they know they need to do awakening not their just self interest but rather their passion? This is where aesthetics becomes crucial.

5. Heidegger and Geoaesthetics

Throughout his writings the philosopher Martin Heidegger continually challenged our culture's definition of science as our best access to reality. Heidegger argued that properly understood, aesthetics gives us our best knowledge of reality, for it is aesthetics that "makes the connection" between things. The recognition of beauty is where we are won over, our minds and souls captured by a person, place, or idea. True knowledge is not the bare awareness of a fact; true knowledge is an *occurrence* it is the moment when we *realize* that is, make real what was always there but not properly appreciated until now. This is why Heidegger calls aesthetics the shining of being it is the place where reality really stands out.

You can therefore see why a geo-aesthetics is potentially so powerful. There are few tasks more important today than changing our relationship to the Earth. And despite the work of legions of ethicists, it is not going to be in the first instance environmental *ethics* that is going to change

people's minds. After all, who comes to Koli or the Grand Canyon for ethical reasons? Rather, the connection between our well-grounded account of the world that science develops and action, the erotic element, will come through aesthetics.

New Orleans presents us with a particularly intricate case of the relation between *logos* and *eros* that is to say, between our accounts of the nature of things and getting people to act on their knowledge. This is because of the combination of New Orleans's exceptional geologic situation and its history as America's most erotic city. This is not the place to explore this curious and wonderful example, which was the subject of a workshop I led in New Orleans in March of 2006, but to note, in closing, that the very uncertainties of New Orleans' geographical, hydrological, and meteorological situation contribute to the erotic history of the city. Desire always plays off of uncertainty and suspense; danger and the certainty of eventual loss heighten our appreciation of the object of contemplation.

Heidegger evokes the intricate relation between time, death, and desire in the Preface to *Being and Time* when he announces his central theme: "time as the possible horizon for any understanding whatsoever of Being." Our experience of and hunger for reality are tied to our temporal circumstances. After all, we do not ignore a child's injured knee even though she will no longer be around in a hundred years. Our feelings for a thing are always wrapped up with its fragility; there is no need to care at all for things that are indestructible.

Whether New Orleans or Koli, our appreciation of beauty is tied to our awareness that the situation cannot last. But rather than despair, our most human reaction is to exercise more care.

ENDNOTES

This paper was first conceived as a plenary talk for a conference in Koli, Finland, on The Aesthetics of Stone and Rock. It has been slightly modified for publication here.

[1] *Science* Vol. 308, no. 5722, 617.

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