Learning from the Pandemic: Catastrophic Epistemology

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Amidst the COVID-19 pandemic of 2020, we mourn our dead, fear for ourselves and our loved ones, miss our friends and families, and compulsively wash our hands as we shelter in place, waiting for the bio-storm to moderate so that we can once more return to the world we knew. The old normal, however, is passing into history, and its successor—21st century version 2.0—struggles to be born. On the one hand, there is widespread yearning to return to the simple pleasures of ordinary life, coupled with powerful interests in resisting change. On the other hand, there is growing awareness that there is no going back. The current order is becoming increasingly precarious. Reality intrudes; resilience and sustainability require a reordering (cf. Adler 2019; Bourbeau 2018; Joseph 2018).

The pandemic has produced a torrent of talk, attempting to make sense of the disaster itself, and more significantly, the changes it implies. Our major institutions for making sense of the world have ramped up. One is the media system. Not surprisingly, many of the initial responses reflect familiar standpoints: for example, reportage features broad field coverage across a daily (or hourly) news cycle, and conservatives reaffirm the value of organic institutions and economic growth while liberals highlight the need for government to secure public goods and human welfare. Another institution for sense-making is science. STEM disciplines are being mobilized to solve the biomedical problems, while social scientists address the dynamics of collective behavior and information use necessary to suppress contagion (Van Bavel et al. 2020). These near-term responses are vitally important, but they also depend on standard assumptions and current practices.

If the response to the pandemic is limited to managing the medical and economic problems, it could eventually become a success story, but one embedded in a much larger tragedy. Like any other catastrophe, the COVID-19 pandemic can provide an opportunity for deep learning on behalf of systemic change. That opportunity, however, is fleeting. As Walter Benjamin observed: "Catastrophe—to have missed the opportunity. Critical moment—the status quo threatens to be preserved" (Benjamin 1999, [N10,2] 474). Thus, we face two catastrophes: an event that ruptures the status quo, and restoration of that status quo. Nor is Benjamin's alternative possible: his belief that progress depended on political revolution is not credible—even now, or especially now, when both revolution and progress pale before a horizon dimmed by political dysfunction, socio-economic inequity, and climate change. Like others writing about the COVID-19 pandemic and its aftermath, we believe that the pandemic exposes deep problems in the dominant economic and political systems. Unlike many of these discussions, we also believe that the pandemic is not just an epidemiological disruption but also an epistemological crisis: a crisis involving defective epistemes that limit knowledge of what is real and that constrain the imagination necessary for effective structural change. This paper will outline basic elements of a "catastrophic epistemology," that is, an approach to learning from a disaster in which knowledge itself is one of the casualties.

The Epidemiological/Epistemological Crisis

COVID-19 is of course an epidemiological crisis, as the deaths and sudden destruction of wealth daily remind us. The non-human world has intervened to unsettle what was thought

to be an intensively modern, technology-intensive society based on the successful control of nature.

Thus, one surprise of COVID-19 is that it is producing an epistemological crisis. It is true that established scientific expertise is showing its value and educating the public about testing, contact tracing, treatment, vaccine development, and so forth. Even as such expertise is appreciated, however, the larger apparatus is revealed to be problematic. As pathogens, markets, and regimes become intertwined, assumptions about what is real, stable, uniform, predictable, or intelligible have been shaken. Worse, the disaster reveals how deficits of knowledge in the system are a byproduct of the system. For example, controlling nature becomes a fool's game with dangerous externalities when unmonitored and lucrative human practices are exacerbating viral mutations. Likewise, as the gap between expert knowledge and common knowledge accelerates, and as it follows the tracks of related disparities in wealth, education, and health, the relationship between knowledge production and governance becomes both more essential and more tenuous. Disasters reveal what always was true: there are severe limits of human knowledge, limits that typically are occluded by the arrogance of the powerful.

We consider here the epistemological crisis in terms of four aspects of knowledge— description, explanation, prediction, and control. A first epistemological casualty of the pandemic is *description*. Of course, we have vivid accounts of individual suffering and mass statistics of cases and deaths. Yet the stories are local while the numbers are incomplete and misleading. We do not have accurate aggregate information about even the grossest measures. In some cases, like China, governments hide the truth; in other cases like deaths in homes or nursing facilities, or from pre-existing conditions, the numbers are simply not included in the totals. Beyond such narrow biomass data lie massive downstream phenomenal cascades—political, economic, social, and cultural avalanches of disruption, anxiety, and noise. These currents are so immense and far-reaching that they defy even macroscopic description. The waters are uncharted and perhaps unchartable.

More seriously, the surrounding context for description is dissolving. The writer Anne Enright, when asked to document the coronavirus outbreak, remarked that the recent past "now seems to belong not just to another time but to another model of the world—one in which, among other things, people thought their opinions mattered. I deal in words for a living, but I have had difficulty forming them . . . whether to describe or analyze. I don't really understand them anymore." She adds, "I had considered numbers, as though they were real and meant something—I forgot you have to collect them first. . . . I don't even have the wherewithal to feel stupid about all this. I cannot find a tone" (Enright 2020).

Enright speaks for many who reflect on the problem of writing about the unknown. It's not that the words themselves are no longer available. Nor is it a psychological blockage: discourse is gushing through the media system. The difference is that the rupture in routine exposes the abyss underlying language and the social order itself. As unknown reality rears up with unexpected and mortal force, words lose their meaning and numbers ring hollow

(White 1984). For meaning to be readily available, a great deal has to be in place; disruption leaves us disoriented, grasping for context when context is what has collapsed.

A second epistemological casualty is *explanation*. To be sure, a host of epidemiological models, operating from different assumptions, have attempted to describe the pandemic in terms of source vectors and target vulnerability. Yet they are deeply non-operational; we do not have the resources to confirm or falsify their assumptions and precise dynamics in global mass society. For example, there has been much popular discussion of "herd immunity." Once a certain proportion of the population has had the disease, the whole population supposedly becomes immune. Yet a closer examination of the literature reveals a much more complex and problematic picture. Even when large segments of the population have had the disease, those not previously exposed can remain at significant risk (Fine, Eames, and Heymann 2011).

From a broader perspective, there are at least two developments that confound standard approaches to explanation. As mathematical catastrophe theory suggests, one is non-linearity. Amitav Ghosh suggests that in the Anthropocene era it is becoming clear that "natural" phenomena do not conform to modernist assumptions of uniformity and gradual, incremental, progressive change (Ghosh 2016). What some scientists have known for a century is only now penetrating public consciousness: nature does take leaps, and it cascades, accelerates wildly, and otherwise disrupts attempts at systematic control. The nature/culture distinction blurs: is a virus only natural as it propagates so effectively through human societies? Long held and now intuitive commitments to a blinkered realism that focuses on continuity can impede the paradigm shifts that are needed.

The other obstacle to explanation is that the phenomena that need to be explained have gone paradoxical. Although modernity increasingly has had to contain the "normal accidents" of a "risk society," this class of problems could be explained as external shocks and be limited within a technocratic system of governance; disasters could be dismissed as the result of political or other outside interference (Beck 1992; Perrow 1999; Davis 1999; Larabee 2000; Posner 2004; Sarat and Lezaun 2009; Wright 2004). What happens, however, when normal system operation is becoming indistinguishable from system breakdown, or when the shadow in the system overwhelms the dream (Hariman, 2015, 13; Beer 2013)?

One of the remarkable spots in the response to the current crisis is that writers are assuming it can happen again in the relatively near term; there is no talk akin to a "100 year flood," even though the last major pandemic was a century ago. Not to make light of the suffering, but COVID-19 is providing something like a simulation for the next bug. Even so, that is not enough: what is needed to deal with a vastly more lethal virus is being ignored. Stockpiling face masks isn't going to do much to prevent supply chains from collapsing if you have a death rate of 40 percent. A response equal to that scale would require that structural changes are taken seriously and on the basis of reconfigured approaches to explanation. Those approaches would break through the illusion that catastrophe comes from outside the system, to consider how it is produced by the system itself.

Beyond description and explanation lies a third epistemological casualty: *prediction*. In spite of Yogi Berra's opinion that the future is one of the hardest things to predict, and the skepticism of philosophers from Cicero to Hume, one might have thought that modern sciences could pretty well project the shape of things to come. One of the major purposes of knowledge has always been to help foretell the future, and many subsystems or domains of activity have become increasingly routinized. What happened last was supposed to be an empirical guide for what would happen next. Yet no one has adequate data or theoretical models for most relevant predictions. What is needed, of course, is not fewer models, but even better models would not be enough (Beer 1993).

Prediction has to be rethought in respect to other modes of knowing. The explanation/prediction distinction in twentieth century philosophy of science provides one example, but one that now is inadequate. That relation operated entirely within the context of standard, settled scientific knowledge; what is needed now is understanding how prediction might work in conjunction with other modalities of understanding, how it needs to be altered better to incorporate social learning (beyond correlation and regression, dynamic Bayesian probabilities and AI learning). Above all, one must remain attentive to how routine prediction can inhibit the political imagination, which is a resource that already had been seriously eroded in the 21st century and could be the most important modality for articulating a more just and sustainable modernity.

And finally, a fourth epistemological casualty of the pandemic is a myth of *control*. The masters of the universe who gathered each year at the Davos branch of Olympus thought that they were managing the world pretty well. Isn't that why they were there? They were the leaders of the political and epistemic communities, their massive pride and power based on claims to superior knowledge. What could possibly go wrong?

The limits of control follow directly from the deficits of description, explanation, and prediction. They show clearly in the chaotic medical and public health responses to the pandemic. In place of Davos managers, the new normal is Do It Yourself. As one online newsletter put it, there have been

> … insufficient tests, slow results, scarcity of protective gear, the shortage of breathing machines for seriously ill patients and burned-out staffs anxious for their own safety … Many hospitals are responding by improvising their own solutions. Some explored buying face masks from nail salons due to the shortage of personal protective equipment, or PPE. Others have been trying to make their own hand sanitizer by blending ultrasound gel with alcohol from local distilleries" (Politico PlaybookPM, 6 April 2020).

Sheltering at home has been the major strategy to buy time to correct these deficiencies, at vast political, economic, social, and cultural cost. At the end of the day, all of this will have to do until the emergence of mass testing, contact tracing, and a vaccine for the entire global population. The eradication, though incomplete, of smallpox and polio show the possibilities and also the limits such efforts. But neither the organisms nor the anti-vaxers ever

completely disappear. Indeed, control feeds its opposite: the tighter the system, the less predictable its outliers and the more efficient its collapse.

The Pedagogical Moment

We have been surprised, but should we have been? Our knowledge of global history and the *longue durée* should have prepared us. Human history is replete with pestilence and plague (Harper 2019; Graeme 2018; Campbell 2016; Diamond 1999; McNeill 1976; Zinsser 1935). Yet there are powerful reasons for our lack of foresight and preparation. Studies of risk aversion suggest a cognitive tendency to favor recent events and also direct experience, rather than longer and larger scale conditions. Likewise, standards for knowledge certification go up as the stakes are raised, a condition that can actually impede effective response (as the tobacco and energy companies have demonstrated repeatedly). Further, ideologies and practices of denial lower standards. For example, one scientist's dissent can be represented as a minority scientific consensus, or a conspiracy theory can appear equivalent to complex modeling. One temptation on all sides is to recur to "modernity's gamble": the pervasive belief that the problems created by modern technologies can be solved through additional technological innovation (Hariman and Lucaites 2007, 244). For such reasons, unless a special effort and timely provocations are made, the default will be to merely tactical changes in preparedness and minimal improvement in system resilience.

At this point one also might raise an objection against our argument for a catastrophic epistemology. How can we say both that the catastrophe reveals deep problems and that it disables description and other modes of understanding? Doesn't identifying the deep problems require familiar, workable means of description and explanation? The question leads directly to a core observation, and then to an important qualification. The basic insight is that the problems being revealed are *problems that already were known but partially denied*; the knowledge was there but interdicted. Note how this awareness is embedded in a statement by Eliza Blue, a writer and shepherd in South Dakota:

> Even before the pandemic laid bare the instability of the industrialized food supply chain, ranchers knew that chain wasn't working. At its core, our work will always be based around the rhythms of nature rather than technically derived calculations. Instead, sun and rain, dormancy and renewal determine our obligations. At the height of a pandemic that is exposing nearly every systemic flaw in society, our work on the ranch remains virtually unchanged (Blue 2020).

The passage documents specific knowledge and an inability to use it to alter the chain of production. More important yet is the matter-of-fact tone about "a pandemic that is exposing nearly every systemic flaw in society." That summary of the last few months of public discourse is as accurate as it is succinct. Of course this society knew about its problems, but only now is this knowledge becoming evident, immediate, significant, and perhaps terrifying. The knowledge of structural flaws had not been completely suppressed, but it had been displaced well enough by financial power, practices of buffering production

from consumption, and more: note how Blue is contrasting two different relationships with nature. What the catastrophe does, at least in the near term, is tear the context of justification for the status quo. Once problems can be seen without the standard filters, they are seen anew.

Which leads to the qualification: the problems are only seen, exposed, revealed. They are not reframed, re-examined, reconfigured with other parts of the whole, or otherwise prepared for new understandings, policies, or practices. Material impediments due to the disaster and much more get in the way. Not least, the loss of context that allows the problems to be exposed also interferes with a society's ability to think and communicate about them. That's the difference between a catastrophe and an accident: the former disrupts both a situation and the means of response or recovery. Catastrophe exposes deep problems by shredding their contexts of denial, but it also damages contexts of communication needed for analysis and collective action.

The result need not be futility. Catastrophe also opens an opportunity for new concepts and renewed modes of inquiry. In this context, we ask, how we could use this temporary shock to advance an evolutionary and emancipatory epistemology? How can we capture the insights, learning, and adaptations that are emerging during the crisis but likely to be lost thereafter? If a catastrophe exposes debilitating tendencies in global capitalism, modern society, and national politics, can that knowledge be marshalled on behalf of the common good?

We have two assumptions about the temporal window for learning. One is that the moment of truth is brief. Quick closure may be due to human psychology or the forces that profit from not changing or the sheer onrush of events in a dynamic and complex world, but it will happen. Our second assumption is that there will be, at least metaphorically, blood. The moment for reflection and redirection is messy: oversaturated with information, highly contested within a political system struggling with high levels of dysfunction, exposing problems that by definition exceed standard protocols for solution, and involving a future that is now palpably inchoate.

Ideally, catastrophic epistemology would be defined through a proof of systemic incapacity exposed by the pandemic, that would lead to carefully reconfiguration of the conditions and criteria for knowledge, and then to articulation of new research protocols. Ideally. We will not abandon that dream, as it remains a good program for the reconstructed logic that, we hope, eventually will become intelligible and useful. In the moment of crisis, however, it is important to realize that some ideals are part of the old system. More to the point, catastrophic learning has to proceed amid disruption. One has to be thrown forward and to go down overgrown paths. To bound over the rubble and to try something new.

Catastrophic learning, at a minimum has to strive to speak and act in a manner that does more than reproduce the conditions that produced the disaster. It does have to be conservative in that it strives to rebuild whatever nurtured a good life for all, but it also has to have the courage to be radical in that it strives to change the arc of history.

In this spirit, perhaps we can hazard a few protocols, if only in the interest of prompting further discussion to develop the perspective outlined above. A catastrophic epistemology could begin with these steps:

❧ Admit to the structural defects the crisis has revealed. Face the catastrophe that was always there. Modernity as we know it depends on urban density and high-volume global travel, conditions that guarantee pandemics. Global supply chains and just-in-time inventories also are problems, in themselves and as examples of how supposedly logistical practices are political regimes with hidden moral costs. Current practices of resource distribution are unjust. Current practices of resource consumption are suicidal.

❧ Reconfigure the epistemic conditions that produced the disaster. Do not pursue wholly technological solutions or a wholly partisan agenda. Redesign information and action systems, standard operating procedures, best practices, and skill sets to be more robust and multi-dimensional. Instead of being trapped in standoffs between enclaved expertise and weaponized ignorance, build templates of practical reasoning (*phronêsis*) in both science and politics.

❧ Recover lost knowledge resources. This is the post-modern impulse: to draw on those dispositions for thought and collective living that modernity disregarded. Indigenous cultures have been living with precarity for millennia. Premodern art and literature preserve different conceptions of nature, community, and time. Modern modes of writing may be suppressing imaginative resources for recognizing and contending with catastrophe: techniques that were curated and transmitted across millennia but are incompatible with literary naturalism (Ghosh 2016). Modernity doesn't even know itself, nor will it until able to recognize other standpoints for knowledge.

❧ Connect multiple ways of knowing. We are reminded by James C. Scott (1998, 340) (quoting Oakeshott quoting Pascal) that rationalism's mistake is not its recognition of technical knowledge, but its failure to recognize any other. Science and the arts may share more than is recognized—for both good and ill. Expertise, public opinion, common sense, and folklore have stark differences, but they also may contain complementary affordances for dealing with problems that no one can manage alone. Many sidebars in the academy—medical humanities, systems theory, posthumanism, social epistemology, etc.—could be reviewed or reconfigured to rethink disasters and their aftermath.

❧ Identify alternate futures. The future is now; the present contains many paths that could be taken. They still lack causal momentum, and we lack sufficient information, but the signs are there. Somewhere large-scale democratic governments are securing public goods through best practices based on expertise and global collaboration; somewhere bioenergy technologies are supporting small egalitarian communities linked through networks of conflict resolution. Somewhere, but not yet here except in hints and fragments.

❧ Do something different. Speculate instead of using weak data shored up with caveats. Develop an ideal type instead of calling for further research. If in the humanities, form a lab; if in the sciences, write a book.

Finally, we should recognize that a robust epistemic community should include very different knowledge registers. Two polar opposites might be information and wisdom (cf. P. M. Haas 2016; E.B. Haas 1990; Gray 1972; Jaeger 1945). That is a tall order, and one that requires wide reading and contemporary insight. Fortunately, both the information and the wisdom that are needed to learn from a pandemic begin at the same point: self-knowledge of our limits, that is, humility. For all their civilizational achievement, modern societies have made a huge mess. Now that citizens have been confined to their caves like the ancient Anasazi, the skies have become cleaner. Modern leaders knew a great deal, but apparently not what was needed to avoid the most ancient of civilization's dangers, a plague.

In spite of the terrible human cost, the COVID-19 pandemic provides an opening to learn and change that was not available before the disaster. The opening occurs because the illusion of a known world was torn and the precarity of knowledge itself exposed. Catastrophic epistemology is the autopoietic attempt to adapt and thrive amid disruption, to move an epistemic community forward from the shock of crisis, in an evolutionary, emancipatory way, and build bridges toward a better world.

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