Phronetic Science for Wicked Times

AJAY SHARMA*

*College of Education, University of Georgia; ajay@uga.edu

Responses

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Abstract. COVID-19 is a global assemblage that presents a wicked problem for scientists and policymakers alike. Wicked problems that defy easy characterization and solutions are expected to proliferate in the Capitalocene. In this essay, I argue that traditional science cannot be expected to help us understand and resolve wicked problems like COVID-19. Rather, we need phronetic science that is transdisciplinary, ethically aware and oriented towards inculcating practical wisdom in its practitioners. Further, if we wish to see phronetic science being used in tackling wicked problems, science educators can contribute by teaching phronetic science in our schools.

Keywords: phronesis • COVID-19 • wicked problems • assemblage • ethical literacy • science education

Introduction

Intellectual thought of the modern age is defined by repeated efforts to discursively reconstruct our world through an overlapping series of dualisms, such as nature/society, mind/body, real/symbolic, presence/absence, male/female, and civilized /savage (Pickering, 2010). These binaries continue to dominate academic as well as lay discourses in the Western world. However, recent history of the planet has thrown up multiple reminders that modernist dualist logic has outlived its usefulness in making sense of life in the 21st century (Latour, 2012). That is, it has become increasingly difficult to ignore the presence of entities around us that resist being categorized under any dualist ontology¹. As I explain ahead, COVID-19 is one such entity. In this essay, I present COVID-19 as a dualism-busting assemblage of the *Capitalocene* that presents a wicked problem for the humanity. Wicked problems like COVID-19 are only expected to proliferate in the Capitalocene, where it is “easier for most people to imagine the end of the planet than to imagine the end of capitalism” (Debney, 2019; para 2). Traditional science does not appear up to the task for understanding and overcoming challenges like COVID-19. Instead, as I argue in this paper, we need *phronetic* science for such wicked times. And if so, it stands to reason that traditional school science should make way for phronetic school science in science classrooms as well.

¹ In recent years Cartesian dualisms have also earned bad press on account of their role in legitimizing commodification of nature, and oppression of women, colonial populations, and peoples of color (Moore, 2016).

COVID-19 as an Assemblage

In a just published materialist analysis of the COVID pandemic, Nick Fox (2020) traced the evolution of the disease. He found that “the ultimate cause of the epidemic is not the coronavirus particle, but the concentrated centers of population, the global market and the contemporary system of international trade within which humans across the planet now live out our lives” (para 3). That is, commodified interactions between humans and nonhumans embedded in a globalized movement of goods and humans fueled and sustained by global capitalism caused the transmutation of a localized outbreak into a global pandemic. Fox, therefore, labeled COVID-19 as an “epidemic assemblage” that comprises both human and nonhuman elements, and thus can’t be understood within a nature/society dualist ontology. As Levi Bryant (2009) articulated in his blog post, “Assemblages are composed of heterogeneous elements or objects that enter into relations with one another. These objects are not all of the same type. Thus you have physical objects, happenings, events, and so on, but you also have signs, utterances, and so on” (para 9). Assemblages beckon us to understand our world through a different set of metaphors, such as mosaic, patchwork, heterogeneity, fluidity and transitory configuration (Little, 2012). An assemblage’s only unity is that it co-functions together with some sense of shared purpose (Deleuze & Parnet, 1987). As we look around, we can indeed see our world as populated by contingently emerging assemblages that consist of heterogenous components that work together for a limited time before morphing into other or becoming parts of other assemblages. For example, just like COVID-19, the efforts to combat it has also taken shape as a vast crisscrossing global assemblage consisting of patients, bats, markets, doctors, hospitals, governments, and so on. This assemblage will dissolve and/or morph into another assemblage as soon as the COVID-19 crisis blows over.

Taking a slightly different approach from Fox (2020), André Lemos (2020) analyzed the COVID-19 virus from a neomaterialist perspective, as a *natureculture* that straddles the nature/society binary (Haraway, 2007). He found that the virus and the associated pandemic constitute a “virus assemblage” that is produced in the fluxos da globalização e na interrelação entre humanos e animais, mas também nos laboratórios de pesquisa que dão nome e instituem a sua ontologia, nas políticas públicas que produzem ações concretas, na guerra das imagens e discursos escolhidos e veiculados nas mídias, na escolha por formas de prevenção e tratamento médico, na definição epidemiológica sobre a situação... (para 10). (Google translation: flows of globalization and in the interrelation between humans and animals, but also in the research laboratories that give their name and institute their ontology, in public policies that produce concrete actions, in the war of images and speeches chosen and broadcast in the media, in the choice of forms of prevention and medical treatment, in the epidemiological definition of the situation ...).

Lemos’s paper helps us appreciate the important role of the discourses, semiotic resources and the nodal centers that generate and circulate them, such a news media, in the global assemblages that structure our lives in the Capitalocene. For instance, it would be difficult to understand the epidemiology of COVID-19 in the United States without taking into account the role that conservative news media has played in shaping people’s behavior and states’ responses to the crisis.

Taken together, both Fox’s and Lemos’s analyses of assemblages invite us to abandon the *substantivist* ontology that defines the modern intellectual thought. Rather, we are encouraged to view COVID-19 through a *posthuman relational* ontology that decenters humans, privileges relations over entities and places everything — human, nonhuman and discursive — at the same ontological level. Then, we can better understand

COVID-19 as a complex global assemblage of relations and entanglements involving local and distant human, non-human, material, social and cultural actors, and ethical-political dimensions. This overlapping network of relations is neither stable nor fixed. As a result, COVID-19 has proven to be a wickedly complex issue to understand and respond to for researchers and policymakers alike.

COVID-19 Assemblage as a Wicked Problem

Unfortunately for us, it so happens that our current epoch of the Capitalocene teems with wicked problems, like COVID-19. In academes, wicked problems are understood as social policy problems that are defined by high complexity, uncertainty, and contested social values (Rittel & Webber, 1973). These problems cannot be satisfactorily or definitively defined. In fact, wicked problems are “often characterized by multiple conflicting and equally valid scientific and social interpretations” (Miler, 2013, p. 279). The solutions to these problems can’t be categorized as true-or-false, but only as good-or-bad and lack any immediate or ultimate tests for the solutions. Further, wicked problems are intrinsically laced with contested social values and, thus, often present vexing ethical dilemmas. As a result, wicked problems are much different from the “tame” problems of the natural sciences, “which are definable and separable and may have solutions that are findable” (Rittel & Webber, 1973, p. 160). Thus, such problems can rarely be addressed by conceptual and methodological tools and resources available in any single discipline, and call for an ethically informed, transdisciplinary approach.

Most socio-ecological problems are wicked problems because they emerge from “the functioning and evolution of interconnected and complexly interacting socio-ecological systems”, and defy solutions because “they are multicausal, intertwined with other problems, and value-laden” (Metzger & Curren, 2017, p. 94). COVID-19 assemblage emerged when the COVID virus jumped across species barrier to infect humans on a global scale. This barrier crossing happened because of commodified human-nonhuman interactions embedded in a global hyper-capitalist social order that spans, expropriate and commodify all socio-ecological systems. There is little clarity about many critical aspects of the COVID-19 assemblage, and lack of agreement about what would be the best ways of overcoming it. For example, not only do we not know how would the seasonal changes impact the spread of the disease, it is also very difficult to predict how individuals and communities will respond to governmental efforts and regulations in different parts of the world. Further, this crisis poses unique ethical dilemmas as policymakers and laypersons alike wrestle with how best to thread the needle between saving lives and saving livelihoods amidst inadequate public health infrastructure and lack of effective treatments. Not surprisingly, therefore, different countries are trying a wide diversity of approaches to combat this pandemic. Thus, an amorphous, open-ended, constantly evolving and binary-busting natureculture assemblage like COVID-19 can be fairly characterized as a quintessential wicked socioecological problem.

Phronetic Science for Wicked Times

As suggested earlier, COVID-19 is not the only wicked problem that confronts us in the Capitalocene. Environmental scientists now recognize all socioenvironmental issues as wicked problems (Miller, 2013).

Hypercapitalism has led to an unending proliferation of global assemblages “comprising ‘global’ organs, networks of brokers and dealers, donors and recipients, sellers and buyers, who interact in various moral and money economies, and through various forms of technical and political regulation” (Collier, 2006, p. 400). These assemblages work to commodify all aspects of our socioecological world for profit and with terrifying consequences for the marginalized populations, other species and future generations. For example, food production systems comprise a big category of global assemblages that pose a particularly wicked problem of food security and sustainability for food policymakers (Peters & Pierre, 2014). Similarly, the global fossil fuel industry assemblage can be seen as the prime suspect in engendering energy security in the era of climate change, and as another wicked problem that has confounded governments all over the world (Chester, 2009).

In the past couple of decades scientists have begun to realize that traditional ecological approaches that take the nature/society as a given may be fast outliving their usefulness in understanding our world (Bradshaw & Bekoff, 2001). Thus, it has become increasingly clear that traditional science approaches will not be enough to help us understand and resolve these wicked problems (Hart & Bell, 2013). Not only such approaches reify the nature/society dualism, and thus are inadequate at understanding wicked natureculture assemblages, such as COVID-19. They, at best, can only offer technical instrumental solutions that do little to address the deeply entangled social and ethical components of the wicked socioecological problems. For instance, it is now accepted within the scientific community that science alone will not be able to rescue our planet from the scourge of global climate change (Intergovernmental Panel on Climate Change, 2014). Unfortunately, however, the dominance of technocratic discourse in US public policymaking has worked to marginalize the nonscientific dimensions of wicked problems in policy decisions (Lemke, 2005). This has led to depoliticization of socioecological issues as they are reduced to technical problems to be solved by experts. We see this particularly in the case of environmental issues, such as global climate change (Taylor, 2013). Depoliticization excludes citizens and affected populations from decision making with usually terrible consequences for those who are unable to find a designated role in the global capitalist production and consumption system.

Thus, for things to change for the better traditional disciplinary science focused technocratic discourse has to lose its dominance among scientists and policymakers alike. We can begin by prioritizing transdisciplinary approaches, such as those of sustainability science, to better understand and resolve wicked problems like COVID-19. This is because sustainability science is a transdisciplinary field of research that deals “with the interactions between natural and social systems, and with how those interactions affect the challenge of sustainability: meeting the needs of present and future generations while substantially reducing poverty and conserving the planet's life support systems” (“Sustainability Science”, n.d.). Fortunately, in recent years sustainability science and other transdisciplinary approaches have indeed come to the forefront as offering better ways to understand wicked socioecological issues (Hart & Bell, 2013).

But, transdisciplinary science alone may not be enough. This is because, as indicated earlier, all wicked problems are also necessarily ethical problems. That is, in addition to understanding the wicked issues from a transdisciplinary perspective, we also need to make difficult ethical decisions regarding what is the right thing to do when multiple stakeholders press their case backed by different and contesting objectives, claims and sociocultural values. Further, in our decision making we also need to include marginalized stakeholders that are unable to or cannot speak for themselves, such as indigenous populations, nonhuman species and future

generations. Thus, I am increasingly of the view that we need a new kind of science to understand and resolve wicked problems like COVID-19 in the Capitalocene.

If we go by Aristotle's classification of knowledge in the *Nicomachean Ethics*, it can be said that on the whole science has proved to be remarkably successful at developing universal, context independent and analytic rationality-based knowledge systems (*episteme*). It has also excelled at offering practical, context-dependent and instrumental rationality guided technical solutions of problems or knowhow (*technē*) about the world (Flyvbjerg, 2001). Where it has failed has been in developing *phronesis*; i.e., practical wisdom that manifests itself in "the kind of prudential judgement by which equivocal circumstances are negotiated and acted upon with a view for the common good" (Chia, 2016, p. xv). As a morally guided and praxis-oriented form of knowledge, *phronesis* is characterized by

its irreducibly experiential nature, its nonconfinement to generalised propositional knowledge, its entanglement (beyond mere knowledge) with character, its need to embrace the particulars of relevant action-situations within its grasp of universals, and its ability to engage in the kind of deliberative process that can yield concrete, context-sensitive judgements (Dunne, 2005, pp. 375-376).

Given that wicked problems are marked by value-laden moral predicaments that are impervious to both *episteme* and *technē*, it is clear that if we are to survive the Capitalocene we need to collectively position *phronesis* as a primary end-goal of science.

Such a phronetic science would be transdisciplinary as well as ethically informed. By balancing instrumental rationality with value rationality it will be a science directly oriented towards the public good rather than capitalism fueled destruction of the planet. Further, I am of the view that phronetic science for the Capitalocene epoch would eschew modern ethical frameworks of the West, such as consequentialism and deontology, in recommending ethically justifiable actions. These frameworks suffer from the same intellectual and moral conceit that inflicted modern Western thought. For instance, they are: (a) rooted in human exceptionalism that naturalizes nature/social dualism; (b) reify humans as autonomous, rational, responsibilized individuals in full control over their ethical agency; (c) follow a material essentialism that marks entities with "a set of immutable properties that are relatively or absolutely autonomous from those of other entities and relatively enduring" (Castree, 2003, p. 4); (d) are anthropocentric, as they assume "capacity for reason as the definitive basis of a distinctively human ethical standing" (Whatmore, 1997, p. 38) and, therefore, deprive the nonhuman world of any independent ethical status and visibility in ethical decision making; and, finally, (e) work to depoliticize socioecological ethical dilemmas by reducing ethical decision making to following of rules and norms. Not surprisingly, therefore, modern ethical frameworks have been accused of being complicit in legitimizing much of the terrors and depredations of colonialism and Western notions of development (Bauman, 1994).

Thus, I would argue that phronetic science suited for the Capitalocene should embrace ethical frameworks that are rooted in relational postmodern and posthumanist ontologies built on "webs of connectivity between the livelihood practices and cultural values of particularly situated human actors (collective and individual) and the life-habits and relationships of other biotic agents" (Whatmore, 1997, p. 45). By jettisoning nature/society and other binaries, ethical perspectives based on such relational ontologies will encourage us to see our socioecological world as comprising overlapping networks of natureculture collectives (Latour, 2012). Further, nonhumans in these natureculture collectives or assemblages will have their own independent ethical standing. Thus, we will extend just and equitable ethical obligations to them just as they are naturally assigned to the

humans. Finally, as COVID-19 pandemic has made it abundantly clear, it is not unusual for the nature-culture assemblages in today's globalized, hyper-capitalist world to spread far and wide transcending political and geographical boundaries. Thus, to overcome COVID-19 and other socioecological crises of the Capitalocene, we need a phronetic science with ethical commitments that go beyond our geographically localized communities (neighborhood, city, nation-state, etc.) to cover all humans and nonhumans members of the local and global natureculture assemblages that we find ourselves embedded in.

Coda

Given the dominance of neoliberal discourses and hypercapitalism in these dire times, mere advocacy for a societal paradigm shift towards phronetic science perhaps may not work. But there are a few things that we all can do. First, we can begin by contributing to existing critiques of the hegemony of neoliberalism and allied discourses, such as ecological modernization and green governmentality, and circulating these critiques in professional and community networks we are embedded in. Further, I believe that formal and informal science learning spaces can be good places to start work on bringing about a societal paradigm shift that replaces technocratic science with phronetic science as the critical resource for understanding and tackling COVID-19 like wicked problems.

This is because of two reasons. First, there exists a deeply entrenched *Dominant Social Paradigm* in Western industrialized societies that reifies among people a nature/social dualist ontology, low evaluation of nature for its own sake, untrammelled belief in human technological inventiveness in overcoming limitations to human progress and economic growth, and an unfounded belief that modern society, culture, and politics are basically okay (Harper & Snowden, 2017). Admittedly, formal education constitutes only one among a plethora of sources instrumental in shaping our students' orientation towards and understanding of our socioecological world (Weaver, 2002). But, it is one space where we as science educators can make a difference. More importantly, we need a receptive public to support phronetic science as the basis for resolving wicked socioecological issues facing our planet and supply scientists and policymakers who can practice it. Schools are critical institutions where such foundational work can be undertaken. After all, students will perhaps need several years of sustained exposure to transdisciplinary perspectives and ethically informed action before they can grow up as agentive citizens who can challenge and replace the *Dominant Social Paradigm* with more hopeful frameworks, and also appreciate the 'wicked' nature of socioecological issues facing our planet. Thus, if we wish to replace technocratic science with phronetic science as the key policy resource and perspective for such problems, we need to begin teaching phronetic science in our schools as well.

Second, Phronesis cannot be viewed in instrumental-rational terms "as a "resource" or even as a form of "useful" knowledge that can be purposefully deployed in output-oriented, productive action (poiêsis) and/or for personal gain" (Chia, Holt & Yuan, 2013, p. 53). That is, it cannot be grasped directly like one acquires knowledge or skill. Rather, as a habituated disposition phronesis is cultivated over time in the course of repeatedly facing ethically fraught situations filled with ambiguity and uncertainty where no amount of knowledge can tell a person exactly what needs to be done for taking an ethically just action. There will always be a gap between knowledge and an ethically informed action (Fagan, 2013). Phronesis cultivated over time can offer insights into how this gap can be traversed. With sustained praxis, phronesis can become a "part of

the way that one goes about everyday life” (Noel, 1999, p. 284), and gets “associated with what a phronimos does” (Chia, Holt & Yuan, 2013, p. 57). In my view, the kind of indirect knowing that is needed to inculcate phronesis through praxis over time can be best organized in school settings through sustained exposure of students to the challenges of understanding and acting on wicked socioecological problems of the Capitalocene.

Fortunately, there has already been some progress that we can build upon. Science and environmental education community has been cognizant of the need to respond to the socioecological challenges of the Capitalocene. Thus, over time, a strong body of knowledge, practices and curriculum material have emerged on issues and topics related to environmental science and ecology (Hart, 2010). Scholarship on Socio-scientific Issues (SSI) and Science-Technology-Society-Environment Education (STSE) research has also helped educators and researchers better understand how to enable students to appropriate scientific literacy for informed action on science-society issues most of which indeed pose wicked problems for us to resolve (Pedretti & Nazir, 2011). Unfortunately, barring a few notable exceptions, such as Bazzul (2018), Blades (2006), Palmer (2013) and Saunders and Rennie (2013), there has not been much enthusiasm among US and Canadian science education communities for inclusion of ethical literacy as an integral part of science education. That needs to change. COVID-19 is a grim reminder that our world is only going to get more wicked with each passing year. If we start soon, phronetic science may still be able to save us in these wicked times.

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