



New Thinking for a New Dawn

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Introduction

Zadie Smith's *Intimations* confronts what we have come to call 'the new reality' or 'these unprecedented times' while she walks around Greenwich Village in New York City.¹ In the second essay in this collection, she writes, "Disaster demanded a new dawn. Only new thinking can lead to a new dawn. We know that." I've read many of the major papers written about the changing clinical and basic science aspects of COVID-19 which I need to take care of my patients and teach the medical students, but Smith's striking three-sentence imperative: demand- 'a new dawn,' response -'a new way of thinking' and acknowledgment -'we know that,' will have a lasting legacy if we can accomplish it.

What is this "new thinking", how will it come about, how will it propagate, have disasters catalyzed radically new thinking before? The answers to these questions, seem to fall squarely within the mission of this workshop to "bridge the gap between academics and policymakers on key issues surrounding forecasting, including discussions on national security, global health, and the global economy." I suggest that new thinking does emerge from disasters when, and perhaps only when, coupled with radically new scientific advances. A summary is presented to make the historical case, not as a detailed review.

The Peloponnesian War, science and theories of knowledge — Socrates, Plato, Aristotle

Socrates, a combatant in The

Peloponnesian War (431-404 BCE), never wrote a word of philosophy, yet every school child is taught that Socrates was Plato's teacher and thereby has a claim on foundations of western philosophy. The effect of the Peloponnesian War on Socrates' thinking and therefore indirectly on Plato and Aristotle is perhaps less well known. Rebecca Goldstein argues in her *Making Athens Great Again*, that "...the date of the trial (of Socrates) reveals a polis whose exceptionalist identity had been challenged and whose citizens had been caught off-balance: How great were they, really? Where was their moral compass? Athens was still reeling from defeat in the Peloponnesian War five years earlier—and at the hands of those uncultivated Spartans, who had no high culture to speak of, no playwrights or Parthenon. ... Athens may never again have presided as the imperial center it was before the war. Instead, it staked what has proved to be a far more enduring claim to extraordinariness in becoming a center of intellectual and moral progress. Empires have risen and fallen. But the bedrock of Western civilization has lasted, built upon by, among many others, America's Founders--students of Plato determined to create a democracy that could avoid the flaws Plato observed in his own."²

One fascinating coda to the defeat of the Athenians at the hands of the Spartans was the role of a devastating plague (429-426 BCE), the cause of which is not certain, that decimated up to 30 % of the Athenian population and killed Pericles, patron, arguably of Greek science, literature, and architecture including Sophocles, Zeno, and Hippocrates.³ "Everyone, whether

doctor or layman, may say from his own experience what the origin of it is likely to have been, and what causes he thinks had the power to bring about so great a change. I shall give a statement of what it was like, which people can study in case it should ever attack again, to equip themselves with foreknowledge so that they shall not fail to recognize it. I can give this account because I both suffered the disease myself and saw other victims of it. ...The most terrifying aspect of the whole affliction was the despair that resulted when someone realized that he had the disease: people immediately lost hope, and so through their attitude of mind were much more likely to let themselves go and not hold out. In addition, one person caught the disease through caring for another, and so they died like sheep: this was the greatest cause of loss of life. If people were afraid and unwilling to go near to others, they died in isolation, and many houses lost all their occupants through the lack of anyone to care for them. ... No fear of the gods or law of men had any restraining power, since it was judged to make no difference whether one was pious or not as all alike could be seen dying.”⁴

Joan-Antoine Mallet argues that “No political regime was able to establish peace anymore, so Plato needed to create a brand-new political system to solve the problems raised by the Peloponnesian War.”⁵

A discussion of the specific scientific advances following the Peloponnesian Wars is outside the scope of the arguments presented here but would recognize the rise of theories of knowledge and scientific inquiry by the ancients.⁶

The Crusades (1095 to the fall of

Acre to the Mamluks in 1291), Black Death, the Renaissance:

Working on a project on public-private partnerships to achieve global health goals, at the Rockefeller Foundation villa in Bellagio on Lake Como with weekend trips to Florence and Venice, the Renaissance, Yersinia pestis, and the Crusades are never far from my mind. No doubt dissertations and books will be written on the theme of plague/covid/renaissance/rebirth. In fact, it appears that Professor Palmer (University of Chicago) is already well on the way. From her blog on this very subject, “The Black Death first: it didn’t cause the Renaissance, no one thing caused the Renaissance, it was a conjunction of many gradual and complicated changes accumulating over centuries (banking, legal reform, centralization of power, urbanization, technology, trade) which came together to make an age like the Medieval but ever-so-much-more-so.... What the Black Death really caused was change. It caused regime changes, instability letting some monarchies or oligarchies rise, or fall. It caused policy and legal changes, some oppressive, some liberating. And it caused economic changes, some regions or markets collapsing, and others growing.”⁷

The Thirty Years War, The Enlightenment: Copernicus, Galileo, Kepler, Newton, Descartes

Margaret C. Jacob, a prominent Enlightenment scholar at UCLA lays out the following argument for the combined effects of major developments of the Scientific Revolution in mathematics, astronomy, and physics and the apocalyptic social/political upheaval of the Catholic/Protestant Thirty Years War in which up to 8 million people died before the Peace of

Westphalia ended it in 1648 and the Enlightenment, in The Secular Enlightenment: “The German Enlightenment, and indeed the Enlightenment in general, cannot be understood outside the conditions created by a generation of religious warfare in Central Europe. Theorists and ministers of state in the period after Westphalia looked for a political solution that would prevent another Thirty Years War. In the search, German universities played a prominent role, and therein emerged the first stirrings of ideas we can later associate with enlightened thinking. ... At their root lay the new science, from Descartes to Newton and Leibniz. All elevated mathematics as one key to the acquisition of all knowledge, as a way forward in both philosophy and empirical studies.”⁸

Specifically consider the case of Immanuel Kant. The Stanford Encyclopedia of Philosophy describes the influence of the Enlightenment on Kant, and is worth a rather long quote:

“To understand the project of the Critique better, let us consider the historical and intellectual context in which it was written. [5] Kant wrote the Critique toward the end of the Enlightenment, which was then in a state of crisis. Hindsight enables us to see that the 1780s was a transitional decade in which the cultural balance shifted decisively away from the Enlightenment toward Romanticism, but Kant did not have the benefit of such hindsight.

The Enlightenment was a reaction to the rise and successes of modern science in the sixteenth and seventeenth centuries. The spectacular achievements of Newton in particular engendered widespread confidence and optimism about the power

of human reason to control nature and to improve human life. One effect of this new confidence in reason was that traditional authorities were increasingly questioned. Why should we need political or religious authorities to tell us how to live or what to believe, if each of us has the capacity to figure these things out for ourselves? Kant expresses this Enlightenment commitment to the sovereignty of reason in the Critique: Our age is the age of criticism, to which everything must submit. Religion through its holiness and legislation through its majesty commonly seek to exempt themselves from it. But in this way they excite a just suspicion against themselves, and cannot lay claim to that unfeigned respect that reason grants only to that which has been able to withstand its free and public examination.”⁹

[The American Civil War, Pullman labor strikes, pragmatism, Darwin](#)

Louis Menand in *The Metaphysical Club* suggests that, like the Enlightenment, the social/political catastrophes of the Civil War and the brutal Pullman strike, and the Darwinian scientific revolution combined to influence the emergence of pragmatism, a major transformation of American thought. In addition, Menand notes, “For James and Dewey, ... a new idea is not the inexorable next link in a chain of prior ideas; it is a chance outgrowth, a lucky variant that catches on because it hooks people up with their circumstances in ways they find useful.”¹⁰

[Between the two world wars: World War I, general relativity, quantum mechanics](#)

The logical positivists of the Vienna Circle,¹¹ Wittgenstein, the Bauhaus school, Kurt Gödel’s revolutionary

theories of provable statements and consistency of formal axiomatic systems, general relativity,¹² Schoenberg's music, Freud's psychology, and Schumpeter, von Mises, Hayek, and Keynes economics, all represent profound new thinking that emerged from the turmoil of the interwar years. More complete analyses can be found in.¹³

World War 2, existentialists, atomic age, electronic computation, molecular biology

The theorists of just wars, declarations of universal human rights, existentialists confronting an absurd world, while certainly having earlier intellectual antecedents, were influenced by the atrocities of Spanish Civil War, Fascism, global war, genocide, and the perverted science of National Socialism, which, as Churchill memorably said will “sink (the whole world) into the abyss of a new Dark Age made more sinister, and perhaps more protracted, by the lights of that perverted science.”

Today: Global pandemic, climate change, machine learning, quantum computing, complexity theory, big data analytics, CRISPR-CAS and other gene editing techniques.

The events in our time are unexplainable using our current mental models and constructs. How can we understand and deal with the attraction of false news, the inability to adequately communicate risks to life and limb, the tragic lack of attention to expert evidence and advice, the failure of local and global governance, and the disparities of privilege, place, and power, to name just a few? Not surprisingly, Smith has something important to say in *Intimations*, “Just before the global shit hit

the fan, we were in a long, involved cultural conversation about “privilege.” We were teaching ourselves how to be more aware of the relative nature of various forms of privilege, and their dependence on intersections of class, race, gender and so on. As clarifying as this conversation often was, it cannot now be applied, without modification, to the category of suffering... privilege and suffering have a lot in common.”

When anomalies accrue that can't be explained by current theories, Thomas Kuhn famously tells us in *The Structure of Scientific Revolutions* (1962) that it is time for a new paradigm, time for a revolution in thought.¹⁴ Demand new ideas, demand a new dawn.

Why are we in this horrible situation? The theme of this workshop is to ask questions about key issues surrounding forecasting. Surely there must have been warnings, somebody must have forecasted this. In fact, there are decades of forecasts, warnings, and recommendations. Concerning pandemics, most warnings went unheeded and unimplemented. Garrett M. Graff compiled a list of these warnings in his article in *Wired*.¹⁵ Robin Marantz Henig's list of even earlier warnings was in the April 8 2020 issue of *National Geographic*.¹⁶ The *Atlantic* published, “We Were Warned: When the inevitable inquiry into the government's response to COVID-19 happens, it will conclude that sins of a coming crisis were everywhere” by Uri Friedman, March 18, 2020.¹⁷

How can we possibly explain and understand deferral and denial of pandemic preparedness? If we figure this out, perhaps we can find ways to overcome any hesitancy to implement plans for this

pandemic and for future pandemics which are sure to happen, or as Thucydides said long ago, “I shall give a statement of what it was like, which people can study in case it should ever attack again, to equip themselves with foreknowledge so that they shall not fail to recognize it.”

Several common themes that may help explain why warnings are ignored emerge from the analyses of risk aversion and risk-seeking. Daniel Kahneman the winner of the Nobel Memorial Prize in Economic Sciences writes about these in his best-selling, *Thinking, Fast and Slow*.¹⁸ He points out that participants start with cognitive biases such as the tendency to be swayed by the first option or opinion offered to us. This is the anchoring effect where decision-makers are reluctant to change their minds if, for example, they originally believe that a pandemic is extremely unlikely. In other instances, we may focus on short-term horizons in cost-benefit calculations rather than the more complex long-term calculations and we often want to maintain the status quo because of the uncertainty of the benefits of investing in protective measures. Perhaps more to the point in the context of the ongoing chaos concerning COVID-19 planning, decision-makers appear to suffer from a herding bias. They base their action on the actions of others, often not the experts.

If sweeping policy changes are simply too expensive and bureaucratically too difficult to implement, some experts suggest using the tools of political economy and power analysis to encourage change. However both approaches have fundamental limitations, especially in the context of a global pandemic; they require a common contextualized and agreed upon model of change, one that itself is dynamic and constantly changing, and, who has agency

in building and implementing the model?

The clichéd, but true, observation that we are all in this together defines the democratization of the disaster. This pandemic has truly democratized the fragility of the interdependencies of cultures, societies, economies, and political systems. The same, of course, can be said about climate change, and, of any global crisis of public health.

If the argument holds that new thinking arises in a time of disaster in the setting of radical changes in science and technology, then now is that time; but what is the radical new science and technology? New thinking has to address the thorny problem of personal responsibility and accountability under difficult circumstances when we are embedded in an increasingly complex and networked world. Consider, for example, advances in gene-editing technology that could generate new, personalized treatments for a wide range of diseases, including arguably viral diseases that can cause pandemics. The same technology may also allow permanent alterations in the human gene pool to be passed on to future generations, personalized medicine with huge interdependent consequences. How we behave, what we believe, and how we are perceived in our networks strongly determine our strengths and vulnerabilities. Mathematics of complex systems and big data analytics informing, predicting, and even manipulating individual and crowd behavior represent technical and scientific foundations that could set in motion creative, safe, and fair remedies for problems we face, or result in deadly outcomes.

Rephrasing new thinking as new wisdom focuses the discussion on who has agency

and begs the question what is wisdom? No need now to engage in definitional disputes, so let's just stipulate wisdom to be as Sharon Ryan, Professor and Chair of Philosophy at West Virginia University, defines it, S is wise if and only if:

1. S has a wide variety of epistemically justified beliefs on a wide variety of valuable academic subjects.
2. S has a wide variety of justified beliefs on how to live rationally (epistemically, morally, and practically).
3. S is committed to living rationally.
4. S has very few unjustified beliefs and is sensitive to her limitations.¹⁹

Given this as wisdom, we can now ask if wisdom can be lifted out of the elite and be democratized, and would it help? Can democratized wisdom help us dig our way out of our current disaster or will we just end up not with the wisdom of the crowd but with the stupidity of the crowd? The idea of the wisdom of the crowd has currency and goes under a number of names including epistemic democracy, collective intelligence, group intelligence or, our phrase, democratization of wisdom. Note that there is science behind the idea of the wisdom of the crowds. An important paper just published in the Proceedings of the National Academy of Sciences notes, "Groups can collectively achieve an augmented cognitive capability that enables them to effectively tackle complex problems. Importantly, researchers have hypothesized that this group property—frequently known as collective intelligence—may be improved in functionally more diverse groups. This paper illustrates the importance of diversity for representing complex interdependencies in a social-ecological

system."²⁰

No matter what it is called, democratized wisdom is far from perfect and it needs far more research and development. Errors arise from social pressures, incomplete and inaccurate data, a whole raft of psychological biases and, not the least of which—what independent body decides on the correctness of the crowd's decisions? See Professor Melissa Schwartzberg's comprehensive 2015 discussion of epistemic democracy in the Annual Review of Political Science.²¹ Even if errors can be minimized, we would still be in the dilemma of using democratized wisdom to figure out how to implement democratized wisdom. Are we caught in a circular, self-referential argument with no real solution?

Is there a middle ground between elite, expert advice and wisdom, and the democratization of science and technology? As Joshua Ober, Professor of Political Science and Classics at Stanford University and one of the experts in articulating epistemic democracy poses the following: "All other things being equal, anticipated outcomes are more likely to be achieved when legislation is predicated on knowledge about relevant features of the world. Since antiquity, political theorists have asked whether a political regime can be at once democratic and epistemic. Can policy-making processes express democracy's core values and serve citizen's interests when decisions are based on well-justified beliefs, rather than ill-founded popular opinions? How a democratic community might employ knowledge in choosing among alternatives is a question of institutional design that concerned classical Greek political theorists and that remains central for contemporary political scientists ... It is a pressing question, not least because it exceeds the bounds of the

state. Universities, business firms, NGOs, federations, and transnational agencies all confront the question of how many individuals, who share certain interests in common, can choose wisely among available options.”²²

Ober gets close to new wisdom when he proposes, “Relevant Expertise Aggregation (REA) – a “middle-way” system for making good decisions among two or more options on issues with multiple relevant criteria. In REA the best overall choice is a function of how the options score in terms of the criteria. Each criterion is defined as a relevant domain of expertise. Options are ranked by experts in each domain, or by mass voting based on recommendations of multiple experts.... Might a computerized “expert system” (Buchanan, Davis, and Feigenbaum 2006) aggregate relevant expertise better than human collectivities?”

Ober’s last question is key. It opens a world of possibilities: some good, others quite fraught. Can one confidently build on the argument that advances in big data analytics, machine learning, complexity theory, trust and verification using quantum computing and other methodologies have the potential to aggregate wisdom and couple it to wisdom-based global governance systems. We may have tools to give Zadie Smith and the rest of us hope, but only if we use our tools with wisdom.

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Endnotes

- 1 Smith, Zadie. *Intimations: Six Essays*. Penguin Books, 2020. Paperback. ISBN: 9780593297612 p 11.
- 2 Goldstein, Rebecca Newberger. “Making Athens Great Again.” *The Atlantic*. April 2017. <https://www.theatlantic.com/magazine/archive/2017/04/making-athens-great-again/517791/>.
- 3 Littman, R.J. *The Plague of Athens: Epidemiology and Paleopathology*, <https://doi.org/10.1002/msj.20137>; Kagan, D. *The Peloponnesian War*. Penguin Books. 2003. NY, NY.
- 4 *History of the Peloponnesian War*, II.vii.3-54 as translated by scholar P. J. Rhodes and given by Michael Grant in his *Readings in the Classical Historians*.
- 5 “War and Peace in Plato’s Political Thought,” Joan-Antoine Mallet. *The Philosophical Journal of Conflict and Violence* Vol. I, Issue 1/2017.
- 6 “Episteme and Techne” Stanford Encyclopedia of Philosophy. Published April 11, 2003, <https://plato.stanford.edu/entries/episteme-techne/>; For a fascinating analysis of Greek theories of knowledge and epistemic democracy, see Daniela Cammack’s chapter (pp 9-38) in *The Discovery of the Fact* ed. Clifford Ando, William P. Sullivan. Univ. of Michigan Press 2020.
- 7 Palmer, A. writing as exurbe blog: exurbe.com/black-death-covid-and-why-we-keep-telling-the-myth-of-a-renaissance-golden-age-and-bad-middle-ages/
- 8 Jacob, M. C. *The Secular Enlightenment*. Princeton University Press, 2019. p159.
- 9 “Immanuel Kant.” Stanford Encyclopedia of Philosophy. “2.1 The Crisis of the Enlightenment.” May 20, 2010, <https://plato.stanford.edu/entries/kant/#CriEnl>.
- 10 Menand, L. *The Metaphysical Club : A Story of Ideas in America*. Hardcover; New York: Farrar, Straus And Giroux, 2001; ISBN-13: 978-0374199630.
- 11 Ayer, A.J. Interview “saw Einstein’s work on relativity and also the new quantum theory as a vindication of their approach.” The Ayer interview can be viewed at: <https://www.youtube.com/watch?v=VAqicPNeKY0> (at 10 min); Friedman, M. “Philosophy and the Exact Sciences: Logical Positivism as a Case Study” “a brief examination of the actual history of logical positivism reveals that one of its most fundamental inspirations is precisely this Einsteinian revolution. The early writings of the logical positivists – of Schlick, Reichenbach, and Carnap, in particular – all focus on the theory of relativity, a theory whose revolutionary impact is explicitly recognized in the course of a polemic against their philosophical predecessors.” (Chapter 5 in *Inference, Explanation, and Other Frustrations: Essays in the Philosophy of Science*.

Edited by John Earman. University of California Press, 1992).

12 Stanley, M. *Einstein's War: How Relativity Triumphed Amid the Vicious Nationalism of World War I* (Dutton, 2019).

13 *100 years of European Philosophy Since the Great War: Crisis and Reconfigurations* (Philosophical Studies in Contemporary Culture Book 25) 2017, Matthew Sharpe, Rory Jeffs, Jack Reynolds (Editors); De Warren, Nicolas. "THE FIRST WORLD WAR, PHILOSOPHY, AND EUROPE." *Tijdschrift Voor Filosofie*, vol. 76, no. 4, 2014, pp. 715–737., www.jstor.org/stable/24673365.

14 Kuhn, T. S. *The Structure of Scientific Revolutions*. 3rd ed. Chicago, IL: University of Chicago Press, 1996.

15 Graff Garrett M., "An Oral History of the Pandemic Warnings Trump Ignored." *Wired*. April 17, 2020, <https://www.wired.com/story/an-oral-history-of-the-pandemic-warnings-trump-ignored/>.

16 Henig, Robin Marantz. "Experts warned of a pandemic decades ago. Why weren't we ready?" *National Geographic*. April 8, 2020, <https://www.nationalgeographic.com/science/article/experts-warned-pandemic-decades-ago-why-not-ready-for-coronavirus#close>.

17 Friedman, Uri. "We Were Warned." *The Atlantic*. March 18, 2020, <https://www.theatlantic.com/politics/archive/2020/03/pandemic-coronavirus-united-states-trump-cdc/608215/>.

18 Kahneman, D. *Thinking, Fast and Slow*. Macmillan. ISBN 978-1-4299-6935-2.

19 Ryan, S, "Wisdom", *The Stanford Encyclopedia of Philosophy* (Spring 2020 Edition), Edward N. Zalta (ed.), <https://plato.stanford.edu/archives/spr2020/entries/wisdom/>

20 Aminpour et al, *PNAS* February 2, 2021 118 (5) e2016887118; <https://doi.org/10.1073/pnas.2016887118>.

21 Schwartzberg, M. *Epistemic Democracy and Its Challenges*. *Ann Rev Pol Sci* 18, 187-203, 2015.

22 Ober, J., 2013. "Democracy's wisdom". *Am.Polit.Sci.Rev.*107:104–22.