

The Dangers of Systems Illiteracy

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In 1918, as the Great War was coming to an end after four bloody years of brutal conflict, an influenza pandemic began to ravage societies around the globe. While in Paris negotiating the terms of the peace agreement in the spring of 1919, evidence indicates that US president Woodrow Wilson was stricken with the flu.

Wilson, who had been intransigent in insisting on just peace terms for the defeated nations (what he called “peace without victory”), underwent a profound change of mental state that his personal physician and closest advisors attributed to his illness. While sick, Wilson suddenly agreed to all the terms he had previously adamantly rejected and approved a treaty that made onerous demands of Germany.

Wilson’s reversal left Germans embittered and his own advisors disillusioned. Historian John M. Barry, who recounts this episode in his book about the 1918 pandemic, *The Great Influenza*, observes that most historians agree “that the harshness toward Germany of the Paris peace treaty helped create the economic hardship, nationalistic reaction, and political chaos that fostered the rise of Hitler.”

This anecdote is a vivid illustration of how a public health disaster can intersect with world affairs, potentially sowing the seeds for a future of war. Converging crises can leave societies with too little time to regroup, breaking down resilience and capacities for governance. Barry concludes from his research into the 1918 pandemic that to forestall this loss of authority—and perhaps to avoid future, unforeseen repercussions—government leaders should share the unvarnished facts and evolving knowledge of a situation.

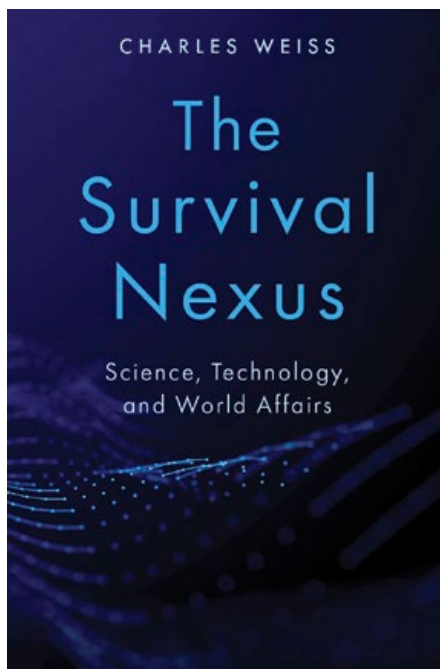
Society is ultimately based on trust; during the flu pandemic, “as trust broke

down, people became alienated not only from those in authority, but from each other.” Barry continues, “Those in authority must retain the public’s trust. The way to do that is to distort nothing, to put the best face on nothing, to try to manipulate no one.”

Charles Weiss makes a similar argument in his new book, *The Survival Nexus: Science, Technology, and World Affairs*. Weiss contends that the preventable human and economic losses of the COVID-19 pandemic were the result of politicians avoiding harsh truths: “Political leaders suppressed evidence of virus spread, downplayed the importance of the epidemic and the need to observe measures to protect the health of the population, ignored the opinions of local experts, and publicized bogus ‘cures’—all to avoid economic damage and public panic, but equally importantly to consolidate political power and to show themselves as strong leaders who were firmly in control.”

The global response to the COVID-19 pandemic encapsulates the elements of what Weiss calls the “survival nexus,” in that it involves science, technology, politics, economics, business, law, culture, and psychology. According to Weiss, these elements and how they interact are not fully appreciated. This point resonated with me as I reflected that, as the pandemic continues for a third year, there is little public discussion of its medium- to long-term socioeconomic implications. Contrast local news coverage—which may or may not mention the pandemic at all—with the warning recently issued by the World Health Organization’s chief scientist, Soumya Swaminathan, on her personal Twitter account: that countries affected by COVID-19 “need to prepare for large increases in cardiovascular, neurological & mental health disorders.”

At the same time, Russia’s invasion of Ukraine has renewed concerns about nuclear disasters, crimes against humanity, European energy supplies, and global food insecurity. Elsewhere in the world as I write, one-third of Pakistan is



The Survival Nexus: Science, Technology, and World Affairs

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submerged in floodwaters, large swaths of China are enduring the most severe heat wave ever recorded, and the Horn of Africa is on the brink of famine. Yet there is scarcely any public analysis of these disasters, their root causes and future effects, and how they may interact.

The need to confront and understand these complex realities without cant or illusion has never been more urgent—but who has a broad enough view to explain them? Is there a coherent framework through which to grasp how a changing biosphere is affecting the outlook for human civilization and what to do about it?

Weiss, who directed the Science, Technology and International Affairs program at Georgetown University, provides some answers in his book. He writes that people tend to neglect the scientific and technological dimensions of a broad range of world affairs: war and peace, environmental sustainability, epidemic disease, the future of the

human genome, personal freedom, access to information, economic development, and world poverty. Scientists, he notes, “tend to be immersed in their own disciplines” and the “links that connect science and technology with world affairs are not generally recognized as having a coherent intellectual framework or as constituting an academic discipline.” His goal is to present such a framework.

Weiss explains that he started writing the book out of his conviction that these links need to be emphasized in university curricula. But as he got further into the research, he found that the dangers society faces are more urgent and serious than he initially realized. He describes the necessity of a broad reappraisal of humanity’s approach to dealing with these challenges and the need to mobilize science and technology in these efforts:

“We are running out of time. Nature does not wait for the slower processes of social learning and political change. Measures that could have been phased in relatively smoothly and affordably twenty or thirty years ago are now drastic, painful, expensive, and hampered in many countries by populist uprisings.”

The book is unique for its scope, depth, and economy of language in describing complex subjects. It makes for useful reading for decisionmakers and lay citizens alike, offering a sophisticated foundation for grasping risks to the security and well-being of democratic nations. Weiss covers the historical, scientific, and political context of strategic issues, including climate disruption, nuclear threats, public health and pandemics, the internet and social media, cyberwarfare and cybersecurity, gene drivers, geoengineering, and global inequalities in access to technology and capital investment. He writes about breakthroughs in medical and pharmaceutical sciences. He also addresses the new world of work, its socioeconomic consequences for people whose lack of education leaves them behind, and the implications of this widening inequality of opportunity for political instability and the rise of techno-

authoritarianism. Whew.

Weiss's discussion of the pandemic is a useful example of his method. He emphasizes how global interconnectedness can bring seemingly far-off crises close to home rapidly in ways that affect society and security. The pandemic thus epitomizes the survival nexus, in that no one can be safe unless everyone is safe. This is why, as Weiss says, "we talk about 'global health,' a term that implies that disease knows no boundaries." He suggests that the term "planetary health" is more accurate, because it captures the reality that "climate, food, people, environment, and disease all continuously interact with each other and with global health." Driving home this point is recent research published in *Nature Climate Change* that concludes that more than half of all known human infectious diseases are aggravated by the effects of climate change, meaning that mitigating greenhouse gas emissions is an urgent matter of global health—and only one of many linked issues that constitute Weiss's survival nexus.

Weiss's work made me reflect on how difficult it is for individuals, let alone societies, to grasp new realities as quickly as is necessary to deal with novel problems as they arise. This is particularly the case now that the Earth system itself has undergone drastic changes in the last century. The new reality is so different from what came before that humans lacked the concepts to describe it; new words, and even a new epoch—the Anthropocene—had to be coined, and even now society is only beginning to comprehend the linkages between its technological systems, the biosphere, global health, and the political, economic, and cultural ramifications of these changes.

A mismatch between emerging realities and existing knowledge creates systems illiteracy, which is an inability to recognize the new circumstances created by the systemic interconnections and behaviors arising from complex human and natural systems. This kind of

illiteracy, as I've noted in *Issues* before, has contributed to notable strategic surprises, sometimes involving intelligence and policy failures, such as the unexpectedly sudden end of the Cold War or the global financial crisis of 2007–2008. Such ignorance is particularly dangerous in times of rapid change.

Knowledge vacuums in times of uncertainty and flux historically have given rise to fearful societies. These societies, in turn, become ripe targets for demagogues and dictators, as many historians have documented in various times and places. Looking ahead, it is imperative to reach for new approaches and knowledge that can fortify societies and democracies against risks and challenges that otherwise might tear them apart. These may take the form of novel ways to organize political economy that end society's reliance on fossil fuels, reduce wealth inequality, and support a robust public sphere.

I believe an educated citizenry is also essential. Emphasizing the humanities (especially history), public ethics, and Earth system sciences in formal and informal education seems imperative. Weiss underscores the role of ethics—to confront issues of intergenerational equity, for example—in dealing with existential crises; this requires urgent follow-up. The work of public ethicists, philosophers, and political economists deserves attention for innovative thinking about these issues. Books by ethicist and philosopher Clive Hamilton and economist Kate Raworth have been particularly influential on my thinking in this area.

In my view, society needs to encourage university students to pursue humanities and foreign languages as fields of study with the assurance that these provide the critical thinking and cross-cultural skills (as well as employability) they need in a world of interlinked natural and human systems. One implication of Weiss's work, in fact, is that the ability to think critically about what one reads in the media is becoming more important, as is the ability to put current events into historical context.

According to Weiss, although more attention must be paid to their role in world affairs, science and technology alone cannot be relied upon to resolve today's existential challenges. A broader array of disciplines, such as law, ethics, and human rights, as well as the involvement of new and diverse voices, must be included when confronting these challenges. Scientific knowledge and advice, however, should be incorporated into decisionmaking processes in ways that, Weiss writes, acknowledge "the risks and uncertainties in our understanding of the science and technology we are trying to manage, as well as in their ramifications for the larger society."

Weiss warns that understanding the linkages between science and technology and other domains is critical to humanity's future. While this is true, the task ahead is more monumental still, in my view. Also needed is a systems-wide rethinking of *all* knowledge disciplines that evolved during a time when few people considered the health and resilience of the Earth system to be factors in the future of civilization itself. Scholars know better now, and knowledge disciplines must catch up. This rethinking would necessarily call upon the knowledge traditions of Indigenous communities, with a focus on their relationship with the environment.

Boosting humanity's collective intelligence, foresight, and capacities for working together is the only way to survive, let alone thrive, in the damaged world we're bequeathing to our children. To do this requires embracing the fact that knowledge, like science itself, must evolve to keep pace with—if not anticipate—global changes. Society's ability to respond humanely to mounting challenges will influence what it means to be human in the years ahead. These are issues of practical ethics, as Weiss notes, and are not resolvable by science, technology, or markets.

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