Introduction

Despite the allure of change, there has been a disconcerting suspicion in some corners of society that those controlling the science and technology industries around the world have come to dominate government to the detriment of the common good. That is, something is replacing the interests of humanity.[1] It would be foolish to essentialize the dilemma as man versus machine, because there are innumerable examples of science and technology producing beneficial effects. No one would deny the benefits of anesthesia during surgery. However, it would also be foolish to ignore concerns or fail to anticipate harm. In such cases, it is to humanity that we must turn for a solution. Humans, I assert, get to take all of the credit and all of the blame if science and technology pose problems, and a legal and governmental approach to avoiding such harm is as human as it gets.

Since the early Industrial Age, a call to arms against "the machine" has served more as an expression of fear and uncertainty than as a clarion call for change. Our technology has made us nervous about human well-being in a number of respects, at times with a distracting focus on the technology itself rather than on the humans making use of it. In 1863, while in New Zealand, a young Samuel Butler wrote a piece of satire identifying "the mechanical kingdom" as the evolutionary successor to the "animal kingdom," which had in turn

[1] In the Danish children's story by Hans Christian Andersen (1805–1875), he also anticipates the replacement of life by machine, in the form of a mechanical bird. Although "the real nightingale sang in its own way and the artificial one could only sing waltzes," the music master professed that the toy is "perfectly in time and correct in every way." The real nightingale, concerned and abandoned, flew away. *The Nightingale*, Hans Christian Andersen, Andersen's Fairy Tales 242, 248 (New York, Grosset & Dunlap 1973) (1843).

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"supervened upon the vegetable."[2] He described the machine as superior to man in every way, with its mind in a "perpetual state of calm." The machine would be inseparable from us as we are inseparable from all other living things, enslaving us as we have enslaved and eaten other living things.[3] After deliberately producing a degree of discomfiture, Butler abruptly professes that mankind should proclaim a "war to the death" against the machine and "go back to the primeval condition of the race."[4] Should society be resigned to the belief that the door had already closed, he argued, "we are not only enslaved but are absolutely acquiescent in our bondage."[5] Offering no solution, Butler did not leave his nineteenth-century readers ready for action, but the point was made that humanity in a mechanized age is a problem of our own making. For him, Juvenalian satire was a good choice. Even better, from a legal perspective, would be to come up with a reasonable plan, but in order to do so the absurdity of anthropomorphizing "the machine" had to be called out.

Butler did try to speak up for "mankind," and I use that term thoughtfully as, of course, it would not have included me and so many others during that time period, when selective disenfranchisement and forced labor were supported by law in the nineteenth century. Innovation contributed to a series of turbulent eras. Butler's Industrial Age benefited from the steam engine and the transportation revolution enabling the United States to push nations in East Asia to open up trade while domestically facing a civil war within its own borders. A century later, in the 1960s – after the Gilded Age and la Belle Époque, the telephone, automobiles and airplanes, the Great Depression, two world wars, civil rights protests, television, and the Soviet Union's launch of the world's first satellite (Sputnik) – Western scholars continued to wring their hands over the role of science and technology. After all, this was the Atomic Age, and how could nuclear war be progress? As Bertrand Russell expressed in 1924 in the midst of these events: "Men sometimes speak as though the progress of science must necessarily be a boon to mankind, but that, I fear, is one of the comfortable nineteenth-century delusions which our more disillusioned age must discard. Science enables the holders of power to realize their purposes more fully than they could otherwise do."[6]

[2] Samuel Butler, *Darwin among the Machines*, *in* A First Year in Canterbury Settlement with Other Early Essays 179, 180 (A. C. Fifield, New Zealand Electronic Text Collection, Victoria University of Wellington 1914) (written to the Editor of the Press, Christchurch, New Zealand, 13 June 1863).

[3] *Id.* at 182–184.

[4] *Id.* at 185.

[5] *Id.*

[6] Bertrand Russell, Icarus or the Future of Science 57 (New York, E. P. Dutton & Co. 1924).

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In 1969, British sociologist Donald Macrae bemoaned the modern state, which offered to humanity efficiency, security, and some economic benefits but also rising disenchantment with a government bureaucracy "increasingly dependent on the idiot rationality of machines."[7] He made the bleak observation that a modern Western society, structured around regimented surveillance, bears the "detailed, remorseless burden of demand from which there is no refuge, in which there are no new beginnings, no possibilities of existential choice, and to which only death can bring oblivion."[8] For German-American psychologist Erich Fromm, it was man who had become the idiot in the modern Industrial Age, complicit in his alienation, as a "perpetual infant" more interested in materialism than in self-awareness.[9] Both social critics of modernism were alarmed at the escalating threat of annihilation during the Cold War, but it was Fromm who envisioned a strange theme familiar to us today with talk of artificial general intelligence, P(doom), and singularities: "The survivors [of a nuclear atomic war] will set up a world dictatorship in which all values of the Western tradition will be lost and robots will rule over robots."[10] During World War II, Russian-born American writer Isaac Asimov had a more absurdist take, in that the survivors of a technological apocalypse would be the unintelligent, the very young, the mentally ill, and the intoxicated, for they would be the only ones who would not go mad upon realizing that the world had ended and anarchy was the new reality.[11] Such intentional absurdity raises questions in the present and serves effectively as a dare to change course.

And yet, despite this twentieth-century outcry, the public did not necessarily agree with the sweeping assertion that technology and materialism were inevitably destructive. Globally, televisions were the norm in American households by the 1950s and in households in East Asia by the 1990s.[12] The first successful

[7] Donald G. Macrae, *Introduction to* Herbert Spencer, The Man versus the State, with Four Essays on Politics and Society 7, 49 (Donald Macrae ed., Baltimore, MD, Penguin Books 1969).

[8] *Id*.

[9] Erich Fromm, On Being Human 21, 21–23 (New York, Continuum Pub. Co. 1998) (from *Modern Man and the Future* (1961)). Fromm anthropomorphizes the state, industry, and society, without expressing any faith in the individual human: "Modern man is controlled by the products of his own hands. He becomes a thing. He is nothing, yet he feels big when he feels at one with the state, with production, with the company."

[10] *Id*. at 29.

[11] Isaac Asimov, *Nightfall* (1941), *in* Nightfall and Other Short Stories by Isaac Asimov 2, 25 (New York, Doubleday & Co., Inc. 1969).

[12] Fangjing Zha & Di Zhou, *The Long-Term Effect of Television on Children's Human Capital Development in China*, 176 J. Dev. Economics (2025), https://doi.org/10.1016/j.jdeveco.2025.103538 (noting the proliferation of cable and satellite television in developing economies, including China, since the 1990s).

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human heart transplant occurred in 1967 in South Africa during apartheid.[13] Apollo 11 landed humans on the Moon in 1969 as "one giant leap for mankind," the year after civil rights leader Dr. Martin Luther King, Jr. was assassinated in Memphis, Tennessee. In the midst of the Cold War, the popular Disneyland ride Space Mountain was built in 1977 in Orange County, California, the same year that the first Star Wars film opened in movie theaters. Fear and hope continually blended regarding the impact of human innovation. In 1986, in the last decade of his life, Fromm made a compassionate appeal: "As we marvel more and more over the power of machines, we understand less and less of the wonderful powers of human beings."[14] By the end of the 1990s, over half of British adults and about two-thirds of American adults had used the Internet,[15] and the innovations kept coming, such as smart tech, fintech, nanotech, and genetic engineering. The emphasis on the hard sciences in education to galvanize the economy and remain globally competitive meant a comparable de-emphasis on the social sciences, humanities, and the arts – the fields of study most likely to consider the needs and nature of humanity.

Were the sages of the 1960s correct? I think we have legitimate and continuing concerns about the fate of humanity, but a greater resilience as humans than is often countenanced in the literature. In the last two centuries, we have now tried and tested various social and legal policies around the globe to ease the transition to rapid technological change and to backpedal when they go awry; some might argue half-heartedly, but we should be wary of an enduring risk of heavy-handedness in government solutions. If science and technology can get it "wrong," so can government and its legal system. For example, recent scholars have promoted genetic determinism, such as selective traits, but with the guardrail of added legal guidelines "about what it means to be human, how we should relate to one another and the environment, and what the true marks of human dignity require of us."[16] This implies that more

[13] *See* Marina Joubert, *1967: Reflections on the First Human Heart Transplant and Its Impact on Medicine, Media and Society*, 27(1) Public Understanding of Science 110, 113 (2018) ("In the political context of South Africa in 1967, the media coverage of Barnard's second and third heart transplants highlighted the immorality of the country's racial policies where black and white people were not allowed to sit next to each other on a bus, but a black person's heart could save a white person's life").

[14] Erich Fromm, For the Love of Life 8 (Hans Jürgen Schultz ed., Robert Kimber and Rita Kimber transl., New York, The Free Press 1986).

[15] Ronald E. Rice et al., *Social Interaction and the Internet: A Comparative Analysis of Surveys in the US and Britain*, *in* The Oxford Handbook of Internet Psychology 7, 7 (Adam N. Joinson et al. eds., New York, Oxford University Press 2007).

[16] William F. Schulz & Sushma Raman, The Coming Good Society: Why New Realities Demand New Rights 126 (Cambridge, MA, Harvard University Press 2020).

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law is required in order for the state to decide what we are in order to regulate human relations. I think we would all prefer to have our say on the nature of our own existence, and that we would feel more sanguine about a government that listens and considers our varying needs than a government that dictates what we are and how we are permitted to experience life. It is a tricky enterprise to get the balance right on legal intervention on behalf of the common good, which is a key focus of this work.

What I do not think we have at present is a sufficient collective *appreciation* for what we are. The law has a calcifying and homogenizing effect, as much as we attempt to infuse it with flexibility, such as discretionary reasonableness standards. The incessant complaint about the law failing to "keep up" with technology reflects the absurdity of pursuing fixed solutions in a kinetic reality. Science and technology are extensions of humanity, and we, by nature, are in flux. In addition, legal and nonlegal approaches work best in tandem, not to "keep up" with innovation but to adjust our priorities and emphasize humanity more when needed. The common good is what is at issue and I recognize that the term itself is charged and malleable. According to Plato's *Republic*, justice – providing each their due – is a dedication to the common good and "absolute communism," but, according to political philosopher Leo Strauss, for Plato this view is limited to the city in an era of smaller states, not the world as a whole and not one's enemies.[17] That is, it is the role of government to attend to the needs of people, but not all people, a perilous state of affairs for those on the wrong side of the fence. Today, there are more inclusive international and regional human rights, but the common good expressed in most constitutions would have their legal jurisdictional bounds and favored associations leading to the development of partnerships with the highly specialized and self-interested private sector.[18]

The science and technology industries partner regularly with governments around the world, but I argue these industries have internalized an aversion to prioritizing the needs of the public for historical and even philosophical reasons. In fact, scientists have periodically been vocal about their desire to guide society themselves, irrespective of the will of the people. J. D. Bernal warned in 1939 that "[t]he socialized, integrated, scientific world organization is coming."[19] In 2024, the Scientists' Coalition proclaimed themselves to be the "honest knowledge broker" in all treaty negotiations related to the pending

[17] *See* Leo Strauss, The City and Man 73 (Chicago, University of Chicago Press 1964).

[18] For an interpretation of the power and influence of the Anglo-American rule of law internationally, see Ugo Mattei & Laura Nader, Plunder: When the Rule of Law Is Illegal (Malden, MA, Blackwell Publishing 2008).

[19] J. D. Bernal, The Social Function of Science 409 (Cambridge, MA, MIT Press 1967) (1939).

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UN Plastics Treaty to curtail global pollution, with the highest proportion of coalition members coming from western Europe and North America.[20] Part of the concern is that professionals in scientific fields are trained to take a more atomized view of the human individual, even in medicine and neuroscience, rather than focusing on the integrated needs of humanity. Our social theorists, however – political scientists, anthropologists, sociologists, historians, and the like – despite their own checkered past, continue to devote their attention to what we are, where we are going, and where we need to be.

Our changing external world, due largely to the rapid impacts of science and technology, has made manifest the outline of a Leviathan. I have noticed a wavering of public trust in our institutions to face such a creature, but it is merely a new iteration of an ancient problem. The Leviathan is a massive sea monster, symbolic of a threat to humanity in the form of nature in biblical scripture,[21] of an organizing state according to English philosopher Thomas Hobbes,[22] and of industry per American journalist Frank Norris.[23] In each representation, the monster is complex – a many-headed or many-armed entity characterizing both threat and opportunity, aggressor and resource.[24]

[20] Kristian Syberg et al., *Informing the Plastic Treaty Negotiations on Science: Experiences from the Scientists' Coalition for an Effective Plastic Treaty*, 4 Microplast. Nanoplast. 14 (1–10) (2024).

[21] *See* Robert Alter, The Hebrew Bible: A Translation with Commentary 704 (New York, W. W. Norton & Co. 2019) (explaining "Leviathan, the twisting serpent" as conquered by God "in order for dry land, safe from the raging sea, to come into being" in Isaiah 27:1 [ca. 730 bce]).

[22] *See* Thomas Hobbes, Leviathan 7 (J. C. A. Gaskin ed., New York, Oxford University Press 2008) (1651) (referencing artificial automata and engines created by humans: "For by art is created that great Leviathan called a Commonwealth, or State, (in Latin *Civitas*) which is but an artificial man; though of greater stature and strength than the natural").

[23] *See* Frank Norris, The Octopus: A California Story 205 (Cambridge, MA, Robert Bentley, Inc. 1971) (1901) (describing a railroad map as "a veritable system of blood circulation, complicated, dividing, and reuniting, branching, splitting, extending, throwing out feelers, off-shoots, tap roots, feeders – diminutive little blood suckers that shot out from the main jugular and went twisting up into some remote county, laying hold upon some forgotten village or town, involving it in one of a myriad branching coils, one of a hundred tentacles, drawing it, as it were, toward that centre from which all this system sprang").

[24] The following passage, according to Hebrew scholar Robert Alter, portrays the works of human civilization, where "Leviathan can be reduced to a plaything." Alter, The Hebrew Bible at 245 (Psalms 104:22–27).

> How many Your deeds, O Lord,
> all of them You do in wisdom.
> All the earth is filled with Your riches.
> This sea great and wide,
> where creatures beyond number stir,
> the little beasts and the large.
> There the ships go,
> this Leviathan You fashioned to play with.

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That dual state of existence is true for the fields of science and technology as they generate dominant global industries today. To understand humanity's contested relationship with its own tools, I hope to convey a shared interdisciplinary appreciation for what it is to be human and the necessity for humanity's legal primacy as we cope with the more serious risks accompanying innovation.

This discussion is presented in three parts. Part I (Being Human) addresses the scientific research, social theory, and primarily Western legal interpretations of human well-being and what it is to be human.[25] Part II (Science, Technology, and the Law) more closely examines the philosophy of science, scientism, and technological exceptionalism and their influence on government. Finally, Part III (Humans in Legal Exile) examines select examples of how government and industry have enabled humanity's legal exile, given its narrow loyalty to science, technology, and rationality, while neglecting the needs and nature of humanity as a whole.

[25] By the term "West," I have primarily included European and British Commonwealth traditions, but I recognize the fluidity of any region based on the millennia of trade, migration, conquest, and shared language and culture. For example, sociologist Anthony Giddens has noted that Islam is as Western as Christianity – "Each emerged in the same part of the world, and their histories are interwoven." Anthony Giddens, Turbulent and Mighty Continent: What Future for Europe? 129 (Malden, MA, Polity Press 2014). *See also* Seyyed Hossein Nasr, Science and Civilization in Islam (Cambridge, The Islamic Texts Society, 2d ed. 1987) (first ed. 1968 Harvard University Press).

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