The Origins of Cornucopianism:  
A Preliminary Genealogy

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ABSTRACT
The threat of accelerating climate change has revived a long-standing debate over the environmental limits to economic development. Can the biosphere sustain exponential economic growth over the long run? This article explores the historical origins and logic of cornucopianism as an ideology. I take issue with Timothy Mitchell’s recent argument that the postwar oil economy gave rise to dreams of endless growth. Instead of a single technical or conceptual breakthrough, we appear to be dealing with overlapping myths of abundance and exploitation, shaped in great part by the promise of available technology and its environmental limits. Natural philosophy, frontier expansion, and manufacturing development gave rise to alternating objects of cornucopia. Each of these visions of abundance proved unstable and temporary. Indeed, cornucopianism and environmental anxieties have been closely intertwined in theory and practice from the eighteenth century onward.

Modern politics thrives on a pledge of endless growth. Once the prerogative of alchemists and colonial projectors, this faith in cornucopian abundance has become the common sense of our age.1 Here is Larry Sum-
mers’s paean to infinite progress, delivered in 1992 when he served as chief econom-
ist at the World Bank: “There are no limits to the carrying capacity of the earth that are likely to bind any time in the foreseeable future. There isn’t a risk of apoca-
lypse due to global warming or any thing else. The idea that we should put limits on growth because of some natural limit, is a profound error and one that, were it ever to prove influential, would have staggering social costs.”

It is fair to say that Summers’s position reflects the received wisdom of main-
stream economics in the postwar era. This system of thought holds that “human ingenuity and adaptation through technological and social responses, not natu-
ral limits, set the boundaries of human wealth and well-being.” There is no “re-
source shortage or pollution problem with which society cannot cope.”

Yet we now have increasing reason to suspect that the cornucopian promise of economics is historically myopic, technologically dubious, and ecologically ir-
responsible. Geophysicists and ecologists predict multiple and overlapping environ-
mental crises of the near future, including rapidly accelerating climate change (Jim Hansen), mass extinctions (E. O. Wilson), loss of ecosystem function and ecological overshoot (Mathis Wackernagel), and the transgression of several planetary bound-
aries that are necessary to maintain the Earth system “in a Holocene-like state” (Johan Rockström). From this perspective, our current age of fossil fuel abundance resembles nothing so much as a giddy binge rather than a permanent achievement of human ingenuity. Indeed, a small but growing number of critics call for a steady
state society or circular economy as the only viable long-term solution. In this transition toward resilience, there is work to be done for historians. A genuine reorientation of the economy must include a systematic historical critique of consumer society and the ideology of growth that underpins modern politics and economics. Such a genealogy generates two distinct but compatible hypotheses: (1) Cornucopian ideology emerged in tandem with fears of physical limits to growth. Since the late Enlightenment at least, these two forces have been feeding on each other, generating rival forecasts of technological development. (2) The long duel between these competing ideologies must in turn be situated within an environmental history of economic growth. The great triumphs of the industrial economy have involved a series of increasingly fraught gambles. The escape from the old biological regime into industrial society was achieved only at the expense of mounting ecological problems, including falling biodiversity, the degradation of nonsubstitutable resources, and accelerating climate change.4

I

What were the historical origins of cornucopian ideology? One possible starting point is David Ricardo’s concept of rent, first articulated in the 1817 Principles of Political Economy and Taxation. Ricardo here rejected T. R. Malthus’s idea of absolute limits to food production. Instead, he held that nature was nonhomogeneous, that is, soil fertility was differentiated into distinct zones. When conventional arable lands were fully exploited, food production moved to zones of lesser fertility. These inferior soils could be improved indefinitely through added inputs of capital and labor. The same principle held for mineral resources as well. Mutually beneficial trade and technological innovation further stimulated the process of substitution. “By the extension of foreign trade, or by improvements in machinery, the food and necessaries of the laborer can be brought to market at a reduced price.” Later resource economists have extended Ricardo’s model to imagine a process of indefinite substitution among all natural resources, including

the energy base of our society. Beyond coal, oil, and natural gas beckon cold fusion and the hydrogen economy. 5

To us, Ricardo’s view might seem self-evident. Yet as E. A. Wrigley has suggested, the notion of indefinite substitution was counterintuitive to many of Ricardo’s peers, who failed to appreciate the full implications of the Industrial Revolution. To classical economists such as T. R. Malthus, J. S. Mill, and William Stanley Jevons, it was easier to imagine a world of finite resources and permanent limits, even as coal and steam were transforming society around them. In fact, Ricardo himself proved susceptible to this view. He too acknowledged the prospect of a stationary state, though he located this condition in the distant future. Timothy Mitchell has argued that a “principle of limitless growth” only gained political momentum with the new oil economy of the postwar era. He takes William Stanley Jevons’s forecast of coal depletion as emblematic of nineteenth-century politics. But the gloom of classical political economy should not tempt us to look for dreams of abundance only in subsequent periods. Too narrow and canonical a view of these theories of economic growth obscures the deeper origins of cornucopianism. 6

Fortunately, there are a number of promising leads in the historiography of early modern thought and imperial expansion to help us bypass the hurdle of Victorian pessimism. Joel Mokyr has recently drawn attention to the legacy of Francis Bacon’s natural philosophy and the culture of “technical literacy” associated with popular Newtonianism and civil engineering in the eighteenth century. Charles Webster and Thomas Hughes in turn interpret this Baconian tradition as a project to recover Eden through technology by making a “second creation.” Carl Wennerlind explores the expectations of infinite growth associated with alchemy, credit, and labor in the Hartlib circle during the English Civil Wars and Interregnum. William Newman traces the “Promethean ambitions” of Bacon’s natural philosophy back to medieval and early modern alchemy. Historians of colonial America such as Jack Greene, Karen Kupperman, and Joyce Chaplin have shown how the projecting impulse transformed colonial environments and economies in the seventeenth and eighteenth centuries. Jackson Lears tracks what he calls the “fables of abundance” back to seventeenth-century promotional tracts on New World coloniztion.


William Cronon’s environmental history of Chicago suggests a theoretical link between “world making” and frontier expansion. For Cronon, it was the hinterland of the greater west that made possible the “second nature” of metropolitan Chicago. Taken together, these different threads of scholarship suggest that the idea of long-term growth cannot be considered simply as a technical problem of economic thought. Instead we need to delve deeper into the past and consider a broader range of historical precedents. Cornucopianism serves as useful umbrella term for these many forms of experience.°

II

The term cornucopia seems to have entered into the English language sometime between the reigns of Elizabeth I and James I. The preface of the King James Bible from 1611 contrasted the true spiritual riches of the Bible with the false promise of alchemy and cornucopia: “Men talke much . . . of the Philosophers Stone, that it turneth Copper into Gold, of Cornu-copia, that it had all things necessary for foode in it.” Francis Bacon employed the term in his 1606 memorandum to James concerning the planting of Ireland. Ireland was a second Britain “vast, and void of all things necessary” but “endowed with . . . many dowries of nature, considering the fruitfulness of the soil . . . the fishings, the quarries, the woods, and other materials.” Bacon compared the planting of Ireland to the divine labor of Genesis. It would create “one of none” “resembling the creation of the world . . . de nihilo ad quid.” But to succeed, the new settler population had to be concentrated in a few fortified towns and villages where commerce and arts could prosper: “Whereas, if they build scattered . . . every man must have a cornu-copia in himself for all things he must use.” This ambition to create the world anew was also at the heart of Bacon’s natural philosophy. In the Great Instauration from 1620, Bacon explained that proper natural philosophy must imitate divine procedure by exploring the Light of Creation before seeking experiments of

Fruit. He observed in *De augmentis scientiarum* (1623) that art was not simply the assistant of nature, but rather the means to “transmute, or fundamentally alter nature.” Carolyn Merchant has long underscored the violent metaphors of Bacon’s project. In order to refashion nature into something useful to humanity, it was necessary to “torment,” “torture,” “vex,” and “penetrate” the material world. Nature could be “put in constraint, moulded, and made as it were new by art and the hand of man: as in things artificial.”

Francis Bacon’s utopia *The New Atlantis*—printed posthumously in 1627—has often been read as a precocious piece of propaganda for the possibilities of technoscience. Bacon here suggested that it might be possible to reverse the effects of the Fall without offending God. This daring reinterpretation of Genesis was coupled with a fable of abundance in the New World. A caste of natural philosophers in the College of Six Days’ Work governed Bacon’s island state of Bensalem. They managed an empire of light by gathering information abroad through acts of espionage and knowledge transfer. Since the philosophers traded in information rather than commodities, the raw materials for their projects came from within the island itself. But this was not simply a fantasy about resource extraction and cash crops in the mold of early modern empires. *The New Atlantis* chronicled in great detail the transmuted bodies forged in the laboratories and gardens of the House of Solomon. The natural philosophers of Bensalem created new kinds of animals and plants, new forms of heat, new weapons, and new kinds of medicine. They could command the winds and accelerate growth in living organisms. They built sky-high towers and vast subterranean chambers. They were even capable of prolonging human life, remaking the species itself. In this sense, Bacon’s project to recover Eden was also a form of second creation, transmogrifying nature in “diverse strange forms,” as Merchant puts it.

In the generation after Bacon, his follower Samuel Hartlib proposed that the vision of Bensalem could become reality in England. Like *The New Atlantis,*


Hartlib’s *Cornu Copia* (1652) took the form of a lengthy list of possible inventions and discoveries, imagining new realms of ingenuity and power. Hartlib reserved a special place for sown grasses. Old exhausted soils could be restored and enriched “to far greater fruitfulnesse than ever they yielded before, without laying so much as a load of muck thereon, or without any considerable charge or trouble.” The secret to success was to sow different kinds of grasses on barren land. Hartlib hoped to discover a native English fodder grass that would surpass the properties of “glower grasse, Sain Foine, Lucerne, or any other outlandish grasses whatsoever.” Hartlib also promoted other kinds of agricultural diversification. The compendium *Samuel Hartlib: His Legacy of Husbandry* (1651) encouraged all “Ingenious Gentlemen and Merchants, who travel beyond the Sea” to collect information on the husbandry of overseas countries. If possible, they were to gather seeds and plants as well, including cedars, cherries, and sarsaparilla from Virginia, and cranberries, squashes, and wild hemp from New England. To persuade skeptics about the merits of ecological exchange, Hartlib reminded them that many English plants were in fact naturalized exotics: “Cherries, Hops, Liquorice, Potatoes, Apricocks, Peaches . . . Rape-seeds, Colliflowers, Great Clover, [and] Canary-seeds.” Doubters deserved only contempt: “why might not our fore-fathers upon the same ground, have held their hands in their pockets, and have said, that Wheat and Barley would not have grown amongst us?” Already in 1646, Hartlib conceived of an institutional framework for information gathering, a real world equivalent of Bensalem’s empire of “light.” Combining Bacon’s science fiction with the practical example of Reynaudot’s *Bureau d’adresse* in Paris, Hartlib called for an English “Office of Address.” In the spirit of Bacon’s College of Six Days’ Work, Hartlib envisioned a state-led enterprise charged with the duty of collecting histories of trade and other useful secrets. Certain aspects of this scheme in fact came to fruition in the Council of Trade (1650). After Hartlib, cornucopian arguments proliferated in British political economy and financial mathematics. Steve Pincus has proposed that Whig political economists elaborated an ideology of infinite growth based on a belief in the Promethean potential of labor and property. Nicholas Barbon proclaimed that the “Wants of the Mind” were “infinite” in *A Discourse of Trade* (1690). Chief among these wants was the desire to adorn one’s body and “advance the Pomp of Life.” This psychological definition of cornucopian desire was matched by new developments in mathematics. William Deringer argues that real estate
promoters, entrepreneurs, and mathematicians embraced a technique of exponential discounting in the period. By assuming a steady rate of compound interest, they suggested that it was possible to calculate the present value of future wealth. Moreover, such calculations seemed to demonstrate that the future would be vastly more prosperous than the present.¹⁰

III

The peripheries of Europe offered a crucible for optimistic predictions of political economy and natural history. Advocates of colonial expansion projected outward the possibility of endless abundance. In the promotional tract “Advertisements for Ireland,” investors were promised magnificent opportunities in fisheries and timber. Barnabe Rich praised Irish soil and climate, good for both “Corne and pasture” and equal to the best land in Europe. In the wake of the English victory in the Nine Years’ War, pilchard fisheries and hardwood exports were booming. America, like Ireland, constituted an “empty world” of ecological frontiers open to settlement and extraction. Hakluyt and his successors wrote of the “infinite treasures” sent back from the New World by the Spanish conquerors. English travelers who surveyed the fishing waters of the Northwest Atlantic witnessed astonishing marine abundance, compared with the depleted ecological baseline of European seas. When Francis Bacon became involved in a scheme to settle Newfoundland in 1610, he suggested that the shoals of the Grand Bank were richer than all the mines of Mexico and Peru. Images of Eden were a commonplace in the promotional literature about the New World and overseas tropical islands. Actual and apparent natural wealth mingled in these accounts. Virgin soils and abundant wildlife blurred into visions of El Dorado and the Land of Cockaigne. But for most observers, the fruits of the New World were not spontaneous products of a terrestrial paradise. They had to be won through organized labor and expert knowledge. Richard Drayton traces this ambition to improve nature to a hybrid ideology that

combined strands of Christian and Renaissance thought. In practice, improvement schemes assumed a wide variety of guises, from the plantations of the Deep South to the fisheries of New England and the sheep farms of New South Wales. By the nineteenth century, these schemes of extraction and commercialization made possible the growth of sprawling new cities, born out of the boom and bust cycles of the settler frontier. To Adam Smith, the prosperous future of North America was evident from the trend of population and wages. Smith predicted that cattle farming and mixed husbandry there would follow the pattern of improvement set in England and Lowland Scotland, though on a much grander scale. Indeed, the American colonies were “much more thriving” than England and “advancing with much greater rapidity to the further acquisition of riches.” While population in Great Britain and “most other European countries” took five hundred years to double, in the British colonies, they doubled “in twenty or five-and-twenty years.” Wages were high, people married young, and famine was unknown. In “little more than a century,” the center of gravity within the British Empire would shift to the New World, and its capital be relocated to America.11

Behind these glories of improvement lay the reality of the settlement frontier. Environmental historians have rehabilitated Frederick Jackson Turner’s original concept to highlight the ecological effects of colonization. William Cronon sees the logic of the frontier as a wild oscillation between abundance and scarcity. Richard Grove and David Watts have drawn attention to the processes of deforestation, soil erosion, and biodiversity depletion that took place in many parts of the West Indies after 1492. Jeffrey Bolster observes that New England fisheries rapidly diminished what had seemed an infinite resource to early observers, forcing local

authorities to regulate access to local stock and fishermen to travel farther and farther offshore. Jason W. Moore suggests that the great boom in Dutch shipping came at the cost of exhausting Norwegian timber by the middle of the seventeenth century. John F. Richards has charted the overhunting of beavers, whales, and other species along commodity frontiers in the eighteenth and nineteenth centuries. Environmental histories of the periphery thus reveal the ecological costs of capital accumulation. They also show that cornucopian objects and spaces proved malleable and migratory. Tropical forests were cut down, virgin soils depleted, and valuable prey extirpated. When a particular resource was exhausted, the frontier moved elsewhere. The appearance of infinite riches in any particular locale was stable only within a limited temporal horizon. In this sense, we might speak of a universal logic of ephemeral and sequential cornucopia—projects of nature—repeated again and again in different locations and periods. Arguably, this logic still persists in the economic doctrine of indefinite substitution.¹²

IV

The mineral energy economy of industrial Britain opened up a new frontier underground. But there was a substantial lag between the eighteenth-century technical breakthroughs in steam technology and the intellectual recognition that these changes could revolutionize manufacturing productivity as well as transportation and trade. E. A. Wrigley believes that the process comprised “an almost imperceptible revolution to contemporaries.” Indeed, genuine confidence about the new industrial economy may not have become widespread until the Crystal Palace Exhibition of 1851. The concept of the “Industrial Revolution” came even later, with

Arnold Toynbee’s lectures of 1884. Yet though it is certainly true that the classical political economists remained deeply skeptical about the prospects of growth for a very long time, there was in fact another camp of projectors and boosters that recognized the dynamism of the new economy much earlier. Erasmus Darwin’s popular science poem of 1791 *Economy of Vegetation* celebrated the revolutionary potential of coal: “the Giant Power from earth’s remotest Caves.” The physician and inventor Darwin had close ties with the Birmingham manufacturing elite. He was, one might say, the first poet of industrialization, in the business of selling to the public a new world of steam and iron. This was the era of Thomas Telford’s cast-iron bridges as well as the first iron-framed building—the Ditherington flax mill in Shrewsbury (1796). But Darwin’s imagination pushed further, predicting that steam-driven ships, trains, and dirigibles would be invented within half a century. In *The Temple of Nature* (1803), Darwin suggested that science might transform Britain’s landscape with hydraulically engineered rivers and teeming cities filled with vast skyscrapers. Human ingenuity promised to create a new artificial world, forged out of the raw materials of the natural order, but built in man-made forms without precedent in nature.13

Darwin’s scientific romance articulated a new ideology of power for the manufacturing lobby in Britain. Another kind of poetry made the quantitative dimensions of the new economy known to the reading public. This was the work of the Scottish economist John Ramsay McCulloch. Best known today as the student of David Ricardo and the first professor of political economy at the University of London, McCulloch was one of the most widely read economic publicists in the period. Unlike Malthus and Ricardo, he made frequent use of statistical data to discuss the nation’s manufacturing output and trade. Such work helped make the productive capacity of industrial Britain visible to a broad readership. Yet his statistical representation of progress met with a fair share of skepticism. It is best perhaps understood as a polemical intervention in a bitter quarrel over the long-term prospects of growth.14


Mineral energy liberated the British economy from its traditional dependence on the organic produce of the land surface. But a growing number of observers worried that this revolution was reversible, since coal constituted a limited and consumptive stock of fuel. Paradoxically then, the beginnings of sustained economic growth provoked increasing concern about the finitude of extant reserves. Already in 1789, the mining engineer John Williams predicted that Britain would soon exhaust its coal fields. This alarming forecast was probably the fruit of Williams's experience as a surveyor in the Scottish Highlands. He had been appointed to discover coal on estates confiscated by the government after the Jacobite rebellion of 1745–46. After a futile odyssey spanning more than a decade, Williams concluded that the region was bereft of significant coal seams. The Highlands seemed destined never to develop a strong manufacturing sector. This notion of permanent limits to regional development led Williams to ponder the problem of coal stocks at the national level. What would happen to British industry if its resource base was exhausted? In *The Natural History of the Mineral Kingdom*, Williams reported worrisome signs of strain everywhere in the coal fields of Britain. Miners were reaching what he took to be the lower limits of extraction, at 120 fathoms. The frequent use of “fire engines” to clear water from deep mines was a sign of growing difficulties rather than a sign of progress. If the nation proceeded undaunted down the same path of heedless consumption, it risked absolute exhaustion. In some not too distant future, “the prosperity and glory of this flourishing and fortunate island” would come to “an end.” London and the other “great towns” of the kingdom must “then become ruinous heaps for want of fuel, and our mines and manufactories must fail from the same cause, and then consequently our commerce must vanish. In short, the commerce, wealth, importance, glory, and happiness of Great Britain will decay and gradually dwindle to nothing, in proportion as our coal and other mines fail.” Like an eighteenth-century Jared Diamond, Williams predicted the collapse of civilization when the coal was gone: “the future inhabitants of this island must live, like its first inhabitants, by fishing and hunting.” This forecast of peak coal in 1789 was especially remarkable for its precocious recognition of the centrality of mineral energy to the British economy. In contrast, Adam Smith’s famous account of the division of labor in *The Wealth of Nations* was essentially pre-industrial and blind to the true importance of mineral energy. For Williams, the nation’s dependence on coal made energy husbandry a question of national security: “If our coals really are not inexhaustible, the lavish consumpt of them calls aloud for the attention of the Legislature.” A reviewer in *The Scots Magazine* argued that only the Hanoverian state had the foresight and institutional stability to plan for the distant future: “private advantages cover that
important object of public interest with a veil, which, in less than a century, will be torn aside . . . when there will be no remedy.” Far-sighted statesmen were needed to overcome the myopic tendencies of the market.\(^\text{15}\)

During the following decades, economists and geologists on both sides of the political spectrum sought to quantify remaining stocks. At the end of the Regency, the controversy reached Parliament, which convened a committee on the coal trade and held expert hearings on the state of the coal mines. In July 1834, Liberals and Tories clashed over a reform proposal aimed at doing away with the tariffs on coal exports. The conservative leader Sir Robert Peel made the case for long-term coal fuel husbandry: “The Legislature was surely not to contemplate merely the present interest of the country—it was bound to look forward—to look forward even for a period of 400 or 500 years.” There was more than an echo here of Edmund Burke’s ideal of British history, which posited a deep organic community based on a shared sense of public good. But Peel projected Burke’s vision of intergenerational community into the future rather than the past. He continued: “in matters of legislation or of fiscal arrangement, the interests of the remote periods ought always to be considered, unless some immense immediate advantage was to be gained.”\(^\text{16}\)

McCulloch’s great output of statistical works from the 1820s onward was meant to settle the debate in favor of the cornucopian liberals. “There are no limits to the bounty of nature in manufactures,” he declared in his 1825 treatise *Principles of Political Economy*. The coal stocks of the nation were “inexhaustible.” In McCulloch’s 1837 *Statistical Account of the British Empire*, he calculated that the Newcastle mines would last many more decades and that the new fields in South Wales could supply all domestic needs “for 2,000 years after most of the other coalfields are exhausted.” As it happens, British coal production reached its peak


shortly before the outbreak of the First World War. McCulloch’s cornucopianism thus grossly underestimated the growth in coal consumption. Economic historians calculate that coal output rose more than twentyfold from 1700 to 1850. Between 1830 and 1850 it increased from 30 billion tons to 68 billion tons per annum. By 1880 it had doubled again to 147 billion tons, and at its peak in 1913, it stood at 287 billion tons. McCulloch’s cornucopian estimate of coal stock was undone by the sheer magnitude of growth in demand. In the end, his millennial time scale contracted to a mere century of growth followed by even more rapid decline.17

V

The ecological footprint of affluent societies grew prodigiously in the aftermath of the Second World War. Will Steffen, Paul Crutzen, and John McNeill have aptly termed this phenomenon the Great Acceleration. A number of vital indicators demonstrate unprecedented increases in material growth after 1950. The world population doubled from 3 to 6 billion in the second half of the nineteenth century, while economic activity rose fifteenfold and petroleum consumption grew by a factor of 3.5. More ominously, ecological and geophysical indicators show accelerating degradation in the environment. Carbon dioxide increased from 311 parts per million in 1950 to 369 parts per million in 2000.18

The Great Acceleration triggered conflicting responses, much like the earlier transformation wrought by the first Industrial Revolution. Among economists, a mood of self-conscious celebration prevailed, wholly unlike the tenor of economic analysis a hundred years earlier. The power of markets and technological innovation now seemed to guarantee unending growth in the long run. Harold Barnett, a staff member of the US Department of Interior, formulated a striking forecast of abundance in the 1948 report *Energy Uses and Supplies 1939, 1947, 1965*. Barnett here proposed that energy consumption was governed by a trend of increasing efficiency over time, so that less and less energy was needed per unit of production. Over the next decade, Barnett refined his views into a major contri-


bution to resource economics, the 1963 study *Scarcity and Growth: the Economics of Natural Resource Availability*, coauthored with Chandler Morse and sponsored by the Washington, DC, nonprofit Resources for the Future (in turn a creation of the Ford Foundation). Barnett and Morse invoked David Ricardo’s theory of differential rent and soil fertility as a weapon against Malthusian pessimists. For Ricardo, diminishing returns and scarcity were constantly felt forces, but their economic consequences were creative rather than catastrophic. Scarcity triggered expansion, innovation, and substitution instead of Malthusian misery. Resources should be defined “in terms of known technology” rather than “absolute limits.” Vermont granite had once served merely as a building material but now offered an astonishing new fuel, “each ton of which has a usable energy content (uranium) equal to 150 tons of coal.” In fact, technological change had become “self-reproductive in modern economies.” Human power over resources was now so far-reaching that it could reshape matter at the level of “atoms and molecules.” Natural inputs “should . . . be conceived as units of mass and energy, not acres and tons.” The same was true of fuel consumption. Nuclear fission marked a significant step toward a new world where energy would be “available in unlimited quantities.”

Barnett’s defense of second creation occurred in the midst of the first oil crisis. The winter of 1947–48 saw widespread shortage of domestic heating fuel in the United States. This was in great part a consequence of the Marshall Plan, which channeled Middle Eastern oil exports toward European reconstruction. In the long term, the crisis marked the beginning of US dependence on oil imports, but at the time, there was no clear sense of the volume of Middle Eastern reserves. Instead, many observers worried that the fuel crisis was a harbinger of permanent scarcity. Eugene Ayer at the American Petroleum Institute called for a switch to renewable forms of energy. At the same time, the conservationists Fairfield Osborn and William Vogt warned that current rates of economic growth were unsustainable. Resource exhaustion and environmental degradation were sure to follow if Americans continued to pursue material abundance. A number of scholars see this crisis of confidence in the immediate aftermath of the Second World War as the origin of modern environmentalism. Osborn warned in *Our

Plundered Planet of 1948 that the human species now was capable of destroying
the entire biosphere. A new idea of the “environment” undergirded Osborn’s
vision: the life supporting system of the planet was a fragile thing, threatened by
myopic habits of growth and consumption.20

This pattern of cornucopian hopes and environmentalist anxiety has surfaced
repeatedly over the course of the Great Acceleration. Neo-Malthusian ideas
gained widespread public attention with the works of Paul Erlich at the end of
the sixties and again with the report on the Limits to Growth commissioned by
the Club of Rome. But Erlich’s pessimism also provoked a far-reaching critique
of environmentalism in neoliberal circles. The popular writer Julian Simon em-
braced the term cornucopianism—previously a label of opprobrium—as a badge
of honor in his 1981 book The Ultimate Resource. For Simon, like Barnett before
him, human ingenuity was the real driver of economic development. But Si-
mon embraced a far more aggressive faith in the power of free markets to stim-
ulate advances in science and technology. More recently, neoliberal observers
have married this notion of market-driven knowledge to a faith in information
economies. The economic historian Joel Mokyr sees in “information technol-
ogy . . . the key to the future of technological creativity.” Paul Romer’s so-called
new growth theory postulates a property of “nonrivalry” for shared knowledge.
On this count, information sharing defies the principle of scarcity. Mokyr affirms
this tenet in his history of technology: “Ever faster and cheaper access to huge
stores of knowledge has shown little evidence so far of diminishing returns.”21

VI

Let me end by drawing these different threads together into a tentative sketch
of the historical origins and trajectory of cornucopian ideology. Instead of a single


21. Robertson, Malthusian Moment; Fabien Locher, “Les pâturages de la guerre froide: Garrett Hardin
et la Tragédie des communs,” Revue d’Histoire Moderne et Contemporaine 60, no. 1 (2013): 7–36; Julian Simon,
Simon and Our Gamble over Earth’s Future (New Haven, CT: Yale University Press, 2013); J. Eastlin, “The Two
“The Economics of Resources or the Resources of Economics,” American Economic Review 64, no. 2 (May
Princeton University Press, 2004), 113, 154; Paul Romer, “Endogenous Technological Change,” Journal of
technical or conceptual breakthrough, we appear to be dealing with overlapping visions of abundance and exploitation, shaped in great part by the promise of available technology and its environmental limits. The deepest roots of cornucopianism seem to lie in the realm of alchemy and natural theology. To overcome the effects of the Fall, Francis Bacon hoped to remake the natural order into a second, artificial world. Such theological and alchemical aspirations were intertwined with imperial ideology. The enormous reservoir of American resources gave concrete meaning to the dream of immanent abundance. Yet the environmental history of frontier expansion also underscores how malleable and temporary were these objects of growth. In particular, the question of good husbandry brought home the fundamentally limiting factor of soil fertility. But just as some observers began to worry that American land use was shortsighted, Britain’s Industrial Revolution opened up a new horizon for the cornucopian imagination. Coal liberated the economy from the conventional dependence on organic sources of energy, making possible a new kind of mineral cornucopianism, first announced in Erasmus Darwin’s vision of a new world forged by steam and iron. Though, here too, the finite nature of coal stock soon encouraged attempts to calculate long-term trends of supply and demand. In this way, the transition to the industrial economy simultaneously fostered expectations of abundance and fears of depletion.

These doubts about the long-term viability of fossil fuel civilization seem likely to intensify as our present crisis worsens. The human ambition to make a second world depends not just on energy abundance but also on the resilience of the life-supporting systems that make up the biosphere. Anthropogenic climate change is only one of several mounting global pressures. This is a problem of sinks as much as stocks. The ecosystems of the planet can no longer easily absorb the waste products of economic growth. Instead of discovering a permanent escape from natural limits, we appear to have opened up a Pandora’s box of unintended ecological consequences. Against the received wisdom of mainstream economics, we may not be able to grow our way out of this dilemma. Indeed, the consumption levels of the affluent countries can probably not be replicated by the rest of the planet’s population without dangerous pressures to the life supporting system of the biosphere. This apparent disjunction between

prosperity and equality seems to demonstrate the historically specific character of cornucopianism. Frontiers and fossil fuel stock appeared bountiful only because they were expropriated by a minority of the world population. Our ambition to make a second world has tempted us to forget that a finite biosphere cannot sustain exponential growth indefinitely. The bonanza of New World settlement and fossil fuel energy gave rise to this dream over the last few centuries. More recently, the discipline of modern economics has entrenched our complacency by systematically neglecting the ecological costs of growth. We can no longer afford the luxury of such ignorance.  