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MALTHUS AND DARWIN: The Population Boon

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Theme: History

As U.S. troops were massing in England for the Normandy invasion, the U.S. Congress engaged in a heated debate about how to avert mass unemployment when millions of servicemen came home at war's end. Their concern followed precedent. Only a dozen years earlier, at the nadir of the Great Depression, World War I veterans had converged on Washington to demand early disbursement of congressionally mandated payments. The result was an ugly confrontation between the "Bonus Marchers" and U.S. Army units led by none other than the chief of staff, General Douglas MacArthur. Wishing to avoid a repetition of this disturbing scenario, Congress enacted the GI Bill, signed into law by President Roosevelt on June 22, 1944.

The GI Bill was a momentous piece of legislation, credited ever since its passage with creating opportunities for an entire generation. That it certainly did. But that success was largely an unanticipated by-product of a more pressing concern that never materialized. Returning veterans accepted the government's offer of free college tuition and zero-interest home mortgages in numbers far exceeding congressional projections. But the government's estimates pertaining to the unemployment benefits available to returning veterans turned out to be dramatically exaggerated: Only 20 percent were claimed.

This far better-than-expected outcome did not end concern over the potential for large-scale unemployment and impoverishment as two new putative sources of these problems soon came to the fore: The first was automation, and the second was global overpopulation.

Almost exactly four years after V-J Day, on August 13, 1949, an MIT professor named Norbert Wiener wrote a letter to Walter Reuther, president of the United Auto Workers (UAW), containing a darkly prophetic message. Within a decade or two, Wiener warned, the advent of automatic automobile assembly lines would result in "disastrous" unemployment. The power of computers to control machines made such an outcome all but inevitable. As a creator of this new technology, Wiener wanted to give Reuther advance notice so that the UAW could help its members prepare for and adapt to the massive displacement of labor looming on the horizon.

Now, if anyone in 1949 grasped the disruptive potential of computing machines, it was Norbert Wiener. A prodigy who earned his Ph.D. from Harvard in mathematical philosophy at age 18, he had contributed to the development of the first modern computer, created the first automated machine and laid the groundwork for a new interdisciplinary science of information and communication that he termed "cybernetics." His work anticipated and inspired Marshall McLuhan's heralded studies of mass media, provided the initial impetus for the explorations by James Watson and Francis Crick that led to the discovery of the double

helix, and spurred science-fiction writer William Gibson to coin the term “cyberspace” to describe a type of virtual world that Wiener himself had envisioned two decades before the creation of the first web page.

Reuther took Wiener’s letter seriously, responding promptly by telegram: “Deeply interested in your letter. Would like to discuss it with you at earliest opportunity following conclusion of our current negotiations with Ford Motor Company. Will you be able to come to Detroit?” When the two met in March 1950, they pledged to work together to create a labor-science council to anticipate and prepare for major technological changes affecting workers.

At about the same time Reuther and Weiner were meeting, a brain trust was gathering in the orbit of John D. Rockefeller III to address another problem: global overpopulation. The basic concern of this group was both old and simple: Human populations keep growing, but the planet isn’t getting bigger, so sooner or later disaster will be upon us. Funding from the Rockefeller Brothers Fund permitted the creation of the Population Council in 1952. John D. Rockefeller III appointed Frederick Osborn to be the Council’s first president.

The work of the Population Council took its cue from the famed 1798 masterwork by Reverend Thomas Robert Malthus: *An Essay on the Principle of Population.* “The power of population is indefinitely greater than the power in the earth to produce subsistence for man”, Malthus wrote. This slim volume has become one of the most celebrated works of political economy ever published, a distinction made a bit surprising by the fact that it was published at pretty much exactly the time when history began to prove its core thesis incorrect. Starting not long after *An Essay on the Principle of Population* appeared in print, global population levels and per capita income began a long and steady ascent—in tandem. Yet we have only recently begun to note the strong correlation between population growth and increased prosperity. For most of the past two centuries Malthusian fears of demographic doom have obscured the increasingly evident fact of a global demographic dividend.

In 1893, almost a century after the publication of Malthus’ book, Henry Adams (grandson of John Quincy Adams) proclaimed that “two more generations should saturate the world with population and should exhaust the mines.” At about that time, a new intellectual movement took shape that combined Malthusian fears with social Darwinism. Its proponents dubbed it “eugenics.” For the first half of the 20th century the eugenics movement flourished in the United Kingdom and the United States; the result was an intellectual architecture that provided justification for some of the most abhorrent acts that humans have perpetrated upon other humans—the Holocaust being primary among them.

The Nazi embrace of eugenics largely (though not entirely) put an end to its appeal in the United Kingdom and the United States following World War II, but core concerns about the proliferation of people in poor places found new expression in the global population control programs that came into being in the 1950s and 1960s, including ones funded by the Population Council. Frederick Osborn himself had been a founding member of the American Eugenics Society, and was the author of a 1940 book titled *Preface to Eugenics.* Another protagonist of the postwar population control movement was General William Henry Draper, Jr.—military leader, diplomat, and venture capital pioneer—who coined the phrase “population bomb” to refer to the dim prospects for humanity (in particular, cream-skinned humanity) in the face of a globally increasing population. The phrase lived on in the title of a hugely influential 1968 book by Paul and Ann Ehrlich, as well as several subsequent publications, most recently a spring 2010 cover essay in *Foreign Affairs* titled “The New

Population Bomb."

So what actually happened over the past two centuries since Malthus penned his famous treatise, or in the sixty years since Reuther and Wiener met to discuss the danger of mass technological unemployment?

With regard to the threat of global overpopulation, the facts are as I briefly summarized them above: Growth in population is minimal until the start of the 18th century, at which point a steady increase begins. Population really starts to take off, though, after World War II. In the second half of the 20th century, global population more than doubles, from roughly 2.5 billion in 1950 to almost 6 billion in 2000. And the data show that, in material terms at least, individual well-being (as measured by global per capita income) takes off at exactly the same time as population.1

This doesn't necessarily mean that the observed increase in population directly caused the observed increase in per capita income; nor does it mean the reverse, for that matter. It just means that the two processes—increasing population and increasing wealth on a global scale—have been strongly correlated over the past two millennia.

Why has Malthus so far turned out to be wrong? First and foremost, there is the global historical regularity known as the "demographic transition." If the meaning of words were more connected to the sound they produce, this technical-sounding term would rhyme with "We're saved!" It simply means that as people get richer, they tend to have fewer children. This effect is so powerful that the fertility rate in Hong Kong today is lower today than it is in the rest of China, despite the fact that residents in relatively wealthy Hong Kong are the only ones in China excluded from that PRC's draconian one-child policy. The same has been true pretty much everywhere else in the world. The result: The population bomb turns out to be a dud.2

An insightful paper written in the early 1990s by a Harvard economics graduate student named Michael Kremer helps us understand why we should not be surprised to observe today that humanity has experienced a "population boon" over the centuries, rather than a bomb.3 When Kremer wrote this paper, the most accomplished theorists in the economics profession were busy trying to fix an inconsistency between newly fashionable models of economic growth and a particular feature of economic reality at the time. The issue was this: The improved approach to studying economic growth that was then making the rounds predicted that large countries should grow more rapidly than small countries, because they have more people to invent stuff. Back in the early 1990s, the world's most populous countries, China and India, were not growing more quickly, but more slowly, than other countries, and they had been doing so for some time. That fact threw sand in the gears of this particular theory.

Kremer's approach to this puzzle was to situate the facts of the late 20th century in a longer historical time frame—much longer. By considering the growth of human populations since more or less the beginning of time as it relates to human society, Kremer was able to look anew at the prediction that large populations actually drive economic growth. What he found was that the slow growth of large countries such as China and India was actually an historical aberration and thus not negative evidence for the theory as such.

Over the very long term, the evidence supports the claim that the creativity of individuals

powers human productivity and the improvements in societal well-being that follow. More people imply a likelihood of more ideas; more ideas, in turn, imply more of the great ideas that ultimately propel human societies toward increased prosperity.

In the two decades following Kremer's more-or-less solitary stand in defense of scale effects, his position was vindicated in dramatic style as the world's two most populous countries, China and India, transformed themselves from basket cases to growth engines. Kremer believed that the likelihood of great invention is pretty much a constant in all cultures, through all periods of time, and this assumption seems to fit the data on the long-term evolution of human society pretty well.

As humanity is increasingly liberated from the daily struggle for survival that was the norm for all millennia prior to the 18th century, its potential for economic growth through structured social creativity goes up. Reduced to its quantitative basics, the story of improvements in human well-being over the period of millennia is the classic S-shaped adoption curve familiar to anyone who has studied the diffusion of technology. The only difference in this case is that it's not a transistor radio or a mobile phone being adopted but the state of being liberated from a subsistence existence, with the cognitive freedom that entails. As Bob Litan of the Kauffman Foundation put it, the generations alive today are living on the "S" of human history: the steepest part of the slope of human progress.

Just a few decades ago, the average person in the developing world (or Appalachia) was more likely to see his or her child die from diarrhea than to make a phone call or turn on an electric light at home. On a global scale, prosperity was as much a function of the accident of birth as it was of ability or effort. The result was a persistent rift, not between rich and poor countries, but between a global majority destined for a highly localized and materially impoverished existence, and a global minority blessed with the resources and freedom to travel without restriction in search of the best in education, career opportunities and living environment. The result was, and still is today, a world sharply divided between the globally rich and the locally poor.

Yet after four centuries of sustained advances in science, innovation and the organization of society, the frontier of technology is finally reaching the heart of the human community. Never before have so many people had such great opportunities to connect, create, contribute, and collaborate—along the way, producing value for society and for themselves.

The consequence? Predictions of demographic disaster, consistently pushed back for the two centuries since Malthus, are finally reaching their expiry date. A combination of entrepreneurship, technological innovation and broad societal transformation are giving even children born in the most persistently poor places a chance to benefit from and contribute to the vitality of global markets and communities of collaborative action.

What about the pernicious effects of automation? If growing populations don't doom societies, won't the substitution of machine labor for human labor do the same? No, Norbert Wiener's prediction of calamitous post-World War II unemployment did not come to pass. As partial explanation we can cite the brilliant 1965 book by Herbert A. Simon, in which he argued technological innovation invariably produces more and better jobs, not employment crises; at least up to that point in time, he found that general educational levels posed no barrier to the continuation of the process.4 And, looking back further, we can easily mock the anti-technological fanaticism of the early 19th-century Luddites, or recall Frédéric Bastiat's 1845 open letter to the French Parliament in which he lampooned protectionism

put forward as a means to protect employment.5 But just because Simon and Bastiat were right in their day does not mean that they are right in ours, especially as regards the ability of discrete national education systems to keep up with the accelerating demands of the postmodern job market.

Indeed, sixty years after Wiener wrote to Reuther, his darker visions have in some sense been borne out. Robots do now perform much of the production-line work in auto factories that UAW members once did. Employment in the auto industry is also now far below the peak levels reached in 1995. More broadly, the manufacturing workforce in the United States has atrophied—from 35 percent of non-farm employment in 1960 to 10 percent today. This was primarily due not, as is widely believed, to "offshoring" to China and other parts of the world, but rather to automation-driven increases in manufacturing productivity. (Evidence: Between 1995 and 2002, the United States lost two million manufacturing jobs; China during the same time period lost *15 million*.)6

In a twist that even Wiener did not anticipate, the world of cyberspace that he was among the first to imagine has forced workplace transformations far from the factory floor—ones more rapid and more extensive than any caused by the advent of automated production. Phenomena as distinct and seemingly disconnected as the outsourcing of back-office functions by large corporations, the collapse of the newspaper industry, and the recent proliferation of options for online education are all manifestations of the fundamental trends Wiener identified decades ago. First journalists and accountants, then X-ray technicians, artists and photographers, among many others, have undergone the disconcerting experience of watching old market structures that previously would have guaranteed lifelong livelihoods crumble before their eyes. The jury is still out on whether we can keep running faster, creating more new jobs than the forces of creative destruction can destroy old ones, even as world population pressures may strain a finite resource base.

Yet there is ample reason to anticipate a good outcome here as well. Today, new technologies of communication and collaboration are enabling not just lone innovators but entire populations to connect and create at a scale previously unimaginable. Not only do we have more people, which is good; we have more well-connected people both within and among societies, which is even better.

Think what you will about the fall 2011 "Occupy Wall Street" protests, but they are not comparable to the Luddites of the early 1800s who smashed mechanized looms to protest the transformations brought about by the Industrial Revolution. David Graber, a contributor to the thinking behind the Occupy Wall Street protests, put it this way: "One of the most abundant resources on earth is smart, creative, imaginative people. And yet 99.9% of the power of the human race is not being marshaled right now. . . . All we need to do is open that spigot a little bit and we could come up with endless ways to create and produce and distribute."

In this generation as in generations past, people deprived of ways to realize their productive potential do become frustrated in a hurry. Graber and those who share his particular variety of dissatisfaction acknowledge, just as Wiener did before them, that putting the genie of technological change back into the bottle is neither possible nor desirable. Rather, the interesting question—in fact, the only question—for people in the United States as elsewhere is ultimately this: How do we direct the inexorable movement of technology to enhance, rather than obstruct, the ability of people everywhere to realize their productive potential?

To suggest an answer, let's go back to where we began, to the expected economic calamities following World War II that never took place. Back then, the United States underwent the most dramatic and sustained period of economic expansion that any nation had so far experienced, even as its population boomed.

What caused that economic expansion? Too often the post-World War II boom in the United States is attributed entirely to the work ethic and ingenuity of the Greatest Generation, or other characteristics of America itself. Certainly, the can-do spirit of millions of veterans returning to the workforce from the frontlines played a role, as did the need to satisfy long pent-up domestic demand. But America's ascent to global dominance was eased considerably by the fact that every other major center of production in the world was either obliterated or incapacitated by the war—the most devastating conflict in human history.

The advantage that the United States suddenly held over the rest of the world in terms of physical capital was substantially bolstered by an epochal influx of top talent from every part of the planet—a massive human capital transfer that continues to pay dividends even today. This positive insurgency of ability was a key factor in building the global competitive advantage that the United States enjoyed for two generations as immigrant and home-grown talent combined with massive investments by government to turn American universities and corporations into awe-inspiring engines of innovation.7

Daniel Chee Tsui, born in a farming village in Henan Province in 1939, came to the United States in 1958 to attend Augustana College in Rock Island, Illinois, where he was the school's only student of Chinese descent. He continued his studies at the University of Chicago, ultimately making fundamental discoveries relating to semiconductors, for which he was awarded the 1998 Nobel Prize in Physics. Vinod Khosla, famed entrepreneur and venture capitalist, came to the United States in 1979 at age twenty after failing at his first entrepreneurial venture—a soy-milk company whose intended market was the many people in India without a refrigerator. He went on to found Sun Microsystems and become a partner in the legendary venture capital firm Kleiner Perkins Caufield & Byers. (Entrepreneur-turned-academic Vivek Wadhwa—himself an immigrant to the United States—has documented that 52 percent of the founders of Silicon Valley's start-ups were foreign-born.)

These are specific examples, but they are not isolated ones. Many more like them (did I mention Albert Einstein?) came to the United States during the 45-year interval following World War II when educational and business opportunities in America exceeded those anywhere else in the world. But the era when we in the United States could assume top talent would flock to our shores is drawing rapidly to a close—a fact that has little to do with the United States, and a whole lot to do with everywhere else.

Every time the light of opportunity has started to shine anew somewhere in the world, the beacon drawing immigrants to the United States has shone, in relative terms, somewhat less brightly. Countries that in previous centuries were dominating economic and political powers—China, India and Turkey notable among them—are surging forward, regaining some of the ground they lost during eras of conflict or colonization.

Will the gains made elsewhere in the world come at the expense of the United States, Europe and Japan? The answer is an emphatic "that depends." If we ignore the reasons for and sources of the coming prosperity—or, if we go even further and cut ourselves off from the major trends driving global history in our lifetimes—then the citizens of currently rich countries will become poorer. But the real poverty we experience will be that of imagination,

not of circumstance.

Americans cannot “Win the Future” by re-winning the past. Bringing routinized factory jobs back is a “win the past” strategy, because most of those jobs never really went overseas to begin with—they went to machines. Responding to competitive threats from overseas by investing narrowly in science, technology, engineering and mathematics (STEM) education is also a “win the past” strategy because 21st-century innovation is deeply integrative and interdisciplinary. It incorporates design and an understanding of human behavior in at least equal measure with core STEM fields—and also (importantly, a hard fact) because real innovation leadership in the 21st century can only come if America continues to draw the best talent from around the world, regardless of how well we develop talent at home. Shutting our borders to immigrant talent doesn’t even qualify as a “win the past” strategy, since it’s an approach that never created prosperity, and never will.

So what constitutes a genuine “win the future” strategy? Simple: Since we can’t beat global prosperity, let’s join it. To do so we need to repurpose our institutions to make the most of the abundant opportunities that exist in the global age of entrepreneurship. As individuals and as a nation, we need to be relentless in finding new ways to connect, create, contribute and collaborate with those building value for themselves and their communities elsewhere in the world.

At every stage of institutional repurposing, incumbent interests will resist. Such is the nature and function of incumbent power. Too abstract? Think about what happens in the United States anytime momentum builds to change the status quo in health care, energy, education or finance. Can you picture the ads? Do they look like reasoned public discourse or frantic pushback by threatened incumbents? Q.E.D.

That can’t stop us. Ours is an era of enormous, indeed unprecedented, potential. Human well-being—the fundamental combination of capacities and opportunities that bounds each person’s experience of life—will likely grow more over the next quarter century than it has at any other time in human history. In comparison with the magnitude of these changes, the political discourse in the United States isn’t just polarized—it is positively, and unacceptably, Lilliputian.

We’re not alone in that respect. In every corner of the world, from Abu Dhabi to Zurich, just as in Washington and Wall Street, yesterday’s power-brokers can be counted on to paint opportunity as threat and dig in their heels against change. As a consequence, the work of making the most of a growing humanity’s moment will fall to those hundreds, thousands or millions of entrepreneurs and innovators who dedicate themselves to discovering pathways to progress in the decade to come, just as others did in decades past.

Notes

1The usefulness of per capita income as an indicator of human well-being is a subject of longstanding debate; on the macroeconomic level, the discussion extends to Gross Domestic Product (GDP). While a summary of this debate would require multiple dissertations (not a footnote), it is safe to say that for levels of income below roughly $10,000, per capita income is a fairly good proxy for well-being. For more on this topic, see the report of the Commission on the Measurement of Economic Performance and Social Progress, convened by the President of France and co-chaired by Joseph Stiglitz and Amartya Sen.

2For a further development of this concept, see Duncan Foley, “Stabilization of Human Population through Economic Increasing Returns”, *Economic Letters* (September 2000).

3Kremer, “Population Growth and Technical Change, One Million B.C. to 1990”, *Quarterly Journal of Economics* (August 1993).

4Simon, *The Shape of Automation for Men and Management* (Harper & Row, 1965).

5The latter bears the extensive title “A petition from the manufacturers of candles, tapers, lanterns, sticks, street lamps, snuffers, and extinguishers, and from producers of tallow, oil, resin, alcohol, and generally of everything connected with lighting.”

6See Daniel Ikenson, “Manufacturing Discord Growing Tensions Threaten the U.S.-China Economic Relationship”, Cato Institute Center for Trade Policy Studies, Working Paper no. 29, May 4, 2010. Thanks to Brink Lindsey for bringing these facts to my attention.

7A data point to evidence this dominance: In the early 1960s, the United States Department of Defense accounted for one third of all research and development expenditures in the world.

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