

Technology, Society, and Culture in the 21st Century

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There are both similarities and differences between the International Revolution of the 19th century and the post-1989 Information Technology Revolution. (An excellent study of the history and ramifications of the latter is *The Internet Galaxy: Reflections on the Internet, Business, and Society*, by Manuel Castells.) The Industrial Revolution occurred within a number of conceptual arenas—geographical, technological, economic, cultural, political, social, and geopolitical—with the social conceptualization, in which the literature on technology is located within a point of view, being of particular interest. Three trends can be observed in society's approach to technology: 1) an optimistic approach (embodied in much popular literature): "Everything that happens in the technological sphere is good"; 2) a negative approach: "Technology increases alienation in society"; and 3) a middle approach: "Technology in itself is neither good nor bad; it depends on what you do with it" (Dr. Holub's approach).

There is a tendency to say that the Industrial Revolution "had to happen in Europe"; but it is actually a global story, and there is a need to relate the transatlantic story to the global story. In this connection, the work of Janet Abu-Lughod and Andre Gunter Frank posits a *world system*, in which the transatlantic world develops along with, and in relation to, the rest of the world. The following synoptic examination of the chronology of the Industrial Revolution illustrates its global nature.

The first three dates cited by Holub were 1910, when London was the world's financial center and a hub of global trade; 1848, when commercial transportation, previously accomplished by wooden sailing ships, was transformed by electricity and the steam engine into a much faster and more widespread enterprise; and the present, in which the European Union could be viewed as an agglomeration of *economic regions*, rather than countries. Returning to the period around the start of the 20th century, the aspects of life in the West transformed in the wake of the Industrial Revolution included the organization of factories (electricity enabling non-stop toil); architecture; systems of transportation and communication; the urbanization process; the cultural organization of mass societies; and what might be termed "ideological" organization—for example, the notion that profit is a good thing, and that in a society whose wealth depends on industrial, rather than agricultural, labor, coordinated discipline (i.e., a labor force willing to get up and go to work at the same time every morning) is mandatory.

In 1910 capitalism was thriving in Europe. Prevailing economic analysis has it that productivity is a factor of labor, resources, and capital. Social legislation in Europe had smoothed the way to

an efficacious relationship between government and labor force, while a multitude of large capitalists ensured adequate capital; but resources were critically limited. That capitalism in the region flourished nonetheless compels examination of European efforts to obtain access to resources outside their home continent. Egypt, Holub observed, has been a key location from antiquity to this day; an ancient trade route ran from Alexandria down the Nile to Cairo, over to the Gulf of Suez, and then around the Arabian peninsula to India and Asia. Egypt was already part of the British sphere of influence, and both France and Holland had African possessions, when the leaders of Europe assembled in Berlin to “cut up” Africa in 1880; but much of Africa still lay in the hands of Africans. By 1910, Africa was almost wholly under Belgian, Ottoman, Portuguese, French, English, Dutch, Italian, German, or Spanish control. Meanwhile, these same groups (minus the Belgians, Ottomans, and Spanish) were appropriating huge portions of Asia, in the ongoing European crusade to acquire the resource base necessary to capitalist growth.

Coinciding with, and stimulated by, early 20th-century productivity growth were parallel developments in communications and transportation; emergent technologies included telephony, radio, automobility, aviation, and tanks. The enormous impact of automobility on the social experience, particularly in America, has been much noted. Telephony, too, proved transformative: for one thing, a number of key positions were consigned exclusively to females, who had to be young, white, and unmarried; this situation, whatever its repressive constraints, enabled women—who had been active members of the workforce since the dawn of labor—to go out and get their own paychecks for the first time.

Another global aspect to the development of industrial technology in the early 20th century was the enormous influence of two world wars, whose oil contracts and materiel requirements provided both funding and urgent, specific scientific challenges to be met. Car factories were rapidly transformed into weapons factories and tank producers (interestingly, Ford proved an unwilling player in the latter activity, although he eventually responded to “persuasion”). Pilots had to be trained for World War I and places found for them between, or after, wars, first in mail delivery and later with commercial air lines. An intriguing side-story was that in only two places were civilian populations bombed during World War I; those places, bombed by the British in what Holub believes was an attempt to assess the feasibility of killing people from the sky, were Iraq and Afghanistan.

The post–World War II period saw the rise of television and communications technologies—in 2012, information technology’s largest producer of wealth. Holub posited 1989 as a notional turning point in communications technology; it is a somewhat arbitrary date which nonetheless corresponds with the end of the Cold War, the reunification of Germany, and significant advances in the computer industry.

Audience Member: 1989 is a good date, actually, because that’s when the decision was made to demilitarize the Internet, since, with the demise of the Cold War, its military function was no longer needed. The Internet was developed to communicate war information . . . but now that the war was over, what should be done with it? Make money!

Renate Holub: Social theorists examining social technology began to discuss “informational capitalism”; industrial capitalism continued, but informational capitalism was increasingly

important to profit. Its ascendancy changed production and distribution patterns completely. In contrast to the stationary nature of industry (e.g., the automotive industry's firm association with the city of Detroit), information technology is developed and distributed *wherever it's cheapest*. (The power remains centralized.) So, to harken back to the similarities and differences between the Industrial Revolution and 2012, Egypt is *still* important: Africa is wired for optical fiber submarine systems to pass through Suez. Production and distribution may be global, and there may be some information transfer via satellite, but geopolitical strategies are still in play; the concept of profitability is still in play. But now when economists discuss productivity growth, the terms "labor," "resources," and "capital" have been replaced by the variable *E*, which encompasses an array of quantities: 1) informational technological organization of production, since global scale of production requires huge organization; 2) IT commodities (robotics, software, data, hardware); 3) the legal dimension—very much new terrain, lacking applicable precedents; and 4) high-level human capital. This last element has required countries wishing to compete in the IT sphere to overhaul their educational facilities in order to facilitate the training of brain power capable of maintaining their productivity. There are many "Silicon Valleys" in the world, usually in the neighborhood of universities, whether in Siberia or Africa. Usage takes place all around the world; but production is tied to a high-level, highly trained workforce.

For Castells, "informationalism" implies an understanding that high wealth production is related to high human brain power, a formulation embraced by such nations as Brazil, Russia, India, China, and South Africa. As Carly Fiorina is said to have declaimed to the American public, "What are you whining about? China is producing more Ph.D.s in one year than you do in thirty." The ideology of capitalism always has been and remains, "*Profit! Profit! Profit!*" Profit used to be tied to industrial production (a result of the Industrial Revolution); it now derives chiefly from information technology. So there's the similarity between the two revolutions that economic profit remains the key player in the capitalist story, and the difference between them lying in the shift in sectors entrusted with the generation of that profit.

Asked why *E* isn't under "Resources" in her schema, Holub responded that it's not just a resource. Old resources such as coal are still important in Nigeria, and Africa, because certain minerals are needed for iPhones; not to mention [the resource issues involved with] Iraq. But brain power, always important, is now a highly complex commodity and cannot be produced all over, which is a problem [given a weak educational infrastructure] in Africa. She referred to Manuel Castells's beamed computer courses for educationally deprived regions.

The theory of informationalism also impacted theories of development: most theorists of development after World War II said that if developed countries wanted to develop they would have to do it via industrial production, as we did. But with informational technology, the so-called Third, or Developing, World might be able to jump some stages, because it's not access to, but actual independent *production* of, informational technology that matters. So the Developing World need not necessarily adopt the model of the Transatlantic world, but can jump, rethink, some of it, perhaps incorporating a new consciousness of global warming, climate change, food security/insecurity, food justice/injustice, water justice/injustice, crises in global leadership, and economic and environmental crises arising because the preceding issues had not been addressed.

Asked about her prognosis for 2050, Dr. Holub said that with the crises on campus since 2001—those of finance, those of cops beating up students—it had been impossible for her to focus on that. She asks her students [about the future], because they seem to have more perspective. Another question dealt with the comparatively greater ability of European educational institutions to prepare people for trade: were they in fact less focused on people going to university? Dr. Holub said that while the U.S. met the huge crisis in capitalism that began in the mid-1970s with denial, Scandinavia, Italy, Spain, Greece, and her own country were much older, its people more resilient: they have lost everything. “My family lost everything twice,” she said. “There is no ‘European Dream’.” In the 1980s, mid-70s, during the shrinking of the economy, her female students would say to her, “I would like to be nurse,” to which she, as a veteran feminist, would respond, “Why not a doctor?” “It’s too much work,” the student would respond. “All I need is a small apartment, ’cause I might be leaving tomorrow.” Not everyone has to have a university degree—you can live a good life without one. Of course you have huge unemployment in Southern Europe. . . .