

Basalla 1988:Chap.7

[material in square brackets added by Dr. Roe]

Darwin, [the author of one half of the theory of evolution (natural selection acting upon preëxistent variability in life forms); he was unaware of the Moravian monk Gregor Mendel's work on genes (because the latter did not publish widely), which would have given him the other half of the modern theory of evolution, the reason for the variation itself=genetic recombination & mutation] "...never considered applying his evolutionary theory to technology" (Basalla 1988:207) [nor to human society, for that matter, which is why others who did are called "Social Darwinists"]. He published his monumental Origin of Species in 1859.

Karl Marx="...a number of Darwin's contemporaries readily drew analogies between the development of living beings and material artifacts. The earliest, and perhaps the most famous, nineteenth-century figure to do so was Karl Marx, who published his Das Capital in 1867. "Marx's evolutionary analogy includes two stages [all of these explanations were "stage" models, usually progressing in the same sequence that archaeologists were discovering for Europe, hence "unilineal," or "one-line," something that will prove fatal for Marxism in the non-Western world.]

- 1.) In the first stage technology engages humanity in a direct, active relationship with nature. Men and women use their labor to shape physical reality, thus creating the artifactual realm. Once the natural world is transformed by work, nature becomes a virtual extension of the human body. Thus, men and women working with natural objects and forces bring nature within the sphere of human life. [This]... minimized the differences between the made and the living worlds"

(Basalla 1988:207). [The central cultural metaphor for Marx, as a Westerner, was nature as a "mine," to be dug-out ("mined") and exhausted by humans for their own benefit. Labor took the place of God for "giving" the bounty of nature to humans].

- 2.) Marx "...suggests that the Darwinian approach to the 'history of Nature's Technology' [the productive organs of plants, animals & humans as a product of natural selection]...evolutionary explanations should be applied to...the technological means that humans use to sustain life."

Differences between Darwinian & Marxist thought:"

In Darwin's theory biological evolution was self-generating; in the Marxian scheme the evolution of technology is not self-generating but is a process directed by willful, conscious, active people and molded by historical forces" (Basalla 1988:207-208). [but Marx never pursued the evolution of tech.]

Diversity

"The concept of diversity, which stands at the beginning of evolutionary thinking, is basic to an understanding of technological evolution" (Basalla 1988:208).

Technical Diversity=Production of the Superfluous

The Spanish social philosopher, José Ortega y Gasset (1933) declares "...that technology was the production of the superfluous."

Absolute Necessity is not a Reason for Technology

[Basalla is against the old saw, "Necessity is the Mother of Invention"]. "Artifacts are uniquely identified with humanity, -indeed they are a distinguishing characteristic of human life; nevertheless, we can survive without them...Fire, the stone axe, or the wheel are no more items of absolute necessity than are the trivial gadgets that gain popularity for a season and quickly disappear. Biological necessity is not the reason that so much thought and energy are expended on the making of novel artifacts [but he does not explain why; I suggest that the "play impulse" is that mechanism]...The history of technology is not a record of the artifacts fashioned in order to ensure our survival. Instead, it is a testimony to the fertility of the contriving [note he does not say "playful," perhaps because he is also a product of our culture, one that labels play as just childish activity of only entertainment value, not a powerful "search mechanism" for generating the superfluidity of artifacts which is then culturally-selected].

Play & Fantasy

[but, he does say...] "The importance of play and fantasy in the creation of technological innovation has been stressed here because their significance has been overlooked by scholars who believe necessity is the sole spur to invention" (Basalla 1988:209).

[Military Competition is "Absolute necessity"]

[Perhaps in theory, humans could exist without tech., but only as an isolated single band of humans. Basalla ignores the best case for necessity, human social

competition & no single human "technoless" society could survive for long in contact with another armed with technology. This may not have meant open warfare, especially at the beginning when human population densities were small and thinly spread, but it could have been expressed even then equally effectively in "agonistic" displays of threats that would have spaced and competitively-excluded less technically-precocious societies].

Economic Explanations Aren't Sufficient

"The supporting scholarship for the economic interpretation of innovation is notable for the amount of data it has amassed and the ingenious reasoning it has advanced. Yet, in the final analysis, the arguments put forth on behalf of the economic interpretation are unconvincing, and we are obliged to seek out those cultural factors that fuel the drive for novelty" (Basalla 1988:209-210).

Technological Continuity

"If artifactual diversity is to be explained by a theory of technological evolution, then we must be able to demonstrate that continuity exists between artifacts, that each kind of made thing is not unique but is related to what has been made before...The prevalence of artifactual continuity has been obscured by the myth of the heroic inventive genius, by nationalistic pride, by the patent system, and by the tendency to equate technological change with social, scientific, and economic revolutions. However, once we actively search for continuity, it becomes apparent that every novel artifact has an antecedent... Whenever we encounter an artifact, no matter what its age or provenance, we can be certain that it was modeled on one or more pre-existing artifacts" (Basalla 1988:208-209).

Progress dates to the Renaissance & has 6 assumptions:

- 1.) "First, technological innovation invariably brings about a marked improvement in the artifact undergoing change."
- 2.) "second, advancements in technology directly contribute to the betterment of our material, social, cultural, and spiritual lives, thereby accelerating the growth of civilization."
- 3.) "third, the progress made in technology, and hence in civilization, can be unambiguously gauged by reference to speed, efficiency, power, or some other quantitative measure."

- 4.) "fourth, the origins, direction, and influence of technological change are under complete human control."
- 5.) "fifth, technology has conquered nature and forced it to serve human goals, and"
- 6.) "sixth, technology and civilization reached their highest forms in the Western industrialized nations" (Basalla 1988:211).

Opposition to the Idea of Progress

"...appeared as early as the seventeenth century, but not until the mid-twentieth century did all six assumptions come under strong critical attack on a variety of issues" due to the heavy casualties of the 2 World Wars, the threatening advent of the Nuclear Age posing a threat to all life on earth as well as the looming ecological disasters. "Finally, the long-held belief in the inherent superiority of Western technology was challenged by those who cogently argued that some non-Western technologies better served human needs without disrupting the natural world" [as much] (Basalla 1988:211).

The Quantitative Response

"As proponents of progress found it increasingly difficult to present the control of nature or the betterment of human life as the goal of technological advance, they redoubled their efforts to use physical quantities as indicators of technological progress" [i.e., we move faster, communicate better, heal better, learn more, etc.] (Basalla 1988: 211).

Numbers mean Nothing Cross-Culturally (in Time or Space)

Yes, rates of anything, say travel speed, have gone up & were one to place an ancient sledge being hauled at 2 mph with a modern car going 60 mph on the same highway, there would be no doubt as to the "progress" of velocity. But would there? As the British prehistorian V. Gordon Childe said, "Did a reindeer hunter in 30,000 B.C., or an Ancient Egyptian in 3000 [B.C.]...really need or want to travel a couple of hundred miles at 60 mph?" (Basalla 1988:212).

"...TECHNOLOGY..MUST BE EVALUATED IN TERMS OF THE CULTURES IN WHICH THEY WERE CONCEIVED AND USED. CROSS-CULTURAL COMPARISONS, OR THOSE MADE WITHIN A GIVEN CULTURE OVER EXTENDED PERIODS OF TIME [FOR THE PAST OF EVEN ONE'S OWN CULTURE WAS, IN FACT, A DIFFERENT CULTURE], ARE VERY POOR

SOURCES OF DATA...FOR ESTABLISHING THE ADVANCEMENT OF TECHNOLOGY" (Basalla1988:212).

Total Cost Involved is rarely Calculated [just end-products, not process]

If one compares Mexican slash-and-burn horticulture with a modern North American farmer, "the yield of corn by weight is 2.8 times greater on the American farm" but if one factors in the cost of the corn in terms of energy input/output the scales are reversed! With his modern gasoline-powered tractor, the necessity of buying monocrop hybrids & the pesticide, fertilizer & water needed to grow them the North American farmer has a ratio of 3:1 whereas the Mexican, using just human & animal labor & local seed corn, yields 11:1 returns! What is progress, yields or cost (sustainability or non-sustainability)? (basalla 1988:213).

The Demographic Index for Progress=V. Gordon Childe did believe, however, that he could measure progress directly by adding the longer prehistoric view to the shorter time span of history. He pointed out that a measure of Darwinian "fitness," the result of successful adaptation via natural selection, was reproductive success. If technological progress was like evolution then the increasing numbers of people going from earliest prehistory to modern times is ipso facto proof of progress (Basalla 1988: 215)! However, even if one could link the greater numbers to technological progress, which perhaps we can in the case of modern medicine, one still has the fears of a modern 6 billion population will cause catastrophic environmental & human cost. [Is this progress or cancer that will kill the host (the planet), and with it the pathogen (us)? Remember Mr. Smith's, the guard program's, soliloquy about humans in the first Matrix film.]

[If Science-Fiction is Our Mythology what does it say of progress? A minority Star Trek opinion is the multiculti heaven of resolved conflict, the brooding Blade Runner film noir response, which is in the distinct majority, presents a burnt-out world filled with vengeful androids and hunted humans]

Basalla's Solution

like natural evolution, no implied teleology, or over-reaching goal. Technological evolution must be judged within a narrow scope of time, place & culture, for narrow purposes & without generalizing these advancements to greater qualitative concerns such as "advancement" or "civilization."

e.g., transmission distance of electromagnetic radiation

starting after 1887 the German physicist Heinrich Hertz was content to achieve a

15-meter transmission as proof of concept, by 1894 Oliver Lodge reached 54 meters, then Guglielmo Marconi communicates via radio (Morse Code) across the English Channel in 1899 & across the Atlantic in 1901. "this constitutes technological progress" since "The events took place within a limited time span, less than twenty years, and within a relatively homogenous cultural setting, England and Germany. The goal was simply the transmission of a radio signal over ever greater distances" (& using the same principle--intermittent sparks created by an induction coil or banks of capacitors)--the continuous wave transmission of the human voice, radio as we know it, came later, after 1920, & that is a different story (Basalla 1988:216-217).

Limited Evolution, No Progress

"Neither the historical record nor our understanding of the current role of technology in society justifies a return to the idea that a causal connection exists between advances in technology and the overall betterment of the human race" (Basalla 1988: 218) altho he implicitly recognizes that this position will not be acceptable to most people, who still hold the "...popular but illusory concept of technological progress" (p.218). It is arguable that medicine is an exception to his argument since health & longevity have been increased, altho humans are now victim to a whole host of cancers and other ailments produced by technological complexification].

