

The machine age
historical
perspectives on
technology sociology



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The Machine Age is a term of the late 19th to mid twentieth centuries associated with engineering of mass production for consumer goods, car and train travel, modern war machines, skyscrapers, Modern Art and more. The Machine Age includes a captivation with new engineering as machines seemed to embrace an full civilization in the United States. This sparked a lively dialogue in books and articles about Machine Age engineering and its societal effects. Has technological advancement Lashkar-e-Taiba to societal betterment, increased leisure and wealth? Or, is our civilisation doomed to dependence on engineering?

This historiographic essay synthesizes the major scholarship, readings, and points of argument that emerged from the Machine Age. Besides included are literary plants that reflect the values and perceptual experiences of engineering over clip. Despite diverse readings, historiographers assert that engineering has cultural significance far beyond its original purposes. As an look of our modern civilization, it is clear that engineering is neither impersonal nor value-free.

David Lovekin, a philosopher of engineering and civilization, reports that major plants in the history of engineering by and large fit into one of three schools of idea[1]:

(1) engineering is inherently evil and unnatural ;

(2) engineering is a positive motion enabling personal and social freedom ;

(3) engineering creates jobs that require human ends be applied to its development.

However utile these classes, the diverse thoughts about the practical, societal and cultural impacts of Machine Age engineering have been unstable and mutable. To measure these impacts, the major subjects of this essay include: Influence of Romanticism ; Technological Utopia ; Nebiims of Doom ; and the Imprint of the Machine Age on Contemporary Life.

Influence of Romanticism on the Machine Age

The Machine Age reveals a tenseness between the promise of a future technological Utopia and the fright of losing personal creativeness that was so outstanding in the Romantic epoch. Ruth Cowan maintains that rational thoughts of Romanticism from Europe had a great influence on the Machine Age. In fact, the poetic linguistic communication of the Romantics was shortly adopted by the advocators of industrialisation. Harmonizing to Cowan, industrialisation was sold as a emancipating tool that would take to prosperity and leisure. This leisure would so take to creativeness, free look and ultimate felicity.[2]In his essay “ Poet in the Machine Age ” , Peter Viereck imagined how philosophers, authors, and poets arrived at their worldviews of the Machine Age. He describes how the 18 century pre-romantics (such as Wharton, Goldsmith, Cowper, Blake, etc.) provided the pastoral images that ulterior poets would follow when confronted with the machine world. th[3]Cowan references how the iconic American author, Walt Whitman, used the linguistic communication of the romantics to foreground the work of applied scientists and machines.[4]This is apparent

in Whitman ‘ s Passage to India:

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“ A worship new I sing, A A A A A A A A A A A A

You captains, voyagers, adventurers, yours, A A A A A A A A A A A A

You applied scientists, you designers, mechanics, yours, A A A A A A A A A A
A A

You, non for trade or transit merely,

But in God ‘ s name, and for thy interest, O psyche. ”[5]A A A A A

Through his authoritative work, *The Machine in the Garden*, Leo Marx describes how American authors have reacted to industrialism. He refers to the literary plants of Hawthorne, Emerson, Thoreau, and Melville to depict the transmutation of life by the machine in the 19 century[Thursday]. Scholars acknowledge how Leo Marx highlighted the important function that the humanistic disciplines play in assisting Americans “ a^!to mentally inhabit the new universe of industrialisation ” , an of import transitional clip in American history.[6]

From the position of the protagonists of Romantic thoughts, Cowan argues that they hated the universe of constituents, machines, net income, and advancement of the emerging Machine Age. Romantics considered that machinery deprived worlds of their creativeness and they were the premier critics of industrialisation.[7]

Technological Utopia

Technological Utopianism was derived from the belief in engineering as the agencies of accomplishing a near-perfect society. George Kateb, a professor

of political relations at Princeton, describes the Utopian ideal as one of a universe without discord, poorness, or “ irrational authorization ” .

[8]Harmonizing to Professor Howard Segal, this Utopia would include efficient transit and communicating systems that would enable people to populate and work where they choose.[9]The utopians would decide Leo Marx ‘ s tenseness of the machine in the garden by transporting the garden into the metropoliss.[10]Harmonizing to Cowan, mills would go more efficient and this, in bend, would be the key to supplying leisure and prosperity for even ordinary people.[11]Both Viereck and Segal describe the technological Utopians as holding a strong belief in the inevitableness of technological advancement. Viereck references the enthusiasm of the 1945 Atomic Energy Commission and its leader, David Lilienthal: “ The prevailing fact of our clip is the looming topographic point of the machine in the life of world. ”[12]

Harmonizing to John Nef, scientists and applied scientists turned their attending to issues of human wellness, longer life, and increased productiveness in the 20 century. Nef argues that the rate of incremental betterments through scientific discipline and engineering became much steeper than experienced in earlier centuries. Scientific consequences that would hold required coevalss could be achieved in a few months.[Thursday]

The general populace shared in the enthusiasm of bookmans and politicians. They believed that engineering could supply many of the replies to the jobs of modern life. All sectors of the economic system participated in the thrust toward a Utopian hereafter, as exemplified in an article from a hebdomadal

intelligence magazine about engineering and a remedy for malignant neoplastic disease:

“ Cancer, Number Two Killer of world, may be mowed down by the mechanical developments of the machine age we are now populating in. This image of the conquering of malignant neoplastic disease being added to the obliteration of clip and infinite by semisynthetic machines appears in a reappraisal of latest malignant neoplastic disease developments announced by the American Society for the Control of Cancer. ”[13]

Cowan describes how Technological Utopia became a subject in popular literature - the perfect universe of the machine would repress nature. The organic structure of literature that emerged in the late 19 and early 20th centuries presented an image that engineering was unbeatable. A noteworthy book from this genre includes Edward Bellamy ' s Looking Backward.[14]Utopianism based on engineering was closely associated with the economic Utopianism of Frederick Taylor ' s scientific direction in the mills. Cowan explains that the outlook for these Utopian visions would “ a^|create prosperity and stuff comfort for ordinary people, a set of thoughts that is sometimes referred to as the American Dream. ”[15]

Of class, there were many people who were disbelieving about how this technological Utopia would be achieved. These sceptics were sometimes dismissed as “ esthetic wincers ” or “ pious sneerers ” .[16]Kateb, a protagonist for technological progresss, expressed the belief that Utopianism would last its critics by taking to bosom certain valid warnings about the trade-offs and costs that would come for this Utopian society.[17]Lewis

Mumford, at one clip a Technological Utopian, saw the dangers and troubles of the technological way.

Nebiims of Doom

“ We term it so, in ordinary linguistic communication, the Machine of Society, and talk of it as the expansive working wheel from which all private machines must deduce, or to which they must accommodate, their motions. Considered simply as a metaphor, all this is good plenty ; but here, as in so many other instances, the “ froth hardens itself into a shell, ” and the shadow we have wantonly evoked bases awful before us and will non go at our command. ”

from Sign of the Times, 1829 (Carlyle) [18]

The major critics of the Machine Age and its long-run effects fall into wide and overlapping classes: 1) engineering is a consequence of bad picks we have made based on capitalistic impulses ; 2) engineering is merely an look of modern civilization ; and 3) engineering has become a agencies without terminals. By the early 20 century philosophers and historiographers began to turn to Machine Age issues, and Lewis Mumford was in the moving ridge of 1930s authors. Mumford lived a long life and was able to supply fresh positions on engineering for many decennaries. Mumford received international acclamation and unfavorable judgment for his readings of engineering in the West.[Thursday]

Mumford ' s Technics and Civilization of 1932 hints the class of engineering, and how it shaped civilisations.[19]Mumford pointed to the moral, economic, and the political picks we make, non the machines we use. He

believed that engineering was a direct consequences of human aptitudes and nisuss.[20]Melvin Kranzberg noted that the diary Technology and Culture, “ a^|emphasizes the interrelatednesss of engineering with society and civilization and adopts a really wide position of what constitutes engineering. Mumford ‘ s Technics and Civilization helped. ”[21]The mutuality of engineering and civilization would non be to the full understood without Mumford ‘ s wide vision. However, in a 2002 retrospective position of Technics and Civilization, Rosalind Williams maintains that Mumford was non successful in explicating the larger historical context of engineering. In her position, Mumford did successfully connect engineering with cultural history in ways that have been valuable for historiographers.[22]

In the 1935 article, “ Philosophers Appraise the Machine ” , E. W. Zimmerman describes the debut of the machine as closely associated with capitalist economy. Many critics hold capitalist economy responsible for the negative impacts of mechanisation.[23]However, Mumford maintained that the relationship between capitalist economy and the machine is non inevitable. Based on a reappraisal by Ostrander, Mumford considered the machine a “ impersonal agent ” , but wanted it function societal intents. [24]Mumford ‘ s 1967 assessment, The Myth of the Machine, reaches a decision that is a more baleful position of engineering than his earlier plants. He was no longer confident that engineering could be a force for good.[25]

Mumford refers to a democratic-authoritarian societal contract, under which each member of the society may claim stuff advantages in nutrient, lodging, transit, communicating, amusement, instruction, etc. However, Mumford states there is one status: 1 must take from the system everything offered.
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In his position, autocratic engineering will give back merely what can be produced in measure and jointly manipulated.[26]

In the 1930s Charner Perry, a philosopher from the University of Chicago, interpreted Mumford ' s position that through the machine society has embodied in itself values and ideals which it can non reject since they are indispensable constituents of its being.[27]This reading of engineering is besides present in the doctrine of Jacques Ellul, a European sociologist and historian, whose primary belief is that engineering has become an terminal in itself, wholly finding modern life. Ellul ' s attack in *The Technological Society*[28]was that, “ Everything in the technological universe is merely a agencies, while the terminals have practically disappeared.

”[29]Harmonizing to Melvin Kranzberg, a historiographer of engineering, it is non easy to separate terminals from agencies in the interaction between society and civilization.[30]

Lovekin interprets the doctrine of Ellul as one in which engineering is non external to the civilization ; instead, “ a^it becomes the purpose, the consciousness, of the civilization. ”[31]Lovekin refers to Alvin Toffler, a booster of industrialisation, who believed that Ellul was excessively pessimistic about engineering and that we merely must larn to do picks more quickly.

Leslie Sklair, Professor Emeritus from the London School of Economics, provides an enlightening reading of Ellul ' s indispensable point - engineering has already permeated all countries of life. She states, “ It is non a power to which we succumb or which we resist, it is the medium in which we live ” .

[32]Harmonizing to Sklair, Ellul ' s message is that engineering has really replaced capital as the dominant and finding factor of human life. The technological society is one in which all societal issues are non so much influenced by it, as situated in it.[33]Ellul argues that engineering and scientific discipline are amoral, neither good nor bad. This is consistent with the positions of Mumford, Kranzberg, Ferguson and others. Sklair maintains that Ellul challenges society to supply a more realistic review of engineering ' s function in societal alteration " .[34]Ellul ' s indispensable point is that " a^|no one wills the technological society, but it emerges " .[35]

Stuart Chase, an economic expert and philosopher of engineering, wrote Men and Machine in 1929. Chase expressed a blue position about the human impacts of the Machine Age. In a prescient transition that anticipates 9/11, Chase undertakings how engineering would be used against civilians:

" ... Particularly complete would be the expiration of New York. With her Bridgess and tunnels bombed, with her many tall edifices crashing like canonized tenpins, with her super-congestion, citizens would barely hold clip to prehend their chequebooks before being summoned to the waiting suites of the recording angel. ... This is the kind of thing which aeroplanes, with bombs swung below them, pilot controlled or automatic, are absolutely equipped to make. "[36]

The Imprint of the Machine Age on Contemporary Life

No 1 can deny the comfortss that chances that are direct benefits of engineering. From medical specialty to instruction, engineering has led to come on in many sectors of society. It is besides true that engineering has

had impacts that are unintended. In the longer term, these effects of engineering may be good or non but they are seldom impersonal. Cowan finds it clear that industrialisation has brought many alterations, some positive, but these alterations are extremely dependent on the business, race, gender, etc. of the person. Some have prospered and many others have found their chances diminished.[37]Harmonizing Tyler, technological alteration displacements occupational forms and chances among businesses and that some of these displacements have been black to persons and groups.[38]

One of the unintended effects of modern engineering today has been the global ingestion of resources required to do, keep, and dispose of technological constituents. Harmonizing to Cowan, industrialisation enforces a common dependance on others to supply constituents of the technological system.[39]In a technological system, merchandise picks are made from a technological position. Cowan views this dependence on engineering as a tradeoff for a anterior dependence on natural systems. We are “
a^}enmeshed in technological systems from which we can non get away and about which we need to be informed.”[40]Cowan cautiousnesss that engineering has profound societal and even ethical effects, and that we can non trust on experts to do wise determinations for us.[41]This is due, in portion, to the fact that the experts are non disinterested parties and are themselves dependent on the web of engineering. In Western society the usage of market mechanisms as the footing for picks causes built-in struggles.[42]It is from this position Ellul claims that we truly no longer hold any control over engineering.[43]

Thomas Misa, a bookman composing on the interactions of engineering and modern civilization, introduced the construct of “ supplanting, ” the unintended effect that technological determinations can displace options or prevent unfastened treatment about technological systems.[44]Historian Eugene Ferguson contends that an progress in one way may smother progresss in other waies that one time were, but are no longer, either likely or possible.[45]The wisdom or folly of a peculiar pick of way may non look until old ages subsequently, and by so the scope of picks has been narrowed by the earlier determination.[46]

Kranzberg describes effects that go beyond the original intent of a technological solution. The same engineering can be deployed in different fortunes with immensely different consequences. In add-on, perceptual experiences of engineering and advancement alteration. In one illustration, Kranzberg refers to smokestacks as a metaphor for environmental pollution ; at one clip, smokestacks were regarded as symbols of prosperity. Kranzberg states that innovations frequently require extra engineering to do the original thought more utile. The car demanded a broad scope of subsidiary engineering such as main roads and traffic visible radiations. Harmonizing to Kranzberg, hazard perceptual experiences can drive the credence of engineering systems. Strong public frights about atomic power works accidents persist, despite a deficiency of informations to back up this fright.

In the early 1960s, Tyler provided a retrospective analysis of engineering of the Machine Age during the war old ages in the U. S. He maintained that the United States realized the troubles of planing control systems for

engineering, but leaders were more concerned about the force per unit areas of clip and the dangers of war.[47]

A. Zvorikine, a taking Soviet historiographer of engineering, analyzed the nature of engineering in the United States. He believed that unless we understand the intents of adult male in developing engineering, the underlying Torahs steering proficient advancement can non be comprehended. Zvorikine viewed that the history of engineering should “ a^|reveal the motor societal forces and societal and economic conditions for the development of engineering. ”[48]It is notable that in 1952 Yale Brozen, an economic expert and strong advocate of the U. S. free market economic system, besides believed that in the absence of any understanding on the intents of technological alteration or even the intents it should function, it was hard to explicate any policies for the appropriate function of engineering in society. Furthermore, he claimed that until more is known of the effects of alteration due to engineering, understanding on intent will make nil to better policymaking. It is ill-defined what mechanisms are in topographic point to judge the societal, cultural, economic, environmental, etc. branchings and the unintended effects of engineering.[49]

Nicholas Rescher maintained that proficient advancement inflates outlooks faster than it can really run into them.[50]Segal inquiries if it is possible for non-technological advancement (societal, political, cultural, and economic) to develop at the same gait as technological development.[51]Under the class of failed outlooks, Sklair proposed in 1971 that the leisure promised with technological advancement will come excessively late, for by the clip sufficient leisure is available, engineering “ a^|will have suppressed

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creativity and imaginativeness" .[52]This claim is likely to be contingent on fortunes, but bookmans tend to hold that engineering has changed the lives of workers, leisure activities, and acquisition.

Based on a 2010 article and analysis by Leo Marx, philosopher Veblen predicted that engineering had the power to transform both the mental wants and moral premises of those who worked with it. Veblen ' s doctrine was that the machine compels unremitting attending and forces the version of the worker to the work, instead than the version of the work to the worker. Tyler claims that an unwanted effect of technological systems has been that design does not see the workers who use systems. In addition, investments in a peculiar engineering compel a going usage of that engineering.

In a 21 century reappraisal, Williams noticed that Mumford kept returning to the subject that the development of engineering necessarily leads to increasing disaffection from the universe.[st]

Harmonizing to some societal theories, engineering alterations society by altering our environment, to which we, in bend, adapt. This version may happen rapidly or may dawdle well behind the debut of engineering systems. A slowdown occurs if society has been affected by engineering, so fails to maintain gait with the causative agent. " Social slowdown " is a construct formalized by the sociologist William F. Ogburn in 1923, and his Hagiographas advanced the apprehension of the societal impacts of engineering. Francis Taylor credits Ogburn with it indicating out the demand for " sensible accommodation " between human nature and cultural alteration brought on by engineering.[53]Ogburn ' s description of cultural

slowdown explains why society seemed to be so severely out of accommodation.[54]

Decisions

Historical and philosophical positions on the Machine Age support the position that engineering is now so imbedded in the civilization that it defies analysis as a separate field of human enterprise. It appears that society has determined that the hazards of engineering are acceptable given the benefits. In add-on, there is a tenseness in society ' s relationship to engineering. The struggles include pride in engineering ' s accomplishments, ignorance about how it functions, and rejection of what is accepted as the ineluctable societal and cultural effects of engineering.[55]

Historians Eugene Ferguson, Kranzberg, Mumford and others were convinced that the history of engineering has something important to state in a historical context to the societal jobs of engineering. Technology is non impersonal or value free ; it does hold a character of its ain. Ferguson proposes a theory that engineering is deterministic in that it influences or even compels users to make things they would non try in the absence of engineering.[56]

For many, the fulfilment of the technological ideals of work and leisure have non been successful.[57]For all the easiness and comfort that engineering has provided, the personal and corporate felicity that technological Utopians assumed has proved elusive.[58]There is a turning inclination to fault engineering instead than ourselves for non bring forth the addition in personal felicity that was expected.[59]

It is Cowan ' s thesis that cultural significances have become more powerful than the technological maps the systems were designed to execute.

[60]Historian Cyril Smith notes that both art and scientific discipline are symbol-making activities, and both have the quality of “ a^|yielding metaphors that match far more than their Godheads intended. ”[61]

In footings of the inquiries posed in this essay, the consensus is that Machine Age technological advancement led to societal betterment for some members of society. It is besides likely that engineering has helped to widen the spread between those populating in desperate conditions and societal categories that receive direct benefit from engineering. While engineering has non destroyed our civilisation, neither has it put us on the way to doing wise determinations about how we design and deploy technological systems.

Historian John Staudenmeier stated that “ a^|the human cloth is non merely an envelope around a culturally impersonal artefact. The values and universe positions, the intelligence and stupidity, the prejudices and vested involvements of those who design, accept, and maintain engineering are embedded in the design itself ” .[62]Many bookmans believe that society must go smarter about the benefits of engineering and larn new ways to administer its goods based on specific intents and societal ends. The Western thought of advancement in specific has been measured by domination of nature and economic sciences. It is likely that humanity would be better served by an thought of advancement measured on the footing of the biophysical universe in which we live.

Notes

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