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Education in the Technological Age: A Philosophical Analysis

Over the last one hundred and fifty years, a radical shift in human thinking has occurred in response to the technological forces that govern the social, political, economic, and cultural systems of the world. Modern technologies, and the types of thinking that their implementation promotes, have caused large-scale changes in the ways that human beings perceive and make sense of the world. Education, as the primary institution by which knowledge is transmitted from one generation to the next, has been greatly affected by the changes induced by this new technological paradigm. In the attempt to understand how technological obsession and the dependency it brings imperils our humanity, this essay examines Thomas Carlyle's "Signs of the Times," Martin Heidegger's "The Question Concerning Technology," and Jacques Ellul's "The Technological Society." Through these writers this essay seeks to elucidate questions—as they directly affect the educational sphere—concerning whether we live in a world governed by strict technological determinism or a world in which internal human motivations govern external technological advancement.

Technology surrounds man in the twenty-first century in an unprecedented manner. Never before in human history have material inventions been more readily available or influential in human life. The repercussions of material technology upon the mind and upon human behavior are broad, affecting not only the manner in which we perceive the world, but the ways in which humans interact and individually and collectively experience the world. Technology pervades every facet of human existence, making the task of defining its effects exceedingly complicated and thus difficult to achieve. The task is made even more complicated by the fact that within all human endeavors technology acts and affects our thinking process in different ways. (Verbeek, 2006) For example, in the business world, technology assists and limits human behavior in ways that it does not in the worlds of politics, medicine, sports, music, or art. Thus, while it may be difficult to assess specifically the different manners in which various domains of human endeavor are affected by technology, it is not particularly difficult or controversial to make the claim that technology is indeed affecting the thinking and understanding of the twenty-first century human in an unprecedented manner.

To address the universal effects that technology has upon human thinking it is necessary to look at an attribute of the human condition foundational to all other processes: knowledge. Knowledge allows us to make sense of the world and act appropriately towards it in a manner that is unique to our species and distinct from that of all other living creatures. Given that human beings are such a cerebral species, the proper dissemination of knowledge is fundamental to human flourishing. (Shermer, 2004) Education is therefore vitally important in providing access

to knowledge and in shaping the ways we perceive and make sense of the world. The question then becomes, in terms of technological effect, is human reason, as passed on through education, coevolving with technological expansion? Or have we reached a point in human history where technological determinism governs human behavior, making education an endeavor ruled by external technological forces rather than by internal human motivation? (Ihde, 2004). These are the questions that this essay will attempt to address. Through an exploration of classical and modern philosophies of technology, as established by the nineteenth and twentieth century philosophers Thomas Carlyle, Martin Heidegger, and Jacques Ellul, the theme of education will be fleshed out and examined through a critical lens of philosophical inquiry.

The dramatic impacts that technology has had on civilization, and in turn upon the methods by which we acquire knowledge, are not recent. If we examine the literature of English nineteenth century philosopher Thomas Carlyle, we find many of the same questions and observations in his work concerning technology—or in his case "machinery"— as we might find fifty or a hundred years later in the works of Martin Heidegger or Jacques Ellul.

> Let us observe how the mechanical genius of our time has diffused itself into quite other provinces. Not the external and physical alone is now managed by machinery, but the internal and spiritual also. Here too nothing follows its spontaneous course, nothing is left to be accomplished by old natural methods. Everything has its cunningly devised implements, its pre-established apparatus; it is not done by hand, but by machinery. Thus we have machines for Education: Lancastrian machines;[1] Hamiltonian machines;[2] monitors, maps and emblems. Instruction, that mysterious communing of Wisdom with Ignorance, is no longer an indefinable tentative process, requiring a study of individual aptitudes, and a perpetual variation of means and methods, to attain the same end; but a secure, universal, straightforward business, to be conducted in the gross, by proper mechanism, with such intellect as comes to hand. (Carlyle 5, 1858)

This excerpt, from an essay titled *Signs of the Times*, was written in 1858. Over one hundred and fifty years later Carlyle's insights into the effects of technology—mechanism—upon society and education are just as valuable as they were in the 1850's. Although Carlyle's essay devotes most of its attention to the changes that technology has caused in religious institutions and political systems, it has nuggets of tremendous philosophical import that concern themselves with education. The above passage that states "Instruction, that mysterious communing of Wisdom with Ignorance, is no longer and indefinable tentative process, requiring study of individual aptitudes, and a perpetual variation of means and methods, to attain the same end"; is revelatory

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[1] *Lancastrian machines*: Joseph Lancaster (1778-1838) was a pioneer of primary education. In particular, he advocated the monitorial system, in which older pupils taught the younger.
[2] *Hamiltonian machines*: James Hamilton (1769-1831) devised a system of language teaching.

because it shows that even at the inception of the Industrial Revolution, society was being affected by the processes of mechanization caused by breakthroughs and advances in fossil fuel technologies. With the increased transportation and commodification of goods, along with the rise of better communication technologies, the standardization of various processes was taking place, ranging from how train conductors could better control their shipping schedules to how teachers could educate students on a large scale. As Carlyle makes clear, English education in the 1850's was a mechanized business that should be conducted by way of "cunningly devised implements" so as to nurture the faculties of a group of people rather than the intellect of a single individual. However, it was the process in classroom settings, not necessarily the number of people, that changed. Instead of being a philosophical enterprise—"a communing of Wisdom with Ignorance"—education tried to become an exact science, inclined towards the values of mechanism—efficiency, calculation, precision, standardization, raw outcomes, and material change. The shift from education as a plastic and variegated practice to a universalized and nationalized activity had begun. Instead of valuing creativity, freedom of thought, philosophical exploration, and a genuine interest in attaining knowledge and wisdom, mechanized education valued uniformity, exactitude, and scientific thinking. Although cultural changes were occurring irrespective of the technological revolutions taking place throughout Europe, the insidiousness of the "machine" taking a hold of educational practice in the nineteenth century was likely doing more to produce technological dependence at a national level than any other force present at the time. The educational institutions, governed by the greater societies to which they belonged, were already being conditioned to a new standard of educational practice; one guided by mechanized modes of thinking, easy access to diverse educational resources, and complex new teaching apparatus.

The "machine" taking a hold of nineteenth century would only tighten its grasp in the twentieth century. Europe, having suffered two World Wars—caused some would argue, at least in part by the enormous technological advancements of the nineteenth century—was overrun by various new inventions of the industrial revolution. Automatic weapons, war vessels, tanks, humvees, aeroplanes, rockets, chemical weapons, biological weapons, and nuclear weapons are but a few of the many grizzly technological advancements that came directly out of the World Wars. It seems inevitable that a philosopher critical of the new technological paradigm would emerge in such a context. In 1953 an abstract and philosophically dense critique of technology would be produced eight years after World War II and almost one hundred years after Carlyle's. This critique, titled *The Question Concerning Technology*, was written by the famous German philosopher Martin Heidegger. Although primarily focused on the question of Being, Heidegger makes tremendous intellectual leaps forward in terms of understanding the impact of technology upon twentieth century thought. Heidegger wrote nothing that directly addresses how education had been or might be affected by the technological revolutions of the nineteenth and twentieth centuries. However, insofar as Heidegger's philosophy of technology relates to the ways in which human beings acquire and interpret knowledge, one can extrapolate his theories to the

realms of educational development and evolution in the early twentieth century without inciting controversy.

In *The Question Concerning Technology* Heidegger views the implementation and spread of technology as being fundamentally associated with the adopting of a certain type of worldview. In questioning technology Heidegger does not examine technology's material or technical aspects, but rather devotes his attention to uncovering the essence of technology. The essence, he declares, that lies within technology concerns itself with truth. More specifically the essence of technology lies within revealing. Technology provides a *weltanschauung* that revolves around the exposure of truth through the insatiable need for presence in a secure and controlled world. As Heidegger elegantly illuminates this idea:

> What has the essence of technology to do with revealing? The answer: everything. For every bringing-forth is grounded in revealing. Bringing forth, indeed, gathers within itself the four modes of occasioning—and rules them throughout. Within its domain belong end and means as well as instrumentality. Instrumentality is considered to be the fundamental characteristic of technology. If we inquire step by step into what technology, represented as means, actually is, then we shall arrive at revealing. The possibility of all productive manufacturing lies in revealing. Technology is therefore no mere means. Technology is a way of revealing. If we give heed to this, then another whole realm for the essence of technology will open itself up to us. It is the realm of revealing i.e. of truth. (Heidegger 318, 2008)

What Heidegger makes clear in this passage is that to properly understand technology we can no longer view it, in the classical sense, as instrumental technology which defines technology as 1) a means to an end and 2) as a human activity. Technology now has a *telos* that goes beyond human control. It is purpose driven and will overwhelm human activity by transforming the objects of perception, with their own "natural" aims and purposes, into resources or "stock." In this way technology is less about achieving an ends through a technical means and more about arranging the objects of the life-world into active, useful agents for manipulation and processing. As applied to material objects of the life-world, Heidegger's philosophy is original but not radical. Human beings with modern machines mine the earth for coal, transport this coal to a factory, pulverize it, reorganize it, and burn it for energy. We manipulate and rearrange one object so that it operates and is revealed as another. Fundamentally the truth of this manipulated coal has been reconstructed and re-presented into a very specific mode of being. The coal is revealed in only one way. The manifolds of presentation given to the coal in a natural state are lost through the technological process.

Heidegger's philosophy of technology truly becomes radical when applied to the human sphere. Technology, by arranging and placing in reserve the materials of the life-world into

resources, causes human understanding to dwindle towards a single point of reference. By "bringing-forth" the objects of the world through a technological revealing we have oriented ourselves towards these revealed objects accordingly and adjusted our behavior to conform to the technology. In this manner we ourselves become resources that stand by in reserve, stockpiled and without dimension. The process by which we have wielded technology as a tool for the exploitation and manipulation of objects has in turn objectified and exploited our own humanity. Through the quest to rule over and control the capricious forces of the world we have truly conquered ourselves and our own natures. Mankind has overstepped its bounds. By striving for a purer understanding of the world, man has demonstrated the ultimate hubris and subordinated the world to the limitations of the technological perspective. As Heidegger eloquently writes, "Thus when man, investigating, observing, pursues nature as an area of his own conceiving, he has already been claimed, by a way of revealing that challenges him to approach nature as an object of research, until even the object disappears into the objectlessness of standing reserve." (Heidegger 324, 2008).

This quote captures the mentality of the technological age in the early twentieth century. By investigating the objects of the world through the apparatus of technology, with the mindset of placing in reserve the nature that we reveal, human beings dive further into an abyss of appearances. In education, through the sciences and by way of increased technological ability, we seek to make firm and incontestable knowledge claims, but fall only deeper into "objectlessness." The truth of the knowledge we acquire becomes only more tenuous as we apply more technological analysis towards it. Objects fade and disappear as we draw nearer to them by way of technological enterprise. Heidegger's philosophy of technology discloses a discomforting paradox of twenty-first century education: That by delving more deeply into the great questions of our age using the road map of technological revelation, we raise only more questions. Truth becomes deflated and single faceted, and knowledge as presented by the technological endeavor becomes scholastically unpalatable. The educational structures, as affected by the operations of technological revealing as elucidated by Heidegger, have become enveloped by a framework of technological understanding that is inherently self-bounded and can only provide truth through reduction.

Some ten years after Martin Heidegger's critical philosophical analysis of technology, the modern world was entering a time of relative peace. Technological advancement was taking place for the sake of improving living standards, rather than for the sake of war. Computational technologies, such as the computer, were moving full steam ahead, along with advancements in exploration technologies—satellites, spaceships, deep sea submarines, and high altitude aircraft. In a manner different from early twentieth century, advanced technologies were affecting the societal and cultural norms of entire nation states. It was the influential French sociologist and philosopher, Jacques Ellul, who would address the societal impacts and philosophical repercussions of technology in the latter half of the twentieth century with the most vigor. Ellul

is unique in his approach to understanding the effects of technology because he focuses primarily on society at large whilst taking no particular opinion as to whether technological man is better or worse off than non-technological man. In this way his philosophy of technology is descriptive rather than prescriptive, lending itself toward furthering human understanding rather than pushing forth an agenda. His main contribution to the philosophy of technology, especially where education is concerned, is the concept of *technique*. Distinct from technique as skillfulness or craftiness, *technique* as Ellul defines it is the "organized ensemble of all individual techniques which have been used to secure any end whatsoever."(Ellul x, 1964) Without becoming moralistic Ellul makes clear that *technique,* as embraced by the technological society, is indifferent to human values and ends, establishing itself as an end in itself rather than means. The thesis of his magnum opus, *The Technological Society,* can best be summed up as "a description of the way in which an autonomous technology is in process of taking over the traditional values of every society without exception, subverting and suppressing these values to produce at last a monolithic world culture in which all nontechnological difference and variety is mere appearance."(Ellul xx, 1964).

Like Carlyle's *Signs of The Times* over a hundred years prior, Ellul's *The Technological Society* is broad in its scope, exploring the effects of technology upon economics, politics, religion, history, art, and many other disciplines. Also like Carlyle, Ellul devotes a section of his book to education, reflecting upon the pedagogical practices of his time. Specifically he focuses on the newly developed public school educational techniques implemented in post-World War II Europe. As he explains, the course taken by most nations was to provide pupils the chance of optimal happiness through developing their social abilities. Opposition to society by way of a social ineptitude is unacceptable, throwing the individual out of "psychic equilibrium" and therefore causing detriment to the state. Conformity is essential for the successful operation of any large society. Modern educational practices, with the seemingly noble goals of enhancing social potency and stimulating personal growth, are driven to promote social adaptation in the burgeoning student populous primarily to regulate societal harmony in the state. As Ellul cogently remarks, "What looks like the apex of humanism is in fact the pinnacle of human submission: children are educated to become precisely what society expects of them."(Ellul 348, 1964) In this way, the student is not being educated in and for himself, but rather in and for society.

> The corresponding educational technique, as a consequence, takes a completely determinate direction. Social conformism must be impressed upon the child: he must be adapted to his society; he must not impair its development. His integration into the body social must be assured with the least possible friction. (Ellul 347, 1964)

Ellul makes clear that the educational path pursued by most modern nation states is one first and foremost of training technicians. Education is no longer about instilling humanistic

values, rather it is geared towards producing technicians. In the technological society, to nurture the intellectual capacities of a young human being would lack practical purpose. Instruction must be useful, and be put towards some technical ends. To educate a human being so as to enhance his or her non-technical faculties would be an unsound and impractical life choice. There must be reconciliation between the individual and the technological society. The only way to enact this reconciliation is to transform the individual from a rebellious free thinker to a conforming technician, for a technician, so specialized in his craft, is dependent upon the support of the greater social network to which he belongs. Without a surrounding technological society a technician is doomed to destruction, because his identity is formed through the active application of his acquired technique. As Ellul describes, “An education will no longer be an unpredictable and exciting adventure in human enlightenment, but an exercise in conformity and an apprenticeship to whatever gadgetry is useful in a technical world.” (Ellul 349, 1964).

Human beings of the twenty-first century need to take a critical look at the technological milieu in which they are immersed. The historical developments of technology and the social and psychological responses to them have been tremendous over the last two hundred and fifty years. The manners in which we make sense of the world and in turn educate future generations have been greatly adapted to fit the rubric established by the technological age. Whether or not the life course generated by the technological expansionism of the nineteenth, twentieth, and twenty first centuries is sustainable is a question that lies outside of the scope of this essay. However what this essay can provide is perspective on the progressions—or perhaps digressions—in human thought that have been made over this period.

It goes without saying that a nearly ubiquitous outcome of the newly founded technological orientation is specialization. The concept of specialization—or some would say overspecialization—is rooted in the global pandemic of *technique* as promoted by the self sustaining processions of technological advancement. Indeed, in the globalized world, success is primarily determined by the technical skill set a person possesses. What we can do, in terms of technical outcomes, is valued over how or why we can do the things at all. This hierarchy of values is reflected in the educational sectors of the modern world. Above all other things, including the humanities and the arts, we place the sciences and the technical thinking required to succeed in the sciences. This trend is not localized to a few technologically inclined first world nations. Every nation is striving to be as technologically efficient and advanced as its neighbor, and therefore promotes an educational pedagogy that values technical thinking over intellectual pursuit. The repercussions of this prioritization of educational values have been, and will continue to be, immense. Reorganization of pedagogical values and the conscious implementation of change, in terms of combating this trend, are not viable answers to the technological rearrangement of human thinking. Awareness and understanding, along with empathy and action, are the best provisos for a critical reevaluation of our technological society.

Technological determinism seems unlikely. If technique, as the ensemble of practices used to attain various material ends, precedes technology, and technology precedes the scientism of our modern age, then human creativity, as the ingenuity of free choice and self governance, precedes technique and therefore invalidates the possibility of its being a self-determined entity. In his foreword to *The Technological Society* Ellul makes the moving remark that:

> The challenge is not to scholars and university professors, but to all of us. At stake is our very life and we shall need all of the energy, inventiveness, imagination, goodness and strength we can muster to triumph in our predicament. While waiting for the specialists to get on with their work on behalf of society, each of us, in his own life, must seek ways of resisting and transcending technological determinants. Each man must make this effort in every area of life, in his profession and in his social, religious and family relationships. (Ellul xxxii, 1964)

By educating ourselves, and hence striving to transcend the historical, social, political, and economic operations that govern our lives, we must recognize that there is a force that even the strongest systems of control obey: our humanity. Technological obsession and the dependency that it brings is a force which imperils our humanity. Human beings are inherently diverse and variegated, and the mind is an extraordinary gift of nature. Through the standardization, mechanization, revelation, and control inherent to the implementation of technique, technological proclivity threatens to subdue our unique mental capacities. It is through education, a domain of human discourse already greatly affected by the technological endeavor, that efforts can be made to “resist and transcend” the technological machinations of our age. Such is the purpose of elucidating the relationship between how man acquires knowledge and the modes by which technological expansion is changing the ways we come into contact with the world. The illumination of the unprecedented technological conditions modern man and his educational systems exist under is not a fanciful historical overview, but a call to action. Ellul puts it best when he explains that the purpose of critiquing our technological systems is not to promote passivity but spread awareness. The call to understanding the repercussions of our new technological paradigm is a call for the sleeper to awake.

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