ABSTRACT

ASSOCIATE PROF. DR. AYDAN TURANLI **DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES FACULTY OF LETTERS AND SCIENCES ISTANBUL TECHNICAL UNIVERSITY AYAZAGA KAMPUSU MASLAK 34469**

ISTANBUL TURKEY

E-mail: turanliay@itu.edu.tr

REFLECTIONS ON HERBERT MARCUSE'S TECHNOLOGY CRITIQUE THROUGH THE ANALYSIS OF **CHARLIE CHAPLIN'S MODERN TIMES**

As is well known Charlie Chaplin's 1936 film *Modern Times* is among one of the most important

films of all time. The importance of the film comes from the plot as well as the cast. The plot is

very important in emphasizing and revealing the character of a modern life style. In the film,

the nature of modern times is analyzed within the context of one of the most important

economic crisis periods of history. In this article, I discuss Charlie Chaplin's film *Modern Times*

by correlating it with Herbert Marcuse's critique of technology.

The first part of the article argues in what sense *Modern Times* is related to Herbert

Marcuse's critique of technology. The second part focuses on the inadequacies of the

alternative presented by Marcuse, and how it can be amended. The third part discusses Herbert

Marcuse's alternative, which is to create a free society.

Key Words: Herbert Marcuse, Technology Critique, Modern Times, Charlie Chaplin, Jürgen

Habermas, Martin Heidegger, Johann Wolfgang von Goethe, Thomas S. Kuhn, Philosophy of

Technology.

1

REFLECTIONS ON HERBERT MARCUSE'S TECHNOLOGY CRITIQUE THROUGH THE ANALYSIS OF

CHARLIE CHAPLIN'S MODERN TIMES

ASSOCIATE PROF. DR. AYDAN TURANLI

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES FACULTY OF LETTERS AND SCIENCES

ISTANBUL TECHNICAL UNIVERSITY

AYAZAGA KAMPUSU MASLAK 34469

ISTANBUL TURKEY

E-mail: turanliay@itu.edu.tr

Because it is "A story in industry," Charlie Chaplin's Modern Times is easily connected with the

topics discussed in Science, Technology and Society Studies. Like other members of the

Frankfurt School, Herbert Marcuse is one of the most discussed philosophers in Science,

Technology and Society Studies. The significance of Herbert Marcuse's thought is understood

accurately if it is discussed in the context of the film of *Modern Times*. The film and Marcuse's

view can be easily associated because while the film is "A story in industry," most of Herbert

Marcuse's writings are an investigation into the ideology of advanced industrial societies. In the

following section, I discuss the relation between Modern Times and Herbert Marcuse's

technology critique.

MODERN TIMES AND HERBERT MARCUSE'S TECHNOLOGY CRITIQE

According to Marcuse, one of the reasons for the problems emerging in modern times stems

from our outlook of science. Before I analyze the film, I concentrate on Herbert Marcuse's

reasons for not being satisfied with the vision of modern science.

2

I distinguish two combined and parallel points in Marcuse's discussion of the character of science and technology. The first one has to do with the discussion of the nature of science, while the second one is related to the vision of modern science. One is associated with science, while the other one is linked with philosophy of science and technology. I think, in Marcuse's writings there are implications for both, and the critique of the one goes hand in hand with the critique of the other. In other words, the critique of the nature of modern science implies the critique of the standard view of science as well.

According to Marcuse, the bothering characteristic of modern science lies in its relation with nature. As is well known, the standard view of science defines the functions of modern science as explanation, and prediction, with the aim of controlling nature.

Marcuse criticizes technical reason implicit in modern science. He implies that although technological rationality is the product of the modern period, the conditions preparing the dominance of the technical reason over Eros starts with Plato. Starting from Plato on, the union of Logos and Eros is broken in favor of the supremacy of Logos. This predomination of Logos over Eros continues in the modern period. Logos, embedded in modern science, shapes instrumental technical reason in its implementation.

Marcuse criticizes the modern view of science depending on calculation in Galileo's work, as well as others. The Galilean science is methodical in relying on specific anticipation and projection. The features of modern science such as quantifiability, calculability and predictability are functional devices prerequisite for the domination of nature (Marcuse 1964, 164). The new scientific rationality succeeding the pre-technological model, depending on the quantification of nature leads the explanation of nature in terms of mathematical structures by

means of which the true is separated from the good, and science from ethics. The role of a subject in this new rationality is discarded as unnecessary. Although, the role of the subject seems to be constitutive as the point of observation, measurement and calculation, still this subject cannot play its scientific role as an ethical, aesthetic or political agent (Marcuse 1964, 146-147).

This mentality is active not only in pre-technological, but also in technological reason in the modern period. The quantification of nature leads to its explication in terms of mathematical structures, which causes the separation of science from ethics (Marcuse 1964, 147). Observation, measurement and calculation are divorced from the subject and they become neutral means rejecting the subject's role as ethical, aesthetic and political agent in scientific inquiry (Marcuse 1964, 147).

Although there are differences, Herbert Marcuse's critique of technology is in line with those of Heidegger and Habermas with regard to the idea that instrumental reason, or "purposive rational action" as Habermas calls it, which characterizes technological rationality, leads alienation in modern societies.

Heidegger emphasizes that technical reason paves the way for a world in which truth and freedom are completely abolished. Habermas asserts that because technical action predominates over communicative action, technology and science become ideology. Marcuse, on the other hand, underlies that the instrumentalist character of scientific rationality produces a form of social control and domination (Marcuse 1964, 158). Science achieves this by means of its privileged method and concepts. A vision of science, including the standard view of science encourages a world in which the domination of nature is a major drive. Marcuse, in the

Habermasian manner, emphasizes that technology becomes ideology in modern societies. Domination, on the other hand, brings and extends itself not only through technology, but also as technology and "the latter provides the great legitimation of the expanding political power, which absorbs all spheres of culture" (Marcuse 1964, 158).

As is well known, Charlie Chaplin's film *Modern Times* starts with displaying a big clock and a sheep flock obeying the bells of the clock. Actually, the film criticizes modern, industrially well developed societies by concentrating on the events illustrating the 1929-1930 economic crises known as the Great Depression.

In *Modern Times*, Charlie Chaplin portrays a factory worker employed on an assembly line. All of the shots taken in the factory are very important in revealing the character of the life style or the cultural horizon created around a technological artifact, which is an assembly line.

Marcuse's depiction of the life style characterizing industrially well-developed societies can be observed in the film. From the very beginning we see Charlie Chaplin as a factory worker trying to keep up with the work given to him. The interior design of the factory is significant in showing the relations between factory workers and the boss. The boss controls all of the places in the factory by surveillance cameras, which reminds us of the Panoptic prison portrayed by Michel Foucault. He controls the factory workers to make sure that they are working efficiently to produce as much as they can. He also warns them against the situation in which they reduce their work speed and cut their work-hours by smoking cigarettes in the restrooms. The drive to increase profit, as much as he can, pushes the boss to accelerate the assembly line, which has the effect of a mental breakdown in our factory worker Charlie Chaplin. He starts making spasmodic movements even when he is away from the assembly line, which reminds us of

"dehumanization," "alienation," and the "instrumentalization of human beings" discussed by Karl Marx and Herbert Marcuse.

The culmination of the factory shots is the boss's decision to test the automatic feeding machine suggested by a company. The boss welcomes the test of the machine, supposing that this will eliminate the lunch hour of the factory workers. As Marcuse points out, technological rationality, which aims at increasing profit by increasing economic and technical efficiency, is the only motive of the boss letting the company test the new machine. Unfortunately, there is an obstacle in implementing the machine, it starts harming the worker (Charlie Chaplin) rather than feeding him. The boss rejected the machine on the basis that it is not practical. However, the workers are exposed to indignities with the test of the automatic feeding machine.

In almost all of the factory shots, we see the effects of instrumental reason forcing workers to produce more on an accelerated assembly line. At some point we even see Chaplin drawn and crawl into the machine, portraying a factory worker as a cog in the machine.

Marcuse, in a Heideggerian manner, emphasizes that in the modern era the instrumentalization of things turns into a fetter of liberation and results in the instrumentalization of man (Marcuse 1964, 159). We see the workers in *Modern Times*, becoming a mere means in the production process, and losing their autonomy and authenticity. The functional character of techno-scientific rationality, aiming at increasing productivity, results in an elimination of freedom. Technological rationality protects rather than cancels the legitimacy of domination (Marcuse 1964, 158-159). As Marcuse diagnoses it, this process causes a one dimensional and surveillance society in which human beings experience mental breakdown as our hero does.

After his recovery, the unemployed Chaplin is mistakenly arrested for leading a demonstration of a group of people protesting unemployment, and demanding freedom and liberty.

The pitfalls of the modern epoch, reach in their peak especially in an economic crisis period. In the film, this can be seen in the prison, the demonstration, the strike and the burglary scenes. Because people are unemployed, they steal; go into prison; protest and demand liberty.

Following his imprisonment, our former factory worker (Charlie Chaplin) fails to get a proper job, and realizes that the conditions outside the jail are cruel. He runs into an orphan girl, who has stolen a loaf of bread from a store, and wants to save her from the police by saying that he is the thief. However, a witness states his innocence and he is freed. After that he tries all kinds of misdemeanors to get back into the jail, where he finds a stable life. When he is taken to the jail, he again meets the orphan girl and they escape from the police together. With a reference letter given by the sheriff earlier, he finds a job in a department store as a watchman.

The scenes in the department store are interesting enough to show the modern life style. The interior design of the department store represents a kind of life style imposed upon the consumers. It also reminds us of Marcuse's discussion of "false needs" and "false consciousness." For example, on the Bedroom Display floor, we see the orphan girl (played by Paulette Goddard) wearing expensive furs, sleeping on an expensive bed with furs and imitating the life style of the higher classes imposed upon consumers by commercials.

As Marcuse emphasizes in the modern era, in consumption societies we are not aware of our genuine needs, and interests, and we usually have the inclination to accept the needs

imposed upon us by commercials. Hence, our needs and interests are shaped by technological rationality, which creates a false consciousness by enforcing a certain life style upon us without opening up a space for our own choices.

As mentioned earlier, the historical background of the film is the 1929-1930 economic crises. The footsteps of the crisis can be seen in all of the scenes of the film. Unemployment, factory closings, strikes, street demonstrations, burglary and hunger are everywhere.

At the very first night of his job in the department store, our former factory worker (Charlie Chaplin) working as a watchman confronts unemployed hungry people, who break into the department store just to end their hunger.

What kind of a solution is presented by Herbert Marcuse to amend the flaws of modern societies? I want to discuss Marcuse's alternative briefly, before I discuss the other scenes of the film.

HERBERT MARCUSE'S ALTERNATIVE VIEW OF TECHNOLOGY

As stated earlier, the vision of science is one of the main problems creating disturbed societies in industrially well-developed countries. The modern vision of science objectifying nature and separating subject from object, values from objective reality, should change. Marcuse suggests a new science and technology, considering nature as a subject rather than an object. In this sense, his view diverges from that of Jürgen Habermas seeing nature as an object. Viewing nature as a subject helps us develop fraternal relations with nature. Developing fraternal

relations with nature, on the other hand, is possible by changing our attitude towards nature.

This can be done, only if we transform our vision of science, defining the function of science as controlling nature by explaining and predicting.

Although Marcuse talks about new science and technology, he does not develop properly the point of what kind of science and technology he visualizes. As mentioned earlier, Marcuse's critique of science and technology implies the critique of the established view of science, influential in philosophy of science that describes the ultimate goal of science as truth.

Marcuse's inadequately developed proposal to build a new science can be improved, by correlating it with Johann Wolfgang von Goethe's and Thomas S. Kuhn's views of science.

It is helpful to summarize Johann Wolfgang von Goethe's view of science briefly, in order to articulate what kind of vision of science helps us develop fraternal relations with nature.

Goethe presents an alternative view of science, based on the critique of the Cartesian-Newtonian scientific framework on which modern science is built. The flaw of the Cartesian scientific universe lies in its dualism. Complete separation of body or the mechanism of the world, from the soul results in the "alien in the machine" as Brent Robbins describes it.

According to Robbins, this picture eliminates a participatory involvement of human beings in natural inquiry (Robbins 2005, 116). "Relationally-responsive" (Quoted from Goethe by Robbins 2005, 123) or participatory involvement in natural inquiry, on the other hand, allows us to feel morally responsible for nature, by means of which the separation of science from ethics is eliminated.

Goethe articulates his alternative view of science with the concepts such as; morphology, delicate empiricism and archetypal phenomenon.

Morphology requires scientists' understanding of living formations in their contexts; therefore a result of scientific investigation should be *Bildung* rather than *Gestalt*. While *Gestalt* is a structured form, *Bildung*, which is related to the verb *bild[en]* has something to do with construction and in this sense it is broad enough to open a space for human involvement, and participation, in the investigation of nature.

Goethe's delicate empiricism, on the other hand, considers all factors such as environmental, historical, cultural and social factors, as determining a creature as a whole. His morphology is holistic in the sense that it is deep enough to let us discover the whole in the smallest part.

The "archetypal Phenomenon" or *Urphänomen* consists of the idea that in the process of understanding nature; contemplation, knowledge, divination and faith are all effective. Understanding (*Verstand*) with the highest Reason (*Vernunft*), characterized as synthesizing ability, are necessary to "come into contact with the Divine" (Goethe 2000, Chapter7 §12). Of course, Goethe is pantheistic enough to regard the "Divine" as a material power implicit in Nature.

According to Goethe, intuition, a sure awareness of the present, mathematical profundity, physical exactitude, the heights of reason (*Vernunft*) and sharpness of intellect (*Verstand*) "together with a versatile and ardent imagination, and a loving delight in the world of the senses...are all essential for a lovely and productive apprehension of the moment" (Goethe 2000, Chapter 9 §3). Sensuality and reason, imagination and common sense are

necessary to develop human understanding of nature (Goethe 2000, Chapter 9 §5). This "richly endowed" (Goethe 2000, Chapter 1 §2 29) world can be understood by trusting our senses and by keeping our intelligence awake.

Goethe interpreter Robbins implies that we develop better and fraternal relations with nature in case we see nature as an end in itself. Robbins says,

when we spend time in deep contemplation of the structure of a plant, for instance, we come to appreciate the plant as an end in itself rather than a mere means. We come to better understand ways that we can live harmoniously with the plant. We sensitize ourselves to actions that may violate the value of the plant. And through the wisdom we gain, we create a space not only to improve our own lot, but also ways to improve the plant, which we come to understand as an extension of our own existence, indeed, as part of the ground of being that sustains us (Robbins 2005, 123-124).

In the same manner, Marcuse implies that fraternal relations with nature can be developed, if the instrumental reason producing abusive relation with nature is transformed into a new rationality.

As said earlier, Marcuse's view can be correlated with Thomas S. Kuhn's view of science. Correlation with Thomas S. Kuhn's view may shed light on Marcuse's demand for a new vision of science. Thomas S. Kuhn in his well known book, *The Structure of Scientific Revolutions*, presents an alternative view of science depending on the idea that evolution of science occurs through paradigm changes. The revolutionary period in a history of science is followed by a normal science period until a resistant, or crisis-provoking, anomaly appears and the cycle continues without the aim of reaching truth. The significance of Kuhn's theory stems from the idea that science is not an objective, but an intersubjective activity that has an aim of understanding nature, rather than controlling it. All of the concepts shaping Kuhn's view of

science, such as "incommensurability," "theory-laden observation language," "paradigm" as *Weltanschauung*, show us that science is molded by a scientific community. Hence, values, including moral values, are essential component of scientific activity. In this sense, Kuhn's view eliminates the separation of science from moral and human values.

In the same manner, Marcuse rejects the basic presuppositions of the standard view of science that defines the purpose of science as the approximation to objective truth. According to Marcuse, the objects of physics are not objective qualities of the external world, but "convenient intermediaries" or "cultural posits" (Marcuse 1964, 149). "Events," "relations," "possibilities," on the other hand, can be "objective" only in terms of the subject's relation to that object (Marcuse 1964 p.150). He thinks that the philosophy of contemporary physics should suspend judgment, or should consider the very question of what reality is in itself, as meaningless, or unanswerable (Marcuse 1964, 151). Hence, in a Pyrrhonian manner, Marcuse suggests suspension of judgment regarding the essence of objects, or in a Wittgensteinian manner, proposes a question shift from "What is...?" to functional "How ...?" (Marcuse 1964, 151). This implies the rejection of an essentialist view of science and eliminates the separation of science from ethics.

Marcuse thinks that "truth" and "objectivity" are shaped by human beings and science becomes humanistic only if the good and the beautiful, peace and justice are derived from scientific-rational conditions (Marcuse 1964, 148). A new vision of science prospers only if the broken link between Eros and Logos is restored.

THE CREATION OF A NEW SENSIBILITY

Along with a proposal to develop the new science and technology, Marcuse suggests our creation of a new reality principle and a new rationality principle liberating consciousness. Within this framework, the new reality principle appears, only if technique becomes art and art then forms reality: this is also the Heideggerian ideal.

Heidegger in the piece of work entitled "A Question Concerning Technology" (Heidegger 1977) compares and contrasts the ancient Greek use of the word "techné" with "technology" by emphasizing that in the modern era "techné" lost its ancient function that entails artful creation. Technology may create an artful atmosphere and a life style, only if it regains its ancient aura.

Marcuse, in the same manner, visualizes an aesthetic society in which there is no poverty and toil. In this society, we do not see the supremacy of one type of reasoning over others. On the contrary, there is a harmonious union of sensuousness, imagination and reason in the beautiful "as the Form in which man and nature come into their own: fulfillment" (Marcuse 1969a, 27).

The creation of the new Reality principle, and a new sensibility, are necessary conditions for our overcoming negative aspects of the modern times. The new sensibility requires a revolution in perception "which will accompany the material and intellectual reconstruction of society, creating the new aesthetic environment" (Marcuse 1969a, 37). "The radical transformation of society implies the union of the new sensibility with a new rationality. The

imagination becomes productive if it becomes the mediator between sensibility, on the one hand, and theoretical as well as practical reason on the other, and this harmony of faculties guides the reconstruction of society" (Marcuse 1969a, 37-38).

Marcuse appeals to the synthesis of Kant's second and the third *Critique* to articulate his solution. From the second *Critique* he adopts the idea that human beings should not be used as a mere means in actualizing our aims, and the respect for humanity is accomplished by creating free individuals in a society. From the third *Critique* he gets the idea of "purposiveness without purpose." The purposive rational action shaping technological rationality may be transformed by appealing to this Kantian idea. "Purposiveness without purpose" defines a form in which an object appears in an aesthetic representation.

Whatever the object may be (thing or flower, animal or man) it is represented and judged not in terms of its usefulness, not according to any purpose it may possibly serve, and not in view of its 'internal' finality and completeness. In the aesthetic imagination, the object is rather represented as free from all such relations and properties, as freely being itself. The experience in which the object thus 'given' is totally different from the everyday as well as scientific experience....This experience, which releases the object into its 'free' being, is the work of the free play of imagination. Subject and object become free in a new sense....Imagination comes into accord with the cognitive notions of understanding and this accord establishes a harmony of the mental faculties which is the pleasurable response to the free harmony of the aesthetic object (Marcuse 1969b, 130-131).

Marcuse's main assumption is that even political problems can be solved by passing through an aesthetic experience leading to freedom (Marcuse 1969b, 136).

I want to return to some of the scenes from *Modern Times* to evaluate them from the Marcusean perspective.

As already mentioned, imagination is very important in creating an aesthetic society, in which there is freedom and abundance. In the film, we see our hero and heroine hungry and

unemployed, right in front of a small house imagining a house in which they become happy. Chaplin imagines them in an eco-friendly atmosphere; a small wonderful house in which fruit is picked from the trees grown in front of the house, and milk comes from a cow living in the garden of the house. Like all human beings they have right to live and satisfy their hunger in a proper way.

Marcuse underlines that it is possible to imagine an aesthetic society, in which scarcity and poverty are eliminated. This can be accomplished by a transformation of vision of the beautiful. Influenced by Schiller, he says that aesthetic culture requires "a total revolution in the mode of perception and feeling," and such revolution becomes possible only if civilization has reached the highest physical and intellectual maturity" (Marcuse 1969b, 136).

The last scenes of the film are very important in showing that in a society in which technological rationality is dominant, false needs are forced upon individuals. Human beings, without being aware of their abilities, try to comply with what is given to them and their real potentials are repressed. This is seen in the last scene of *Modern Times*: after he tried and failed in almost all works, Charlie Chaplin's last trial, which is improvised singing, dancing, and pantomiming, ends up with success. His true and repressed potential flows freely in performing them.

Marcuse says, "[o]nly when the 'constraint of need' is replaced by 'constraint of superfluity' (abundance) will the human existence be impelled to a 'free movement which is itself both end and means.' Liberated from the pressure of painful purposes and performances necessitated by want, man will be restored into the 'freedom to be what he ought to be'" (Marcuse 1969b, 136).

CONCLUDING REMARKS:

As one of the most important films of history, Modern Times demonstrates the mentality implicit in advanced industrial societies on the background of the 1929-1930 economic crises. In the film, how technological rationality shapes and affects the lives of human beings on the street is seen from the perspective of a factory worker. The cultural horizon created around an assembly line consisting of alienation, surveillance cameras, factory closings, demonstrations, demand for liberty are very well depicted. We see how the imposition of false needs and false consciousness result in suppression of real interests and needs of human beings, so as to close the way to express their abilities freely. However, only human beings with liberated consciousness build an environment free from violence and aggressive relationships. This is done by altering the purposive rational action. Marcuse thinks that this is possible by the transformation of our vision of the beautiful. He appeals to Kant's second and third Critique that suggests that the aesthetic experience of an object implies "purposiveness without purpose," which transforms and liberates consciousness. According to Marcuse, freedom is not only self-determination creating autonomy, but also determination of goals which protect and unite life on earth. The aesthetic way of living presupposes our creating a new sensibility, and a new aesthetic ethos in both individual and societal relations, so as to free human beings.

REFERENCES

Bimber, Bruce. "Three Faces of Technological Determinism." In *Does Technology Drive History?* The Dilemmas of Technological Determinism, edited by M.R. Smith and Leo Marx, 79-100. Cambridge MA: MIT Press, 1994.

Bortoft, H. The Wholeness of Nature-Goethe's Way of Science. Edinburgh: Floris Books, 1996.

Bywater, Bill. "Goethe: A Science Which Does Not Eat Other." *Janus Head*, 8 (1) (2005): 291-310.

Feenberg, Andrew. Questioning Technology. New York: Routledge, 1977.

Feenberg, Andrew. "Democratic Rationalization: Technology, Power and Freedom." In *Philosophy of Technology: The Technological Condition*, edited by Robert Schraff and Dusek Val, 652-666. Oxford: Blackwell, 2003.

Fulzon, Christopher. Philosophy Goes to the Movies, New York: Routledge, 2002.

Goethe, Johann W. Goethe on Science, edited by Jeremy Naydler. Edinburgh: Floris Books, (2000) 1996.

Habermas, Jürgen. *Toward A Rational Society*. Translated by Jeremy J. Shapiro. Boston: Polity Press. 1970.

Heidegger, Martin. *The Question Concerning Technology and Other Essays,* Trans. William Lovitt. New York: Harper Torchbooks, 1977.

______. *Pathmarks,* Edited by William McNeill. Cambridge: Cambridge University Press, 1999.

Held, David. *Introduction to Critical Theory: Horkheimar to Habermas*. Oxford: Polity Press, (2004) 1980.

Holdrege, Craig. "Doing Goethean Science." Janus Head 8 (1) (2005): 27-52.

Kuhn, Thomas. *The Structure of Scientific Revolutions*. The University of Chicago Press, (1970) 1962.

Latour, Bruno. Pandora's Hope. Cambridge: Harvard University Press, 1999.

______. *Politics of Nature*. Translated by C. Porter. Cambridge: Harvard University Press, 2004.

Mahoney, Michael J. "What is Constructivism and Why is it Growing?." Contemporary

Psychology 49 (2004): 360-363.

Marcuse, Herbert. One Dimensional Man. London: Routledge, (1991) 1964.

_______. An Essay On Liberation. Boston: Beacon Press, 1969a.

______. Eros and Civilization. London: Beacon Press, (1973) 1969b.

Miller, D. Johann Wolfgang von Goethe-Scientific Studies. Suhrkamp, 1988.

Pippin, Robert. "On the Notion of Technology as Ideology," In *Technology and the Politics of Knowledge*, edited by Andrew Feenberg and A. Hannay, 43-62. Bloomington: Indiana University Press, 1995.

Pitt, C. Joseph. Thinking About Technology. New York: Seven Bridges Press, 2000.

Robbins, Brent Dean. "New Organs of Perception: Goethean Science as a Cultural Therapeutics." *Janus Head* 8 (1) (2005): 113-126.

Seamon, David. "Goethe's Way of Science As a Phenomenology of Nature." *Janus Head* 8 (1) (2005): 86-101.

Sepper, Dennis L. "Goethe and the Poetics of Science." Janus Head 8 (1) (2005): 207-227.

Rockmore, Tom. "Heidegger on Technology and Democracy." In *Technology and the Politics of Knowledge*, edited by Andrew Feenberg and A. Hannay, 128-145. Bloomington: Indiana University Press, 1995.

Sclove, Richard. "Technological Politics As If Democracy Really Mattered." In *Technology and the Future*, edited by A. Teich, 103-121. Boston: Bedford/St. Martin's, 2000.

Wajcman, Judy. "Feminist Perspectives on Technology." In *Technology and the Future*, edited by A. Teich, 137-150. Boston: Bedford/St. Martin's, 2000.

Schraff, Robert, Dusek Val (Editors). *Philosophy of Technology: The Technological Condition*. Oxford: Blackwell, 2003.

Sismondo, Sergio. *An Introduction to Science and Technology Studies*. Oxford: Blackwell Publishing, 2004.

Wahl, Daniel C. "'Zarte Empirie': Goethean Science as a Way of Knowing." *Janus Head* 8 (1) (2005): 58-76.

Wartenberg, Thomas. Thinking On Screen: Film as Philosophy. New York: Routledge, 2007.