EACH THOUGHT AND THING ALLIED: LEWIS MUMFORD ON TECHNICS AND SOCIETY

by

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Each Thought and Thing Allied: Lewis Mumford on Technics and Society

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ABSTRACT

This thesis examines the work of Lewis Mumford (1895-) in an attempt to assess his contribution to the study of the social history of technology. This examination entails a consideration of Mumford's own work as well as an effort to contextualize his thought historically. An American scholar, who is a self-professed "generalist," Mumford has published more than twenty books, in a variety of areas, over the last fifty years. Still, there has been no full-length critical study of his works published.

This thesis, therefore, begins with a general introduction to the range and scope of Mumford's intellectual pursuits. This is presented in the form of two sketches - the first biographical and the second bibliographical. The consideration of Mumford's thought on the question of technology deals with his core works on the subject: Technics and Civilization, Art and Technics, and The Myth of the Machine. Three primary, overlapping themes are found to unite Mumford's work. These themes are The Critique of Industrial Society, The Critique of False Dichotomies, and the Renewal of Life. Mumford argues that the contemporary world is characterised by a series of artificial divisions. In particular, the "Machine Age" overemphasises the "objective," technological aspects of our lives and actively devalues the "subjective" and organic elements of existence. The renewal of life demands a reunification of these elements in a "dynamic equilibrium."

An examination of Mumford's primary sources reveals a hidden tradition of communication thought which begins with Ralph Waldo Emerson, and continues with John Ruskin, Henry Adams, Thorstein Veblen, and Mumford's "Master", Patrick Geddes. Mumford's debt to these thinkers is elucidated through an examination of their major works. Several themes are found to unite these diverse and marginal thinkers: a sense of civilization threatened, an understanding of technology as a social construct, and a belief in the possibility of a reconstituted new world. This thesis argues that Mumford culminates the line of thought represented by this "hidden tradition."

The thesis concludes that while Mumford is heir to a rich tradition of thought on the question of technology his own work is not without originality. His claim to originality lies in his ability as a

synthesiser to unite diverse and sometimes disparate strands of thought into a coherent and unified whole. While his ultimate project of the reconciliation and synthesis of the dichotomies of the Machine Age is unsuccessful, this does not negate his achievement as an acute diagnostician of the modern world. It is found that Mumford's primary contribution to the study of technology resides in the achievement of shifting the focus of consideration away from technology per se and toward a more extensive and comprehensive examination of the social matrix within which technology develops and operates.

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The Department of Communication at SFU is a remarkable world. As my "home" for the last few years, it has afforded me the privilege of meeting and working with a variety of people, too numerous to mention here, who have contributed to the making of this thesis. In a very real sense, this thesis, whose faults, naturally, lie solely with me, is a communal product.

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CHAPTER I

INTRODUCTION

One occasionally encounters a thinker who looms large on the margins of conventional thought, a figure who ranges over several disciplines and resides in none. Such thinkers, who refuse to acknowledge disciplinary boundaries, are often exiled from the realm of acceptable academic pursuits. Lewis Mumford is such an intellectual wanderer who has been banished to relative obscurity for the sin of excessive scholarly peregrination. A self-proclaimed "generalist", Mumford has steadily refused to narrow his focus, to limit his enquiries to a particular field, or to classify himself within one of the social science or humanities disciplines (a word which itself suggests inflexible limits and rigid control).[1]

This thesis seeks to present and assess Lewis Mumford's works, particularly his thought on the social history of technology. It is a premise of this thesis that since Mumford's corpus revolves around the two fundamental issues of intersubjectivity and the relationship of people to things, he may be considered a communication theorist.

Because Mumford stands so firmly outside the traditional departments of academic thought it is tempting to see him, sui generis, as a lonely and heroic figure without precursors and doomed to a posthumous oblivion without heirs. This thesis argues that Lewis Mumford culminates a line of what may be termed a hidden tradition of communication thought which begins with Ralph Waldo Emerson, and continues with John Ruskin, Henry Adams, Thorstein Veblen, and Mumford's "Master," Patrick Geddes. It is suggested further, that Mumford remains a powerful voice who, from the margins, has much to contribute to our understanding of technology.

The remainder of this Chapter is devoted to two sketches of Mumford – the first biographical and the second bibliographical. Chapter II contains the discussion of Mumford's major works in the area of technology and culture. This Chapter considers Technics and Civilization, Art and Technics, and The Myth of the Machine in some detail. These works are presented with reference to the three dominant

themes of: The Critique of Industrial Society, The Critique of False Dichotomies, and The Renewal of Life. Chapter III explores the hidden tradition of communication theorists in an attempt to contextualize Mumford's thought and in order to better assess, in the Concluding chapter, Mumford's unique contribution to the study of technology.

BIOGRAPHICAL SKETCH

Lewis Mumford was born on the Upper West Side of New York in 1895, the same year as the invention by Edison of the motion picture projector, and the year before Marconi premiered the radio telegraph. The Wright Brothers' historic flight would not occur until 1903, and the New York of the turn of the century was still characterized by pedestrian and horse–powered locomotion. Mumford was born into a world on the brink of profound changes, both social and technological. With one foot planted in the nineteenth century and the other firmly rooted in the twentieth, Mumford has been in the dubiously enviable position of witnessing, indeed participating in, the transformations taking place visibly around him.

The domestic situation of Mumford's early years was slightly unorthodox. There was no father in sight, nor any mention ever made of him; paternal parentage was a forbidden topic. It was not until Mumford was forty–seven that he learned the circumstances of his birth: Lewis was born "out of wedlock," and his mother's marriage to John Mumford had long since been annulled, probably on grounds of non–consummation.[2] His mother, despite repeated pleas from Lewis' father, never remarried.

The young Mumford was not, however, divest of male companionship. He credits his life–long interest in the history of the city to the frequent rambling walks with his maternal grandfather through the streets of New York. These perambulations left a lasting impression on Mumford: in each of his autobiographical works he refers to them fondly, and sometimes reverentially.

At school age Mumford attended Stuyvesant High School, an industrial, scientific, and technical school at which he "received the rudiments of a sound technical and scientific education, and in particular achieved familiarity with the basic tools and mechanical process, in cabinet making, smithing, wood and metal turning, and foundry work."[3] His first foray into publishing was with articles for popular technical journals on improvements to the radio set he had built when he was twelve. This early predilection for writing is also seen in his editorship of the high school newspaper.

After high school Mumford enrolled as an evening extension student at City College, New York. City College at this time was a free university requiring no tuition fees, and the extension programme had no formally designated programme for graduation. Mumford took courses in several areas including English poetry, politics, psychology, and philosophy.[4] He eventually accumulated enough credits for a B.A., but never applied to graduate. One wonders to what extent this lack of formal academic qualifications has contributed to the relative coolness of Mumford's reception by the Academy.

After a short stint in the Navy (April 1918 to February 1919), during which time he trained as a radio-telegraph operator,[5] Mumford returned to New York to work on The Dial. The Dial had had an illustrious history, being founded by Ralph Waldo Emerson, and edited by Henry David Thoreau. It published, during Mumford's tenure there, first as a writer of book reviews and then as an Associate Editor, many of the luminaries of the day. One such contributor was Thorstein Veblen, and Mumford's acquaintance with him dates from this time. This "literary apprenticeship" at The Dial constituted Mumford's last "formal job" aside from infrequent periodic stints as visiting professor at various universities.

New York during these very early inter-war years seems to have been a place of buoyant optimism. Along with the excitement of building a new world went an intense interest in discovering an American heritage. Works of American history, literature, and letters flourished alongside a quickening interest in the events taking place in Russia. Although this mood was not to last long, Mumford enjoyed its spirit at the time. He was part of a group of exuberant young intellectuals intent on reconstruction and renewal. A group reminiscent of Emerson's famous Saturday Club met regularly to discuss the state of contemporary civilization. Membership in this group, at one time or another, included John Dos Passos, Harold Stearns, J.E. Spingarn, Katherine Anthony, Van Wyck Brooks, Elsie Clews Parsons, Geroid Robinson, Paul Rosenfeld, Walter Pach, Ernest Boyd, Clarence Britten, and, of course, Mumford himself.[6]

Mumford's first book, The Story of Utopias (1922) seems to reflect this climate in microcosm, as will be seen below. This book, which marked the end of Mumford's literary apprenticeship, was made

possible primarily through the financial support of Sophia Wittenberg who had married Mumford in September, 1921. Although our knowledge of her is indirect, through Mumford's own writing, "Sophy" seems a remarkable woman whose early socialist and feminist sympathies had their influence on Mumford's thought and work.

From 1922 onwards Mumford devoted himself to his writing, pausing briefly for several trips to Britain and Europe, and, in 1942, for a teaching position at Stanford in the Humanities Department. The battlefield death of Mumford's only son Geddes at the age of nineteen left Mumford with a profound personal grief and may also have contributed to his gradually intensifying concern with the subject of war. "1946 found Mumford engaged in a one-man campaign against the nuclear arms race, an issue with which he was passionately identified."[7]

While this quote may contain elements of hyperbole, it is true that both in his writings and deeds Mumford came to be very closely identified with a number of political issues. The first of these positions was Mumford's urgent call, during the early years of the Second World War, for American intervention to help stem the tide of Nazism and Fascism. "This earned Mumford much unpopularity and criticism: friendships were strained and lost and he was attacked at a war-monger, even as a Fascist!"[8] Mumford's battle against nuclear weapons from the mid nineteen-forties to the present constitutes the second of these political positions. Finally, Mumford took an early and leading position against American involvement in the Vietnam war. This again earned him great unpopularity with the establishment. It seems likely that Mumford's intellectual marginality has been reinforced by his vociferous and oppositional political involvement.

Mumford currently lives and works in Amenia, New York, his home for over fifty years.

These brief and bare outlines of Mumford's life reveal little about the man and his thought. It is necessary to look at Mumford's publishing history to put some flesh on the skeleton of this intellectual biography.

BIBLIOGRAPHICAL SKETCH

A comprehensive overview of Mumford's books, articles, newspaper columns, addresses, and reviews is beyond the scope of this thesis. Elmer S. Newman's bibliography, which is exhaustive, is available to those with a more detailed interest in Mumford's oeuvre. The following catalogue and description is not, therefore, complete but does include all of Mumford's book-length publications.

The span of Mumford's book-publishing career to date is exactly sixty years, beginning in 1922 with The Story of Utopias and ending with the autobiographical Sketches From Life in 1982. While there is a fair amount of repetition in these works the scope and depth of Mumford's thought is remarkable. The corpus of Mumford's works, taken together, form an organic whole which, in fact, says more than the sum of its parts. This is true in at least two ways: first, readers, with their own knowledge and life experiences, are able, through their engagement with the books, to make fresh connections with and develop deeper insights into both the corpus itself and the immediate world; second, the works seen as a whole, and spanning a period of over half a century, are a testimony of our times.

The catalogue and review which follows is organized into six major themes or subjects. This division is for convenience only, and there are some works which would readily fit under more than one heading. While the discussion follows a rough chronological order, this is occasionally interrupted in the interests of brevity or clarity.

A. Literary Criticism and American Cultural History

Mumford opens his literary career with a series of works devoted to literary criticism combined with American cultural history. These books in many ways set the stage for Mumford's later investigations - both thematically and methodologically.

1. The Story of Utopias

In his earliest work, The Story of Utopias, Mumford gives expression to several themes that will recur throughout his work. He devotes the last third of the book to an analysis of the contemporary social situation – a section which, in a conventional sense, bears only a tenuous connection to the rest of the book. The first section of the work is a history of literary utopias, the second an account of contemporary social myths or utopias.

Mumford's Preface to The Story of Utopias locates two general strands in the book which reappear consistently throughout his works. One of them is "a foreboding awareness of the problems and pressures of the contemporary world."[9] The other is a sense that "the human adventure had just begun."[10] Mumford also claims quite categorically that: "As a personal document, The Story of Utopias foreshadows, I have no doubt, much of my later work..."[11] An author is not always in the best position to pronounce verdicts on his or her own work, for the inevitable personal involvement is apt to colour one's view. Yet in this case Mumford's judgement seems sound.

The first two-thirds of The Story of Utopias chronicles historically the various literary utopias of the western world. What strikes the reader is that Mumford deals with these works not so much from a literary as a social standpoint. His concern is clearly not with the literary or aesthetic qualities of any utopia but rather with its historical context and significance and the implications for us today. Mumford is quite conscious about his purpose in exploring the utopias of the past:

> We travel through utopia only in order to get beyond utopia: if we leave the domains of history when we enter the gates of Plato's Republic, we do so in order to re-enter more effectively the dusty mid-day traffic of the contemporary world.[12]

This concept, which is embodied in Mumford's method, reflects a consistent theme in his work: art (and technology) exists because of, and must always be understood in relation to, the community out of which it springs. Furthermore, the point of studying the genesis of such a social product is to cast light on the immediate and contemporary world.

The three themes which form the organizing principle for the discussion of Mumford in Chapter II each makes its appearance in this first book. Although I shall employ these categories for this initial introduction to Mumford's work, they will not appear again in the remainder of this chapter.

The Critique of Industrial Society

In the second half of The Story of Utopias Mumford is concerned with exposing the social myths of the modern age. To this end he describes what he sees as the four most powerful social creations of modern society: the Country House (which analysis, incidentally appears more than twenty years later in almost its original form in The Condition of Man (1944)), Coketown, The National State, and Megalopolis. There is not the space here to engage in a detailed discussion of any of these categories. Rather, I hope the salient features of these myths will become apparent in the ensuing consideration.

The most basic of Mumford's criticisms against the modern age with its industrialism, is a position common enough to many thinkers, and we will see its appearance in Mumford's sources:

> Those machines whose output was so great that all men might be clothed; those new methods of agriculture and new agricultural implements, which promised crops so big that all men might be fed – the very instruments that were to give the whole community the physical basis of a good life turned out, for the vast majority of people who possessed neither capital nor land, to be nothing short of instruments of torture.[13]

And the fundament of his continuing critique against the effects of industrialism is beautifully encapsulated in just three sentences in The Story of Utopias:

> Up to a certain point, industrialism is good, especially in its modern neotechnic, electrical phase: Coketown, on the other hand, believes that there is no limit to industrialism.
>
> Up to a certain point – but what point? The answer is, up to the point at which the cultivation of a humane life in a community of humane people becomes difficult or impossible.[14]

The reader will recognize the term neotechnic which plays such a prominent role in the typology developed in Technics and Civilization. It is interesting also to note that the attempt to avoid reducing the analysis to a single and simplistic aspect is quite evident in this first book by Mumford.

A theme, played with many variations, which is prominent in most of Mumford's works, is the question of who or what is in control of technology and man's activites in general. In The Story of

Utopias the problem is expressed as a version of the Roman question: Quis custodiet ipsos custodes?: Who is to control the controller?[15] "The more completely man is in control of physical nature, the more urgently we must ask ourselves what under the heavens is to move and guide and keep in hand the controller."[16] Mumford later strengthens the formulation of this question in a manner that implies very much more than it says: he employs the metaphor of the Sorcerer's Apprentice, frantically and ineffectually trying to stop a process he himself has ignorantly initiated and which threatens to overpower him.

The above quotation asks the question which is at the heart of Mumford's condemnation of the present society's lack of values, and his emphasis upon rediscovering a system of values that will inject meaning into a world rendered senseless by an exclusive concern with quantification and an irrational pursuit of power. We return to this idea in the consideration of Mumford's belief in the renewal of life.

The Critique of False Dichotomies

The most important of the dichotomies Mumford locates is the split between the inner, subjective world and the outer, objective one, and the devaluation of the former in favour of the latter. For Mumford the inner world, the idolum, undergoes as many transformations as the physical, material world, but these changes are all too rarely held to be important. Mumford holds these areas to be essential to one another, integrally interrelated parts to the whole that is human life. Mumford's bitter complaint against most utopian writers and indeed against the mechanized industrial society revolves around the endorsation of this unnatural and forcible separation and one–sided elevation with its concomitant impoverishment of mankind.

This rupture or dichotomy is illustrated most concisely in The Story of Utopias in Mumford's discussion of the historical separation of the artist from the community. The artist begins, first of all, to be divorced from his society by the institution of the Country House. The Country House, with its emphasis on passive ownership rather than production, promotes literature and the fine arts only as the objects of passive appreciation: "In the Country House the arts are not married to the community, but are

kept for its pleasure."[17] And culture itself came to mean not a "participation in the creative acts of one's community" but the acquisition of the products of other communities.[18] This separation implies a further disjuncture: between enjoyment and achievement. The culmination of this trend is the establishment of a notion of good defined by quantities of goods. In a passage that could appear anywhere in Mumford's works, he states:

> More than ever the Country House today tries to make up by an abundance of physical goods for all that it has lost through its divorce from the underlying community; more than ever it attempts to be self-sufficient within the limits of suburbia. The automobile, the phonograph, the radio-telephone have only served to increase this self-sufficiency; and I need not show at length how these instrumentalities have deepened the elements of acquisitiveness and passive, uncreative, mechanical enjoyment.[19]

Coketown arose out of this Country House desire for goods and it is devoted to the production of material goods – "there is no good in Coketown that does not derive from this aim."[20] It is to be expected, then, that the sole question Coketown poses to the arts is: What are they good for? If the answer is not quantifiable, the arts are good for nothing.

Science, too, has undergone a similar separation from social life. It has become a "gross superstition," an end in itself having no contact with the community that produces it. The sciences themselves separate off from each other and pursue highly specialized areas quite independently from each other and the society. Science cannot provide its own values, and

> Unfortunately, when science has furnished the data its work is at an end: whether one uses the knowledge of chemicals to cure a patient or to poison one's grandmother is, from the standpoint of science, an extraneous and uninteresting question. So it follows that while science has given us the means of making over the world, the ends to which the world has been made over have had, essentially, nothing to do with science.[21]

Where art has ceased to be recognized as an end toward anything non-instrumental, science has achieved the status of an end in itself, regardless of the relevance, or lack thereof, of any of its pursuits to the social environment. Although Mumford does not call direct attention to it, the reader may note the reversal here of the conventional formulation of art as an end in itself, and science as directed to the physical betterment of human life.

The analysis of science and art is centred around the critique of the Country House, Coketown, and Megalopolis as social myths or utopias. Mumford will continue to employ this analysis, stressing the falsely oppositional character of science and art, only dropping the somewhat facile and reductive appellations. Indeed, Mumford's hope for the renewal of life depends upon a recognition that these institutions are man-made myths and thus not immutable:

> We may perhaps approach our social institutions a little more courageously when we realize how completely we ourselves have created them; and how, without our perpetual "will to believe" they would vanish like smoke in the wind.[22]

The Renewal of Life

The desire for the renewal of life, manifested in each of Mumford's works, is rooted in the search for values, the problem of ends, the need to answer the urgent question: what are people to do with their knowledge and power? This question is articulated clearly in The Story of Utopias and is even here linked to the phenomenon of the conquest of nature. This aspect is developed more fully in Mumford's later studies.

What Mumford proposes is a reintegration of all the compartmentalized aspects of life. Science and art must be brought into balance and integrated with our social life. The gap must be healed and the dichotomy abolished. "If this dissipation of Western civilization is to cease, the first step in our reconstruction is to make over our inner world, and to give our knowledge and our projections a new foundation."[23] This message is repeated over and over in Mumford's works; what changes is simply the urgency with which it is expressed. This urgency increases gradually but perceptibly until the mid-1940s and the arrival of the atom bomb, when it makes a profound jump and Mumford begins to appeal for nothing less than the very survival of the human race.

The emphasis on a whole and balanced life is central to Mumford's thought. Mumford's books, in their content, reflect this attempt at wholeness and balance in several ways, and The Story of Utopias, although a very early work, is no exception. First, Mumford, as I have suggested, avoids reductive answers to complex questions: in his analysis of various social conditions he takes great pains to point to

both positive and negative attributes and to make his evaluation in the light of all available information. Second, he actively and consciously rejects the compartmentalisation of specialisation and opts instead for the freedom of investigation afforded to the "generalist." Third, in direct contrast to Mumford's perceived artificial dichotomy between the materialist and the idealist, his method combines a thoroughly materialist analysis yet with an emphasis on the ideal, the subjective. The Story of Utopias contains these three elements and embodies the method Mumford will continue to use throughout his long career as a writer.

2. The Golden Day, Herman Melville, The Brown Decades

The Golden Day (1926) is subtitled "A Study in American Literature and Culture" and concentrates on the period between 1835 and 1860. The Brown Decades (1931) is essentially a sequel to the earlier book and is subtitled "A Study of the Arts in America 1865–1895" – a period roughly spanning the death of Lincoln to the Chicago World's Fair of 1893.

The Golden Day opens with an examination of the cultural background of the colonization of the New World. Although Mumford is ultimately concerned with the Golden Day of American literature which he locates between the years 1830 and 1860, he feels it necessary to situate this period in its historical context. Mumford, in fact, reaches even further back in history in order to provide the context for nineteenth century America. The first chapter outlines the dissolution of the old cultural forms of the middle ages and their replacement with an interest in time, space, and money. Mumford then chronicles the rise of abstraction and scientism and their links with Protestantism.

Mumford continues through the first two chapters to depict the social conditions, and their causes, in America during the first half of the nineteenth century. He pays particular attention to the American attitude toward Nature, describing the changing attitudes toward Nature of the pioneer, the Puritan, and the businessman. The "conquest of the physical environment"[24] became paramount with the rise of industrialism, and "Positive knowledge and practical action, which are indispensable elements in every culture, became the only living sources of our own...."[25] All this strikingly foreshadows much of his later

work and can be seen encapsulated in some aspects, expanded in others, in a chapter entitled "New World Utopia" in The Pentagon of Power, Mumford's last critical work.

Mumford moves from this social scene–setting to the central work of the book, which is to present and critically evaluate the five artists with whom American literature reaches its apex of achievement. The five individuals listed chronologically and with the metaphoric appellations Mumford uses to both describe and rank them, are: Emerson, the "Morning Star"; Thoreau, the "Dawn"; Whitman, "High Noon"; Hawthorne, "Twilight"; and Melville, "Night." Emerson, in particular of these five, will be considered in Chapter III.

The Brown Decades deals with a slightly later period in American history and concentrates on architecture, landscape design, and the graphic arts.

Mumford was a Melville critic long before it was fashionable, indeed respectable to be so. It was not until the 1920s that Melville began to be seriously considered as an important literary figure. In fact, American literature in general was in most circles not considered worthy of serious or sustained attention. D.H. Lawrence went a long way toward rectifying this situation with the publication of Studies in Classic American Literature in 1923, in which he dealt with Melville. When Mumford's Herman Melville was published (1929) there had been only one previous full–length study of Melville. Mumford was, then, pioneering the area of Melville criticism. And indeed Mumford's work has withstood the test of time: in many selected bibliographies it is the earliest reference cited.

Herman Melville opens with a sentence that typifies Mumford's method: "The society in which Melville was born...."[26] This method, of always situating a person in the context of his historical situation, characterises not only this book, but every other discussion in which Mumford considers an individual. It should be noted that this method of literary criticism stands directly opposed to the prevalent contemporary approach to literature. Both then and now, the dominant practice in literary exegesis and evaluation can loosely be grouped under the general heading of New Criticism. This position holds, essentially, that the literary text must be considered in and of itself, without regard to external factors.

Mumford, of course, flies in the face of this theory: be believes that literature must be studied as communication, and communication is conditioned and informed by its cultural context.

The study of Melville has two vital functions, the presentation of one dependent upon the presentation of the other, and existing in a dialectical relationship. Mumford is concerned to both depict the social conditions of the time and to reveal the man and the artist, Herman Melville, to the reader. This totalizing picture is achieved through the presentation of the integration of Melville and his world. Melville's works reflect the society in which he lived, and an examination of these works helps us to understand the society. Conversely, the conditions of the society will inform the literary works and reveal aspects of them not comprehensible without reference to the historical situation. Again, this dialectical method exemplifies Mumford's approach to the various subjects with which he deals.

B. Architecture and Civilization

Related closely to Mumford's burgeoning interest in the history and development of the city, the three works under this heading are Sticks and Stones (1924), The South In Archictecture (1941), and finally the work which most overlaps the concern with the city, From the Ground Up (1956), subtitled: "Observations on Contemporary Architecture, Housing, Highway Building, and Civic Design." Mumford also collected, edited and contributed to a volume entitled Roots of Contemporary American Architecture in 1952.

Sticks and Stones, which Mumford subtitles "A Study of American History and Civilization," was the first published history of "American architecture as a whole."[27] This work may also be considered to make up the fourth volume of the series dealing with American culture and history, previously mentioned. And as with most of Mumford's works, the ostensible topic acts as a kind of Archimedean point from which to discuss culture and life in its totality. Mumford himself sums up his method and his conception of architecture:

> In the course of this survey we have seen how architecture and civilization develop hand in hand: the characteristic buildings of each period are the memorials to their dearest institutions. The essential structure of the community – the home, meeting-place, the work place – remains; but the covering changes and passes, like the civilization itself, when new materials, new methods of work, new ideas and habits and ways of feeling, come into their own.
>
> If this interpretation of the role of architecture is just, there is little use in discussing the needs and promises of architecture without relating the shell itself to the informing changes that may or may not take place in the life of the community itself. To fancy that any widespread improvement of architecture lies principally with the architects is an esthetic delusion: in a barren soil the most fertile geniuses are cut off from their full growth.[28]

This last sentence, as we shall see, is a variation on John Ruskin's insistent theme that only a great nation can produce great artists. This entire passage is also a reiteration of one of Mumford's most regular themes, again a legacy from Ruskin: the connection between form and function. The social function of a building must be the first determinant of its form. Similarly, the form of a building will affect its social function. Form and function are often divorced from one another, a false dichotomy, creating deleterious consequences for both. This theme runs throughout Mumford's writings on art, architecture, and city development.

From the Ground Up (1956) consists of reprints of articles from Mumford's "Sky Line" column in The New Yorker. Mumford wrote this column from 1932 to 1962. From the Ground Up, although it makes the occasional generalization, is primarily concerned with the environs in and around New York.

C. The Social History of Technology/Technology and Culture

Technics and Civilization (1934) begins the long examination of what comes to be Mumford's core concern: the social history and contemporary implications of technology. This investigation culminates in Mumford's piece de resistance, the two-volume The Myth of the Machine, consisting of Technics and Human Development (1967) and The Pentagon of Power (1970).

Bridging Technics and Civilization and The Myth of the Machine are two key works: Art and Technics (1952) and The Transformations of Man (1956). Although it is an important work, principally in

preparing the way for the reconsideration of early man which characterises Technics and Human Development, there is little in The Transformations of Man that does not appear in other works to be considered in detail in Chapter II, therefore The Transformations of Man is omitted from the ensuing chapter.

D. The Renewal of Life

This term gives its name to a series of four works: Technics and Civilization, The Culture of Cities (1938), The Condition of Man (1944), and The Conduct of Life (1951). Originally planned and executed as a trilogy, Mumford added a fourth volume in the series in order to more maturely discuss "the final problems of man's nature, destiny, and purpose...."[29] The renewal of life may also be seen as a unifying thread in Mumford's oeuvre as has been mentioned.

As Technics and Civilization begins the long investigation into the social history of technology, so the second volume in the Renewal of Life series, The Culture of Cities, initiates Mumford's life-long concern with the city as a social institution. Where the earlier work examined the psycho-social implications of the physical ordering of the world along mechanical principles, The Culture of Cities focuses on technological man's primary physical habitat, the city. The Culture of Cities, then, may be seen as a companion volume to Technics and Civilization on the question of the structure and organization of the physical and social environment.

The Condition of Man traces historically the changing conceptions of personality and community. The Conduct of Life may be seen either as an introduction to the other three volumes, as Mumford prefers,[30] or as a final summation of Mumford's position on the nature of man. This work is less historical and more philosophical in its organization and subject matter.

The Condition of Man and The Conduct of Life may also be considered as a pair: one which provides the complementary perspective of the inner world. If Technics and Civilization and The Culture

of Cities are principally concerned with man's physical, material existence, The Condition of Man and The Conduct of Life provide the counterpart in their concern with the psychological and metaphysical elements of human existence. The series itself thus embodies another major theme in Mumford's work: the necessity of balance between the inner and outer worlds.

E. The History of the City

I do not propose to consider the works in this area individually, but rather to point briefly to their common features. The one academic discipline in which Mumford may be said to have found recognition is in geography, and this is due chiefly to these five works which deal with the history of the city and urban development. Mumford the geographer is a far less marginal figure than Mumford the philosopher and social historian of technology, and his work in the former area has not been subject to the same neglect as his books in the latter.

The five books which comprise the core of Mumford's writings on the city are: The Culture of Cities, City Development (1945), The City in History (1961), The Highway and the City (1963), and The Urban Prospect (1968). In this, as in Mumford's other areas of pursuit, his concern is with the social history of the city and the human implications of life conducted within the confines of large metropolitan areas. Although critical of the modern city's furtherance of tendencies towards the depersonalization, fragmentation, isolation, and mechanisation of man, Mumford does not believe this to be an intrinsic aspect of city life. Rather, it is a product of forces which organize and "develop" the city primarily with regard to economic considerations which are often inimical to life. Mumford proposes a new system of city development, which will have at its core, not the interests of the land speculator and industrialist, but genuine human needs. As part of the renewal of life the city will engage in its "final mission" which is to "further man's conscious participation in the cosmic and historic process."[31]

F. Political Tracts, Anthologies, and Autobiographical Works

1. Political Tracts

Between 1939 and 1954 Mumford wrote four explicitly political works. While the majority of Mumford's works are characterized by a somewhat polemical style, these four works are dominated by it.

The first two of these works, Men Must Act (1939) and Faith For Living (1940) were prompted by the hostilities in Europe. Men Must Act is both an analysis of fascism and an urgent plea for American armed resistance to it. The rise of fascism, for Mumford, is facilitated by the emphasis on the mechanical: the mechanical world view and its attendant characteristics. Although fascism has taken seed and flowered in Italy and Germany, it is incipient in all post-industrial societies.

Aside from its power as a polemical treatise, Men Must Act is important in its demonstration that Mumford's plea for a more balanced life, to militate against the dominance of the automatic and mechanical, as the sole protection against barbarism is not simply an academic concern with a theoretic possibility. For him barbarism has already shown itself as an all too real, albeit nightmarish, actuality in the guise of fascism. The threat of a similar recurrence is a very real and omnipresent one.

Faith For Living continues where Men Must Act leaves off; it continues the analysis of fascism and reiterates the call to action. Although now dated in its specificity, the work still remains a persuasive argument for the use of force against barbarism. The book reads like an extended political pamphlet, exhorting recalcitrant liberals to take up arms in defense of democracy. It is an impassioned and eloquent plea for armed resistance to fascism and an end to barbarism.

Men Must Act and Faith For Living graphically illustrate Mumford's already evident concern with an analysis of society which has an underlying project of liberation – the renewal of life. Mumford offers a theory of society with an emancipatory intent.

Values For Survival (1946) is subtitled "Essays, Addresses, and Letters on Politics and Education," and Mumford describes it as "variations on a single theme: What must modern man do to be saved?"[32] The work is divided into three books. The first of these, "Essays on Politics," is comprised of the following self-descriptive essays: "Call to Arms" (1938), "The Corruption of Liberalism" (1940), "The Reasons for Fighting" (1940), "The Aftermath of Utopianism" (1941), and "Program for Survival" (undated). This last essay is Mumford's first extended treatment of the dangers of the existence of the atomic bomb. Mumford argues here that nihilism, "the social counterpart of the atomic bomb,"[33] is almost as grave a danger as the physical threat of the bomb itself.

The second book in Values For Survival, "Addresses on Education" is prefaced by a quotation from John Ruskin's Munera Pulveris: "You do not educate a man by telling him what he knew not, but by making him what he was not."[34] The essays in this section are characterised by a stress upon the desirability of a "unified approach in terms of the process of study."[35]

The final book of Values For Survival is entitled "Letters to Germans." Shortly after the war Mumford was approached by the Office of War Information with a request to "write a short book addressed to the Germans, to give them some insight into the way an American looks upon the career of Nazism and the crimes that were committed in the name of Germany."[36] Mumford adopted the form of the letter, addressed to real or composite people, in order to personalize the style and assist in communication.

The final work in this series of political endeavours is In the Name of Sanity (1954). The first sentence of the frontspiece, by Mumford, to the work reads: "The aim of this book is to give fresh insight – and with that insight hope and courage – to those who are disquieted by the violence and irrationality of our times."[37] This work is most memorable for an essay, written in 1946, titled "Assumptions and Predictions." This essay gives first voice to what is now almost a commonplace: the very existence of atomic weapons and the threat of nuclear war, regardless of whether or not war actually occurs, have profound negative consequences. Mumford's Fourth Assumption, in a series of speculative scenarios, is:

> Atomic war does not break out at all. But meanwhile, for at least a century, in every part of the earth it remains a growing threat; and the response to this threat is made only in those departments that can be controlled by individual non-cooperative states. The adaptation is complete.[38]

On this assumption

> ...not a single life has been lost in atomic warfare; nevertheless death has spread everywhere in the cold violence of anticipation, and civilization has been almost as fatally destroyed as it would be under...[a nuclear holocaust].[39]

2. Anthologies and Autobiographical Works

Interpretations and Forecasts: 1922-1972 contains forty-two relatively short pieces, all of them previously published, with the majority (twenty-six) culled from earlier books. The work is useful as an introduction to the scope of Mumford's pursuits.

The four autobiographical works consist of one early book, the biography of Mumford's son Geddes, Green Memories (1947) and three later works which all appear after Mumford's last critical work. This group contains Findings and Keepings (1975), My Works and Days (1979), and Mumford's last published work, Sketches From Life (1982). [40]

NOTES

1. The O.E.D. offers the following, unintentionally ironic, definition of "discipline": "In earlier use, to instruct, educate, train; in later use, more especially, to train to habits of order and subordination, to bring under control." Roget's Thesaurus supports this with the following catalogue of synonyms: "training, drill, practise; RESTRAINT, control, repression, PUNISHMENT, correction," and adds, almost as an afterthought: "see TEACHING." The word discipline as applied to the Academy may very well reflect more of the later usage than the original etymology of "disciple."

2. Lewis Mumford, Sketches From Life. (Boston: Beacon Press, 1982.) P. 26.

3. Lewis Mumford, Technics and Civilization. (New York: Harcourt Brace Jovanovich, 1963 (1934).) Introduction, (1963), unpaginated.

4. Sketches From Life, p. 131.

5. In a curious parallel to H.A. Innis.

6. See Lewis Mumford, Sketches From Life. (Boston: Beacon Press, 1982.) Chapter 26, "Our Great Expectations," pp. 365–381.

7. Michael Hughes, Ed., The Letters of Lewis Mumford and Frederic J. Osborn. (New York: Praeger, 1972.) P. 4.

8. Ibid., p. 3.

9. Lewis Mumford, The Story of Utopias. (New York: The Viking Press, 1962 (1922).) P. 2.

10. Ibid., p. 3.

11. Ibid., p. 9.

12. Ibid., p. 26.

13. Ibid., pp. 115–16.

14. Ibid., p. 220.

15. See also Lewis Mumford, The Transformations of Man. (Gloucester, Mass.: Peter Smith, 1978 (1956).) P. 123.

16. The Story of Utopias, p. 23.

17. The Story of Utopias, p. 204.

18. Ibid., p. 205.

19. Ibid., pp. 210–11.

20. Ibid., p. 214.

21. Ibid., p. 272.

22. Ibid., p. 234.

23. Ibid., p. 268.

24. Lewis Mumford, The Golden Day. (New York: Dover Publications Inc., 1953 (1926).) P. 137.

25. Ibid., p. 140.

26. Lewis Mumford, Herman Melville. (New York: Harcourt, Brace & World, Inc., 1962 (1929).) P. 3.

27. Lewis Mumford, Sticks and Stones. (New York: Dover Publications, 1955 (1924).) Preface, 1954, v.

28. Ibid., p. 91.

29. Lewis Mumford, The Conduct of Life. (New York: Harcourt Brace Jovanovich, 1971 (1951).) Preface, 1970, unpaginated.

30. Ibid.

31. Lewis Mumford, The City in History. (New York: Harcourt Brace Jovanovich, 1961.) P. 576.

32. Lewis Mumford, Values For Survival. (New York: Harcourt, Brace & Co., 1946.) vii.

33. Ibid., p. 92.

34. It is interesting to note that this is Mumford's only reference to Munera Pulveris. It does not appear in any bibliography. This may be an instance of Mumford's assertion that often the most obvious sources don't appear in his bibliographies. I am particularly grateful for its casual appearance here as I rely heavily on this eccentric work by Ruskin in the Chapter on Mumford's sources.

35. Ibid., p. 151.

36. Ibid., p. 242.

37. Lewis Mumford, In the Name of Sanity. (Westport, Conn.: Greenwood Press, 1973 (1954).) Unpaginated.

38. Ibid., p. 23.

39. Ibid., p. 31.

40. Findings and Keepings and My Works and Days, published four years apart, are almost duplicates of each other. Less than a fifth of the material in each of these books is not to be found in the other. The subtitle of Findings and Keepings, "Analects for an Autobiography," despite its rather pompous evocation of Confucius, is descriptive of the structure of both these books. Random diary entries, snatches from letters, poems, short articles, and a play add up to two rather confessional volumes, which, in a mosaic fashion, allow the reader a glimpse of Mumford, his life and world.

CHAPTER II

TECHNICS AND MUMFORD

INTRODUCTION

Before we look at the specifics of Mumford's thought on technology, it will be useful to identify the major themes that underlie his work. I have divided these themes into three major groups, although as implied earlier, this is a fairly arbitrary and flexible classification. The three areas are: The Critique of Industrial Society; The Critique of False Dichotomies; and the Renewal of Life. The first of these may be imagined as overlapping circles with the third as a larger sphere representing a potential which would eclipse them both. It is possible also to identify a core principle which governs the analysis of these three primary themes: an anti-hegemonism. The essence of Mumford's argument runs as follows.

We have artificially divorced certain things that are really interconnected. As a consequence, there has been a loss of balance. The overarching split is between the objective and subjective worlds. This split is false for two reasons. First, historically, technics is a product of the artistic impulse; it is simply the practical side of the human will-to-create. Second, and most important, without human interpretation and values, subjectively derived, the outer world is meaningless. Within this primary sundering of the inner and outer worlds lie a variety of other splits, between: art and technics; science and religion; the rational and the non-rational. [1] An approximation of Mumford's position here is that these are "equations," each side of the same coin. They cannot be understood separately from each other; they cannot be divorced from each other; and finally, one side cannot be said to have a greater "value" than the other.

The metaphor that Mumford most often uses to characterise this split is that of the gods of Prometheus and Orpheus. Prometheus, the god who stole fire from heaven, represents man's domination over the world of nature - the rational/outer/objective world. Orpheus, the god of music and poetry, represents man's attempt to understand himself and this world through art and human-value - the

life–giving impulses of the spirit.

What are the implications of this split? In the first instance, this leads to an increasing tendency toward compartmentalisation and specialisation in many aspects of our lives. Second, but perhaps most significantly, this primary split does not simply relegate these two things to separate and equally valid spheres, but actively devalues one – the subjective – in the process of elevating and making exclusive the other.

The method of science (itself the product, not the cause of technics), with its emphasis on detached objectivity, "seeing is believing" sterile empiricism, becomes imposed on all other aspects of life. The rules governing science become the rules governing everything. Other modes of apprehending and describing the world come to be seen as insignificant, or worse, invalid.

Science becomes subsumed into technology, and the technological or mechanical world view becomes hegemonistic, monopolistic, and autonomous. Mumford, as we have seen, employs the image of the Sorcerer's Apprentice to dramatise this "technics out of control." But, says Mumford, a science or technics not controlled by and for human purposes and values is meaningless at best, and at worst, actively dangerous, as in the most extreme case of nuclear power.

There is, however, a paradox in the ostensible divorce of technics from human purposes. While science and technics have become independent from conscious human direction, at the same time they have become instruments of the negative elements of the subjective world: the irrational pursuit of power and profit. Technology itself is neutral; it has, however, come to be exclusively in the service of these irrational elements in the human psyche.[2]

What is necessary then, for the renewal and reconstitution of life, is to restore Orpheus to his rightful place beside Prometheus. To put technology under the control of genuine, conscious human values, to reintegrate the objective and subjective worlds. This, then, is the project of the renewal of life. The specifics of this project are examined below, and an evaluation offered in Chapter IV.

TECHNICS AND CIVILIZATION

Introduction

Although Mumford had demonstrated in his earliest works an interest in the place of technology, both historically and currently, Technics and Civilization, published in 1934 was his first systematic and sustained investigation into the issue. Although most significant for its timing, the book today remains one of the most important accounts of the social history of technology. In this work Mumford sets out to provide a comprehensive description of the development of technics over the last thousand years.

Technics and Civilization follows the general contours of many of Mumford's works in its organization. The social and cultural stage is meticulously set before the historical and contemporary developments in, and consequences of, technology are discussed. While not sparing of criticism of the dehumanizing elements of technics, the book ends on a note of cautious optimism, with Mumford identifying a new wave of technics based, not on the wanton conquest and destruction of nature and man, but on newly emerging ecological principles. Following this Mumford offers projections for the future: the last third of Technics and Civilization is devoted to the possibility and probability of a renewed technics.

Before engaging in a detailed discussion of the book a word is necessary about Mumford's terminology. The primary distinction between "a machine and a tool lies in the degree of independence in the operation from the skill and motive power of the operator."[3] A machine, then, has a relative autonomy compared to the tool. Mumford recognizes that this is not an absolute distinction; the machine–tool, for instance, tends to blur this discrimination. Mumford, however, seems unconcerned about the vagueness of this definition. The phrase "the machine" carries an even more expansive definition; it is

> ...a shorthand reference to the entire technological complex. This will embrace the knowledge and skills and arts derived from industry or implicated in the new technics, and will include various forms of tool, instrument, apparatus and utility as well as machines proper.[4]

Finally, the term technics itself requires comment. Although the term is nowhere clearly defined, I shall

take the risk of putting words in Mumford's mouth, and, by inference, define the word as referring to both the physical apparatus - the technology, and its application and social uses - the technique. The term includes then both the "hardware" and the "software" of technology and the arena in which they are implemented. In yet simpler terms "technics" substitutes for the lengthier "technological complex."

Mumford prepares the reader for the investigation to follow with a series of questions. I shall catalogue the most significant of these questions here as an introduction to Mumford's main concerns and procedures in the book. While not directly posed in this fashion, the groups of questions define the thematic areas outlined above: preparation and development; the current situation; and prognosis. The first of these areas is asked directly from the opening thesis-statement of Technics and Civilization:

> During the last thousand years the material basis and cultural forms of Western Civilization have been profoundly modified by the development of the machine. How did this come about? Where did it take place? What were the chief motives that encouraged this radical transformation of the environment and the routine of life: what were the ends in view: what were the means and methods: what unexpected values have arisen in the process?[5]

Two further questions anticipate Mumford's analysis of the current situation: How did it happen that "the peoples of Western Europe" carried "the physical sciences and the exact arts to a point no other culture had reached" and adapted the "whole mode of life to the machine....How in fact could the machine take possession of European society until that society had, by an inner accommodation, surrendered to the machine?"[6]

Mumford's lengthy discussion of the possible renewal of life is framed by the following questions. What has limited the beneficence of the machine? Under what conditions may the machine be directed toward a fuller use and accomplishment?[7] These questions underlie the practical purpose of Technics and Civilization and the final list of questions outlines the procedure Mumford will use to arrive at his hope for a reconstruction of the world along more human and humane lines. After asking whether it is possible to detect "the characteristic properties of [an]...emergent order...?", and whether this technics can supercede the "earlier forms of technology," Mumford concludes:

> Can one distinguish and define the specific properties of a technics directed toward the service of life: properties that distinguish it morally, socially, politically, aesthetically from

the cruder forms that preceded it?[8]

Mumford is at pains to do away with the myth of a sudden, and immaculate conception of technics during the "Industrial Revolution." To counter this misconception Mumford insists that Western technics has had a much longer history than the phrase "the Industrial Revolution" suggests. His description of Western technics resides in three phases or "waves" in the history of technics which Mumford locates, describes, and analyses: the eotechnic, paleotechnic, and neotechnic phases. The latter two terms are taken from Patrick Geddes, with the first being Mumford's own. In his subsequent works on the history of the machine Mumford all but abandons these categories, whether because he wished to distance himself from Geddes, because having employed this typology so thoroughly he felt no need to do so again, or because he felt they were invalid, is a matter of speculation. Whatever Mumford's private reasons for dropping these categories they remain a major part of Technics and Civilization and will be considered here.

Mumford uses four basic criteria in his typology: he locates first of all the uses of resources and raw materials as an important dimension of each phase; second, he turns to the energy source of each phase; third, the special forms of production particular to each stage; and finally, the role of the worker in each period. Using this system the three successive and sometimes overlapping waves become evident in the historical process. Here I will offer a general introduction to this typology. Some salient characteristics of each will be examined in the next section.

The first phase, the eotechnic age, runs approximately from 1000 to 1750 A.D. This stage is the dawn age of technics and its two most significant inventions are the clock and the printing press. The eotechnic period saw changes in the means and mode of production; it witnessed the destruction of the guild system, and toward its close, the dissolution of the medieval synthesis. A radical transformation in our ways of seeing and thinking was effected by the clock and the printing press. These inventions, with their tendencies toward standardization, repeatability, and quantification profoundly altered our perceptions of time and space.

The paleotechnic phase begins about 1750 and contains within it what is normally called the Industrial Revolution. Mumford concedes that while a revolution and mass upheaval did occur much of what has been attributed to the Industrial Revolution in England had already taken place in Western Europe. Paleotechnic industry was born out of the breakdown of the old cultural forms of European society. It witnessed the degradation of a large section of the population and saw the creation of the stinking, smoking, deadly industrial cities. Mass production and wage labour became the dominant characteristics of this period of large–scale destruction, both human and environmental, which culminated in the First World War.

The neotechnic phase is more difficult to locate temporally, but it can be seen to have its beginnings around 1832 with the perfection of the water turbine. The paleotechnic and the neotechnic phases overlap here and the paleotechnic ideals and procedures continue to play a major role. However, the neotechnic phase heralds a reversal of the paleotechnic phase. While the latter is characterized by a waste of resources and a mindless bespoiling of the environment, the former begins to be interested in conservation. In general, the principles of the neotechnic age are directly opposed to those of the paleotechnic – so much so in fact that Mumford is acutely aware of the tremendous resistance of a society still dominated by the paleotechnic principles to embrace the life–giving ideals and principles of the neotechnic phase. Mumford recognizes that the neotechnic period, with its emphasis on planned production and distribution in the service of human life, and the conservation of the environment, is to a large extent trapped in limbo by the forces paleotechnic industry serves. Still, the tone and prognosis reveal a guarded optimism that diminishes in Mumford's later works, though he never loses sight of the idea of the "basic communism" which he expects ultimately to characterise the nascent "biotechnic" order.

The remainder of this description of Technics and Civilization is divided under the three themes outlined in the beginning of this chapter, and is followed by a brief concluding discussion. It should be remembered that these themes are not fully discrete.

The Critique of Industrial Society

Mumford's critique of industrial society is centred around the characteristics of the paleotechnic ideology and procedures. This critique is brought into sharper relief by being presented in opposition to the characteristics of the technics in the surrounding periods.

The eotechnic period illustrates, for Mumford, the promise of a humane technics denied and thwarted by later developments. Mumford maintains the Renascence, far from being the birth of a new day, is actually its twilight. As in Hegel's metaphor of Minerva's owl, "the tempo of invention became more rapid, and the multiplication of machines and the increase of power took place" in the dusk of the fading order.[9] As the eotechnic period nears its close, its essential values and underlying humanism are supplanted by the domination of the mechanical world view, which itself has roots in the eotechnic stage. As we will see below, the liberating potential of technics is distorted by the forces which control its development: it is in this sense that we may say the period reflects a promise unfulfilled.

Mumford analyses the three most important inventions of the eotechnic period: two material – the mechanical clock and the printing press; and one intellectual – the discovery of the scientific method. These three inventions brought with them profound changes in both the physical world and our ways of apprehending that world. In a sense all of these developments may be related to communication: the first two as media of communication and the third as a mode of communication. We will, therefore, look more closely at each of them.

The clock is not commonly thought of as a medium of communication, and it may be well to pause here for a moment to clarify the statement. The clock may be seen as such in two ways. First, it is a transmitter of information. And second, it mediates our relationship with other people and with the world.

The mechanical clock developed in the monasteries of the thirteenth century. Its use gradually spread outward from these centres. The clock replaced organic time with all its irregularities and

fluctuations with mechanical time, steady and visibly unrelenting in its passage. The varying seasons, length of days and individual internal rhythms which had previously conditioned human activities are swept away by the inexorable hands of the mechanical clock. The clock, then, can be seen as a kind of leveller: mechanical time applies to all alike, it does not recognize individual differences. In its positive aspect it is a unifying force, in its negative, a homogenizing factor. The clock, says Mumford, "became the new medium of existence"[10] and it gradually came to regulate even organic and biological functions. Time, with the widespread use and acceptance of the mechanical clock, becomes something that appears to happen "by itself," it is no longer mediated and given significance by human actions. In fact the direct reverse happens – the clock comes to be seen as an instrument which itself imparts meaning to human actions. Human actions now become measurable and evaluated by how much time they consume. It is but a short step from the mechanization of the clock to the commodification of time.

From the circular movements of organic time with its endless but varying cycles of birth and death, day and night, summer and winter, time now becomes both uniform and linear. The clock-face remains circular with its hands describing never-ending circles around its face, but the content contradicts the form.[11]

The clock, then, instigated profound changes in the society and consciousness of the inhabitants of the late medieval world. It made possible a way of thinking about the world which is still the dominant one today. In its utility to the developing capitalism the clock was unparalleled. And five centuries after the birth of the mechanical clock Benjamin Franklin could declare, perhaps triumphantly, "Time is Money."

In a later book Mumford quotes Karl Marx: "the clock is the first automatic machine applied to practical purposes; the whole theory of *production and regular motion* was developed through it."[12] Mumford does not employ this quote in Technics and Civilization, but he maintains that the clock was the archetypal machine for all later automatic technologies, the master-model for other automatic machines.

Mumford has some difficulty in assigning pre–eminence to the clock or the printing press, as the following somewhat equivocal statement suggests: "Second to the clock in order if not perhaps in importance was the printing press."[13] But there is no doubt that he considers the development of movable–type print and the printing press as a crucial factor in the emerging of the modern world.

The most important consequence of the development of print, according to Mumford, was that it broke down the class monopoly of culture and knowledge and gave to the common (or at least the literate) person a new sense of the world outside his own immediate circumstances. As print broke class monopolies of knowledge it was essentially a democratising agent. It opened the world in time and provided a reliable vehicle for the transmission and transference of tradition. It faciliated the diffusion of technological knowledge, and gave impetus to further technological development.

But there were and are negative aspects as well: it brought with it a loss of first–hand experiences and contacts and gradually intensified a reliance upon vicarious experience through the book. "To exist was to exist in print: the rest of the world tended gradually to become more shadowy."[14] The printing press "was a powerful agent for producing uniformity in language and so, by degrees, in thought. Standardization, mass–production, and capitalist enterprise came in with the printing press..."[15]

The third eotechnic invention that Mumford sees as of paramount importance in the making of the mechanical world view, which reaches its ascendancy in the paleotechnic period, is the development of the scientific method. As with print, this invention brought with it both gains and losses in the human arena, but it was "without doubt the greatest achievement of the eotechnic phase."[16] The experimental method itself:

> ...owed a great debt to the transformation of technics: for the relative impersonality of the new instruments and machines, particularly the automata, must have helped to build up the belief in an equally impersonal world of irreducible and brute facts, operating as independently as clockwork and removed from the wishes of the observer: the reorganization of experience in terms of mechanical causality and the development of cooperative, controlled, repeatable, verifiable experiments, utilizing just such segments of reality as lend themselves to this method: this was a gigantic labour–saving device.[17]

This introduction of order into a previously inscrutable universe fostered the changing attitude toward Nature as a phenomenon to be understood and, ultimately, conquered. The negative elements of the scientific method emerge as it begins to dominate all other modes of apprehending ourselves and our world. This will be seen more clearly in the ensuing section: The Critique of False Dichotomies.

While these technologies and inventions are themselves neutral, [18] having equal potential for good and evil, the transformed technics of the eotechnic age are gradually "put at the service of morbid ambitions and a corrupt ideology...."[19] As well, having their development so inextricably linked with the negative, dehumanizing forces of mining, warfare, and capitalism, the machine took on an "anti-social bias."[20] The dialectical interplay between machine and society demanded: "...for the further exploitation of the machine, that a social organization, appropriate to the technology itself, should have been invented."[21] And this social organization crystallized around the humanly disastrous paleotechnic economy and technics.

Despite its sad twilight, and the negative uses to which its characteristic inventions were put, the eotechnic day stands for Mumford as "one of the most brilliant periods in history."[22] It was a stage characterised by a fundamental harmony between its culture and its technics, and it left the enduring legacy of a dilation of the human senses.[23]

> The rift between the mechanization and humanization, between power bent on its own aggrandizement and power directed toward wider human fulfillment had already appeared: but its consequences had yet to become fully visible. [24]

The eotechnic phase constituted "the fundamental industrial revolution"[25] and by about 1750 this revolution was complete. After 1750 a new revolution, which had been growing invisibly since the fifteenth century, came into its own.

> ...after 1750 industry passed into a new phase, with a different source of power, different materials, different social objectives. This second revolution multiplied, vulgarized, and spread the methods and goods produced by the first: above all, it was directed toward the quantification of life, and its success could be gauged only in terms of the multiplication table.[26]

This new phase, the paleotechnic, brought with it the worst excesses of "carboniferous capitalism."[27] The period stands as the nadir of human "development." What is so anomalous in this period of history, for

Mumford, is that it constituted an "upthrust into barbarism, aided by the very forces and interests which originally had been directed toward the conquest of the environment and the perfection of human culture."[28]

The paleotechnic period saw the massing of people to urban centres, the growth of what Patrick Geddes called "conurbations" with their filthy and degrading conditions. Wanton destruction, both human and ecological, accompanied the rise of the new economic order. Work becomes an hegemonistic end in itself, and human beings are reduced to the status of things. Pecuniary values replace all others.

What, asks Mumford, can have caused this patently unhealthy, perhaps even fatal, phenomenon to develop? In an implicit critique of Marx, Mumford argues that the degradation of the worker, which accompanied the rise of industrialism and capitalism, cannot be understood in terms of "capitalist production's unfolding itself according to an inner dialectic of development..."[29] According to Mumford: "What lay behind its [capitalism's] sudden impetus and fierce intensity was the new contempt for any mode of life or form of expression except that associated with the machine."[30]

We have seen that the machine entered the paleotechnic stage with an already appearing "anti-social bias." Although the machine, in its essence is the "outcome of man's impulse to conquer his environment and to canalize his random impulses in orderly activities – [it] produced during the paleotechnic phase the systematic negation of all its characteristics..."[31] Its genetic links with mining and warfare become exaggerated during this stage and the needs and forms of organization particular to the mine and the battlefield come to dominate the development of paleotechnics.

Because the machine carried this anti-social bias it necessarily encouraged similar anti-social qualities in the society at large. At the same time as these anti-social qualities are being fostered by the new technological complex the machine itself recedes from the everyday direction of those who use it:

> ...the machine process itself, with its matter-of-fact procedure, its automatism, its impersonality, its reliance upon the specialized services and intricate technological studies of the engineer, was getting further and further beyond the worker's unaided power of intellectual apprehension and political control.[32]

This last point, although clearly made in Technics and Civilization is to some extent underemphasized; it is not until The Pentagon of Power that Mumford more seriously explores its ramifications. And, in fact, The Pentagon of Power may be seen as having at its core the question of precisely why and how this came about: the question of political economy.

The two most important effects of paleotechnic society are the "Destruction of Environment" and the "Degradation of the Worker." These elements are related in two ways. First, the gradual displacement of human by mechanical values permitted the emergence of "a new type of personality..., a walking abstraction: Economic Man."[33] This abstraction can readily be treated as itself a machine, "a means to cheaper mechanical production."[34] This new object could, in turn, be "dealt with in the same spirit of brutality as the landscape:...a resource to be exploited, to be mined, to be exhausted, and finally to be discarded."[35] Second, and more directly, the fouled environment of factory and city had immediate ill-effects on the bodily health of the paleotechnic worker.

In a passage highly reminiscent of John Ruskin, Mumford outlines the paleotechnic attitude toward air and sunlight, and by implication other non-profitable natural resources. "[T]he environment itself, like most of human existence, was treated as an abstraction. Air and sunlight, because of their deplorable lack of value in exchange, had no reality at all."[36]

The "widespread perversion and destruction of environment"[37] had the most immediate and deleterious effect on the bodily health of the paleotechnic population. But there were other, less immediately perceptible consequences. The rise of the factory system demanded the "castration of skill,"[38] and the human being, as worker, was reduced to a state of sensual impoverishment. This condition, which Mumford terms the "Starvation of Life" begins with a "restriction and depletion of the physical body"[39] and migrates into all areas of human experience.

> The eye, the ear, the touch, starved and battered by the external environment, took refuge in the filtered medium of print....The museum took the place of concrete reality; the guidebook took the place of the museum; the criticism took the place of the picture; the written description took the place of the building, the scene in nature, the adventure, the living act. This exaggerates and caricatures the paleotechnic state of mind; but it does not

> essentially falsify it. Could it have been otherwise? The new environment did not lend itself to first hand exploration and reception. To take it at second hand, to put at least a psychological distance between observer and the horrors and deformities observed, was really to make the best of it. The starvation and diminution of life was universal: a certain dullness and irresponsiveness, in short, a state of partial anesthesia, became a condition of survival.[40]

In brief, then, the paleotechnic period, with its "topsy-turvey"[41] values, dominated by the procedures of the mine and warfare, and increasingly characterised by an "over-stressed power ideology,"[42] was inimical to the development of a full and humane life. In a turn of phrase that owes much to Ruskin's "illth", Mumford sums up the period:

> Exploited for power and profit, the destination of most of the goods made by the machine was either the rubbish heap or the battlefield. If the landlords and other monopolists enjoyed an unearned increment from the massing of population and the collective efficiency of the machine, the net result for society at large might be characterized as the unearned excrement.[43]

Although many of the qualities of the paleotechnic stage remain with us, Mumford sees the beginnings of a new technological complex and age. This new period, while not clearly defined, because still emergent, is heralded by the advent of electricity. This stage of development signals also the potential of the renewal of life. It will, therefore, be dealt with under that heading subsequent to the following consideration of Mumford's critique of false dichotomies.

The Critique of False Dichotomies

This critique is not stressed as strongly in Technics and Civilization as in Mumford's later works, although it is evident here. As mentioned earlier, the basic argument has two elements: the falsely oppositional separation of certain phenomena, and the elevation of one side of this split over the other.

There is some ambiguity in Technics and Civilization regarding whether the increasing reverence for the machine is cause or symptom of the problem. But irrespective of this uncertainty, several elements of this phenomenon have profoundly affected the shaping of the modern world.

As we have seen, with the rise of the scientific method and the increasing employment of the machine - neither of these things in itself negative - came a corresponding rejection of "non-instrumental

aspects of thought."[44] The underside of the illuminating lamp of the scientific method was its casting into shadow the elements of human existence which could not readily be apprehended by the scientific method. This involved the displacement of not only the immaterial, psychological, or spiritual human qualities and endeavours, but also, in many instances, the living and organic. The method of the physical sciences, "the isolation of the world from the self,"[45] disturbed the early eotechnic equilibrium between the individual and his environment, and with its emphasis upon the external and objective world implicitly disparaged the "self."

The machine, the embodiment of the preoccupation with the objective, rational and orderly universe, comes to be seen as a new "Messiah."[46] And our other products, (works of art, etc.) which spring from the non-rational, imaginative elements of our constitution are trivialized. In Mumford's terms: we must not "confuse the objective or rational personality with the whole personality..."[47] In short, the paleotechnic stress upon the rational and mechanical has meant the denial of one whole side of human existence, and increasingly only those qualities which furthered the development of the machine were encouraged.

> *In projecting one side of the human personality into the concrete forms of the machine, we have created an independent environment that has reacted upon every other side of the personality.*[48]

The reification of the machine has gone hand-in-hand with the ascendance of a "pervasive instrumentalism"[49] which finds manifestation also in a "purposeless materialism."[50] As the good life is transformed into the goods life[51] "purposeless materialism"

> ...casts a shadow of reproach upon all the non-material interests and occupations of mankind: in particular, it condemns liberal aesthetic and intellectual interests because, 'they serve no useful purpose.'[52]

At the same time that the objective and subjective get pushed further apart, and the objective becomes increasingly hegemonistic, compensations for the mechanical order assert themselves. Thus, for Mumford, war represents "the most disastrous outlet for the repressed impulses of society..."[53] The false sundering of the positive elements of the rational and non-rational from each other, has paradoxically

produced the equally false, and perhaps fatal, union of "the mechanized and the savage primitive."[54] Leading us directly to a discussion of the renewal of life, Mumford claims the above split and destructive re–union

> ...is the alternative to a mature, humanized culture capable of directing the machine to the enhancement of communal and personal life. If our life were an organic whole this split and this perversion would not be possible, for the order we have embodied in machines would be more completely exemplified in our personal life, and the primitive impulses, which we have diverted or repressed by excessive preoccupation with mechanical devices, would have material outlets in their appropriate cultural forms.[55]

The Renewal of Life

There are two parts to Mumford's discussion of the renewal of life in Technics and Civilization. Mumford opens his discussion with a consideration of the emergent neotechnic era, and concludes it with a sketch and programme of the still–to–develop biotechnic order.

The neotechnic stage is, perhaps, the least developed of Mumford's tripartite scheme of technological development. Aside from the characteristics mentioned earlier, the neotechnic period remains rather shadowy. It is seen primarily as a negation of the preceding paleotechnic period – and hence is most clearly seen as what it is not. Perhaps the reason for this ambiguity – a vivid negative portrayal and a vague positive one – may be found in the following statement which Mumford uses to introduce his discussion of neotechnics.

> Now, while the neotechnic phase is a definite physical and social complex, one cannot define it as a period, partly because we are still in the midst of it and cannot see its details in their ultimate relationships, and partly because it has not displaced the older regime with anything like the speed and decisiveness that characterized the transformation of the eotechnic order in the later eighteenth century.... *Paleotechnic ideals still largely dominate the industry and politics of the Western world...*[56]

While the details of neotechnics are obscured, its essence is clear enough: it is a technics in the service of, not antagonistic to, life. In the preceding chapters Mumford has been most concerned to point to the negative and deleterious aspects and effects of the machine. In the last third of Technics and Civilization Mumford turns to the question of the machine's essential nature in order to maintain the

promise of a new, and more humane technological world.

In a word, Mumford holds that this promise is inherent in the very nature of the machine. While the machine itself is neutral with regard to possibilities for oppression or liberation, it does have a central feature: "the machine is a communist."[57] This aphorism requires some elaboration, for this belief lies at the core of Mumford's hope for and trust in an incipient renewal of life.

The renewal of life is seen, by Mumford, as a product of the Machine Age, which carries "an antidote to its own poison."[58] This antidote is primarily the machine's inherent tendencies toward levelling, its characteristic method of the stripping down to essentials, and its aesthetic based on form and function:

> The real social distinction of modern technics...is that it tends to eliminate social distinctions. Its immediate goal is effective work. Its means are standardization: the emphasis of the generic and the typical: in short, conspicuous economy. Its ultimate aim is leisure - that is, the release of other organic capacities.
>
> The powerful esthetic side of this social process has been obscured by speciously pragmatic and pecuniary interests that have inserted themselves into our technology and have imposed themselves upon its legitimate aims.[59]

This may be termed the "dialectic of technics." The problem becomes, then, one of recognizing and assimilating these positive elements of the machine, and rejecting and repudiating those aspects created by the distorting effects of capitalism. The renewal of life entails a dual process: "of making social insititutions keep in step with the machine" and "of altering the nature and rhythm of the machine to fit the actual needs of the community."[60]

To effect this change Mumford proposes a programme, which, in concert with these emerging beneficent characteristics of neotechnics, would lead to the development of the utopian biotechnic order. Economically, this new system means the abandonment of capitalism - by "revolution...whether humane or bloody"[61] and the adoption of "basic communism." Mumford is at pains to divorce this concept from Marxism, claiming in an italicized and parenthesised note (which may have been added after the book's original publication), "*that this communism is necessarily post- Marxian.*"[62] Basic communism is the "chief social implication" of the machine.[63]

The programme for, and characteristics of, basic communism, has four components: increased conversion, economized production, normalized consumption, and socialized creation. A brief word about each of these will conclude this section.

By increased conversion Mumford means the development of efficient and clean sources and systems of energy. This calls for the socialization of land and raw materials and resources. Pecuniary interests, which today dominate production, must give way to a production based on the collective needs of the society. This implies:

> ...the reduction of trivial and degrading forms of work: it likewise means the elimination of products that have no real social use....In addition, the stimulation of invention and initiative within the industrial process, the reliance upon group activity and upon intimate forms of social approval, and the transformation of work into education, and of the social opportunities of factory production into effective forms of political action...[64]

Normalized consumption entails the establishment of a "vital standard"[65] which would allow everyone "an adequate diet, proper facilities for hygiene, decent dwellings, sufficient means and opportunities for education and recreation."[66] Socialized creation is at once an element in the programme toward basic communism, and its goal. It involves the "realization that the creative life, in all its manifestations, is necessarily a social product."[67] It also demands an end to the unnecessary division and specialization of labour. The economic system of basic communism has, as its "essential task" the production of "a state in which creation will be a common fact in all experience: in which no group will be denied, by reason of toil or deficient education, their share in the cultural life of the community, up to the limits of their personal capacity."[68]

When basic communism is instituted, society will be in a position to move toward the ideal state of "dynamic equilibrium." False dichotomies will be abrogated and equilibrium in the environment, in industry and agriculture, and in population will characterise the utopian biotechnic world.

Conclusion

Technics and Civilization is Mumford's first effort to trace the "dehumanization of society through capitalist exploitation and military conquest."[69] The machine has played a role in this progressive dehumanization, although in its essential nature, it is "ambivalent. It is both an instrument of liberation and one of repression."[70] The machine, by being yoked to capitalism's expansion has contributed to this dehumanization and at the same time has "seemed to have a reality and an independent existence apart from the user."[71] This reification of technics has obscured both its connection with the dehumanizing aspects of capitalism, and its true nature. This has led to either an outright repudiation and condemnation of the machine with a concomitant retrogressive desire for an older order, or to an unqualified embrace of the machine with a corresponding belief in the machine as saviour. This latter attitude, which Mumford sees as prevalent, has led to the cult of the machine, the transformation of technics into a new religion, with the Machine as Messiah.

In an effort to correct these obscurities and distortions, Mumford has attempted to present a "balanced" picture of the strengths and weaknesses of technology. Whether, and to what extent, this attempt is successful will be considered in Chapter IV of this thesis.

ART AND TECHNICS

Mumford's next major work on technology, Art and Technics, published in 1952, was originally a series of lectures. In book form they constitute a series of discrete but interconnected essays. The titles of these essays, more or less self-descriptive, provide a useful overview of the major areas of concern in Art and Technics: "Art and the Symbol", "The Tool and the Object", "From Handicraft to Machine Art", Standardization, Reproduction, and Choice", "Symbol and Function in Architecture", and "Art, Technics, and Cultural Integration".

Mumford's intention in this book is to examine the "relations between art and technics" which "give us a significant clue to every other type of activity, and may even provide an understanding of the

way to integration."[72] Art and Technics contains Mumford's most elaborate definitions of the two terms:

> We ordinarily use the word technology to describe both the field of the practical arts and the systematic study of their operations and products. For the sake of clarity, I prefer to use technics alone to describe the field itself, that part of human activity wherein, by an energetic organization of the process of work, man controls and directs the forces of nature for his own purposes.[73]

Problematic as this definition may be, Mumford's definition of art is even more general and vague:

> Art, in the only sense in which one can separate art from technics, is primarily the domain of the person; and the purpose of art...is to widen the province of personality, so that feelings, emotions, attitudes, and values, in the special individualized form in which they happen to one particular person, in one particular culture, can be transmitted with all their force and meaning to other persons or to other cultures.[74]

The distinction between art and technics, is, however, a clear one:

> Because of their origin and purpose, the meanings of art are of a different order from the operational meanings of science and technics: they relate, not to external means and consequences, but to internal transformations...[75]

Yet at the same time that art and technics have their separate provinces, they are not unrelated in their origins and functions. The "divergent development of art and technics during the last few centuries"[76] is the core theme of the book and will be considered below under the heading "The Critique of False Dichotomies."

Mumford states that his "purpose in these lectures is to bring these two sides of life into working relationship once more...."[77] The contours of Mumford's argument, elaborated upon below, may be summed up briefly.

Art and technics have a genetic relationship, each one satisfying some basic human need and impulse. Mumford himself has nicely summed up the respective areas:

> Art and technics both represent formative aspects of the human organism. Art stands for the inner and subjective side of man; all its symbolic structures....Technics...develop mainly out of the necessity to meet and master the external conditions of life, to control the forces of nature and to expand the power and mechanical efficiency of man's own natural organs, on their practical and operational side.[78]

This complementary relationship, however, has rarely been in balance, and today the objective,

mechanical, realm of technics has come to dominate the whole human personality. Art has proven powerless to defeat this imperialism, for the modern arts "are so conditioned by the very disintegration they draw upon for nourishment that they are incapable, without themselves undergoing a profound spiritual change, of bringing a new balance and security into our life."[79] Modern art can still diagnose, but it has lost its power to cure.[80] Violence in the external world, and nihilism in the arts characterise the day. Blake's aphorism: "Art degraded, imagination denied, War governed the nations," hangs as a dark cloud over much of this book.

The situation is not, however, completely hopeless. Using the technologies of print and the photograph as "case studies" Mumford attempts to describe the interrelationship of art and technics in both their negative and positive aspects. He concludes through this examination that art and technics, the subjective and the objective, may be brought into balance. The beginning of this balance is the recognition and understanding of the proper functions and spheres of each. This possible integration of art and technics is discussed below as "The Renewal of Life."

Critique of Industrial Society

This aspect of Mumford's thought, perhaps because it was so strongly emphasized in Technics and Civilization, receives only brief treatment in Art and Technics. Nothing is added to the analysis offered in the earlier book, and in Art and Technics Mumford's core argument revolves around the Critique of False Dichotomies. Accordingly we shall immediately turn to that topic.

Critique of False Dichotomies

Mumford makes two basic assumptions in Art and Technics. These assumptions, taken together, form the essence of both his critique of false dichotomies and indeed his primary argument in the book.

> My basic assumption is that our life has increasingly split up into unrelated compartments, whose only form of order and interrelationship comes through fitting into the automatic organizations and mechanisms that in fact govern our daily existence.[81]

In a series of questions that reveal obvious assumptions, Mumford expands the final element of the above

quote. Underlying Art and Technics, he claims, was

> ...an effort to arrive at a crucial question of our time: Why has our inner life become so impoverished and empty, and why has our outer life become so exorbitant, and in its subjective satisfactions even more empty? Why have we become technological gods and moral devils, scientific supermen and aesthetic idiots – idiots, that is, primarily in the Greek sense of being wholly private persons, incapable of communicating with each other or understanding each other.[82]

The two fundamental elements of the critique of false dichotomies, as outlined earlier, are also present here: the artificial division of art and technics, and the ascendance of the latter over the former.

In Art and Technics Mumford makes his first concentrated attempt to trace historically these phenomena: a project which becomes the core endeavour of Technics and Human Development. The basic features of Mumford's argument are outlined below.

In order to demonstrate that the "divergent development of technics and art over the last few centuries" is actually an aberration, Mumford must, of course, insist upon their more "natural" unity, or at least complementarity. To this end he speculates on the origins and functions of each, and concludes with a two-sided argument appropriate to the bilateral critique of false dichotomies. Art and technics, says Mumford, developed side by side, each representing a fundamental aspect of the human personality, but in essence art must be seen to have priority over technics.

Mumford rests his argument of the relative priority of art over technics upon the claim that man's unique trait is his capacity to symbolize.[83] Arguing from this that it is art which is the unique, indeed the defining, characteristic of the human,[84] Mumford claims "the function of communication precedes the function of work, and is of immensely greater significance for the development of human society."[85] Speech, the "greatest of man's symbolic functions,"[86] is intimately connected to, and indeed forms the genetic base for, art. The essential function of art – social communion – is identical to the function of speech. And, although man is both a tool-maker and a symbol-maker:

> Man was perhaps an image maker and a language maker, a dreamer and an artist, even before he was a toolmaker. At all events, through most of history, it was the symbol, not the tool, that pointed to his superior function.[87]

Mumford employs the metaphors of the gods Orpheus and Prometheus to represent, respectively, the spheres of art and technics. And in this metaphorical mode Mumford makes his strongest statement to date for the importance of art and its chronological (and ontological) priority over technics. Mumford disputes the "Promethean myth" that fire, and by extension technics,

> was the original source of man's development. Against that view, or rather as a supplement to it, I have sought to show grounds for believing that Orpheus, not Prometheus, was man's first teacher and benefactor; that man became human, not because he made fire his servant, but because he found it possible, by means of his symbols, to express fellowship and love, to enrich his present life with vivid memories of the past and formative impulses toward the future, to expand and intensify those moments of life that had value and significance for him.[88]

Through much of man's history Orpheus reigned supreme; control of the physical environment was attempted primarily through symbolic means - prayers, rites, etc. Aesthetic symbolism was applied, then, not only to its proper province

> - works of poetry and art, systems of conceptual knowledge like mathematics, or patterns of law and custom - but also to the physical environment and to natural forces: he foolishly invoked art and ritual to bring on rain or to increase human fertility. Without the counterbalancing interests and methods of technics, man might easily have gone mad, in that his symbols might have progressively displaced realities and in the end have produced a blind confusion that might have robbed him of his capacity for physical survival.[89]

As attention began to be increasingly turned toward technics a balance between the subjective and objective worlds was approached.

However, with the increasing preoccupation with the mechanical, the technical, the external, came the opposite imbalance. The need for order and power, which originally turned man toward technics, and helped to bridle a "curdled subjectivity"[90] gradually became the predominant motivating forces of human existence. "Unable to bring the various parts of his life into harmony, he traded wholeness, so to say, for order; that is, order of a limited mechanical kind."[91] The new emphasis on the external and the mechanical progressively displaces the human person from the picture, and impoverishes the inner life.

This historical perspective provides the backdrop for Mumford's discussion of the situation today, a situation characterised, as we have seen, by the split between art and technics and the over-valorisation of the latter. Mumford examines the condition of art and technics, and pronounces them both to be in an

unhealthy state.[92] Technics has gradually become more impersonal, apparently autonomous, compulsive, and tyrannical.[93] At the same time art has become neurotic, irrational, empty, and self-destructive.[94]

In an effort to examine the existing relationship betweeen art and technics Mumford discusses the positive and negative elements of the "democratization of the image"[95] through mechanical reproduction. The positive elements Mumford claims are so obvious as to be not worth dwelling upon. The negative aspects, on the other hand, he claims have not been taken seriously enough. There has grown up, along with the technical capacity of mass production and reproduction, an assumption that to have this ability implies an obligation to use it to its fullest capacity.[96] Through their incontinent mechanical proliferation, aesthetic symbols have progressively been emptied of meaning. As well, the imperative of the machine age to produce goods not in the interest of genuine human needs, but for the purposes of "power and profit"[97] and its concomitant duty to constantly consume have contributed to this "perversion of technics" which "saps the vitality of real art."[98] It does this in two ways: "first by destroying any sound basis for discrimination and then by taking energy and attention away from those aspects of human experience in which the unique and the personal are supremely important."[99] This "miscarriage of the machine"[100] has caused the "canons of conspicuous waste"[101] to replace aesthetic sensibility.

Overwhelmed by "the rank fecundity of the machine,"[102] we are, like the Sorcerer's Apprentice threatened by the very instruments which once promised liberation. And, as in the Goethean fable, our salvation lies in our ability to once more master these forces that have escaped our control.

The Renewal of Life

Mumford's discussion of the renewal of life is, in this work, centred around the possible reconciliation of art and technics. Again, his intent is to further the process toward dynamic equilibrium, to bring together "the mechanical and the personal, the objective and the subjective sides of our life, in order to establish them once more in an organic working relationship."[103]

This involves the cultivation of a "purposeful selectivity"[104] with regard to machine products; a repudiation of the "terrible burden"[105] of compulsive consumption, and a more discriminating attitude toward what, and how much, the machine may produce. Mumford sees two signs of hope that industry itself is undergoing positive transformations. The first of these is "a shift in interest from the mechanical process to the human operator" and the second, industry's "keen attention to the aesthetic qualities of its products."[106]

These signs, however, are no guarantee of renewal, and the first really encouraging step toward regaining control of the machine will be the recognition of one of its central characteristics: unlike art, the machine may, and should, attain a state of "static perfection." [107]

> In short, the machine, and the machine arts, when taken on their own essential terms, are necessarily stable, like all type forms, and there is nothing more fatal to a good machine form than irrelevant subjectivity, misplaced creativeness, meretricious uniqueness....[108]

In short, we arrive at the paradoxical notion that a crucial element in regaining control of the machine is the necessity of permitting it its own true development.

THE MYTH OF THE MACHINE

In the late 1960s Mumford's crowning work appeared: the two-volumed The Myth of the Machine - Technics and Human Development and The Pentagon of Power.

Technics and Human Development

The first volume of The Myth of the Machine spans the period from prehistory to the sixteenth century. This work serves two essential functions: it elaborates upon the thesis sketched in Art and Technics of the priority of art over technics; and, with the introduction of the concept of the megamachine, sets the stage for the second volume, The Pentagon of Power. Since this work may be seen

as a lengthy postscript to Art and Technics and a preface to The Pentagon of Power I shall not here have recourse to the tripartite division I have hitherto used. Instead, I shall briefly discuss Mumford's major points in the book, attending to his speculation on the pre-history of man, and stressing those elements absent from Art and Technics. I will conclude with an explication of "the megamachine" – the one radically new idea in the book, and one which plays such an important role in its sequel.

Implicit in Mumford's earlier work, is a view of "human nature" which he now makes explicit and central. Mumford wishes to dispel the belief that what makes man human is his ability to fashion and use tools: the view of "homo faber." Against this Mumford poses the view that the human involves primarily the ability to symbolize. Further:

> ...man is pre-eminently a mind-making, self-mastering, and self-designing animal; and the primary locus of all his activities lies first in his own organism, and second in the social organization through which it finds fuller expression. Until man had made something of himself he could make little of the world around him.[109]

An essential component of Mumford's argument is the position that man's development has "always had a subjective, non-adaptive, sometimes irrational side,"[110] and man's first preoccupation was with controlling this "inner unruliness."[111] The importance of this perspective will not become fully clear until we examine The Pentagon of Power.

On this view, "cultural 'work' by necessity took precedence over manual work."[112] Furthermore, Mumford suggests that the symbol and the ritual were developed as a way of controlling the "lawless absolutism of the unconscious,"[113] a way of bringing order into a world terrifying in both material exigencies and in man's inner workings, such as the dream. The earliest technology was the "technology of the body."[114] Mumford thus argues that "the technological implications of body alteration and decoration must not be overlooked. Possibly the passage from purely symbolic ritual to an effective technics was opened through surgery and body ornament."[115] The implications of this line of thought are clear: technics is a product of art.

Technology in turn completes the rescue of thought from its "helpless immersion in dream and myth."[116] But at the same time, technics itself, stemming as it does from the delight and necessity in repetition of ritual, is not free from "both transcendental aspirations and demonic compulsions."[117]

While this is the central point made in the first half of Technics and Human Development, there are two other important elements which should be mentioned. The first of these is a correction of what Mumford sees as a major flaw in Technics and Civilization: the omission of consideration of a crucial element in technics. This element is the container, less destructive and masculine than the other early technologies of the hunt. The container, from jars and cups to libraries and cities, bears the imprint of the female of the species. Significantly, in another context, Mumford even refers to language as "the great container of culture."[118]

Another important element, indeed purpose, of the book is a graphic representation and modification of a point made in Technics and Civilization, namely, the long history of the development of technics. Again, there is the disagreement with the notion of a fairly recent Industrial Revolution which is discontinuous with earlier historical trends. For Mumford, the Middle Ages are a time of tremendous technical achievement which in turn rely heavily on older technical developments.

These arguments, in whole or in part, fulfill several essential functions for the design and purpose of The Myth of the Machine. First, the attack on the myth of the Industrial Revolution is intended to lay bare a less innocuous myth: the myth of Progress, upon which rests the justification for much of the violent imperialism – both military and mechanical – of the modern age. In brief, the concept of Progress demands the creation, if not the actuality, of a time of horrors and ignorance from which we have progressed. The Middle Ages become transformed retrospectively into this whipping boy. The idea of Progress through mechanical invention and expansion is the primary justification of their position given by those contemporary proponents of technology whom we may term, at the risk of being reductive, "technophiles."

At the same time, the stress on the natural origins and the long continuous history of technics also responds to those "technophobes" who see the machine as a modern and essentially extrinsic phenomenon which must be abolished before mankind can be liberated.

Finally, these anthropological and historical arguments, together with the concept of the megamachine (to be examined below) permit Mumford to make a case for the possibility of a technics in the service of life. We will return to this point following consideration of the megamachine.

A good deal of Technics and Human Development is devoted to the concept of the megamachine. Mumford identifies the first great machine, and the archetype of later machines, as arising during the Pyramid Age and consisting of human components. The slave gangs who built the pyramids and performed other large-scale mechanical feats, and the bureaucratic apparatus developed to manage this enormous labour pool, together constitute the megamachine.

> This was an invisible structure composed of living, but rigid, human parts, each assigned to his special office, role, and task, to make possible the immense work-output and grand designs of this great collective organization.[119]

Large-scale standardization, interchangeability, and mechanisation thus find their first expression in this great organic machine. The "invention" of the megamachine is an extension of Mumford's earlier assertion that the earliest technological experiments were conducted upon the human body.

The creation of the megamachine involved the establishment of new forms of social power centred upon the divine king, with a vast bureaucracy radiating out from him. A cult of power grew up around, and ensured the continued operation of, the megamachine. The megamachine could take shape either as a "labour machine" or a "military machine."[120] But the army became the "standard model of the megamachine,"[121] and war its usual form of transmission from one culture to another.

The "technical equipment derived" from the megamachine Mumford terms megatechnics. This concept enables Mumford to make the distinction, so important for the renewal of life, between authoritarian and democratic technics.[122] The first of these technics is, in our day, in the service of the reconstituted megamachine and the "pentagon of power," while the second has the potential to serve the

forces of life.

The Pentagon of Power

The Pentagon of Power picks up the chronological narrative where Technics and Human Development left off – the beginning of the sixteenth century. This second volume of Mumford's magnum opus is a rectification of the somewhat naive optimism of the early Technics and Civilization. This hopeful anticipation of an impending, more humane technics clearly needed to be rethought in the context of nuclear power and an escalating arms race, the Cold War, the Vietnam War, and the continued dehumanization of man by machine. That rethinking demanded the inclusion of a more serious consideration of the political economy of technics. The Pentagon of Power is, therefore, primarily devoted to a critique of the contemporary technological society.

The Critique of Industrial Society

The Pentagon of Power opens with a discussion of the historical prelude to the reconstitution of the megamachine and the coeval power complex. Here, Mumford is concerned to trace the rise of "scientific thought," which, following Bertrand Russell, Mumford characterises as "power thought."[123] He also discusses the earliest components of the new megamachine which will reach its full development in the twentieth century.

The new astronomy of Copernicus is seen as the first step toward the rejuvenation of the megamachine. The new heliocentrism recapitulated the Egyptian worship of Atum–Re, the Sun God.[124] With the sun as the centre of the universe, a fact discovered through scientific observation, Christian theology – with its location of man at the centre of the universe and its stress upon revelation rather than observation – gradually ceased to be the accepted explanatory principle of existence. At the same time, the new astronomy's emphasis upon mechanical causes, vast and impersonal, contributed to the making of the mechanical world picture.

> Astronomy prepared the ground for the great technical transformation that took place after the sixteenth century: for it provided the frame for a depersonalized world picture within which mechanical activities and interests took precedence over more human concerns. The organization of this world picture was largely the work of a series of mathematicians and physicists who count among the great luminaries of all times. Beginning with Copernicus, Kepler, Galileo, and Descartes and culminating in Leibnitz and Newton, their systematic descriptions of space, time, motion, mass, gravitation eventually brought about a major shift in technology: from the workshop to the laboratory, from the tool-using craftsman and artist, himself a prime mover as well as a designer, to the complex power-driven automatic machine under centralized direction and remote control. And it was this world picture, not individual mechanical inventions alone, that contributed to the final apotheosis of the contemporary megamachine. [125]

Mumford devotes considerable space to a consideration of Francis Bacon, who on the one hand stands for a humanistic science and on the other bears some measure of responsibility for the evolution of "science as technology." Both these possibilities are embodied in Bacon's famous assertion that the goal of science is "the relief of man's estate." A foreshadowing of the twentieth century obsession with power is seen in Bacon's aphorism, "Knowledge is Power." And one of Mumford's projects in this book is to examine the relationship between power and knowledge.

The new science, coupled with its emphasis on the mechanical, a developing capitalism and a crumbling feudal order, and an increasing centralization of political power conspired to overthrow the existing polytechnic tradition - a tradition rich in human skill and creativity. In its stead was established a "monotechnics" which in turn provides the foundation for the megatechnics which characterises our own age.

Having set the historical stage Mumford is now in a position to turn to the actual constitution of the new megamachine. He notes three primary pre-twentieth century components. First was the re-birth of the Sun God in the heliocentric system of Copernicus, which provides the "cosmic religious preparation."[126] Second was an increasing tendency toward centralized political power which culminates in the emergence of the "impersonal sovereignty of the State."[127] Along with this last element came the increasing reliance on the standing army. "With the coalition of political absolutism, military regimentation, and mechanical invention came the re-introduction of an ancient institution that had long been in abeyance: forced labor and compulsory national service for war."[128] This third factor completed

the preparation for the final rejuvenation of the megamachine in the twentieth century.

Mumford notes that by the beginning of our century there were still two elements missing - "a symbolic figure of absolute power, incarnated in a living ruler, a corporate group, or a super-machine; and a crisis sufficiently portentous and pressing to bring about an implosion of all the necessary components."[129] Demonstrating his fondness for triadic typologies, Mumford again locates three principal stages in the reconstruction of the megamachine. In brief, these stages are: the development of the national state after the French Revolution of 1789; World War I; and finally the totalitarian states as represented by Stalin and Hitler. The aerial bombing of civilians, practiced in the Second World War by both Allies and Axis alike bears testament to the demoralization and dehumanization already in effect: it represents "an unconditional moral surrender to Hitler."[130]

There remained, however, one final component missing from the megamachine. In a rather curious return to the stress on energy so evident in Technics and Civilization, Mumford states: "Under the stress of war, the missing component of the megamachine, the form of energy whose coming Henry Adams had predicted, was finally unlocked and utilized: 'Bombs of cosmic violence.'"[131] Mumford is referring here, of course, to atomic power. There are two particularly significant implications of this last element of the megamachine. First it gives "the scientists a central place in the new power complex and resulted eventually in the invention of many other instruments that have rounded out and universalized the system of control first established to meet the exigencies of war."[132] Second, "*...in order to keep that megamachine in effective operation once the immediate military emergency was over, a permanent state of war became the condition for its survival and further expansion.*"[133] The threat of nuclear annihilation provides the basis for this "permanent state of war."

Mumford sums up the parallels between the Pyramid Age and the Nuclear Age.

> Once again, a Divine King, embodying all the powers and prerogatives of the whole community, supported by a revered priesthood and a universal religion, that of positive science, had begun the assemblage of the megamachine in a technologically more adequate and impressive form. If one forgets the actual part played by the King (wartime American President), by the Priesthood (secret enclave of scientists), by the vast enlargement of the bureaucracy, the military forces, and the industrial establishment, one would have no realistic

conception of what actually took place. Only in terms of the Pyramid Age do all the seemingly dispersed and accidental events become polarized into an orderly constellation. The construction of the modernized totalitarian megamachine, fortified by the invention of mechanical and electronic agents that could not be fully utilized until this assemblage had taken place, proved to be Hitler's most sinister, if wholly unintended, contribution to the universal enslavement of mankind.

Thus, one of the supreme feats of modern man's understanding of the ultimate constituents of the 'physical universe,' culminating in his unlocking of the very energies that the Sun God commands, came about under the pressure of a genocidal war and the threat of wholesale annihilation: a condition that paralyzed all life–conserving and life–promoting efforts. The continuation of that state, with the deepening and widening of the crisis in the ensuing Cold War, has greatly increased the malign possibilities that Henry Adams foresaw.[134]

There are two differences between the ancient and contemporary megamachine. The first of these is the diminished importance of human components. The second is the employment of systems of instantaneous communication. Mumford recognizes that the previous megamachine "would hardly have been conceivable without the invention of writing."[135] But he sees the properties and contribution of modern electronic media as of a qualitatively different order from the advantages of writing to the older system.[136] This factor, plus the greater difficulty of opposing the impersonal state, helped to remove the traditional limitations of the megamachine. The "omni–computer" which comes to substitute for the Divine King further strengthens the megamachine's vast and impermeable facade.

The similarities between the two megamachines far outweigh their differences. The ideology underlying both megamachines is one oriented toward death and away from the development and nurturance of life. It "ignores the needs and purposes of life in order to fortify the power complex and extend its domain."[137]

The Power Complex is synonymous with the "myth of the machine."[138] Mumford defines it as: "a new constellation of forces, interests, and motives, which eventually resurrected the ancient megamachine and gave it a more perfect technological structure, capable of planetary and even interplanetary extension."[139] From this is it clear that the megamachine is the vehicle through which the power complex pursues its aims. The power complex, or the Pentagon of Power, is comprised, not surprisingly, of five essential ingredients, each of which originally had its valid place within the "ecosystem" and performed its

necessary function.[140] "What the power complex did was to wrench these separate components from their organic matrix and enclose them in an isolated sub–system centred not on the support and intensification of life but on the expansion of power and personal aggrandizement."[141]

The power complex rests upon, and has as its ultimate goal, the pursuit of power. Although power as energy is referred to, Mumford here is concerned primarily with social power. Mumford sums up the Pentagon of Power:

> Organized political power backed by coercive weapons is the source of both property and productivity: first of all in the cultivation of the land, using sunpower, and then at later stages in every other mode of production. Mechanical productivity, linked to widening markets, spells profit; and without the dynamic stimulus of profit – that is, money power – the system could not so rapidly expand. This perhaps explains why cruder forms of the megamachine, which favored the military caste rather than the merchant and industrial producer, and relied on tribute and pillage, remained static, and in the end unproductive and unprofitable to the point of repeated bankruptcy. Finally, no less an integral part of the power system is publicity (prestige, *panache*), through which the merely human directors of the power complex – the military, bureaucratic, industrial, and scientific elite – are inflated to more than human dimensions in order better to maintain authority.[142]

Power, property, productivity, profit, and publicity coalesce in the service of the ultimate goal – "progress."[143]

Elsewhere Mumford notes: "In a short time, the orginal military–industrial–scientific elite became the supreme Pentagon of Power, for it incorporated likewise both the bureaucratic and educational establishments."[144] Mumford uses the term Pentagon of Power in two, interchangeable, ways. It is both the elite who direct the megamachine, and the fivefold alliterative components outlined above.

The current situation, then, sees the realization of the "ultimate goal" of the megamachine – "[p]redictable behaviour and remote control from the centre."[145] The new power complex encourages the convergence of science and technics and finally the conversion of science into technics. Science is now "pursued relentlessly for practical ends: material wealth, political control, and military power, all ostentatiously dressed up and prettified as 'the relief of man's estate.'"[146]

There are several profound psycho–social consequences of the new power system. The first of these is an idea not new to Mumford, but formulated by Marx: the gradual dissolution of individual and cultural differences. With the loosening of the "binding ties of habit, custom, and moral code," says Mumford, comes the re–creation of a monolithic human personality: Organization Man. This "cultural type" is the common result of both the ancient and the modern megamachines.[147] His "concern with quantitative accountancy,"[148] and his delight in repetition and standardization return us to the theme of the "natural" basis of these propensities, insisted upon in Technics and Human Development.

> It is precisely because mechanical order can be traced back to these primal beginnings, because mechanization itself has played a constant role in human development, that we can now understand the danger of isolating Organization Man as a self–constituted personality, detached from the natural habitats and cultural traits, with their limitations and inhibitions, that ensure a fully human character.[149]

The Critique of False Dichotomies

The essential argument as we have seen Mumford present it remains the same, but with a shift in emphasis. The second half of the critique – that of the false ascendancy of one side of each dichotomy – is now posed as a problem of "one–sided universalism."[150] Again, we are reminded of a concept from Marx: that of false or imagined universality. Mumford's "one–sided universalism of megatechnics" implies first of all that "One part of our civilization – that dedicated to technology – has usurped authority over all the other components, geographical, biological, anthropological."[151] Not only does technology increasingly mediate our human interactions, it also comes to be seen as the sole repository and conveyor of meaning. This is most clear in Mumford's discussion of the role of knowledge in the megatechnic order.

As knowledge becomes "automated," as information multiplies "to a point where it defies individual appraisal and assimilation,"[152] two antinomies develop: standardization and specialization. Knowledge is standardized not only in the sense of being mass–produced, but also in the sense that only those types of knowledge based on empirical, quantitative standards become permissible. The power complex permits only knowledge which endorses it and filters out that which is inimical to it. Knowledge

and information get increasingly channelled "through official distribution agencies. Though a trickle of fresh or unorthodox knowledge may still filter through to a minuscule minority by means of print, nothing will be transmitted further that does not conform to the current standards of the megamachine."[153]

Standardization is accompanied, paradoxically, by specialization. The territories of knowledge become divided up into increasingly narrow compartments. The "method of analytic dismemberment ... resulted in the dissociation, segmentation, and insultation of knowledge...."[154] Human experience as a whole becomes an "impermissible"[155] investigation.

This specialized and standardized scientific knowledge is both the precondition and product of the megamachine. "[E]very part of the megamachine was made over in consonance with the peculiarly limited type of knowledge, deliberately sterilized of other human values and purposes that their [the scientist-technician] refined mathematical analysis and exact method had been designed to further."[156] The common aim of "both theoretic science and advanced technology" was the elimination of "the human personality" which was "an embarrassment to the new conception of 'objectivity.'"[157]

For Mumford, of course, the absolute separation between subject and object, upon which much of science rests, is a faulty distinction. The mechanical world picture, by universalizing the object and erasing the subject, increasingly paints out the very possibility of genuine "objective" human decisions based on an appraisal of the entire situation.

The Renewal of Life

> The present analysis of technics and human development rests on belief in the imperative need for reconciling and fusing together the subjective and the objective aspects of human experience, by a methodology that will ultimately embrace both. This can come about, not by dismissing either religion or science, but first by detaching them from the obsolete ideological matrix that has distorted their respective developments and limited their field of understanding.[158]

Along with this new synthesis a new technics must emerge. The megatechnic order must be replaced by a polytechnics – a varied and many-sided technics[159] – in the service of life. This technics, whose other name is biotechnics, would serve not the principle of power, but that of plenitude.

How is this bright new world to be attained? Mumford immediately dismisses the possibility of organized mass opposition to the megamachine. Mumford claims, without elaboration, that "mass organizations and mass methods of persuasion" are impotent against the power system because "these mass methods support the very system they attack."[160]

The megamachine is, however, vulnerable to "localized guerilla assaults and raids."[161] There are two preconditions for this type of attack. The first is the cultivation of "cultural identities and autonomies"[162] through nationalist and regionalist movements. This idea had found expression in Mumford as early as Technics and Civilization. The second requirement for the renewal of life is very similar to Marcuse's Great Refusal: "a steady withdrawal of interest, a slowing down of tempo, a stoppage of senseless routines and mindless acts."[163] A policy of non-cooperation, then, is seen as the only possibility of halting the continued expansion of the megamachine.

Mumford acknowledges the great obstacles to such an occurrence, and recognizes that he is calling for no less than a "universal awakening"[164] in which "mankind will need to undergo something like a spontaneous religious conversion."[165] Yet despite the admitted difficulty of such an event, Mumford concludes his critical life-work with a rather startling optimism:

> ...for those of us who have thrown off the myth of the machine, the next move is ours: for the gates of the technocratic prison will open automatically, despite their rusty ancient hinges, as soon as we choose to walk out.[166]

NOTES

1. This will be evaluated in Chapter IV of this thesis.

2. The question of whether this is a genuine paradox or simply a contradiction in Mumford's thought will be addressed in Chapter IV.

3. Technics and Civilization., p. 10.

4. Ibid., p. 12.

5. Ibid., p. 3.

6. Ibid., p. 4.

7. Ibid., pp. 5–6.

8. Ibid., p. 7.

9. Ibid., p. 112.

10. Ibid., p. 17.

11. And today, even these last graphic vestiges of cyclical time are vanishing with the ascendance of the digital watch. To what extent this change will affect us psychologically and socially is an interesting matter for speculation.

12. Lewis Mumford, Technics and Human Development. (New York: Harcourt Brace Jovanovich, 1967.) P. 286.

13. Elsewhere, further demonstrating Mumford's ambivalence, we find: "printing is second only to the clock in its critical effect upon our civilization." Lewis Mumford, Art and Technics. (New York: Columbia University Press, 1952.) P. 66. And, later still: "Even more, perhaps, than the clock, the printing press was the most revolutionary development of New World Culture." The Transformations of Man., p. 25.

14. Technics and Civilization, p. 136.

15. Ibid., caption to Plate 2, unpaginated.

16. Ibid., p. 132.

17. Ibid., pp. 132–33.

18. This concept is examined in more detail in Chapter IV of this thesis.

19. Ibid., p. 147.

20. Ibid., p. 144.

21. Ibid., p. 139.

22. Ibid., p. 111.

23. Ibid., p. 148.

24. Ibid.

25. Ibid., p. 151.

26. Ibid., p 151.

27. Ibid., p. 158.

28. Ibid., p. 154.

29. Ibid., p. 176.

30. Ibid.

31. Ibid., p. 194.

32. Ibid., p. 189.

33. Ibid., p. 177.

34. Ibid., p. 172.

35. Ibid.

36. Ibid., p. 168.

37. Ibid., p. 169.

38. Ibid., p. 173.

39. Ibid., p. 180.

40. Ibid., p. 181.

41. Ibid., p. 169.

42. Ibid., p. 210.

43. Ibid. p. 196.

44. Ibid., p. 50.

45. Ibid., p. 130.

46. Ibid., p. 45.

47. Ibid., p. 362.

48. Ibid., p. 324.

49. Ibid., p. 274.

50. Ibid., p. 273.

51. Ibid., p. 105.

52. Ibid., p. 273.

53. Ibid., p. 310.

54. Ibid.

55. Ibid., p. 311.

56. Ibid., pp. 212–13.

57. Ibid., p. 354.

58. Ibid.,pp. 325–26.

59. Ibid., pp. 355–56.

60. Ibid., p. 367.

61. Ibid., p. 421.

62. Ibid., p. 403.

63. Ibid., p. 406.

64. Ibid., p. 385.

65. Ibid., p. 398.

66. Ibid.

67. Ibid., p. 409.

68. Ibid., p. 410.

69. Ibid., pp. 302–3.

70. Ibid., p. 283.

71. Ibid., p. 322.

72. Art and Technics, p. 11.

73. Ibid., p. 15.

74. Ibid., p. 16.

75. Ibid., pp. 16–17.

76. Ibid., p. 59.

77. Ibid., p. 32.

78. Ibid.

79. Ibid., p. 14.

80. Mumford's attitude toward art will be considered and evaluated in Chapter IV in light of the "crisis of humanism."

81. Ibid., p. 136.

82. Ibid., pp. 137–38.

83. Ibid., p. 17.

84. A rather tautological claim rectified to some extent by a more expansive definition of the human in Technics and Human Development.

85. Ibid., pp. 17–18.

86. Ibid., p. 17.

87. Ibid., p. 35.

88. Ibid., pp. 34–35.

89. Ibid., p. 51.

90. Ibid., p. 52.

91. Ibid.

92. Ibid., p. 138.

93. Ibid., p. 32, p. 137.

94. Ibid.

95. Ibid., p. 88.

96. Ibid., pp. 99–100.

97. Ibid., p. 80.

98. Ibid.

99. Ibid.

100. Ibid. p. 118.

101. Ibid., p. 75.

102. Ibid., p. 96.

103. Ibid., p. 5.

104. Ibid., p. 109.

105. Ibid., p. 104.

106. Ibid., pp. 153–54.

107. Ibid., p. 83.

108. Ibid., p. 75.

109. Lewis Mumford. Technics and Human Development. New York: Harcourt Brace Jovanovich, 1967, p. 9.

110. Ibid., p. 50.

111. Ibid., p. 51.

112. Ibid., p. 7.

113. Ibid., p. 70.

114. Ibid., p. 62. A term credited to Andre Varagnac.

115. Ibid., p. 110.

116. Ibid., p. 90.

117. Ibid., p. 11.

118. Ibid., p. 97.

119. Ibid., p. 189.

120. Ibid., p. 192.

121. Ibid.

122. Ibid., pp. 235–36.

123. Lewis Mumford. The Pentagon of Power. (New York: Harcourt Brace Jovanovich, 1970.) P. 31.

124. Ibid., p. 28.

125. Ibid., p. 51.

126. Ibid., p. 238.

127. Ibid., p. 238.

128. Ibid., p. 239.

129. Ibid., p. 243.

130. Ibid., p. 252.

131. Ibid.

132. Ibid., p. 255.

133. Ibid., p. 256.

134. Ibid., pp. 257–58.

135. Ibid., p. 258.

136. Following Innis' notion of time and space biased media, and remembering that Mumford uses the term "the Pyramid Age" in a much more expansive way than its normal employment, we could interpret this quite differently. In this scheme, the invention of writing and light, easily transportable media such as papyrus would be seen as analogous to the invention of instantaneous communication, in that they both make possible expansion of empire directed and controlled from a centralized location. Mumford would thus have yet another parallel between the two ages. But since this implies negative elements of writing Mumford may have been reluctant to see the connection.

137. Ibid., p. 260.

138. Ibid., p. 166.

139. Ibid.

140. Ibid., p. 167.

141. Ibid.

142. Ibid., p. 166.

143. Ibid., p. 167.

144. Ibid., p. 269.

145. Ibid., p. 100

146. Ibid., p. 124.

147. Ibid., p. 277.

148. Ibid.

149. Ibid., p. 277.

150. Ibid., p. 375.

151. Ibid., p. 283.

152. Ibid., p. 182.

153. Ibid., p. 183.

154. Ibid., p. 113.

155. Ibid., p. 105.

156. Ibid., p. 255.

157. Ibid., p. 430.

158. Ibid., p. 420.

159. Ibid., p. 298.

160. Ibid., p. 408.

161. Ibid., p. 347.

162. Ibid., p. 375.

163. Ibid., p. 433.

164. Ibid., p. 411.

165. Ibid., p. 413.

166. Ibid., p. 435.

CHAPTER III

SOURCES

INTRODUCTION

An examination of Mumford's oeuvre reveals a multiplicity of sources, too numerous even to catalogue here. While Mumford owes his share to the great and acknowledged thinkers of the Western World, from Plato to Marx and Darwin, he has also been profoundly influenced by a series of lesser known social critics. This chapter, which explores some of these debts, does not claim to be exhaustive. Rather, it locates some of Mumford's most important sources and elucidates their contribution to his thought. Any comprehensive account of Mumford's sources would have to include such figures and Henry as William James, Peter Kropotkin, Samuel Butler, Alfred North Whitehead, Graham Wallas, William Morris, Charles Pierce, and Victor Branford. Their exclusion from consideration here is due to two factors. The first of these is the rather mundane one of time and space limitations. The second is that the figures discussed below provide Mumford with both the frame of his perspective, and the general contours of its triple themes, discussed in Chapter II. While Mumford takes from others, he does so in order to fill in the details of his argument.

RALPH WALDO EMERSON AND THE FATHERS OF AMERICAN LITERATURE

As I have earlier indicated Mumford has written extensively about the five major figures in pre–twentieth century American literature: Emerson, Thoreau, Whitman, Hawthorne, and Melville. Of these Emerson is the most important, partly because he represents the Grandfather of American literature, and partly because he was an early, and continuing influence on Mumford. I will briefly look at the other four figures before turning to a discussion of Emerson.

Thoreau occupies for Mumford a very important place in American literature and history. That Thoreau was a very early influence on Mumford there can be no doubt. It would also appear that Mumford retained a life-long respect for both the man and his work. In Interpretations and Forecasts: 1922-1972, Mumford has reprinted in its entirety the section from The Golden Day on Thoreau. Mumford's appreciation for Thoreau stems from the latter's willingness to repudiate his culture's norms and assumptions:

> What he discovered was that people are so eager to get the ostentatious "necessaries" of a civil life that they lose the opportunity to profit by civilization itself: while their physical wants are complicated, their lives, culturally, are not enriched in proportion, but are rather pauperized and bleached.[1]

We have seen that this premise is a central one to Mumford's work.

Mumford is more critical of Whitman. While he has some harsh words to say about the early Whitman, the later writings elicit some high praise from Mumford: "Whitman finally achieved his own metamorphosis, and emerged, with dripping wings, into the untempered mid-day of the American scene."[2] Although in Emerson's phrase, lives of "quiet desperation" may be the norm, Mumford values Whitman for his immense joy and love of life, and as representative of the attempt to achieve a balanced and harmonious life. In The Condition of Man Mumford calls Whitman's "Democratic Vistas" the most fundamental work of American literature. He sees the work as the finest expression of the syncretism necessary for human survival: a dynamic union of philosophies in which the "idolum of the machine" unites under "a new sign with the idolum of the organism."[3]

There are three quotations from Whitman which recur throughout Mumford's writings and which reveal Whitman's profound influence on Mumford's philosophy. Perhaps the most significant of these, which appears at least three times in Mumford's works, is the following passage: "It is provided in the essence of things, that any fruition of success, no matter what, shall come forth to make a greater struggle necessary."[4] It is not difficult to see that this assumption of life as a perpetual process underlies Mumford's belief in the possible renewal of life. We are also reminded of Mumford's Preface to The Story of Utopias in which he states that a major theme uniting his work is the notion that the "human

adventure is just beginning." In other words, for Mumford, as for Whitman, every ending is a beginning.

Another favourite quote from Whitman seems employed as much for its power as an image as for its meaning: "The soul stands cool and composed before a million universes."[5] Again, we can see the important position that the possibility of choice has in Mumford's world view. Without the potentiality of self-determination and rational choice, humankind would have no hope of change and Mumford's dream of the renewal of life would be a hopeless delusion.

The final Whitman quote that I shall present here plays a similar role in the context of Mumford's dream of a new world. Whitman said: "I and mine do not convince by arguments: we convince by our presence."[6] Mumford's regular employment of this aphorism reflects his belief, not always consistently articulated, that action, not rhetoric, will be the catalyst and vehicle for social transformation.

Hawthorne does not enjoy such an illustrious reputation as the other four representatives of the "Golden Day" of American literature. Yet Mumford sees Hawthorne as important as an "aesthetician of sin,"[7] and accords The Scarlet Letter a very substantial place in the hierarchy of American literature. The metaphor applied to Hawthorne in the scheme of the "Golden Day", "Twilight", is appropriate insofar as Hawthorne signals the end of the day and the relative temporal briefness of twilight is reflected in the extremely short section on Hawthorne.

It is no surprise, then, to find Mumford's later references to Hawthorne to be both fewer and less substantial than his references to Melville, Emerson, Whitman, and Thoreau. But as literature, in Mumford's later works, become increasingly important in its relation to technics, the following passage appears.

> As it happens Teilhard de Chardin was only putting in more explicit quasi-scientific terms a thought that Nathanial Hawthorne had uttered a century earlier through the mouth of Clifford, in "The House of the Seven Gables." "'Then there is electricity, the demon, the angel, the mighty physical power, the all pervading intelligence...by means of electricity...the round globe is a vast head, a brain, instinct with intelligence. Or, shall we say, it is itself a thought, nothing but thought, and no longer the substance which we deemed it.'" In a few sentences, this poetic mind had identified, long before professional physicists, the new agency that would shatter the whole mechanical world picture.[8]

We have had occasion to discuss Mumford's work on Melville in Chapter I. Accordingly here I shall only say a few brief words. Mumford devotes a considerable amount of space and time to Melville's attitude toward his society. Melville does not accept uncritically the "boons" of the industrial society. Civilization is often depicted as "snivelization", and the picture of life in the "savage" South Sea Islands is favourably contrasted with life in the American cities. It would appear that Mumford continued to learn from Melville if the later appearance of quotation marks around the word "Civilization" in Mumford's later works bears witness to this.

Melville's dissatisfaction with his society and his awareness that civilization was often a corrupting influence, bringing greed, acquisitiveness, and the senseless necessity of the meaningless and useless production of redundant goods, would clearly impress Mumford. Indeed, in the occasional later work, Mumford refers to Melville as an authority on these matters.

Mumford sees Ralph Waldo Emerson as the leader of the great minds of the "Golden Day," "the central figure of them all,"[9] the "Morning Star" signalling the way for later thinkers.

> Emerson's affirmation of both physics and dialectic, of both science and myth, an affirmation which justified the existence of the artist, the poet, the saint, was of prime importance; for he did not make the mistake of disdaining the order and power that science had achieved within its proper department.[10]

Neither did Emerson underestimate the effect of the machine:

> Mines, forges, mills, breweries, railroads, drill of police, rule of court and shop–rule have operated to give a mechanical regularity to all the habit and action of men. A terrible machine has possessed itself of the ground, the air, the men and women, and hardly even thought is free.[11]

Emerson also comments that the "machine unmans the user" and condemns the practice of intemperant production.[12] The effect on individuals also finds a larger social expression. By the machines of steam and the Bank, our "social system is moulded."[13]

Emerson's most celebrated aphorism: "Things are in the saddle and ride mankind," not only appears again and again in Mumford's works, but may also be seen as the most fundamental assumption underlying Mumford's thought. Mumford's characterisation of a technics out of control is prefigured in

Emerson's colourful metaphor: "The machinery has proved, like the balloon, unmanageable, and flies away with the aeronaut."[14] Emerson shares with many of Mumford's sources a great disquiet about the increasing power available to modern man and the possibility of its capacity for destruction if not properly directed. Implicit in this position is a belief in the unequal development of man's material and moral powers.

> Don't trust children with edged tools, Don't trust man, great God, with more power than he has, until he has learned to use that little better. What a hell we should make of this world, if we could do what we would. Put a button on the foil till the young fencers have learned not to put each other's eyes out.[15]

That Mumford retained a life–long interest in Emerson can be immediately seen in the continuity between The Golden Day and the 1968 essay, reprinted in Interpretations and Forecasts entitled "Morning Star: Emerson." Mumford points to his adolescent interest in Emerson in this essay: "I myself carried a World's Classic edition of Emerson's Essays in my middy blouse, while training in the Navy in 1918."[16] That Emerson had a formative influence on Mumford seems clear. (Indeed, Mumford's Conduct of Life echoes Emerson's essays on the "Conduct of Life.") What is perhaps surprising is that this influence is not explicitly acknowledged by Mumford. In fact, in one rather curious sentence Mumford appears to deny his debt to Emerson and to imply that while many of his ideas echo Emerson they are arrived at quite independently: "Emerson...came near to formulating my own view..."[17] The proposition is, of course, inverted: the conventional usage would be something to the effect that Mumford's views approach those of Emerson. This is made more curious by the fact that this cannot be construed as a general reluctance to give credit as Mumford does not hesistate to acknowledge other influences, and in fact, rather shamelessly refers to Patrick Geddes as his "Master."

Nevertheless Mumford refers frequently to Emerson, often concentrating on Emerson as a critic and observer of technological developments of his time. He is impressed by Emerson's perception that "'Our civilization...is reducing the earth to a brain. See how by telegraph and steam the earth is anthropolized.'"[18] And Emerson's famous comment on the export of pianos to the American frontier – "The more piano the less wolf" – is remarkably similar to Mumford's own, somewhat incomplete, view of

the intrinsically sanative nature of art.

JOHN RUSKIN

Although remembered chiefly as an art critic, John Ruskin (1819–1900) devoted the better part of his career to a critique of the mechanized and dehumanized industrial world. Ruskin, art critic turned social commentator, is an important precursor to Mumford, and, like many of Mumford's sources of inspiration, his pursuits were numerous and wide–ranging. Mumford rejects many of the specifics of Ruskin's theory of art and political economy, yet takes from him the general orientation of art as a fundamental social product and activity. A brief look at Ruskin's work and concerns will assist in appreciating Mumford's deep respect for this eclectic and eccentric thinker.

Ruskin achieved instant fame and critical acclaim with the publication of his first book, Volume One of Modern Painters (1842). This work, written when he was a young man of 22, established Ruskin as the pre–eminent art critic of his day. As a champion of Turner and later of the Pre–Raphaelites, and a vitriolic critic of Whistler, Ruskin's positions were often controversial but always respected. For the next eighteen years Ruskin continued to distinguish himself as a critic of art and architecture. The year of the publication of the final volume of Modern Painters, 1860, also saw the appearance of Ruskin's first explicitly political work, Unto This Last. This work marks a fundamental shift in Ruskin's emphasis, and a corresponding decline in his reputation. Although art remains a core concern for Ruskin, his stress is increasingly on the current, deplorable state of the industrial world. By the time he came to write the bizarre series of "Letters to the Workmen and Labourers of Great Britain" known as Fors Clavigera (1871–1885), the Daily News could sneer:

> 'Mr. Ruskin's Fors Clavigera has already become so notorious as a curious magazine of the blunders of a man of genius who has travelled out of his province, that it is perhaps hardly worthwile to notice any fresh blunder.'[19]

In a sense, with the move from "his" area of art criticism to political economy, Ruskin had successfully marginalized himself.

Ruskin's interests took him all over the intellectual map. He began publishing articles on geology at the age of fifteen, and remained an active member of the Geological Society from 1840 through most of his life.[20] In fact, Ruskin harboured ambitions to be a geologist.[21] Geology was not, however, his only interest outside his art studies. In a letter to Thomas Carlyle written in 1855, before Ruskin's turn to political economy, he catalogues some of his current pursuits. These include horticulture, political economy, German metaphysics, navigation, geology, and the art of illumination.[22]

Opposed to the "specialisms" which fragmented the modern world, Ruskin attempted, both in his life and his teaching to "unify responses toward a whole life:"[23]

> ...his own preferred model of coherence was some Kunst-und-Wunderkammer, a gallery, museum and cabinet of curiosities all combined and organized on Ruskin's own principles so that fine art, geology, mineralogy, botany, economy, philology and ornithology were shown to be interdependent and mutually illuminating.[24]

While occupying the Slade Professorship of Art at Oxford (1870–78; 1883–84) Ruskin became increasingly critical of the system's "separation of design from art, of simple technical skills from larger educational aims, its mechanical forms of instruction and its competitive examinations as a means to monitor students' progress."[25] As a way of counteracting these rigidities Ruskin established a gallery/museum which "consisted of twelve cabinets, each with twenty-five examples, of everything from elementary Greek design, through Gothic architecture and landscape, to foliage, rocks, water and clouds."[26] A similarly eclectic collection was later established near Sheffield:

> ...the germ of a museum, arranged first for workers in iron, and extended into illustration of the natural history of the neighbourhood of Sheffield, and more especially of the geology and flora of Derbyshire.[27]

These projects, neither of which was particularly successful, anticipate Patrick Geddes' favourite mode of instruction through his Outlook Tower and Cities Exhibition.

Ruskin's most ambitious project, the creation of the St. George's Guild, occupied him until his death. Quentin Bell has provided an admirably succinct summary of the subject upon which Ruskin himself expended so much energy and ink:

> The immediate aim seemed modest enough, land was to be reclaimed, workers to be resettled. The ultimate aims were vast; a new rural society was to be created, firstly in England and then throughout the world. A new peasantry, strictly disciplined and sternly educated would be established on the land under a resident gentry. Machinery would be abolished, prices fixed, newspapers suppressed, literature regulated. There would be schools, museums, libraries and home industries. Typically, Ruskin gave as much attention to the adornments of life as to its economic arrangements. There would be a currency and a costume of his own invention, a new scientific nomenclature, a new geographical terminology.[28]

The Fors Clavigera, ("[i]n the entire history of political agitation there can have been no stranger publication,"[29]) was Ruskin's vehicle to promote the growth and objectives of the St. George's Guild. Anticipating McLuhan by a hundred years, Ruskin describes his method: "...these letters...are a mosaic-work into which I can put a piece here and there as I find glass of the colour I want; what is as yet done being set, indeed in patches, but not without design."[30]

While there is a definite shift in subject-matter, this cannot be seen as an epistemological break between an early and late Ruskin. His thinking on art provides the backdrop, and informs all of Ruskin's later writing on political economy. Ruskin underlines this point with a comment in the Fors Clavigera, written in the 1870s while he was Slade Professor of Fine Art at Oxford: "...the teaching of art is the teaching of all things."[31]

For heuristic purposes, in the discussion that follows I have separated Ruskin's opinions on art from those of political economy; this is, however, an artificial divorce. The section on Ruskin's critique of the industrial world, which for convenience I refer to as his political economy, is further artificially divided into four major themes: mammonism; the defilement of nature; militarism; and science, technology, and industry.

1. Art and Society

Throughout Ruskin's writings on art one fundamental point is stressed repeatedly: "The art of any country is the exponent of its social and political virtues."[32] To look at the art of a nation is to see the moral character of that country. Similarly, "You can have noble art only from noble persons, associated under

laws fitted to their time and circumstances."[33] Art, then, is both the exponent and the index of a society's development. Ruskin never loses sight of this central principle which comes to form both the basis and core of his "political economy of art." The idea of art as a barometer of a society's character is, perhaps, Ruskin's single most important legacy to Mumford.

Mumford also takes from Ruskin an idea which follows from this premise: "All the great arts have for their object either the support or exaltation of human life – usually both...."[34] The combination of these two ideas mark both Ruskin and Mumford as essentially humanist.

For Ruskin the highest faculty of the human mind is the imagination.[35] But even the imagination must necessarily work within and from the confines of a given social order. The modern world, which systematically substitutes "mechanism for skill," propounds the belief that "You can get everything by grinding – music, literature and painting. You will find it grievously not so; you can get nothing but dust by mere grinding."[36]

Although often thought of as an ultra-conservative in matters of art and culture Ruskin was not absolutely opposed to mechanical reproduction. His comments are worth quoting at length as they demonstrate a modern and sophisticated understanding of the relationship of art to mass production and consumption.

> ...there is a continually increasing demand for popular art, multipliable by the printing-press, illustrative of daily events, of general literature, and of natural science. Admirable skill, and some of the best talent of modern times, are occupied in supplying this want; and there is no limit to the good which may be effected by rightly taking advantage of the powers we now possess of placing good and lovely art within the reach of the poorest classes. Much has been already accomplished; but great harm has been done also, – first by forms of art definitely addressed to depraved tastes; and secondly, in a more subtle way, by really beautiful and useful engravings which are not yet good enough to retain their influence on the public mind; – which weary it by redundant quantity of monotonous average excellence, and diminish or destroy its power of accurate attention to work of a higher order.[37]

Ruskin devotes considerable attention to the issue of what are the fit products of artistic activity. Again, his discussion of the question reveals his commitment to an understanding of art within its specific social context. Deploring the planned obsolescence – or in Ruskin's colourfully ironic terms, the

"wholesome evanescence, beneficent destruction" – of art,[38] he insists upon a necessary balance between a work of art's beauty and its utility.[39] Mumford will later take up the same theme, with similar conclusions, under the general heading of the relationship between form and function.

The balance which Ruskin demands can, even in an individual work of art, only be achieved under certain social conditions. But: "...as long as there are any who have no blankets for their beds, and no rags for their bodies, so long it is blanket-making and tailoring we must set people to work at – not lace.[40] Therefore, "the beginning of art is in getting our country clean and our people beautiful."[41] Questions of aesthetics metamorphose into questions of economics.

2. Political Economy

From the political economy of art, Ruskin immersed himself more deeply in a consideration of the contemporary industrial world. There is a logic in this progression. The young Ruskin had always insisted that only a great nation can produce great artists. The turn to political economy involves an attempt to explore this maxim in its specifics: what is the current state of England?; and what kind of producers and consumers of art are possible under these conditions?

Quentin Bell has summed up John Ruskin's political position as one of authoritarian socialism.[42] Certainly his utopian projections evoke a world which today we might rather term totalitarian feudalism. Yet however unpalatable Ruskin's ideal world is to the modern reader, his diagnosis of his society is worth taking seriously.

A single phrase encapsulates Ruskin's essential attitude toward the modern world: industrial society "manufacture[s] everything...except men."[43] "Progress," for Ruskin, was an illusion, "seeming prosperity" masked "destruction and sorrow."[44] Manual labour was imputed to be inferior, but had in fact been debased by "mechanical operations"[45] which "grind out the soul of man from his flesh."[46] The Capitalists have, through "occult theft," kept the labourer "poor, ignorant, and sinful, that they might, without his knowledge, gather for themselves the product of his toil."[47]

i. Mammonism

Ruskin held that the fundamental questions of economy – what is to be our product, how much of it do we make, and why? – had been replaced with a senseless drive for money and endorsed by the prevailing theory of "self-interest" propounded by the political economists. But although "wealth" was the goal of life its pursuit usually produced a corresponding "illth."[48]

Mammonism, the "false business of money-making,"[49] had become such an all-consuming passion that it was now "simply and sternly impossible for the English public to understand any thoughtful writing..."[50] Although the "insanity of avarice" had not yet corrupted the inner nature of man,[51] it was in grave danger of doing so.

What the modern world had become blind to is that:

> THERE IS NO WEALTH BUT LIFE. Life, including all its powers of love, of joy, and of admiration. That country is the richest which nourishes the greatest number of noble and happy human beings; that man is richest who, having perfected the functions of his own life to the utmost, has also the widest helpful influence, both personal, and by means of his possessions, over the lives of others.[52]

ii. The Defilement of Nature

One of the foulest consequences of the modern industrial order was, for Ruskin, its pernicious effects upon the world of Nature. An early conservationist, Ruskin passionately decries the systematic pollution of Air, Water, and Earth.[53] Although very much in the Romantic tradition, Ruskin's condemnation of the lack of respect for the natural environment, and his pleas for a programme to clean the air, earth, and water, strike a curiously modern note.

iii. Militarism

Ruskin also denounces the militarism he sees as characteristic of his age. He is unequivocal in his denunciation of war: "There is no physical crime, at this day, so far beyond pardon, – so without parallel in its untempted guilt, as the making of war machinery, and invention of mischievous substance."[54] "The mechanical instrumentality of martial power" is used by the Capitalists of a nation to subdue its workers.[55] But he exhorts the workmen of Great Britain: "you must simply rather die than make any destroying mechanism or compound."[56]

War-mongering is intimately connected with Mammonism. Nations go to war because they are populated by thieves who covet their neighbours' property.[57] The manufacture of articles of war serves to illustrate Ruskin's sense of the quintessential stupidity of a purposeless production:

> ...of most things which the English, French, and Germans are paid for making now-a-days – cartridges, cannon, and the like – you know the best thing we can possibly hope is that they may be useless, and the net result of them, zero.[58]

iv. Science, Technology, and Industry

Although Ruskin himself was an aspiring scientist he was critical both of the general tendencies of modern science, and its service to capitalism and industry. He was an early critic of scientific compartmentalisation and disciplinary specialisation, exclusivity, and protectionism – all of which is implied in the phrase, the "jealousies of the schools [of science]."[59] These jealousies "corrupt and retard general science."[60]

Perhaps because of tendencies toward specialisation, science often attends to minute particularities and loses sight of the whole. Ruskin's suspicion of science is best revealed in his own words. I employ the passage in its entirety because, apart from the geographical specificity, it could have been written by Mumford in any number of works in which he deals with the mechanisation of man. Ruskin comments, with some acidity, upon

> ...the general temper and purposes of modern science. It gives lectures on Botany, of which the object is to show that there is no such thing as a Flower; on Humanity to show that there is not such thing as a man; and on Theology to show that there is no such thing as a God. No such thing as a Man, but only a Mechanism; no such thing as a God, but only a series of Forces. The two faiths are essentially one: if you feel yourself to be only a machine, constructed to be a regulator of minor machinery, you will put your statue of such science on your Holborn Viaduct, and necessarily recognize only major machinery as regulating you.[61]

Perhaps the core theme in Ruskin's reflections on science, technology, and industry is the issue of the ends toward which scientific endeavours, technological developments, and machine energy are directed. The question is approached from a variety of diverse angles, sometimes obliquely, sometimes directly, but which all converge on the problem of ultimate ends.

Although sympathetic to the plight of the industrial workers, Ruskin wonders whether, if they, and not the capitalists, commanded the use of the machine's work, they would know what to "best set them to work at? and what useful things [they] should command them to make for [them]."[62] Implicit in this question is the idea of purposeless production, one of Ruskin's major themes.

Ruskin discusses much more directly the issue of the purposelessness of many scientific and technological inventions. On the occasion of the transmission of the first telegraphic message from England to Bombay Ruskin asks, pointedly if rhetorically: "But what was the message, and what the answer? Is India the better for what you said to her? Are you the better for what she replied?"[63] While not disparaging the technology per se, Ruskin is scathingly critical of a technology developed and implemented with no genuine human ends and needs to serve, a technology employed for its own sake.

The following passage amplifies this concern and contains in abbreviated form two other aspects of the issue of ends in the employment of machinery.

> To talk at a distance when you have nothing to say, though you were ever so near; to go fast from this place to that, with nothing to do either at one or the other: these are powers certainly. Much more, power of increased Production, if you, indeed, had got it, would be something to boast of. But are you entirely sure that you have got it – that the mortal disease of plenty, and afflictive affluence of good things, are all you have to dread?
>
> ...Out of so much ground, only so much living is to be got, with or without machinery....So that the question is not at all whether, by having more machines, more of

you can live. No machines will increase the possibilities of life. They only increase the possibilities of idleness.[64]

The following passage, often quoted by Mumford, is Ruskin's counterpart to the apocalyptic ruminations of Henry Adams, and to Mumford's own scenario of Post-Historic Man.

> ...from shore to shore the whole of the island is to be set as thick with chimneys as the masts stand in the docks of Liverpool: that there shall be no meadows in it; no trees; no gardens; only a little corn grown upon the housetops, reaped and threshed by steam: that you do not leave even room for roads, but travel either over the roofs of your mills, on viaducts; or under their floors, in tunnels: that, the smoke having rendered the light of the sun unserviceable, you always work by the light of your own gas: that no acre of English ground shall be without its shaft and its engine; and therefore, no spot of English ground left, on which it shall be possible to stand, without a definite and calculable chance of being blown off it, at any moment, into small pieces.[65]

Ruskin and Mumford

There is scarcely a book of Mumford's which does not contain a reference to John Ruskin. While the longest of Mumford's discussions regarding Ruskin deal with architecture, there are frequent shorter allusions to Ruskin as art critic and as economist. The two aspects of Ruskin that Mumford sees as most important may be illustrated by his bibliographical annotations. Mumford comments on The Stones of Venice: "Social interpretation of architecture and architectural interpretation of societies both have their essential beginnings here..."[66] Mumford himself proceeds, in his writings on architecture, in this dialectical fashion: he may be seen, in this respect, as a direct continuator of Ruskin.

The other aspect of Ruskin's work that Mumford deems of eminent importance is Ruskin's political economy.

> Ruskin was the first economist to express the realities of energy income and living standards in relation to production. His grasp of the consummatory and creative functions, neglected by the money economists, makes him – despite frequent solecisms – the fundamental economist of the biotechnic order.[67]

Elsewhere, this element of his political economy is linked to Ruskin's "evolutionary vitalism," so important to Mumford and to Patrick Geddes before him.[68]

Mumford, referring to Ruskin as "the most bitter critic of the new regime,"[69] cites Ruskin's famous aphorism, "There is no wealth but life," as an antidote to the imperialism of the monetaristic way of thinking. Mumford has recourse to this quotation on more than one occasion; it forms a fundamental premise of Mumford's work and thought.[70]

Several specific stances or principles of Mumford find their origin in John Ruskin's works. The three areas in which this debt is most apparent are Ruskin's discussions of the dialectic of science, his anticipations of what Mumford would later term "the mechanical world view," and his self-styled communism which is very similar to Mumford's "basic communism." The last of these is perhaps the least significant: the two basic principles which characterise his "communism" are by no means unique to Ruskin and are shared by thinkers of diverse political persuasions. In brief, these principles call for universal common labour and insist that "the public, or common wealth, shall be more and statelier in all its substance than private or singular wealth."[71]

Ruskin's discussion of what I have termed "the dialectic of science" finds a direct counterpart in Mumford's analysis of the origins of technics in Technics and Human Development. Although himself an aspiring scientist, Ruskin was not unaware of the dangers and limitations of the scientific method, as we have seen. As cited in Hunt, Ruskin held that

> ...though science helps to raise us 'from the first state of inactive reverie to the second of useful thought,' scientific pursuits may well check our 'impulses toward higher contemplation...having a tendency to chill and subdue the feelings and to resolve all things into atoms and numbers.'[72]

The last few words of the above quote may be considered in tandem with Ruskin's nascent critique of the mechanical world view. Ruskin has an imaginary interlocutor answer his objections to the equation of happiness and prosperity with mechanical and industrial progress:

> 'But when once everybody is convinced that heaven is a large gasometer, and when we have turned all the world into a small gasometer, and can drive around it by steam, and in forty minutes be back again where we were, – nobody will be poor or wretched any more. Sixty pounds on the square inch, – can anybody be wretched under that general application of high pressure?'[73]

As if it was necessary Ruskin answers the question in the affirmative and continues to describe even the

"rich and merry" in this future world as people of "steam legs and steel hearts."[74] This is clearly a metaphorical anticipation of Mumford's "mechanisation of man."

While Ruskin does not use the term idolum, employed by Mumford, it is apparent that he is concerned with the transformation of the imaginative, the spiritual, and the organic into the mechanical. Both Ruskin and Mumford view incontinent technical and industrial advancement as culminating in the loss of the human, the mechanisation of the body, the imagination and its products.

HENRY ADAMS

Mumford uses Adams for two purposes: as a prophet of the new age of exterminism, and as a whipping boy for all the reductive technological determinists Mumford so despises. Mumford's portrait of Adams fails to do justice either to the richness of Adams' thought or to its dynamic influence upon Lewis Mumford, the historian of culture and technology. A brief overview of Adams' central works will reveal many commonalities with Mumford.

Adams' two core works as a philosopher-historian are Mont-Saint-Michel and Chartres (1904) and The Education of Henry Adams (1906). These two works are bracketted by the earlier biography of Gallatin and the monumental nine-volume History of the United States, and the later, and less substantial writings on the science of history. Adams' private subtitle for the Mont-Saint-Michel was "A Study of Thirteenth-Century Unity," and for The Education "A Study of Twentieth-Century Multiplicity."[75] These two works embody either side of the metaphor Adams uses to encapsulate the spirit of each of the two ages: the Virgin and the Dynamo.

Mont-Saint-Michel and Chartres is essentially a tour-de-force of cultural history, while ostensibly a work on architecture. Mont-Saint-Michel itself occupies only one short chapter in the beginning of the book, and Chartres is granted but a few short chapters. The work spends a greater time on the literature of the age - the Chanson de Roland, King Richard's Prison Song, and the philosophical writings of Francis, Thomas Aquinas and Bernard of Clairvaux. Without the Chanson de Roland "one cannot

approach the feeling which the eleventh century built into the Archangel's church."[76] And we have been warned in the opening pages of the work that we are seeking not facts but feelings.[77] There is something of a private joke in this elliptical approach, embodying Adams' love of contradiction. One also hears a faint, but respectful chuckle at the expense of William Morris who held that architecture is the key to all the other arts.[78]

Adams takes his readers – imaginary nieces – through a grand tour of the twelfth and thirteenth centuries, beginning with the two great cathedrals, through the popular ballads and poems of the day, and finally visiting the participants of the great theological debates of the period. Through this journey we never lose sight of the ubiquitous unifying symbol – the Virgin Mary. This image is both a useful heuristic device and literally the guiding spirit of the age; the core around which the "Thirteenth Century Unity" was built. She represents the possibility of a gentle and compassionate religion, not bound by the masculine laws of theology. R.P. Blackmur has suggested that Mariolatry is essentially the worship of the human – Mary, herself human, wilfully defies the iron laws of the Father and intercedes on behalf of her worshippers no matter how hopeless their case.[79] The spirit of Mary penetrated every corner of the lives of the twelfth and thirteenth century people, giving value and unity to the world. The Virgin was a felt presence humanizing an impersonal religion – she is the motive force in the twelfth century, both determinative and propelling.

In contrast to the animating spirit of the Virgin the symbol of the twentieth century is the Dynamo. Vast, impersonal, efficient. The high point of unity in the thirteenth century stands as the antithesis of the contemporary world which Adams characterized as one of multiplicity. Adams' brother Brooks had declared, in the Law of Civilization and Decay, progress a delusion and characterized the contemporary world as suffering from corrosion through spiritual decay.[80] Henry Adams' metaphor of this process and situation was the abdication of the Virgin in favour of the ascension of the Dynamo.

While the Dynamo stands as a symbol and motive force of the age it has not an animating but an enervating function. The Dynamo represents the semi-autonomous, anonymous, imponderable force

which had come to rule the world – in a mechanical, not a human fashion. Adams' prose reveals echoes here of a force out of control, a technology on its own accelerating yet ultimately purposeless trajectory impervious to human will and intervention.

Adams describes his epiphany of discovering the Dynamo while visiting the Chicago world's fair in 1893:

> Some millions of other people felt the same helplessness, but few of them were seeking education, and to them helplessness seemed natural and normal, for they had grown up in the habit of thinking a steam–engine or a dynamo as natural as the sun, and expected to understand one as little as the other....[The dynamos] gave to history a new phase.[81]

And what was the effect of this new force upon the millions under its influence? Adams is unequivocal:

> The new American showed his parentage proudly; he was the child of steam and the brother of the dynamo, and already, within less than 30 years, this mass of mixed humanities, brought together by steam, was squeezed and welded into approach to shape; a product of so much mechanical power, and bearing no distinctive marks but that of its pressure. The new American, like the new European was the servant of the power–house, as the European of the twelfth century was the servant of the Church, and the features would follow the parentage.[82]

The Dynamo's effect upon the political and social system is equally clear:

> Modern politics is, at bottom, a struggle not of men but of forces. The men become every year more and more creatures of force, massed about central power–houses. The conflict is no longer between men, but between the motors that drive the men, and the men tend to succumb to their own motive forces.[83]

The violence of the Dynamo extends to the violation of the natural world:

> Every day Nature violently revolted [against the new mechanical energies], causing so–called accidents with enormous destruction of property and life, while plainly laughing at man, who helplessly groaned and shrieked and shuddered, but never for a single instant could stop. [84]

Adams' apocalyptic vision darkens until toward the end of his life he predicts the imminent destruction of civilization. Thirty years before Mont–Saint–Michel and Chartres Adams had responded to the "triumph of naval technology" by declaring "that man might in a hundred years have it in his power to blow himself off the face of the earth."[85] In this passage, which is often referred to by Mumford, one has the sense that this is Adams' darkly playful speculation in operation. But by 1905 Adams was convinced that:

> ...at the accelerated rate of progression shown since 1600, it would not need another century to tip thought upside down. Law in that case, would disappear as theory or a priori principle and give way to force. Morality would become police. Explosives would reach cosmic violence. Disintegration would overcome integration.[86]

This dim vision is repeatedly cited by Mumford as an example of Adams' prophetic insight. In later years, speculation hardens into certainty and Adams desperately seeks a science of history that would allow for prediction – and one suspects, control.

This project is already in evidence in the final chapters of The Education, and it occupies Adams until the last two years of his life when he again turns to the thirteenth century for comfort. In essence, Adams hoped to uncover a universal scientific formula to account for change. He believed he had found such a formula in the historical development of mechanical energy. There is, of course an irony in the spectacle of a man who could say such things as "My belief is that science is to wreck us, and that we are like monkeys monkeying with a loaded shell"[87] and "Either our society must stop or bust"[88] attempting to develop a rigid scientific tool to control history.

Adams may very well have been aware of this contradiction. In The Education he had laconically styled himself a "Conservative Christian Anarchist." There is obviously a wry joke in the appellation, yet at the same time it illustrates a fundamental philosophical orientation. Given the impossibility of maintaining a coherent political/philosophical/spiritual attitude amid the mad multiplicity of the modern world, the best position to adopt is one of embodied contradiction. As Adams said, "Evidently, the new American would need to think in contradictions."[89] One thinks here of Mumford, for whom the most apposite label is the contradictory "liberal anarchist."

It is clear from this brief examination that Mumford has taken from Henry Adams more than he has acknowledged. On the most apparent level, Adams shares with many of Mumford's sources a sense of civilization threatened. Mumford's critique of Adams, the mechanical determinist is a just one. Yet Adams is much more than this and even here Adams has left a legacy which Mumford freely, if unconsciously, draws upon. Perhaps what Mumford owes most to Henry Adams is the understanding of power as a determining force in history.

For Adams the term "force" is a crucial and multi-purpose tool of both description and analysis. In Mumford the term "power" takes on this multivalent character. As metaphor, the Virgin and the Dynamo is compelling. It captures and encapsulates one of the common themes of civilization threatened - the abandonment of a spiritually rich and humanistic world in favour of a sterile and mechanical one. While Mumford does not adopt Adams' particular metaphor, he does constantly reiterate this theme.

As representative of Adams' analytical and methodological strategy the Virgin and the Dynamo is less successful. Is "energy" a causal factor in the shift or a symptomatic one? How does the development of a new technology effect change in the social and political world? What factors lie behind the development of the technology itself? Adams is rather vague on these issues. He says that the new technologies of gunpowder and the compass

> literally ... seemed to drop from the sky at the precise moment when the Cross on one side and the Crescent on the other, proclaimed the complete triumph of the Civitas Dei.... Very slowly the accretion of these new forces, chemical and mechanical, grew in volume until they acquired sufficient mass to take the place of the old religious science, substituting their attraction for the attractions of the Civitas Dei[90]

Mumford, of course, also uses new technologies and new forms of energy to mark particular periods of history. We have seen how he demarcates the three major stages of history the eo-, paleo-, and neo-technic periods, in Technics and Civilization, by reference to the predominant "technological complex" of each period.

Mumford's taxonomy is triadic. The technological complex in any given period consists of: the resources and raw materials; the means of utilizing and generating energy and forms of production; and finally, the creation of certain types of workers. Mumford's typology seems only an amplified and more sophisticated version of Adams' characterization of historical periods on the basis of forms of energy used. Mumford clearly avoids the reductionism of Adams by minimizing the unilateral causal connection between technology and new social forms. But the critic may argue that what Mumford has done is simply to obscure this connection with resort to the vague device of the "technological complex." This is an issue to which we must return in the evaluation of Mumford's theories. [91]

THORSTEIN VEBLEN

Veblen is perhaps the most interesting of Mumford's sources. His is a fascinating mind with an acute and acerbic critical approach. His works are a delight to read for those who are prepared to savour them, for those who approach them from the perspective of what Veblen would term "idle curiosity." Conversely, one suspects they are something of a nightmare for those who consult them for a "pragmatic" end, for those who are seeking clearly packaged information. While Veblen is perfectly capable of being clear and direct, his more favoured approach is one of irony. There is a danger or quoting Veblen out of the larger context of his work because so much of what he says is anchored in a contextual mode of irony.

His professed method is one of matter of fact description, and his attitude toward the phenomena he is describing is characterised by an ironic, and impersonal "objectivity." It is not always easy to discern the judgement behind the description.

It should be stressed as a prefatory note to the ensuing discussion that Mumford takes from Veblen his diagnosis, but does not always share Veblen's attitude toward the particular diagnosis. This will be seen below.

Veblen was born in 1857; the son of Norwegian immigrants, he did not begin to learn English until he entered school. Veblen's doctorate was in philosophy but the majority of his later studies were in economics. He was also "engrossed by philology [and] natural history,"[92] and "in the practical application of physics."[93] "Veblen was quite unable to be a specialist....[He] was a professional anti-specialist."[94] His inscrutability is seen as early as the opening years of the 1890s, when Veblen taught a course on socialism. "No one could determine whether he was himself a socialist."[95]

The Theory of the Leisure Class, first published in 1899, established Veblen as a writer of great insight, wit, and originality. In this work Veblen located and analyzed the several phenomena of "pecuniary emulation," "conspicuous consumption and waste," and "invidious comparison." All these concepts find their place in Mumford. Veblen points to the fact that the desire for gain and accumulation

stem, not from material, but from cultural needs.[96] Wealth has come to be seen as an end in itself and as an intrinsic badge of merit, and non-productive behaviour - conspicuous leisure - stands as a demonstration that wealth is possessed.[97] In other words, and in terms more reminiscent of Mumford, money becomes reified and productive labour devalued.

Veblen insists upon the dialectical nature of the relationship between people and institutions.[98] The prevailing social organization of a time will encourage the development of a particular type of individual. The human qualities best suited to and encouraged by the pecuniary culture include: "Freedom from scruple, from sympathy, honesty and regard for life...."[99]

The test of whether an object or activity is essentially a demonstration of conspicuous consumption is

> the question whether it serves directly to enhance human life on the whole - whether it furthers the life process taken impersonally. For this is the basis of award of the instinct of workmanship, and that instinct is the court of final appeal in any question of economic truth or adequacy.[100]

The "instinct of workmanship" and that of "idle curiosity" stand over and against the negative phenomena of "invidious comparison," "pragmatism," and "pecuniary emulation."

There are several themes, central to Veblen's work, which recur in Mumford. The first of these is Veblen's explicit insistence that the machine is a cultural product which, in turn, has profound psycho-social consequences. The tendency of the habits of mind engendered by the machine process to migrate into other departments of life is also explicitly present in Veblen. The relation between science and technics which Veblen sketches, is adopted by Mumford, and Veblen's claim for the levelling effect of technology makes its appearance, as Mumford's own, in Technics and Civilization. We will look at each of these elements in slightly more detail after glancing briefly at another debt Mumford owes to Veblen.

Central to Veblen's work is a distinction between business enterprise and its concomitant human characteristics, and those of the machine process. The principles of operation and habits of thought generated by these systems are antithetical and inimical to one another. We will look more closely at

Veblen's conception of the place of technology in the modern world, and its human consequences. Here, it should be noted that Veblen's distinction is recapitulated in slightly different terms in Technics and Civilization. In this work Mumford points to the contradiction between capitalism and technics, and holds the latter to be perverted by the former.

A few brief quotes encapsulate Veblen's basic proposition regarding the place of technology in the modern world, and its effects upon the human agent.

> The machine process pervades the modern life and dominates it in a mechanical sense. Its dominance is seen in the enforcement of precise mechanical measurements and adjustment and reduction of all manner of things, purposes and acts, necessities, conveniences and amenities of life to standard units....The point of immediate interest here is the further bearing of the machine process upon the growth of culture – the disciplinary effect which this movement for standardization and mechanical equivalence has upon the human material.[101]

In brief, this process inculcates a new habit of mind, one based on a matter-of-fact, impersonal, and dispassionate approach; anything not consonant with this approach comes from the past.[102]

> The machine throws out anthropomorphic habits of thought. It compels the adaptation of the workman to his work, rather than the work to the workman....Within the range of this machine-guided work and within the range of modern life so far as it is guided by the machine process, the course of things is given mechanically, impersonally, and the resultant discipline is a discipline in the handling of cause and effect.
>
> ...In a sense more intimate than the inventors of the phrase seems to have appreciated, the machine has become the master of the man who works with it and an arbiter in the cultural fortunes of the community into whose life it has entered.[103]

It is not simply the workplace and the workmen who are affected by the machine process; the machine process and its attendant habits of mind encroach on other aspects of life. "The machine discipline...touches wider and wider circles of the population, and touches them in an increasingly intimate and coercive manner."[104] Before elaborating on this, a word is required with regard to Veblen's conception of the relationship between science and technics. In brief, Veblen holds that while modern science has its beginnings before the Industrial Revolution, the new technologies developed during that Revolution have altered the preconceptions and procedure of the scientific method.[105] Although the pursuit of science is a product of "idle curiosity," the exigencies of machine technology increasingly turn it toward practical ends.[106] This is, of course, highly reminiscent of Mumford's claim that science increasingly gets

transformed into technology. Both science and technology demand the elimination of "the personal equation."[107]

Science comes to be seen as the final authority on all manner of questions, and science's answers are held to be the only true ones.[108] While Veblen does not disparage the procedures and consequences of science and technology per se, he does admit that the "cult of science is not altogether a wholesome growth...."[109] As well, he is thunderously critical of the "predilection for an air of scientific acumen and precision where science does not belong,"[110] such as in the humanities.

Veblen, and Mumford after him, condemn the "hegemony" of the animus of the machine process: Veblen states that:

> By the early decades of the nineteenth century, with a passable degree of thoroughness, other grounds of validity and other interpretations of phenomena, other vouchers for truth and reality, had been eliminated from the quest of authentic knowledge and from the terms in which theoretical results were conceived or expressed. The new organon had made good its pretensions....[The movement was toward establishing] the hegemony of workmanlike efficiency.[111]

This movement similarly requires "the working population... to be standardized, movable, and interchangeable in much the same impersonal manner as the raw or half wrought materials of industry."[112]

What is Veblen's prognosis for the future? Despite the fact that the "increasing mechanistic orientation of the modern time" prevents thought on certain "imponderables," such as "personal and spiritual traits, qualities and relations,"[113] Veblen is not without a modicum of hope for a kind of renewal.

The machine is seen as essentially a leveller: this has a positive and negative aspect, with the former outweighing the latter. In its negative aspect: "The machine is a leveller, a vulgarizer, whose end seems to be the extirpation of all that is respectable, noble, and dignified in human intercourse and ideals."[114] One must allow here for the possibility that Veblen's irony is in operation: he may very well be pleased to see the disappearance of those things, which, in the conventional understanding of the pecuniary economy are thought of as "respectable, noble, and dignified." In its clearly positive aspect, in

Dorfman's terms: the machine process is "socialistic, iconoclastic."[115] Dorfman goes on to quote Veblen:

> "We must adapt ourselves to the rule of the machine if we would use it and we have to use it not as we would always wish but as it is determined for us. Society has adapted itself to the machine process. Either you learn to think in its terms or not at all unless you want to go back to the farm and a pretty small farm at that."[116]

This adaptation to the machine process, is, for Mumford, a core concern related to the abdication of the human person. Veblen, however, seems quite happy with the prospect, seeing it as an abandonment of archaic, animistic habits of mind. Despite this difference, Mumford's aphorism, "The machine is a communist," quite clearly stems from Veblen.

Mumford also takes from Veblen in adapted form the idea that the contradiction between the industrial and pecuniary employments will lead to the abolition of the latter: in essence, the vanquishing of capitalism. A final, and important notion in Veblen is also a central tenet in Mumford: the idea that the machine itself carries the seeds of its own, and human, liberation.

> The modern large-scale dynastic state violates the technological foundation upon which it rests. "The Imperial system of dominion, statecraft, and warlike enterprise necessarily rests on the modern mechanistic science and technology, for its economic foundations and its material equipment as well as for its administrative machinery and the strategy necessary to its carrying on. In this, of course, it is in the same case with other modern states. Nothing short of the fullest usufruct of this technology will serve the material needs of the modern warlike State; yet the discipline incident to a sufficiently unreserved addiction to this mechanistic technology will unavoidably disintegrate the institutional foundation of such a system of personal dominion as goes to make up and carry on a dynastic state."[117]

In his later years Veblen saw a new and bright possibility for the future in Bolshevism: "Six months before his death in 1929, Veblen said in substance...:'Naturally, there will be other developments right along, but just now communism offers the best course that I can see.'"[118]

PATRICK GEDDES

Patrick Geddes exerted a profound influence on Mumford. Referring to him as his "Master", Mumford used Geddes both as his inspiration and his point of departure. Their meeting, when it eventually occurred after years of correspondence, was a disappointing one for Mumford. Yet it marked a

pivotal moment in Mumford's own development, for he seems to have become aware of the necessity of pursuing his own directions without the sometimes oppressive tutelage of the "Master."

The singular and surprising figure of Patrick Geddes is a difficult one to sketch briefly. Nevertheless, such an attempt is essential here as Mumford was affected as much by Geddes' life as by his writings. "P.G."'s life embodies his teaching and thought: his status as a "generalist" is best seen in his actions and activities, and his published writings are remarkably slim.

Life

Born in 1854 in a small village in Scotland as the adored youngest child of his parents, Geddes early displayed an interest in botany. One week into his first year in Botany at the University of Edinburgh, the young Geddes returned home in disgust over the sterile, mechanical and life-denying methods used to teach what was for him a wondrous, richly alive, and inspiriting pursuit. Geddes would never lose this attitude toward institutionalized education which glorified and revered the laboratory while disparaging the field. In later years all forms of conventional education came to be seen as "penal servitude" in "conventional respectable futility."[119]

Geddes had long admired the work of Thomas Huxley and upon his premature return from Edinburgh determined to go to the Royal School of Mines where Huxley taught zoology. Despite his family's religious reservations, the young Geddes set out for London in 1874; there he soon became a favourite pupil of his master, Huxley. For the next five years he studied and taught there, briefly taking time to participate in a botanical field school at Roscoff, Brittany and to attend the Ecole de Medecine at the Sorbonne. While in Paris he discovered the thought of Frederic Le Play - an engineer-cum-sociologist. Earlier Geddes had been attracted to the "humanistic approach" of Comtean Positivist doctrines and had joined Richard Congreve's Positivist Society. But Le Play's doctrine of "Work, Place, Folk" deeply impressed Geddes and confirmed him as a sociologist. In the Le Play triad, Geddes saw the equivalent of the Biological Trinity of Function, Environment, Organism.[120]

Feeling the need to further expand his horizons Geddes set sail in 1879 for a botanical and geological expedition to Mexico. The work was disappointing and to compound this Geddes suffered a temporary blindness. Recuperating in a completely darkened room and despondent over the possible permanent loss of his eyesight (there was a family history of blindness), Geddes evolved his famous "thinking machines." These were simply pieces of paper on which were written concepts or labels and which, when folded, indicated, Geddes believed, the relationships between these things. It is difficult to convey the importance Geddes attached to his thinking machines. They stood as a useful adjunct to thinking, enabling one to graphically encapsulate whole areas of thought. Marshall Stalley has said that the "'thinking machine' became a Patrick Geddes trademark. Years later 'Geddesians' were noted, sometimes derisively, for their penchant to fold and unfold reams of paper while expounding their master's ideas."[121] Up until the end of his life Geddes was accompanied on his travels by numerous heavy trunks packed with rolls of paper on which he was attempting to work out the entire intellectual and cultural history of the human race. This is not without irony; and one is reminded of a similar contradiction in the thought of Henry Adams. Adams, the anti-mechanist, spent much of his energies in attempting to find a universal formula for the movement of history; Patrick Geddes, the vitalist, became increasingly preoccupied with the effort to reduce the complexity of human history to an immediately apprehendable graphic representation.

Geddes returned to Edinburgh to take up a minor instructional post at the University. The success of his marriage served to balance a series of failures to achieve a more significant and prominent academic position. Despite dozens of enthusiastic recommendations from eminent and influential scholars, among them Darwin, Alfred Wallace, and Huxley, Geddes was refused, one after the other, the positions of Chair of Botany, Edinburgh University (1888); Director of the Edinburgh Museum of Science (1903); and Principal of Durham College of Science (1904).

These disappointments notwithstanding, Geddes' energies seemed only to increase during these first years in Edinburgh. He always had a multitude of projects either in effect or imminent. The absence of housing available to University students caused him to purchase an old building, renovate it, and organize

it into University Hall – a self–governing, self–sustaining student residence, the first of its kind in Britain. Appalled at the miserable conditions in the Edinburgh tenements, he moved his family into one, and began a successful campaign for their rehabilitation. In 1887 he established the "Summer Meetings," a form of what we would now call "alternate education." Among the lecturers in this series of informal study sessions were "evolutionist Ernst Haeckel, educator Abbe Felix Klein, sociologist Edmond Demolins, geographer Elisee Reclus, his anthropologist brother Elie Reclus, and political philosopher Peter Kropotkin."[122] Geddes acquired an old structure adjacent to Edinburgh Castle and made it over into an odd "teaching environment" wherein his visitors were treated to a tour of the "Outlook Tower." Beginning at the top room and descending through a myriad of rooms each illustrating a particular phase of human history or culture, Geddes would talk incessantly explaining their various features.

With his wild hair combed upward from either side of his head, his unmanageable beard, and his intensely penetrating eyes, Geddes became a familiar figure on the streets of Edinburgh. Rapidly bustling about both slums and university Geddes would often accost citizens with his enthusiastic descriptions of current or impending projects and requests for assistance. More often than not he would come away from these encounters with offers of support from his dazed victims.

Through the offices of a friend Geddes managed to secure a chair of botany at University College in Dundee.[123] Although at a "second rate school," this appointment suited Geddes well for he was required to teach only during the summer. Free eight months of the year for his own pursuits, Geddes' passion for projects was given free rein. These projects are too numerous to catalogue, but mention must be made of several of them.

In 1903 Geddes and Victor Branford established the Sociological Society. Among the founding members were H.G. Wells, Leonard T. Hobhouse, J.A. Hobson, and Graham Wallas. Geddes was also instrumental in instituting a variety of other organizations: the Regional Survey Association, the Civil and Moral Education League, the Town Planning Institute, and the Ecological Society.[124] Along with the Outlook Tower, Geddes' proudest achievement was the Cities Exhibition – itself a collection from the

Tower. This was exhibited in a variety of cities before being sunk en route to join Geddes in India in 1914. It was reconstituted, primarily through the largesse of Geddes' many friends, and continued to be used and valued by Geddes throughout his life.

Amidst all this activity Geddes also found time for his practical town planning assignments and for travel. Geddes made three trips to the United States: the first in 1900, the last in 1923. On his first visit Geddes formed strong friendships with, among others, G. Stanley Hall, John Dewey, and Thorstein Veblen. Veblen in particular became an admiring friend and stayed with the Geddes family in Scotland in 1902. It was on his final trip to America that Geddes met his young protege – who had been largely responsible for organizing the visit – Lewis Mumford.

Geddes divided most of his time in his later years between India and France. In 1919 he relinquished his post in Dundee and accepted the founding Chair of Civics and Sociology at the University of Bombay. In 1925 he established Scots College in Montpellier – his final and fondest project. In this "alternate University" Geddes hoped to put his views on education into practice – and for a short time was successful. They year before his death Geddes accepted a second offer of knighthood, having refused the first in 1911. "P.G.", "The Professor" died Sir Patrick Geddes at Montpellier in 1932.

Works and Thought

Our concern here is primarily with Geddes' critique of the industrial world and his position on science and technology. However, since Mumford has said – "In general Geddes gave me the frame for my thinking: my task has been to put flesh on his abstract skeleton."[125] – it is necessary to glance at the general contours of this frame before looking specifically at Geddes on technology.

Despite the fact that Geddes published relatively little there is a great problem in attempting to summarize or even characterize, his thought. As a self–proclaimed "generalist" Geddes' works embody the antithesis of his favourite bete noire – compartmentalization and specialization. It is impossible to

find a comprehensive label for the manifold and mercurial thought of Patrick Geddes: his critics, both friendly and unfriendly, have resorted to multi-hyphenated descriptions. Marshall Stalley has offered the following catalogue: "planner-teacher-sociologist-political economist-botanist-activist."[126] And to this must be added the categories of "historian, communication theorist, and social critic."

Geddes hoped his organic philosophy which united the artificially separate areas of art and science, city and country, region and nation, and education and life would form the basis of a "new humanism."[127] In a sense, all of Geddes' work may be seen as a battle against false dichotomies. (And this is a characteristic not only of his protege Mumford, but also of Geddes' three favourite writers: Emerson, Ruskin, and Carlyle.[128]) He believed the current practice of separating thought and inquiry into discrete categories crippled creative thinking and encouraged acceptance of the mechanical world view. Geddes especially condemned the mutual exclusion from each other of science and art. And within this primary split, Geddes, following Veblen's lead, criticized the "separation of the school of industry from the school of science which produces 'pedants in the University and Philistines in the workshop.'"[129]

Geddes held that the "life and labour of each race and generation of men are but the expression of the working out of their ideals" and went on in an apparent (and characteristic) non sequitur to condemn the "two-fold dissipations" common in our age of "crude luxuries and sports" and war.[130] Geddes encouraged the study of war as a sociological phenomenon and insisted that understanding the current situation demanded a viewpoint different from that of the militarists.[131]

In all his projects Geddes stressed the dangers of the conventional habit of approaching single subjects in isolation. Things cannot be understood, he regularly repeated, divorced from their context, the matrix of social and natural life which gives them their meaning. Geddes escaped currents of thought which seem to demand "either/or" answers. Instead he, and Mumford after him, adopted the essentially Swiftian technique of "neither/nor." The finest example of this attitude may be found in his repudiation of both the Romantic and the Utilitarian attitudes toward industry and life. Although deeply indebted to "Carlyle, Ruskin, Morris" he felt that

> ...they were too largely Romantics – right in their treasuring of the world's heritage of the past, yet wrong in their reluctance, sometimes even passionate refusal, to admit the claims and needs of the present to live and labour in its turn, and according to its lights... The romantics have too often been as blind in their righteous anger as were the mechanical utilitarians in their strenuous labour, their dull contentment with it.[132]

What is required, Geddes insisted, is a new attitude, combining aspects of the romantic, and even the "futilitarian" movements, but which would be essentially a new commitment to life.

> From this standpoint the case for the conservation of Nature, and for the increase of our access to her, must be stated more seriously and strongly than is customary....On what grounds? In terms of the maintenance and development of life; of the life of youth, of the health of all, which is surely the very foundation of any utilitarianism worth its name.[133]

This theme of the "renewal of life" is a steady one in Geddes' life and work, and this "neither/nor" attitude permeates his thinking about technology.

Geddes' perspective on technology is most readily seen through his contrasting conceptions of the paleotechnic and neotechnic periods. Philip Boardman's discussion of these two systems contains an uncharacteristically eloquent quote from Geddes:

> Briefly described the earlier paleotechnic period was that based on coal and steam typified by waste of resources, smoke– and soot–covered cities, blighted landscapes and stunted human lives. 'A time of making money anyhow and having wars anyhow, with only utilitarian economists and liberal lawyers, or else imperial bureaucrats and bards, as our rival priesthoods: the whole system being crowned at its summit by the ruling financier.' The neotechnic period, however, which is just beginning to subordinate the older one, is marked by the use of electricity as motive power, the combining of beauty with utility in technological products, and the planning of cities wherein men may really live.[134]

The respective qualities of these two periods are antithetical to each other. The paleotechnic period is one of a life–denying "organized sacrifice of men to things, a large–scale subordination of life to machinery,"[135] with a corresponding system of senseless mass production. Its opposite, the dawning neotechnic age, consists of a life–giving application of machinery for life demonstrated by a system of production limited to and by genuine human needs (including aesthetic elements) that Geddes called a "vital economy."

Geddes believed that "life under the rule of machine and mammon"[136] would gradually give way to the more humane neotechnic order. Although not sanguine about this change – in 1911 he predicted that

war would engulf Europe in August, 1915[137] – Geddes never lost his faith in its ultimate arrival.

Although this belief falls firmly within the tradition of anticipated Enlightenment, Geddes both implicitly and explicitly rejected current and conventional ideas of progress. An implicit opposition to the idea of progress lies behind Geddes' attempt to rehabilitate the reputation of the historical periods that precede the paleotechnic era. He denounces the myth of "the misery and degradation of the towns of the Middle Ages"[138]: what the critics find to blame in these towns has actually "been introduced in the centuries since the middle ages died – the very worst of it within our own times."[139] Philip Mairet, a biographer of Geddes, also finds within this stance an opposition to imperialism – the politics which the doctrine of progress supports:

> 'We need,' he would say, 'to recognize the far vaster, if slower progress of the human race before the dawn of the Paleotechnic age. Having got the smoke into the air – from the use, or rather abuse of the coal measures – we do not, as it were, see so clearly the monumental achievements of prehistoric days.' Similarly, our cosmopolitan and mechanical contrivances tend to blind us to the profounder and more human intelligence of the rural and regional cultures that they corrupt and exploit.[140]

While the proponents of "progress" held a unilinear view of history as an ever-improving process toward an ultimate perfection that had been reached in the industrial world, Geddes located two basic movements in history. The first of these is the degenerative "long drawn-out breakdown of medieaval equilibrium between town and country, chiefs and people, temporal and spiritual power"[141] which reaches its nadir in the contemporary industrial world. The other is the upward movement toward a new age referred to above. In the contemporary world, both these tendencies and movements exist simultaneously, making possible both the imperialist aggression characteristic of the "paleotechnic war-obsession"[142] and a critical reexamination of the "poor and dull existence" of the present industrial order.

Geddes' most direct attack on the concept of progress was given in an early lecture entitled "Conditions of Progress of the Capitalist and the Labourer." This was given as part of a series of lectures organized by Geddes under the general title "Is the Present System of Distribution Satisfactory?" Among the other lecturers in the series were Alfred Russel Wallace and William Morris.[143] In his lecture Geddes claimed that for both the capitalist and the labourer "life is a decidedly poor affair, life is equally blank at

present."[144] "Progress" has contributed nothing to the quality of life of either. Progress itself

> '...lies in always growing more cheap corn and cotton to feed and clothe more cheap labourers to grow more corn to feed more labourers, until we had an indefinite population with nothing to eat and nothing to live by and for. Such is the goal of this statistician's progress.'[145]

Geddes and Mumford

It is not possible in this brief space to do full justice to the extent of Mumford's debt to Geddes. An outline of the relationship between the two men, and a representative sample of Mumford's comments on his Master will help to provide a backdrop for a final brief discussion of the importance to Mumford's thought of his connection with Patrick Geddes.

Mumford first encountered the writings of Geddes when he was a student of eighteen at the City College in New York. This first introduction, to Evolution by Geddes and Thomson, propelled Mumford to the library to discern which of the two writers was speaking so profoundly to him. He describes his discovery of other works by Geddes: "I hadn't read more than a few pages of Geddes before I found myself almost choking with excitement over his way of looking at things..."[146]

The first letter of the unpublished Geddes/Mumford correspondence, housed in the National Library of Scotland, is dated November, 1915, and contains Mumford's request to the Outlook Tower for information regarding courses of study.[147] Geddes was out of the country when this letter was received by the Outlook Tower, but by 1917 Mumford had begun the direct correspondence with Geddes which was to last until Geddes' death.

The correspondence is revealing of Mumford's attitude toward Geddes and the nature of their relationship. Even before their meeting in 1923 Mumford is signing himself, "Yours in discipleship," and addressing Geddes as "Dear Master." This remains Mumford's standard salutation throughout the correspondence. Geddes, on the other hand, seemed to warm to Mumford only after their meeting, and in the subsequent year switches from the rather formal "Dear Mumford" to "Dear Lewis."

In 1923 Geddes made his final trip to America. This trip had been largely planned by Mumford, partly for the purpose of spreading his Master's word, and partly to enable Master and Disciple to finally meet. Just before Geddes' visit Mumford received a note from Delilah Lock, Victor Branford's secretary and close acquaintance of Geddes. Anticipating trouble, she warned Mumford: "Geddes must be accepted as a good Catholic accepts grief, with an open heart and no reserves if he is to benefit those whom his presence scourges."[148]

In fact, the meeting proved to be a singularly disappointing one for Mumford. The projected collaboration between them came to nothing. Mumford has written on several occasions of the encounter, in essence explaining its failure as due to Mumford's own independence. This is, no doubt, true enough, but it is also true that Mumford, although styling himself as his Master's disciple, had expected to be taken more seriously and accorded more respect than Geddes demonstrated. Instead, Geddes treated Mumford rather peremptorily and without the respect due to a genuine collaborator. Indeed, Mumford was later to say, "...there were two demanding, self-absorbed egos to reckon with."[149]

Yet despite this disappointment, as soon as Geddes returned to Britain, Mumford was writing to him to offer his services. Their personal relationship, however, was to be limited to their written correspondence: one subsequent meeting in Edinburgh left Mumford even more frustrated, and perhaps wounded, than the first. This did not prevent Mumford from appending to a somewhat bitter lamentation of their inability to work together - written directly upon saying goodbye to Geddes for what was to be the last time - the following paean: "And yet I love him; I respect him; I admire him; he still for me is the most prodigious thinker of the modern world."[150]

There is hardly a single book of Mumford's which does not contain some reference to Patrick Geddes. In the Acknowledgements to Technics and Civilization Mumford states: My principal debt, throughout this study, has been to my master, the late Patrick Geddes."[151] Along with numerous references to various specific ideas of Geddes, Mumford has also written fairly extensively directly about Geddes. One lengthy quotation will illustrate the flavour of most of Mumford's writings about Geddes.

The final paragraph of this passage could be a description, not of Geddes but of Mumford himself; it reveals the importance of the legacy left to him by his "Master."

> Happily there is one figure whose life-interests fully represent the forces I have been describing: one whose conscious philosophy reached a fuller stage of formulation than either Emerson or Whitman: one whose actual life, coming later, faced more fully the corruptions and devitalizations of the present scene. Obscure in his own lifetime, hardly better known today, a dozen years after his death, he incarnated the organic and made an orderly constellation of its vitalities. Patrick Geddes was his name. What he was, and what he stood for, what he pointed toward will become increasingly important as the world grows to understand both his philosophy and his example.
>
> Geddes coupled thought to action, and action to life, and life itself to all the highest manifestations of sense, feeling, and experience....
>
> The depletion of vitality, the arrest of growth, the dominations of the living by the non-living, the persistence of fixity and habit over flexibility and purposive change - against all these forms of disintegration Geddes endlessly battled. Geddes was on the side of life, wherever it was threatened or besieged.[152]

It is not possible to overestimate the importance Mumford attached to Geddes' work and life-example. Without the slightest consciousness of hyperbole Mumford can equate Geddes with Socrates and proceed to say: "Throughout his life-work Geddes is the Bacon and Leonardo, perhaps the Galileo, of an idolum that will replace the half-world of the period of expansion."[153] At the same time, Mumford is very defensive toward "superficial interpreters [who] have sometimes taken for granted that my more significant contributions can all be traced back to Geddes."[154]

Mumford is, of course, right in disclaiming absolute dependence upon Geddes, but at the same time, perhaps the gentleman doth protest too much. In his insistence that there is much in Geddes that he rejects, Mumford concentrates on the side of Geddes literally and metaphorically represented by the "thinking machines." Yet it would be more surprising if Mumford accepted this formulaic and mechanical side to his Master; and it is generally accepted that this tendency in Geddes was an eccentric and unfortunate one which should not be allowed to cloud his more genuine achievements. Mumford, then, makes much of rejecting what is usually considered the least significant aspect of Geddes' thought.

There can be little doubt that his contact with Geddes is responsible for at least the general trajectory and development of Mumford's intellectual course. And it may be further claimed that all of Mumford's major themes, concerns, or interests may be found in one form or another in Geddes. This is not to assert, however, that Mumford himself made no significant contributions in these areas. While these ideas certainly become thematic because of Geddes, Mumford develops and modifies these ideas and often reaches different (although congruent) conclusions from Geddes. Furthermore, Mumford takes many ideas found in Geddes in only fragmentary or embryonic form and develops and integrates them into a sophisticated and complex theoretical whole.

Mumford's major areas of inquiry are all areas with which Geddes was also concerned. These include: cultural and intellectual history, the history and function of architecture, the history and future of the city, and the history, development and social and psychological effects of technology. His method itself is derived from the Geddesian principle of "diagnosis before prescription." And the three primary themes referred to in Chapter II are all explicitly prefigured in Geddes' work.

The first of these themes, the critique of false dichotomies, stems from one of Geddes' most insistent positions: the false sundering from each other of science and art. Subsidiary themes to this in Geddes' writings include the importance of the development of the inner life, and the necessity of aesthetic considerations in the processes of both production and consumption. We have seen how Mumford amplifies these concerns and reverses their order of importance. For Mumford, the overarching split is contained in the separation of the objective and the subjective worlds: the separation of science and art is not the cause, but a symptom, of the problem. Mumford's emphasis is, then, very different from Geddes', yet the theme itself, and many of its constituent parts, stem from Geddes' analysis.

The second theme, the critique of industrial society, is also, as we have seen, one of Geddes' major areas of concern. Within this legacy, Mumford owes some specific debts to Geddes. We have already seen Mumford's use of Geddes' taxonomy of the paleo– and neo–technic periods. Once again, Mumford does not simply adopt these categories uncritically, but rather modifies, develops, and expands them.

Geddes' definition of specialization as "knowing more and more about less and less,"[155] is employed by Mumford often. Mumford also recontextualizes this aphorism and uses it to characterize the modern system of senseless mass-production as the production of "more and more of less and less." Mumford also takes from Geddes the fundamental concept of the loss of values and meaning in the modern world. This is a tremendously important perspective which links Geddes, through Mumford, to such eminent contemporary communication theorists as Jean Baudrillard.

Finally, the ultimate purpose behind Mumford's work, the renewal of life, stems immediately and directly from Geddes. "Physical construction, P.G. kept repeating, is useless unless accompanied by mental, moral, and social renewal."[156] Mumford accepts this proposition implicitly and his project becomes one of diagnosing the present ills of society in order to move toward a renewal that would allow for the development of integrated, balanced, human beings, in a world no longer divided into artificially created compartments which permit the exercise of an illegitimate power of one group over another.

Conclusion

The thinkers considered in this chapter share with Mumford a certain marginality. Emerson retired from the pulpit and from all the protective respectability it afforded him. His philosophy ran counter to the general philosophical orientation of the day and his work in the abolitionist movement similarly identified him as a rebel. Emerson the social critic today stands in the shadow of Emerson the literary critic. The same may be said of John Ruskin: while certainly not marginal with respect to art criticism, his political economy was not taken seriously in his time and is scarcely more so today. Henry Adams remains a rather shadowy figure, who, although at the centre of political life, and despite repeated efforts, never held formal office. As well, apart from a brief stint at Harvard, he eschewed academic appointments, and has, in turn, been neglected by the Academy. Patrick Geddes held a minor academic post and distinguished himself as a botanist and biologist, but his social thought has not been accorded the same respect. This shared marginality, coupled with the inter- and multi-disciplinary nature of their

approaches, has served to hide the contributions these thinkers have made to the study of the social history of technology.

As well as their status as generalists and their shared marginality, these thinkers also have in common a series of themes. The first of these is a sense of civilization threatened, the second an understanding of technology as a social construct, and the third a belief in the possibility of a reconstituted new world.

Lewis Mumford shares with these thinkers a position of marginality, a multidisciplinary perspective and these three primary themes. This, along with his profound connection to Geddes (who in turn had acquaintance either personal and/or literary with Emerson, Ruskin, and Veblen) places Mumford at the end of the tradition of thought represented by the figures examined here.

Notes

1. The Golden Day, p. 53.

2. Ibid., p. 60.

3. Lewis Mumford, The Condition of Man. (New York: Harcourt Brace Jovanovich, 1944 (1934).) Pp. 381–82.

4. Ibid., p. 337.

5. Ibid., p. 11.

6. The Conduct of Life, p. 105.

7. The Golden Day, p. 68.

8. The Pentagon of Power, p. 314.

9. The Golden Day, p. 45.

10. The Golden Day, p. 50.

11. Ralph Waldo Emerson, Emerson's Complete Works V: English Traits. (Boston and New York: Houghton, Mifflin and Co., 1903.) P. 103.

12. Ibid., p. 167.

13. Ibid., p. 161.

14. Ibid., p. 168.

15. Joel Porte, Ed., Emerson in His Journals. (Cambridge, Mass.: Belknap Press, 1982.) P. 81.

16. Interpretations and Forecasts, p. 19.

17. The Pentagon of Power, p. 421.

18. The City in History, p. 567.

19. John Ruskin, Ruskin's Works IV: Fors Clavigera I–II. (New York: Clarke, Given and Hooper, undated.) Fors Clavigera II, "Notes and Correspondence", Letter 30, p. 18.

20. George Allan Cate, Ed., The Correspondence of Thomas Carlyle and John Ruskin. (Stanford, CA: Stanford University Press, 1982.) Pp. 108–109n.

21. Quentin Bell, Ruskin. (London: Oliver and Boyd, 1963.) P. 6.

22. Cate, p. 68.

23. John Dixon Hunt, The Wider Sea. A Life of John Ruskin. (London: J.M. Dent and Sons Ltd., 1982.) Pp. 301–302.

24. Ibid., p. 5.

25. Ibid., p. 338.

26. Ibid., p. 339.

27. John Ruskin, Ruskin's Works V: Fors Clavigera III–IV. (New York: Clarke, Given and Hooper, undated.) Fors Clavigera III, Letter 56, "Notes and Correspondence," p. 13.

28. Bell, p. 87.

29. Ibid., p. 85.

30. Fors Clavigera II, Letter 36, p. 121.

31. Fors Clavigera, IV, Letter 76, p. 7.

32. John Ruskin, Lectures on Art. (Orpington, Kent: George Allen, 1887.) P. 35.

33. Ibid.

34. Ibid., p. 44.

35. Ibid., p. 142.

36. Ibid., p. 125.

37. Ibid., pp. 13–14.

38. John Ruskin, A Joy Forever. (London: George Allen and Sons, 1909.) P. 42.

39. Ibid., p. 10.

40. Ibid., pp. 60–61.

41. Lectures on Art, p. 142.

42. Bell, p. 49.

43. Quoted in Hunt, p. 197, from The Stones of Venice.

44. Lectures on Art, pp. 119–20.

45. Ibid., p. 6.

46. Fors Clavigera II, Letter 46, p. 280.

47. Ibid., Letter 97, p. 7.

48. Unto This Last, p. 175.

49. Sesame and Lilies, p. 54.

50. Ibid., p. 41.

51. Ibid.

52. John Ruskin, Sesame and Lilies, Unto this Last, and the Political Economy of Art. (London: Cassell and Co. Ltd., 1909.) Unto this Last, p. 190.

53. Fors Clavigera I, Letter 5, p. 67.

54. Ibid., Letter 7, p. 99.

55. John Ruskin, Time and Tide. (New York: John Wiley and Sons, 1886.) P. 150.

56. Fors Clavigera I, Letter 7, p. 99.

57. Ibid., p. 96.

58. Ibid., Letter 1, p. 10.

59. Fors Clavigera II, Letter 34, p. 93.

60. Ibid.

61. Fors Clavigera I, Letter 5, pp. 61–2.

62. Ibid., p. 67.

63. Ibid., p. 63.

64. Ibid pp. 64–5.

65. John Ruskin, The Two Paths: Being Lectures on Art and Its Application to Manufacture. (Orpington, Kent: George Allen, 1896.) Pp. 118–19.

66. The City in History, bibliographical annotation, p. 621.

67. Lewis Mumford, The Culture of Cities. (New York: Harcourt Brace Jovanovich, 1970 (1938).) Bibliographical annotation of Munera Pulveris, p. 542.

68. Lewis Mumford, My Works and Days. (New York: Harcourt Brace Jovanovich, 1979.) P. 102.

69. Technics and Civilization, p. 205.

70. See, for instance, Technics and Civilization, p. 378. Also, Lewis Mumford, Interpretations and Forecasts 1922–1972. (New York: Harcourt Brace Jovanovich, 1979.) The last sentence of this work reads: "So my final word to you is to remember what the young are saying to us, in words that were first used by John Ruskin: "There is no wealth but life." – Let it flower!" P. 496.

71. Fors Clavigera I, Letter 7, p. 91.

72. Hunt, p. 59. Ruskin quote from Modern Painters III.

73. Fors Clavigera II, Letter 41, p. 200.

74. Ibid.

75. Henry Adams, The Education of Henry Adams. (Boston: Houghton Mifflin Co., 1974.) P. 435

76. Henry Adams, Mont-Saint-Michel and Chartres. (Garden City, N.Y.: Doubleday, 1959 (1913).) P. 13.

77. Ibid., p. 16.

78. William Morris, Hopes and Fears for Art". (London: Ellis and White, 1882.)

79. R.P. Blackmur, Henry Adams, (London: Marlin Secker and Warburg Ltd., 1980.) Pp. 205-207

80. Ernest Samuels, Henry Adams: The Major Phase. (Cambridge, Mass.: Belknap Press, 1964.) P. 209.

81. The Education, pp. 341-342.

82. The Education, p. 466.

83. The Education, pp. 421-22.

84. The Education, pp. 495.

85. Quoted in Samuels, p. 440.

86. Quoted in Samuels, p. 325. From a letter to Henry Osborn Taylor, January, 1905.

87. Quoted in Samuels, p. 451.

88. Quoted in Samuels, p. 241.

89. The Education, p. 498.

90. The Education, p. 482, 485.

91. One of Mumford's most famous theories concerns the development of the "megamachine." In The Education we find the following remarkable statement: "Outside of occult or fetish-power, the Roman world was incredibly poor. It knew but one productive energy resembling a modern machine - the slave."(P. 480) This needs no further comment.

92. Wesley C. Mitchell, Intro. to What Veblen Taught. Wesley C. Mitchell, Ed. (New York: Augustus M. Kelly, 1964.) xi.

93. Joseph Dorfman, Thorstein Veblen and His America. (New York: Augustus M. Kelly, 1961 (1934).) P. 57.

94. C. Wright Mills, Intro. to Thorstein Veblen, The Theory of the Leisure Class. (New York: New American Library Inc., 1953.) x.

95. Dorfman, p. 96.

96. The Theory of the Leisure Class, p. 39.

97. Ibid., p. 45.

98. Ibid., p. 131.

99. Ibid., p. 151.

100. Ibid., p. 79.

101. Thorstein Veblen, "The Cultural Incidence of the Machine Process," from The Theory of Business Enterprise, in What Veblen Taught, p. 306.

102. Thorstein Veblen, The Place of Science in Modern Civilization. (New York: Russell and Russell, 1961.) P. 1.

103. "The Cultural Incidence of the Machine Process," pp. 309, 321.

104. Ibid., p. 367.

105. Ibid., p. 358.

106. The Place of Science in Modern Civilization, p. 17.

107. Thorstein Veblen. Absentee Ownership and Business Enterprise in Recent Times. (New York: Sentry Press, 1964 (1923).) P. 262.

108. The Place of Science in Modern Civilization, p. 4.

109. Ibid.

110. Ibid., p. 27.

111. Ibid., p. 50.

112. "The Cultural Incidence of the Machine Process," p. 324.

113. Thorstein Veblen, "The Intellectual Pre-eminence of Jews in Modern Europe," in Essays in Our Changing Order. (New York: Sentry Press, 1964 (1934).) P. 228.

114. "The Cultural Incidence of the Machine Process," p. 354.

115. Dorman, p. 244.

116. Dorfman, p. 244.

117. Dorfman, p. 345.

118. Ibid., p. 500.

119. Patrick Geddes, "The Education of Two Boys", in Marshall Stalley, Ed., Patrick Geddes: Spokesman For Man and the Environment. (New Brunswick, N.J.: Rutgers University Press, 1972.) P. 376.

Geddes seems to have delighted in inventing new insults for formal education: schools were "examination machines"; and "Much of our so-called education is literally definable as the production of artificial defectives". Quoted in Philip Boardman, Patrick Geddes Maker of the Future. Lewis Mumford, Intro. (Chapel Hill: University of North Carolina Press, 1944.) p. 270.

120. Abbie Ziffren, in Stalley, pp. 8, 10.

121. Ibid., p. 11.

122. Ibid., p. 21.

123. Endowed, especially with Geddes in mind, by his old friend J. Martin White. Ibid., p. 23.

124. Ibid., p. 45.

125. Quoted in Boardman, p. 413.

126. Stalley, xiii.

127. H.V. Lanchester, in Jaqueline Tyrwhitt, Ed. Patrick Geddes in India. (London: Lund Humphries, 1947.) Preface, p. 14.

128. "Readings now on the appropriate levels of adolescence; of poets Tennyson and Wordsworth for choice, for whom Longfellow in school age had happily prepared me; and of the moralists, mainly Emerson (with his poems too), Ruskin and Carlyle; and at first in that order of preference and impulse, though later reversed." "The Education of Two Boys," in Stalley, p. 372.

129. Boardman, p. 142.

130. Cities in Evolution, in Stalley, p. 150.

131. Ibid., p. 153.

132. Ibid., p. 161.

133. Ibid., p. 162.

134. Boardman, p. 374.

135. Quoted in Boardman, p. 362.

136. Cities in Evolution, p. 157.

137. Ziffren, p. 71.

138. Ibid., p. 118.

139. Ibid.

140. Philip Mairet, Pioneer of Sociology: The Life and Letters of Patrick Geddes. (London: Lund Humphries, 1957.) P. 105.

141. Boardman, p. 373.

142. Cities in Evolution., p. 151.

143. Boardman, p. 96.

144. Quoted in Ziffren, p. 18.

145. Quoted in Boardman, p. 98.

146. Sketches From Life, p. 148.

147. MS. 10575. National Library of Scotland, Edinburgh.

148. Quoted in Sketches From Life, p. 319.

149. Sketches From Life, p. 326.

150. My Works and Days, p. 99.

151. Technics and Civilization, p. 475.

152. The Condition of Man, pp. 382–84.

153. Ibid., p. 389.

154. My Works and Days, p. 100.

155. Sketches From Life, p. 145.

156. Boardman, p 67.

CHAPTER IV

EVALUATION AND CONCLUSIONS

Before turning to an evaluation of Mumford's major positions it will be useful to recap their principal elements, attending particularly to changes in his thought between Technics and Civilization and The Pentagon of Power. These changes will be discussed under the three headings used in Chapter II.

The Critique of Industrial Society

While the basic line does not change – a technics increasingly divorced from human purposes and a world dominated by the exigencies of a technics in the service of a few – there are several important shifts within this basic premise. First, the historical framework or typology moves from that of the eo–, paleo–, and neo–technic stages to the distinction between poly–, mono–, and mega–technics, with the concomitant distinction between authoritarian and democratic technics. This is essentially a move away from defining a technical order principally on the basis of forms of energy. Mumford had defined the "technological complex" in Technics and Civilization in terms of both forms of power and social organization. The idea of a technological complex is retained, but the emphasis is, in the later works, on its social rather than its material elements.

Consonant with this shift is the development of the idea of the megamachine. We have seen that this new concept permits Mumford to argue more convincingly for the long and continuous history of the machine. The previous historical schema put Mumford in the uncomfortable position of arguing on the one hand against a radical rupture during the industrial revolution, yet on the other for a similar discontinuous development with the rise of paleotechnics. Although Mumford had sought to minimize this element of discontinuity through his insistence upon the overlapping and interpenetrant nature of the historical stages, this typology still suggested discrete and distinct historical periods. The idea of the "reconstitution" of the megamachine implies continuity and allows Mumford to underline his consistent argument that the machine is in the grip of irrational human motives. These motives did not suddenly

emerge either from the womb of capitalism, or as a product of paleotechnic production, as the earlier schema implied, but rather are resurgences of ancient and primitive urges. Although they are destructive, they are "natural", and not extrinsic forces; and as human forces they may also be controlled and checked by other, more positive, human qualities.

The concept of the megamachine is also designed to rectify the somewhat naive optimism with which Mumford heralded the arrival of neotechnics in Technics and Civilization. The reconstitution of the megamachine answers the inevitable question of why has this liberating technics not materialised. In Technics and Civilization there was an implicit assumption that a technics based on electricity as a source of power would not be subject to the same kind of control for pecuniary purposes as was the earlier paleotechnics. This assumption was quite clearly unfounded and untenable by the 1960s.

> Christopher Lasch, in a rare appreciatively critical article on Mumford, has stated:
>
> In Technics and Human Development and The Pentagon of Power, he gave up the naive distinction between technology and "pecuniary interests." He now proposed a more fruitful distinction between labor-saving machinery and a form of social organization, first introduced by the divine kings of Egypt and Mesopotamia, in which society itself is collectivized as a vast "labor-machine."[1]

The Critique of False Dichotomies

The critique of false dichotomies undergoes no profound changes in Mumford's corpus. The later work elaborates upon, and attempts to construct a more solid foundation for the claim made as early as The Story of Utopias that life is becoming increasingly compartmentalized and one-sided. The attempt to account for the sundering of fundamentally interconnected phenomena comprises a major part of Mumford's work. The later analysis puts much more emphasis on the question of social power than the former. The stress on the idea of power as energy in Technics and Civilization is replaced with an emphasis on social power.

The very early attitude toward science that we have seen in The Story of Utopias - the idea that science no longer has any contact with the community out of which it springs - becomes somewhat

modified in The Pentagon of Power. Here, Mumford is concerned to show much more concretely the development of "science as technics" and the domination of science by massive bureaucratic, corporate, and military institutions.

We have also seen Mumford's gradual shift away from the belief in the absolute equality of art and technics. In Technics and Human Development he argues openly for the priority of the subjective/art over the objective/technics. This argument will be looked at below.

The Renewal of Life

Although Mumford becomes less hopeful of an imminent renewal of life as the years wear on, he never loses his belief in its necessity and possibility. Mumford's early optimistic projections in Technics and Civilization for a political renewal via the programme of "basic communism" give way to a conviction that renewal cannot be achieved through organization. Instead, the individual is the sole locus of any possibility of resistance. Naturally enough, the only form of resistance open to the individual is the passive one of withdrawal, of non-cooperation.

While the proposed methods of resistance change, and while the tone becomes markedly less sanguine, the ultimate objective remains consistent throughout all of Mumford's works. In essence the renewal of life demands the reconciliation of artificially sundered aspects of life and the establishment of a technics designed and implemented to save labour, to free humankind from unnecessary drudgery, to make possible a world in which each individual is free to fulfill his or her own potential.

Since the renewal of life is the raison d'etre of Mumford's life-work it will be evaluated in some detail below.

Evaluation

The Critique of Industrial Society

Mumford argues that technology is neutral almost as a matter of necessity. To do otherwise, that is, to argue for some intrinsic teleological character, runs counter to the entire thrust of both the diagnosis and the prescription in Mumford's work. Mumford argues, therefore, that technology has the potential for both oppression and liberation. While this position is a respectable enough one, it is not without its problems. How, for instance, can nuclear weapons be seen to be "neutral"? Indeed Mumford's argument in In The Name of Sanity suggests that nuclear power itself, with its attendant threat of global annihilation, has some inherent and inevitable psycho–social consequences.

We will be in a better position to judge the worth of Mumford's claim for the neutrality of technology if we first turn to another element of his thought: the idea of the technological complex. The technological complex is comprised of the constellation of social forces and interrelationships which control, direct, and implement the specific technics of a period. This idea leaves open the question of the causal relationship between the development of specific technical forms and social organization; most often Mumford uses terms such as coincident, or simply suggests a parallel development. This implies a mutual interdependence of social and technological change, but this implication is not rendered fully explicit. This may very well be a weakness in Mumford's thought. But the ideas of the technological complex and the neutrality of technology have one great strength which serves to minimize objections we may have about their specific elements. These ideas, taken together, constitute a methodological and philosophical imperative: the necessity of viewing technology not as a phenomenon in and of itself, but as firmly embedded within a social structure which both directs it and gives it meaning.

This position insists, then, and this is not without irony given Mumford's emphasis upon technics, that it is not technology per se which is the problem, but rather its social application. Again, this perspective may be seen as a direct response to both "technophobia" and "technophilia", each of which postulates certain intrinsic traits of technology. The claim that technology is neutral, that its consequences

are dependent upon its social application, shifts the ground of the question of technology away from a consideration of technology proper and toward a more extensive social analysis. This general achievement is Mumford's greatest contribution to the study of technology.

Mumford's predilection for sweeping and sometimes rather facile typologies leaves him open to criticism. The worst of these, that of Axial Man, Post-Historic Man, One-World Man, etc., in The Transformations of Man, while perhaps commendable as an attempt to characterise the human agents in the various technological complexes, is simplistic and reductive. The schema of Technics and Civilization suffers perhaps from the opposite problem of being too expansive and general, although one cannot doubt its heuristic usefulness. And within this triadic typology itself there are some questions. The most obvious of these is Mumford's insistence upon the printing press as an eotechnic phenomenon. To locate the printing press within the realm of an older technological order denies its essentially modern nature, which Mumford himself admits. One suspects that this is a characterisation of convenience. Mumford's obvious print-bias – his repeated stress upon the salutory and sanative effects of print – prohibits him from classifying the printing press as a paleotechnic instrument. The question of nuclear power presents a similar problem. Is this a paleotechnic or a neotechnic development? Given its attendant dangers of wholesale destruction of the environment – characteristic of paleotechnics – it can hardly be included among neotechnic inventions. Yet, again, to locate this quintessentially modern development within an older technological complex contradicts common sense.

The terms poly-, mono-, and mega-technics do not bind Mumford so closely to the physical properties of technology and are more compatible with the notion of a technological complex. At the same time they serve as general descriptive terms rather than as a system of rigorous classification. This flexibility perhaps compensates for loss of specificity but also indicates another limitation of Mumford's approach. His tendency to operate within metaphorical modes, while both vivid and consonant with his emphasis on the subjective, appears on occasion to substitute for rigorous thinking.

Despite these limitations, Mumford's critique has great merit. As previously mentioned, the approach which treats technics as a "system of social relations"[2] is invaluable. The intention behind this approach is essentially a demystification and "de–reification" of technology. Within this general approach there are elements which also have great significance.

The machine as an instrument of culture has several effects upon those who employ and live with it. The first of these is the displacement of traditional loci of meaning and the increasing tendency to impute meaning through the machine. In one of its aspects, this is a less extreme, more acceptable and expansive version of McLuhan's "the medium is the message." The paradoxical loss of subjective freedom induced by incontinent production and consumption is coupled with the idea of the loss of the immediate and its replacement with vicarious experience. Compulsive consumption, at once the bedrock and product of the power complex, leads to "more and more of less and less," as quantity subsumes quality and renders the latter concept barren. This situation makes it increasingly difficult to live one's life in any way other than that endorsed by the power complex, itself a form of organization which, by default if not by design, serves the purveyors of power. Individual development is inhibited and interpersonal communication, increasingly mediated by the machine and robbed of genuine, human sources of shared meaning and experience, becomes increasingly distorted.

The Critique of False Dichotomies

While the concept of false dichotomies is not without validity, there are several criticisms we may make against Mumford's employment of the idea. There is a tendency to over–polarize and schematize. Although insistent upon the interrelatedness of each side of the splits (i.e. between the objective and subjective, art and technics, etc.), in his analysis Mumford often treats them as if they were unconnected. He does, in fact, the very thing he critiques. One may excuse this on the grounds of analytic expediency, but a second, and related, problem is not so easily dismissed. There also appears in Mumford's work a proclivity toward an over–valorization of one side of the dichotomy: the subjective or artistic. Again, he is guilty of the thing he most rails against, and seems to have fallen prey to the principle of a dictum he

regularly quotes: A.E.'s "Man becomes the image of the thing he hates." The criticism loses some of its sting if we understand this as an inevitable over-compensation for the extremity of the opposite position against which Mumford is struggling. Nevertheless, we must conclude that Mumford's attempt at balance has not been entirely successful.

As noted in Chapter II, there is an ostensible contradiction in Mumford simultaneously holding that technics is out of control and at the same time that it is operating in the service of irrational human motives. Upon examination, however, this is seen to be, not a contradiction, but a genuine paradox. Technics increasingly appears to be operating autonomously, outside the realm of human agency. And, in fact, the imperatives of technics itself have gradually come to replace human imperatives. Yet at the same time, these imperatives of technics are also those of the capitalist power complex – each in the service of the other.

Mumford seems blithely oblivious to the questions posed by a major strand of twentieth century thought – that which I have termed the "crisis of humanism." Represented most clearly by George Steiner, this line of thought seriously questions a principle Mumford continues to take for granted. This principle, summarized by Emerson's "The more piano, the less wolf," holds art to be an inevitable antidote to barbarism. The atrocities committed by educated and "cultured" individuals during the Second World War caused many humanists to reconsider this fundamental tenet of their creed. This area demonstrates both a weakness and a contradiction in Mumford's thought. The weakness lies in Mumford's failure to tackle, or even acknowledge, the questions raised by the crisis of humanism. The contradiction resides in Mumford's recognition, on the one hand, of the "demoralization and nihilism" prevalent in modern art, and his absolute faith, on the other hand, in the inherent and inevitably sanative effects of art, or at least of a reconstituted art. If technology for Mumford is "ambivalent," art is absolute.

Nevertheless, despite these criticisms, the attempt at balance, although not altogether successful, is an important one. "Balance," while an ancient principle, is reformulated in Mumford and given contemporary significance. The general argument – that we valorize technology while disparaging other

aspects of life – is sound. And the attempt to historically trace this phenomenon is valuable. Finally, the insistence upon the imagination as the tool and vehicle for effecting this balance is also substantial. The imagination, for Mumford (what I call the "embodied imagination"), is the source of both resistance to the oppression of the mechanical order and the active liberation of humankind.

The Renewal of Life

The goal of the renewal of life is a commendable one, and Mumford's analysis of the contemporary technological complex solidly supports his plea for a radical transformation of society. His hope for the future, however, is unfortunately greater than his ability to provide an adequate programme for this transformation or to convince his readers of its likelihood. Spurning the possibility of organized political resistance, Mumford is left with the rather wan hope for a wholescale "spontaneous religious conversion," an extremely unlikely possibility. Mumford's attempt to provide some grounds for taking this situation seriously by equating the modern world with ancient Rome appears a rather desperate tactic.

Mumford does a much too powerful job of convincing us both of the immensity of the power system and of the deleterious and continuing effects of the machine in our time. The argument as it is presented and developed through his life work is so convincing that it does not admit of the possibility of a passive and spontaneous renewal. Having built a house of bricks, now Mumford wants to huff and puff and blow it down as if it were straw.

As Mumford has made abundantly clear, those who hold the reins of power are using, quite deliberately, "superhuman powers for subhuman purposes."[3] Now it seems hardly likely that these individuals, who are capable and even desirous of transforming man into machine, to say nothing of actively exterminating large segments of the population through the barbarity of war, are suddenly going to "see the light" and renounce their former monstrous activities and ideologies. But perhaps we cannot ascribe this naivete to Mumford: he may be suggesting that the system itself would grind to a halt provided this mass conversion takes place in sufficient enough people who comprise the "general public." But even this is problematic for it ignores a large area of Mumford's own thought; namely, the uses of

coercion and destruction by the ruling classes in any period to maintain their position of power when under attack. Again, the possibility that those in the service of the megamachine would willingly and peacefully abandon their previous positions is simply not congruent with Mumford's analysis of the deeply entrenched "Pentagon of Power." To the contrary, more in line with Mumford's writings would be the possibility that the elite would simply initiate nuclear war while safely underground in their radiation-proofed shelters.

Another problematic area involves mass communications and the media. Mumford claims that the modern electronic media exemplify and promote the negative characteristics of the machine age. If advertising and the media are as efficient at reducing us to the status of mechanical consumers as Mumford claims, the "spontaneous religious conversion" is indeed going to require nothing short of a miracle to be successful.

Although I have been critical of Mumford in this section I have a great deal of respect for the sincerity and urgency of his call for a reversal of present life-denying tendencies. And nowhere is Mumford's humanism more apparent than in this area. Finally, Mumford's own eloquence provides the justification for any attempt, no matter how weak or misguided, to effectively control the machine and the forces it serves:

> Is this a dream? Naturally, it is a dream, for all challenges to animal lethargy and inertia begin in a dream. The dream of flight eventually produced the airplane, and the dream of brotherhood will bring forth, as its engine, an effective world government. But it is better to sink one's last hopes in a dream than to be destroyed by a nightmare...[4]

Conclusion

Although Mumford has inherited a rich tradition of thought, his own work is not without originality. Mumford's greatest talents lie in his ability to synthesize; this is so in two ways, one methodological, the other programmatic. In the first instance, Mumford demonstrates great skill in pulling together, from various sources, different and disparate strands of thought. This inter- and

multi-disciplinary procedure exemplifies the the tradition of the generalist, which Mumford inherits from his predecessors. The second type of synthesis Mumford undertakes is the reconciliation of modern dichotomies. This synthesis Mumford sees as a necessary part of the renewal of life.

The first of these types of synthesis is eminently successful. Mumford paints with a broad brush on a wide canvas, but is not incapable of taking a finely-sharpened pencil to fill in the details. He locates patterns in large historical sweeps, revealing breadth, if not always depth, of vision. His style is clear and accessible and his repudiation of the scholar's footnote comes, at least to this reader, as a welcome relief. At the same time, this clarity of style suggests two related things. First, it may help to explain the relative paucity of critical material on Mumford. Obscurantism and obfuscation breed epidemics of scholarly exegesis; clarity and directness, on the other hand, generate but silence. Second, Mumford's style puts him more clearly within the camp of the popularizers, so shunned by the academic establishment. Yet there need be no contradiction between the processes of scholarship and popularizing. Perhaps a resurrected notion of the "popular scholar" would help to rehabilitate Mumford's reputation.

Mumford's attempted programmatic synthesis fails for two reasons. In the first place, as generations of literary critics have pointed out with regard to Milton's Paradise Lost, a dynamic Hell is an inherently more interesting place than a static Heaven, and lends itself more readily to vivid description. Mumford's utopia is not successfully portrayed with any degree of concreteness; the diffuse sunlight bathing the ideal biotechnic order pales in comparison to the fire and brimstone of the contemporary world. The second problem with the synthesis is Mumford's failure to provide anything like an adequate programme for the transformation of our society.

Yet even if Mumford's own attempts at prescription are pathetically lame, we would be acting contrary to the spirit of his works if we left it at that, or if we dismissed his diagnosis on those grounds. His books are a challenge to us to think through a variety of issues, to begin to rethink our world and our potential role for social change. If nothing else, Mumford's corpus is a call to action. Perhaps his very failure is the most vital stimulant to further questions – and possibly answers. Here, we may reverse G.K.

Chesterton's famous maxim, oft-quoted by Mumford, and say, "Nothing succeeds like failure..."

Notes

1. Christopher Lasch, "Lewis Mumford and the Myth of the Machine," in The Salmagundi Reader. Robert Boyers and Peggy Boyers, Edd. (Bloomington: Indiana University Press, 1983.) P. 146.

2. Lasch, p. 147.

3. The Transformations of Man, p. 13.

4. In the Name of Sanity, p. 9.

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