

Technology and Liberation

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Critics of capitalism have traditionally considered technological development as subject to the control of dominant interests and thus as one aspect, albeit crucial, of a broader strategy aimed at reproducing existing social relations. In opposition to technological determinists (who hold material progress to be dependent on the number of individuals there happen to be of sufficiently inventive and practical bent to provide the means of rationalizing the production process) they have stressed the ultimately political direction taken by scientific research. Further, the unprecedented control of the environment facilitated by a high-level technology, thus the possibility of eliminating toil and poverty, has been assumed to be the necessary prerequisite for overcoming the struggle between men themselves. Marx wrote in the *Paris Manuscripts*:
The rich human being is simultaneously the human being in need of a totality of human life-activities - the man in whom his own realization exists as an inner necessity, as need.

The actualization of this value of abundance, the creation of a non-alienated communal form in which each, possessed of a highly refined sensorium, fully appropriates the historical attainments of the species, presupposes a material basis engendered by the development of a machine technology.

Of late, however, it has been argued that the recent institutionalization of technological innovation as a means of avoiding threatening crises of over-production through the maintenance of a high rate of consumption, has brought about a condition of material abundance which now stands as the major obstacle to the release of the socialist potential inherent within capitalism. Twentieth century men and women may well be deformed by atomistic experiences in which selfhood becomes equivalent to commodity consumption. Yet seduced into a sense of enervated affluence, they are divested of any felt need to precipitate the transition to an alternative communal form. Bewitched by the dazzling achievements of capitalism, they all too easily fall prey to an ideology in which the technical values of instrumental rationality and efficiency are significant elements. Thus it is said that technology *per se*, in some sense abstracted from the social framework in which it is embedded or, perhaps, as determining that very framework, inhibits a drastic structural upheaval and renders the usual Marxist analysis anachronistic.

I suggest that this non-dynamic analysis of contemporary capitalism, which conceals its essential fragility by reifying technology (and in this respect is little improvement on the bourgeois economists who similarly disguised the internal momentum of capitalism by their assertion of immutable economic laws), is to a large extent the result of displacing the concept of labour from the significance it held for Marx as a central ontological category. The consequence is a mixture of nihilism, in which an alternative society is projected not because it is perceived as a potential to be attained by the *Aufhebung* of

existing structures but because it provides a mentally satisfying construct for the despairing intellect, and a peculiarly subjectivist conception of human freedom, a solipsistic affirmation of the inner life. Alienation is thus effectively ontologized. Apparently impotent before the increasingly hostile forces of corporate capitalism, the unhappy consciousness seeks refuge in mystical flights of fancy or, what amounts to the same thing, contents itself with constructing the blueprint of a non-attainable utopia.

Scientific Knowledge as a Commodity

*Thus, just as production founded on capital creates universal industriousness on one side - i.e. surplus labour, value-creating labour - so does it create on the other side a system of general exploitation of the natural and human qualities, a system of general utility, utilizing science itself just as much as all the physical and mental qualities... Thus capital creates the bourgeois society, and the universal appropriation of nature as well as of the social bond itself by the members of society... For the first time, nature becomes purely an object for humankind, purely a matter of utility; ceases to be recognized as a power for itself; and the theoretical discovery of its autonomous laws appears merely as a ruse so as to subjugate it under human needs, whether as an object of consumption or as a means of production.*¹

Most critics of capitalism would follow Marx in tracing the political utilization of science by dominant interests to the emergence of capitalism, coinciding with a relatively rapid expansion of the natural sciences and a novel conceptualization of their subject matter. Pre-capitalist societies were characterized by a reverential appreciation of nature as the source of a normative pattern for the regulation of human affairs. The sixteenth century English writer, John Aylmer, proclaimed:

*Nature is nothinge els but God him'selfe, or a diuine order spred throughout the whole world, and ingrafte in euerye part of it.*²

The belief was that the universe was arranged hierarchically, a series of ranks ascending from the lowest physical level to the angelic plane, and that, manifesting the wisdom of its single creator, the design of the whole was recurrent in its every part. Thus patterns of authority, the allocation of various social functions and the differentiation of material rewards which accompanied them, were justified as being incorporated into this immutable structure. The human imperative was to accommodate and adjust to the divine plan, not to actively reshape the natural world into objects of human need.

Capitalism eroded the assumption of a just correspondence between hierarchical social relationships and the structure of the natural world, dissolving all relationships into exchange values and divesting nature of inherent meaning or teleological significance. No longer replete with norms for humankind, nature was conceived as raw material governed by mathematically expressible laws, matter which could be investigated and controlled through the application of appropriate methods. From the start those engaged in the scientific enterprise were imbued with the unshakeable conviction that the theoretical understanding, and consequent practical mastery, of extra-human reality would be registered communally through the generation of material progress. Francis Bacon, for instance, who conceived science as a methodologically precise and cooperative activity designed to satisfy human needs, noticed

the intimate connection between knowledge and power:

*Now the true and legitimate goal of the Sciences is none but this: that human life be enriched with new discoveries and wealth.*³

His *New Atlantis* leaves us in no doubt that the material abundance of this imaginary island, its cultural attainments, and the generosity and urbanity of its people, derive in no small measure from the influence of Solomon's House, a scientific establishment

seeking the knowledge of causes, and secret motions of things; and the enlarging of the bounds of human empire, to the effecting of the bounds of all things possible.

Engaged in this secular but nonetheless rarefied activity, the scientific elite is immune from the scrutiny and control of the community and itself determines which of its results are worthy of publication as being practically applicable and socially desirable. Indeed, Bacon's description of the reverence accorded to the scientists by the rest of the populus, a respect corresponding not to any claim to divine authority but rather to a recognition of the very tangible benefits contingent upon their enterprise, anticipates the mystique surrounding latter day technocrats as the architects of the consumer paradise we supposedly inhabit.

Bacon's assumptions, the belief that the fruits of scientific investigation would be assimilated into the social structure in the form of material progress which justified the privileged social position accorded to the harbingers of prosperity, were accepted more or less unquestioningly by the pioneers of social science as well as by natural scientists. Political problems were conceived as ultimately technical, amenable to solution through the eradication of those outmoded institutions and authority structures which prevented humankind from reaping the potentially rich harvest contingent upon the scientific control of the environment. And this could be achieved through the application of the criteria of science itself to the reorganization of society. St Simon, for example, projected a rationally calculated and coordinated community in which various generic aptitudes would be harnessed for maximum production; a functionally differentiated social organism in which those who excelled in technical skills were to assume responsibility for maintaining and administering the material abundance in which all would presumably share.

What was omitted from this conception of scientific activity was the fact that, being conducted within a framework of structurally generated conflicts, its practical utilization was geared to the extraction of a surplus for the benefit of a minority. The assertion of an interest-free knowledge, from which material benefits would flow apparently unmediated by class conflicts, disguised the fact that the practical mastery of nature was a means of ensuring capital accumulation. It thus became part of the ideological baggage by which the prevailing framework of domination was sustained through its anchorage in the consciousness of its members. In this way scientific knowledge, both in its practical uses and in its account of society, became a commodity which scientists exchanged for their location within the general division of labour; a division of labour no longer validated by its imagined conformity to some divinely established pattern but by the laws of progress which demanded a proliferation of occupational functions. The carriers of the community's technical skills were naturally entitled to their disproportionate

social rewards because the expertise by which all social ills would eventually be cured lay in their hands

Only in the late nineteenth and twentieth centuries, however, did technologically applicable scientific research become the mainspring of developing productive forces, first through the introduction of a type of large-scale machinery consonant with the reproduction of existing social relations because it regimented and fragmented the work force, and latterly in the form of manipulated consumption. Simultaneously the ideology of scientism, implicit in the self-conception of scientists from the beginning of the modern era, has become the dominant *Weltanschauung* in which the unjust distribution of wealth is obscured by the affirmation of growth, a technically soluble problem, as a primary value.

*What is singular about the 'rationality' of science and technology is that it characterizes the growing potential of self-surpassing productive forces which continually threaten the institutional framework and at the same time, set the standard of legitimation for the production relations that restrict this potential.*⁴

It is on this basis that technology has displaced capitalism as the evil genius in the minds of some critics of advanced industrial society, a force to be reckoned with because it suppresses any awareness of the potentialities inherent within the constellation of existing structures.

Technology as Ideology

At its most naive, this line of argument locates the obstacles to the emergence of an alternative communal form at the level of consciousness, claiming that the instrumental values emerging from the prevalence of the technological mode of experience induce humankind to regard one another, like nature, as objects to be dominated and manipulated. Theodore Roszak writes:

*We must return once again to the intimate link between the search for an epistemological objectivity and the psychology of alienation: that is, to idolatrous consciousness. It is no mere coincidence that this devouring sense of alienation from nature and one's fellow man - and from one's own essential self - becomes the endemic anguish of advanced industrial societies. The experience of being a cosmic absurdity, a creature obtruded into the universe without purpose, continuity, or kinship, is the psychic price we pay for scientific 'enlightenment' and technological prowess. Only those who have broken off their silent inner dialogue with man and nature, only those who experience the world as dead, stupid, or alien and therefore without a claim to reverence, could ever turn upon their environment and their fellows with the cool and meticulously calculated rapacity of industrial society.*⁵

The solution is the formation of an alternative consciousness through a renewal of the sacramental and visionary, a sense of rapturous wonder emanating from an awareness of being absorbed into a cosmos throbbing with vitality and significance.

Rozak's conception of man is less one of a being who simultaneously modifies himself and the environment through his own mediating activity than one of a creator of values which, once produced, gain objective existence and subjugate their creator. Hence structural changes assume incidental significance in his programme for it seems that the attainment of the appropriate mental vantage point is sufficient to dispel all contradictions.⁶ Roszak's response to the contemporary

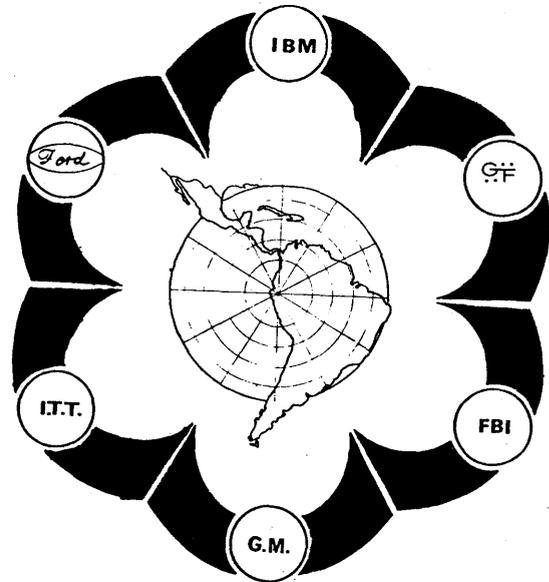
scene, whereby mind is identified as the agent of liberation, is by no means unique, for it links with a dominant strand of thinking of the current youth movement, especially prevalent among those who have gravitated Eastwards. It amounts to the celebration of inwardness in which each is conceived as a potentially ethereal monad who, once having attained communication with his/her true self through introspection or vacuous contemplation, cannot but respond to that which is essential in those with whom he/she happens to have contact. Liberation is thus made equivalent to detachment from the world with the effect of transforming men and women into abstract bundles of unactualized and unactualizable potentialities. For what is absent from the theory is any understanding that the human self must fabricate the objective conditions of its autonomy through a collective recreation of the social world.

The flaw in Roszak's analysis is the attribution of a false role to ideology in perpetuating alienated social relationships. Bourgeois ideology, of which scientific mystification or the technological veil is now evidently a main ingredient, is part of the total process through which existing structures are sustained. Yet its role is to reinforce the institutional structures of capitalism. To grasp why people treat one another as objects we need to familiarize ourselves with their (and our) basic life experiences: the socialization process to which they are subjected to prepare them for hierarchical and fragmentary productive roles. The manipulative aspect of technology is not an intrinsic feature *per se* which necessarily elicits a corresponding set of values determining the manner in which people relate to one another, but an indication of technology's embodiment in an institutional structure designed to maximise commodity production at the same time as maintaining authoritarian social patterns. As such, technology reflects in its present organization the political relationships of capitalism for, as André Gorz has aptly established, social relations do shape productive forces. But given transformed life experiences, with a correspondingly different form of technology, in which individuals engage in mutually beneficial and satisfying activities, there is no reason to suppose that they would adopt an instrumentalist attitude to one another. To suggest otherwise is to tacitly admit of the possibility of transcending, not merely a set of values, but capitalism itself.

Technology as Manipulated Consumption

A somewhat more sophisticated line of approach is the claim that the technological framework of domination has penetrated the psychic structure of its members, ensuring a passive compliance with productive requirements so that any negative or oppositional elements within capitalism are rendered inoperative. By entering the production process technology not only maintains a high rate of commodity production but ensures that any surplus is disposed of by a massive employment of advertising techniques through which leisure time activities are dissolved into consumption patterns as individuals are persuaded to accept available needs as the only desirable or essential ones. The effective domination of nature thus conceals the domination of men and the system of social control assumes a pleasant visage, all too easily tranquilizing its acquiescent victims. Simultaneously, the ubiquity of technical norms diverts rational thought from questioning the system as

a whole into the discovery of increasingly efficient means of exploitation. This, of course, is the argument relentlessly pursued by Marcuse in *One Dimensional Man* and elsewhere. It receives esoteric expression in Jeremy Shapiro's claim that *one-dimensionality operates as a universal semiotic of technological experience in which all of the oppositions of two-dimensional civilization are irreversibly homogenized and subjected to self-regulating laws of a synchronic system in which the traditional distinctions of form and matter, subject and object, the conscious and the unconscious, and the beautiful and the necessary are overcome. This universal semiotic is the ground of all future political and social development.*⁷



Leaving aside for the moment the fact that Marcuse's non-dialectical analysis, in which actual social tendencies are concealed in an imaginary picture of stasis, leads him to indulge in utopian pipe-dreaming, it simply and briefly needs to be said that a closer examination reveals the essential instability of technological society. For example, it may well be that the intensified utilization of the mass media to convince people that the privatized gratification of commodity consumption is an adequate substitute for the satisfaction of social needs testifies not to a successful containment of contradictions, as Marcuse would have us believe, but to a recognition by image-makers and others with a stake in the capitalist system that there are stresses which may prove to be ultimately explosive. No matter how many consumer goods technology manages to deliver, and how adept it is at gratifying artificial needs, it cannot obliterate the experiences of daily life: the lack of control of vital social processes, the smouldering frustration issuing from the realization that one's soul is not to be discovered in commodities. As automation increases the opportunities of satisfying needs beyond those of mere subsistence, so the absurdity of submitting to alienating experiences becomes glaringly apparent. The popular dissatisfaction with life in capitalist society, indicated by the number and nature of strikes and by the proliferation of counter-cultures, is ample evidence that the dialectic is alive and healthy.

Autonomy as a Flight from Reality

I suggested at the outset that the type of analysis exemplified in the writings of Roszak and Marcuse is not an adequate reflection of objective conditions but is a consequence of adopting a different philosophical anthropology from Marx. Labour was a central category for Marx in that it is through an active interchange with the natural world that humankind creates the opportunities for self-determination. The generic feature of man is that he transcends his 'naturalness' through his own productive activity, creating social forms that are successively displaced as they become inadequate to satisfy the needs which they generate. At least three conclusions follow from this conception. (i) A deficient social form is characterised as one where the products originating from the process of objectification exercise an independent and alien power over its members. (ii) An alternative communal form is not projected as an ideal to be superimposed upon existing social reality but as a potential present within it, to be realized through a rationally regulated interchange with the object world whereby the contradiction between general productive wealth and the inner poverty of individuals is overcome.

*When the limited bourgeois form is stripped away, what is wealth other than the universality of individual needs, capacities, pleasures, productive forces etc., created through universal exchange? The full development of human mastery over the forces of nature, those of so-called nature as well as of humanity's own nature? The absolute working-out of his creative potentialities, with no presupposition other than the previous historic development, which makes this totality of development, i.e. the development of all human powers as such the end in itself, not as measured on a predetermined yardstick? Where he does not reproduce himself in one specificity, but produces his totality? Strives not to remain something he has become, but is in the absolute movement of becoming?*⁸

(iii) The primacy of production over consumption implies that any attempt to bring about this state of affairs must begin with a reconstitution of the realm of necessity into a non-alienated mode, because work is the quintessentially human activity in which, under prevailing conditions,

individuals diminish themselves. And in a class-structured society this can only mean proletarian self-emancipation.

Now the odd characteristic of those who identify technology as the main obstacle to the creation of a humanized environment is their unwillingness to believe that the appropriation of the object world can ever be a liberating experience. This scepticism is revealed in a number of ways. Negatively, it is manifested in their treatment of current events. Whereas Marx was continually seeking in the contemporary scene significant lessons for the revolutionary struggle, as in the case of the Paris Commune where he located in its formation of a people's militia and election of revocable functionaries a microcosmic political form of widespread economic emancipation, these writers are reluctant to analyse the efforts of workers to emancipate themselves. They have plenty to say about an event such as May '68 - not so much because it may possibly provide a pattern for future development in its fusion of those whose life-styles embody needs counter to the dominant culture with those whose economic demands channel a desire to reshape the institutions determining everyday life, but more because the former group has apparently stumbled across the alternative consciousness to which so much significance is attached.

In Roszak's case there is an evident connection between his neglect of reorganization in the economic sphere and a subjectivist notion of autonomy because for him liberation is largely a cognitive affair that has little to do with the human self appropriating the object world by subjecting it to the mastery of its own rational activity.

Surprisingly, perhaps, a similar conception of freedom is implicit in Marcuse's thought. The Frankfurt School has always been distressed by the fact that labour featured so centrally for Marx, both Adorno and Horkheimer claiming that he wished to transform society into a vast workhouse in which the efficient domination of nature would effectively obscure human exploitation. According to Walter Benjamin, the undue emphasis on labour

*recognizes only the progress in the mastery of nature, not the retrogression of society; it already displays the technocratic features later encountered in Fascism... The new conception of labor amounts to the exploitation of nature, which with naive complacency is contrasted with the exploitation of the proletariat. Compared with this positivistic conception, Fourier's fantasies, which have so often been ridiculed, prove to be surprisingly sound.*⁹

For Habermas, too, Marx's thought contains a residual positivism resulting from the collapsing of all categories into that of labour, the effect being that the stress on the technical mastery of nature provides a theoretical basis for conflating socialism with bureaucratic centralism. In similar vein Marcuse argues that the Marxian conceptualisation of nature derives from what capitalism has made of it, lifeless material to be aggressively exploited and dominated through labour whereas he, like Roszak, thinks that it deserves to be treated as a subject in its own right.

Implicit in Marcuse's revisionism is a rejection of the assumption that labour can ever be an adequate mode of self-determination, the consequence being that he wishes to see the realm of necessity disposed of as swiftly as possible, at the expense of considering how, through appropriate participatory arrangements, it might be transformed

CRITIQUE

A JOURNAL OF SOVIET STUDIES
AND SOCIALIST THEORY

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into a truly human form of activity! In an essay of 1933 Marcuse betrays the influence of Heidegger by suggesting that alienation is a necessary concomitant of objectification, thus treating it as an ontological rather than historical category.

*In laboring, the laborer is always 'with the thing': whether one stands by a machine, draws technical plans, is concerned with organizational measures, researches scientific problems, instructs people, etc. In his activity he allows himself to be directed by the thing, subjects himself and obeys its laws, even when he dominates his object, directs it, guides it, and lets it go its own way. In each case he is not 'with himself', does not passively stand by his own existence. On the contrary, he places himself in the service of an 'Other than himself', and he is with an 'Other than himself' - even when this doing fulfills his own freely assumed life. This externalization and alienation of human existence ... is ineliminable in principle.*¹⁰

Real freedom is held to be possible only beyond the realm of material production where the burden of labour is removed and the individual may engage in activities that are not constrained by any external obstacle. Thus play becomes the paradigmatic activity in which autonomy is achieved because

*in a single toss of a ball, the player achieves an infinitely greater triumph of human freedom over objectification than in the most powerful accomplishment of technical labor.*¹¹

Marcuse does alter his perspective somewhat in his later works by admitting that the realm of necessity can be transformed into a mode of self-determination. But only insofar as it incorporates the realm of freedom into itself, that is, to the extent that work becomes play.¹² Now it is no coincidence that those who seek to make work wholly attractive by transforming it into a purely spontaneous, unconditioned activity are usually prepared to subject individuals to a large dose of institutional control and manipulation.

Fourier, for whom Marcuse shares with Benjamin a high regard, devised a complex pastoral utopia in which the multiplicity of individual passions would attain gratification by being channelled into socially beneficial activities. Yet his design depended on the presence of a minority able to organize the realm of necessity in the most rational manner so as to provide the rest of the population with the communal facilities for indulging their desires. Similar élitist tendencies are latent in Marcuse's speculations. Recognizing that the realm of necessity will always entail a degree of discipline and thus of instinctual arrest, he advocates a full-scale automation permitting libidinal energies to be expended outside work. The qualitative transformation of the realm of freedom consequent upon its quantitative expansion will, he suggests, be registered in the realm of necessity so that the small amount of work remaining will be experienced as play rather than toil. There would be little wrong in this except that in his haste to reduce work to its barest minimum, Marcuse fails to consider how it might become a mode through which associated individuals express their creative powers. He concedes, for example, that the most rational appropriation of nature might entail the centralized control of productive forces, in addition to a division of labour in which technical functions were the prerogative of experts.

*However, the executive and supervisory functions would no longer carry the privilege of ruling the life of others in some particular interest.*¹³

We are left with this bald statement because he is so eager to create the material basis of freedom - understood as spontaneity or play - that he is prepared to countenance practically any measure, including occupational specialization, to bring it about without considering what institutional arrangements are necessary to prevent a new form of technocracy from emerging. Indeed, the existence of such an élite might prove to be an indispensable prerequisite for allowing the majority to indulge in a plenitude of playful experiences.

There is another dimension of Marcuse's thought, expressed in *Counter-Revolution & Revolt* and other more recent writings, where his projected society hinges on the formation of a new sensibility in which the play impulse or imagination, mediating between the senses and reason, would provide the basis for the aesthetic experience of the whole of reality. Whereas art has presently lost its subversive function of transcending social contradictions by its incorporation into the process of reproducing artificial needs, the alternative sensibility would repel the instrumentalist values now materialized in technology, generating a need to cooperate with nature so as to release or restore those of its inherent aesthetic qualities which capitalism has concealed and obliterated. Thus Marcuse writes not only of a new technology (which is feasible when construed as an alternative technology which would neither make an irrational use of materials which were not renewable nor be geared to a reinforcement of hierarchical social relationships) but also of a new science that would use different concepts and establish different facts - which even Habermas



Engels sketch of the Berlin group of Young Hegelians (Ruge, Buhl, Nauwerck, Bauer, Wigand, Edgar Bauer, Stirner, Meyen and Koppen)

From Vol.2 (*Engels 1838-1842*) of the *Collected Works of Marx and Engels*. These *Collected Works* are being published by Lawrence & Wishart in 50 vols. at the amazingly low price of £3 each. They will include all the works of Marx and Engels published in their lifetime or since, their complete correspondence, a considerable part of their unpublished handwritten manuscripts and some of their works and letters newly discovered. The first two volumes are already available, two more should appear this year, and the whole set should be complete within ten years.

admits is a piece of wishful thinking, for there can be no substitute for a science oriented to the technical control of the environment so long as humankind has to appropriate reality in order to survive.¹⁴ More generally, the effect of wishing to transform society into a giant playground through the convergence of art and technology is the resolution of all contradictions in an idyllic and utopian image of stasis and harmony in which peace and solitude become the hallmarks of the good life. Instead of an active mastery of nature, Marcuse advocates a flight from reality in which man and nature would coexist as two separate entities, humankind tacitly agreeing to respect its environment on the assumption that the latter would not erect obstacles to human autonomy conceived as the unimpeded ability to gratify non-aggressive instincts.

Technology as a Basis of Autonomy

*The full development of capital, therefore, takes place... (when) the entire production process appears as not subsumed under the direct skillfulness of the worker, but rather as the technological application of science. (It is) hence, the tendency of capital to give production a scientific character; direct labour (is) reduced to a mere moment of this process.*¹⁵

Instead of seeking to abolish work by transmuting it into something it cannot be while it remains an expression of the need to live, we would do better to reject the notion that it is intrinsically oppressive and instead focus attention on how it might become an activity that evokes the creative potentialities of its participants. A more fruitful exercise would be to consider the structural reforms of basic institutions which are needed to transcend all alienated modes of existence: the decentralization of political control, the abolition of the distinction between the general categories of mental and manual labour etc - reforms which can only be precipitated by those presently denied self-determination in the sphere of work. If we really do require a handbook for guidance we would do well to turn from Roszak and Marcuse to Marx's *Grundrisse* where the outline of a more satisfactory philosophical anthropology is wedded to an attempt to spell out how technology provides the material basis for work as a non-alienated activity.

The replacement of living by dead labour heightens the contradictions of capitalism because though wealth is still measured in terms of labour power expended, its creation is increasingly dependent on the application of science and technology to the production process. The transformation of productive work into technical labour and the reduction of the amount of time spent in the realm of necessity because of automation provides the basis for the formation of a new subject who, equipped with scientific and other aptitudes, can relate to the production process as a virtuoso.

*This process is then both discipline, as regards the human being in the process of becoming; and, at the same time, practice, experimental science, materially creative and objectifying science, as regards the human being who has become, in whose head exists the accumulated knowledge of society.*¹⁶

By tying creativity to production Marx was able to envisage how, given another communal form, the ongoing process of appropriating reality might

offer the human self the opportunity of continually refining its sensibilities. For autonomy is related to the ceaseless task of humanising the material world through a conscious formulation of projects entailing a practical mastery of the environment, through encountering obstacles to be overcome by proficiency and endurance.¹⁷ In this way Marx avoided falling into the subjectivist trap of confusing autonomy with indeterminacy because the self attains to maturity through its interaction with the object world. And the technological achievements of capitalism are the foundation on which this rational and practical mastery of reality becomes a real possibility.

Footnotes

- 1 Marx, *Grundrisse*, trans. Martin Nicolaus, London, 1973, pp409-10
- 2 *An Harborowe for Faithfull and Trewe Subjectes*, Strasbourg, 1559, p89, sig. M.3 recto-verso
- 3 *Novum Organon*, Oxford, 1855, p57
- 4 Jurgen Habermas, *Toward a Rational Society*, London, 1971, p89
- 5 *Where the Wasteland Ends*, London, 1972, p168
- 6 In this John Passmore, a stern critic of Roszak, whose *Man's Responsibility for Nature*, London, 1974, has been widely acclaimed by the media, is substantially no different. For his attack on Roszak and others focuses on the fact that they have chosen to revive an inappropriate set of values for dealing with contemporary issues.
- 7 'One-Dimensionality: The Universal Semiotic of Technological Experience' in Paul Breines (ed), *Critical Interruptions*, New York, 1970, pp137-8
- 8 *Grundrisse*, op. cit., p488
- 9 Cited in Martin Jay, *The Dialectical Imagination*, London, 1973, p57
- 10 'On the Philosophical Foundation of the Concept of Labor in Economics', *Telos* 16, Summer 1973, p25
- 11 *ibid*, pp14-15
- 12 See for example 'The Realm of Freedom and the Realm of Necessity: a Reconsideration', *Praxis*, 1969, pp20-25
- 13 *One Dimensional Man*, London, 1968, p49
- 14 See his 'Technology and Science as "Ideology"' in *Toward a Rational Society*, op. cit.
- 15 *Grundrisse*, op. cit., p699
- 16 *ibid*, p712
- 17 See *ibid*, pp611-12, where Marx attacks Fourier for confusing work with play and Adam Smith for failing to grasp that this overcoming of obstacles is in itself a liberating activity - and that, further, the external aims become stripped of the semblance of merely external natural urgencies, and become posited as aims which the individual himself posits - hence as self-realization, objectification of the subject, hence real freedom, whose action is, precisely, labour... Really free working, e.g. composing, is at the same time precisely the most damned seriousness, the most intense exertion. The work of material production can achieve this character only (1) when its social character is posited, (2) when it is of a scientific and at the same time general character, not merely human exertion as a specifically harnessed natural force, but exertion as subject, which appears in the production process not in a merely natural, spontaneous form, but as an activity regulating all the forces of nature.