Contents

PREFACE

Beyond European Civilization is the sequel to *Nihilism Incorporated*, a work in which I described how European civilization came to embody a nihilistic world-orientation and to conquer the world, and how, through the expansion of capitalism, it continues to impose its environmentally destructive culture on the rest of humanity. Through a critical analysis of the failure of Marxism to overcome the defects of European culture, *Beyond European Civilization* elaborates the foundations for a culture to transcend European civilization.

This book, along with *Nihilism Incorporated*, grew out of courses of lectures on environmental philosophy given at the University of Queensland and the University of Western Australia in 1981 and 1983. Further research on Russian culture and Soviet Marxism has enabled me to situate the central ideas of *Beyond European Civilization* within a tradition originating in the work of Aleksandr Bogdanov who not only conceived humans as part of and within nature and recognized the environmental limits to economic activity, but also argued for a central role for culture in the dynamics of history and in the creation of a new social order. The *Proletkul't* movement inspired and led by him represented and still symbolizes the alternative to both capitalism and the centralized system of State control forged by Lenin and Stalin. The tradition of thought originating in this movement encompasses the pioneering efforts of Joseph Needham to combine Marxism and process philosophy and to transcend European culture in his monumental study of science and civilization in China, and makes it possible to link the more radical aspects of Marxist thought with the achievements philosophers, scientists and environmentalists inspired by process philosophy such as Ivor Leclerc, C.H. Waddington, Ilya Prigogine, David Bohm, Charles Birch and John Cobb Jr.

For their encouragement of and support for my work I am grateful to my Perth colleagues Ruth Barton, Michael Booth, Robert Flower, Barry Maund, Graham Priest, Ian Rowe, Leigh Smith and Peter Vintilla; and beyond Perth to Charles Birch, Robert Cohen, Val Plumwood, Valeria Russo, and Richard Sylvan. I am particularly thankful to Douglas Weiner for sharing his vast knowledge of Russian environmentalism and for his guidance of my research on Russian and Soviet culture. I am also indebted to a number of institutions. These include the Western Australian Society for the History and Philosophy of Science and Curtin University for granting me a research fellowship in 1984, the Australian-American Educational Foundation for granting me a Fulbright Post-doctoral Fellowship in 1985, the Center for the Philosophy and History of Science, Boston University for hosting my stay in U.S.A., Curtin University again for a further research fellowship in 1988, and

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INTRODUCTION

> Let there be no illusions. Taking effective action to halt massive injury to the earth's environment will require a mobilization of political will, international cooperation and sacrifice unknown except in wartime. Yet humanity is in a war right now, and it is not too draconian to call it a war for survival. It is a war in which all nations must be allies.[1]

So proclaimed Thomas A. Sancton in the first issue of *Time* magazine of 1989. In *Nihilism Incorporated: European Civilization and Environmental Destruction* I examined the nature and extent of this environmental crisis. It was shown to present the greatest complex of problems humans have ever had to confront. Most of the world's species are under threat of extinction, vast areas of forest and agricultural land are being destroyed, the oceans are being polluted and over-fished, reserves of minerals are being consumed at ever faster rates, and pollution is not only destroying vegetation, dissolving the ozone layer and undermining people's health, it is undermining the self-regulatory processes by which the optimum conditions for life on earth are maintained. The shortage of resources underlies most of the world's political oppression, particularly of and within poorer countries. The impoverishment of people associated with this oppression is the primary cause of the population explosion in the poor countires. At the same time humans are enclosing themselves within built-up environments which are fragmenting society and isolating people, reducing them to replaceable cogs of the economic system and rendering them politically powerless in the face of such problems. The environmental crisis is the ultimate crisis, and surmounting it is the ultimate challenge.

The civilization which engendered these problems has also produced a culture so nihilistic that people have barely begun to face up to their predicament. This culture of nihilism, the end product of the evolution of Western European civilization, permeates the thinking, practices and modes of being of almost everyone in modern Western societies - irrespective of the views which they might espouse; and this culture has come to dominate the world. People are no longer able to imagine there being more to life than survival, the daily satisfaction of their appetites, social climbing and entertaining distractions. The sole end of human endeavour has come to be the imposition of a mechanical order on the world, reducing everything, including humans, to predictable instruments of the economic machine; an end so taken for granted that it has been argued that computers, as more efficient calculating machines than humans, are the next stage of evolution. Everything that environmentalists have been concerned to oppose is legitimated by this culture, with the silent majority and most of those in positions of power indifferent to the plight of

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1. Thomas A. Sancton, 'Planet of the Year', *Time*, Jan.2, 1989, p.14.

others, fascinated with violence, absorbed in petty vanities and unconcerned about the future of the world.

The nihilism of European culture has manifested itself this century in two world wars, the outbreaks of which were greeted with obscene enthusiasm, and with the greatest arms race in history. People have supported massive expenditures by governments on weapons of mass destruction, but for the most part have been unwilling to support government efforts to alleviate the poverty of their compatriots - let alone to alleviate poverty in the Third World, to preserve environments for future generations or to prevent the degradation and destruction of non-human forms of life.[2] Even those who oppose this state of affairs rarely appreciate the pathological state of society, taking for granted that short-sighted egoism is normal, that it is the concern with nobler ends which must be explained and justified. All this is a symptom of a deeper malaise within Western culture, where the search for truth has undermined the very idea of truth, where the notion of justice has lost all content, where the ideal of individual liberty has been theoretically undermined by a deterministic, mechanical view of people, and practically undermined by a social order increasingly organized for the total physical and mental control of its members, and where the quest for power itself, the ultimate end sanctioned by Western civilization, has created a world in which people are virtually powerless to shape their lives and destinies or to respond to the problems confronting them.

Much of *Nihilism Incorporated* was devoted to analysing the evolution of European culture to show how such modes of thinking emerged and were then embodied in practices and institutions, and how these then became self-perpetuating; how once these practices and institutions were established, the concepts which they incorporated became so transparent that the world constituted by them came to appear to be reality as such, the only way the world could be seen. Through a backward and forward reflection in which society has been used as an analogy for understanding nature and nature as an analogy for understanding society, the existing social order has come to appear as the natural order. In this process, a fixation on timeless laws has underlain a growing instrumentalization and suppression of all that is becoming, which has advanced to such an extent that it has become almost impossible to comprehend the reality of creativity and spontaneity, of life and meaning in the world.

By revealing the historical specificity and uniqueness of this culture, reasons for hope have been revealed. It is possible for people to be radically different than they are; people would act and live differently if the metaphysical assumptions now dominating society could be replaced - although this would also require the transformation of society. Some of the great social transformations of the past were analysed to reveal this - in particular the formation of feudal society after the Dark Ages, and then the emergence of capitalism from feudalism. Augustinian Christianity and then mechanistic materialism were successively successful as orientations for these social revolutions. They provided new metaphysical foundations for society which overcame the contradictions in the old culture, confronted what had come to be the major problems of the era, opened up new vistas for the future, articulated the aspirations of and oriented for effective action potentially powerful sections of the population, and provided the modes of thought and orientations to the world necessary for the creation of new forms of social life. By exposing the major contradictions underlying the culture of the present, most importantly the contradiction between the heroic moralism which originally generated the drive for truth, power and individual freedom, and the nihilistic vision of the world and the nihilistic and environmentally destructive social order which has resulted from this,

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2. Of course there are strong environmentalist movements, but even in West Germany where the environmentalists have been most successful the Green Party only ever managed to get 8.3% of the vote in national elections.

the need to develop new metaphysical foundations for civilization to overcome these contradictions and to reorient people's thinking, ways of living and acting, and to reconstitute their social, economic and political institutions accordingly, has been revealed.

The present state of the world is somewhat analogous to the state of China in the Third Century B.C. The Ch'in, founded on the mechanistic philosophy of Legalism, had by their ruthless aggressiveness ended the period of the warring states by unifying China under an extremely oppressive social order. Western civilization has through its ruthless aggressiveness united the world into one economic system. In ancient China the Ch'in were overthrown and replaced by a much more benign rule inspired by the philosophies of Confucionism and Taoism. The challenge now confronting humanity is to replace the oppressive and destructive civilization which has united the world by a new global civilization based on a more adequate world-orientation. However this challenge is of far greater importance than the one confronted by the ancient Chinese. The overthrow of the Ch'in with their mechanistic and instrumentalist way of viewing people arguably reduced the capacity of the Chinese in their struggles against wave after wave of invaders. In the case of the modern world the threat lies not from without society but from the destructiveness within. Existing environmental problems, horrifying enough in their own right, are portents of almost unimaginable disasters threatening not only civilization, or even humanity as a whole, but all life on earth.

The main opposition to the hegemony of Western culture is still Marxism, although Islamic fundamentalism is becoming increasingly important. In the first part of this work Marxism will be evaluated as a basis for explaining the environmental crisis, as an alternative conception of the world, and as a basis for creating a new social order. It will be argued that those Marxists and thinkers influenced by Marxism who have examined environmental problems are correct in their identification of 'commodity fetishism', the autonomous dynamics of the market, and the domination of people to maintain and extend these dynamics, as the most important immediate causes of environmental degradation. Environmental degradation is the ultimate contradiction of capitalism, impelling people in their struggle for a livelihood to participate in the destruction of the conditions not only of capitalism, but of humanity itself, not to mention a large number of other life forms. They are also correct in their claim that if the world is to have any future, the market must be replaced, or at least subordinated, to some other socio-economic system which evaluates life in terms transcending exchange value. However the Soviet Union and other communist countries also generated massive environmental problems of their own. Through an analysis of Marxism and Soviet society, Marxism itself will be shown to have been largely responsible for this. So in its present form Marxism neither overcomes the nihilistic destructiveness of Western culture, nor provides a foundation for a less environmentally destructive socio-economic formation.

The Soviet experiment, with considerable help from other communist countries, radical political regimes in the Third World and from orthodox Marxists in the West, has largely discredited not only Marxism, but all efforts to create a better world.[3] The upshot of this is that we are now in a situation in which while a rapid development of technology and a deteriorating world economy should be seen as providing the conditions for creating a better society, and the environmental crisis is making this imperative, people no longer believe there is a better form of society. For most people, history has come to an end, a view now defended by Francis Fukuyama.[4] Marxist social theory is disparaged by French *nouveaux philosophes* as a machine for

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3. The ways in which the left has been discredited by communist and other Marxist regimes and political movements has been well described by Fred Halliday; in *The Making of the Second Cold War*, 2nd ed., London: Verso, 1986. pp.134-171.

4. Francis Fukuyama, *The End of History and the Last Man*, London: Hamish Hamilton, 1992.

constructing concentration camps, while socialism is identified with bureaucracy, surveillance, red tape and State control. As Alvin Gouldner described the present predicament: 'The political uniqueness of our own era then is this; we have lived and still live through a desperate political and social malaise, while at the same time we have outlived the desperate revolutionary remedies that had once been thought to solve them.'[5]

However by revealing the cause of the failures of Soviet Marxism it will become evident that Marxism should not be completely rejected by environmentalists. Marx's ideas cannot be dissociated from metaphysics; they are confused and inconsistent because Marx drew on ideas developed within different metaphysical traditions without clarifying his own metaphysical commitments. While his thought originated in intellectual movements deriving from Neoplatonism and mechanistic materialism, Marx partially transcended both these metaphysical schemes in a way which can only be comprehended from the perspective of process philosophy. In the early years of the Russian revolution radical Marxists, Aleksandr Bogdanov, Anatolii Lunacharskii and members of the *Proletkul't* movement accentuated those aspects of Marx's thought which accorded with process philosophy. Under their influence environmentalists made spectacular gains. But Russians were predisposed to adopt Marx's ideas in a way which would accentuate the Neoplatonic and mechanistic tendencies in his thinking. In fact Marxism was the vehicle through which Russians were able to assimilate the Western orientation towards technological domination of the world to their traditionally Neoplatonist, Orthodox Christian culture in their struggle for survival against Western European imperialism. As Soviet Marxism crystallized in the 1930's, and those Marxists who had promoted ideas in accordance with a process view of the world were suppressed, the early successes of environmentalists were negated. Those aspects of Marx's philosophy emphasising the dynamic openness of the future and the creativity of people were subordinated to a linear conception of history which reduced people and nature to means for the realization of the ultimate end of humanity - the total domination of nature by technology.[6] But what if the most original aspects of Marxism could be detached from their Neoplatonist and mechanist roots and reformulated explicitly and consistently in terms of a 'process' metaphysics - as Bogdanov and his colleagues had begun to do, could this synthesis provide the basis for the creation of a new, ecologically sustainable civilization?

The second part of this work attempts such a synthesis. A dialectical epistemology in which the goal of disciplined inquiry is understanding is elaborated, revealing an indissociable relationship between science and metaphysics. A set of categories for process philosophy is outlined, showing how these generate an alternative grand research programme for the sciences. The world must be understood as a process of creative becoming, consisting of a multiplicity of emerging and perishing, inter-dependent, partially autonomous sub-processes or self-ordering patterns of activity, each making its own unique contribution to the becoming of the world. Humanity can then be understood as a complex of emergent processes, resolving the most important problems in the philosophy of mind and philosophical anthropology: the relationship between mind and body, consciousness and the world, thought and action, freedom and determination, and the individual and society.

This conception of humanity is used to formulate a new ethical and political philosophy and a reflexive, critical science of humanity. These are designed to reveal to

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5. Quoted by Alec Nove without reference in the frontispiece of *The Economics of Feasible Socialism*, London: George Allen & Unwin, 1983.

6. In this, Russia set a general pattern. For some acute observations on the role of Marxism in transforming Chinese culture see Michio Morishima;, *Why Has Japan 'Succeeded'?*, Cambridge: Cambridge University Press, 1984, p.197ff. Morishima argues that Marxism was required to recast the indigenous spirit of resistance associated with Taoism into a more logical and tenacious form in order to defeat a corrupt Confucian bureaucracy and to assimilate Western technology.

people what they are and what contributions they can make to the becoming of the world, enabling them to orient themselves in their everyday lives, to transcend the prevailing nihilism and to effectively confront the environmentally destructive tendencies of society; and to provide the concepts and modes of thinking required for the creation of new forms of relationships between people and between humans and the rest of nature. In this way process philosophy is offered as a foundation for creating and developing of an alternative culture to oppose to and to replace the nihilistic culture which underlies the existing economic, social and political world order; and by virtue of this, for creating a new, environmentally sustainable civilization.

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MARXISM AND THE ENVIRONMENT

Marxism is the main tradition of radical opposition to the dominant culture within European civilization. It is committed to a total transformation of society, replacing capitalism with communism, as the only way to solve its problems.[1] Until the collapse of the Soviet Union, the retreat from Marxism by China and the rise of Islamic fundamentalism, mainstream Western culture and Marxism were rivals for world domination. Despite the recent defeats of Marxism, it remains the main focus of opposition to the dominant Western culture. Before any other challenges to the hegemony of mainstream Western culture can be considered it is necessary to evaluate Marxism and its potential for resolving the environmental crisis.

With the worsening of the environmental crisis Marxists claimed that this finally demonstrated the necessity for replacing capitalism by socialism. The editor of *Philosophy and the Ecological Problems of Civilization* argued:

> As many Marxists in all countries have observed, the crisis of the environment, which is reaching extreme development almost everywhere, coincides with the last stage of the general crisis of capitalism. This is evidence that it is inseparable from capitalism and is an integral element of it. A conviction is growing throughout the world that only collapse of the capitalist system and victory of socialism throughout the world will create a general, fundamental, social opportunity for rational use of natural resources and the highest degree of optimum interaction with nature... Convincing evidence that socialism is a necessary condition for optimising relations between society and nature is socialism as it actually exists, and the policy of socialist countries in respect of the environment.[2]

Was this claim justified?

The central idea behind Marx's work is that market relations, imposed and supported by its main beneficiaries, the bourgeoisie, have come to develop a life of their own which forces people to constantly revolutionize their mode of production and their way of life. First coming to dominate human relationships within Europe (where people first came to be treated as possessors of labour power to be bought and sold as a commodity), it then expanded to dominate the rest of the world. Existing antagonistic social relations are not a reflection of human nature but are the product of an historically unique socio-economic formation. This is deforming people, reproducing not only these antagonistic social relations but also the conceptions people have of themselves. While in terms of the prevailing view of

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1. Despite the carping nature of the criticisms in the second and third volumes, Leszek Kolakowski's three volumed *Main Currents of Marxism* (Oxford: O.U.P., 1978) provides the best overview of this tradition. Of particular value is the first volume, describing the tradition of radicalism from which Marxism emerged.

2. A.D. Ursal ed. *Philosophy and the Ecological Problems of Civilisation*, tr. H. Cambell Creighton, Moscow: Progress Publishers, 1983, pp.10f.

the world humans are such that relationships between them cannot be based on anything but a struggle for individual gain, Marx argued that capitalism is generating the conditions for the realization of a social order transcending such egoism in which human sociality and creativity will be acknowledged as the basis of social and economic relations.

These ideas were most fully developed in *Capital* as an immanent critique of capitalism. While this involved both revealing the defectiveness of the assumptions of the prevailing economic theory and implicitly thereby the framework of ideas supporting it, showing how these assumptions and ideas were generated and how they have been sustained, it did not explicitly set out to replace these assumptions. Marxism can be understood as the world-view which has developed to sustain Marx's critique, to explicate and defend his assumptions, and to generalize his analysis to new situations. This has led to the elaboration of both a general theory of history (historical materialism) and a general philosophy (dialectical materialism) to challenge the world-view on which capitalism is based. Though some Marxists, Karl Korsch for example, have criticised these efforts, the development of this world-view has been absolutely essential for the extension of Marx's ideas to changing historical circumstances. The questions which must be considered by environmentalists are whether Marx's critique of the prevailing socio-economic formation is justified, whether the Marxist critique extends to or can be extended to environmental issues, whether Marxism is capable of superseding the nihilistic world-view of mechanistic materialism, whether Marx has in fact revealed the way to a new social order, whether the new social order projected by Marxists would be such as to ameliorate environmental problems, and whether Marxism is adequate to sustain Marx's insights.

Answering these questions is a complex task. Marxism has been constructed out of various minor works, asides and polemical statements of both Marx and Engels, many of which are inconsistent with each other. Consequently there have emerged almost as many versions of Marxism and interpretations of Marx as there are avowed Marxists, and the Marxism of Communist countries was radically different from Western Marxism. Furthermore Marxian analyses of environmental problems have frequently been undertaken by people who are not avowedly Marxists, while until the late 1980s most avowed Western Marxists have been hostile to environmentalists. I will proceed by first outlining Marx's analysis of capitalism, focussing on the place of the environment in Marx's thought and showing the relevance of this analysis for environmental problems, and then describe the efforts of Marxists to extend Marx's insights. Whether Marxism points the way to a social order which is not environmentally destructive will be answered in a preliminary way by examining the state of the environment in the Soviet Union before its collapse.

Marx, Capitalism and the Environment

There can be no doubt that Marx considered nature as of no significance except from the point of view of human development. He was utterly contemptuous of the nature enthusiasm of the True Socialists, and the emancipation of humanity was seen by him in terms of the mastery of the whole of society over the mastery of nature. As Alfred Schmidt wrote of Marx's notion of communism:

> The new society is to benefit man alone, and there can be no doubt that this is to be at the expense of external nature. Nature is to be mastered with gigantic technological aids,

> and the smallest possible expenditure of time and labour. It is to serve all men as the material substratum for all conceivable consumption goods.[3]

Despite this, Marx's framework of analysis reveals the most important cause of humanity's recent destructive relationship to its environment.

The starting point for Marx was the conception of humans as a conscious part of nature in the process of forming themselves through their transformations of nature. In *Capital* he proclaimed:

> [Man] opposes himself to Nature as one of her own forces ... in order to appropriate Nature's productions in a form adapted to his own wants. By thus acting on the external world and changing it, he at the same time changes his own nature.[4]

However Marx pointed out that humans are only capable of reorganizing matter, and that labour is assisted by the forces of nature:

> The use-values, coat, linen, & c., i.e., the bodies of commodities, are combinations of two elements - matter and labour. If we take away the useful labour expended upon them, a material substratum is always left, which is furnished by Nature without the help of man. The latter can work only as Nature does, that is by changing the form of matter. Nay more, in this work of changing the form he is constantly helped by natural forces. We see, then, that labour is not the only source of material wealth, of use-values produced by labour. As William Petty puts it, labour is its father and the earth its mother.[5]

Seeing labour in such terms points to the limitations of human exploitation. However it was Engels rather than Marx who emphasised these limitations. Engels declared:

> Let us not ... flatter ourselves overmuch on account of our human victories over nature. For each such victory nature takes its revenge on us. Each victory, it is true, in the first place brings about the results we expected, but in the second and third places it has quite different, unforeseen effects which only too often cancel the first. The people who, in Mesopotamia, Greece, Asia Minor and elsewhere, destroyed the forests to obtain cultivable land, never dreamed that by removing along with the forests the collecting centres and reservoirs of moisture they were laying the basis for the present forlorn state of these countries. When the Italians of the Alps used up the pine forests on the southern slopes, so carefully cherished on the northern slopes, they had no inkling that by doing so they were cutting the roots of the dairy industry in their region; they had still less inkling that they were thereby depriving their mountain springs of water for the greater part of the year, and making it possible for them to pour still more furious torrents on the plains during the rainy seasons. Those who spread the potato in Europe were not aware that with these farinaceous tubers they were at the same time spreading scrofula. Thus at every step we are reminded that we by no means rule over nature like a

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3. Alfred Schmidt, *The Concept of Nature in Marx*, [1962] London: New Left Books, 1971, p.155.

4. Karl Marx, *Capital* tr. Samuel Moore and Edward Aveling, ed. Frederick Engels, Moscow: Progress Publishers, 1974, Vol.1, p.173.

5. Ibid. p.50.

> conqueror over a foreign people, like someone standing outside nature - but that we, with flesh, blood and brain, belong to nature, and exist in its midst... [6]

While assuming that humans are part of nature, the specific problem Marx was concerned with was the emergence and development of capitalism. He described how capitalism originated, how it was developing according to its own laws independently of people's intentions, and why it was far more dynamic than any previous social organization, why it is breaking through all boundaries, both physical and social, to dominate the world. It is in relation to this dynamism that he considered the effect of capitalism on the environment.

The starting point for the emergence of capitalism from feudalism was the development of market relations to a stage in which people themselves were forced to sell their creative potential as labour-power, and exchange value came to take precedence over use value in defining people's relations to their products. This commodity fetishism engendered the process whereby capitalism attained a dynamics independent of people's intentions. As Marx argued:

> [T]he exchange of commodities breaks through all local and personal bonds inseparable from direct barter, and develops the circulation of the products of social labour, [developing] a whole network of social relations spontaneous in their growth and entirely beyond the control of the actors.[7]

This system produces 'not only commodities, not only surplus-value, but it also produces the capitalist relation; on the one side the capitalist, on the other the wage labourer.'[8] And as he emphasised: 'the capitalist is just as enslaved by the relationships of capitalism as is his opposite pole, the worker, albeit in a quite different manner.'[9]:

> Only as personified capital is the capitalist respectable. As such, he shares with the miser the passion for wealth as wealth. But that which in the miser is mere idiosyncrasy, is, in the capitalist, the effect of the social mechanism, of which he is but one of the wheels. Moreover, the development of capitalist production makes it constantly necessary to keep increasing the amount of the capital laid out in a given industrial undertaking, and competition makes the immanent laws of capitalist production to be felt by each individual capitalist, as external coercive laws. It compels him to keep constantly extending his capital, in order to preserve it, but extend it he cannot except by means of progressive accumulation... To accumulate is to conquer the world of social wealth, to increase the mass of human beings exploited by him, and thus to extend both the direct and the indirect sway of capitalism.[10]

It is this self-perpetuating expansion of the market which has also produced and reproduces ways of thinking and conditions conducive to environmental destruction. It has produced the conception of people as labour-power to be bought and sold and reduced nature to a mere resource to be exploited. It has produced general insecurity by creating a continuing reserve of unemployed, impelling the short term economic orientation which is

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6. Frederick Engels, *Dialectics of Nature*, Moscow: Progress Publishers, 1976, p.180.

7. Marx, *Capital*, Vol.1, p.114.

8. Ibid., p.542.

9. Karl Marx, 'Results of the Immediate Process of Production' in appendix to the Penguin edition of *Capital*, Vol.1, tr. Ben Fowkes, Harmondsworth: Penguin, 1976, p.990.

10. Marx, *Capital* Vol.1, Progress Publishers, p.555.

one of the most important causes of environmental destruction. And it has generated population growth. In relation to this degradation of humans and nature to nothing but means of production Marx wrote:

> 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, while there appears nothing *higher in itself*, nothing legitimate for itself, outside the circle of social production and exchange. 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. In accord with this tendency, capital drives beyond national barriers and prejudices as much as beyond nature worship, as well as all traditional, confined, complacent, encrusted satisfactions of present needs, and reproductions of old ways of life. It is destructive towards all this, and constantly revolutionizes it, tearing down all the barriers which hem in the development of the forces of production, and the exploitation and exchange of natural and mental forces.[11]

And he argued that this is associated with an inherent tendency to upset the balance of nature:

> Capitalist production, by collecting the population in great centres, and causing an ever increasing preponderance of town population, on the one hand concentrates the historical motive power of society; on the other hand, it disturbs the circulation of matter between man and the soil, i.e., prevents the return of the soil of its elements consumed by man in the form of food and clothing; it therefore violates the conditions necessary to the lasting fertility of the soil ... [A]ll progress in capitalist agriculture is a progress in the art, not only of robbing the labourer, but of robbing the soil; all progress in increasing the fertility of the soil of a given time, is a progress towards ruining the lasting sources of that fertility. The more a country starts its development on the foundation of modern industry, like the United States, for example, the more rapid is this process of destruction. Capitalist production, therefore, develops technology, and the combining together of various processes into a social whole, only by sapping the original sources of all wealth - the soil and the labourer.[12]

In relation to population growth he noted:

> In fact, not only the number of births and deaths, but the absolute size of the families stand in inverse proportion to the height of wages, and therefore to the amount of means of subsistence of which the different categories of labourers dispose. This law of capitalist society would sound absurd to savages, or even civilised colonists. It calls to mind the boundless reproduction of animals individually weak and constantly hunted down.[13]

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11. Marx, *Grundrisse*, p.409f.

12. Marx, *Capital*, Vol. 1, p.474f.

13. Marx *Capital* Vol. 1, p.602.

However Marx offered no real explanation for this phenomenon.

Finally Marx revealed how this system, with all its destructive characteristics, has immanent within it the tendency to continue expansion until the entire world has been dominated: 'The tendency to create the *world market* is directly given in the concept of capital itself.'[14] And so:

> In history up to the present it is ... an empirical fact that separate individuals have, with the broadening of their activity into world-historical activity, become more and more enslaved under a power alien to them ... a power which has become more and more enormous and, in the last instance, turns out to be the *world market*.[15]

Marx's attitude to this expansion of the market was ambiguous. While he saw the overthrow of pre-capitalist modes of production such as those in India as progressive, in the case of Ireland he recognized a tendency for this expansion to lead to exploitation of one region by another, and he saw that the effects of this could be to divide and weaken the opponents of capitalism. And in a lecture on the free trade issue, he pointed out that:

> All the destructive phenomena which unlimited competition gives rise to within one country are reproduced in more gigantic proportions on the world market... If the free-traders cannot understand how one nation can grow rich at the expense of another, we need not wonder, since these same gentlemen also refuse to understand how within one country one class can enrich itself at the expense of another.[16]

Apart from revealing the exploitative and destructive dynamics of capitalism, Marx was concerned to expose the debasement of humanity by capitalism, and through this, of the possibility of life in which people will realize higher potentialities than they are able to recognize within a capitalist society. He argued in the *1844 Manuscripts*: 'Production does not produce man only as a *commodity*, the *human commodity*, man in the form of a *commodity*; it also produces him as a *mentally* and physically *dehumanized* being.'[17] And his revulsion against this dehumanisation informed all his later work. *Capital* began with an analysis of 'the categories which make up the inner structure of bourgeois society', the categories of , 'capital', 'wage labour' and so on which under capitalism mediate people's relationships, are the 'forms of being'.[18] In doing so he revealed how people are more than they are conceiving themselves to be - they are beings who to some extent form themselves through the way they conceive their social relationships. Rather than being nothing but commodities, commodity producers and commodity consumers, or labour power moved to work by their appetites, this analysis reveals people to be creative, social beings, and it implies that people have the potential to form relationships based on different categories in which their true nature is recognized and valued.

Marx, as opposed to his followers, clearly recognized that these categories are also blinding people to nature. In his *Critique of the Gotha Program*, Marx asserted: 'Labour is not the source of all wealth. Nature is just as much the source of use values... as labour,

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14. Karl Marx, *Grundrisse* tr. Martin Nicolaus, Harmondsworth: Penguin Books, 1973, p.408.

15. Karl Marx and Frederick Engels, 'The German Ideology', in *Karl Marx, Frederick Engels: Collected Works*, N.Y.: International Publishers, Vol.5, 1976, p.51.

16. Karl Marx, *The Poverty of Philosophy*, Moscow: Progress Publishers, 1973,p.193f.

17. Karl Marx, 'Economic and Philosophical Manuscripts' in *Early Writings*, Harmondsworth: Penguin, 1975, pp.279-400, p.336.

18. Marx, *Grundrisse*, p.108, 106.

which itself is only the manifestation of a force of nature, human labour power.'[19] He then pointed out that by ascribing a supernatural creative powers to labour the bourgeoisie are able to avoid acknowledging that by reducing nature to something belonging to individuals they are depriving people of access to the primary conditions of labour, and are thereby forcing people to sell their labour power as a commodity in order to live.

Marx went on to show how the conceptions people are constrained to adopt about themselves and their relationships to each other and to nature mystify the real nature of these relationships, a mystification which is essential for the reproduction and development of capitalism independently of people's intentions. At the same time he showed how this development was creating the conditions for a revolution: the development of the means of production from which a new social order based on different principles of organization could be based - increasing instability in the economy and the growth of a disciplined social class, the proletariat, which could take advantage of this instability to create the new social order. So, revealing the cause of the nihilistic conceptions people hold about the world and themselves, he pointed a way beyond this nihilism.

In this way Marx provided a framework for analysing and explaining environmental degradation and pointed a way to overcoming it. However environmental problems were not nearly as severe when Marx was writing as they are now, and neither he nor Engels offered more than brief comments on these problems. Research in this area was left to his followers.

Marxist Social Theory Since Marx

Marx's identification of capitalism as historically unique and his characterisation of its dynamics have been accepted by virtually all major social theorists (although few economists). Even a minor apologist for capitalism like Herman Kahn quoted Marx's ideas on this with approval.[20] Where anti-Marxist social thinkers disagree with Marx is about capitalism's oppressiveness, over the role of culture in the formation of capitalism, about the possibilities of its transformation, and more recently, about the relevance of Marx's analyses to modern societies. However Marxist social theorists have extended Marx's ideas to meet these challenges. The most important developments of Marxism since Marx have been studies of the expansionist, imperialistic tendencies of capitalism and its effects, studies of ideologies and culture, and more recently, studies of the State.

The most important of the early Marxist theorists of imperialism were Hilferding, Luxemburg and Bukharin.[21] Hilferding's main contribution to the theory of imperialism was his elaboration of the concept of finance capital - the product of the fusion of industrial and financial capital into huge interlocking groups which then competed with each other not by price cutting, but by enlisting State support to gain control of whole industries, this leading to inter-imperialist rivalries.[22] Luxemburg argued on doubtful grounds that capitalism can only overcome its contradictions by expanding into the non-capitalist world, but her real importance was to have revived Marx's concern with the way capitalism expands and breaks up non-capitalist social formations. Bukharin transformed previous studies of imperialism by setting them in the context of a world economy within which two tendencies were seen to be at work: the tendency towards monopoly and the integration of finance capital, and the tendency towards the acceleration of the geographical spread of capitalism and its

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19. Karl Marx, 'Critique of the Gotha Program', in Robert C. Tucker ed., *The Marx-Engels Reader*, 2nd ed., N.Y.: W.W. Norton & Co., 1978, pp.525-541, p.525.

20. Herman Kahn et.al. *The Next 2000 Years*, London: Associated Business Programs, p.47n.

21. Lenin is also regarded as a major theorist of imperialism, but his ideas derive almost entirely from Hilferding, Bukharin and the non-Marxist underconsumption theorist, Hobson.

22. Rudolf Hilferding, *Finance Capital*, [1910] tr. Tom Bottomore, London: Routledge & Kegan Paul, 1985.

integration into a single world capitalist economy.[23] Competition then becomes competition between State capitalist trusts within a world economy, with annexation and war being its instruments. None of these theorists of imperialism ever doubted that capitalism, despite its oppressiveness, was anything but a force for progress in economic development. The one person who did question this, the Indian Marxist Nath Roy who argued at congresses of the International in Moscow in the 1920s that the most important form of exploitation by capitalism was of its colonial territories rather than of its proletariat, disappeared into oblivion.

When imperialism became a major topic of Marxism again after the Second World War, the progressive nature of capitalism came under question. In 1957 Paul Baran published his *Political Economy of Growth*, an analysis of the dynamics of monopoly capitalism which included an argument that Western Europe was responsible for the poverty of Third World nations, having organized them into suppliers of cash crops. Baran's ideas concurred with the South American dependency theorists, the most notable of whom, Raul Prebisch, had argued that the poor countries of the world were being held in a state of dependent poverty by the affluent centres of the world-economy. Later Marxist theorists of imperialism attempted to assimilate the ideas of the Latin American dependency theorists to develop a Marxist version of dependency theory. The most influential of these were Paul Sweezy, Andre Gunder Frank, Arghiri Emmanuel and Samir Amin.[24] This Marxist notion of dependency was then reformulated in terms of a more general theory of global economics by Immanuel Wallerstein who argued that the economy of the world must be seen as a system, dominated by one mode of production: capitalism, and that the differentiation of the world system into affluent, semi-affluent and impoverished regions organized into a network of nation states, must be understood as a product of the dynamics of this system.[25] The different regions of the world were characterized as economic zones: the core, semiperipheral and peripheral zones. The core, the industrialized centres, contains everything which is most advanced and diversified and exploits the rest of the world, the semiperiphery possesses only some of these features and is both exploited and is exploiting, while the huge periphery represents backwardness, archaism, coerced cash-crop labour and raw materials, and exploitation. In opposition to Marx's claim that 'The country that is more developed industrially only shows, to the less developed, the image of its own future',[26] Wallerstein argued that nations will develop differently according to their position within the world-system.

While there has been considerable empirical evidence brought forward to support the claim that the economic centres have exploited and impoverished the Third World,[27] and a number of efforts to account for this evidence theoretically, there has been a revival by neo-orthodox Marxists of the view that capitalism is generally progressive. Bill Warren rejected the arguments of the dependency theorists as inconsistent with Marxism and offered counter-evidence to suggest that capitalism is progressive, that it undermines pre-capitalist modes of production and having done so, leads to rapid economic growth. He argued that to the extent that there is any backwardness in the world, this is due to the failure of capitalism

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23. N. Bukharin, *Imperialism and World-Economy*, [1917] London: Allen Lane, 1972.

24. Most of these have been examined by Anthony Brewer in *Marxist Theories of Imperialism: A Critical Survey*, London: Routledge & Kegan Paul, 1980.

25. I. Wallerstein, *The Modern World System*, 3 Volumes, N.Y.: Academic Press, 1974 - 1989; *The Capitalist World-Economy*, Cambridge: Cambridge University Press, 1979; and *The Politics of the World-Economy*, Cambridge: Cambridge University Press, 1984. The influence of Wallerstein's concepts is immense, not least through the two series *Explorations in the World-Economy* and *Political Economy of the World-System Annuals* (both published by Sage) both of which are edited by Wallerstein.

26. Karl Marx, *Capital*, Vol.1, p.19.

27. See for instance L.S. Stavrianos, *Global Rift: The Third World Comes of Age*, N.Y.: Morrow, 1981.

to penetrate these regions and thereby to undermine the pre-capitalist modes of production.[28] Wallerstein in particular has been criticised for simply assuming the existence of a world-system without defining this theoretically, for over-emphasizing the role of the market and ignoring the role of force in subjugating peripheries, the particular modes of production in different regions, and the social relations, class struggles, power structures and cultures of the nations involved in this system.[29] His work, like that of most other Marxist dependency theorists, is characterized as empirical generalization rather than a theory accounting for the differentiations in this world economy, and he has been criticised for taking the world-market as the dynamic force of history rather than the capitalist mode of production.

While there is some substance to the criticisms of Wallerstein's methodology, notably his over-emphasis on the market, failure to take into account the amount of sheer force involved in the impoverishing of peripheries, the importance of class struggle, the failure to consider local conditions and to appreciate the degree of autonomy of States, and a tendency towards functionalism, a number of theorists aligned with Wallerstein have attempted to overcome these theoretical deficiencies and to describe the actual relations which constitute the global system of differentiation and exploitation described by the dependency theorists. Wallerstein has defended the primacy of the world-system over local modes of production as an object of analysis, arguing that non-capitalist modes of production are maintained by the world-system driven by the capitalist mode of production. Capitalism provides the conditions for the continued existence of non-capitalist modes of production by providing markets for goods produced, and by providing military support to oppress groups who attempt to undermine these modes of production. This has clearly been the case in Latin America where cash crops have been produced under a feudalistic mode of production, and efforts to redistribute land to the peasants have been violently opposed with strong backing from the United States. Wallerstein's argument in this regard has been supported by P.P. Rey and G. Arrighi who have argued that such a situation also pertains in Africa. As Rey argued: 'Throughout the world, capitalism to-day plays a fundamentally counter-revolutionary role: it keeps the most archaic forms in existence; it restores them when they are threatened (see for example the sultanates of Chad).'[30] With further developments in the world-systems approach the issue has become not whether what happens in each part of the world is determined by the world economic system, but how each country and region is constrained by the dynamics of the world-system with its associated power relationships and how have they responded to these constraints.

The nature and significance of ideology was made a focus of interest by those Marxists of the 1920s influenced directly or indirectly by Hegel, notably Georg Lukács, Karl Korsch and Antonio Gramsci, although many of their ideas were anticipated by Stanislav

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28. Bill Warren's major works are: 'Imperialism and Capitalist Industrialization,' in *New Left Review* Vol.81, Sept/Oct 1973, pp.3-44; and *Imperialism, Pioneer of Capitalism*, London: New Left Books, 1980. For a review of the arguments and literature surrounding this debate see James H. Weaver and Marguerite Berger, 'The Marxist Critique of Dependency Theory: An Introduction,' in Wilber ed. *The Political Economy of Development and Underdevelopment*, 3rd ed. N.Y: Random House, 1984, pp.45-64.

29. Robert Brenner, 'The origins of capitalist development: a critique of neo-Smithian Marxism', *New Left Review*, 104, July/August, 1977; Theda Skocpol, 'Wallerstein's world capitalist system; a theoretical and historical critique', *American Journal of Sociology*, Vol.32, No.5, 1977, pp.1075-1089; Ernesto Laclau, *Politics and Ideology in Marxist Theory*, London: Verso, 1979, pp.42-50; S. Aronowitz, 'On Wallerstein's thesis', in *Theory and Society*, July, 1981, pp.503-520; and Peter Worsley, 'One World or Three? A Critique of the World-system Theory of Emmanuel Wallerstein', in David Held et. al. eds, *States and Societies*, Oxford: Basil Blackwell, 1985, pp.504-525.

30. P.P Rey, *Colonialisme, Néo-colonialsme et Transition au Capitalisme*, Paris: Maspero, 1971, p.463, translated and cited by Brewer in *Marxist Theories of Imperialism*, p.198.

Brzozowski in Poland and Aleksandr Bogdanov in Russia more than a decade earlier.[31] Since then the study of ideology has made rapid advances in a number of directions, engendering the sociology of knowledge, the sociology of science and the whole field of Marxist aesthetics.[32] Ideology was studied to clarify the effects of capitalism on consciousness, to reveal how radical action is stifled or prevented by the dominant ideology, and to show what role consciousness must play if society is to be transformed. Lukács developed and extended Marx's notion of reification, arguing that under capitalism not only do we fetishise commodities, but that also 'time sheds its qualitative, variable, flowing nature; it freezes into an exactly delimited, quantifiable continuum filled with quantifiable "things"', and that '[i]n this environment where time is transformed into abstract, exactly measurable, physical space, an environment at once the cause and effect of the scientifically and mechanically fragmented production of the object of labour, the subjects of labour must likewise be rationally fragmented.'[33] Also going beyond Marx, Antonio Gramsci developed a more complex, multidimensional and concrete analysis of the role of ideology based on his notion of cultural and ideological hegemony - the organization of consent by a dominant class. Ideological hegemony was seen to encompass the whole range of values, attitudes, beliefs, cultural norms and legal precepts which are transmitted through the State, the legal system, the schools, the churches, bureaucracies, the media, the family - as well as the workplace, solidifying the class structure and the multiple forms of domination associated with it.

Since the end of the Second World War the study of ideology has expanded as the 'industrialization of the mind',[34] the systematic control of what people think, has become ever more ubiquitous. The most significant studies have been the Frankfurt Institute philosophers' work on the domination of instrumental reason and the development and mind warping nature of mass culture, Marxist studies of science, in particular, of the origins of mechanistic science, Darwinism and Social Darwinism, and Marxist theories of education focussing on how modes of thinking on which capitalism is based are reproduced from generation to generation. More recently attention has focussed on the effect of advertising, of public relations, and of new media, most importantly television, in forming the way people think. It is argued on the basis of such studies that it is because of the reproduction of the dominant modes of experiencing and thinking that socialism has been unable to establish itself, and that what is required is the emancipation of humanity from misconceptions reproduced by capitalist society. Extending this to the Third World, it has been argued that it is through the cultural imperialism of the economic centres and the destruction of local cultural traditions that the exploitation of the peripheries of the world-economy has been possible.[35]

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31. On Brzozowski see Andrzej Walicki, *Stanislav Brzozowski and the Polish Beginnings of 'Western Marxism'*, Oxford: O.U.P., 1989. Bogdanov's ideas will be discussed in Chapter 10 of this work.

32. For some idea of the extent of this burgeoning field of study see Jorge Larrain, *The Concept of Ideology*, London: Hutchinson, 1979; and John B. Thompson, *Studies in the Theory of Ideology*, Cambridge: Cambridge University Press, 1984.

33. Georg Lukács, *History and Class Consciousness*, tr. Rodney Livingstone, London: Merlin Press, 1971, p.90.

34. From Hans Magnus Enzensberger, 'The Industrialization of the Mind' in Stanley Hoffmann and Paschalis Kitromilades eds. *Culture and Society in Contemporary Europe*, London: George Allen & Unwin, 1981, pp.83-97.

35. A good example of this is Renato Constantino, *Neocolonial Identity and Counter Consciousness*, London: Merlin Press, 1978. See also Armand Mattelart ed. *Communication and Class Struggle: 1. Capitalism, Imperialism*, N.Y.: International Genergal, 1979 and Armamd Mattelart, *Transnationals and the Third World: The Struggle for Culture*, South Headley, Mass.: Bergin and Garvey, 1983.

The final area in which Marxist thought has been developed is in the study of the State.[36] Marx himself never developed an adequate theory of the State, and Marxists have striven to fill this gap. To begin with, the State was represented as an instrument of the ruling class of the capitalist economy. As such it was seen to have become increasingly important in capitalism's final monopolistic phase in which there appeared to be a fusion of monopoly forces with the State, forming a single mechanism of economic exploitation. It was this form of the State which is supposed to have climaxed in two world wars and with the rise of the military-industrial complex. However this orthodox view of the State (an alternative to which had already been developed by Gramsci) has recently been severely criticised.[37] It has been argued that the relationship between economic and State institutions is far more complex; that the State is a battleground for opposing classes, that it has interests of its own independently of any class, that it consists of a diversity of conflicting institutions, that it is part of a world-system of nation-States, and that it is now caught in an increasingly untenable position as social relations, international relations and the international economy become more complex. It is argued by Marxist theorists of the State that what we now have within the affluent nations of the world is a crisis of the State accentuated by the internationalization of capital.[38]

Marxist Environmentalism

Marxist environmentalism has a long history. It began in Marx's own lifetime as efforts were made to take into account the second law of thermodynamics and give an account of Marx's labour theory of value and surplus value in terms of the accumulation of useful energy. The first to argue along these lines, a Ukrainian socialist named Serhii Podolinskii, proposed this to Marx personally, and Marx and Engels corresponded on Podolinskii's proposals.[39] A succession of socialist or otherwise radical thinkers put forward similar ideas at regular intervals up until the 1920s, but then because 'energism' was associated with the empirio-criticism of Bogdanov which Lenin attacked so vehemently, and probably because it implied limits to the economic growth which most Marxists believed would be the salvation of humanity, these thinkers were forgotten about until recently.[40] When the environment first began to become a major issue in the West in the early 1970s, most Marxists dismissed environmentalists,[41] and the late 1980s, Marxist environmentalists were marginal to both the Western tradition of Marxism and to the environmentalist movement. However with the publication of a number of significant works and the establishment in 1990 by James O'Connor of the journal *Capitalism, Nature, Socialism,* Marxist

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36. An excellent short introduction to these debates is Martin Carnoy's *The State and Political Theory*, Princeton: Princeton University Press, 1984. See also David Held et. al. eds, *States and Societies*, Oxford: Basil Blackwell, 1985; and James Anderson ed. *The Rise of the Modern State*, Brighton: Wheatsheaf Books, 1986.

37. See Bob Jessop, *The Capitalist State*, Oxford: Basil Blackwell, 1984; and *State Theory: Putting Capitalist States in their Place*, Cambridge: Polity Press, 1990.

38. For an analysis of the crisis of the State in modern capitalist societies see J. O'Connor, *Fiscal Crisis of the State*, New York: St Martin's Press, 1973; Claus Offe, *Contradictions of the Welfare State*, J. Keane ed., London, 1984; and Scott Lash and John Urry, *The End of Organized Capitalism*, Cambridge: Polity Press, 1987.

39. See J. Martinez-Alier and J.M. Naredo, 'A Marxist Precursor of Energy Economics: Podolinski', *Journal of Peasant Studies*, Vol.8, Jan., pp.207-224. Engels wrote disparagingly of the proposal, and argued against Podolinsky in a number of articles. See J. Martinez-Alier, *Ecological Economics*, Oxford: Blackwell, 1987, p.222.

40. See ibid. for a study of these thinkers.

41. See for instance Hans Magnus Enzensburger, 'A Critique of Political Ecology' in *The Political Economy of Science*, ed. Hilary Rose and Stephen Rose, London: Macmillan, pp.161-195.

environmentalism is now one of the most dynamic fields of Marxist research.[42] The environmental crisis is portrayed as the 'second contradiction' of capitalism.[43]

In their concern to reveal behind the glittering facade of capitalism the environmental irrationalism it engenders, Marxist and Marxist influenced environmentalists have not only extended Marx's own ideas on the environment, but have drawn on and developed the more recent extensions of Marxism. In essence, environmental problems are seen to be produced because in a capitalist society economic activity is production of commodities for the market, with production for profits having replaced production for consumption as the primary goal of activity.[44] This system cannot take into account anything which cannot be expressed as a demand on present markets (such as the needs of future generations) which at its best can anticipate demand ten years into the future,[45] it reduces nature and people to mere factors of production and it opens the possibility of increasing production and exploitation indefinitely until the environment is destroyed. Where economic decisions are made on the basis of what will produce the greatest profit by business enterprises struggling for survival in a competitive environment, it is in the interests of, and in fact imperative for decision-makers to strive to create scarcities to drive up prices, to produce in a way which deprives people of control of their lives and forces them to attain their needs and their livelihoods through markets over which monopoly or oligopoly control can be established, and to produce commodities which do not satisfy demand but which generate new demands, either by wearing out, by becoming obsolete, or by imposing new requirements on people. Thus Susan George noted in her study of the causes of Third World hunger:

> This is where the question of the individual sincerity of industry leaders is answered: they themselves - even if they are corporation presidents with the best will in the world - are not free agents. They *must*, under the logic of their system, market produce in countries that can best pay for it; they must get the best possible return on investment, which means either cheap labour or less labour and more amortizable machinery; they *must* control all the facets of food production and distribution for maximum profitability from field to supermarket to shelf.[46]

In such a system most business enterprises are compelled to use up reserves as quickly as possible. Since investments amount to interest foregone and immediate income is necessary to return interest, they are compelled to exploit renewable resources in such a way that they are destroyed if this generates only slightly greater profits,[47] and to pollute their environments. Beyond this it actually pays firms to degrade the environment, to waste reserves and to destroy resources, to pollute the air and the water, since it is through the production of scarcities and the generation of needs that profits can be made. If timber companies can destroy most of the forests of the world, their profits will increase rather than

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42. See for instance Reiner Grundmann, *Marxism and Ecology*, Oxford: O.U.P., 1991, and Ted Benton, *Natural Relations: Ecology, Animal Rights and Socialist Thought*, London: Verso, 1993.

43. This phrase was coined by James O'Connor. See 'The second contradiction of capitalism: causes and consequences', *Conference Papers*, Santa Cruz, CES/CNS Pamphlet 1. It is the theme of the recently published anthology, *Is Capitalism Sustainable?* ed. Martin O'Connor, N.Y.: Guilford University Press, 1994.

44. On some of the imperfections of the market mechanism in relation to resources, see Richard Lecomber, *The Economics of Natural Resources*, London: The Macmillan Press, 1979.

45. Theoretically anticipated future profits should be discounted at the rate of interest, but because of uncertainties, they are discounted at a higher rate.

46. Susan George, *How the Other Half Dies*, Harmondsworth, 1977, p.234.

47. It would be more profitable to farm in a way which totally destroyed the land in seven years if this generated a profit of 20% per year on the cost of the land as opposed to farming sustainably, preserving the land for a billion years, for a profit of only 10% per year.

decrease since scarcity will lead to escalating prices. If air is unpolluted, there is no room for capitalist enterprise; but if it becomes so polluted that people have to use respirators to breath, a whole new profitable industry will come into being. Where people are made ill by pollution G.N.P. can grow as drug companies and medical practicioners find new markets for their products and services.

Capitalism itself can be guaranteed to inspire solutions to some environmental problems, and in fact this is likely to be big business in the future. But by the very nature of the capitalist mode of production, the production of solutions will always fall behind the generation of the problems. To begin with, it is only where problems are recognized and there are people able to pay for solutions that capitalism will ever generate industries to solve these problems. Given the time required for problems to be recognized and along with vast numbers of impoverished people with no market power, this will always be only a small fraction of the problems. We now have cures for some of the cancers caused by pollution but it is only the affluent of the world who can afford them, and the cures hardly match the increased incidence of cancer generated by pollution.[48] And beyond this there are theoretical limits to how many problems can be solved. All activity generates at least as much disorder as it creates. It is clear that it requires far more usable energy to purify the world of pollutants than to pollute the world in the first place, and using up such energy must create even more pollutants.

The destructive nature of capitalism is particularly evident in its effects on agriculture. This has been more clearly manifest in the United States than in Europe because capitalism has reigned with less dilution from older traditions, and it is here that its dynamics are revealed. An exemplary work revealing these dynamics is Donald Worster's study of the creation of the Dust Bowl in USA through farming for profit.[49] The southern plains of the United States have been and continue to be used in a way which destroys their fertility, and the resultant dust bowl, along with the deafforestation of China's uplands about 3000 B.C. and the destruction of the Mediterranean vegetation by livestock, is frequently cited as one of the three worst ecological blunders in history. However the Dust Bowl took only 50 years to create and was not the work of illiterates or the product of over-population, but was the 'inevitable outcome of a culture that deliberately, self-consciously, set itself that task of dominating and exploiting the land for all it was worth.'[50] Since the publication of Worster's book, the dynamics of capitalism have further advanced the industrialization and concentration in control of agriculture.[51] While before the war farmers in the United States spent half their income on capital investments, they now must spend over 80%. The effect of this has been that by 1987 a third of the farmers in the Bread-Basket states of the Mid-West were facing bankruptcy. The family farm is being driven to extinction and farming is being completely taken over by transnational agribusiness companies, destroying whole farming communities. This means a complete separation between workers and the ownership of land, which is treated by big business solely in terms of its capacity to make short-term profits. The effect on the land is worse than ever. Farms now lose two bushels of topsoil for every bushel of corn produced. By 1985, the USA had lost one third of its topsoil. Continual cropping has also reduced soil fertility, and agrochemicals have caused an actual fall in productivity since the mid 1970s. Crop mono-culture has played havoc with natural ecosystems: bird, fungi and insect species disappear while others multiply, increasing the need for pesticides. And the narrowing of the genetic base of crops makes

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48. See Samuel S. Epstein, 'Losing the War Against Cancer', *The Ecologist*, Vol.17, No.2/3, 1987, pp.91-101.

49. Donald Worster, *Dust Bowl: The Southern Plains in the 1930s*, N.Y., Oxford: Oxford University Press, 1979.

50. Ibid. p.4.

51. See Bennett, *The Hunger Machine*, Ch.6, and Michael W. Fox, *Agricide*, New York: Schocken Books, 1986 for accounts of what is happening.

them increasingly susceptible to disease. The aquifers which are used to supply water for irrigation are being depleted, and will be practically exhausted by 2030. Finally, such agriculture uses huge amounts of energy. The energy required to feed one person amounts to more than 310 gallons of petroleum a year. And the situation in USA is if anything better than in other countries: Canada, Australia, New Zealand and Argentina for instance.[52]

This industrialization of agriculture has been associated with the rapid growth in secondary industry to supply its new needs for fertilizers, pesticides, seeds and machinery, and this has produced some of the greatest irrationalities of capitalism. For instance the pesticide industry is now an extremely profitable industry, as pesticides destroy predators of pests, weaken the defences of crops, and thereby create an ever greater need for pesticides.[53] While the use of pesticides increased twelve fold between 1950 and 1980, losses to pests doubled,[54] while alternative, far more promising, approaches to pest control based on ecological principles have been ignored and their proponents have been hounded out of their jobs.[55] Not only has the use of pesticides been counter-productive, but it is poisoning wildlife, farm animals and half a million people throughout the world each year. Since all this involves continual production of new opportunities for profit making, the pesticide industry must be regarded as the archetypical successful enterprise within the capitalist economy.

Capitalism also leads to irrational behaviour when it comes to pollution. Pollution collectively affects the whole society adversely, but the pollution produced by each business enterprise scarcely affects its profits at all, which means that it pays individual firms to pollute their environment to the detriment of all. One of the best illustrations of this effect is the production of the chlorofluorocarbons which are destroying the ozone layer. It has been calculated that it would cost the United States $4 billion to reduce CFCs by 20% which, it is estimated, would save the lives of 993,000 people in USA over the next 90 years who would otherwise die from skin cancer and other diseases related to the loss of ozone (the lives which would be saved outside USA have not been calculated, but there would presumable be more than 20 million given that USA now has 5% of the world's population, and that this proportion is falling).[56] And as it has turned out, the amount of ozone depletion is greater than expected. But while these deaths would, among other things, cost the country $1.3 trillion, it is not profitable for business companies to spend this money, and it is against the philosophy of the New Right which now dominates politics, and which has been promoted mainly by the business community, to attempt to interfere with the functioning of the market. In Western Europe there has been even greater resistance to any controls over CFCs than in the United States. This resistance is spearheaded by chemical companies such as ICI. Similarly, efforts to control carcinogenic pollution have failed, and as a result, more than 20% of the US population will die of cancer.[57]

While the development of agribusiness has depopulated the countryside and concentrated populations in the cities and megalopolises, the nature of these have been largely determined by the demands of industrialists, the interests of property developers in profits and the

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52. For the situation in Australia see Geoffrey Lawrence, *Capitalism and the Countryside: The Rural Crisis in Australia*, Sydney and London: Pluto, 1987.

53. See for example John H. Perkins, *Insects, Experts and the Insecticide Crisis*, N.Y.: Plenum, 1982.

54. See Edward Goldsmith, 'Pesticides Generate Pests', *The Ecologist*, Vol.10, No.3, 1980, pp.94-97.

55. The most notable case of this were the efforts to discredit Robert Van Den Bosch, author of *The Pesticide Conspiracy.* On the way environmentalist scientists generally have been discriminated against, see Brian Martin, 'The Scientific Straightjacket', *The Ecologist*, Vol.11, No.1, 1986, pp.33-43.

56. See Jeremy Cherfas, 'Ecology Invades a New Environment' in *New Scientist*, 22nd October, 1987, pp. 42-46.

57. See Samuel S. Epstein, *The Politics of Cancer*, San Francisco: Sierre Club Books, 1978, p.8.

interests of States in maintaining a docile population.[58] To begin with, industry has been concentrated in a small number of centres since, due to availability of other products and trained personnel, ease of communication and so on, it is more profitable for firms to locate industries close to each other; and it is not firms which bear the costs of the infrastructure required for this, the consequent pollution and housing shortages. It is the employees who are subjected to higher taxes to pay for the infrastructure of cities and industries, who are forced to move to big cities to find work, who must then pay excessively for accommodation and then spend major proportions of their lives travelling to and from work. With the subsequent expansion of cities, a characteristic structure emerges. Old buildings, particularly old housing and apartments in the centres of cities conducive to the life of culture are knocked down and replaced with high-rise office blocks. There is a further movement inward and upward, as smaller office blocks, losing their customers as they are dwarfed by new buildings, are demolished. Industries take over the areas with the best access to transport, irrespective of the pollution they cause, and exclude housing. People, excluded from the city centres are concentrated in dormitory suburbs, with transport being organized to get their labour-power efficiently to the city or industrial areas then back to the suburbs for regeneration. Thus cities come to embody a one-dimensional functionalism, destroying the conditions for cultural life, fragmenting communities and isolating individuals.[59] With capitalist enterprises holding people and governments to ransom the efforts of people to prevent such developments, to control these cities in the interests of their populations, have been stymied, especially in the New World where pre-capitalist traditions are less strong or non-existent. City planning itself reflects the power of both industrialists and property developers to over-ride people's interests, and the determination of governments to assuage business interests.[60] These developments reinforce cultural changes which are obliterating any critical understanding by people of the world and its problems.

Responsibility for side-effects of profit making or for the future could only be taken by a superordinate authority able to force individuals to take them into account. But State institutions in capitalist societies, subject to subversion by sectional economic interests or lurching from one crisis to the next in a struggle to keep the economy going, are seldom able to enforce such accountability.[61] The criterion of success of modern capitalist economies, that societies maintain growth rates of 4% in order to maintain full employment, implies that there must be an exponential increase in the use of non-renewable resources and in the production of pollution.[62] In recent years national governments have lost power as transnational companies and international financial institutions have freed themselves from national controls and held governments to ransom to hold down taxes and provide incentives to invest. Continually grappling with immediate crises, particularly with the threat of disinvestment and unemployment, governments now have a stronger incentive than ever to block efforts to confront environmental problems, and even where governments have departments devoted to environmental issues (for example, the EPA in USA), their staff have been stymied and the information they have brought to light suppressed. In these

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58. The classic Marxist work on urbanization is David Harvey's *Social Justice and the City*, London: Edward Arnold, 1973. For a major collection of Marxist analyses of urbanization examining these issues see Michael Dear and Allen J. Scott eds, *Urbanization & Urban Planning in Capitalist Society*, London: Methuen, 1981.

59. On this see Samir Amin, 'In Praise of Socialism', *Monthly Review*, Sept. 1974, No.24, Vol.26, pp.1-16.

60. Leonie Sandercock and Michael Berry have examined the way property developers and industrialists operate in Australia, virtually completely controlling the way cities develop. See *Urban Political Economy*, Sydney: George Allen & Unwin, 1983.

61. On this see, R.J. Johnston, *Environmental Problems: Nature, Economy and the State*, London: Belhaven Press, 1989.

62. As R. England and B. Bluestone pointed out in, 'Ecology and Class Conflict,' in H. Daly ed., *Towards a Steady State Economy*, San Francisco: Freeman, 1973, pp.190-214. To the extent that the dynamics of the market are successfully regulated by State institutions in the interests of its members, the society ceases to be capitalist.

circumstances, political power has become virtually unattainable by those who are concerned about fundamental, long-term problems of society.

The Environment and the Third World

The regional differentiation of world-capitalism ensures that it is not in the affluent North that the worst environmental degradation occurs; the worst environmental degradation is taking place in the peripheries of the world-economy.[63] Since the sixteenth century peripheral regions have lost control over their best agricultural land and have been bled of their most valuable mineral reserves, resulting in general environmental degradation. Regional exploitation accelerated in the nineteenth century with the expansion first of British, then of European capitalism, and accelerated even further in twentieth century with the development of U.S. dominated neo-imperialism. By promoting comprador classes and addicting them to luxuries and military hardware, peripheral regions have become indebted to the economic centres and have been impelled to sell off their raw materials on a competitive market and to devote their agricultural land to cash crops for export to raise foreign currency. With transnationals based in USA and Europe controlling most of the markets, and with large numbers of Third World countries in similar positions, prices for these raw materials and cash crops have been kept low. The terms of trade for exporters of raw materials have declined almost continuously over the last hundred years, and with the exception of oil, even more rapidly over the last forty years.[64] Environmental exploitation has intensified in recent years with the international debt crisis. By focussing on the environment, environmentalist Marxists have revealed the full extent of the exploitation between regions in the world-economy, and in doing so have provided strong support for the world-systems approach and put paid to the arguments of those neo-orthodox Marxist defenders of capitalism and imperialism.[65]

While the global economy emerged in the sixteenth century, environmental destruction began to be produced on a global scale through the expansion of capitalism in the nineteenth century when the demands of the metropolitan societies for foodstuffs, fibres and raw materials led to land clearance for cash crop production and accelerating exploitation of forests in the colonies of capitalism.[66] Then, with the backing of colonial governments, indigenous constraints were swept away by market principles. Such destruction of indigenous constraints has accelerated rapidly in the twentieth century. Studies of the present situation have revealed both how transnational companies are able to destroy rainforests, and frequently the livelihoods of those dependent upon them, and how the preservation of forests in the wealthy nations along with the acquisition of cheap agricultural products are achieved at the expense of the land and forests of the Third World countries.[67] As a consequence of this, 40% of the world's tropical rainforests were cleared between 1968 and 1988.

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63. The global nature of environmental problems and the consequent difficulty in confronting them has been well argued by Michael Redclift in *Sustainable Development: Exploring the Contradictions*, London: Methuen, 1987.

64. See L. Rangarajan, 'The Politics of International Trade', in Susan Strange ed., *Paths to International Political Economy*, London: George Allen & Unwin, 1984, pp.126-164.

65. See for instance Jacobo Schatan, *World Debt: Who is to Pay?* London: Zed Books, 1987. An excellent anthology in this area is R.J. Johnston and P.J. Taylor (eds), *A World in Crisis*, Oxford: Basil Blackwell, 1986.

66. P. Tucker and J.F. Richards (eds) *Global Deforestation and the Nineteenth Century World Economy*, Durham, NC.: Duke Press Policy Studies, 1983. The findings of these papers have been summarized by Tucker and Richards in 'The Global Economy and Forest Clearance in the Nineteenth Century' in Kendall E. Bailes (ed.) *Environmental History*, Lanham: University Press of America, 1985, pp.577-85.

67. See for example *The Vanishing Forest*, A Report for the Independent Commission on International Humanitarian Issues, London: Zed Books, 1986; Norman Myers *The Sinking Ark* Oxford, N.Y.: Pergamon Press, 1979; V. Plumwood and R.

The best theoretical analysis of the process by which the peripheries of the world economy have been degraded into suppliers of raw materials to the economic centres of the world - and of the consequences of this, is Stephen Bunker's study of the Amazon. Bunker argued that:

> ... production models cannot explain the internal dynamics of extractive economies because the exploitation of natural resources uses and destroys values in energy and material which cannot be calculated in terms of labour or capital. When natural resources are extracted from one regional ecosystem to be transformed and consumed in another, the resource exporting region loses values that occur in its physical environment. These losses eventually decelerate the extractive region's economy, while the resource-consuming communities gain value and their economies accelerate.[68]

Bunker argued that orthodox Marxist analyses of the reproduction of modes of production and of the relationship between global and regional economies must be revised to take account of the ecological interdependencies between extractive and resource consuming economies, and to take account of the impacts of these relationships on natural ecosystems. He revealed how the increased energy and material flows to productive societies have facilitated the substitution of human for non-human energies to increase their complexity and power, while the consequent reduced energy flows in peripheral societies have simplified them and reduced their power. Increased energy flows in the productive centres has made possible increases in scale, complexity and coordination of human activities, greater division of labour, and the expansion of specialized fields of information. This has facilitated the development of increasingly complex systems of transport and communication and engendered the means for technological and administrative innovation, enabling these centres to change their technologies and thereby find substitutes for essential resources as these have been depleted. Conversely extractive economies have lost energy and so become economically and socially simpler, less diversified, and subject to the changes in market demand associated with new technologies produced by the centres. Under these circumstances, strategies tend to be adopted which maximize the short-term return to labour and capital, and which are little concerned with long-term social reproduction. Once the profit maximising logic of extraction for trade takes over, exploitation is concentrated on a limited number of resources at rates which disrupt the regeneration of these resources, the biotic community and associated geological and hydrological regimes. The development of modern State organizations in peripheral regions, being subject to manipulation by the productive centres of the world-economy, merely increases the rapidity of destructive exploitation of these regions. By exploiting such extractive economies, the industrial modes of production inevitably undermine the resource bases on which they depend; but they have evolved the social organizational and infrastructural capacity to change their own technologies and thereby to find substitutes for resources as they are depleted. However this process is finite as each new technology requires other resources from what is ultimately a limited stock.

The most striking environmental destruction in the Third World is caused by the transformation of agriculture wrought by capitalism, a transformation which has resulted in the massive impoverishment of local populations. In all, to feed and clothe themselves, Europeans and North Americans have been using around 20% more of the world's

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Routley, 'World Rainforest Destruction - the Social Factors' in *The Ecologist*, Vol.12, 1982, pp.4-22; and Emilio F. Moran, 'Current Development Efforts in the Amazon Basin' in Michael Tobias (ed.) *Deep Ecology*, San Diego: Avant Books, 1984, pp.58-73.

68. See Stephen G. Bunker, *Underdeveloping the Amazon: Extraction, Unequal Exchange, and the Failure of the Modern State*, Urbana and Chicago, University of Illinois Press, 1985, p.22.

agricultural land than their own.[69] This exploitation of Third World land has been at its worst where the penetration by the world market is associated with coercion by those in a position to benefit through its extension. This has been shown most clearly in the work of Susan George.[70] George described how where the capitalist market operates, land ownership is rapidly concentrated, and how the local élites then redirect the use of land which had been devoted to producing food for local consumption to the production of more commercially profitable crops, that is, crops for export to the wealthy nations. In South America 17% of the landowners control 90% of the land, and one third of the rural population must make do with 1% of the land. In Africa three quarters of the agricultural population have less than 4% of the land. The largest holdings produce the least food. In Brazil and Argentina the smallest properties produce eight times as much per hectare as the largest estates, while in Columbia they produce fourteen times as much. Cash crops take up the best land and most of the scarce inputs into farming. Fifty-five percent of the agricultural land of the Philippines and 80% of Mauritius are devoted to cash crops, while 50% of Senegal is devoted to peanuts alone.

In these countries the transport systems are all directed to transporting cash-crops to USA and Europe. In their study of agribusiness in Africa, Dinam and Hines noted:

> At present, industrial countries import about 90 per cent of all traded horticultural products, of which Third World countries ship 30-40 per cent. Trade is dominated by citrus fruits, potatoes and tomatoes, but in Africa an increasing amount of land is being cultivated to supply European markets with a variety of fresh flowers and out-of-season vegetables and fruits - either dried or flown fresh.[71]

The effect of these developments, associated with the control of markets by transnational agribusiness, has been to force down prices of such cash crops. As a consequence such countries have attempted to further increase their production of cash crops at the expense of subsistence crops, glutting their markets even further. As P.N. Bradley summed up the situation:

> The different processes: monetization, commoditisation, the manipulation of trade, control of the means of production through state apparatuses, penetration of foreign companies in allegiance with a comprador bourgeoisie, a global financial structure refereed by the IMF; all point to the same conclusion. We observe the transformation of rural societies, whose economies were based on some form of reciprocity in their exchange relationship, to a capitalist model of which the central characteristic is one of surplus value extraction and profit. The net result is that, by being more or less forcibly wedded to this capitalist suitor, peasant societies of the Third World have lost the freedom to determine their own futures... The power to grow food and ensure adequate nutrition has been wrested from them, while the meagre rewards they earn for

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69. Andre Gorz, *Ecology as Politics*, p.65. See also Andre Gorz, 'Their Famine, Our Food' in *Paths to Paradise*, London: Pluto Press, 1985, pp.92-100.

70. Susan George, *How the Other Half Dies: The Real Reasons for World Hunger*, Harmondsworth: Penguin, 1977; *Ill Fares the Land*, Institute for Policy Studies, Washington DC, 1984; Jon Bennett with Susan George, *The Hunger Machine*, Cambridge: Polity Press, 1987; and Susan George, *The Debt Boomerang*, London: Pluto Press, 1992. George's work has been corroborated by C. Tudge, *The Famine Business*, Harmondsworth: Penguin, 1979; F.M Lappe and J. Collins, *Food First*, London: Abacus, 1980; R. Burbach and P. Flynn, *Agribusiness in the Americas*, N.Y.: Monthly Review Press, 1980. For a more recent study, see P. N. Bradley, 'Food Production and Distribution - and Hunger', R.J. Johnston and P.J. Taylor eds, *A World in Crisis?*, Oxford: Basil Blackwell, 1986, pp.89-106.

71. B. Dinham and C. Hines, *Agribusiness in Africa*, London: Earth Resources Research, 1983, p.30.

> accommodating to a profit-based exchange system leave them too poor to purchase the very commodities they have been obliged to produce.[72]

With these developments not only are hundreds of millions of people being driven to the verge of starvation or beyond, but the form of agriculture being developed is more unreliable and more resource inefficient. In their effort to dominate world agriculture and expand business, agribusinesses have promoted crops which tie farmers into the mainstream of economic life.[73] This is the so called Green Revolution in which hybrid varieties of crops are being used which, having less adaptive ability, require far greater amounts of fertilizer, pesticides, weed control chemicals and irrigation, all of which have to be precisely controlled to avoid poorer outputs than with the old varieties. While producing crops with far lower protein content and making farmers dependent upon the transnational producers of seeds, agricultural chemicals and machinery (the prices of which have increased dramatically as a result of the oligo- or monopolistic control by transnational companies of these industries), the Green Revolution has also committed farmers to using far more resources for a given amount of output, produced a form of agriculture which is highly prone to failure (after disease attacked the new strains of rice in the Philippines in 1971 the crops were so devastated that rice had to be imported) and is more destructive of the soil. While at present crop yields are much higher than they were, yields are falling, and the acidification of the soil through the use of fertilizers will make the cultivation of rice increasingly difficult. And in the meantime, the genetic resources of crops are being impoverished as old, replaced strains die out, destroying the potential for adaptation to changing conditions.

All these problems have intensified in recent years as countries have struggled to increase exports to pay off massive foreign debts, which in 1992 stood at $1.2 trillion. As Susan George has pointed out, quoting a former IMF economist, '"environmental issues become totally marginal" when governments face huge debts...'.[74] Whatever conservation had been practiced in the past has been obliterated. As George continued:

> Brazil, contrary to appearances, does have the equivalent of an environmental protection agency, but its budget has been cut to the point that it can barely pay its employees. Outnumbered fire-fighters of the Brazilian national park system can no longer cope with the blazes. Costa Rica is asking for private donations to maintain its national parks. Mexico is draining irreplaceable groundwater to produce export vegetables for the US market. It will be depleted in a few years. Peru has fished its anchovy banks nearly to the point of extinction. Bolivia (aside from the drug trade) is actively engaged in massive exports of endangered wildlife. Mexico recently eliminated fifteen governmental under-secretaries, four of them environment-linked.[75]

Destruction of forests in particular has been accelerating as the Third World countries with the principle tropical forests: Brazil, Indonesia, Zaïre, Peru and Columbia, accounting for 60% of what is left of tropical forests, have been caught up in international debt.[76] Under these circumstances, the pressures to decimate these forests have become almost irresistible. And it is not only in the Third World that the pressure of debt has undermined efforts to

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72. P.N. Bradley, 'Food Production and Distribution - and Hunger' in Johnston and Taylor, *A World in Crisis?*, p.104.

73. George, *How the Other Half Dies*, Ch.5.

74. Susan George, 'Debt and the Environment: Financing Ecocide,' in *A Fate Worse Than Debt*, Harmondsworth: Penguin, 1988, pp.155-168, p.167.

75. Loc.cit.

76. Ibid. p.166.

conserve and preserve the environment in semi-peripheral regions of the world-economy. Australia also is wrecking its environment in the hope of reducing its international debt.

Along with the exploitation of agricultural land, the Third World has also been a source of minerals. The subjugation of the Third World has meant that minerals have been chronically under-valued. The exploitation of Third World minerals has increased dramatically since the Second World War, and for the most part, this has been associated with a decline in mineral prices. The greatest pressure on Third World countries to export their non-renewable resources has also been their international debts. After having been persuaded to borrow money to finance production for export (up to half of which was siphoned straight back to USA and Europe by corrupt politicians and officials with the help of the same banks who had lent the money), interest rates and prices of raw materials have been manipulated to the advantage of the First World, particularly the United States. As Jacobo Schatan concluded his analysis of the role of US government policy in the present plight of the Third World:

> The strangling pincer effect of the opposite trends in the cost of money and the prices of raw materials is forcing a steady increase in the physical resource outflow from South to North. A truly infernal circle is created: defence expenses and fiscal deficits in the US go up, rates of interest increase (or do not decline sufficiently) and debtor countries are forced to augment their remittances of raw materials; at the same time, such export volume increases press commodity prices down, pushing debtor nations to further increase their exports and request additional loans, in order to meet their service obligations... Latin American are donating the metals that serve to manufacture the chains that keep them tied to the yoke of the dominant Northern power.[77]

Schatan pointed out that the Third World was being forced to remit twice as much of its resources to the economic centres to pay off its debts as would have been required if interest rates had been held constant at the level at which they were originally contracted, and prices had remained constant at 1980 levels. As a consequence, the Third World is exporting the cheaper fractions of its resources while keeping for its own population the poorest and costliest mineral strata.

It is in these Third World countries that the most frightening built-up environments are being created. In recent years the peripheral regions of the world economy have become increasingly important for industrial production as suppliers of cheap labour willing to take on jobs in dangerous and polluting industries. Virtually all Marxist analyses of environmental degradation in built-up environments: of pollution, impoverishment of people's life-worlds and so on are applicable with greater force to the Third World, since here people have even less power to resist the forces of capitalism. The wealthy nations are exporting their polluting and health destroying industries to the Third World because people are so desperate for a livelihood (usually after having been forced off their land by the capitalist transformation of agriculture) that they will accept any risks. The cities expanding as a consequence: Mexico City, Sao Paulo and Rio de Janeiro for example, are developing into high-rise nightmares for their poorer inhabitants. During Brazil's 'miracle decade' of export-oriented economic expansion, infant mortality in Sao Paulo increased by 45%.[78] As inflation soared, people were forced to work longer hours to compensate for the reduced purchasing power of their wages. Many were pushed to the periphery of the city by the rise in property values, and deprived of a minimum standard of nutrition, sanitation, and health care for their families.

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77. Schatan, *World Debt: Who is to Pay, p.42.*

78. Bennett, *The Hunger Machine*, p.141.

It is in the Third World that the hegemony of the ruling culture is sustained with the most destructive effects. After noting the increasing numbers of oppressive dictatorships in the world, Dudley Seers commented:

> The explanation seems to be, in brief, that the bureaucrats, traders, and white-collar (as well as some blue-collar) employees in the modern sector, public and private, have become increasingly determined that they and their children shall continue to enjoy the modern lifestyle, largely imported, whatever the brutality and whatever the inflows of aid and private capital needed to ensure this.[79]

This is the effect of extension of the culture of the economic core to the periphery, and has been one of the major achievements of the consciousness industry. As Richard Peet wrote in 'The Destruction of Regional Culture':

> [I]n the interaction between the centre culture and local culture, there can be little doubt which is more dynamic, and what direction cultural synthesis is taking. The tendency is towards the production of one world mind, one world culture, and the consequent disappearance of regional consciousness flowing from the specificities of the human past.[80]

This not only leads to the loss to the world of consciousness of these specificities, but it accounts for the blindness to regional problems, the loss of any ability to work out alternative strategies of economic action other than those imposed by the economic centres, and also the domination of these regions by comprador classes. Control over the consciousness of regional societies is effected at a number of levels. Hollywood factories, presenting dreams invested with all the technical and economic power of the centre, keep half the cinemas in the non-socialist world supplied with films. The mass media thus creates the images of what is the good life, generally creating a contempt for local lifestyles, and the aspiration to participate in the forms of life of the economic centres. Then the intellectual world is dominated by economic centres as it is necessary for scholars to legitimate their work by studying at the major universities of the core zones, or by publishing in their journals. Only when people think in ways acceptable to the culture of the centres are they able to attain respect, credibility and academic positions. Consequently there can be little sustained research on the problems and issues relevant to local regions, or development of quality regional culture which could challenge the prestige of the economic centres. Finally, imported technology and the models of professional training and organization required to use it, especially those associated with mass communications, reproduce in Third World countries the world-orientation of the economic centres.[81] The effect of such cultural control is that the affluent of these regions identify with the interests and aspirations of the economic centres and are completely indifferent to the original aspirations of their compatriots, and it is this more than anything else which makes them willing to use all the technology of repression available against their compatriots in order to continue living in the manner of their models in the core zones.

States developed in the economic peripheries have generally proved incapable of preventing their destructive exploitation by the economic core zones, and in fact usually

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79. Dudley Seers, *The Political Economy of Nationalism*, Oxford: O.U.P., 1983, p.7.

80. Richard Peet, 'The Destruction of Regional Cultures', in Johnston and Taylor, *A World in Crisis*, p.169.

81. As Rita Cruise O'Brien has argued in 'Mass Communications: Social Mechanisms of Incorporation and Dependence', in *Transnational Capitalism and National Development*, ed. José J. Villamil, Atlantic Highlands: Humanities Press, 1979, pp.129-144.

become instruments for the expansion of international capital. This has been demonstrated by Stephen Bunker in his study of the Amazon which revealed how the development of the Brazilian State, itself subject to unequal exchange and resource exploitation from the economic core zones, intensified destructive exploitation of its own peripheries in order to overcome its balance of payments problems. He showed how: 'By irrationally extending energy-expensive structures and operating procedures into the energy-poor social formations of Amazonia, the state undermined existing but fragile human communities, devastated the ecosystem in which they subsisted, and severely distorted its own developmental projects. ... The state's self-legitimating claims that it can transform the underdeveloped society are revealed as an illusion which can be maintained only when there is fundamental consonance of state policy with the evolutionary directions of the central social formation.'[82] In this process the State apparatus comes to be used to oppress the general population to maintain order, and it is supported in this by the economic core zones. So, backing up and complementing the consciousness industry there has emerged the burgeoning industry of oppression.

Capitalism, Socialism and the Environment

The analyses by Marxist environmentalists exploit different facets of the Marxist research programme. Together they are sufficient to demonstrate that it is the dynamics of capitalism which are immediately responsible for the greater part of the world's environmental problems. However this leaves open the question of what caused capitalism, and whether it is possible to replace it. Capitalism could be explained in Social Darwinian terms as the social system which, by facilitating a faster though-flow of energy and materials, has been the most successful system in the struggle for survival, in which case it is likely that the only way in which capitalism will ever be challenged is by developing a system which will be even more environmentally destructive. Alternatively, capitalism could be explained as a cultural innovation, making it just possible that with a further cultural transformation a less oppressive and destructive social order could be created. If this is the case, the most important question is whether Marxism is able to provide a solution to the environmental crisis. Marx was not trying to provide an alternative economic theory but was criticising the very existence of an autonomous economy and of the science of this economy. The real issue posed by Marxism is the existence of capitalism and the possibility of creating from the conditions produced by it a new socio-economic formation which will not have its irrational qualities, which will liberate the potential of humanity, overcoming the nihilism of capitalism and the alienation of people from their creative powers and their social relations, and which at the same time will be environmentally sustainable. To evaluate Marxism in this respect it is necessary to examine its success or otherwise in practice, and to see whether societies based on Marxist thought have fared any better in relation to environmental problems than capitalist societies.

The society which most fully realized Marx's prognostications for capitalism is Sweden. Marx stated on several occasions (which will be discussed later) that his work in *Capital* was an analysis of Western Europe and only fully applicable to it. He wished to show how Western European capitalism was becoming increasingly unstable and at the same time was producing the conditions whereby it could be transformed into a socialist society. As a result of the Great Depression predicted by Marx, the Swedish Social Democratic Party backed by the Swedish Confederation of Trade Unions, gained power in 1932 and pushed by the trade unions, proceeded to re-organize the economy to gain control over its dynamics and to

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82. Bunker, *Underdeveloping the Amazon*, p's.56 & 242.

ensure that the controls over nature were used in the interests of humanity. As distinct from other democratic socialist parties such as those of Denmark and the Netherlands, the Swedish socialists did not confine themselves to constructing a welfare state on the basis of a capitalist economy, but began slowly to change the relations of production. As Winton Higgins has argued, 'The transitional process in Sweden is our first concrete illustration of Marx's general observations about the dissolution of mature capitalism.'[83] This society in which until recently people were not threatened with unemployment, with an egalitarian distribution of income, and with the dynamics of society under democratic control had the best record of any industrialized nation on environmental problems. It had no population growth, strict controls on pollution, had introduced a wide range of resource conservation measures, and was phasing out nuclear power generation.[84] The success of these can be judged from its consumption of energy which, despite its higher standard of living and colder climate is about half that of the United States per head of population. Most of its pollution comes from other countries. Also Sweden is not an imperialist power and has assisted liberation movements in Third World countries.

But most capitalist nations did not embrace socialism during the Great Depression, Sweden has retreated from socialism (although the Social Democratic Party is now back in power), and those countries which have identified themselves with Marxism have been economically backward. Marxism must be judged at least partially in the light of the failure to develop socialism in Western Europe and its affluent colonies, and in relation to what has happened in those countries which have embraced Marxism as their official philosophy.

To begin with, the failure of Marxists in Western Europe during the Great Depression and after has revealed two things. Firstly, that while Marx's analysis of the destructive imperatives built into capitalism may have been correct, these will not necessarily pave the way for socialism. Under present circumstances it is more likely that the collapse of capitalism will pave the way for fascism or military-industrial complexes associated with far more powerful organizations of social control and oppression than exist at present. Secondly, it revealed the defects in Marx's analysis of society. It showed that there is more sustaining the capitalist socio-economic formation than a self-reproducing production process, that Marx underestimated the importance and complexity of States and the relationships between nations, and the importance of culture and ideology in maintaining the existing order and in determining which way people will respond to economic crises, and consequently, which political forces they will back.

Secondly, more recent failures have shown that the world politico-economic system has become more complex since the Great Depression. Apart from the development of neo-imperialism, capitalist societies have engendered institutions and forms of thought which are now moved by principles beyond the imperatives of increasing profits. The military-industrial complex has emerged from industrial capitalism as a new self-sustaining process as capitalism emerged from feudal society. Similarly the enormous size of organizations for such developments as dams associated with hydro-electric power and irrigation has enabled these to some extent to impose their own imperatives on the economies of countries.[85] While the dynamics of the military-industrial complex and other large scale organizations have not transformed the underlying capitalist organization of society, they have added new

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83. Winton Higgins, 'Working class Mobilization and Socialism in Sweden' in *Work and Inequality*, Vol.1, ed. Paul Boreham and Geoff Dow eds, Melbourne: Macmillan, 1980, pp.143-161. Higgins is highly critical of those conservatives and Marxists who have failed to see that what is happening in Sweden is 'an exceptionally powerful and sustained working-class mobilization which has put such pressure on the economy that the dominant mode of production has been undermined.'(p.143)

84. On the Swedish effort to address environmental problems see Peter Bunyard, 'Sweden: Choosing the Right Energy Path?' *The Ecologist*, Vol. 16, No.1, 1986, pp.24-28.

85. See for instance Don Worster's study of hydro-electricity in *Rivers of Empire: Water, Aridity, and the Growth of the American West*, N.Y.: Pantheon, 1985.

dimensions to it. They have given capitalism a new lease of life, and have created conditions which make it even more problematic how the failures of such a system could pave the way for the development of socialism. More recently transnational corporations have grown to such an extent that they have undermined almost all the potential the State previously had to ameliorate the oppressive effects of capitalism. With the power to move capital at astonishing speed, to utilize labour and exploit resources anywhere in the world, they have the ability to hold local organizations to ransom. There is now no longer a unified class opposed to the existing socio-economic system which is in a position to be a real challenge to either the military industrial complex, or to transnational corporations. If Marxism is to be taken seriously as the foundation for a challenge to the prevailing order it must be reformulated to deal with its past failures and with these new conditions. It is not at all clear that the developments in the theory of imperialism and in the theory of ideology, nor even in the more recent work on the nature of the State, have yet been successful in revealing new paths to a better society.

The Soviet Union

Even more problematic for Marxism is the poor record of those countries which embraced it. The first and pre-eminent society to embrace Marxism was the Soviet Union, and the Soviet experiment provides the best measure of the success or otherwise in relation to the environment of a society which has explicitly adopted Marxism as its creed.[86] Damning evidence against the Soviet Union came to light in 1978 in a pseudonymous work, *The Destruction of Nature in the Soviet Union*, written under the name of Boris Komarov as a contribution to the underground *samazadat* literature of the Soviet Union.[87] Komarov described high levels of air pollution, water pollution, destruction of soil fertility and wild-life, wastage of resources, and government inertia in relation to environmental problems. He argued that in relation to its population the Soviet Union produced twice as many air pollutants of all sorts as in the West, and that each Soviet car produced four times as much pollution.[88] A consequence of this was that between 1967 and 1977 the number of people with lung cancer doubled, 5 to 6 percent more children were born each year with genetic defects, and birth traumas and abortions increased at a rate of 6 to 7 percent a year.[89] There was severe chemical pollution of the Baltic sea, more mineral fertilizers were leached from the soil and ended up as pollutants than in any other country, and lakes, in particular Lake Baikal, the Caspian and Black Seas and the Sea of Azov, were being heavily polluted by oil. 100,000 tons of oil each year were dumped into these seas. The Sea of Azov, the worst polluted, now yielded a fish catch only one ninetieth of what it was just after the war.[90] Irrigation was reducing the levels of most of these bodies of water. Land reclamation schemes had succeeded in turning swamps into deserts. The Hydrological Planning Agency acquired enormous power and undertook projects causing far more destruction than benefit,

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86. This is not to say that the situation of all Marxist societies is identical, although Eastern European countries were very similar. While China diverged from the Soviet Union after the cultural revolution of 1968 in a way which improved the environment, since the overthrow of the Maoist ethic environmental destruction has been catastrophic. On Eastern Europe see I. Volges ed. *Environmental Deterioration in the Soviet Union and Eastern Europe*, N.Y.: Praeger Press, 1966 and Ingmar Oldberg, 'Planned Economy and Environmental Problems: Eastern Europe from a Comparative Perspective' in Kendall E. Bailes ed. *Environmental History*, Lanham: University Press of America, 1985, pp.293-333. On China see Qu Geping & Woyen Lee eds, *Managing the Environment in China*, Dublin: Tycooly, 1984, and Vaclav Smil, *The Bad Earth: Environmental Degradation in China*, London: Zed Books, 1984.

87. Boris Komarov, *The Destruction of Nature in the Soviet Union*, London: Pluto Press, 1978. The author now lives in Israel.

88. Ibid. p.30.

89. Ibid. p.25.

90. Ibid. p.37f.

largely by flooding fertile lands and depriving lands down-stream of water. The Kapchagai Power Plant only irrigated one hundredth of the 700,000 hectares it was supposed to while causing the lower Ili and half Lake Balkhash to dry up.[91] Open-cut mining also took huge areas of agricultural land out of production, and the fragile ecologies of the far north were being disrupted by attempts to economically exploit them. As in the West there was a massive switch to aluminium from steel despite the increased costs in energy usage and pollution. And so on.

Komarov's claims have been supported by other sources, particularly after *glasnost* and then the collapse of the Soviet Union. Philip Pryde in his books *Conservation in the Soviet Union* and *Environmental Management in the Soviet Union* pointed to a few successes in conservation, but also to great destructiveness and enormous waste.[92] Between 1963 and 1968 reserves of coniferous timbers decreased by 3,300,000,000 cubic metres, or 5% of the total stand. This was taken from those lightly forested areas where deafforestation matters most.[93] Much of this was transported in streams, which not only was poisoning the streams but resulted in much of the timber being lost. Between 1958 and 1961, 825,000 cubic metres sank in the Kama alone.[94] Zhores Medvedev claims that before its collapse the Soviet Union was losing its forests at the same rate as was Brazil.[95] Thane Gustafson reported research revealing how much damage had been done to agriculture by reservoir flooding. The amount of land affected had doubled during the 1960s and was continuing to grow as the surveys were made. By the mid-1970s nearly 2.3 million hectares had been flooded, one fifth consisting of highly productive land, mostly in European USSR.[96] By 1983 little had changed despite the commotion produced by environmentalists.[97] The USSR was committed to the development of nuclear power, despite having had one major disaster in 1957 in which several hundred square miles were contaminated by radioactive material.[98] The Chernobyl disaster did not affect this resolve. Perhaps the grimmest indication of the seriousness of environmental destruction in the Soviet Union was the widespread pesticide poisoning in Uzbekistan and Moldavia which led to such high rates of mental retardation that secondary and tertiary educational institutions had to simplify their curricula.[99]

The most celebrated instance of environmental action in the Soviet Union, the fight to save Lake Baikal from industrial destruction which really began the post-Stalinist environmental movement, had only temporary success. As Gustafson wrote of this:

> [T]he lake's defenders can boast of no mean achievement, for they raised a nationwide scandal, gained top-level attention for the lake for a span of more than fifteen years, and turned the lake's preservation into a Soviet showpiece that the government now eagerly displays to foreigners. Yet the paradox of Baikal is that its defenders, for all their victories, are gradually losing the war. Large-scale economic development has now come to the entire region. ... These threats to the lake are far more serious than the

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91. Ibid. p.58.

92. Philip R. Pryde, *Conservation in the Soviet Union*, Cambridge: Cambridge University Press, 1972; and Philip R. Pryde, *Environmental Management in the Soviet Union*, Cambridge: Cambridge University Press, 1991.

93. Pryde, *Conservation in the Soviet Union*, p.97.

94. Ibid. p.98.

95 Zhores A. Medvedev;, 'Environmental Destruction of the Soviet Union,' *The Ecologist*, Vol.20, No.1, Jan./Feb., 1990, pp.24-29, p.24.

96. Thane Gustafson, *Reform in Soviet Politics: Lessons and Recent Policies on Land and Water*, Cambridge: Cambridge University Press, 1981,p.47.

97. Philip R. Pryde, 'The "Decade of the Environment" in the USSR', *Science*, Vol. 220, 15th April, 1983, pp.274-279.

98. This is described by Medvedev in 'The Environmental Destruction of the Soviet Union,' p.24f.

99. This is claimed by Medvedev, 'The Environmental Destruction of the Soviet Union,' p.24.

> Baikalsk plant, and yet there has not been the same storm of protest that there was fifteen years ago.[100]

So despite the existence of widespread public concern and support for environmental causes, both in relation to preservation and conservation, a government at least superficially influenced by this concern and forced out of economic necessity to face the problems of environmental destruction, there was an almost complete lack of effective action. The destructive dynamics of this economy were beyond the control of both environmentalists and the government.[101] It appears the environmentally destructive imperatives of the Soviet economy were at least as powerful as those of capitalism. The Soviet Union not only had higher energy consumption per unit of output, but while in Western Europe, USA and Japan this has been decreasing since 1970, it continued to rise in the Soviet Union.[102]

Conclusion

While Marxism provides a powerful framework for analysing the environmentally destructive imperatives of capitalism, it appears that it has not yet provided a solution to environmental problems. If Marxist ideas are to be utilized by environmentalists, the failure of Marxism in practice must be explained.

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100. Ibid. p.45.

101. The literature and state of the debate was reviewed in 1985 by Kristian Gerner and Lars J. Lundgren in 'Nature's Revenge: the Soviet Debate over Nature and Society, 1960-1979', Kendall E. Bailes (ed.) *Environmental History*, Latham: University Press of America, 1985, pp.412-436.

102. These claims are made by William U. Chandler, 'Designing Sustainable Economies', in Lester R. Brown ed. *State of the World 1987*, N.Y. and London: W.W. Norton & Co., 1987, p.193f.

2

MARXISM AND METAPHYSICS

The questions which now must be answered are: To what extent was Marxism responsible for the environmental problems of the Soviet Union? Were these problems a manifestation of basic deficiencies within Marxism? Or can Marxism be augmented to effectively confront not only the environmental problems in the West but also environmental problems of Russia? And these questions raise the more fundamental question of just what is Marxism.

Marx, like most radical thinkers writing in the latter half of the nineteenth century opposed science to metaphysics and rejected metaphysics in favour of science, despite his high regard for the philosophy of Aristotle and his continuing respect for Hegel. For this reason he never fully clarified his ontological commitments. This task was left to Engels who bequeathed to posterity a theory of being which was essentially Heraclitean, but which also combined elements of Hegelianism and mechanistic materialism. Consequently Marx has been interpreted in terms of different metaphysical frameworks. He was first interpreted mechanistically, since especially among radicals, this was the prevailing conception of being. On this basis he was seen as having discovered the laws of the development of humanity. This version of Marxism was itself developed in a number of different directions. Plekhanov in Russia interpreted Marxism in terms of the philosophy of Spinoza, Kautsky interpreted Marxism in terms of Darwinian evolutionary theory, Vorländer and Bernstein attempted to supplement a mechanistic interpretation of Marx with Kantian ethics, the Austro-Marxists developed an original synthesis of their own and Bukharin interpreted Marxism in terms of an early version of systems theory. Lenin developed another version of Marxism which was both voluntarist and materialist, and this became the basis of Soviet Marxism. Marx was also reinterpreted in terms of Hegelian philosophy, first by Gramsci, Lukács and Korsch, and then by the social philosophers associated with the Frankfurt Institute for Social Research. This conception of Marxism came to predominate in Western Europe after the publication of Marx's early works, in particular the *1844 Manuscripts* which was published in 1932. Soviet Marxism underwent a number of transformations with the evolution of Soviet society while new versions of Marxism have been produced in the West at more or less regular intervals, usually to accord with changing intellectual fashions.

To get any perspective on this, to see whether there is any substance to Marxism or whether it is a confused family of ideas whose only coherence derives from their serving to oppose capitalism, it is necessary to understand the historical background against which Marx developed his ideas. And since the background of metaphysical assumptions are part of long term history, this means going back to the origins of Marxian themes in the early Middle Ages.

The Neoplatonic Background

Leszek Kolakowski traced the roots of Marxist eschatology to Neoplatonism, and characterized this in terms of the branching of Western European Neoplatonism which began with John Scotus Eriugena (c.810-c.877) in the ninth century.[1] However what Kolakowski did not point out (which is significant for understanding how Marxism was assimilated into Russia) was that John Scotus was not familiar with the works of the founder of Neoplatonism, Plotinus, nor with the other early Neoplatonist philosophers.[2] His starting point was the works of the thinkers whose ideas formed the foundation of the Orthodox Church: the Greek Christian Fathers - Origin, Basil and his brother Gregory of Nyssa, John Chrisostom, the sixth century Syrian monk known as the Pseudo-Dionysius whose work was inspired by the last great Alexandrian Neoplatonist, Proclus, Maximus the Confessor - and the work of the most influential father of Latin Christianity, St Augustine, whom John quoted more than anyone else. The only work of Plato with which he was familiar was the *Timaeus*. John translated into Latin the works of the pseudo-Dionysius, Maximus the Confessor and Gregory of Nyssa. The basic aim of his major work *Periphyseon* (or *De Divisione Naturae*) was to synthesize the Eastern and the Western traditions of Christianity.[3]

Neoplatonism is the synthesis of Plato's ideas into a system along with aspects of Aristotelianism and Stoicism, which is generally held to have culminated in the work of Plotinus (204-70 A.D.). According to Plotinus, the world consists of a hierarchy of hypostases. The first hypostasis, the indefinable One or the Good, was seen as the source of all defined and limited realities. The second hypostasis, the Intellect or Spirit, seen as the first creation of the One, is the realm of forms or Ideas, together with the unchanging thought of these forms. Soul was seen as the intermediary between the realm of the Intellect and the realm of the senses. It is produced by Intellect, as Intellect is produced by the One, by a double movement of outgoing and return in contemplation. Soul is movement, and the cause of movement. It has different levels, a higher level in touch with the Intellect, which forms and rules the universe from above, and a lower level, nature, which acts as an immanent principle in living and growth. The lowest hypostasis is the realm of matter where the One diminishes into nothingness. The material universe was seen as a living, organic whole in which each part of the universe is in harmony with every other part. The levels of the universe are not spatially separated, and the One, while being nowhere in particular, is present everywhere so that each part of the universe contains the whole. We, as embodied souls, can live at any level of the soul's experience and activity. We can turn away from the desires of the body to return, through intellectual discipline, to the wholeness of the Intellect, or even to a mystical union with the One itself.

As opposed to the Western tradition of Neoplatonic Christianity inspired by St Augustine for whom God is transcendent, the sensible world is the fallen world doomed to destruction, and the final goal of salvation of the soul involves returning to God in heaven, the theology of the Greek Christian fathers represented the world as an emanation of the One which they identified as God. They described two paths to knowledge of God: 'the way of negation' and 'the way of union'. According to the way of negation, the only way God can be defined is by stating what he is not, since it is impossible to establish a ratio between God and anything in the world. 'God is infinite and incomprehensible,' wrote John of Damascus, typifying this point of view, 'and all that is comprehensible about Him is His infinity and

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1. Leszek Kolakowski, *Main Currents of Marxism* (3 vols), Vol. 1 *The Founders*, tr. P.S. Falla, Oxford: Oxford University Press, 1981. The basic tenets of Neoplatonism are described in Volume I, Ch.3 of Kolakowski's work. For a general account of and history of Neoplatonism see R.J. Wallis, *Neo-Platonism*, N.Y.: Charles Scribner's & Sons, 1970.

2. For studies of John Scotus Eriugena and his background see S. Gersh, *From Iamblichus to Eriugena*, Leiden: Brill, 1978; and Dermot Moran, *The Philosophy of John Scotus Eriugena*, Cambridge: Cambridge University Press, 1989.

3. This has been argued by Francis Yates in 'Ramon Lull and John Scotus Eriugena' in Francis A. Yates, *Lull & Bruno*: Collected Essays, Vol. I, London: Routledge & Kegan Paul, 1982.

incomprehensibility.... God does not belong to the class of existing things: not that He has no existence, but that He is above all existing things, nay, even above existence itself.'[4] Nevertheless the goal of life is union with God, and it is believed possible to have an immediate experience of Him through the Prayer of the Heart, a form of prayer involving the whole person, body and soul together, in which people enter into direct relation with His energies. Rather than seeing the material world as in a state of perpetual decay as did Western Christianity, the Orthodox believed that the whole of God's creation, material as well as spiritual, is to be redeemed and glorified. Where the Latins talked of salvation the Greeks spoke of redemption and deification. If humans are to share in God's glory, if they are to be 'perfectly one' with God, this means in effect that humans must be deified, to become by grace what God is by nature. Accordingly St Athenasius summed up the purpose of the Incarnation by saying: 'God became man that we might be made god.'[5]

The radical innovation of John Scotus Eriugena, designed to effect the reconciliation between the East and the West, was to account for God's creation of the world by postulating in Him an original deficiency. God must create the world characterized by transience, contingency and evil so that the fullness and immensity of His goodness could be manifested and adored. In developing this theme John conceived creation as a natural unfolding of the divine unity, and declared in consequence that in creating other things God is equally creating Himself. As he put it:

> [T]he divine nature both creates and is created. For it is created by itself in the primordial causes and thereby creates itself, that is to say it begins to manifest itself in its own theophanies, desiring to pass beyond the most secret boundaries of its nature, in which it is as yet unknown to itself and recognizes itself in nothing, inasmuch as it is unlimited, supernatural and supereternal and is above all things that can and cannot be understood.[6]

In this creative process there are four types of being: the creating and not created (God as the source of all); the created and creating (what the Greeks call forms, the primal causes of everything in the whole universe, the Divine Word or Logos which is the instrument of God's creative power); the created and not creating (the created universe, all that is known in the sensible world); and the not creating and not created (God as the end to which the universe is progressing). Human-kind has a special place in this manifestation of the Deity as the microcosm of the creation with attributes of both the sensible and the invisible world, and they must lead the cosmos, participating in the depths of creation from which they will return to unite with the divine source of all Being. In this return what has been created will not be destroyed but will be absorbed by the higher. Thus the corporeal will be ennobled by becoming spiritual, and the individuality of the soul will be preserved while being united with God. In other words, redemption will be attained by a transformation of life on earth.

The themes developed by John Scotus Eriugena have reappeared again and again throughout the history of European thought, with Hegel arguing in the nineteenth century that with Eriugena, 'true philosophy first begins...'[7] As a structural transformation of the basic Christian Neoplatonist tradition which dominated Europe, they have represented one

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4. Cited by Timothy Ware, *The Orthodox Church*, Baltimore: Penguin, 1967, p.73 from *On the Orthodox Faith*, 1,4, (P.G. xciv, 800B).

5. Cited ibid. p.29. from *On the Incarnation*, 54.

6. John Scotus Eriugena, *De Divisione Naturae* III, 23, tr. Kolakowski *Main Currents of Marxism*, Vol.1, p.25.

7. G. W. F. Hegel, *Hegel's Lectures on the History of Philosophy*, (3 vols) ed. and trans. E.S. Haldane and Frances H. Simon, London: Kegan Paul, Trench, Trubner & Co., 1896, Vol.III, p.59. For a review of the literature on the influence of John Scotus Eriugena in the Middle Ages, see Moran, *The Philosophy of John Scotus Eriugena*, Ch.13.

of the two metaphysical foundations for opposition to the dominant culture, the other being Gnosticism. The most significant group to be influenced by John were the Heretics of the Free Spirit, who also drew on the mystical Neoplatonism of Meister Eckhart.[8] It was because of these Heretics that John's works were condemned as heretical in 1210 and 1225. The Heretics of the Free Spirit argued that history has three stages, the first being the original unity, the second, the present, being the age of the Fall, and the third being the new age about to be realized in which a paradise will be created on earth. This millenialism was reinforced through the appropriation of the ideas of Joachim de Fiore (1145-1202). Joachim argued that history is an ascent through three successive ages, each presided over by one the Persons of the Trinity, with the first age, the age of the Father or the Law being one of fear and servitude, the second and present age, the age of the Son being one of faith and filial submission, and the third age, the age to come, being one of love, joy and freedom - where the knowledge of God will be revealed directly to the hearts of all men.[9] Conceiving of God as immanent in the world, the Heretics of the Free Spirit saw themselves and their actions as expressions of God, as the agents through which God's goals will be realized.

This radical form of Neoplatonism received some legitimation in the fifteenth century with the work of Nicholas of Cusa (1401-1464) who was also influenced by Eastern Christianity. Nicholas had received his first education at the school at Deventer conducted by the Brothers of the Common Life and had been introduced to the works of the Pseudo-Dionysius, John Scotus Eriugena and Meister Eckhart, but went to university at Heidelberg, and then Padua, receiving the standard scholastic philosophy of the fifteenth century. However later in life he was sent on a papal mission to escort the Patriarch of Constantinople and a large number of bishops and theologians to Venice to negotiate the reunion of the Churches. Strongly influenced by this contact he wrote his influential *De Docta Ignoratia*, developing the tradition of ideas he had been introduced to in his school days. Following the Pseudo-Dionysius he argued that it is impossible to define the nature of God except by defining what He is not. Following John Scotus Eriugena, he describes the universe as an outflow from and return to the Deity. Developing ideas of Eckhart he argued that God is the infinite in which all opposites are reconciled; and that the universe and all bodies in it are the result of a contraction of the infinite so that what was enfolded within the Deity, is made finite, and thereby explicit. Nature was seen as the finite spirit, the movement diffused throughout the universe and all its parts through which form and matter is connected.[10] All that can be known positively is known through establishing ratios with other beings, mathematics being the ultimate means for this task, making God unknowable except by negation. On this basis Nicholas concluded that the universe as a whole cannot be conceived as a determinate object, but must be conceived as a sphere whose centre is everywhere and whose circumference is nowhere.[11]

Such Neoplatonic ideas set the stage for the development of Copernicus's astronomy in which the sun was seen and exalted as the centre of the solar system,[12] and for the rise of the Hermetic Neoplatonism of Pico della Mirandola and Marsilio Ficino based on the

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8. See Norman Cohn, *The Pursuit of the Millenium*, London: Paladin, 1970, Chs. 8 & 9.

9. See Marjorie Reeves, *Joachim of Fiore and the Prophetic Future*, N.Y.: Harper & Row, 1977.

10. See Nicolas Cusanus, *Of Learned Ignorance*, tr. Germain Heron, New Haven: Yale University Press, 1954, II, x, p.103ff.

11. Ibid. II, xii, p.111.

12. On the relationship between Neoplatonism and astronomy, see Thomas S. Kuhn, *The Copernican Revolution*, Cambridge: Harvard University Press, 1957, esp. p.131. Copernicus was introduced to Neoplatonism by his associate and teacher at Bologna, Domenico Maria de Novara who knew the Florentine Neoplatonists and who translated Proclus and Hermes Trismegistus.

translations of Hermes Trismegistus and the Jewish Kabbala.[13] The most original thinker of the Hermetic movement was Giordano Bruno who, largely inspired by Nicholas of Cusa, went beyond him to identify the indeterminate One or God of Neoplatonism with matter, and to characterize the universe as not merely the indeterminate manifestation of the Deity but as the Deity itself.[14] For Bruno the universe was a composite of universal matter and universal form, but the matter in this scheme was conceived of as containing the forms and as the source of activity or motion, and thus of being. Matter was then identified with nature, effecting a complete reversal of the relative status given to matter and form in Plotinus and St. Augustine. The universe was seen to consist of a plurality of inhabited worlds. The most important features of this conception of the world was that the hierarchical conception of the world was rejected, nature was elevated and conceived of as divine, living and creative, and humanity was seen as a participant in this creative world.

Another important thinker for the future of this tradition of thought was Jacob Boehme (1575-1624), the Silesian mystic who was designated by Hegel as the forerunner of German idealism.[15] Influenced by both Eckhart and Bruno as well as a number of politically radical German thinkers, Boehme developed his system from within the tradition of the Lutheran Church.[16] As a Lutheran his concern was to find a place for evil in the world. Boehme held all the universe, including evil, to be expressions of God, an infinitely transcendent, yet omnipresent force who had created the universe out of His own essence. All human longings: sexual, intellectual and social were seen as expressions of 'homesickness' for the lost unity produced by the diremption of God in His effort to know Himself. This thirst for reunification is present in God's own longing for Sophia which is not merely the Holy Wisdom, but the principle of 'eternal femininity'. This can only be achieved through human thought which extracts structures from the beings of the world and expresses them in language.

While Hermetic philosophy was widespread, it was largely driven underground by political developments in the seventeenth century associated with the triumph of the rising bourgeoisie, and survived only among the Rosicrucians and some elements of the Masons.[17] The conception of nature as active rather than dead and inert remained a feature of radical thinkers in the eighteenth century, both Diderot and Priestly being examples, though the relationship between this opposition and political commitments became increasingly confused.[18] However a different situation prevailed in Germany. Germany which had been broken up after the Thirty Years War of 1618-1648 only began to develop capitalist social relations in the nineteenth century. German philosophers, who for the most part worked within universities, played little part in the development of mechanistic materialism and preserved the intellectual environment within which the themes of the radical Neoplatonists could be revived and developed to challenge the atomistic ideas of the Enlightenment.[19] The German revival of radical Neoplatonism as a major movement occurred at the end of the

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13. The Hermetics are described by Francis Yates in *Giordano Bruno and the Hermetic Tradition*, [1964] London: Routledge & Kegan Paul, 1964.

14. See Wallis, *Neo-Platonism*, p.70. For an analysis of the relationship between Nicholas Cusanus and Giordano Bruno and an analysis of their metaphysical ideas see Ivor Leclerc, *The Nature of Physical Existence*, London: George Allen & Unwin, 1972, Part III.

15. G. W. F. Hegel, *Hegel's Lectures on the History of Philosophy*, (3 vols) ed. and trans. E.S. Haldane and Frances H. Simon, London: Kegan Paul, Trench, Trubner & Co., 1896, Vol.III, p.188.

16. See Robert F. Brown, *The Later Philosophy of Schelling: The Influence of Boehme on the Works of 1809-1815*, Lewisburg: Bucknell University Press, 1977, p.35f.

17. On this, see Margaret Jacob, *The Radical Englightenment*, London: George Allen & Unwin, 1980.

18. See S. Shapin, 'The Social Uses of Science' in G. Rousseau and R. Porter eds. *The Ferment of Knowledge*, Cambridge: C.U.P., 1980, pp.93-139.

19. See Lewis White Beck, *Early German Philosophy*, Cambridge, Mass.: Belknap Press, 1969.

eighteenth century and the beginning of the nineteenth century as Germans struggled to gain a national identity, to unite Germany and to come to terms with the advance of commerce and the dissolution of old forms of relationships. While these thinkers looked back to Radical Neoplatonists such as Boehme and Bruno for inspiration, three philosophers who cannot be identified with such Neoplatonism but who were nevertheless influenced by it, who developed original ideas on this basis, made major contributions to this intellectual movement. They were Spinoza, Leibniz and Herder.

Spinoza's philosophy was an attempt to overcome the dualism of Descartes' philosophy and to provide an answer to the mechanistic political philosophy of Hobbes, while providing a new foundation for a Platonic - Stoic ethics within mechanistic science. It was firmly rooted in ancient and the medieval tradition of thought.[20] Most importantly from the point of view of the German thinkers influenced by him, Spinoza accepted Bruno's identification of the One and matter to conceive the world pantheistically, with extension and thought being seen as two of an infinite number of attributes by which it could be known. As later understood and appropriated by Herder, Schelling and Hegel, the world for Spinoza was a self-causing, unified totality in which the subject could be seen to fit into a universal current of life.

After reading the work of Spinoza, Leibniz, who had originally accepted the new mechanical philosophy and rejected the reality of substantial forms, came to the conclusion that the new physics was not adequately grounded and attempted to develop a new metaphysics to fulfil this task. Echoing Plotinus, Leibniz rejected the characterization of being as 'extension' and conceived the universe as a pre-established harmony in which everything reflects everything else. He argued that if change in the world is to be explained then being must be conceived of as active rather than inert and argued that the ultimate constituents of the universe must be conceived of on the analogy of minds, referring to them as monads. Rather than substance being taken as the unchanging aspect of the world with changeability pertaining only to accidents, the enduring and the mutable were seen to be mutually dependent. Mutability was no longer subordinated to the changeless, and the stability of the monad was seen as the constant rule of its progression. Thus substance was seen as dynamic, being directly active and revealing its nature in the sequence of its activities. Its stability lies in this capacity to emanate what is preformed within it without cessation. Though composed of an infinity of monads, the pre-established harmony of the world ensures that they will develop as a unity so that: 'In the universe all things are closely knit together, they are in one piece, like an ocean: the slightest movement transmits its influence far and wide all around.'[21] Leibniz temporalized the Great Chain of Being, conceiving development of the universe as an evolution towards greater and greater perfection.

Herder drew on the ideas of a wide range of philosophers in the development of his philosophy. While the most immediate influences were Kant, Hamann, Spinoza and Leibniz, he was familiar with the work of the radical Neoplatonists, and was influenced by Bruno whose opinions he had encountered through the writings of the pantheist John Toland.[22] Following these philosophers, Herder argued that nature is a great stream of life of which we are part. It consists of a great creative force composed of dynamic, purpose seeking forces which clash, combine and coalesce to constitute all movement and growth. But while

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20. As clearly shown by Harry Austryn Wolfson in *The Philosophy of Spinoza* [1934], Cleveland and N.Y.: Meridian Books, 1958.

21. Quoted by Hegel in *Hegel's Lectures on the History of Philosophy*, tr. E.S. Haldane and Frances H. Simson, [1896], (3 vols) Atlantic Heights, N.J.: The Humanities Press, 1974, Vol.III, p.344, from *Essais de Theodicee*.

22. See H. B. Nisbet, *Herder and the Philosophy and History of Science*, Cambridge: The Modern Humanities Research Association, 1970 for an excellent account of all the influences on Herder.

the dynamism of beings is provided by these vital forces, they require the right environment to flourish. This dynamic world is evolving (not through the evolution of species, but through the successive emergence of new species) to produce higher and higher levels of being with humanity a special creation at the top of the scale.

In developing his notion of humanity, Herder elaborated Leibniz's notion of the monad and conceived of civilizations, societies and individuals as defining themselves by unfolding and expressing their inner essences, with humanity as a whole evolving to higher levels of being.[23] While human life was always understood with reference to its physical and geographical environment, all human activity was seen as the expression of individuals or groups striving to actualize their own unique natures. The challenge for each society and civilization is to discover its own centre of gravity and then to actualize its potential. All aspects of a particular people, the way they speak, move, eat, drink; their laws, architecture, theology and social outlook, their music and dance forms, and in particular their language, were seen to be pervaded by and to express patterns and qualities unique to their cultures, each aspect of a culture therefore reflecting the whole culture. In opposition to the individualism of the Enlightenment philosophers, Herder argued that individuality is only achieved by participation in and expressing the particular culture through which one's humanity has been attained. All human activity was seen as expressing the total personality of individuals or groups, with self-realization being the richest and most harmonious form of self-expression, which is what all people, whether they are aware of it or not, live for. With this notion of humanity it was the creativity of people which was emphasised, and people were seen to be living in worlds which they themselves had largely created.

There was another reaction against the mechanical world-view which was not directly connected with Neoplatonism, but which was important for its later development. This was the effort by Rousseau and Kant to resurrect the status of reason as a capacity transcending the mechanical world and the calculation of self-interest. Rousseau was trying to show how people could subordinate themselves to society without losing their freedom, and argued that in fact it is through willing subordination to impersonal rules which are rational in the sense of being in accordance with the General Will, that real freedom is attained. The General Will is the Will of the whole society, transcending the sum of particular, egoistic wills, and true freedom is doing what one ought to do from the perspective of the whole society. Kant accepted this idea, referring to Rousseau as the Newton of moral science. He argued that people are truly free only when they act according to the categorical imperative, that is, when they act according to principles which can be willed to be universal laws. To further legitimate this notion of freedom, Kant represented the mechanically determined sensible world as only the world of appearances, ordered first by the imagination and then according to forms of intuition and the categories of the understanding deriving from the transcendental ego. Only by acting according to moral principles are people direct manifestations of the real world.

The ideas of Herder and Kant, along with the advances of the Romantic thinkers inspired by Herder, were assimilated into an expanded Neoplatonism by Fichte, Schelling and particularly by Hegel whose main concern was to integrate the vision of the world as an expressive totality with the notion of the rationally autonomous will.[24] Fichte used Kant's philosophy to reformulate Neoplatonism, reducing Nature to something posited by the subject, while representing the real world as the moral order founded in God, so that each of

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23. For a succinct statement of Herder's' ideas on humanity see Isaiah Berlin, *Vico and Herder*, London, Chatto & Windus, 1976.

24. On this see Charles Taylor, *Hegel*, Cambridge: Cambridge University Press, 1975, Ch.1.

us exists only in God and through God.[25] He then identified God with the one, true and unchangeable Being or Absolute which manifests the appearance of a world with all its diversity to become visible to itself through the moral life of individuals. Fichte's philosophy was the point of departure for Schelling who, in his early work was mainly concerned with the nature of the physical world, and was both influenced by and influenced the natural philosophy of Herder. He was the main inspiration for the *Naturphilosophen*, the philosophers who attempted to replace the mechanistic conception of the physical world by one which stressed the inter-dependence within and the dynamic activity of nature.[26] He also began the examination of previous Neoplatonists, writing a book on Bruno and coming under the influence of Boehme.[27] However the greatest Neoplatonic systematiser of the German reaction against the mechanistic, utilitarian philosophy of France and Britain was Schelling's colleague, Hegel.[28] Hegel's philosophical system continues the whole tradition beginning with John Scotus Eriugena of conceiving the world as a creation of the Deity in His effort to attain full self-consciousness, a process in which humanity plays the leading part; but in accordance with German Neoplatonism this development was represented as the unfolding of the inner essence or self-actualization of what Hegel variously called the Absolute, the Idea or the World-Spirit.

Hegel's system begins with the Logic, conceived to be the ground-plan of the whole of reality which 'shows forth God as he is in his eternal essence before the creation of Nature and finite Spirit.'[29] Beginning with 'Being', which was taken on its own evidence only, but then revealed to be a mere abstraction, Hegel deduced categories to cover matter, life and mind through a process of immanent critique whereby each finite, limited category was seen to suppress itself and pass over into its own negation, engendering a negation of the negation which transcends and preserves the original category in a less limited category. The full development of the categories enables Being to be grasped in a concrete way in the 'Concept', the universal, self-conscious and self-identical inner principle of the diverse totality of Being. These categories correspond to Plato's hierarchy of forms, with Hegel's absolute unity of the Concept and objectivity, the 'absolute Idea', corresponding to Plato's 'Form of the Good'. Although the relationship of the categories to the rational order within the world was conceived differently than the relationship between Plato's forms and objects, change in the world was regarded by Hegel, as it was by Plato, as 'the moving image of eternity'.

According to Hegel, Logic requires the positing of Nature, and presupposes Nature as its being, and the Philosophy of Nature followed the Logic as the science of the Absolute self-externalized. Since Nature is the Idea estranged from itself and thus unmindful of itself, the study of Nature is required to liberate Spirit in Nature. Spirit emerges as the truth of Nature, the negation of Nature's negativity. However this development is not a development in time but in space. Hegel rejected the idea of evolution in Nature. Though Spirit emerges from Nature, Nature is posited by Spirit and Spirit is logically prior to Nature. Spirit which is presupposed by and develops out of Nature, cognizes the Logical Idea in Nature and thus raises it to its essence.

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25. For the most accessible account of Fichte's philosophy see Johann Gottlieb Fichte, *The Vocation of Man*, [1800] ed. Roderick M. Chisholm, Indianapolis: Bobbs-Merrill, 1956.

26. See F.W.J. Schelling, *Ideas for a Philosophy of Nature*, 2nd ed. [1803] tr. Errol E. Harris and Peter Heath, Cambridge: C.U.P., 1988.

27. For a study of this, see Brown, *The Later Philosophy of Schelling*.

28. As Ludwig Feuerbach noted: 'Hegel is not the German or Christian Aristotle - he is the German Proclus. The "absolute philosophy" is the resurrection of Alexandrianism.' in *Samliche Werke*, ed. Bolin and Jodl, Stuttgart: Frommann Verlag, Vol. II, 1905, p.291.

29. *Hegel's Science of Logic*, tr. W.H. Johnston and L.G. Struthers, (2 vols) London: Allen & Unwin, 1929, Vol.1, p.60.

The Philosophy of Mind or Spirit describes the moral as opposed to the physical aspect of reality. It displays humanity in its development from Subjective Spirit in which it struggles to overcome the vestiges of its natural heritage with its bonds of individualism, to Objective Spirit in which humanity battles to construct objective institutions: the family, civil society and the State. There has been a sequence of forms of Objective Spirit each inspired by the basic principle of a national spirit, a principle which 'defines the common features of [a nation's] religion, its political constitution, its morality, its system of law, its mores, even its science, art, and technical skill.'[30] These forms of Objective Spirit have flourished then decayed as the contradictions of the principles inspiring them became manifest. Since new forms are built on the failures of preceding forms, there has been a constant tendency towards progress, leading from a form of the State in which only one person was free (Oriental depotism), through forms in which only some were free (Ancient Greece and Rome), to the form of the Prussian State in which all are free. This is the social order in which the State, transcending the realm of civil society governed by egoism, provides individuals with a basis for attaining freedom by doing their duty in accordance with the laws and usages of the State. The sequence of social forms have provided increasingly better vantage points for Spirit to attain a view of itself as Absolute Spirit through Art, Revealed Religion and Philosophy. The whole of world history is thus seen as a rational progression by which the World-Spirit, through individuals participating in the socio-cultural development of humanity, struggles to attain full consciousness of itself. Through this historical scheme Hegel attempted to synthesize Herder's conception of humans as expressions of an integral totality with the enlightenment notion of freedom through living according to reason as this had been developed by Rousseau and Kant.

In this account of history, Hegel was only concerned to show the rationality of events after they had occurred. As he put it: 'The owl of Minerva spreads its wings only with the falling of the dusk.'[31] So while Hegel's philosophy incorporated a vision of humanity which was implicitly evaluative of social formations and implied the possibility of creating a new social formation in which the goal of humanity would be fulfilled, Hegel's philosophy was profoundly conservative. When it came to decisions on how to live, Hegel's philosophy left individuals in the lurch. This was the basis of the charge Kierkegaard made against Hegel in *The Present Age* that Hegel had constructed a mighty palace and left the individual living in a hovel on the outside. The task Hegel set his radical followers (the 'Young Hegelians') was to show how philosophical theory could be related to practice,[32] and the most eminent of these radicals was the young Marx.

Neoplatonism and Mechanistic Materialism in Marx

Marx, along with the other Young Hegelians, set about this task by rejecting Hegel's idealism while retaining the basic Neoplatonic eschatology and the conception of humanity as the creative agent through which the ultimate end of history will be realized. In this he was strongly influenced by Feuerbach who, in his *Essence of Christianity*, argued that God is nothing but the highest qualities of Man projected onto an extra-mental realm and treated as a real power, leaving Man with an impoverished conception of himself. The task Feuerbach set humanity was to reappropriate these alienated highest qualities.

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30. G.W.F. Hegel, *Reason in History: A General Introduction of the Philosophy of History*, [1837] tr. Robert A. Hartman, Indianapolis: Bobbs-Merrill, 1953, p.79.

31. *Hegel's Philosophy of Right*, tr. T.M. Knox, Oxford: Clarendon, 1952, p.12f.

32. On Hegel, his opponents and different followers, see John Edward Toews, *Hegelianism*, Cambridge: Cambridge University Press, 1980.

Following Feuerbach, Marx saw humans as part of nature rather than nature as being posited by Spirit:

> Nature is man's inorganic body, that is to say nature in so far as it is not the human body. Man lives from nature, i.e. nature is his body, and he must maintain a continuing dialogue with it if he is not to die. To say that man's physical and mental life is linked to nature simply means that nature is linked to itself, for man is a part of nature.[33]

Then in place of Spirit struggling to attain full consciousness of itself through the development of the State and philosophy, Marx took Man as the subject-object which forms itself through the transformation of nature, with civil society and economic life being placed at the centre of the stage. As he put it: '...the whole of what is called world history is nothing more than the creation of man through human labour, and the development of nature for man...'[34]

Marx conceived this as taking place in stages. Man's original state was understood to one of immediate involvement in the world with non-antagonistic social relations: primitive communism. This was followed by Man's progressive domination of nature. However this was seen to involve the alienation of Man from his creative activity, his Species Being, with the separation of labour from its immediate relation to nature and from its means of production, and with the emergence of class societies. Instead of experiencing an increasing control over nature, Man's creative essence becomes something alien, an external power to which individuals must submit, while the products of labour and labour itself become something external to the individual so that he denies himself rather than affirms himself in his work and creations. This is associated with increasingly antagonistic social relations and with class conflict. The evolution of society is seen to take place through a series of revolutions in which new classes emerge representing their own interests as the interests of society as a whole. These take power from the old classes whose interests have become manifestly at odds with the interests of the whole society. Each new class represents more universal interests than those which preceded it, but each class eventually reveals its own interests to be particular and limited, thereby generating new class antagonisms. However with capitalism there has emerged a new class, the proletariat, which by virtue of its total alienation from its creative essence, represents the universal interests of humanity. It is the universal class, and its coming to power will be the full appropriation of Man's now perfected creative essence and the final supersession of antagonistic social relations. The social order in which this will be achieved, the final stage of history, is communism. In describing this as the culmination of history, Marx clearly revealed the domination of his thinking by Neoplatonic eschatology:

> Communism is the positive supersession of private property as human self-estrangement, and hence the true appropriation of the human essence through and for man; it is the complete restoration of man to himself as a social, i.e. human being, a restoration which has become conscious and which takes place within the entire wealth of previous periods of development. This communism, as fully developed humanism equals naturalism, and as fully developed naturalism equals humanism; it is the genuine resolution of the conflict between man and nature, and between man and man, the true resolution of the conflict between existence and being, between objectification and self-

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33. Karl Marx, 'Economic and Philosophical Manuscripts', in Karl Marx, *Early Writings*, tr. R. Livingstone and G. Benton, Harmondsworth: Penguin Books, 1975, p.328.

34. Ibid. p.357.

> affirmation, between freedom and necessity, between individual and species. It is the solution of the riddle of history and knows itself to be the solution.[35]

This system makes the ultimate goal of history Man's self-actualization in communism, and conceives this actualization as yet to be achieved.

The oddity of this conception of the world is that it retains the radical Neoplatonist Christian eschatology while having rejected the framework which justifies it. There is no Supreme Being whose end pre-exists the beginning of history and whose rationality guarantees the rationality of history. The young Marx avoided this problem in two ways. Firstly Man is hypostatised and treated as the subject-object of history in place of people. In this way the problem of how a multiplicity of separate individuals can generate rational progress is avoided. Secondly nature is reduced to a mere abstraction - that on which Man works in the process of his self-formation. Only as humanized is this nature seen to be really knowable or to be of any significance. Only by such evasions of the real complexity of human history could Marx's optimism about the future be sustained on the basis of his early works.

But Marx did not retain this basis. Stung by Max Stirner's critique of Feuerbach's essentialist conception of Man which had largely formed the basis of his own work, Marx moved rapidly beyond his Young Hegelian origins. He did this by immersing himself in the works of the political economists and attempting to find in them a basis for sustaining his hope for the future, hope that the divisions within existing society could be overcome through the establishment of a communist society.

To this end he first appropriated the general theory of history of the Scottish philosophical historians and political economists, namely, the theory that history passes through stages driven by the quest for fuller control over nature and greater surplus product, each stage having its unique configuration of institutions appropriate to that mode of subsistence.[36] Marx gave the most forceful expression to this theory of society and its history, which after his death came to be known as 'historical materialism', in his preface to *A Contribution to the Critique of Political Economy*:

> In the social production of their existence, men inevitably enter into definite relations, which are independent of their will, namely relations of production appropriate to a given stage in the development of their material forces of production. The totality of these relations of production constitutes the economic structure of society, the real foundation on which arises a legal and political superstructure and to which corresponds definite forms of social consciousness. The mode of production of material life conditions the general process of social, political and intellectual life. It is not the consciousness of men that determines their existence, but their social existence that determines their consciousness. At a certain stage of development, the material productive forces of society come into conflict with the existing relations of production or - this merely expresses the same thing in legal terms - with the property relations within the framework of which they have operated hitherto. From forms of development of the productive forces these relations turn into their fetters. Then begins an era of

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35. Ibid. p.348.

36. See Ronald L. Meek, 'The Scottish Contribution to Marxist Sociology' in *Economics and Ideology and Other Essays*, London: Chapman and Hall, 1967; and Andrew Skinner, 'A Scottish Contribution to Marxist Sociology?' in Ian Bradley and Michael Howard eds, *Classical and Marxian Political Economy* London: Macmillan, 1982, pp.79-114. The main figures involved in the development of this theory were Smith, Millar, Ferguson, Robertson, Dalrymple and Lord Kames. The school was originally inspired by Montesquieu.

> social revolution. The changes in the economic foundations lead sooner or later to the transformation of the whole immense superstructure.[37]

However in opposition to the Scottish thinkers on this subject, Marx argued that commercial society is not the last form of society but are paving the way, through the development of industrial capitalism, for a social order in which class oppression will be eliminated. The material forces of production are driving humanity from one form of society to another, ultimately progressing to communism:

> In broad outline, the Asiatic, ancient, feudal and modern bourgeois mode of production may be designated as epochs making progress in the economic development of society. The bourgeois mode of production is the last antagonistic form in the social process of production and the productive forces developing within bourgeois society create also the material conditions for the solution of this antagonism. The prehistory of human society accordingly closes with this social formation.[38]

The defence of this view of history also drew heavily on British thought. It involved the appropriation and development of the labour theory of value as the basis for the analysis of capitalist society. Ricardo's ideas were most important in this respect. Marx's achievement in the domain of political economy was to develop a more dynamic model of the economy than hitherto to deal with the complexities of an increasingly industrialized society, to reveal the basis of capitalism's instability, and to show why in the long term it is likely to become more so. He also analysed the tendencies of capitalism leading to imperialism, and the by-products of the development of capitalism such as the growth of population and destruction of the soil described in the previous chapter.

Marx's concepts of nature and of humanity changed with his development of political economy. He no longer saw nature purely in relation to humanity. This was especially so after the publication of Darwin's *Origin of Species*. Nature pre-existed humanity and had to be seen as having an independent existence. But in accepting the labour theory of value as a means to understand capitalism, Marx gave the impression that he viewed nature not as a co-participant in human creative activity, but as merely the material for humans to work upon. Everything it offers humanity was thus represented as a spontaneous and free gift. Only when it is formed by labour does it have any value.

With the conception of the struggle for more efficient control over nature as the force pushing society from one socio-economic formation to another and with the labour theory of value, the conception of humans as creative, social beings struggling to overcome their alienation and their antagonistic social relations tended to be displaced by an almost Hobbesian view of people. Only the ascription of motivation and agency to classes rather than to individuals or nations really distinguished the more mechanistic formulations of Marx's ideas from Social Darwinism. The motive force for the creation of communism is then the struggle to improve the productive power of humanity, presumably to facilitate higher levels of consumption, and the only deficiency of capitalism is that it will no longer be the best means for developing the forces of production. All ideas apart from science were viewed as disguises or instruments for the self-interested struggles of classes. Understood in this way Marx was seen by his followers to have discovered the laws of development of society, thereby demonstrating the inevitability of progress. As Engels put it in his funeral oration for Marx: 'Just as Darwin discovered the law of development of organic nature, so

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37. Karl Marx, *A Contribution to the Critique of Political Economy*, Moscow: Progress Publishers, 1977, pp.20-21.

38. Ibid. pp.21-22.

Marx discovered the law of development of human history.'[39] With such a Hobbesian view of humanity there was a tendency to think that only by producing such a super-abundance of goods could the conflicts between people be overcome. Communism is then a system where 'the process of material production ... is treated as production by freely associated men, and is consciously regulated by them in accordance with a settled plan.'[40]

This general theory of history and the theory of capitalist society together with a slightly modified mechanistic view of nature and Hobbesian view of humans formed the elements from which orthodox Marxism was constructed (originally by Kautsky and Plekhanov).[41] According to orthodox Marxism the aim of science is the discovery of causal laws. These are the general laws of nature including those associated with the Darwinian theory of evolution, special laws associated with the development of humanity, and even more particular laws associated with the dynamics of capitalism. The theory designating the most general laws of nature came to be known as 'dialectical materialism', while the theory designating the laws of the development of humanity came to be known as 'historical materialism.' (Each of these terms was coined after the death of Marx.) The whole universe was seen to operate deterministically, making the progress of humanity to communism inevitable, and it was held that there were no scientific value judgments involved in the understanding of these laws. This basic position was succinctly stated by Hilferding in the preface to one of the most important contributions to Marxism, *Finance Capital* published in 1910:

> In logical terms Marxism, considered only as a scientific system, and disregarding its historical effects, is only a theory of the laws of motion of society. The Marxist conception of history formulates these laws in general terms, and Marxist economics then applies them to the period of commodity production. The socialist outcome is a result of tendencies which operate in the commodity producing society. But acceptance of the validity of Marxism, including a recognition of the necessity of socialism, is no more a matter of value judgment than it is a guide to practical action.[42]

Marx and Process Philosophy

However despite appearances, Marx and Engels never really deserted the tradition of German thought which emphasised the creativity and sociality of humans, the value of art and literature, and the importance of liberating the creative potentiality of people. While struggling for a firmer foundation for their vision of the future which would liberate human creativity, Marx and Engels developed ideas which went beyond both radical Neoplatonism and mechanistic materialism, ideas which only cohere when understood in terms of the process view of the world.

The first advance made by Marx in this direction was to develop a new notion of humanity by rejecting the hypostatization of 'man' and 'history' of his unpublished, essentially Neoplatonic works. In relation to history he wrote:

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39. Frederick Engels, 'Speech at the Graveside of Karl Marx' in *Karl Marx and Frederick Engels: Selected Works in Two Volumes*, Vol.2, Moscow: Foreign Languages Publishing House, 1962, p.167. This interpretation of Marx's work is supported by Marx himself in the 'Afterword to the Second German Edition', *Capital*, 3 volumes, tr. Edward Moore and Edward Aveling, Moscow: Progress Publishers, 1974, Vol.1, pp.22-29.

40. Marx, *Capital*, Vol.1, p.84.

41. A slightly polished version of such orthodox Marxism has been argued for by G.A. Cohen in *Karl Marx's Theory of History - A Defence*, Oxford, Oxford University Press, 1979, and has been widely acclaimed by Marxists.

42. Rudolf Hilferding, *Finance Capital: A Study of the Latest Phase of Capitalist Development*, tr. Morris Watnick and Sam Gordon, London: Routledge & Kegan Paul, p.23.

> History does nothing, it 'owns no tremendous wealth', it 'fights no battles'. Instead it is man, real, living man that does all this, owns and struggles; there is no such thing as 'history' that uses man as its means in order to attain its ends - as if it were a separate person - for history is nothing but the activity of man pursuing his ends.[43]

But then in relation to the meta-subject-object 'man' he wrote:

> The individuals, who are no longer subject to the division of labour, have been conceived by the philosophers as an ideal, under the name 'man', and the whole process which we have outlined has been regarded by them as the evolutionary process of 'man', so that at every historical stage 'man' was substituted for the individuals existing hitherto and shown as the motive force of history. The whole process was thus conceived as a process of the self-estrangement of 'man'...[44]

Marx strove to see history not as the development of an hypostatized subject 'man' but as the creation of social individuals struggling within particular historical conditions.

But this did not involve the acceptance of Hobbes' atomic individualism. Marx retained his relational conception of humans as essentially social and creative beings, attacking political economists for seeing commodities, labour, capital, exchange and value as naturally occurring 'things' rather than as historically specific 'relations'. Marx's commitment to a conception of people as creative and social is not only immediately evident from the *Grundrisse*, but is also clear from Marx's analysis of commodity fetishism in the first chapter of *Capital*. It is clear from this that Marx believed that people are forced by the capitalist socio-economic formation to conceive themselves as atomic individuals only interested in the world and other people insofar as they are useful to their own egoistic interests, that it is not 'natural' to be this way. In particular the labour theory of value itself is seen as a category only fully applicable to capitalist society, and as with all economic categories of capitalist society, as a 'form of being' which not only constitutes social relations, but also partly hides the true nature of these relations.[45] Marx was concerned throughout his work to go behind appearances in which people and their products appear as quantifiable things to the underlying durational processes, the labouring process, the processes of production and exchange and the actual consumption of commodities, from which these appearances are generated.[46] Explaining how people have come to conceive their relations in mechanistic, utilitarian terms, how they define all value through money, and how their conceptions have been sustained and reproduced, is a major part of Marx's research programme and a major part of his explanation of capitalism's existence.

Correspondingly Marx vehemently rejected conceptions of humans which reduced them to mechanisms satisfying their appetites. In *Capital* he referred to Jeremy Bentham as 'that insipid, pedantic, leather-tongued oracle of the ordinary bourgeois intelligence of the 19th century', and, condemning the implications drawn from the utilitarian principle that art criticism is of no value because it interferes in the enjoyment of works of art, as 'a genius in the way of bourgeois stupidity.'[47] Marx suggested that Bentham's utilitarianism amounted to

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43. Karl Marx and Frederick Engels, *Werke*, Dietz-Ausgabe, 1958ff. Vol.2, p.98, tr. in Helmuth Fleischer, *Marxism and History*, [1969], N.Y.: Harper & Row, 1973, p.17

44. Karl Marx, 'The German Ideology', in *Karl Marx, Frederick Engels: Collected Works*, Vol. 5, 1845-1847, tr. Clemens Dutt et.al., N.Y.: International Publishers, 1976, p.88.

45. Marx, *Grundrisse*, p.106.

46. See for example ibid. p.'s 91 & 255. Marx's critical analysis of such reification corresponds to Alfred North Whitehead's analysis of the 'Fallacy of Misplaced Concreteness' - the tendency to abstract, to ignore the level of abstraction and then to treat the abstraction as a concrete reality.

47. Marx *Capital*, Vol. 1, p.570 & 571n.

assuming that what is useful for that queer normal man, the modern English shopkeeper, is absolutely useful. In opposition to this he argued that to discover what is good for humanity it is necessary to begin with 'human nature in general, and then with human nature as modified in each historical epoch.'[48]

One of the most important features of Marx's work was to stress the uniqueness of capitalism as an emergent phenomenon which must be understood in its own terms. He stressed that capitalism is more than the conditions of its emergence. As he wrote in the *Grundrisse*: 'These conditions and presuppositions of the *becoming*, of the *arising*, of capital presuppose precisely that it is not yet in being but merely in becoming; they therefore disappear as real capital arises, capital which itself, on the basis of its own reality, posits the conditions of its realization.'[49] To comprehend the dynamics of capitalism once it had been established, Marx developed a new scheme for understanding the relationship between purposive activity and social dynamics, which involved the development of a new notion of contradiction. Marx conceived of the relationships between people as conceptual relations, yet held that the dynamics of capitalism are not reducible to these conceptual relations. The self-reproduction of capitalism involves constraining people to define their relations in terms of the categories of 'commodity', 'capital' and so on, and to define their goals accordingly. But by so doing it can constrain people to act in pursuit of goals, the conditions for achieving which they undermine in the process. Thus there is a contradiction between the capitalists' efforts to maximise their profits by keeping wage levels down, since this deprives consumers of the means to buy what is produced. There is a further contradiction between the effort to expand profits by further investing in fixed capital. Aggregate profits are based on extracting surplus value over wages from the exchange value of what wage-earners produce. If the proportion of variable capital (employed labour-power) to fixed capital increases the possibility of extracting a surplus diminishes. If machinery produces everything there will be no wage-earners to extract surplus value from. The whole basis of the system will be destroyed. Finally there is a contradiction in the drive to overcome rival capitalists since this reduces greater and greater proportions of the population to wage labourers, creating and rendering more powerful the class of wage-labourers which then has the potential to wrest power from the capitalists and to expropriate the means of production. In each case the goals of the capitalists cannot be freely chosen but must be pursued in order to avoid losing the game, which would mean becoming a wage-labourer. According to Marx while such contradictions can be contained for some time, they will eventually render capitalism unviable and provide the conditions for the working class to seize power and replace capitalism with a socialist organization of production.

Marx pointed out that the failure to appreciate the uniqueness of capitalism is a consequence of the tendency to project the categories which dominate the present on the past. Thus, in *A Contribution to the Critique of Political Economy*, in the same work in which the famous passage occurs in which all history is seen as progress in the development of the forces of production, Marx wrote:

> What is called historical evolution depends in general on the fact that the latest form regards earlier ones as stages in the development of itself, and conceives them always in a one-sided manner, since only rarely and under quite special conditions is a society able to adopt a critical attitude towards itself...[50]

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48. Ibid. p.571n.

49. Marx, *Grundrisse*, p.459.

50. Marx, *A Contribution to the Critique of Political Economy*, p.211. See also *The German Ideology*, p.89.

He elaborated on this in the *Grundrisse*. Quoting the adage 'Human anatomy contains a key to the anatomy of the ape' he argued in relation to the categories of capitalist economy which appear in past societies that

> this must be taken with a grain of salt. They can contain them in a developed, or stunted, or caricatured form etc., but always with an essential difference. The so-called historical presentation of development is founded, as a rule, on the fact that the latest form regards the previous ones as steps leading up to itself ... since it is only rarely and only under quite specific conditions able to criticise itself...[51]

Such an affirmation of genuine emergence and rejection of the idea of historical evolution is completely at odds with the Neoplatonic eschatology of the *1844 Manuscripts* and the scientific materialist formulation of this as a technological determinism. This break with historical evolution and technological determinism is not a late development in Marx's thought and appeared throughout his writings. In the *Communist Manifesto* Marx and Engels had pointed out the historical possibility of the common ruin of contending classes of society rather than the emergence of a new order. In his characterization of the types of socio-economic formations in the *Grundrisse* Marx included the Asiatic mode of production without giving it any place in an evolutionary scheme. But most importantly in considering societies other than Western Europe, he at times resolutely rejected the notion that there is one unique course of development for all societies.

In this regard his comments on Russia are most illuminating and reveal the extent to which Marx transcended both his early works and the historical scheme of the 'Preface' to *A Contribution to the Critique of Political Economy*. Engels had engaged in a polemic with the Russian Populist Petr Tkachev in 1874-75 concerning the possibility of establishing a communist society within Russia. Tkachev had argued on the basis of Marx's analysis of socio-economic formations that it is only when capitalism is established that one must wait until it has fulfilled its potentialities. However Russia was in an epoch of transition, and this made it possible to skip capitalism and move straight on to communism. Engels rejected this: 'The bourgeoisie,' he wrote, 'is just as necessary a precondition of the socialist revolution as the proletariat itself. Hence a man who will say that this revolution can be more easily carried out in a country because, although it has no proletariat, it has no bourgeoisie either, only proves that he has still to learn the ABC of socialism.'[52]

Marx took exactly the opposite view. In a letter written in November, 1877 and addressed but not sent to the editor of a Russian literary-political journal in reply to a charge made against Marxism by Nicolai Mikhailovski that it condemned Russians to the oppression of capitalism, Marx rejected the notion that his theory implied anything of the sort. Criticising Mikhailovski's interpretation he wrote:

> He must by all means transform my historical sketch of the development of capitalism in Western Europe into a historical-philosophical theory of universal development predetermined by fate for all nations, whatever their historical circumstances in which they find themselves may be, in order finally to achieve that economic formation which with the highest upswing of the productive forces of social work assures mankind its most universal development. But I beg his pardon. (That [view] does me too much honour and too much insult.)

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51. Marx, Grundrisse, p.105f.

52. Karl Marx and Frederick Engels *Selected Works*, London: 1950, Vol.2, pp.46-47.

Marx then went on to describe how ancient Rome had produced a situation very similar to that of late feudal Europe: peasants were expropriated from the means of production and subsistence in an economic formation consisting of large landownership and large-scale capitalism. But instead of the dispossessed selling their labour-power they became an idle mob, and instead of a capitalist production system, a system developed based on slave labour. Marx concluded from this:

> Thus events of a striking analogy, because they took place in a different historical milieu, led to entirely different results. If one studies each of these developments by itself and then compares them with each other, one will easily find the key to each phenomenon, but one would never thereby attain a universal key to a general historical-philosophical theory, whose greatest advantage lies in its being beyond history.[53]

This conclusion was reiterated in a letter to Vera Zasulich in March, 1881 concerning the possibility of establishing communism on the basis of the Russian village commune. Marx concluded against the avowed Marxist Zasulich and in favour of the populists 'that this village commune is the fulcrum for the social regeneration of Russia...', emphasising that his analysis in *Capital* referred only to Western Europe.[54]

Marx also developed an epistemology appropriate to his relational conception of humans as beings in the process of becoming in which the course of history is crucially dependent upon human agency. In the *Theses on Feuerbach* he argued against the contemplative materialism of Feuerbach, holding that knowers and knowledge must be considered as part of the material world being understood, that the educators themselves must be educated. Correspondingly he argued that it is impossible to judge the validity of theories until they have been acted upon and made part of social reality: 'Man must prove the truth, i.e., the reality and power, the this-worldliness of his thinking in practice. The dispute over the reality or non-reality of thinking which is isolated from practice is a purely scholastic question.'[55] There can then be no question of discovering the laws of history which will determine the future. So much for historical materialism. And this flexible interpretation of history, assuming a relational view of people as essentially social and creative agents, in which capitalism is seen to have developed as an emergent formation or process with its own unique dynamics, and in which people have no guarantee that there will be a happy end to their struggles, fully accords with the framework of the process view of the world.

Engels' Effort to Supplement Marx

Albeit in a very paradoxical way, Engels elaborated a process view of the world in order to provide a general philosophy for Marx's conception of history. In his efforts to conceive the world so that Marx's ideas would be fully intelligible Engels presented a picture of the world:

> ... in which nothing remains what, where and as it was, but everything moves, changes, comes into being and passes out of existence. This primitive, naive, yet intrinsically correct conception of the world was that of the ancient Greek philosophy, and was first

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53. *The Letters of Karl Marx*, ed. and tr. Saul K. Padover, Englewood Cliffs, N.J.: Prentice-Hall, 1979, p.321f.

54. Ibid. p.335f.

55. Karl Marx 'Theses of Feuerbach' (Original Version) in *Karl Marx, Frederick Engels: Collected Works*, Vol.5, 1845-47, tr. Clemens Dutt et.al. N.Y.: International Publishers, 1976, p.3.

> clearly formulated by Heraclitus: everything is and also is not, for everything is in flux, is constantly changing, constantly coming into being and passing away.[56]

Engels argued that despite the achievements of the analytical approach to understanding the world which has displaced this primitive vision of the ancient Greeks:

> ... this method of work has left us as a legacy the habit of observing natural objects and processes in isolation, apart from their connection with the vast whole; of observing them in repose, not in motion; as constants, not as essentially variables; in their death, not in their life.[57]

This static conception of the world is now being transcended, and the view of the world as a dynamic totality is being reinstated, but at a higher level. It is not understood in its primitive naivete, but as enriched by the achievements of science and as the conclusion of strictly scientific research. In opposition to mechanistic materialism of the old science, Engels argued that 'the world is not to be comprehended as a complex of ready made things, but as a complex of processes.'[58]

But Engels did not develop this conception of being consistently. Far more than Marx, he was committed to a deterministic view of the universe in which the coming of communism would be inevitable. To combine a process view of the world with determinism he developed this conception of being in terms of 'dialectics' which he claimed he and Marx had rescued from Hegel's idealist philosophy. He defined dialectics as 'the science of the general laws of motion and development of nature, human society, and thought'[59] and argued that there are three such laws:

> The law of transformation of quantity into quality and vice versa;
> The law of interpenetration of opposites;
> The law of the negation of the negation.[60]

It is this conception of the world which after the death of Engels, Plekhanov designated 'dialectical materialism'.

This list of 'laws of motion and development' describes features one would expect in a world consisting of processes. There would be qualitatively novel processes emerging, processes which are opposed to each other while being dependent upon each other, and developments involving sequences of transformations. But to present such characteristics of being in terms of 'laws of dialects' represents a gross confusion between the logic of the relations between categories or concepts by which the world is conceived and the causal relationships within the world as it is conceived.

The last two of these laws express the relations existing between categories or concepts. The second law expresses the insight common to Neoplatonists that opposites such as A and not A imply a category or concept in terms of which they are related as contradictories. The third law expresses Hegel's conception of the development of thought as the production of new categories which transcend the limitations of old categories. The concepts of the first

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56. Frederick Engels, *Herr Eugen Dühring's Revolution in Science (Anti-Dühring)*, N.Y.: International Publishers, 1939, p.26f.

57. Frederick Engels, 'Socialism: Utopian and Scientific' in *Karl Marx and Frederick Engels: Selected Works*, Vol.II, p.130.

58. Frederick Engels, 'Feuerbach and the End of Classical German Philosophy' in *Karl Marx and Frederick Engels: Selected Works*, Vol.II, p.387.

59. Engels, *Anti-Dühring*, p.155.

60. Frederick Engels, *Dialectics of Nature*, tr. Clemens Dutt, Moscow: Progress Publishers, 1954, p.62. The laws are essentially the same in *Anti-Dühring*.

law: quality and quantity, are categories which Hegel deduced by means of his dialectical method as being essential for understanding the world. But simply presenting these without any framework of support provides no basis for accepting their validity, and most modern physical scientists would disagree with Engels and agree with Galileo that the world can be understood entirely in quantitative terms.

In actual fact the notion of dialectics pertains to discussion and argument. It derives from the Greek word for discourse: *dialektike*, and was originally applied to the question and answer approach to the exploration and development of ideas. It could be applied to nature by Idealists such as Hegel because they saw nature as posited by Spirit, and therefore as having a logical structure reflecting the structure of the development of thought. But a materialist has no grounds for assuming that logical relations are in the world itself - except insofar as logic is a creation of humans who are part of the material world.

However while it might be invalid for a professed materialist such as Engels to refer to these laws of dialectics as laws of nature, he might be justified in ascribing such laws to the development of society and to the development of thought. To think of society as evolving dialectically he would merely have to accept Hegel's arguments that history moves from the embodiment of one set of ideas, categories or concepts to another. But this flies in the face of Marx's struggle to transcend Hegel by showing to what extent the dynamics of history is not the dynamics of a subject-object moving from one conceptual structure to another in its struggle to develop itself, but engenders social forms, notably capitalism, with an autonomy which transcends the intentions of all subjects and which confronts people as a second nature to which they must conform. Marx pointed out that contradictions in society in fact frequently do not impel any developments. As he argued in relation to the contradictory conditions associated with the exchange of commodities, these develop 'a *modus vivendi*, a form in which they can exist side by side.' And he went on: 'This is generally the way in which real contradictions are reconciled.'[61] Engels' characterization of the development of society as a dialectical development cannot be justified as an account of Marx's work.

Lastly, Engels might be justified in claiming that at least his last two dialectical laws apply to thought. It is in this domain that Engels would seem to be on strongest grounds given the inadequacy of empiricist and conventional rationalist theories of knowledge to take into account what is involved in the development of concepts. But this brings to the fore the question of what Engels means by 'laws'. It was seen in Chapter 5 that the notion of law was originally applied to nature on the assumption that it was ordered by God. Engels can hardly claim this conception of law. Secondly the existence of laws implying intelligibility was based on the assumption that these laws were logical laws. The world could therefore be understood as ordered by logical necessity. Even without a God such a notion of law might be justified if reinterpreted subjectively to imply a convenient way of ordering experience to make predictions. But the real superiority of dialectical notions of thought over logicist accounts is that they give a place to the originality involved in developing and creating new concepts. For this reason it is highly misleading to refer to a dialectical account of the development of thought in terms of laws. So even here Engels' ideas are questionable.

But this brings to light the fundamental ambiguity of Engels' ontology. It is an ontology which implies the possibility of new processes forming which cannot be understood in terms of the conditions of their formation. Since these are not determined by such conditions, the future cannot be entirely determined by the past. The idea of a general set of laws of being governing the development of the whole of reality in any conventional sense of the notion of law is therefore simply out of place. Similarly in relation to knowledge. Marx's

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61. Marx *Capital*, Vol.I, p.106. Marx castigated the 'dialectical' account of economic categories and development in his critique of Proudon in 'The Metaphysics of Political Economy', *The Poverty of Philosophy*, Moscow: Progress Publishers, 1973, Ch.2.

achievements were genuinely original and cannot be thought of as simply the product of the operation of specifiable laws of thought. In his effort to capture Marx's achievements, Engels was forced to develop an ontology which would allow for the emergence of novelty, for an open future. But by presenting this ontology first in terms of the categories appropriate to an Idealist conception of being, and then formulating this in terms of a notion of law deriving from mechanistic materialism, Engels disguised the anti-deterministic implications of a process view of the world. When this disguise is shed, then the applicability of the Heraclitean or process conception of being for understanding Marx's most important insights can be appreciated.

Conclusion

To evaluate Marxism it is therefore necessary to consider whether it is Marxism as understood in terms of Neoplatonism, in terms of mechanistic materialism or in terms of process philosophy. In the following chapters the orthodox Marxism of the Soviet Union will be analysed, and it will be argued that its defects derive from its Neoplatonic and mechanistic elements. But at the same time a rival tradition of Russian Marxism committed to reformulating Marx's ideas in accordance with a process view of the world will be revealed.[62] This tradition was inspired by Aleksandr Bogdanov and became a major force after the October revolution in the form of the *Proletkul't* movement. According to Bogdanov, the creation of a new form of society will require a new culture based on a dynamic view of nature and of humans as organized and organizing forms of energy. The dynamics of Russian culture will be shown to have affected the way in which Marxism was appropriated and developed in Russia and then in the Soviet Union, suggesting the importance of culture in constraining what can be achieved in any society. Also, that there are other processes in society than those associated with the market that can take on a life of their own inimical to the ends of the people who are its constituents. Together these arguments will be used to suggest that if Marxism is to be developed to deal with environmental problems and to adequately comprehend history, it must give a far greater role than orthodox Marxists have allowed to the so-called superstructure of society. This will provide a defence for Bogdanov's Marxism and the *Proletkul't* movement and their project of reformulating Marxism in accordance with process philosophy.

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62. While the first thinker to attempt to reformulate Marx along these lines was Bogdanov, in the 1930s Joseph Needham also attempt to synthesize Marxism with a process view of nature. More recently Cornelius Castoriadis, building on the work of Maurice Merleau-Ponty, has contributed to this task. See his *The Imaginary Institution of Society*, [1975] Cambridge: Polity Press, 1987. Taking a very different approach, Russell L. Kleinbach; has shown the relevance of Whitehead for the development of Marxian social theory in *Marx via Process*, Washington: University Press of America, 1982.

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MARXISM AND THE DYNAMICS OF RUSSIAN CULTURE

Throughout most of its history the vast majority of Russia's population have been illiterate, with a relatively small number of noblemen and monks living in a sea of peasants. As a consequence it is even more difficult to understand the nature of the cultural dynamics of Russia than to understand the cultural dynamics of Western Europe. For the most part, only the forms of thinking of a small minority of the population have been given expression to; the forms of thinking of the majority are manifest only insofar as they have positively or negatively influenced this minority. Apart from folktales and the like, the orientation of the vast majority only directly manifested itself in their revolts against the established order.

Russia is distinguished from the rest of Europe first of all by the harshness of its environment. It has featured vast, thinly populated spaces full of forests and swamps, low rainfall, freezing winters, and in the north, poor soil. The impression made by this country on its visitors was described by Braudel: 'A traveller to Persia entering Russian territory at Smolensk in 1602, found Muscovy a "great and vast" country, "wild, deserted, marshy and covered in scrub" and forests, "interspersed with swamps which one crosses by paths made of fallen tree-trunks"...; a country like nowhere else on earth, empty ..., with appalling roads, difficult even in summer, a country in short "so resistant to access that it is impossible to enter or leave it discreetly, without permission or a safe-conduct from the Grand Duke".'[1] Apart from this, Russia lay beyond the Roman Empire. Its Christianization in the tenth century involved the assimilation of forms of thinking which were far more different from its original culture than was the case with those areas of Europe which had been part of the Roman Empire. And Russia was Christianized to the Orthodoxy of Constantinople which separated it further from Western Europe. And yet Russia has been Christian, and consequently its culture has had many surface characteristics in common with those of the rest of Europe, though generally these have been part of basically different cultural configurations.

Partly because of the nature of the physical environment, people's relationship to it has been fundamentally different than in Western Europe. Traditionally, nature was not conceived of as something to be subjugated, but as the source of both life and hardship. As in the West nature has been conceived of as feminine; but it has not been conceived of as a female to be conquered. Rather it has been seen as the great 'damp mother earth.' As G. P. Fedotov put it, 'Earth is the Russian "Eternal Womanhood," not the celestial image of it; mother, not virgin; fertile, not pure; and black, for the best Russian soil is black.'[2] Nature has symbolized the Russian feminine virtues of endurance, non-resistance to evil and voluntary suffering.

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1. Fernand Braudel, *Civilization & Capitalism 15th-18th Century, Volume III, The Perspective of the World* [1979] tr. Sian Reynolds, London, Fontana, 1985, p.26.

2. G.P. Fedotov, *The Russian Religious Mind* (2 vols) Vol. 1. Cambridge Mass.: Harvard University Press, 1946, p.13.

In a land of forests, the axe was the essential tool of men. They cleared the forests with it, cut up, carved and planed wood with it, defended themselves with it against both animals and people, fought with it against Teutonic knights and Mongols, and beheaded prisoners of war with it. It was used by tsars to suppress urban rebellions and by peasant rebels to terrorize the provincial nobility. There was no impetus to develop new technology. But while the Russians' axes cleared the land, provided shelter from the elements and provided defence against large animals and people, the omnipresent insects and rodents constantly gnawed away at their crops, their buildings and at the people themselves. Mosquitoes swarmed over people and lice got into their clothing, infecting them with disease. Cockroaches invaded their dwellings while mice and rats devoured crops and spread disease. The first official English ambassador in the mid-seventeenth century was advised by Russian officials to sleep with his servants 'lest the Rats run away with them being single.'[3]

The harsh conditions fostered not the individualism characteristic of Western Europe, but strong communities in which the virtues emphasised were the capacity to endure hardship and to subordinate oneself to the group. Life was not a struggle to conquer nature, but a struggle to survive within it. The family was of central importance in this struggle, and 'small' or nuclear families frequently recruited new members without blood ties into their households to form extended or 'great' families.

The eternal womanhood of the earth, the axe and the family have been pervasive symbols of Russian culture, but the ultimate symbol and metaphor, the thematic motif which has dominated it as the machine has dominated the West since the seventeenth century, is *fire*. In Russia's bleak, icy winters, fire provided warmth and light. It was revered, requiring cleanliness in its presence and reverent silence when being lit or extinguished. But fires also swept through forests and towns, burning the wooden houses and buildings, and Moscow had seventeen major fires between 1330 and 1453. It was also feared. Fire played a major part in Russian religious symbolism. Perun, the god of thunder and creator of fire held the pre-eminent place in the pre-Christian galaxy of deities, and the firebird a special place in mythology. Russians accentuated all references to or analogies with fire in scripture and in religious philosophy, and their onion domed churches symbolise the purifying power of flames. The basic metaphor for explaining the combination of God and man in Christ has been that of fire infusing itself into iron, and a popular definition of Christian commitment portrayed the committed person as 'having become all fire in the soul, he transmits the inner radiance gained by him also to the body, just as physical fire transmits its effect to iron.'[4] Russians tended to see the heavenly orders in terms of the writings of the Pseudo-Dionysius for whom angels are 'living creatures of fire, men flashing with lightning, streams of flame ... thrones are fire and the seraphims ... blazing with fire.' And they accepted his conception of the world according to which: 'Fire is in all things ... manifesting its presence only when it can find material on which to work ... renewing all things with its life-giving heat ... changeless always as it lifts that which it gathers to the skies, never held back by servile baseness.'[5] Christ's statement that 'I have come to send fire on the earth' was frequently cited, as was the fact that the Holy Spirit first came down to man through 'tongues of fire'. In the seventeenth century fire was the weapon of the fundamentalists who burned musical instruments, foreign style paintings and the buildings of the foreign community itself. After the Old Believers had been anathematized in 1667 they burned themselves in oil soaked wooden churches. Rebels and revolutionaries retained this fascination with fire. Bakunin prophesied during the revolutionary crisis of 1848-49 that 'tongues of flame' would shortly

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3. Cited by James H. Billington, *The Icon and the Axe: An Interpretive History of Russian Culture*, N.Y.: Vintage Books, 1970, p.23.

4. Cited ibid. p.24.

5. Cited, loc. cit.

appear all over Europe to bring down the old gods, the symbol of fire featured centrally in the early twentieth century revolution in music (in such works as Scriabin's 'Poem of Fire'), and Lenin titled his revolutionary journal the *Spark (Iskra).*

Christianity in Medieval Russia

The conversion to Christianity began with the conversion of Grand Prince Vladimir of Kiev in Byzantium in 988. There followed a mass baptism of Russians in the Dnieper. Though the actual permeation of Christianity through the whole of Russia took centuries, the embracing of Christianity by the ruling elite was characterized by its unreservedness. If a society voluntarily adopts a vast new culture then there must be reasons for doing so, and the pre-existing culture must have been such that it was capable of absorbing a whole set of new ideas. Understanding how such a mass conversion was_ possible illuminates one of the most enduring features of Russian culture.

Russian culture has been characterized by a duality.[6] As distinct from the West, Russians have divided everything into the elevated (sacred) and low (profane) without leaving any room for an intermediate, neutral realm. Reflecting the total subordination of the individual to the group, actions have been seen as either good or bad, holy or sinful, pro-state or anti-state. In the religious sphere, Russians allowed no purgatory; only heaven and hell. Politically, they have been either revolutionary or reactionary. There has been no middle ground for conservatism nor for a realm within which a succeeding system could be developed. But this duality has been such that whatever has been rejected remains an active part of the culture. This has facilitated complete cultural inversions with what was previously conceived to be sacred becoming profane and vice-versa. As Lotman and Uspenskii wrote of Prince Vladimir, 'He did not simply accept a new system of values, replacing the old with the new, but rather wrote the old into the new - with a minus sign.'[7] The old culture was preserved in the system of proscriptions and by renaming the pagan gods as saints or devils.

In the Orthodox Christianity to which they were converted, the 'radical' Neoplatonism of Clement, Origen, Gregory of Nyssa, the Pseudo-Dionysius and Maximus the Confessor dominated the religion rather than being a minor tradition, as it had been in Western Europe. Consequently, unlike Western Christianity there was no rejection of the here and now or contempt for the body but a belief in the potential holiness of matter. As Fedotov put it: 'The distance between the two worlds is not the gulf between the flesh and the spirit ... but between the fallen and the transfigured ... flesh.'[8] The end of history was described in the twelfth century by a Russian monk as a conflagration purifying the just, burning the sinners, and transforming the world:

> Afterwards, the earth will be new and flat (the ideal antique landscape) as it was in the beginning, and whiter than snow; it will be changed by the order of God, and will be like gold; there will grow upon it various grasses and flowers, never fading, because spiritual; and trees will come forth, not similar to those visible now; their height, beauty, and splendour the lips of men are unable to express, because spiritual.[9]

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6. Iurii M. Lotman and Boris A. Uspenskii, 'Binary Models in the Dynamics of Russian Culture' in *The Semiotics of Russian Cultural History* Alexander D. Nakhimovsky and Alice Stone Nakhimovsky eds., Ithaca and London: Cornell University Press, 1985, pp.30-66.

7. Ibid. p.34.

8. Fedotov, *The Russian Religious Mind*, p.129.

9. Cited ibid. p.175.

In this transfigured world, humans would be deified, becoming by grace what God is by nature.

The most important function served by this form of Christianity was to provide an ideology to unify Russia's multinational empire. Its focus was not on morality, on the need to transform one's humanity to attain personal salvation, but on cosmic redemption in which the Christian Empire of the East would be transformed into the final heavenly kingdom. All that was needed by Christians was 'right praising' through the forms of worship handed down from the Apostolic Council and defined for all time by the ecumenical councils. Muscovites spoke of following or serving Christ rather than imitating Christ, and put greater stress on the suffering which such service entailed. What was important was Christ's mission rather than his teachings - which were little known anyway in the absence of a complete Slavonic New Testament. The function of the Christian was to serve God by enlisting in that mission, by beating off his enemies and following Christ in his personal compassion and willingness to suffer.

This world-orientation enabled Russians to see themselves in historical perspective, just as did their Christian and Islamic opponents. Constantinople had thought of itself as the New Rome: capital not of 'a' but 'the' Christian Empire, specially chosen to guide men along the path, marked out by the chronicles, from Christ's incarnation to His Second Coming. The Russians represented themselves as superior to Byzantium by virtue of the 'newness' of Russia in comparison with 'old' Byzantium.[10] With the fall of Constantinople and the liberation of Russia from the Mongols, Moscow came to conceive of itself as the 'Third Rome', the only bulwark of Orthodoxy. Since Byzantium had fallen to Islam while Russia had liberated itself from Islam, the two had changed places, and Russia had become the centre of the Orthodox, and therefore of the Christian World. This vision of Russia's place in the world was vividly conveyed in a fifteenth century letter by Filofei of Pskov to Ivan the Great:

> The church of the first Rome fell because of the godless heresy of Apollinaris. The gates of the second Rome at Constantinople were smashed by the Ishmaelites. Today the holy apostolic church of the third Rome in thy Empire shines in the glory of Christian faith throughout the world. Know you, O pious Tsar, that all empires of the orthodox Christian have converged into thine own. You are the sole autocrat of the universe, the only tsar of all Christians ... According to the prophetic books all Christian empires have an end and will converge on one empire, that of our gossadar, that is, into the Empire of Russia. Two Romes have fallen, but the third will last, and there will not be a fourth one.[11]

Individuals were related to this Christianity through the lives of the saints and through icons. Each of these was far more important to people in Russia than to people in the West. These presented the Platonic forms for individuals to participate in and to identify themselves by. As such they reflected the way Russians adapted Christianity to their own culture, with its emphasis on community and endurance. The nature of this adaptation was particularly evident in the evolution of the stories of the martyred princes in Russia.[12]

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10. Lotman and Uspenskii, 'Binary Models in the Dynamics of Russian Culture', p.35.

11. Cited by Eric Voeglin in *The New Science of Politics: An Introduction*, Chicago & London, The University of Chicago Press, 1952, p.114f.

12. Norman W. Ingham, 'The Martyred Prince and the Question of Slavic Cultural Continuity in the Early Middle Ages' in Henrik Birnbaum and Michael S. Flier, eds, *Medieval Russian Culture*, Berkeley: University of California Press, 1984, pp.31-53.

Originally the stories of the Kievan princes, Boris and Gleb, killed by their brother Svjatopolk, were modelled on and strongly resembled the stories of Saint Wenceslas (Vaclav) of Bohemia. In each case innocents, who refused to defend themselves against their brother, were murdered. But in contrast to the Czech stories which, in accordance with Western thought emphasised individual self mastery, the Russian stories strongly emphasised the themes of quiet, humble submission to one's fate, and of brotherly love and the proper relation of younger to elder brothers. Through their murder the brothers are transfigured and are ecstatically reunited in heaven. As Norman Ingham wrote of this:

> Rusian (sic) writers ... did not just 'borrow' ready made formulations; they absorbed ideas and freely reshaped them. They continued some themes and developed others whose seeds they found in the Bohemian texts. Their original contributions were major ones: the kenotic brand of nonresistance; the combined religious and political principle of brother-love....Wencelas's image evolved along different lines. In the religious aspect he came to be portrayed as an ascetic, and in the political, as the rex perpetuus of the Czech kingdom.[13]

Icons or 'forms' (*obraz*) provided an external expression of the transfigured state of humanity and of the material embodiment of an inconceivable Deity. Virtually every peasant possessed and venerated an icon, and screens of icons adorned the churches. Through the icons, people recognized and acknowledged themselves as part of Christian society. Such perceptible identifying signs were far more important in Russia with its poor development of individualism and abstract philosophy than in Western Europe, and paintings rather than philosophical tracts were the medium through which religious confrontations were expressed and fought.[14] The icon screens modelled the hierarchically ordered Russian society, with each figure occupying a prescribed position in a prescribed way, unified by their common distance from the God of the sanctuary and their dependent relationship to the central panel of Christ enthroned. The vertical hierarchy of saints connected the heavenly with the earthly Church, and a hierarchical pyramid of patron saints from the *'saints militaires'* of the ruling elite down to the patrons of trade, agriculture, and cattle raising venerated by merchants and peasants, enabled people to identify themselves within the order of things and provided them with models of ethical-social behaviour. The highest development of this art, the iconostasis produced in the fourteenth century provided 'no less than a pictorial "*Summa Theologiae*" of the Eastern Church, an iconic representation of the conceptual-imperceptible cosmos...'[15] Correspondingly, it was believed that the Christian society ordered on this basis was itself an icon, that 'the Tsar is, as it were, the living icon of God, just as the whole Orthodox Empire is the icon of the heavenly world.'[16] When during the seventeenth century the Patriarch Nikon attempted to increase his power in relation to the Tsar in accordance with Western Christianity, his accuser, Ligardes 'summoned up the distinctively Russian symbol of the icon screen as the model for an ordered hierarchical society to challenge Nikon's concept of a symphony of powers between civil and ecclesiastical authority.'[17]

Russian culture was not such as to generate innovation among its members. Despite the Platonism of Russian Christianity through which the ideal prince was conceived to be the living icon of God, this ideal was not a philosopher but a guardian of tradition. The highest

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13. Ibid. p.53.

14. These are described by Konrad Onasch, in 'Identity Models of Old Rusian Sacred Art' in Birnbaum and Flier eds, *Medieval Russian Culture*, pp.175-205.

15. Ibid. p.186.

16. Billington, *The Icon and the Axe*, p.35.

17. Ibid. p.155f.

good in Muscovy society was not knowledge, but memory, '*pamiat*'. Rather than saying 'I know', the Russian would say 'I remember'. There was no higher appeal in a dispute than the important, good and firm memory of the oldest available authority. Thus Muscovy was 'bound together not primarily by formal codes and definitions or rational procedures, but by an uncritical and unreflective collective memory.'[18] This general attitude was confirmed and supported by Orthodox Christianity since what was most important for the Orthodox was, precisely, being orthodox. This religion was mystical rather than rationalistic and was strongly influenced by the anti-scholastic Hesychasts. Hesychast mysticism encouraged the belief among the Orthodox that the transformation of the Christian Empire of the East into the final heavenly kingdom was possible through a spiritual intensification of their own lives. Generally God's incomprehensibility to the limited human intellect was emphasised. While in Western Europe people believed they could achieve a deeper knowledge of God by investigating the nature of his creation, there was no impulse to investigate nature in medieval Russia.[19] In fact in 1350 the Patriarch of the Church banned the study of mathematics and astronomy. Correspondingly, despite the common Neoplatonic emphasis on hierarchy, the Eastern conception of the endurance of humanity in a natural world beyond their control reflected in the image of God as beyond human comprehension was radically different from the Western image of human domination of nature reflected in the image of God as having created the universe by an act of will. And there was no conception that people were participating with God in His creation of the world. While there was a burst of artistic activity in the production of holy pictures in the fourteenth and fifteenth centuries, 'Russia was moving not toward a renaissance, a new release of emancipated creativity and individual self awareness, but toward a synthetic reaffirmation of tradition.'[20]

The government of Russia has correspondingly developed into a far more autocratic structure than existed anywhere in Western Europe. There were historical reasons for this.[21] The Tartars had contributed to this autocratic tendency by destroying all vestiges of democracy, promoting the rule of oppressive princes, and providing a model of total subordination of subjects to a ruler and by their insisting that the subjugated Russians pray for only one ruler, the Tartar khan. Kiev had been a far more democratic society than Moscow. So also had Novgorod in the north with its close relations with the West, commercial cosmopolitanism, representative government and philosophic rationalism. But it was Moscow with its xenophobic autocracy which emerged as the dominant city of Russia in the fight against the Tartars. The rise of autocracy was also facilitated by the very lack of dynamism of the general population.

Centralization reached its peak with Ivan IV (the Terrible) who ruled from 1533-84 the first ruler to be crowned tsar (caesar) in Russia. Ivan conceived of himself as head of a monolithic religious civilization, never simply as a military or political leader, and brutally suppressed the Russian hereditary aristocracy, the boyars. The leading apologist for Ivan's rule, Ivan Peresvetsov, argued that 'A realm without dread is like a horse beneath a Tsar without a bridle.'[22] While succeeding tsars were not as brutal as Ivan, with the exception of Boris Godunov (1598-1605) they followed Ivan's precedent of absolutism, even after Peter the Great had discarded the religious garb which had legitimated it.

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18. Ibid. p.62.

19. On the slow development of science is Russia, see A. Vucinich, *Science in Russian Culture. A History to 1860*, Stanford: Stanford University Press, 1963.

20. Billington, *The Icon and the Axe*, p.35.

21. These have been analysed by Richard Pipes in *Russia Under the Old Regime*, [1974], Penguin: Harmondsworth, 1990, Part I. See also Dinko Tomasic, *The Impact of Russian Culture on Soviet Communism*, Glencoe: The Free Press, 1953.

22. Billington, *The Icon and the Axe*, p.76.

This autocracy was exercised to appropriate the military and technological innovations of Western Europe so as to be able to effectively confront Russia's western neighbours. In the 1550s Ivan the Terrible began to employ foreign mercenaries and adopted Swedish and Dutch military innovations in the struggle against the Poles, a struggle which only ended with Poland's defeat in the war of 1654-67. Western measurement began to impose itself with the development of military maps, the erection of a gigantic English built clock on the Moscow Kremlin in 1625 (popularly opposed as contamination of eternity with time) and the appearance of weather vanes atop the crosses of churches. In 1632 the Dutch built the first modern Russian arms plant and arsenal, and in 1647 they printed the first military manual and drill book for Russian foot soldiers. The modernization of the army was associated with the growth of bureaucracy and the formalization of peasant serfdom as a means of guaranteeing the state a supply of food and service manpower. The struggle with Poland was followed a half century later by war with Sweden. For this Russia was aided by the Danes to develop a navy.

The tsars' concern with Western culture was almost entirely practical. They were interested in military and administrative techniques. Symptomatic of this, the word '*nauka*' later used for 'science' and 'learning' in Russia was introduced in a military manual in 1647 as a synonym for 'military skill.' However dealing diplomatically with the West, using its technology and conquering the Westernized populations formerly governed by Poland and Sweden, undermined the unity of Russian culture. As Billington noted of Ivan the Terrible:

> The mounting fury of Ivan IV's last years seems less a product of his paranoia than of a kind of schizophrenia. Ivan was, in effect, two people: a true believer in an exclusivist, traditional ideology and a successful practitioner of experimental modern statecraft. Because the two roles were frequently in conflict, his reign became a tissue of contradictions. His personality was increasingly ravaged by those alternations of violent outburst and total withdrawal that occur in those who are divided against themselves.[23]

Peter the Great and the Well Ordered Police State

This contradiction was eventually overcome by discarding the exclusivist, religious character of Russian society. Peter the Great set about reforming Russia into a well ordered, secular state, able to efficiently make use of its natural and human resources, in accordance with the precepts which had been elaborated by cameralist theorists and German rulers since the first half of the seventeenth century.[24] Peter inverted Russian culture, just as Vladimir had done in the tenth century. Whereas previously, the old, identified with Nature and with the Church, were extolled as the sacred, and the new which was identified with Culture was denigrated as profane, Peter rejected the old and Nature as profane, and embraced the new, including the culture of Western Europe, as sacred. The new capital built by Peter, St Petersburg with its Dutch name and geometrical layout became the icon of a new world. As it was described in the early years of Peter's reign:

> geometry has appeared,
> land surveying encompasses everything.

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23. Ibid. p.99.

24. For a full study of this see Marc Raeff, *The Well Ordered Police State: Social and Institutional Change Through Law in the Germanies and Russia, 1600-1800*, New Haven: Yale University Press, 1983.

> Nothing on earth lies beyond measurement.[25]

But Russia did not become a Western culture. As Lotman and Uspenskii pointed out, 'A close examination reveals convincingly... that the new (post-Petrine) culture was significantly more traditional than is usually thought. The new culture was constructed not so much on models from "Western" culture (although it was subjectively experienced as "Western") as on an "inverted" structural plan of the old culture.'[26] But this destroyed the unity of the culture. While it involved the assimilation of much of the achievements of Western European culture, the foundations of this culture which had produced these achievements were not assimilated, and what was assimilated did not fit in easily with other modes of thought and institutions of Russian society. Forms of behaviour and institutions were left floating in a vacuum. As Marc Raeff wrote, 'The effect of Peter the Great's reign was to tear Russian society apart, leaving behind a legacy of uncertainty and insecurity that ultimately led to an identity crisis among the Russian elite.'[27]

In particular, the detached, activist individualism of Western Europe did not replace the Russian tradition of passivity and subordination of the individual to the community. This passivity was described by the Danish envoy, Just Juel in his description of the fire fighting efforts of Muscovites:

> Being endowed with an exceptionally quick intelligence the Tsar [Peter the Great] sees at once what needs to be done to contain the fire. He climbs up on the roof, moves to the most dangerous spots, encourages people and nobles alike to lend a hand, and does not rest until the fire is out. If, however, the ruler is not present, things are totally different. Then the people just watch, often with total indifference, and no one helps. It is entirely useless to berate them or to offer them money to help; they merely wait for the moment when they can steal something.[28]

Only gradually was the conception of the individual as an earthly being with personal attributes, private interests and responsibilities developed. The Russian language only appropriated a future tense in the sixteenth century, and it was only in the late seventeenth century was the word *persona* applied to individuals - and then only to important or strong individuals. The word 'personal' and precise terms for 'private' and 'particular' did not enter the Russian language until the eighteenth century, and only then did the words used for 'law' and 'crime' enter into Russian jurisprudence with their modern meaning.[29] This lack of individualism was characteristic of all classes. Among the peasants it was manifest in the persistence of the communal organization of agriculture until the late nineteenth century. Among the aristocracy it was manifest in the late eighteenth century in the vehemence with which Russian deputies to a legislative commission established by Catherine the Great opposed a proposal by the Baltic nobility to draw up and submit to Catherine a code of laws spelling out the rights and privileges of each individual. The ruling elite preferred relations based on a personalized form of ultimate authority to a system based on a legal code and impersonal regulations. Debates revealed: 'a conception of society as an "organic" structure based on a heredity division of functions, a vision of a stable, harmonious society in which,

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25. Cited from the corrector of books by Billington, *The Icon and the Axe*, p.184.

26. Lotman and Uspenskii, 'Binary Models in the Dynamics of Russian Culture', p.54.

27. Marc Raeff, *Understanding Imperial Russia: State and Society in the Old Regime* tr. Arthur Goldhammer, N.Y.: Columbia University Press, 1984, p.35.

28. Cited by Christian Schmidt-Häuer, *Gorbachev: The Path to Power*, tr. Ewald Osers and Chris Romberg, London, Pan, 1986, p.23.

29. Billington, *The Icon and the Axe*, p.189.

by its very nature, conflict had no place.'[30] And Russians remained unable to compete against Westerners in commerce; as Braudel noted:

> In competition with foreign merchants, in Moscow and later in St Petersburg, Muscovite merchants rarely proved much of a challenge. It is surely curious that the richest merchants in Siberia in the 1730s - a man who had travelled to Peking as agent for Lange - was probably a Dane. Similarly, when after 1748 Russia began direct trading with the Black Sea, once again this was handled by foreign intermediaries.[31]

The opposition to the Western form of individualism continued even after capitalism emerged in the late nineteenth century, and many wealthy heirs of business fortunes turned against their fathers' values.[32]

Symptomatic of the lack of cultural integration and the identity crisis produced by partially adopting Western culture was the way Russians imitated Western forms of behaviour. Russians continued to identify themselves in terms of the role they were playing, rather than conceiving themselves as autonomous individuals, just as previous Russians had identified themselves through the roles represented by icons. But this identification with Western roles lacked integration into a perceived order of things. The image of European life was reduplicated in a ritualized play-acting of European life so that Russian gentry felt as though they were forever on a stage, which in many cases led to a bizarre confusion of life and fiction.[33]

The period from the reign of Peter the Great to the revolution of 1917 was characterized by a struggle to reunify Russian society both by its tsarist rulers and by various ideological factions of the intellectual elite. The tsars struggled to develop the institutions and to educate its population to consolidate Peter's reforms and to keep abreast of Western scientific, technological and military developments. But all the tsars were determined to maintain unlimited autocracy without the benefit of the traditional ideology which had legitimated it. They varied according to how much they also wanted to free people to think and organize within the framework of this autocracy. Peter III (1762), Paul I (1796-1801) and Nicholas I (1825-55) attempted to impose Prussian discipline on Russians, while Catherine the Great (1762-1796), Alexander I (1801-25) and Alexander II (1855-81) were relatively liberal. Catherine was a Francophile, and was the first to confront the dilemma of wanting rational rule based on natural laws while being unwilling to give up any power. After the Pugachev rebellion of 1773-74 and the French revolution she clamped down on free speech and banished one of the foremost Enlightenment thinkers within Russia, Aleksandr Radishchev, to Siberia. The conflict between the implications of Western thought and Russian autocracy came to a head in 1825 with the Decembrist revolt in the reign of Alexander I. The tsar who abolished serfdom, Alexander II, was assassinated. Tsardom culminated and ultimately failed with the oppressive, reactionary, nationalist rule of Alexander III (1881-94) and Nicholas II (1894-1917). The failure of the tsars in their struggle to develop science, technology and a professional administration and to industrialize was manifest by their defeat in the Crimean War in 1856, the Russo-Japanese War of 1905 and the First World War. The last two wars were to some extent the outcome of the final ideology, Social Darwinist Pan-Slavism, by

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30. Raeff, *Understanding Imperial Russia*, p.93.

31. Braudel, *The Perspective of the World*, p.462.

32. See Raeff, *Understanding Imperial Russia*, p.217.

33. This has been brilliantly analysed by Iurii M. Lotman in 'The Poetics of Everyday Behaviour in Eighteenth-Century Russian Culture', 'The Decembrist in Daily Life' and 'Concerning Khlestakov', in Nakhimovsky and Nakhimovsky eds, *The Semiotics of Russian Cultural History*.

which the supporters of the tsars attempted to legitimate their rule. By their own criteria, the fate of the last tsar: Nicholas II was justified.

Opposition to the Police State

The first opposition to Peter the Great's reforms came from Old Believer communalism, the Cossack-led peasant insurrectionists, and the monastic revival within the official Church. These were entirely reactionary. The Old Believers appealed to instinct rather than intellect, and communal honour rather than individual reason. Their ideal order was an organic religious civilization of Great Russian Christians united by traditional forms of ritual worship and communal activity. The peasant uprisings which were a response to their increasing subordination to facilitate the advance of Russian military strength also wished to return to the old organic religious civilization ruled by the true tsar. Pugachev 'claimed to be the surviving tsar, Peter III, and promised the peasants "land, meadows, and woods," as well as "beards" - in other words, a return to the old traditions of pre-Petrine Russia.'[34] Such rebels offered no political program and simply attacked violently anyone symbolizing the new order. Less dramatic than the other forms of reaction, the monastic revival involved the rediscovery of the traditions of patristic theology and inner spirituality.

However the most important opponents of the Tsarist Police State were the intelligentsia who emerged as a distinct group and who became the main bearers of radical ideology in the late eighteenth century. These were the educated, generally French speaking intellectual elite of society who were trained to fill positions within the government. The intelligentsia experienced within their own lives the incoherence of the prevailing order, they were alienated from and felt guilty towards the even more oppressed peasantry and especially after the 1850s they suffered increasing oppression at the hands of the tsars. The members of this group embarked on an intellectual saga which eventually proved successful in forging an ideology able to overthrow the old order. This saga began in the Masonic lodges, fraternal societies and philosophic 'circles', but it was the circles among university students who came to play the greatest role in radicalizing each generation of students, advancing the ideological opposition to tsardom, and assimilating and disseminating new ideas. In this way the intelligentsia came to constitute itself as a self-conscious class.

Philosophy was central in these ideological struggles, and supporters and opponents of the tsars drew on virtually every major philosophy developed in Western Europe. There was a constant battle between rationalists and romantics, French and German influences, universalists and nationalists, St Petersburg and Moscow. It was out of the dialectical conflict between these different positions that there slowly emerged a new vision of the world and the place of Russians within it. However while these ideas were developed through engagement with Western philosophy, they were also rooted in Russian culture.

The philosophical doctrines which took root in Russian society were those which resonated with the Neoplatonic world-vision of Orthodox Christianity, and associated with this, with the strong sense Russians had of being part of an historically significant community. The Russian tradition of philosophy really began with Maxim the Greek who moved to Russia in 1518. Having studied in Renaissance Italy he had absorbed the doctrines of the Neoplatonic revival associated with he rise of Hermeticism, which he effectively espoused in Russia. Among his students were Kurbsky, Karpov, and Ermolai-Erazm, the intellectual leaders of mid-sixteenth century Russia. Another injection of Western radical Neoplatonism occurred when the ideas of Jacob Boehme were brought to Russia in 1689 by Quirinus Kuhlmann in his attempt to prepare Russia for transformation into the apocalyptic

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34. Andrzej Walicki, *A History of Russian Thought: From the Enlightenment to Marxism*, [1973] tr. Hilda Andrews-Rusiecka, Stanford: Stanford University Press, 1979, p.7.

fifth monarchy.[35] Though Kuhlmann was burnt for heresy in the same year he arrived, Boehme's basic ideas took root and influenced the Old Believers. Boehme's ideas also influenced Russia through the highly influential higher order masonry, and in particular through the works of such religious philosophers as Eckhartshousen, Schwartz and Saint-Martin. Inspired by the masons, young Russians flocked to Germany to study the works of the Rosicrucians. The most significant figure in Russian masonry was Novikov who until his arrest was the most influential intellectual figure in the Russian Enlightenment under Catherine the Great. He managed to combine within himself the practical philanthropy, normally associated with Enlightenment philosophy, and Neoplatonist, theoretical mysticism. But his orientation was more towards mysticism and to the development of a new religion based on the theosophy of Boehme and the older religious traditions of Russia, and it was these ideas which he disseminated most widely through the Moscow University Press and two private presses which he set up.

When Schelling's philosophy with its conception of the organic unity of all nature and the presence therein of a 'world soul' was introduced into this intellectual environment it was embraced with enthusiasm and immediately displaced the atomistic thinking of philosophers such as Locke. Schelling in turn paved the way for an even more enthusiastic reception of Hegel. Hegel's works, Herzen wrote,

> were discussed ... incessantly; there was not a paragraph in the three parts of the *Logic*, in the two of the *Aesthetics*, in the *Encyclopaedia*, etc. that had not been the subject of desperate disputes for several nights running. People who loved each other avoided each other for weeks at a time because they disagreed about the definition of 'all-embracing spirit,' or had taken as a personal insult an opinion on the 'absolute personality and its existence in itself.' Every insignificant pamphlet of German philosophy published in Berlin or even a provincial district town was ordered and read to tatters and smudges; the leaves fell out in a few days if only there was a mention of Hegel in it.[36]

Hegel's thought in turn provided the basis for the reception of the works of the Young Hegelians such as Feuerbach, whose materialistic humanism had far more radical implications. With God portrayed as 'merely the projected essence of Man',[37] Man was presented with the task of appropriating from religion his alienated essence. Or as Bakunin formulated this in the tradition of Russian culture: 'Jesus Christ began as a man-animal and finished as a man-god, such as we all must be.'[38]

The notion that Russia was in a privileged position, and by virtue of this was capable of serving as the saviour of European civilization had been a recurring theme of Russian thought ever since Moscow had been conceived of as the 'third Rome'. Thus Russians were susceptible to new explanations of their unique status, as addressed by Leibniz to Peter the Great, the Encyclopaedists to Catherine the Great, and the Pietists to Alexander I. The substance of these arguments were that it was an advantage for Russia to have been absent from the stage of history since it was uncommitted to the follies of Europe. This would enable Russia to play a unique role in the next stage of history. Such notions were reinforced by the philosophy of Schelling with his emphasis on the becoming of the world, and on this basis received their most forceful expression in the philosophical letters of Chaadaev, published in 1836 but widely discussed before then. But with the Hegelianization of Russian

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35. Ibid. p.171ff. and 310ff.

36. Alexander Herzen, *My Past and Thoughts*, tr. Constance Garnett, London: 1927, Vol.2, p.115.

37. Ludwig Feuerbach, *The Essence of Christianity*, ed. E. Graham Waring and F.W. Strothmann, N.Y.: Frederick Ungar, p.65.

38. Cited from a letter, Ginsburg 'The "Human Document" and the Formation of Character,' Nakhimovsky and Nakhimovsky eds, *The Semiotics of Russian Cultural History*, p.205.

thought from 1838-48 the radicals introduced a new dimension to this notion. They began talking of the total destruction of the existing state and its replacement by a socialist society, 'the idea of ideas' which according to Belinsky 'has absorbed history, religion, and philosophy.'[39] The essence of this radical Neoplatonic revolutionary vision was described by Billington:

> Truth was to be found within rather than beyond history. Russia had some special destiny to realize in the coming redemption of humanity. A new, prophetic art was to announce and guide men to this destiny. The golden age 'lay not behind us but ahead': in a time when man's Promethean labours will end and he will come to rest both physically and spiritually in eternal and ecstatic union with the elusive feminine principles of truth and beauty.[40]

Where philosophers who were not Neoplatonists were widely embraced it was generally because their thought resonated in some way with its assumptions and supplemented it where it was inadequate. For instance the ideas of Saint Simon and Comte had a similar teleological view of history and presented the ideal of a new religion of humanity. The nihilists who embraced the materialism of Moleschott and Darwin were struggling for a more concrete grasp of the world around them to facilitate effective action, but remained committed to radical Neoplatonist eschatology. As Billington wrote, they were convinced 'that a direct reconstitution of society was morally necessary, logically implied by the progress of science, and uniquely among the Russian people.'[41]

Along with this general eschatology, Russian philosophical thought was distinguished by three other features. Firstly it was appropriated and developed in accordance with the traditional forms of Russian culture. To a considerable extent Russian philosophical ideas were developed through literature and literary criticism. As the lives of the saints and icons had provided models for people to live by in traditional Russian society, the intelligentsia produced literature and art, the main feature of which was the provision of such models for the people of the day.[42] As Nadhezhin, the literary critic under whom Vissarion Belinsky (1811-48) served his apprenticeship, wrote in 1818: 'To teach people the good is the duty of the poet.'[43] This notion was taken up and developed by almost all other theorists of aesthetics and in almost all literature: that of Gogol, Turgenev, Dostoyevsky and Tolstoy; and of the minor tracts produced by revolutionaries in their efforts to influence the peasants and the proletariat. In this way various forms of being in the world were explored, tried out and evaluated.

Secondly, all Russian thought was coloured by its emphasis on the community. Even Radishchev (1749-1802), the foremost exponent in the eighteenth century of the philosophy of the Enlightenment and its doctrine of individual rights, emphasised the social nature of humanity. He criticised Rousseau's notion that humans are by nature reclusive and defended civic rights as a means for becoming a genuine 'son of the fatherland.'[44] Herzen (1812-70), oriented towards French rather than German thought and concerned to defend the autonomy of the personality and the rationalization of social relations, rejected the atomic individualism of the West just as vehemently as anti-Western Slavophiles. He subsequently

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39. Billington, *The Icon and the Axe*, p.377.

40. Ibid. p.351.

41. Ibid. p.392.

42. See Katerina Clark, *The Soviet Novel: History as Ritual*, The University of Chicago Press, 1981, Ch.2. See also Lidiia Ia. Ginsburg 'The "Human Document" and the Formation of Character'.

43. Cited Billington, *The Icon and the Axe* p.330.

44. Walicki, *A History of Russian Thought*, p.40 & 45.

became the founder of 'Russian Socialism'. And the nihilists of the 1860s who were determined to recognize nothing that could not be rationally justified - bonds imposed by family, society and religion, saw themselves as 'fighting for the happiness of mankind.'[45] However it was in the radical tracts echoing the lives of the saints and prefiguring Socialist Realist literature that the anti-individualist, communalist orientation of Russians was most clearly manifest.[46] These were characterized by three basic features. First, the political movement being championed was identified with a 'family.' This family was frequently to supplant members' natural families. Second, some naive individual was brought to see the light by an emissary of the movement. Third, this individual became a martyr, leading an ascetic life of extraordinary dedication, and frequently dying for the cause, whereby the hero was resurrected in the ongoing movement, often symbolized by one of his comrades picking up the fallen banner.

While these two features of Russian thought were reflections of the traditional Russian culture, the other distinguishing feature of Russian thought was a struggle against this tradition. With a culture characterized by a lack of orientation to individual initiative, the Russians opposed to the prevailing order found themselves engaged in an extraordinary struggle to overcome this deficiency. Early radicals were essentially divided in themselves between their lives of dissolute carousing and their romantic aspirations to transform the world. Awareness of this state of being was manifest in the fascination with the Hamlet theme in the late eighteenth century. Hamlet, the privileged court figure torn between the mission he was called upon to perform and his own private world of indecision and poetic brooding, symbolized life for the Russian intellectual elite.[47]

It became an over-riding preoccupation of these intelligentsia to achieve their romantic ideals. But while their dissolute lives were the traditional, socially acceptable mode of being which they understood unreflectively as a habitus, what they aspired to become was an alien form of behaviour which they had to struggle to realize. The members of the Decembrist movement attempted to overcome this dualism by acting as though every action and gesture had significance, like the descriptions of characters in a novel, and in this way totally excluded their traditional habitus. They succeeded in creating a new type of character capable of self-respect, but despite this they were peculiarly inept. On the morning of December 14, 1825 when the Decembrists came out onto Senate square, before the uprising had begun and while there was every chance of success, Aleksandr Odoevskii cried out: 'We are going to die, brothers, oh, how gloriously we are going to die.'[48] After their arrest and during their investigation they were utterly bewildered. There were no literary role models for their situation, since death without monologues in the vacuum of a military bureaucracy had not yet become the subject of art.

The first group of radicals inspired by the Decembrists were the generation of disaffected aristocrats of the 1830s and 1840s. These included Herzen, Belinsky (though not an aristocrat) and Bakunin. These were followed by less aristocratic generation in the 1850s who paved the way for the much broader group of the 1860s. In the 1860s the intelligentsia, based in the universities, emerged as a self-conscious class and developed the most original of the radical social movements within Russia, the populist movement. The new movement of radicals, manifesting again the Russian tradition of inverting everything while retaining the same basic orientation, totally rejected everything valued by the previous generation of radicals: poetry, literature, etc. and embraced the title 'nihilists'. They outfitted themselves in

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45. V. Zaitsev, quoted ibid. p.210.

46. Clark *The Soviet Novel*, p.49.

47. See Billington, *The Icon and the Axe*, p.351ff.

48. Lotman, 'The Poetics of Everyday Behaviour' in Nakhimovsky and Nakhimovsky eds *The Semiotics of Russian Cultural History*, p.87.

bizarre forms of dress designed to distinguish their members from the past, practiced free love, and attempted to live and work communally. But their major preoccupation was to succeed where the radicals of the past had failed.

The struggle for efficacy took place on many fronts, including literature, both major and minor. In the major literature it took the form analyses of character deficiencies and attempts to develop models of the efficacious personality. Turgenev in particular participated in these efforts. He developed the concept of the 'superfluous individual' in *Rudin* based on Bakhunin. In *On the Eve* he presented the ideal of the 'strong nature' capable of acting effectively in Insarov, a resident Bulgarian fighting for his country's freedom from the Turks. In *Fathers and Sons* Turgenev explored the nature of the new generation of radicals, with their rejection of art and their extolling of science, in the character of Bazarov. The analysis of these characters became a major concern of radical intellectuals, with Dobroliubov championing Insarov and the leading nihilist of the 60s, Pisarev, championing Bazarov. However the character which had greatest influence on the radicals was Rakhmetov, Chernyshevsky's main character in the novel *What is to be Done*. A scion of the wealthy gentry turned revolutionary, Rakhmetov is familiar with the people's lot. He has measured the whole of Russia on foot, and has worked at cutting timber, quarrying stone and hauling riverboats. In order to train his will-power and resistance to pain he even sleeps on a bed of nails. Of Rakhmetov and his kind, Chernyshevsky writes: 'They are few in number, but through them flourishes the life of all; without them it would die out and go sour. ... They are the flower of the best people, the movers of the movers, the salt of the salt of the earth.'[49] Lenin, who according to his wife Krupskaya recalled this work in every slight detail, stated: 'Under his influence hundreds of young people became revolutionaries ... he cast his spell over my brother, for instance, and over me too. He cut a very deep furrow in me.'[50] Lenin went on to explain that Chernyshevsky showed 'what sort of person a revolutionary should be, what rules of conduct he should follow, how he should proceed to his goal, and by what means he should attain it.'[51]

Along with this image of the strong-natured person, intellectuals struggled to place the individual in social context. The intelligentsia of the 30s and 40s moved from an idealization of the personality to an intensive investigation of the personality in terms of philosophical categories, then to realistic determinism - the analysis of humans in relation to their social conditioning. The shift in the 50s away from idealistic philosophy, leading to the nihilists' attacks on their predecessors, on any works of art not serving a political function, to the exaltation of science as the means to liberate humanity, the embracing of a simplistic materialism and a radical utilitarianism, was not merely a manifestation of the changing class background and the changing social position of the intelligentsia (although it was partly this), but was part of the struggle to attain a more realistic understanding of the world. These radicals wished to differentiate themselves from what they regarded as the 'superfluous generation' of the 1840s. They were struggling to be 'practical rather than "superfluous" people: students of science and servants of history.'[52] Their nihilism was not a rejection of all meaning in the world. As I have already pointed out, they remained radical Neoplatonists in their conception of history. What they rejected was everything which did not serve their ambitions to transform the world.

Finally, the intelligentsia struggled to find a formula for effective organization. While the early populists thought in terms of spontaneous, decentralized activities held together by the justice of their aims, later populists attempted to develop a more unified movement. Pyotr

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49. Cited in Robert C. Tucker ed. *The Lenin Anthology* N.Y.: Norton, 1975, 'Introduction: Lenin and Revolution' p.xxx.

50. N. Valentinov, *Reminiscences of Lenin*, tr. Paul Rosta and Brian Pearce, London, 1968.

51. Ibid.

52. Billington, *The Icon and the Axe*, p.390.

Lavrov argued in his *Philosophical Letters* published in 1868-69 that the prime movers of history were critically thinking, justice seeking individuals who became a force through effective organization. Sergei Nechaev in his *Revolutionary Catechism* advocated the formation of a closely organized professional revolutionary cadre ready to employ ruthless and unscrupulous methods. Such methods were justified by Nechaev on the grounds that the revolutionary must despise and hate the existing ethic: 'for him, everything that allows the triumph of the revolution is moral, and everything that stands in its way is immoral.'[53] Peter Tkachev, a former associate of Nechaev became the foremost exponent of this position after the triumph of reactionary Pan-Slavism. He argued in his journal between 1875 and 1881 for the formation out of the rootless intelligentsia of a disciplined, revolutionary military organization capable of destroying the existing regime, attaining power, and effecting a revolution from above.

But effectuality was not achieved. The culmination of populism occurred in the 'mad summer' of 1874 and with the assassination of the tsar in 1881 by the 'People's Will'. In 1874 more than 2000 students dressed as peasants and set out from the cities to live among them, to join in their daily lives and to bring them the good news that a new age was dawning. They were totally rejected by the peasantry who turned many of them over to the police, and 770 were arrested. The assassination of the tsar achieved nothing but an even more repressive reaction, and all the members of the People's Will were arrested and executed. The significant feature of the populist movement was that despite their supposedly Western orientation, they were profoundly reactionary. They were simply combining elements of the three original forms of protest against Peter the Great's reforms. As Billington wrote:

> [P]opulism was a loose tradition rather than an organized movement. Like most of the Old Believers, the populists believed in preserving the old communal forms of economic life and in the imminent possibility of sudden historical change. Like the peasant insurrectionaries, the populists believed in violent action against police and bureaucrats and in the ultimate benevolence of the 'true tsar.' Even after killing Alexander II in 1881, the populists could conceive of no other program than to address utopian appeals to his successor. Like the monastic revivalists, the populists believed in ascetic self-denial and in humbling oneself before the innocently suffering Russian people.[54]

It was in this social and intellectual environment that Marxism was introduced.

The Reception of Marx's Ideas

Marx's writings were received enthusiastically, but critically in Russia by the populists. Marx was seen as an economist who had revealed the exploitative, oppressive nature of Western capitalism. As such, his ideas were embraced as justification for the rejection of capitalism and the attempt to base Russian socialism not on the development of the means of production but on the peasant commune. This led to the polemical debate between Tkachev and Engels in 1874-75, in which Tkachev argued that Marx had only shown the inexorable nature of the development of capitalism once it was established, and that Russia had the opportunity to avoid capitalism before it got underway and to establish communism immediately. However with the failure of the populist program and the growth of capitalism in Russia the idea that society was determined by economic development and must go through a capitalist stage was embraced and systematically argued for by the former populist

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53. Cited by Walicki, *A History of Russian Thought*, p.177n.

54. Billington, *The Icon and the Axe*, p.204.

Georgy Plekhanov (1856-1918). The significance of this was that a radical was arguing not for a reactionary opposition to the tsars but for the need to destroy old forms of relationships and to develop technology. The great mission of the working class, he argued, is to complete the Westernization of Russia begun by Peter the Great.[55]

Plekhanov's viewpoint was generally supported by the Legal Marxists whose defence of capitalism and opposition to populism had enabled them to legally disseminate Marx's ideas throughout Russia. The significance of Lenin was to have used Marxism to give a new direction to the activist orientation developed by the populists and symbolized by the martyrdom not only of the members of the People's Will who had assassinated Alexander II, but also by Lenin's older brother who had attempted to assassinate Alexander III. Lenin developed a voluntarist form of Marxism by rejecting the distinction between subjective and objective factors in history. He did not see Marxism as a theory of the stages of economic development, but as a theory of class struggle intimately related to praxis. For Lenin a materialist discloses class contradictions and in so doing defines his or her own stand-point. In opposition to the Legal Marxists, Lenin argued that capitalism was already definitely and irrevocably established in Russia since, despite Russia's backwardness, it was an economy based on commodity production through hired labour. The class antagonisms were those of a capitalist society and it would therefore be possible to effect a socialist revolution. The achievement of a revolution would then facilitate the development of the means of production. As Lenin put it: 'Communism is Soviet power plus the electrification of the whole country.'[56]

The communist revolution was similar to the cultural inversions which occurred in Russia with the adoption of Christianity in the tenth century and Peter the Great's Westernization of Russia in the late seventeenth century. What had been previously rejected was embraced, while what had been embraced was rejected. The unique feature of the inversion achieved by the Bolsheviks was that it was the opponents of the ruling class who had effected this inversion, and there was a double inversion - against the old ruling class and its political relations to the West, and against the old opponents of the regime. Until Lenin's inversion, revolutionaries had been, despite appearances, essentially reactionary in orientation, looking backward to traditional communalism rather than forward to the development of technology. But as in previous inversions the culture retained a fundamental continuity with its past. Assimilating Marxism to a culture pervaded by Neoplatonism involved the accentuation of the Neoplatonism of Marxism and the transforming of basic concepts of the existing Neoplatonism. In this transformation many of the forms of thinking of traditional Russian culture were also assimilated into Russian Marxism. These imposed themselves on communism like a force field constraining the possibilities open to the revolutionaries.

Marxism realigned the radical opponents of the prevailing order within Russia both in relation to other Russians and to the rest of the world. It aligned them with the new Russian proletariat who were proving to be more radical than the peasants and the main opponents of the dynamics of the West European societies which were threatening Russia. However the most significant feature of this cultural inversion was that it provided the basis for assimilating the orientation towards action, science and technological development of Western Europe to Russian culture. Marxism represented itself as the culmination of Western European culture and extolled its scientific and technological achievements as the means to emancipate humanity, while being profoundly antithetical to the socio-political order of Western Europe, thus enabling Russians to retain their traditional hostility to Western Europe while appropriating its achievements. But more importantly, Marxism fused this scientific-technological orientation with the form of Neoplatonism which underlay Russian

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55. See Walicki *A History of Russian Thought*, p.414.

56. Lenin, 'Communism and Electrification' in Tucker ed. *The Lenin Anthology*, p.492-95, p.494.

culture. Marx was the thinker who had assimilated to the forms of thinking of Eastern Christian Neoplatonism, which had been taken up in the West in the ninth century by John Scotus Eriugena and developed there for a thousand years, the highly activist and technological orientation of Western Europe. The general scheme of history offered by Marx thus accorded with the basic Orthodox Neoplatonic Christian eschatology. Communism was to be the final transfiguration of the material world and the development of technology was now seen as part of the realization of heaven on earth, the process by which, according to the 'God-builders' among the Marxists, humans would become gods. This spirit of Russian Marxism was perhaps best expressed by another founder of Russian Marxism, Pavel Axelrod in a letter to Plekhanov in 1898:

> ...we shall pave the way for a race of gods on earth, of beings endowed with an all-powerful reason and will, consciousness and self-consciousness, and capable of grasping the world with their thoughts and ruling it. This is the psychological foundation of my spiritual and social strivings, of my ideas and my deeds.[57]

Also, Marx; conceived humans to be both essentially social and essentially the creators of their world, thus enabling Russians to reaffirm their traditional tendency to subordinate the individual to the group. As the Marxist Lunacharskii wrote in 1903:

> Man moves towards the radiant sun; he stumbles and falls into the grave. But ... in the ringing clatter of the grave-diggers' spades he hears creative labour, the great technology of man whose beginning and symbol is fire. *Mankind* will carry out his plans ... realise his desired ideal.[58]

Furthermore, since Lenin argued that Russia was in a position to begin the revolution which would sweep the world, the movement towards communism in Russia resonated with the traditional Russian conception of Russia's special historical destiny, its divine mission to consummate world history. Instead of becoming the Third Rome, Russia would become the host to the Third International. Effectively, Russian Marxism integrated the traditional communalism of Russians and a conception of world-history, abandoned by the tsars since Peter the Great, with the drive to technological and scientific development.

In appropriating Marxism, the Russian Marxists also developed it. Lenin's most important conceptual innovation facilitating the assimilation of Marxism to Russian society, the innovation in terms of which all other aspects of Lenin's thought and the subsequent development of post-revolutionary Russian culture must be understood, was to conceive development in terms of the opposition between consciousness and spontaneity.[59] In his most influential work before the revolution, *What is to be Done*, Lenin described and justified the development of a revolutionary vanguard as the means of giving conscious direction to the spontaneous impulses of the oppressed workers of Russia. In this context spontaneity was equated with wildcat strikes, mass uprisings etc. without the guidance of politically aware bodies. However the whole of history was conceived in terms of the struggle between consciousness and spontaneity, between deliberate action and impersonal historical forces, progressing through a series of ever higher order syntheses towards the ultimate culmination in communism in which the opposition will be reconciled. The connotations of the Russian

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57. Cited by Ladis K.D. Kristof, 'Francis Bacon and the Marxists: Faith in the Glorious Future of Mankind' in *Society and History: Essays in Honour of Karl August Witfogel*, The Hague: Mouton, 1978, pp.233-257, p.246f.

58. Cited by Billington, *The Icon and the Axe*, p.488.

59. See Lenin 'What is to be Done' in Tucker, *The Lenin Anthology*, pp.12-115. The significance of this dialectic for the development of Russian culture is shown by Clark in *The Soviet Novel*.

concept of spontaneity, *stixijnost*, which is formed from the root *stixija*, meaning 'the elements' enabled this consciousness/spontaneity dialectic to be extended to cover humanity's struggle with nature.

This form of Marxism provided the intelligentsia of Russia with a framework for the activist asceticism on which the dynamics of Western Europe had been based and which the Russian intelligentsia had been struggling to achieve.[60] Activist asceticism was achieved and symbolized in the personality of Lenin who demanded of his followers an absolute dedication, also conceived of as a struggle of consciousness or disciplined rational awareness over spontaneity: impulse, passion and ego-centric wilfulness. This became an attractive orientation to the intelligentsia who, struggling for control of their destiny within the rapidly industrializing society of late nineteenth and early twentieth century Russia corresponded in social position to the rising bourgeoisie of early capitalist Europe who had converted to Protestantism; though unlike the Protestants who were oriented to self-advancement alone, the Russian intelligentsia were oriented towards the emancipation of the downtrodden of society. Through self-renunciation and ascetic self-discipline, Lenin's followers could experience themselves as transfigured into instruments of Providence through which the millenia would be achieved.

Marxism After the Revolution

The way Marxism was understood after the revolution evolved with the problems confronted by Soviet society and with the ideological conflicts between the different factions of the Bolsheviks. In the early years, Lenin's Marxism was challenged. The concept of material existence was a particular point of contention in ideological struggles, although this was confused by the conflation of epistemological and ontological questions. Lenin's celebrated defence of materialism in *Materialism and Empirio-criticism* is in fact an epistemological argument: a defence of representational realism against the empiricists, specifically as this trend of thought was represented by the empirio-monism of Bogdanov. Defining matter, he wrote: 'Matter is a philosophical category which refers to the objective reality given to man in his sensations, - a reality which is copied, photographed, and reflected by our sensations, but which exists independently of them.'[61] He characterized idealism as a doctrine in which 'the mental is taken as the starting-point; from it external nature is inferred or constructed; and in short order the consciousness is deduced from nature.'[62] Lenin was indifferent to which theory of being is correct, being quite happy to accept that the old notion of matter defined by its impenetrability, inertia, mass and so on had been superseded and explained as relative to the behaviour of electricity.[63] The important point was that consciousness was conceived to be separate from material existence and oriented towards its control.

The dualism argued for by Lenin, which accorded with his basic conceptual dichotomy of consciousness and spontaneity, was similar to the Cartesian dualism which developed in Western Europe at the beginning of the emergence of capitalism. In both cases an activist orientation to the world led to the development of the conception of people as centres of action acting on an essentially passive world existing independently of them. This resonance reveals the extent to which Lenin's thought was an manifestation of the striving by Russians'

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60. An excellent study of this role of Marxism in the Soviet Union is Timothy W. Luke, 'The Proletarian Ethic and Soviet Industrialization' in *American Political Science Review*, September, 1983, Volume 77, no.3. pp.588-601.

61. V.I. Lenin, *Materialism and Empirio-Criticism*, N.Y.: International Publishers, 1927, p.101f.

62. Ibid. p.190.

63. Ibid. p.220.

to industrialize Russia, and the kinship between Russian Marxists and the ruling classes of capitalist societies.[64] However the rise of Marxism and the revolution was associated with the elaboration of more radical ideas and ideals. It was Bogdanov and his followers who thought out what it would mean to create a socialist society, and in doing so, they transcended the Neoplatonism of Russian culture.

Like Western Marxists (and unlike Lenin), Bogdanov was primarily interested in people's alienation from the world and from each other and the cultural conditions for creating a socialist society, rather than in the struggle for political power.[65] To provide a philosophy appropriate for socialism, he developed the ideas of the energeticists who had been concerned to transcend the dualism between the material and the mental aspects of reality. In his work *Empiriomonism*, Bogdanov added a social dimension their epistemological ideas. He argued that the experience of the mental world was the product of individually organized experience, while the physical world was the product of socially organized experience. These two worlds reveal two different biological-organizational tendencies.[66] The conflicts of value associated with the sphere of individually organized experience are manifestations of the divisions within society based on class, race, sex, language, nationality, work specialization, and relations of domination and subordination of all kinds. It was necessary to overcome these conflicts for a new communal consciousness to emerge in which basic values could be agreed upon. But while Bogdanov accepted that it was important to transform class relations to achieve this, he argued that the importance of this had been over-emphasized by Marx. Other conflicts, including organization relations and unequal relations between the sexes, also had to be overcome. And to achieve this, it was necessary for the proletariat to transcend bourgeois culture, which he argued could only be done by creating a new culture to organize their experience.[67]

Bogdanov's critique of bourgeois culture extended to science. Anticipating later Marxist critiques, he saw the mechanical view of the world, the split between mind and matter, idealism and materialism, as expressions of the social practices of capitalist society, of the fetishism of commodities involved in market relationships and of the split between the organizational and the executive functions in the labour process. Bogdanov called for a cultural regeneration based on the modes of understanding appropriate for a society in which the divisions in society, including the division between manual and mental labour, had been overcome. The key to this was presented by him in his three volumed work, *Tektology: The Universal Oganizational Science*.[68] Tektology, for Bogdanov, was designed to provide a harmonious unity between the spiritual cultural and the physical experience of the 'working collective' in whose interest all science and activity were to be organized and all past culture, including bourgeois science, reworked. By uniting the most disparate phenomena under one conceptual scheme, tektology would allow human beings torn apart by strife to find a common language. Since the sources of strife were larger than the merely economic, the common language had to be larger than traditional Marxism, although Marxism was included as a special case.

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64. This has been argued by Anton Pannekoek in *Lenin as Philosopher*, [1938] Merlin Press, London, 1975.

65. See Zenovia A. Sochor, *Revolution and Culture: The Bogdanov-Lenin Controversy*, Cornell University, 1988. See also Robert C. Williams, *The Other Bolsheviks: Lenin and His Critics, 1904 - 1914*, Bloomington and Indianapolis: Indiana University Press, 1986.

66. See Kenneth Jensen, *Beyond Marx and Mach: Aleksandr Bogdanov's Philosophy of Living Experience*. Dordrecht, Holland: D. Reidel, 1978.

67. It appears that Gramsci's ideas ultimately derived from Bogdanov. See Zenovia A. Sochor, 'Was Bogdanov Russia's Answer to Gramsci?' *Studies in Soviet Thought*, Vol. 22, (Feb. 1981), pp.59-81.

68. This has not been translated. However a good idea of his philosophy can be gained from *Essays in Tektology: The General Science of Organization*, tr. George Gorelik, Seaside, Calif.: Intersystems Publications, 1980.

Bogdanov's new proletarian science was a precursor to, and arguably a superior version of, the process oriented systems theory of von Bertalanffy.[69] The focus was not on what the world was made of, but on the nature of organization. Objects are distinguishable as different degrees of organization. Organized complexes or systems are composed of inter-related elements, conceived of as activities, such that the whole is greater than the sum of its parts. Living beings and automatic machines are dynamically structured complexes in which 'bi-regulators' provide for the maintenance of order. Bogdanov argued that no matter how different the various elements of the universe - electrons, atoms, things, people, ideas, planets, stars - and regardless of the considerable differences in their combinations, it is possible to establish a small number of general methods by which any of these elements joins with another. He analysed the emergence, degree of stability, differention within and dissintegration of such systems.

In the early years of the revolution, Bogdanov inspired and largely organized the *Proletkul't* movement which gained 400,000 members, published twenty journals, and attracted the support of a wide section of the Russia's artists, musicians and writers.[70] Bogdanov also established a proletarian university in Moscow with 450 students. He defended such activity in a time of crisis on the grounds that only through a cultural transformation could socialism be achieved. The differences between Leninism and the ideals of Proletkul't were most clearly manifest in the efforts to develop a work ethic. All Russian Marxists were concerned to develop an activist orientation in everyday life, to overcome the slovenliness of Russian workers. Lenin called upon the cadres of the communist party to 'teach people how to work', to develop a new proletarian work ethic in which work would be undertaken as virtuous habit, a transformation which, according to Trotsky, was to seal 'the people's final break with the Asiatic, with the seventeenth century, with Holy Russia, with icons and cockroaches'.[71] The work ethic was propagated through mass educational offensives, with the *Central Labour Institute* organized by A.K. Gastev supported by Lenin promoting Western practices, and the *Time League*, striving to create a new orientation to work appropriate for a socialist society.[72]

The *Central Labour Institute* aimed at a total mechanization of human life on the foundations of Taylorism and Pavlovian psychology. Gastev wanted to reform human psychology, merge Marxism with American practicality, eliminate education in the humanities in favour of technical, practical knowledge, replace universalism with specialism, and adjust individuals to make them into suitable machine parts for the total organization by conditioning people's wills, minds, and bodies. As he described his ideal of scientific organization:

> Before us there is the prospect not only of an individual mechanized worker, but of a mechanized system of labour management. Not a person, not an authority, but a 'type' - a group - will manage other 'types' or groups. Or even a machine, in the literal sense of the word, will manage living people. Machines, from being managed, will become managers.[73]

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69. See Ilmari Susiluoto, *The Origins and Development of Systems Thinking in the Soviet Union: Political and Philosophical Controversies from Bogdanov and Bukharin to Present-Day Re-evaluations*, Helsinki: Suomalainen Tiedeakatemia, 1982; George Gorelik, 'Bogdanov's Tektology: Its Nature, Development and Influence', *Studies in Soviet Thought*, Vol. 26, (1983).

70. On this movement see Lynn Mally, *Culture of the Future: The Proletkult Movement in Revolutionary Russia*, Berkeley: University of California Press, 1990.

71. Cited Luke, 'The Proletarian Ethic...' p.596.

72. On the conflict between these two, see Zenovia A. Sochor, 'Soviet Taylorism Revisited', *Soviet Studies*, Vol. XXXIII, no.2, April 1981, pp.246-264.

73. Cited by Susiluoto, *The Origins and Development of Systems Thinking in the Soviet Union*, p.106.

Members of the *Time League* criticised such measures, arguing that they would facilitate a new kind of subordination, and promoted the application of a new kind of scientific organization to all spheres of human endeavour. Stressing the need for self-discipline rather than the reduction of people to objects to be controlled, they focussed on the organization of time, entreating workers to: 'Measure your time, control it! Do everything on time! exactly, on the minute! Save time, make time count, work fast! Divide your time correctly, time for work and time for leisure! Utilize your leisure so as to work better afterwards!'[74]

The *Proletkul't* movement was attacked by Lenin who republished his *Materialism and Empirio-criticism* to undermine Bogdanov's authority. With Lenin's support, the *Central Labour Institute* prevailed over the *Time League*. Late in 1920 Lenin forced the subordination of the hitherto free-wheeling *Proletkul't* to the People's Commissariat of Education (or Enlightenment) (*Narkompros*), and it was later abolished altogether. As it became evident that the rest of Europe was not going to follow Russia and that a socialist organization could not easily be imposed on the peasantry, Lenin shelved utopian ideas, and to consolidate the revolution promoted the New Economic Policy which was adopted in 1921. This was characterized by limited capitalism controlled by the State. To maintain control of the State in a capitalist society, all other political parties and all factions within the Communist Party were banned. While people associated with the 'Worker's Opposition' were inspired by *Proletkul't* to oppose the 'return to capitalism' of the N.E.P., and also Trotsky's call for a militarization of society based on the principles of war communism, and called for workers' control in the factories, they had little success. By the time *Tektology* was completed in 1922, Bogdanov's prestige had been almost destroyed, though he continued to have some influence, particularly through Lunacharsky, a supporter of Bogdanov's philosophy, who until 1929 was the Commissar of Education.[75]

Lenin's backtracking from socialism was justified by arguing that it is necessary to work in accordance with the dynamics of the world. In terms of his philosophy, spontaneity was given pre-eminence over consciousness. During this period, a mechanistic world-view was promoted within educational institutions, and Marxism was interpreted accordingly. The prevailing interpretation of Marxism was Bukharin's, essentially a mechanistic version of systems theory emphasising the equilibrium of systems. According to this, oppression and class conflict are caused by the economic base of society and are therefore eliminable through its transformation. In psychology, physiological and behaviourist approaches to humans were adopted almost exclusively. Pavlov's ideas on the reflex arc dominated, and those psychologists focussing on consciousness were condemned as idealists. People were seen as products of their environments and biological constitutions, and there was no acknowledgement of the possibility of individuals transcending the conditions of their existence. As Raymond Bauer wrote: 'In the psychologies of the twenties, man was an adaptive mechanism that responded to external forces in such a way as to maintain an equilibrium between himself and his environment.'[76] Those supporting the revolution upheld the primacy of the environment as the determinant of abilities. In relation to the dynamics of society, the future was thus seen to be determined by forces external to individuals. However in the new educational and research institutes established by the Commissariat of Education, provided bases for the proponents of an essentially proletarian culture based on dialectics.[77]

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74. Cited Luke, 'The Proletarian Ethic...' p.598.

75. On Lunacharsky's policies and influence, see Sheila Fitzpatrick, *The Commissariat for Enlightenment*, Cambridge: C.U.P., 1970. This also contains a chapter on *Proletkul't*.

76. Raymond A. Bauer, *The New Man in Soviet Psychology*, Cambridge, Harvard University Press, 1952, p.75.

77. This development, and the struggle between the mechanists and the dialecticians has been described by David Joravsky in *Soviet Marxism and Natural Science*, London: Routledge & Kegan Paul, 1961.

The Rise of Stalin

While many radical breaks were being made with the past, traditional Russian culture continued to influence both Marxists and the general population. This was evident in the struggles of Lenin to oppose the religious terminology of the God-builders on the one hand, and the tendency for people to treat him as a new tsar on the other. Though Lenin imposed and upheld the dictatorship of a small revolutionary elite, suppressing both parties opposing the Communist Party and factions within it, while he was alive there was no office of supreme leader in the Soviet system. The highest party organs were the Central Committee and its subcommittee, the Politburo, and Lenin was officially an ordinary member of these. Decisions in each were taken by majority vote. Lenin had no more than one vote and did not expect people to agree with him. He advocated this system and took care to uphold it in practice, and he would resolve differences between himself and subordinate government leaders by referring the issue to the Politburo for a decision by majority vote. At the Tenth Party Congress in 1921, Lenin gave his party office as 'member of the Central Committee'. But to the people Lenin was the personification of political power, the source of divine light and the icon of the Deity. A reporter to the *New York Times*, Walter Duranty wrote: 'I have seen Lenin speak to his followers. ... I turned round and their faces were shining, like men who looked on God.'[78] Ignazio Silone who saw Lenin in 1921 recalls that 'whenever he came into the hall, the atmosphere changed, became electric. It was a physical, almost a palpable phenomenon. He generated contagious enthusiasm the way the faithful in St. Peter's, when they crowd round the Sedia, emanate a fervour that spreads like a wave throughout the basilica.'[79]

Lenin abhorred this. Recovering in 1918 after an attempted assassination, he was horrified by what had been printed in the press. His attitude is evident in his exclamation to his aide, V.D. Bonch-Bruevich:

> What is this? How could you permit it? Look what they are saying in the papers. Makes one ashamed to read it. They write that I'm such-and-such, exaggerate everything, call me a genius, a special kind of man. And look at this piece of mysticism: they collectively wish, demand, and desire that I get well. Next they'll be holding public prayers for my health. Why, this is horrible![80]

But the fact was that Lenin himself, with all his protestations against old forms of thinking, was being assimilated into the basic forms of traditional Russian culture.

This, along with Lenin's destruction of the *Proletkul't* movement, made it very easy for Stalin to re-invert Russian culture, to embrace the traditional Russian culture as sacred and to condemn Western forms of thinking as profane. In contrast to Lenin, Stalin was always prepared to exploit the legitimating power of traditional Russian culture to the full. A former seminarian educated in the catechistic theology of Orthodoxy, he was much more in tune with this traditional Russian culture than the other Bolshevik leaders - many of whom were of Jewish, Polish or Baltic origin, and his rise to, and maintenance of power was at least partly due to his willingness and ability to accord with and use traditional cultural forms to legitimate himself and his actions. To begin with, Stalin's way of arguing accorded with the way of thinking of ordinary people. As Martin McCauley wrote about him in his struggle with Trotsky, 'He had a knack of communicating easily with the run-of-the-mill party member, whereas Trotsky appeared to be addressing the angels most of the time as no one on

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78. Cited by Tucker in his Introduction to *The Lenin Anthology*, p.lix.

79. Cited loc.cit.

80. Cited ibid. p.lx.

earth could follow him.'[81] The symbolic universes were contrived to accord with Russian tradition. Lenin was embalmed and laid out for public veneration with hands folded in the manner of the saints in the monastery of the caves of Kiev, something which embarrassed all the leading Bolsheviks except Stalin. As Stalin rose to power, his pictures took the place of holy icons, and art and literature were cultivated to take the place of icons and the lives of the saints, with literature being placed under Party control to ensure that it served the revolution.[82] Socialist realist works were expected to provide the ideal forms for people to strive to imitate, and artists and writers were directed what to produce. The evolution of the Socialist Realist novel thus came to reflect the evolution of Soviet ideology.[83]

Having used traditional Russian culture to gain power, Stalin was then able to use it to redirect the revolution. The communists had stressed the conception of society as a 'great family' in accordance with Russia's traditional communal orientation. But while originally the horizontal axis of brotherhood was emphasised, Stalin twisted this axis to emphasise the hierarchical aspects of the family. Socialist realist novels abounded in heroes whose lives have been changed by contact with the fatherly figure of a political leader within the Communist Party, while Stalin was presented as the great father. The aim presented to the general male population was to become 'good sons' to the almighty father of the 'Great Family'. This hierarchical conception of the family resonated with the hierarchical Neoplatonic framework of the culture as a whole inherited from the tsarist past.[84] Stalin as a supra-terrestrial being was held to have access to a higher order truth, a truth which had been passed on to him by the original father of the revolution, Lenin. Access to this truth could be attained by model sons, but they could only grasp intuitively and inchoately and with the father's guidance the forms of higher level knowledge to which the father had complete access. As Katarina Clark wrote of this:

> Lenin passed his 'light' and 'mystery' on to Stalin. Now Stalin was passing it on to his chosen few. The myth of the 'great family' provides not only for a succession of generations but a chain of kairotic moments akin to the laying-on of hands in a church adhering to the doctrine of the apostolic succession. ... For the time being, however, the chain is not infinite. Not all are able to receive the 'mystery' and 'light' that the leaders have to give. ... In Stalinist culture of the thirties there were, then, two orders of reality, ordinary and extraordinary, and, correspondingly, two orders of human being, of time, of place, and so on. Ordinary reality was considered valuable only as it could be seen to reflect some form, or ideal essence, found in higher-order reality.[85]

The Cultural Revolution

The world-orientation of Soviet Marxism finally crystallized with the Cultural Revolution of 1928-1931 associated with the First Five-Year Plan, and what emerged from this was essentially a refurbished form of the nihilism of the radicals of the 1860s.

While the mechanistic conception of being dominated until 1928, the threat of war with England, a breakdown in food acquisition from the peasantry and pressure from the working

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81. Martin McCauley, *The Soviet Union Since 1917*, London: Longman, 1981, p.60.

82. For a description of literature in the 1920s leading up to its co-optation by the Party see Robert A. Macguire, *Red Virgin Soil: Soviet Literature in the 1920s*, Princeton: Princeton University Press, 1968.

83. As shown by Clark in *The Soviet Novel*.

84. Leszek Kolakowski in *Main Currents of Marxism* represents Marxism and socialism as essentially Neoplatonist and blames them as such for the Stalinist developments in Russia.

85. Clark, *The Soviet Novel*, p.145f.

class and students who saw the N.E.P. as a betrayal of the revolution, led Stalin to the conclusion that the collectivization of agriculture was necessary. He then attempted to have the economy organized on the basis of five year plans.[86] From this point onwards, the superiority of communism was seen to rest not on its having overcome a repressive society, but on its superiority for developing the means of production. This was associated with the Cultural Revolution in which the members of the Party struggled to attain control of the positions of power in the sciences and arts and to proletarianize and socialize culture. What they struggled to effect was another cultural inversion. While under the N.E.P. spontaneity was extolled and consciousness was denigrated, under the new order consciousness was extolled and spontaneity denigrated.

To begin with Stalin remained wedded to the metaphor of the machine. He cultivated the form of the machine as the ideal to be realized. The machine was taken to stand for harmony, progress and control, while that which was not integrated into the machine was condemned as chaos, hard labour, primordial and lacking in rhythm. This ideal was used to justify the collectivization of agriculture into large scale, highly mechanized operations subject to central planning. Society was a 'train' rushing to catch up a hundred years of Western development in ten years, and a 'planned city' in which everything was scientifically coordinated and the latest technology used. But the machine did not fit in with traditional Russian culture. It aroused suspicion, it was too impersonal and it gave no place for the centralized, guiding role of the Party. It was also inconsistent with the dialectic of spontaneity and consciousness espoused by Lenin. For these reasons it was soon replaced by the image of the 'Struggle with Nature,' associated with which people were exhorted to overcome all obstacles, to storm and break traditional limits in order to achieve society's ends; that is, to make consciousness dominate over spontaneity. On the basis of this image the view was promulgated that anything can be accomplished; the laws of science are only blinkers imposed upon people to prevent them reaching their full potential.

With the Cultural Revolution, the dialectical materialist philosophers were able to gain positions of power and to make their views prevail over those of the mechanists. The term 'dialectical materialism' which has become the official theory of being of Soviet Marxism, was coined by Plekhanov, but apart from interpreting Marxism in terms of Spinoza, conceiving matter and thought as two aspects of the one reality, Plekhanov did not speculate on the nature of matter. However the term was taken up by other Marxists, led by Deborin, who set about elaborating on Engels' philosophy of nature. Attacking the mechanistic conception of being for its reductionist implications, they followed Engels in arguing that matter is essentially active and that it generates qualitatively new levels of being which must be understood according to their own specific laws. Their intellectual credentials were reinforced by the publication of Engels *Dialectics of Nature* in 1925 and then Lenin's *Philosophical Notebooks* in 1929, but the real reason why they were able to gain positions of power was that they gave a far greater role to consciousness than the mechanists. Consciousness was seen by them to be irreducible to biology or behaviour, and capable of acting according to its own principles. This legitimated the rejection of the principle of equilibrium, associated with Bukharin's defence of the N.E.P., as a projection of biology onto a higher level of being. The dialecticians justified the primacy of consciousness over spontaneity, the demands being made by the Party for a radical break with the past, and the struggle to consciously transform society and nature.

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86. See Alec Nove, *An Economic History of the U.S.S.R.* Harmondsworth, 1982, Ch.'s 7 & 8; Maurice Dobb, *Soviet Economic Development Since 1917*, 6th ed. London: Routledge & Kegan Paul, 1966, Ch.10; Sheila Fitzpatrick, *The Russian Revolution: 1917-1932* Oxford: Oxford University Press, 1982, Ch.5. For the cultural revolution associated with this see Sheila Fitzpatrick ed. *Cultural Revolution in Russia: 1928-1931*, [1978] Bloomington: Indiana University Press, 1984.

The significance of the Deborinites went beyond this. They had successfully promoted the view, which had originally been put forward by Bogdanov, that there is a socialist science different in character from bourgeois science, and that the Communist Party was entitled to ensure that scientists developed their ideas along Marxist lines. This paved the way for the attempt by the Party to effect far-reaching control over the sciences to create a specifically Soviet science in opposition to Western science.

The reign of the Deborinites was short-lived. With the failures of the first five-year plan and changes in the West increasingly threatening Russia, Stalin intensified the struggle for rapid economic development. This was associated with an increasingly anti-Western attitude and with a growing emphasis on Russian nationalism. His attitude was expressed in his famous 1931 speech calling for the full mobilization of society:

> One feature of old Russia was the continual beatings she suffered because of her backwardness. She was beaten by the Mongol khans. She was beaten by the Turkish beys. She was beaten by the Swedish feudal rulers. She was beaten by the Polish and Lithuanian gentry. She was beaten by British and French capitalists. She was beaten by Japanese barons. All beat her - because of her backwardness, because of her military backwardness, cultural backwardness, industrial backwardness, agricultural backwardness... We are fifty to one hundred years behind the advanced countries. We must make good this distance in ten years. Either we do it or we shall go under.[87]

Responding to this new climate, Deborin and his colleagues were attacked for showing insufficient party spirit by a band of younger party activists led by M.B. Mitin at the second philosophical conference in April 1930. They were charged in particular with 'separating theory from practice'. Stalin labelled their position 'menshevising idealism' and their fate was sealed. They were purged from the party in January, 1931.

While the mechanists had been knowledgeable about science but relatively ignorant about philosophy and the Deborinites had been knowledgeable about philosophy but relatively ignorant of science, Mitin and his colleagues constructed a version of dialectical materialism which synthesized the ignorance of each.[88] While they did formulate a version of dialectical materialism, it was not the conception of being which was taken as defining the socialist science as Deborin had believed. The real defining feature of socialist science and of the philosophy of Mitin and his colleagues was a revival of the views of the Russian nihilists of the 1860s who had argued for the total subordination of science to technology, and the elimination of everything which did not serve a strictly utilitarian function for the Revolution.

According to this version of the unity of theory and practice, practice is 'the basis of knowledge and the touchstone of truth'. Knowledge only has significance and is only to be pursued for practical and technological reasons, and practical efficacy is the ultimate test of the hypotheses on which action is based. This was formulated to accord with Lenin's reflection theory of knowledge in opposition to the 'hieroglyphic' theory of knowledge of Plekhanov which had been upheld by Deborin. This pragmatic theory of knowledge, which was very similar to that developed in America by William James under the influence of Darwinian evolutionary theory, ultimately led to the view that what is true is what is good for the development of communism. Everything, including truth, came to be measured in terms of its contribution to the goals of the Communist Party. As Ernst Kol'man, a leading agent of the great break in philosophy and science declaimed:

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87. J.V. Stalin, *Works*, Vol.13, Moscow: Progress Publishers, 1955, p.40-41.

88. See Leszek Kolakowski, *Main Currents of Marxism*, Volume 3, 'The Breakdown', p.65ff.

> Now it is clear to everyone that the basic lesson of the philosophical discussion is this: philosophy, and every other science as well, cannot exist in the conditions of the proletarian dictatorship separate from the Party leadership. Now it is clear to everyone that all efforts to think of any theory, of any scholarly discipline, as autonomous, as an independent discipline, objectively signify opposition to the Party's general line, opposition to the dictatorship of the proletariat.[89]

It is important to note in relation to evaluating the contribution of Marxism to the development of Stalinism that this theory of knowledge has little to do with either Marx's notion of the unity of theory and practice outlined in his *Eleven Theses on Feuerbach*, nor with Lenin's philosophy. Marx did not reduce the status of theory but pointed out that since people and their theories are part of the world and theories change the world by affecting people's behaviour, this must be taken into account in theory.[90] Social theory must struggle to articulate and express the problems and aspirations of people and reveal how, through this new consciousness, they can change the world. This is inconsistent with a reflection theory of knowledge with its implicit dualism between mind and world and its reduction of truth to a means for realizing the millenium. And the narrowly utilitarian view of science was at odds with the ideas of Lenin, who in opposition to Bogdanov also rejected the whole idea of a specifically socialist science. The reduction of knowledge to an instrument of power was condemned by Lenin's wife, Krupskaia, as 'a naive, idiotic conception of the matter.'[91]

These developments in philosophy inspired attacks on mechanistic psychology for its failure to deal with consciousness. Such psychology had presented a view of people which was far too passive for a society in which they were supposed to be transforming the world. This inverted the previous state of affairs where those psychologists who had focussed on consciousness had lost or were in danger of losing their positions. As one Soviet psychologist wrote: 'That which I had considered my virtue - regarding objective reality as the direct source of the laws of psychological development - became its opposite, or nearly so.'[92] However even psychologists who had argued for the reality and causal significance of consciousness such as Vygotskii were criticised for relying too heavily on concepts of adaptation and equilibrium. Vygotskii had argued that the child grows and develops in the process of accommodating to disequilibrating forces, while his critics argued that the initiative for action lies with the individual alone independently of his or her environment. The psychologists were to produce a theoretical model of a conscious, purposeful builder of socialism. The two factor theory of development according to which behaviour is determined by heredity and environment gave way to a three factor theory according to which behaviour is determined by heredity, environment and training, and then by a four factor theory which also included self-training, the shaping by people of their own character.[93]

Similarly, from 1930, onwards the natural sciences were also reduced to instruments of the Party. The attack against the scientific establishment was led by I. I. Prezent and his main follower, Lysenko, on grounds that they were promoting ideas which implied that there are limitations to the dominion of humans over nature. Most well known of the theories attacked was the Mendel and Morgan theory of heredity - which the Deborinites had supported. This theory implied that there are limits to what species can be acclimatized to Russian

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89. Cited by David Joravsky in 'The Construction of the Stalinist Psyche' in Sheila Fitzpatrick ed. *Cultural Revolution...* p.109.

90. See Leszek Kolakowski, 'Karl Marx and the Classical Definition of Truth' in *Marxism and Beyond* tr. Jane Zielonko Peel, London: Paladin 1971, pp.59-87 on this.

91. Cited by Douglas Robert Weiner, *The History of the Conservation Movement in Russia and the U.S.S.R. from its Origin to the Stalin Period*, Ph.D. Thesis, Columbia University, 1983, p.362.

92. M. Ia. Basov, *Pedologiia*, 1931, nos. 5-6, p.16; cited by Bauer *The New Man in Soviet Psychology*, p.102.

93. Ibid. p.149. See also David Joravsky, *Russian Psychology: A Critical History*, Oxford: Blackwell, 1989.

conditions. However the attack on these theories had been preceded by attacks on community ecology, for virtually the same reasons.

Associated with these developments there were new demands placed on education and training in industry. By 1931 the Central Committee of the Party was clamouring for 'completely educated men possessing a good foundation in the sciences'[94] in place men trained by rote in a restricted range of mechanical skills. In 1935 Stalin instructed that the old slogan 'Technique decides everything' be replaced by a new slogan, 'Cadres decide everything.'[95] In Socialist Realist literature individuals were extolled for showing initiative to battle against the elements and red tape to achieve outstanding developments in industry. Writers were instructed to create a literature of 'revolutionary romanticism' in place of bourgeois literature which depicts the small deeds of small people.

The general pattern for these novels has been described by Katarina Clark.[96] In brief they begin with the hero arriving at a microcosm, seeing that all is not right (the state plan is not being fulfilled) and concocting a scheme for righting the wrong which is then rejected by the local bureaucrats. The hero defies the bureaucrats and mobilizes the people, and work on the project begins. With snags in this and problems in the hero's love life the hero seeks help from a more authoritative figure. A dramatic/heroic obstacle associated with an actual, symbolic or near death leads to grave self-doubt on the part of the hero. The hero talks with his local mentor and this gives him the strength to carry on to the completion of the task. The completion is associated with the resolution of the emotional problems, the hero transcending his selfish impulses and acquiring an extrapersonal identity. A funeral is held for the victim killed during the climax, or alternatively the protagonists visit their fallen comrade's grave, and they make speeches. There is then a reshuffling of personnel in the microcosm with the hero frequently being promoted to the post formerly held by his mentor. The theme of regeneration and the glorious time that awaits future generations is introduced at the completion of the task as a thematic counterpoint to sacrifice and death.

These developments further accentuated the Neoplatonism of Marxism. History was hypostatised and treated as a subject using people as willing instruments in its struggle to attain the millenium. This was dramatically illustrated even by the opponents of Stalin, for instance in the 'confession' of Bukharin in 1937 before his execution. Bukharin had originally developed a version of Marxism in terms of a version of systems theory. However while on trial he defined his position from the point of view of the world-historical process. As he stated: 'World history is a world court of judgement ...'[97] Treating history as a judge, Bukharin was left to conceive himself as nothing but a rejected instrument of history. This means in effect that to be right is to be successful, precisely the same ethic as Social Darwinism.

The reformulation of Marxism into an anti-Western ideology was translated into work, educational and social practices, a process which led to the reassertion of many traditional Russian cultural practices against the efforts of those who had striven to transform Russians according to Western principles. In fact the main bearers of these Western principles, the radical intelligentsia, were a major component of the several hundred thousand people who were executed in the purges of the 1930s, and most of the remainder found themselves among the 4½ to 5 million prisoners who became a virtual class of slaves in the forced labour camps of the Gulag. And the new class of intellectuals and administrators who rose from the ranks of the working class and peasantry to take control of the society embodied a fusion of traditional Russian orientations and the technicist rationality of the nihilists both

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94. Ibid. p.100.

95. Ibid. p.46.

96. Clark, *The Soviet Novel*, Appendix A, pp.255-260.

97. Maurice Merleau-Ponty, *Humanism and Terror*, [1947] tr. John O'Neill, Boston: Beacon, 1969, p.62.

towards nature and towards people. This reversion manifested itself in the Stakhanovite movement, in which workers were made heroes for vastly overfilling production quotas, which began in 1935. It was associated with a rejection of the effort to develop a generalized work-discipline and was a return to a more traditional approach of exalting the exceptional. Similarly in 1936 pedologists with their batteries of tests were dropped from the education system. While failure had previously been blamed on heredity or environment, it was henceforth demanded of students that they succeed whatever the external limitations, although success had to be defined from above. While initiative was encouraged, this was supposed always to serve the party.

In accordance with this orientation, efforts were made to develop and to inculcate an ethics of service to society, to the country and ultimately, to the realization of socialism, an ethic which has persisted up to the rise to power of Gorbachev.[98] The account of communist morality by V. Afanasyev in his popular exposition of Marxist philosophy is a typical expression of this:

> Communist morality ... is subordinated to the interests of the proletariat's class struggle. *Its content and aim is to build and consolidate communism*. It is this idea which underlies the *moral code of the builder of communism*, formulated in the Programme of the C.P.S.U. *Devotion to the cause of communism, love for the socialist Motherland* which blazes for mankind the trail into the communist morrow, *love for all socialist countries*, is the first, cardinal demand in the moral code of the Soviet citizen.[99]

The most important feature of this moral service was seen to be 'conscientious labour for the good of society.'[100] In other words in accordance with the traditional Russian tendency to subordinate the individual to the group and with the Neoplatonic emphasis of Soviet Marxism, people were required to become willing instruments of Providence, represented by the Communist Party, for the creation of the order on earth to be achieved through the transfiguration of nature by industry.

With these developments, the brilliant intellectual life of Russia which had developed in the nineteenth century and had flowered in the early years of the revolution, was virtually snuffed out. As David Joravsky described this change:

> From autonomous critics of the existing system, seeking an integral understanding of the universe and of human destiny as the first step to reform or revolution, the intelligentsia has been transformed into a class of obedient servants of the exiting system, performing specialized mental labour for specified rates of pay.[101]

With the Second World War the nationalization of Soviet Marxism and the mobilization of the population for service to society was completed, with Stalin successfully appealing to Russians to fight for the Soviet motherland.

This mobilization was successful to the extent that the Soviet Union was able to defeat the Nazis in the Second World War (although given Stalin's massive blunders, including purging the army of its best commanders just before the war, then refusing to prepare for the German attack, despite precise intelligence reports on when it would take place, orders not to retreat, leading to the encirclement of Soviet troops, and so on, there is no reason to believe

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98. The place of ethics in Soviet Marxism has been analysed by Herbert Marcuse in *Soviet Marxism: A Critical Analysis* [1958], Harmondsworth: Penguin, 1971, Part II.

99. V. Afanasyev, *Marxist Philosophy: A Popular Outline*, [1963], Moscow: Progress Publishers, 1968, p.338.

100. Loc.cit.

101. David Joravsky, 'The Construction of the Stalinist Psyche' in Fitzpatrick, *Cultural Revolution...*, p.106.

Stalinism as such was required for this victory). Then, after having endured the massive mobilization of society before the war with its associated famines and starvation, after having had twenty million people killed and much of the pre-war achievements destroyed during the war, under constant threat of nuclear attack from the United States, they were able to again rebuild their country.

To achieve this, they had not only developed an economic base, but appear to have had some success in changing the mode of being of Russians. As Bauer wrote of emigres in the early 1950s in comparison to emigres before or immediately after the Revolution:

> They are more practical and less contemplative; more concerned with results and less with the means whereby they are gained. They are more manipulative and better extemporizers. Rationality is more prominent and emotion less so. They are more militantly self-confident. They exhibit, in short, the 'reflex of purpose' which Pavlov found lacking in the Russian.[102]

However such changes must not be over-emphasised. In the conclusion to his study of the Russians, the journalist Hedrick Smith noted the continuity of the traditional Russian character: 'the centralized concentration of power, the fetish of rank, the xenophobia of simple people, the futile carping of alienated intelligentsia, the passionate attachment of the Russians to Mother Russia, the habitual submission of the masses to the Supreme Leader and their unquestioned acceptance of the yawning gulf between the Ruler and the Ruled.'[103] The contrast between Estonians and Russians provides a good measure of the limited success in the efforts of the Communists to transform the Russian habitus.

From Khrushchev to Gorbachev

After the death of Stalin in 1953 ideological conflicts took the form of a struggle between Stalinists, the anti-semitic, xenophobic, essentially anti-Marxist nationalists oriented towards achieving central control over society and expanding the international power of the Soviet Union; and Leninists, the people who took the ideals of Marxism seriously and tried to liberalize society and decentralize power, and who were outward looking and tried to reduce the tensions of the Cold War.[104] The most extreme of these Stalinists have been the Russophiles or 'Russites', the heirs of Social Darwinist Slavophiles of the late 19th century, described by Christian Schmidt-Häuer:

> To them, Lenin is suspect. For him, the extension of the Russian empire was a means to achieve world revolution, not an end in itself. It was Stalin who re-asserted Russian hegemony, transforming the Comintern (the Communist International) into an instrument for the expansion of Russia. For this reason, the Russites see Stalin as a true expression of Russian history, and his purges as the cleansing of the homeland from Western, Marxist and Jewish subversion.[105]

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102. Bauer, *The New Man in Soviet Psychology*, p.182.

103. Hedrick Smith, *The Russians*, London: Sphere Books, 1976, p.614.

104. See Christian Schmidt-Häuer, *Gorbachev: The Path to Power* tr. Ewald Osers and Chris Romberg, London: Pan Books, 1986, Ch.4. A good idea of the nature of the political struggles in the Soviet Union between 1964 and 1971 can be gained from the translations of the *samazadat* (self-publishing) *Political Diary* edited by Roy Medvedev. These are contained in Stephen F. Cohen ed. *An End to Silence*, tr. George Saunders, N.Y.: Norton, 1982.

105. Schmidt-Häuer, *Gorbachev: The Path to Power*, p.74f.

However behind the more extreme form of Stalinism characteristic of the Russites, an increasingly hereditary class of bureaucrats tended towards Stalinism not as an expression of nationalism, but as a means of suppressing critics of their privileges and incompetence. Marxism allowed this class to present itself not as a privileged class, but as the representatives of the proletariat of the world, so that any criticism of them or of Russia's exploitation of national minorities in the Soviet Union or of Russia's Eastern European allies, could be condemned as treason against the international working class and against socialism.

The major events in the conflict between the Stalinists and the Leninists were the rise to power of Khrushchev and his denunciation of Stalin in 1956, the deposing of Khrushchev, which was engineered by the Russites, and the domination of political life by Suslov, Kosygin and Brezhnev, and then the deaths of Suslov, Kosygin and Brezhnev and the rise to power of Andropov and later, Gorbachev.

During the period when Khrushchev was premier between 1958 and 1964, the degree of control over literature, philosophy and the sciences was relaxed. Individuals were no longer expected to defy the laws of nature, and a more consumerist orientation developed in society. The Socialist Realist novels portrayed and celebrated better educated, better dressed and more senior members of the Communist Party. After the death of Stalin the main characters tended to be less heroic, and there was some exploration of more complex issues such as the relationship between individual initiative and discipline. Systems theory and cybernetics were slowly revived as the basis for management, just as they have been developed in the West.[106] A more polished version of the vulgarized dialectical materialism of Mitin and his colleagues became the orthodox position in Soviet philosophy and science, with a basic opposition emerging between the more orthodox 'Aristotelians' and the more radical 'Hegelians'.[107] The Hegelians promoted Lenin's *Philosophical Notebooks* as against his more mechanistic *Materialism and Empirio-Criticism*. But science continued to be regarded as the means to control nature (though a role in this has been found for 'basic science' to replace 'pure science'), and dialectical materialism continued to be formulated to accord with the reflection theory of knowledge and the dualism between materialism and idealism promoted by Lenin. Since thought is seen to be reflecting the material world, and idealism is understood as denying that contents of consciousness are really representations of something existing independently of thought, this has led to the maintenance of the dualism between thought and matter.

In this philosophical environment, consciousness retained a more significant role in Soviet psychology than in Western psychology, although as in Western psychology cybernetics was incorporated into research.[108] Pavlov was rehabilitated as a hero of Soviet science, but as a biologist rather than as a psychologist, and a more positive attitude was taken to the work of Vygotskii. In economic thought there was a veritable revolution in thinking as the input/output models of the economy, originally developed by Leontief and Fel'dman in the 1920s, were revived as a basis for planning the economy, linear planning, which was also originally developed within the Soviet Union, came to be used as a general

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106. As noted by Susiluoto, *The Origins and Development of Systems Thinking in the Soviet Union*, Ch.11.

107. The basic position is espoused by Afanasyev, *Marxist Philosophy*. A more recent and polished version is presented in the works of E.V. Ilyenkov, in particular, *Dialectical Logic*, Progress Publishers, Moscow, 1977. The classic Western study of Soviet philosophy is Gustav Wetter, *Dialectical Materialism*, tr. Peter Heath, London, 1958. The developments and problems of dialectical materialism have been analysed by N. Lobkowicz in 'Materialism and Matter in Marxist-Leninism' in Ernan McMullin ed. *The Concept of Matter in Modern Philosophy*, Notre Dame: University of Notre Dame Press, 1963, pp.154-188. The struggles within Soviet philosophy have been described by Eugene Kamenka in 'Soviet Philosophy 1917-67' in *Social Thought in the Soviet Union*, ed. Alex Simirenko, Chicago: Quadrangle Books, 1969. For the influence of dialectical materialism on Soviet science see Loren R. Graham *Science and Philosophy in the Soviet Union*, N.Y.: Knopf, 1972.

108. On psychology after 1953 see John A. Molino, 'Is There a New Soviet Psychology?' in *Social Thought in the Soviet Union*, pp.300-327.

means for calculating the most efficient way of using resources, economists strove to work out how the criterion of utility could be incorporated into planning and how markets could be developed to improve efficiency, and the Stalinist dogma that steady growth requires that the investment sector of the economy grow faster than the consumption sector was laid to rest.[109] In social science, historical materialism came to be understood more in accordance with the systems theory of Bukharin, and the role of consciousness was downgraded. As Helmuth Fleisher described Soviet social science:

> We are not told that producers and managers are faced with professional politicians, legislators and administrators, but that 'the economy' determines 'politics', that the latter has repercussions on the economic base, and that base and superstructure influence each other with unequal determinative force. We are not told that men, who among other things work, consume and quarrel, and in the process develop theoretical ideas and make practical plans about the objects of their environment ... but that economic development produces ideas that in turn influence economic development and play an 'active role'.[110]

The state of social thought can be judged from the enormous popularity achieved by the sociological theories of Talcott Parsons.

Khrushchev attempted to liberalize Soviet society and achieve a rapprochement with the West. He successfully downgraded the status of Stalin and inaugurated a flowering of new ideas in virtually all intellectual fields. But he failed to break down the concentrations of power which had developed under Stalin, and the limitations of centralized planning became evident for the first time. The economy had become too complex. The expulsion of Khrushchev from power was engineered by Suslov, a patron of the Russites, who until his death in 1982 was a major driving force in insulating Soviet society from the West. The reign of Brezhnev saw the further entrenchment of the new privileged class of bureaucrats and officials of the Communist Party, with an extension of their special privileges and the power to pass on these privileges to their descendants by giving them preferential treatment in their careers. This was associated with the stagnation of the economy. But despite the high regard for Stalin and the suspicion of the ideals and Western orientation of Lenin, neither Suslov and those he supported, nor Brezhnev and his retinue were able to undo all that Khrushchev had achieved, while at the same time increasing numbers of people had come to recognize the impossibility of a totally planned economy. (As one sarcastic Soviet author remarked: 'Mathematicians have calculated that in order to draft an accurate and fully integrated plan for material supply just for the Ukraine for one year requires the labour of the entire world's population for 10 million years.'[111])

With the rise to power of Gorbachev in 1985 a new cultural revolution was inaugurated.[112] Gorbachev represented a new inversion of Russian culture, this time with spontaneity being exalted over conscious direction from above, and with traditional Russian culture being downgraded in favour of a Western outlook.[113] Under the slogans '*glasnost*' and

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109. See Howard J. Sherman, 'The "Revolution" in Soviet Economics' in Simirenko ed. *Social Thought in the Soviet Union*, pp.222-268.

110. Helmuth Fleischer, *Marxism and History* [1969], tr. Eric Mosbacher, Harper Torchbooks, N.Y.: Harper & Row, 1973, p.39f.

111. O. Antonov, cited by Alec Nove, *The Economics of Feasible Socialism*, London: George Allen & Unwin, 1983, p.33. For a full study of the Soviet economy and its problems, see Alec Nove, *The Soviet Economic System*, 3rd ed. Boston: Allen & Unwin, 1986. On East Europe in general, see Michael Ellman, *Socialist Planning*, Cambridge: Cambridge University Press, 1979.

112. Some idea of this can be gained from Gorbachev's manifesto, *Perestroika*, London: Collins, 1988. However the movement is best described by Alec Nove, *Glasnost in Action: Cultural Renaissance in Russia*, Boston: Unwin Hyman, 1989.

113. See Christian Schmidt-Häuer, *Gorbachev: The Path to Power* p.74f.

'*perestroika*', Gorbachev attempted to democratize the political order and replace central planning of the economy by markets (although not to the same extent as in Hungary). However the liberalization of Soviet society led to economic breakdown, ethnic violence and the rise of disintegrating nationalisms. The radicals were divided among themselves, consisting of 'liberals' - essentially Moscow intellectuals who believed that the Soviet Union should emulate Western liberalism, various democratic socialist groups, and anarcho-syndicalists.[114] A number of independent populist movements also emerged, the most significant of which was that inspired and led by Boris Yeltsin. The growing chaos within the Soviet Union combined with the abandonment of communism and hostility towards Russians by Eastern European nations led to a resurgence of the conservatives, and a move towards the use of force to re-establish law and order. This culminated in the attempted coup in August, 1991. The defeat of this coup and the consolidation of Boris Yeltsin heralded the end of communism in Eastern Europe and the destruction of the Soviet Union.

What is the significance of this? The historical perspective offered here supports the diagnosis of the Soviet historian Yuri Afanasyev who argued that the current political and economic crisis must be seen as part of a greater problem. As he put it: 'The current crisis coincides with another, larger one, which began in the nineteenth century - the crisis, or perhaps the exhaustion, of this Eurasian civilization, with its egalitarian, statist ethic and its imperial forms and values. This civilization is no longer workable.'[115] The failure of Gorbachev must be seen as a failure of Soviet culture.

It is in the context of this history of Russian culture and of Soviet Marxism that the role of Marxism in the Soviet Union's relation to its environment must be understood and evaluated.

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114. On the various movements within the Soviet Union, see Boris Kagarlitsky, *Fairwell, Perestroika: A Soviet Chronicle*, tr. Rick Simon, London: Verso, 1990.

115. Yuri Afansayev, 'The Coming Dictatorship', *The New York Review of Books*, Vol. XXXVIII, No.3, January 31st, 1991, pp.36-39, p.39.

4

SOVIET ENVIRONMENTALISM AND THE FUTURE OF MARXISM

The effects of humans on the environment was not a significant issue in Russia until the reign of Peter the Great - when Russians set out systematically to appropriate Western technology to develop their economy. The effect of this was to reveal the reverence felt by Russians for nature. While Peter the Great was concerned with expanding the productivity of Russia's economy, he also acknowledged that there were limitations to this and that there was a need to conserve forests, and promulgated regulations accordingly. Though little action was taken on these regulations, developments within Russian thought indicate that this concern for conservation was widespread. The subsequent history of Russians' relationship to their environment can be seen as a conflict between a growing concern to develop science and technology to dominate nature to keep up with the West, and reactions against this based on a deep rooted reverence for nature. The concern to preserve the environment was manifest in the development of ecological thought which was frequently in advance of that in Western European and USA. This precocity was stimulated by battles over conservation, and the career of ecology is an index of the successes and failures of environmentalism in Russia.[1]

The orientation to nature of Russians involved in biological research is evident G.I. Dokhman's, *Istoriia geobotaniki v Rossii*.[2] Russians were far more inclined to see nature holistically and to recognize inter-relations within nature than Western European biologists. Ivan Komov was already treating the forest as a community in 1788, and in the early years of the nineteenth century Schelling's anti-reductionist philosophy of nature was received with great enthusiasm. This influence was reflected in studies of nature which presaged later developments in ecology. In 1835 Gilderman observed that nature prefers mixed forests to monocultures, and Semenov took forests as a unit in his study of forest self-renewal. In 1838 M.G. Pavlov argued that nature should be taken as a model for working out what crops should be rotated. In 1848 Teploukov noted that 'Virgin forests regenerate themselves continuously according to the laws of externally acting nature' and that, '[i]n the economy of nature, all trees are equally important, the willow, the aspen and birch ... are just as essential for natural forest renewal as the oak and ash.'[3]

An opposing tendency was inspired by French thought with its stress on empiricism, materialism and concern for practical applications. People influenced by this tradition, including biologists, evaluated science in terms of its technical benefits. Karl Rul'e (1814-1858), who in mid-nineteenth century had become the doyen of Russian zoology, under the influence of Geoffry Saint-Hilaire and Lamarck argued for the plasticity of species and

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1. This is the subject of Douglas, R. Weiner;'s superb study, *Models of Nature: Ecology, Conservation, and Cultural Revolution in Russia*, Bloomington: Indiana University Press, 1988.

2. G. I. Dokhman *Istoriia geobotaniki v Rossii*, Moscow: Nauka, 1973. The translations which follow have been made for me by Dr Douglas Weiner, at the time, a research fellow in the Center for Russian Research, Harvard University and at present (1996), professor of history at the University of Arizona. For this entire section I am deeply indebted to the work and advice of Professor Weiner.

3. Ibid. p.176 and 177.

conceived the notion that zoological knowledge could be applied to the acclimatization and domestication of new species into Russia.[4] Following the establishment of an acclimatization society in France in 1954 Rul'e and his supporters, most notably Bogdanov (1834-96) and Usov (1827-86), established an acclimatization society in Russia in 1857. This continued to grow in strength after the death of Rul'e and its members worked to acclimatize a number of new species into Russia. The golden age for acclimatization was the late 1850s and early 1860s. The movement's specific aims and general philosophy were supported by a wide cross-section of Russian society, from one of the Tsar's brothers and from ministers of the government to the nihilists of the 60s and 70s who were concerned to create a utilitarian paradise on earth through the scientific mastery of nature, and who accordingly promulgated the view that science must serve technology. While subsequent to this the movement suffered financial set-backs and slowly declined, efforts at acclimatization were still being made at the time of the communist revolution, most notably by Michurin.

However biologists influenced by *Naturphilosophie* developed a strong counter movement to the acclimatizers and their philosophy, and soon came to dominate the field. In 1863 A.M. Bazhanov, a Professor of Agronomy argued that people should look at natural meadows as a model for agriculture, providing humans had not interfered with the 'economy of nature' in these meadows. In the 1880s V.V. Dokuchaev developed soil science along lines inspired by the *Naturphilosophen*. He was extremely critical of Western geology which studied soil only for utilitarian reasons. In place of this he analysed the 'extremely close and everlasting inter-relationships between water, air, land, plant and animal organisms' as well as growth and changes in human society.[5] In 1883 Kravchinski argued that forests are communities, and in 1884 Ia. Medvedev used the adjective 'social' to describe forest structure for the first time. Kravchinski studied forests as communities, developing the distinction between pre-climax communities which pave the way for their own dissolution by changing the nature of the soil, and climax communities which sustain the conditions of their existence. This was more than two decades before Clements in USA developed similar ideas. While in the 1890s a group of scientists argued along mechanistic lines that the physical environment, and in particular the soil, determines vegetation; such thinkers were in a minority. In 1896 the term 'phyto-sociology' was coined, uniting the discipline studying the relationships between organisms under an explicitly anti-reductionist metaphor. Research proceeded rapidly and by 1898 P.N. Krylov had investigated the role of fauna in determining vegetation and examined the nature of the equilibrium which develops between different plants and local conditions. Between 1904 and 1910, G. F. Morozov used and fully elaborated the metaphor of 'organism' to describe plant communities, and developed a conception of abstract models as the means for analysing particular concrete communities. At the fiftieth jubilee congress of the acclimatization society in 1908, its new president, Kozhevnikov, elevated conservation to the status of paramount concern, and made not one reference to the need to acclimatize anything.[6]

Concern with nature was not confined to biologists, and it was a Russian (or rather, Ukrainian) Marxist who in the 1870s and 1880s first attempted to reformulate economic theory to accord with the second law of thermodynamics. Serhii Podolinskii (1850-91), a Ukrainian socialist and a friend of Lavrov, attempted to measure the input/output ratio in agriculture in terms of energy, beginning with the assumption that all physical and biological

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4. For a description of this movement from its origins until the revolution see Douglas Weiner;, 'The Roots of "Michurinism": Transformist Biology and Acclimatization as Currents in the Russian Life Sciences', *Annals of Science*, Vol.42 (1985), pp.243-260.

5. Billington, *The Icon and the Axe*, p.444.

6. Weiner, 'The Roots of "Michurinism"', p.258.

phenomena on earth are expressions of the transformation of usable energy from the sun.[7] Representing the task of labour as being to increase the accumulation of usable solar energy on earth, he attempted to combine an energy theory of value with the labour theory of value, and with only limited success, to gain Marx's endorsement for his project to give a foundation in natural science to the theory of surplus value. Podolinskii then used this framework to attack Social Darwinism, arguing that poverty is caused by social relations, and that 'in the countries where capitalism triumphs, a great part of work goes towards the production of luxury goods, that is to say, towards the gratuitous dissipation of energy instead of increasing the availability of energy.'[8]

At the beginning of the twentieth century with the growth of capitalism and with conservation being undertaken in the West, three orientations emerged in Russia towards environmental protection. The first group argued for conservation on utilitarian grounds, pointing out how non-renewable resources imposed limits to economic growth.[9] The second group, for whom Semenov-Tian-Shanskii was the most articulate spokesman, represented the romantic tradition which approximated the transcendentalists in USA. Semenov-Tian-Shanskii urged Russians to 'strive to realize ... not only a broad right for humans to live and develop in all of their spiritual variety, but also the right (upon which humanity now tramples) of all living things on Earth to their existence.'[10] However the most important group were the ecologists, led by Grigorii Aleksandrovich Kozhevnikov who was professor of invertebrate zoology at Moscow University. Kozhevnikov argued for the preservation of wilderness areas, *zapovedniki*, which could serve as standards of nature (*etalony*) against which human actions could be measured. This idea presupposed that existing ecosystems embodied a natural harmony and were to a certain extent self-regulating. By preserving such wilderness areas, the extent to which humans had disturbed the natural environment would be revealed - knowledge which would be invaluable for restoring areas damaged by humans to health.

Environmentalism After the Revolution

The tsarist regime did very little for conservation, so environmentalists were generally happy to see it overthrown. The leading Bolsheviks, especially Lenin, enthusiastically embraced conservation, and in particular the ideas of Kozhevnikov,[11] and a large number of game reserves, monuments to nature and *zapovedniki* were set up. Weiner wrote of this period in Russian history: 'Only in the 1920s did the first truly popular conservation organization - the All-Russian Society for Conservation - emerge, and it is only in those years as well that the beginnings were laid for the creation of planned network of *zapovedniki* throughout the USSR.'[12] While game management and forest protection were administered by the People's Commissariat of Agriculture, Lenin put the Commissariat of Education in charge of protection and conservation of the environment, and in particular, of

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7. On Podolinskii see J. Martinez-Alier; and J.M. Naredo;, 'A Marxist Precursor of Energy Economics: Podolinski', *Journal of Peasant Studies*, Vol.8, pp.207-224; and Juan Martinez-Alier, *Ecological Economics*, Oxford: Blackwell, 1987, Ch.3.

8. Cited ibid. p.48.

9. Bogdanov;'s concerns are evident in his novels *Red Star* and *Engineer Menni*. See Alexander Bogdanov, *Red Star: The First Bolshevik Utopia*, ed. Loren R. Graham and Richard Stites, tr. Charles Rougle, Bloomington: Indiana University Press, 1984 with an afterword on the subject 'Bogdanov's Inner Message', by Loren Graham.

10. Douglas R. Weiner, 'The Historical Origins of Soviet Environmentalism' in *Environmental History: Critical Issues in Comparative Perspective*, ed. Kendall E. Bailes, Lanham: University Press of America, 1985, p.383.

11. This is described in Douglas Robert Weiner;, *The History of the Conservation Movement in Russia and the U.S.S.R. from its Origin to the Stalin Period*, Ph.D. Thesis, Columbia University, 1983. *Models of Nature* was based on this.

12. Ibid. p.161.

the *zapovedniki*. Having no interest in resource exploitation and headed by Lunacharskii who was strongly sympathetic to conservation (and also to the program of the *Proletkul't* movement to create a socialist culture, including a socialist science), this proved an effective defence for the environment against those concerned with purely economic goals, in particular the Commissariat of Agriculture and the Commissariat of Foreign Trade.

It is clear from this that Lenin interpreted Marxism in such a way as to acknowledge the limitations of the environment, of the existence of dynamics within nature with which humanity must accord. His 'consciousness/spontaneity dialectic' was not understood by him as implying the possibility of the total subordination of nature to human designs. In fact it suggests that Lenin recognized the limitations of such efforts and the impossibility of such total control. However in his conflict with Bogdanov, Lenin not only rejected Mach's theory of knowledge, but also Ostwald's energetics. The domination by Lenin of Marxism virtually ruled out the possibility of assimilating Podolinskii's work to found the labour theory of value on an energy theory of value which might have related Marxist theory and environmental concerns in a systematic way, and led to a devaluation of all those socialist thinkers who had argued this position.[13] Furthermore, Lenin crippled the efforts of *Proletkul't* to create a new socialist culture, and promoted the acceptance of the instrumentalist rationality of capitalist societies. [14]

Lenin's environmental policies had considerable success. By late 1927, 29 *zapovedniki* with a combined area of about three million hectares had been established, with twelve more, having been promoted by the State Committee on Conservation, at some stage of environmental review.[15] There were also hundreds of *zakazniki* or game reserves, and hundreds more 'monuments to nature'. Taken together these territories had a combined area of 7 million hectares; and beaver, saiga, moose and egrets were moving away from the brink of extinction. Associated with reforms in education inaugurated by the revolution and carried out by the Commissariat of Education, there was also a considerable amount of research undertaken. From 1924 to 1928 the budget of the Astrakahn *zapovednik* was increased from 950 to 27,200 roubles, that of the Caucasus, from 2,120 to 74,920 roubles.

Ecological research undertaken on the *zapovedniki* resulted in major theoretical advances. I. K. Pachoskii studied the division of labour within plant communities, V.N. Beklemishev articulated theories on the structures of ecological communities and S.A. Severtsov pioneered the study of population dynamics among wild mammals. However the most important work was done by V. V. Stanchinskii. Stanchinskii was strongly influenced by energetics and the work of Vernadskii on geo-chemistry and on the concept of the biosphere, which in turn had been partly inspired by the work of Podolinskii. Developing such ideas, Stanchinskii worked out mathematical models based on his research to show the nature of energy flows, and in particular, trophic levels in eco-systems a full decade before similar ideas were developed in USA by Hutchinson and Lindeman.

These ecologists, and Stanchinskii in particular, conceived their work to be important both for the advancement of science, and for the development of agriculture. S.A. Severtsov showed the importance of ecology in working out the best way to exploit nature through his studies of population dynamics, and N.A. Troitskii pointed out how overgrazing reduced yields. When the Five Year Plan was formulated, the ecologists attempted to make a contribution, and they spelt out the significance of the work they were undertaking. At the First All-Russian Congress for the Conservation of Nature held in September, 1929, V.V.

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13. As Juan Martinez-Alier; has shown in *Ecological Economics*, Oxford: Blackwell, 1987.

14. On this see Arran Gare, "Aleksandr Bogdanov: Proletkult and Conservation", *Capitalism, Nature, Socialism*, Volume 5 (2), pp.65-94; and "Soviet Environmentalism: The Path Not Taken" in *The Greening of Marxism*, ed. Ted Benton, N.Y.: Guildford Press, 1996, pp.111-128.

15. See Weiner, 'The Historical Origins of Soviet Environmentalism', p.387f.

Alekhin attempted to show how removal of land to the *zapovedniki* would increase agricultural production. Stanchinskii argued that a truly planned economy functioning within the sustainable limits of the productivity of nature could be achieved only with the active participation of conservationists. He pointed out how biocenotic research could aid in such areas as biotic protection, which would obviate 'the use of pesticides, which often contain toxic substances ... that not only kill the pests but cause injury to human and to useful organisms.'[16] His concern for the applicability of ecological research was manifest in his proposals for the siting of *zapovedniki*. He argued: 'We must select for *zapovedniki* the most typical territories which will have the greatest economic significance as natural *etalony* ... The network of *zapovedniki* must be linked with the Five Year Plan.'[17] It was also proposed at the congress that an inventory of all natural resources in the Russian Soviet Federal Socialist Republic be made, and it was argued that the conservation organizations must be able to review Plan targets and monitor Plan fulfilment.

Stanchinskii's arguments carried the day, and the Congress resolved:

> The economic activity of man is always one form or another of the exploitation of natural resources ... The distinction and tempo of economic growth can be correctly determined only after the detailed study of the environment and the evaluation of its production capacities with the aim of its conservation, development and enrichment. This is what conservation is all about.[18]

The ecologists became trenchant critics of the implementation of collectivization. To the project of increasing harvests by 35% A.A. Teodorovich exclaimed: 'without conservation, without rational ... use of natural resources. there cannot be any talk about increasing the harvest.'[19] N.N. Podiapol'skiii;, an agronomist warned in March, 1930 that the tractor and the combine would be environmentally destructive, imposing a uniformity hitherto unknown. And the ecologist .i.Kashkarov; slated the collectivization of traditional societies, arguing that:

> ... the entire life cycle of the Kirghiz is determined by ecological considerations ... The Kirghiz is the product of his habitat: His annual cycle of activity and his nomadic wanderings are dictated by ecological considerations, his psychology and practical philosophy of life as well.[20]

Environmentalism Under Attack

However this was the period of Cultural Revolution associated with the struggle to raise economic output. The relative status of spontaneity and consciousness was inverted with the rejection of the N.E.P., and the image promoted was that of the 'Struggle Against Nature'. Typical of the new orientation of this period were the sentiments of a book written for students by a young Soviet engineer, M. Ilin. With titles of chapters such as 'Conquerors of Their Own Country', 'The Conquest of Water and Wind', 'On the March for Metal', and the 'The War with the Kilometres', Ilin pronounced:

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16. Cited by Weiner; in *The History of the Conservation Movement...* p.334.
17. Cited ibid. p.338.
18. Ibid. p.348.
19. Ibid. p.353.
20. Ibid. p.377.

> Within a few years all the maps of the U.S.S.R. will have to be revised. In one place there will be a new river... in another a new lake... A great new power has appeared in Nature - the power of human labour. Not only the blind forces of Nature, but also the conscious, organized, planned labour of man now fashions rivers and lakes, plants forests, and transforms deserts, moderates and accelerates the flow of waters, creates new substances and new species of plants and animals.[21]

The achievement of such ends was seen not as in the West as the subjugation of an essentially passive nature, but as a mighty struggle against an aggressive opponent. As Ilin wrote in relation to a section entitled 'The War with the River': 'Man must fight the river, as the animal-tamer fights wild beasts.'[22] This was not a propitious cultural environment for the promotion of environmental causes.

Criticism of environmentalism began at the Conservation Conference in 1929. Some delegates could not see why all land should not be used for economic production and conservationists were labelled the 'old bourgeois professoriat'. One enthusiastic member of the Young Naturalist Organization declared that 'The naked idea of preservationism is organically alien to active youth and in particular to Soviet Youth, seized ... with the enthusiasm of socialist construction and reconstruction.'[23] and A. Kiselev argued that under the prevailing economic conditions, science for science's sake would not do, and that conservationists should not look on *zapovedniki* as sanctuaries for birds and animals. Conservation was also attacked in the press. On 30th June, 1930 a letter from V.V. Karpov was published in the journal of conservation *Okhrana prirody* attacking the organization for conservation. Karpov argued:

> It is clear ... that the old theory of conservation of nature for the sake of nature itself ... an idea which reeks of ancient cults of nature's deification ... stands in sharp opposition both to our economic as well as our scientific interests that there is no place for it in our land of socialism-in-the-making...[24]

Ecology first came under attack from the Deborinites. The Deborinites charged the mechanists with reducing everything to the conservation and transportation of matter and energy. Following this attack Kozhevnikov was deprived of his position at Moscow University and a number of other ecologists were upbraided for promoting ideas inconsistent with dialectical materialism. Kashkarov for instance was seen as being too mechanistic in his assessment of the situation of Kirghiz. V.N. Liubimenko was attacked as reductionist for arguing that 'Social problems are problems of a biological character, and therefore we must seek out biological laws which govern social phenomena and the life of all natural communities alike.'[25] It was argued that humans are cultural beings and cannot be reduced to the laws of biology. However Bugaev, the Deborinite who focused his attention on ecology, did not want to demolish it but to ensure that it was consistent with Marxism. Most ecologists were able to make the appropriate modifications to their theories. Stanchinskii took special pains to stress the historical, dynamic and dialectical nature of his concept of biocenosis, replacing the static notion of 'equilibrium' with the more acceptable 'proportionality' and emphasising the continuous self-creation of the biocenosis. He depicted

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21. M. Ilin, *New Russia's Primer: The Story of the Five-Year Plan*, tr. George S. Counts and Nucia P. Lodge; Boston and New York: Houghton Mifflin Co., 1931, p.141f.

22. Ibid. p.35.

23. Cited by Weiner;, *The History of the Conservation Movement*..., p.279.

24. Cited ibid. p.424.

25. Cited ibid. p.373.

this self-creation of the biocenosis as emerging from interactions between both its components the abiotic environment, with the result that new syntheses were continually arising in successional series.[26]

Furthermore the philosophy of the Deborinites made it possible to continue to justify conservation. Humans were seen as part of nature and the biological realm was seen as having laws irreducible to physical laws to which humanity must accord. Most importantly, Engels had already spelt out the implications of this in the *Dialectics of Nature*, the book the Deborinites revered.

But with the rise of I.I. Prezent and his associates, community ecology and the conservation cause came under sustained attack. Rejecting all science not immediately serving the development of technology, and committed to the wholesale importation and acclimatization of exotic species, they set out to demolish community ecology as a discipline standing in the way of their projects. Their general aim was expounded by Kashchenko:

> The final goal of acclimatization, understood in the broad sense, is a profound rearrangement of the entire living world - not only that portion which is now under the domination of man, but also that portion that has still remained wild. All living nature will live, thrive, and die at none other than the will of man and according to his designs. These are the grandiose perspectives that open up before us.[27]

To begin with they began attacking the holism of ecology. V.L. Komarov argued in his *The Vegetation of the USSR and Adjacent Countries* which appeared in 1931 that all reference to 'plant communities' should be expunged from biology. The conflict came to a head after the 1931 Anti-Drought Congress and the 1932 Faunistics Conference.[28] Prezent called upon the Soviet biologists to become 'engineers' and 'inventors' in a top-to-bottom transformation of nature. Among the first of the projects developed by his minions was the 'General Plan for the Reconstruction of Economically Important Fauna of European Russia and the Ukraine' drawn up by B.K. Fortunatov directed towards wholesale acclimatization of exotic species. When this plan was outlined at the All-Union Congress of 1933, it was attacked by Stanchinskii, Severtsov, Kozhevnikov and other distinguished figures. Their holistic views on ecology also led them to oppose projects that constituted the very centre of socialist reconstruction. For example projects to construct enormous hydroelectric installations were opposed by hydrobiologists, and projects to extend monocultural agriculture to the virgin steppes were opposed by zoologists and phytocenologists. Led by Prezent, ecologists were denounced as 'traitorous' opponents of the heroic projects of the five year plans.

By mid-1932, Prezent and his supporters had succeeded in closing down Stanchinskii's pathbreaking research at Askania-Nova, and converting the reserve to the All-Union Institute for Agricultural Hybridization and Acclimatization of Animals. By 1934 Stanchinskii and his supporters had been driven from Askania and vilified as 'mongrels of society' and 'saboteurs'. At the Academy of Sciences' Ecological Conference of January, 1934 Prezent explained that the holistic conception of the biocenosis implied natural limits to the ability of people to transform nature and was therefore in opposition to socialist construction. Following this, Prezent succeeded in putting an end to almost all the original theorizing on ecology in the Soviet Union: Alpatov's work on the role of density in regulating animal populations, Severtsov's statistically based attempts to correlate fertility with longevity in animals, and Gauze's experiments in population dynamics which led him to postulate the

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26. Douglas R. Weiner, 'Community Ecology in Stalin's Russia', *Isis*, Vol.75, 1984, pp.684-696 p.692.

27. Cited by Weiner, *The History of the Conservation Movement*... p.517.

28. For a description of this see Weiner, 'Community Ecology in Stalin's Russia', p.691f.

competitive-exclusion principle for which he is still known. And he aborted the publication of Stanchinskii's major work.

The demise of ecology did not coincide with the undoing of all that had been achieved by the environmentalists. Though the head of the Commissariat of Education, Lunacharskii, lost his position in 1929, a large number of Bolsheviks of the second order continued to support conservation issues. The deputy director of the Main Administration for *Zapovedniki*, Vasilii Nikitich Makarov actually managed to expand the network of *zapovedniki*. But there was a slow whittling away at the role of the *zapovedniki* associated with a general increase in environmental destruction, much of it due to the acclimatizers. Then in 1951 and 1952 there was a general attack on the *zapovedniki*, an attack in which the number of reserves was decreased from 128 with an area of 12.5 million hectares to 40 with an area of less than 1.5 million hectares.[29]

The Institutionalization of Anti-Environmentalism

The fate of the ecologists symbolized the general state of environmentalism in the Soviet Union. Some associated movements, such as the movement of the architects to decentralize housing and industry, maintained their positions for longer, but they were all ultimately defeated.[30] Moscow was rebuilt in stone, and people were packaged in fourteen storey apartment blocks. But what is most important from the point of view of ideological analysis is which ideas are incorporated into institutions. The defeat of the ecologists meant that the forms of thinking which came to underlie the Five Year Plans did not take into account the limits of the environment. This failure was consolidated with the liquidation of economists and by an adherence to the labour theory of value. Taken out of the context of the analysis of capitalist society and in a society in which economic ends were conceived of not in terms of reduction of necessary labour time but in terms of the development of industrial capacity, the labour theory of value led to the contributions of nature, capital and services being ignored.[31] Nature was seen as a free gift, and land, water and minerals were not counted as costs of production. The Five Year Plans incorporated the ideas promulgated by the ideologists such as Ilin and Prezent in support of Stalin's policies in the 1930s. And as institutionalized, they have taken pre-eminence over all other forms of thinking. They have presupposed a conception of humanity struggling to subdue nature, and have measured success in terms of material production and the rate of increase of this production.

These developments were associated with a reinterpretation of the meaning of socialism. While Lenin had thought of his policies as backtracking to develop the conditions for the achievement of socialism, Stalin defined his militarisation of society in the service of economic development as socialism achieved. Soviet Marxism was formulated as a technological reductionism underpinned by a Neoplatonic eschatology, with history being understood as a progression measured in terms of the development of the material base, that is, the means of production of societies. Stalin presented socialism as superior to capitalism by virtue of its greater capacity to develop the means of production. After the Second World War this came to be encapsulated in the slogan 'Catch up and pass the United States', and later, Khrushchev's claim that the Soviet Union with its faster growing economy would bury USA.

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29. Weiner, 'The Historical Origins of Soviet Environmentalism' p.397f.

30. See S. Frederick Starr;, 'Visionary Town Planning during the Cultural Revolution' in Fitzpatrick ed. *Cultural Revolution in Russia: 1928-1931*, pp.207-40.

31. See Gustafson;, *Reform in Soviet Politics*, Ch.4.

The destruction of nature wrought in this process was not measured or considered in the criteria by which the Five Year Plans and economic growth were judged. At the same time these Plans gave enormous power to those sectors of Soviet society involved in the development of the means of production. In particular, *Gidproekt*, the hydro-power engineering agency was almost unmatched for 'arrogance and seemingly unassailable political strength.'[32] The power of this agency, which through the use of convict labour was closely associated with the KGB was only curtailed in the 1950s when it was incorporated into the Ministry for Power and Electrification. However other such large scale organizations had entrenched powers which made them extremely difficult to regulate.

Although there were variations with the rise to power of different power groups, the direction in which Soviet socialism developed varied little. The central focus was on growth of material production. It was associated with the use of material incentives to get people to work harder, and the development of highly differentiated scales of income. As in the West, money became the measure of people's participation in historical progress, and the success of Soviet society was defined in terms of the commodities available to people on the market. Workers sold themselves as labour power to State enterprises, and the built-up environment was organized for the efficient movement of commodities, of labour power to and from work, and for the recuperation of labour power. The managerial elite of the West and the Soviet Union had essentially the same orientation to people: to control them efficiently, and this led to similar developments in the West and the East. As in the West, the ruling elite of the Soviet Union committed itself to the development of nuclear power rather than decentralized forms of energy production, and promoted distinctive consumption, rapidly expanding the number of privately owned cars despite the excellent public transport available. These developments were associated with increasing levels of corruption, what Brezhnev in 1979 called 'negligence, lack of responsibility and stupid bungling'[33], and the loss of meaning in the lives of Soviet citizens which expressed itself, among other things, in the highest incidence of alcoholism in the world. It was also associated with the reintegration of the Soviet Union into the capitalist world economy.

The New Environmental Movement

A new environmental movement began to develop as soon as Stalin died, and gained momentum in the sixties. Membership of the main environmentalist organization, the All-Russian Society for Conservation (VOOP) grew immensely, and has continued to grow, from 916,000 in 1959 to 32 million in 1981, along with other, more vigorous environmentalist groups.[34] With Stalin's death Lysenko came under attack, ecologist-activists inaugurated a war of liberation for the *zapovedniki*, and they demanded a return to fundamental ecological research in the reserves.[35] By 1961 this movement had increased the areas of the reserves to 6,360,000 hectares. In 1967, the Ministry of Agriculture finally got around to banning acclimatization in its reserves. The environmental movement manifest itself most dramatically in the early 1960s with a storm of protest over the building of paper and pulp industry on the shores of Lake Baikal, a protest which had some success in controlling economic activity. In the seventies there also emerged strong environmental sentiments associated with the 'village movement,' which depicted rural society as one of the

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32. Ibid. p.54.

33. Cited by Nigel Harris in *Of Bread and Guns*, Harmondsworth: Penguin, 1983, p.176.

34. See Douglas R. Weiner;, 'The Changing Face of Soviet Conservation', *The Ends of the Earth: Perpsectives on Modern Environmental History*, Cambridge: Cambridge University Press, 1988, pp.252-273.

35. Douglas R. Weiner;, *Prometheus Rechained: Ecology and Conservation in the Soviet Union* unpublished paper, 1987, p.8f.

great sources of virtue and strength in Russian society. This has found expression in literature. In general, the village, organic unity and nature are celebrated. For instance Boris Vasiliev's work *Don't Shoot at While Swans!* published in 1973 has the hero, Egor, exclaim: '...we are orphans. We are not at peace with our mother earth; we have quarrelled with our father the forest, and, with our sister the river, there has been a bitter separation.'[36] The theme of this work is the ending of innocence and wholeness when the city intrudes into the village, and throughout nature is exalted at the expense of technology. Each of these developments can be seen as part of a struggle to elevate the status of spontaneity in relation to the status of consciousness, and to free life from the rigid central control which had been the legacy of Stalin's reign.

But for the most part, this movement was only effective when its ends coincide with the economic and political aims of the government. The most effective pressure for environmental reform has come from the realization that environmental destruction is limiting present economic growth, and most of the pressure for taking account of environmental problems was utilitarian. For instance the debate over Lake Baikal were largely framed in terms its role as a filter of water.[37] The conservation program which was mounted was 'not a program designed primarily to preserve wilderness or protect natural beauty but to protect public health and facilitate further economic growth (particularly of irrigated agriculture) in the most highly developed regions of the country.'[38] The idea that nature is significant in itself independent of human goals was rejected by Soviet philosophers.[39]

In the mid-1970s the state of the world environment became a major focus of attention, and in the Soviet Union much was written on this topic. That which was published in translation was, for the most part, directed against capitalism, arguing the necessity for its replacement by socialism. The ecological crisis was portrayed as due to the way 'material production operates as production for the sake of profit' in capitalist societies and as 'a component of the general crisis of capitalism at today's stage, and one of its manifestations.'[40] Then when it came to the Soviet Union, environmental problems were presented as though they were merely minor and correctable malfunctions of socialism due to such factors as the attitudes of the managers of industries, or of particular workers. However within the Soviet Union the significance of environmentalism went far beyond this. It became one of the most active areas of intellectual debate, with some thinkers radically departing from orthodoxy in their efforts to confront the issues. The only real limitations were that the superiority of socialism over capitalism could not be questioned.

The most important feature of this debate was the change in focus in Soviet environmentalism from particular issues to global issues. Whereas the ecologists of the 1950s and the 1960s had echoed the ecologists of the 1920s with their focus on preserving ecological communities unsullied by human interference, this had proved indefensible. Their opponents were able to show the impossibility of identifying ecological communities as pristine, discrete, self-regulating ecological communities and of conceiving of nature in abstraction from human activity. To counter these arguments the proponents of environmentalism shifted their focus to the conditions of survival of populations of species living in particular areas. Focussing on these conditions led to concern with increasingly

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36. Cited Clark;, *The Soviet Novel*, p.247.

37. Pryde, 'The "Decade of the Environment" in the U.S.S.R.' p.275.

38. Gustafson, *Reform in Soviet Politics*, p.51.

39. See Yu. A. Sholenko in 'Human Ecology and Social Consciousness' in Ursal ed. *Philosophy and the Ecological Problems of Civilisation* p.398f.

40. I.T. Frolov, 'The Marxist-Leninist Conception of the Ecological Problem', Ursal ed. *Philosophy and the Ecological Problems of Civilisation*, p.43.

broader contexts, and ultimately, to the state of the world. The basic framework for the new analyses of environmental problems was the conception of humans as part of nature, but with their own unique laws of development. The two concepts which were most important in developing these analyses were the 'noosphere' developed by the geologist Vernadskii, and the 'biotechnosphere' developed by the biologist Khil'mi. According to Vernadskii, the noosphere is the 'final stage of evolution' in which 'man, taken as a whole, becomes a powerful geological force. And before him, before his thought and labour, stands the question of the rebuilding of the biosphere in the interests of freely thinking humanity as a unified whole.'[41] According to Khil'mi, the initial biosphere and urban surroundings created by man form a new system,' a symbiosis of nature and technology which includes 'the physical surroundings, living organisms, and technical equipment, in particular - the large-scale structures, transforming the atmosphere, the hydrosphere, and the lithosphere of the Earth.'[42] On this basis efforts were made to elaborate concepts to analyse humanity in the context of nature.[43]

The conclusions drawn on the basis of these ideas were often that more centralized technological control was needed. Ecology was seen to imply complex interdependence, and the only way to capture and manage this is through engineered, closed cycle cybernetic systems on a large scale. While most Soviet scholars rejected the complete replacement of the self-regulating features of the biosphere by a complex of technical mechanisms, there were those whose commitment to the underlying eschatology of Soviet Marxism led them to take the principle of subordinating spontaneity to consciousness even to this ultimate stage.[44] For example E.V. Girusov argued that human progress has so far passed through three stages: firstly the overcoming of natural limitations of men's use of the material of nature through the development of tools; secondly the overcoming of the natural limitations of the use of energy resources; and thirdly, the stage we are going through in which the constraints of natural information processing on production are being overcome by the development of artificial means of processing information. He then projects the fourth stage, a new revolution in human history as the 'ecological revolution':

> The ecological constraint is a very real one. It consists in the limiting values of natural resources, including the limits of environmental pollution, the limits of territory, and the limits of biospheral equilibrium. In the long run removal of all these constraints will constitute a transition to artificial means of ensuring all the natural conditions of men's existence up to and including artificial means of maintaining equilibrium of the a, which means that we will have to pass, in that case, to what may be called artificial reproduction of the environment.... [This] will be a matter of a radical change in the very mode of society's development. In place of the mode spontaneously built up there will be a mode of development consciously controlled in accordance with scientifically developed theories of progress.[45]

Other writers with similar commitments have called for the industrialization of outer space.

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41. Cited Joan DeBardeleben;, *The Environment and Marxism-Leninism: The Soviet and East German Experience*, Boulder: Westview Press, 1985, p.93.

42. Loc. cit.

43. See for example Yu. P. Trusov, 'The Ecological Approach and Problems of Moulding the Noosphere' and I.P. Gerasimov 'Methodological Problems of the Ecologising of Modern Science' in Ursal ed. *Philosophy and the Ecological Problems of Civilisation*, pp. 58-78 and 189-206.

44. The dominant attitude is typified by E. Fedorov who concludes his book *Man and Nature*, Moscow: Progress Publishers, 1980 with a call for a transformation 'From Spontaneously Developing to Consciously Directed Civilization'.

45. E.V. Girusov, 'The Normative Character of Ecological Knowledge' ibid. p.215.

Other significant ideas on the environment were developed in geography. Geography had a major place within the Soviet academic world, and geographers were among the first to concern themselves with environmental problems. In doing so they went against fundamental tenets of their discipline. Under Stalin, economic and physical geography were held to be distinct, as the laws of society were held to be irreducible to the laws of nature. This division was attacked in 1960 by Anuchin on the basis of a perceived ecological threat. Though his ideas were attacked as 'bourgeois determinist', (while Anuchin countercharged that his opponents were 'voluntarists' i.e. Stalinists) it gained official favour, an indication that at least some elements of the Soviet leadership were unconvinced by the technological optimism of scholars such as Girusov and were concerned with the limits of conscious control revealed by environmental problems.

The scholars who were most important for their influence on immediate practices however were the economists. Most of these remained wedded to the labour theory of value and rejected the idea that nature has any value until labour is added. What was disputed was the character of labour expended to make resources usable for production. While the labour theory of value had some good effects in that the attention paid to the real productivity of labour brought to light the deleterious effects of environmental destruction on the economy, it also had some negative features. One negative consequence was that there was a bias towards material production in evaluating economic success. But more importantly the labour theory of value meant that until recently there were no direct charges for resources. It was affirmed in 1968 that the 'Use of land free of charge is one of the greatest achievements of the Great October Socialist Revolution' and it was not until 1982 that charges were introduced for water.[46] While DeBardeleben has pointed out that there are a number of indirect ways by which resources have been charged for, these have still been inadequate to force efficient use of them.[47]

However some economists attempted to strike out in new directions. The most radical position in the field was taken by P. G. Oldak. Oldak along with some other economists argued for the establishment of the field of bioeconomics to 'study the productive environment - to study the relationship between rates of growth, level of technology, and the quality of the environment', and he rejected the simple coordination of scientific disciplines as inadequate for this task.[48] Bioeconomics was to be a completely new discipline. Using systems analysis, Oldak himself tried to demonstrate the applicability of this modelling to the analysis of the optimal use of Lake Baikal. He also proposed replacing the notion of 'gross social product' by 'gross social wealth' as the basis for evaluating the economy. Social wealth was defined as: (1) accumulated material wealth; (2) the flow of services; (3) accumulated knowledge; (4) the condition of reproduced natural resources; and (5) the condition of the health of the population. As Joan DeBardeleben wrote of this:

> Oldak clearly intends a nearly revolutionary critique of existing economic concepts, a tendency expressed not only in regard to environmental issues but also in his demand for inclusion of social activities like education and scientific research in gross social wealth. He explicitly rejects the notion underlying the productive-unproductive distinction - the idea that material production serves as the basis for expansion of non-material services. On the contrary, Oldak sees knowledge as the decisive element of natural wealth.[49]

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46. Cited DeBardeleben;, *The Environment and Marxism-Leninism*, p.244.

47. Ibid. Ch.8, 'Natural Resource Pricing and the Labour Theory of Value'

48. Ibid. p.116.

49. Ibid. p.214.

But while Oldak was taken more seriously by his colleagues than comparable economists in the West (N. Georgescu-Roegen or H. Daly) he still had little influence on government policy.

Other thinkers made radical departures from the prevailing doctrine by basing their environmental critiques on the humanism of Marxism-Leninism. For instance I.T. Frolov condemned capitalism for being uncoordinated 'either with the needs and wants of a real individual or the possibilities and constraints of external nature.' The consequence of this is that it 'leads to man and society beginning to relate to material production (i.e. the process of the "exchange of matter" between man and nature) as to a field of "absolute freedom" passing into gross despotism, in which nature functions as a defenceless, passive material and man as its omnipotent "demiurge".'[50] In a later paper, written with Viktor Los, he came to the revolutionary conclusion that:

> Under the influence of the crisis nature of the developing socio-ecological situation man is gradually moving away from the illusion of anthropocentricism and rejecting the traditional hegemonistic relationship to nature. His thinking has ceased to limit itself to notions centring around needs and designs of him and him alone. His activity is acquiring an ever broader a orientation, and his thinking is drawn to 'biocentrism.'[51]

This clearly involved the rejection of the striving for total power which is characteristic not only of those committed to mechanistic materialism in capitalist societies, but also to Marxist-Leninism dominated by a Neoplatonic eschatology formulated in terms of the struggle to totally subordinate spontaneity to consciousness. In opposition to this it implies the ideal of achieving a situated freedom in place of the ideal of an absolute freedom which must inevitably turn against itself by reducing everything: nature and people, to instruments for this abstract ideal; and Frolov also argued for the need to reintegrate both aesthetics and values into our way of relating to the world. He argued against thinking of people in the present as mere means to the achievement of some superior future state. Frolov's position also involved some acknowledgement of a convergence between the problems of the East and the West which not only went against the orthodox affirmation of the qualitative superiority of socialism, but could be seen as an effort to divert the struggle between social systems to a confrontation with what he regarded as a world problem. He suggested that international cooperation may further 'a general rapproachment of peoples and the strengthening of peace in the world.'[52]

The thesis of a convergence between East and West was upheld even more radically by other scholars, notably Rychkov and Arutiunov. Arguing for a convergence in both problems and cultures, these scholars rejected the model which reduced culture to a superstructural aspect which must be explained in terms of the forces and relations of production. Arutiunov went so far as to argue for the need to undertake ethnic studies to find out which cultures are ecologically sound. He attributes much of environmental destruction to 'ritual-prestige consumption.'[53]

These published intellectual debates were far more significant within the Soviet Union than similar debates in the West would be. They were much more closely related to what the Soviet leadership was actually thinking. Furthermore, the way environmental problems were addressed made their arguments more effective. There was not the separation of values and facts, of romantic idealists and realists, characteristic of the debates on the environment in

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50. Frolov; 'The Marxist-Leninist Conception of the Ecological Problem' p.43.

51. Cited by Weiner in *Prometheus Rechained*, p.25.

52. Cited by DeBardeleben;, *The Environment and Marxism-Leninism*, p.125.

53. Ibid. p.84.

the West. This was particularly important as having an explicit ideology underpinning the legitimacy of the government made the legitimacy of the ruling élite far more vulnerable than Western ruling classes. Therefore the fact that such departures from orthodoxy were aired indicated the seriousness with which the Soviet leadership were taking environmental problems.

However a major part of this could have been an effort to retain legitimacy in the face of a decline in economic growth which had previously been the main basis of their legitimacy. And when all the works in relation to environmental problems are examined, the radical forms of environmentalism were exceptional. The positions argued for were, at least until the rise of Gorbachev, still predominantly in accordance with the Neoplatonic Prometheanism of orthodox Soviet Marxism. There remained the emphasis on the development of material production as the subjugation by consciousness of spontaneity as the principle of the history of humanity, and on the need to retain or increase central control of society. While there were some individuals who challenged the extent to which consciousness can be made to prevail over spontaneity, the majority of Soviet environmentalists appeared to believe that environmental problems could be solved through technology.

Furthermore this orientation was institutionalized, making it difficult for environmentalists with opposing points of view to have any impact (although it is noteworthy that environmentalists were more successful in Estonia than elsewhere, revealing the extent to which failure is a matter of culture). The Soviet leadership defined themselves as consciousness striving to dominate spontaneity, as a central decision-making apparatus controlling society and nature. The idea of decentralizing power to deal with environmental problems was consequently anathema. And with a theory of history as progressive technological mastery of society over nature combined with the obvious failure of past central directives to prevent environmental destruction, there was a constant tendency to look to massive technological projects for which such centralized control of nature was appropriate as a means to deal with environmental problems. This included the project of diverting northward flowing rivers to the south.

Also, the leadership was deeply committed to the maximum growth of material production, associated by them with both international competition and meeting consumer demands, as a means to maintain their legitimacy. The criterion for success in all areas of the economy was meeting the production schedules of the Five Year Plans. It was for such successes that people were rewarded. As a leading Soviet economist explained: 'Since the economic mechanism is above all oriented toward the fulfilment of traditional plan indicators, the enterprises are not interested in the realization of nature-protecting legislative acts and plan targets of the regulation of nature-protection.'[54]

What the environmentalists were up against was manifest in the struggle for Lake Baikal. As I pointed out in Chapter 8, the environmentalists were partly successful in limiting the development of the original polluting industries. But the struggle revealed far more fully the way economic organizations were able to over-ride directives even from the Communist Party, and were frequently able to ignore legal regulations with impunity. No success achieved by the environmentalists was final, and the economic managers were ready to continue on their path as soon as political and public pressure eased. And other industries were being developed which were even more destructive to the lake without any correspondingly outcry from the public.

While Soviet environmentalists attributed great theoretical importance to closed-cycle and low waste technology, it was difficult to get even these adopted. Since the amount of resources used did not enter into the criteria by which managers were evaluated, and since it was impossible for managers to develop uses and customers for their by-products, there was

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54. Cited ibid. p.151.

little incentive for them to consider such options. The attempt to ameliorate these conditions through the introduction of fines for environmental damage had even less effect than such extrinsic environmental regulation in capitalist economies. This was illustrated in the case of timber cutting. As Pryde wrote:

> No manager objects to paying a few hundred or thousand rubles of the firms money in fines, if the extra timber gained enables his firm to overfill its quota, thereby bringing in ten times the amount in bonuses payable to the individual employees themselves.[55]

And while fines were later increased and laws enforced with greater vigour, the overall effect was negligible (again with the exception of Estonia, where people had traditionally been more law-abiding).

So, it must by concluded that Soviet environmentalists were no more successful than Western environmentalists. Ecologically based conceptions of how the economy should be organized which were suppressed by Stalinism were only just beginning to be redeveloped, and had only minor influence. The aspects of Marxism on which such thinking could find support, those which accorded with the process conception of being, remained subordinate to Marxism's Neoplatonist and mechanist aspects. Dialectical materialism was anti-mechanistic and closer to process philosophy, thus providing a better ontological foundation for anti-reductionist ecology. But its liberating potential was almost completely neutralized by the reduction of science to a means for developing technology in accordance with the technological determinism of historical materialism. And this debasement of science was embedded in an economic, social and political order which embodied the instrumentalist orientation to both nature and people as fully as the West.

Before the ascent to power of Gorbachev, it was clear that the structure of Soviet society was inimical to facing up to environmental problems. As Nigel Harris argued in 1983: 'The blunt instrument of the State and a monopoly of power, so effective, if so cruel, in bludgeoning crude output out of an obdurate nature, now becomes a powerful obstacle ... [T]he physical planning targets which pay little attention to the relative scarcity of materials militate against economy...'[56] With Gorbachev's *perestroika*, this situation changed. The environmental movement played a significant part and symbolized the opposition to the project of total control by consciousness over spontaneity, and there was a close association between intellectuals such as Frolov and the struggle within the Communist Party which culminated in the rise to power of Gorbachev. Gorbachev himself expressed strong concern for environmental issues, and Frolov was later appointed chief editor of the Communist Party's theoretical journal *Kommunist*. The exaltation of spontaneity over conscious direction involved a determined attack on bureaucratic inertia with its heavy handed approach to the environment. Perhaps the biggest success for environmentalists was the shelving of plans to divert rivers flowing North to the South. The 'progressives' of the Popular Front, the social democrats and independent communists made environmental problems a central issue.

However it was the push for a market economy which dominated *perestroika*, driving the Soviet economy towards a Western style, market driven consumerism. And not the consumerism of the core zones of capitalism, but of the Third World. As Kagarlitsky pointed out:

> The guardians of old ideas can talk about the restoration of capitalism, but the fact is that this social milieu is incapable either of creating from within itself a modern Western-style bourgeoisie or of 'building' developed capitalism. The most of which it is capable is

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55. Pryde, *Conservation in the Soviet Union*, p.99.

56. Harris, *Of Bread and Guns*, p.176.

> forming a dependent, poorly developed society with a parasitic ruling class combining all the negative features of both the 'Eastern' and 'Western' models... We have yet to realize fully that we are needed by the centres of contemporary advanced capitalism only as a supplier of cheap resources and as a massive (one sixth of the world!) rubbish heap for filthy technologies...[57]

Despite expressions of concern for the environment, *perestroika* did very little for the environment.

Conclusion

What, then, can be concluded from this examination of Marxism in general and Soviet Marxism in particular in relation to the environment? To begin with, it is necessary to accept that Marx's work remains the single most important critical analysis of the distinctiveness, dynamism and destructiveness of capitalism. As part of this analysis, Marx revealed the inevitable environmental destructiveness of capitalism to the environment, and he tried to point the way to overcoming this system and its nihilistic modes of thinking. Some of these insights have since been developed further, and those influenced by his ideas have revealed the extent to which the dynamics of capitalism are responsible for the massive destruction of the environment in the Third World. It is clear from their work that an unregulated market will lead to enormous suffering and destruction in the short term, and total disaster in the long term. It will only by overcoming the fetishism of commodities, by controlling of the dynamics of the market and creating a socio-economic formation in which people and nations are not forced into continual competition with each other for economic survival, that it might be possible to live without destroying the conditions for humanity's continued existence.

However Marx under-estimated the limitations of the natural environment, and those who have used Marxist notions to analyse environmental problems have been marginal to the mainstream of Marxism. The failure to take up and carry through the initiative of Podolinskii in reformulating the theory of value to ground it in physical reality has meant that most Marxist thought has not taken the environment into account in any systematic way - with disastrous consequences for the environment in communist countries. As Juan Martinez-Alier argued:

> The ecological view of the conditions of human existence could have been easily connected with Marxism through an adequate definition of productive forces or productive powers. This was not done by Marx. Despite the superficial similarity between an ecological approach and an approach in terms of 'reproduction' of social systems, there has been a long-standing divorce between Marxism and ecology.[58]

The best framework of analysis incorporating Marxist notions to study environmental destruction, that of Stephen Bunker, broke fundamentally with many traditional Marxist ideas. To begin with, Bunker defended an energy theory of value in opposition to the labour theory of value, arguing:

> A labour theory of value excludes from consideration the usefulness to continued social reproduction of energy transformations in the natural environment. Nor can it take into

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57. Boris Kagarlitsky, *Fairwell; Perestroika*, London: Verso, 1990, p.204.

58. Juan Martinez-Alier, *Ecological Economics*, Oxford: Blackwell, 1987, p.5.

> account the value of ideas, beliefs, and information which underlie human social organization. These and all other human experiences are formed out of previous dissipation of energy. ... Measures of energy and matter and their conversion, however, touch everything which is humanly useful. Rather than separating human activity from other ecosystemic processes, these measures allow us to see the interdependencies between human energy use and energy transformation processes which proceed naturally, i.e., without human intervention.[59]

From this starting point, he then went on to attack the blindness of various Marxist theories of development and underdevelopment:

> All these theories have assumed variants of labour theories of value; all have extended economic models based on the false notion that production systems in some sense are self-enclosed and can reproduce themselves; none has taken into account that production systems require extraction systems; that extraction systems subservient to present forms of industrial production inevitably deplete their own resource bases; and that this process is finite as the limited stock of matter and energy which is or will become convertible to human uses.[60]

On the basis of his research on the Amazon he attacked economic reductionism, arguing that: 'Marxist notions of the primacy of the economic in explaining the activity of the state ... must ... be qualified to include the motives of ideological consistency and bureaucratic facility within the state's political imperative to maintain itself and to expand its control.'[61] This is clearly a long way from mainstream Marxism.

While in the Soviet Union Marxism did originally provide the basis for the development of an approach to the environment in which the constraints of ecosystems were recognized, this was swept away with the Cultural Revolution and the rise of Stalinism. It appears that Marxism was developed and incorporated into Soviet society in such a way that it became very similar, though not identical, to Social Darwinism in the West. With the development of Marxism into Stalinism, Soviet society incorporated the Western fixation on progress through technological transformation of the physical world and the development of a consumer society in which the significance of people is measured in terms of money, the mode of thinking foreshadowed by the Russian nihilists of the 1860s. As in the West the ultimate goal of society was seen as economic progress in order to win out in the struggle for world power, and everything was reduced to a means to this end, though in the case of the Soviet Union this was supposedly part of a long term struggle to realize the immutable ideal of communism. In both forms of society an extreme instrumentalist orientation was institutionalized so that both nature and people came to be defined by the dominant institutions as instruments of economic progress. Soviet Marxism was then scarcely less nihilistic than the modes of thought dominating the West.

In fact it appears that the roots of Soviet Marxism, as with the culture of the West, lay in ancient Greek philosophy, specifically in Neoplatonism. This Neoplatonism had been developed so that the cultures of Eastern and Western Europe had become mere structural transformations of each other.[62] Following the Christian Neoplatonic tradition there was a

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59. Stephen Bunker, *Underdeveloping the Amazon*, Urbana and Chicago: Illinois Uni. Press, 1985, p.35.

60. Ibid. p.244.

61. Ibid. p.223.

62. This is similar to cultural transformations noted by anthropologists and historians. Levi-Strauss identified a number of these among different Indian groups in Brazil, and similar transformations have been revealed between the Maori and Hawaiian

common rejection of the changing world of the present for an eternal world. But while in the West, dominated by St Augustine's philosophy, this eternal world was seen as beyond the material world, in the East the eternal world was seen as something to be realized through the transfiguration of the material world. While in the West the rejection of the world ultimately produced mechanistic materialist science, capitalism, neo-classical economics, Darwinian evolutionary theory and Social Darwinism, in the East it produced a culture oriented to realizing a perfect world on earth. So both East and West, which between them dominated the world, were both ultimately founded on the Neoplatonic rejection of life and becoming for what is eternal, and they both produced societies within which everything came to be reduced to instruments for some abstract notion of progress. As in the West, political movements which contravened the metaphysical assumptions dominating society were unable to achieve the unity required to become effective.

Thus the important question, in what sense can Marxism be said to be an alternative to the prevailing world-view of the West of neo-classical economics and Social Darwinism based on mechanistic materialism, cannot be answered in any simply way. Its interpretative successes prevent its being completely ruled out, but these have generally been undertaken by non-orthodox Marxists. As a starting point in any attempted evaluation it is necessary to rule out orthodox or neo-orthodox Marxism, that is, an economic and/or class reductionist theory of society and history underpinned by a radical Christian Neoplatonist eschatology - but assuming humans to be egoists, in which technology is seen as the engine of progress leading inexorably towards a proletarian revolution and a socialist mode of production from which a socialist society will unfold itself. For the superiority of Marxism to be demonstrated it must be shown to provide a basis for comprehending both the successes and the failures of the prevailing ideology, and for going beyond these failures. But orthodox Marxism explains virtually nothing that cannot be explained by Social Darwinism, and Social Darwinism can explain much else beside. Social Darwinism justifies the contention of orthodox Marxists that history has been the progression of socio-economic formations from those which produce small surplus value to those which produce greater surplus value. But the driving force of this has been the struggle between societies, with those formations able to devote the greatest efforts to developing their war machines having subjugated the rest. From the perspective of Social Darwinism, political ideals, including communism, are simply instruments for mobilizing people to unite in their struggle against others. When a society is not threatened by outsiders, people will not subordinate themselves to the interests of society as a whole but will struggle for supremacy against each other, using political ideals as means to exploit each other. The liberation of humanity from such egoistic struggle is impossible, and where people do succeed in reducing competition, the result is decay and stagnation. All this is clearly manifest in the history of Russia, from when its struggle against the West began to the present, from the rise of Marxism to the stagnation of the Soviet Union under Brezhnev and Kosygin, to Gorbachev's *perestroika* when under pressure from a more dynamic West, markets were introduced to promote efficiency. If this is the case, there can be little hope for the future of the environment. All that can be expected is an intensification of the struggle between nations and power blocks for diminishing resources, which will inevitably increase the rate of environmental destruction and the conflict between nations until overwhelming international tensions culminate in all-out nuclear war. Orthodox Marxism provides no solution to this.

However I have also tried to show that there are tendencies within Marx's thought associated with the different metaphysical assumptions which have been suppressed by Marxists. It was because Marx did not fully emancipate himself from the prevailing

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cosmologies by Marshall Sahlins and between the Roman historical epic and Indian cosmic myth by Georges Dumazil;. See Marshall Sahlins, *Historical Metaphors and Mythical Realities*, Ann Arbor: The University of Michigan Press, 1983, p.14.

intellectual environment that his thought is vitiated by tendencies towards a conception of history as a unilinear movement towards a final state of perfection and by tendencies towards technological determinism. And it was for this reason that forms of Marxism which freed themselves from these conceptions, such as that developed by Bogdanov and elaborated by the *Proletkul't* movement, could be condemned as heretical, and which allowed Soviet Marxism to be transfigured into Stalinism. This transfiguration was further facilitated by the original condition of Russia - its economic backwardness in relation to the Western powers threatening it, and the underlying Neoplatonism of Russia's Orthodox Christianity. It is for this reason that despite the orientation towards the liberation of human potential implicit in all Marx's work, and despite the development of dialectical materialism with many features in common with process philosophy, it has been the Neoplatonist and mechanist aspects of Marx's thought which have dominated and become institutionalised within Soviet society. In fact Marxism has been essentially a means of appropriating the orientation to the world developed in Western Europe by Russia, and then following Russia, by other areas of the world.

In opposition to both Social Darwinism and orthodox Marxism I have shown how significant is culture and the forms of thinking embodied by it in history, that culture cannot be explained as nothing but instruments of egoistic struggles and that ideas play a major role in determining the direction of development of societies and civilizations. Furthermore I have shown that Marx's most original ideas have never really been given a chance, although the *Proletkul't* movement took the first steps necessary for recreating a socialist society in the years immediately following the revolution. I have suggested that the dimensions of Marx's thought which show promise of challenging the dominant ideology, those in terms of which the analysis of the dynamics of capitalism was based, those on which the *Proletkul't* movement was based and the original successes of environmentalism in the Soviet Union were founded, and those which accord with the analysis of the dynamics of society presented here, are those which accord with a process view of the world. This process view of the world undermines the most fundamental assumption of both Western and Eastern culture which has underlain the aggressiveness and oppressiveness of each, that the end of history is more significant than the process of moving towards it. And in doing so it provides a framework to incorporate the insights of Podolinskii, Bogdanov's quest for a new science, and the anti-reductionist ecology of Stanchinskii, and to support the ideas of Soviet environmentalists such as Oldak, Frolov and Arutiunov and Western environmentalists such as Stephen Bunker. So while orthodox Marxism is little more than a variant of Social Darwinism, a consistent reformulation of Marx's ideas in terms of process philosophy might offer an alternative vision of the future to that of both Western capitalism and Soviet bureaucratic centralism, able to provide the coherence for new political movements and for new forms of social life, other than those based on the market and those based on a centrally planned economy.

However merely proposing an alternative to capitalism and bureaucratic centralism does not say anything about its viability. As Alec Nove asked of socialism: 'What if the vision is unrealisable, contradictory? Does it make sense to "blame" Stalin and his successors for not having achieved what cannot be achieved in the real world?'[63] It has also been pointed out how much more difficult than Marx anticipated will be the task of those struggling to create a more just world, and that the difficulties are increasing. Communism in Eastern Europe has failed, the proletariat is fragmented and we can no longer rely on a growing proletariat, the capitalist system has generated an immense apparatus of social control which functions to ensure its continued reproduction, it has engendered an international struggle for power so that any country which fails to keep pace with economic and technological developments of

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63. Alec Nove;, *The Economics of Feasible Socialism,* London: George Allen & Unwin, 1983, p.ix.

the most powerful nations is liable to be subjugated, and it has generated transnational corporations of enormous power which cannot be controlled by any State. Only by deepening our understanding of the world social order, developing an alternative world-orientation to that of mechanistic materialism and by developing new strategies for action can there be any hope for the future. And what will now be argued is that this will only be possible through the development of a process world-orientation, the development of a new ethics, political philosophy and science of humanity on this foundation, and a struggle to act and to live in accordance with this philosophy.

5

METAPHYSICS, EPISTEMOLOGY AND DIALECTICS

The analyses of the relationship between environmental problems and the dynamics of Western civilization and Russian and Soviet culture have been undertaken from a perspective outside both the dominant world-orientation and orthodox Marxism. The ordained disciplinary boundaries have been ignored and questions posed which are of a scope generally not considered academically respectable. This was necessary because only in this way has it been possible to reveal the metaphysical assumptions, encoded in disciplinary boundaries and in what is considered 'academically respectable', underlying Western civilization and Eastern European culture. Furthermore, relationships such as those between the concepts developed in practices and those which are articulated theoretically, socio-economic formations and geographical conditions, have been examined from a pre-formulated interpretative scheme. This interpretative scheme and the associated disregard for academic boundaries is justified on the basis of metaphysical notions, those of process philosophy, which I contend have the capacity to completely replace the dominant world-orientation and orthodox Marxism. The attempt to redefine academic boundaries and to analyse the ideological history of European civilization has been designed as a test for this metaphysical scheme. If I have been at all successful in these analyses, this should provide some evidence in favour of process philosophy.

In the following chapters this metaphysical scheme will be articulated more fully and the framework of analysis which until now I have assumed, will be defended. At the same time the approach used: of analysing the problems and dynamics of civilizations in terms of an implicitly accepted set of assumptions about the nature of the world and of humanity, and then concluding by defending these assumptions, will be justified. The nature of metaphysics will be clarified and it will be shown what sort of reasons could justify the claim that process philosophy is superior to prevailing metaphysical assumptions. This requires an examination of the relationship between metaphysics and epistemology, which will be the main subject of the present chapter. Then a defence of process philosophy will be made on the basis of its capacity to generate the concepts required to make intelligible both the phenomena revealed by recent advances in the physical sciences and the existence of life and mind; how concepts deriving from process philosophy have been vindicated within various domains of science, and how these offer support both for each other and for many of the 'creative redescriptions' of life and humanity developed within philosophy.[1] This work itself attempts a creative redescription of these ideas in an attempt to formulate the process world-orientation with greater coherence, and to improve its prospects as a research programme for the sciences and humanities, as a basis for action, and ultimately as the foundation for a new world order.

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1. The term 'creative redescription' comes from Charles Taylor, 'Philosophy and its History' in Richard Rorty et. al. eds, *Philosophy in History*, Cambridge: Cambridge University Press, 1984, pp.17-30. Taylor defends it as an essential part of philosophy.

What is Metaphysics

As was suggested in the introduction to this book, in the academic community the enterprise of developing metaphysical systems, that is, speculative theories about the nature of being or existence, is barely acknowledged to have any meaning, and the forms of reasoning associated with it have no acknowledged status.[2] There are a number of layers of obfuscation involved in the denigration and rejection of metaphysics, some of which have been implicitly or explicitly argued against. Firstly, metaphysical speculation is represented as having been displaced by science. That in the seventeenth century 'science' was part of philosophy, and that its advance was only possible because philosophers had developed a coherent metaphysical theory which could serve as the basis for experimental research, is not generally acknowledged. Secondly, that what is now taken as common sense is largely the world-view based on this metaphysical theory is denied. Thirdly, scientific theories, insofar as they accord with the metaphysical assumptions which now dominate everyday life - such as Newtonian physics and Daltonian and Mendeleevian chemistry - are presented in a dogmatically realist way, while those developments of science which bring these assumptions into question - such as relativity theory, quantum theory and non-linear thermodynamics - are presented in educational institutions in a forbiddingly formalistic manner interpreted in a vaguely positivist way; as though all that matters is getting the predictions right. This has been reinforced in recent years by the tendency to conceive science only as a means for developing technology. Finally the nature of metaphysics, insofar as it is considered at all, is grossly misrepresented, 'metaphysics' being used as a term of denigration for everything from dealing with questions about the existence and nature of a transcendent realm of being beyond what is knowable empirically (by Kant and then by the logical empiricists), and belief in a reality independent of all interpretations and beliefs to which true beliefs correspond (by Hilary Putnam), belief in immediately given absolute knowledge (by Jacques Derrida), to scholastic nitpicking (by almost every other philosopher). Metaphysics is seen to be in a space of its own, and at very best a decoration to life.[3]

What then is metaphysics? The notion of metaphysics derives from Aristotle, and simply designates the work that came after physics in Aristotle's collected writings. Consequently it is how Aristotle defined his subject matter and what he analysed in his *Metaphysics* which must be given the pre-eminent position in defining the subject. Aristotle defined the subject thus:

> There is a science which takes up the theory of being as being and of what 'to be' means, taken by itself. It is identical with none of the sciences whose subjects are defined as special aspects of being. For none of them looks upon being on the whole or generally; but each, isolating some part, gets a view of the whole only incidentally, as do the

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2. This theme together with a defence of metaphysics has been further developed in Arran E. Gare, '"After Philosophy" After Speculative Metaphysics', (forthcoming).

3. There are exceptions to all this. The most clear-headed modern defences of metaphysics have been made by Charles Sanders Peirce in 'The Approach to Metaphysics' republished in Justus Bucher ed. *Philosophical Writings of Peirce*, N.Y.: Dover, 1955, pp.310-314, and by Alfred North Whitehead in 'Speculative Philosophy', *Process and Reality*, [1929], N.Y.: Free Press, 1978, Chapter 1, pp.3-17. More recent purported defences of metaphysics such as Stephan Körner, *Metaphysics: Its Structure and Function*, Cambridge: Cambridge University Press, 1984; Brian Carr, *Metaphysics: An Introduction*, Houndmills, Hampshire: Macmillan, 1987; and José A. Benardete, *Metaphysics: The Logical Approach*, Oxford: O.U.P., 1989, only defend a very attenuated form of metaphysics.

> mathematical sciences. Since we are searching for the first principles and most general factors of being, these must clearly be distinctive traits of some nature.[4]

Aristotle did not see himself as creating the subject matter of metaphysics but as clarifying what had always been the central problem of philosophy. As he put it: 'In short, the question that has always been asked and is still being asked today, the ever-puzzling question "What is being?" amounts to this: "What is primary being?"'[5] ('Primary being' here translates '*ousia*', usually and very misleadingly translated as 'substance'.)[6] And he saw metaphysics as basic to all enquiry, both theoretical and practical, by facilitating the investigation of the world and by enabling the world to be understood in all its complex diversity:

> ... since any science deals chiefly with what is primary to its subject, other considerations being derived from and dependent upon the primary, the philosopher must have within his province the first principles and primary factors of primary beings. Furthermore, as any class of things is united in sense perception and in a science (for example, grammar is one science and unites in theory all articulate sounds), so the theoretical science of being as being includes as its parts the sciences of the species of being within the general class of being as being.[7]

At the same time Aristotle included a definition of metaphysics as a theory of entities which are both independent and immovable, that is, as theology, which was then distinguished from the science of entities which are independent but changing - natural philosophy, and the science of entities which are immovable but dependent - mathematics. However this definition can be regarded as a particular answer to the question of what is being, and it is not the only answer proffered in the *Metaphysics*. Even while claiming that metaphysics is the science of immovable primary beings, the unmoved movers, Aristotle acknowledged that if there were no such beings then natural philosophy would be first philosophy;[8] and in Books *Zeta*, *Eta* and *Theta*, which may have been written later than the other books, Aristotle appears to have accepted this identification and characterized primary beings as individuals, the intelligible constitutions of which are the outcome of processes.

Metaphysical questions are only indirectly related to questions such as whether knowledge is obtainable by reason alone, whether there can be synthetic *a priori* knowledge, or whether the nature of the world beyond our experience can be known. These are epistemological questions. And there is no reason why a theory of being should not be based on experience, and ultimately verified in experience. One of the most important requirement of a theory of being is to be able to serve as the foundation for the sciences. As Kant argued in his *Metaphysical Foundations of Natural Science*, metaphysics must demonstrate the possibility of the theoretical concepts required by the different sciences.[9] A metaphysical

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4. Aristotle, *Metaphysics*, 1003a21-28. Unless otherwise indicated, I have quoted the Richard Hope translation, University of Michigan Press, 1960.

5. Ibid. 1028b3-5.

6. 'Substance', implying that which 'stands under' changing accidents, is a totally inadequate translation of '*ousia*'. To overcome this, Leibniz used the term 'monad' and Whitehead the term 'actual entity'. 'Primary being' is used by Richard Hope in his translation of Aristotle's *Metaphysics*, and also by Edward Pols. For a discussion of this concept, see Ivor Leclerc, *Whitehead's Metaphysics*, [1958], Lanham: University Press of America, 1986, Ch.2.

7. Aristotle, *Metaphysics*, 1003b15-23.

8. Ibid. 10026a25-32.

9. See Immanuel Kant, *The Philosophy of Material Nature*, Indianapolis: Hackett Publishing Co., 1985 which contains the James W. Ellington translation of 'Metaphysical Foundations.' That metaphysics so understood is essential to science has been argued this century by Alfred North Whitehead, Alexandre Koyré and Edwin Arthur Burtt; and more recently by Gerd

system should be able to provide the basis for understanding inanimate nature, what is life, and in particular, what is human life. Science has a privileged place not only because of its past achievements, but also, as Aleksandr Bogdanov pointed out, because it is the one area in which the division between intellectual and manual labour has been transcended and theory and practice united. Then, as Aristotle argued, by providing the basis for an understanding of the place of humanity in the cosmos, a metaphysical theory serves as the foundation for the practical sciences: ethics and politics, and for the productive sciences: art and technology. By doing so, metaphysical ideas can be incorporated into the social and physical worlds of people as a major component of what is taken as common sense, and so can become a major determinant of the way people live their lives.

Epistemology, Dialectics and Process Philosophy

How then is any particular metaphysical theory to be judged? This brings us to the question of what is knowledge. The problem with most theories of knowledge is that they presuppose and assume the validity of a particular metaphysical theory. They do this not only by the criteria they present for judging the validity of claims to knowledge, but also by the very conception of knowledge they take for granted. This tendency arises from the nature of metaphysical systems which must be total perspectives on the world and must therefore include theories of knowledge as part of their domain. Theories of knowledge therefore must be able to be explained by the metaphysical systems which are legitimated by them. The consequence of the acceptance of metaphysical assumptions is that any alternative to the theory of knowledge which has been formulated in accordance with the dominant metaphysics will tend to be evaluated in terms of criteria based on the assumptions of the dominant metaphysics. Any theory of knowledge which implies that these assumptions are questionable will thereby be ruled out. What will be defended here is a theory of knowledge which is compatible with alternative metaphysical systems and which at least allows the possibility of cognizing the intrinsic significance of the world. As stated in the introduction to this book, a dialectical theory of knowledge in which the ultimate goal of disciplined inquiry is understanding will be argued for. To avoid the dogmatism which would follow from a closed circle in which a theory of being and a theory of knowledge mutually imply one another, a theory of knowledge, explicable by a philosophy of process, which can justify a claim to validity being made by this philosophy without assuming that it is valid, will be proposed and defended.

For most of this century the academic establishment in Anglophone countries have accepted some variant of logical empiricism as the correct account of the nature of knowledge.[10] The status of this doctrine can be attributed to its concordance with the dominant metaphysical assumptions of society. These have their roots in Platonism but are more immediately grounded in the acceptance of a mechanistic conception of the world. The most important and most taken for granted assumption of logical empiricism is that the objects of knowledge must be found outside time and be free of all particular viewpoints. Truth must therefore be unprovisional. This assumption derives from the arguments of Plato concerning the need for an omni-temporal object of knowledge if knowledge itself is to escape the flux of change. Then with the development of mechanistic materialism (itself grounded in Platonistic forms of thinking) the central problem became: How can individual

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Buchdahl in *Metaphysics and the Philosophy of Science*, Oxford: O.U.P., 1969, and also by Ivor Leclerc in *The Nature of Physical Existence*, London: Allen & Unwin, 1972, and in *The Philosophy of Nature*, Washington: C.U.A. Press, 1986, (although Leclerc does not characterize natural philosophy as metaphysics).

10. See Richard Rorty, *Philosophy and the Mirror of Nature*, Oxford: Basil Blackwell, 1980 for a critical analysis of modern epistemology.

minds, spatially enclosed within mechanical bodies, attain knowledge of the outside world? This problem was brought into focus by Descartes' replacement of the medieval notion of intentionality by the notion of knowledge as representation, and was explicitly formulated in these terms by Hobbes. Locke's representational realism according to which knowledge is conceived of as 'ideas' of primary qualities in the mind which actually represent the external world, the subjective idealism proposed by Berkeley and worked out consistently by Hume according to which we can only talk about such ideas (or sense impressions), their copies and their relationships, and Kant's transcendentalism according to which sensations are ordered by imagination, the forms of intuition and categories of the understanding, are all proposed solutions to this problem. Logical empiricism can be understood as the effort to represent the objects of knowledge as eternal (true propositions or facts and the logical relations between them), while being consistent with the form of empiricism engendered by the mechanistic conception of the world (true propositions are those which have been confirmed directly or indirectly by sense impressions). And this amounts to a research programme to characterize human knowledge and rationality in a way which is consistent with the conception of humans as complex machines - a project continued by most Anglophone philosophers of language. This was clearly evident in Russell's philosophy, though most of his epigoni have lost sight of this as their goal. In fact the goal has been hidden by the anti-psychologism of these epistemologists, while at the same time the problems which revealed themselves within this research project have to some extent undermined the programme. Still, the project's underlying *telos* has been revealed by its success in providing the foundation for the development of computers. Knowledge is now seen as information which can be stored and processed by machines. It is for this reason that logical empiricism appears as a 'hard-headed' conception of knowledge, despite its manifest failures.

Despite their overwhelming success within the philosophy of science, the more radical opponents of logical empiricism have been suspect and misinterpreted because they have rejected the prevailing assumptions and their associated problematics.[11] Historically oriented post-logical empiricist philosophers of science abandoned the attempt to characterize knowledge atemporally or specify in atemporal terms the criteria of validity of all inferences, and the conception of knowledge as a relationship between the individual consciousness and the external world. In effect they were no longer constrained by the effort to understand human thought in mechanistic terms. They were more likely to be concerned with scientific creativity and with freeing science from the constraints of over-rigid methodologies rather than formulating prescriptions to delimit science. Consequently they were inclined to formulate their arguments in accordance with this freer notion of rationality. To those committed to the dominant modes of thought, therefore, their work appeared to lack the features which are required for intellectual respectability.

To overcome this situation the ideas of the historically oriented opponents of logical empiricism will be supported by presenting a theory of knowledge specifically in terms of anti-mechanistic metaphysical assumptions.[12] My concern in doing so will not be to specify the eternal criteria for what is to count as knowledge and valid inference, which I believe to be impossible, but to address the more fundamental issue (addressed by Plato in *Theaitetus*) of what knowledge is; though without devoting an entire work to the subject neither all the ramifications of this answer nor all the reasons for accepting it can be presented.

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11. See Richard J. Bernstein, *Beyond Objectivism and Relativism*, Philadelphia: University of Pennsylvania Press, 1983, p.52ff. for an account of the misrepresentations of anti-positivist philosophers of science.

12. Some justification for such an approach is provided by Hilary Putnam who summed up the argument of his book *Reason, Truth and History* (Cambridge: C.U.P., p.215) as 'that theory of truth presupposes theory of rationality which in turn presupposes our theory of the good. "Theory of good", however, is not only programmatic, but is itself dependent upon assumptions about human nature, about society, about the universe (including theological and metaphysical assumptions).'

The theory proposed here is meant as a continuation of the tradition which began in Ancient Greece with the establishment of the democratically ruled polis on the assumption that truth could be arrived at through discussion. Though this truth was seen to be continually open to revision and development by individuals in dialogue, it was given a status and significance above and beyond individuals. This is the tradition which was formalized in philosophy as dialectics (from the Greek *dialektos*, 'art of debate' and *dialektike*, 'discourse').[13] According to Aristotle, it was Zeno of Elea who 'invented' dialectic as a philosophical method.[14] In his hands it was a way of refuting an opponent's opinion by accepting it hypothetically and forcing his opponent to admit that it led to conclusions contradicting this opinion, or some other of his beliefs. Plato explored the possibilities of dialectics and its relation to truth more fully. For him it became a form of dialogue in which through a series of questions and answers, and ultimately through the method of division and synthesis, one attempted to find true definitions and an understanding of their relations to achieve a comprehensive knowledge of the diverse totality of the forms of the world. He was particularly concerned with which forms could and which could not be combined with each other. Plato himself denied having arrived at eternally valid truths, although he presented this as an ideal. Aristotle also accorded a primary place to dialectic conceived as the critical examination of reputable opinions to establish the first principles of any enquiry.[15] And in practice he developed all his ideas dialectically. But he also presented the ideal of knowledge as the attainment of eternal verities presentable through syllogistic logic. With the rise of Christianity and its development in the Middle Ages, the philosophies of Plato and Aristotle were assimilated in such a way that to begin with, genuine dialectics was eclipsed by the view of knowledge as doctrine to be passed on through disciplines from generation to generation. However dialectics of a kind was revived in the high Middle Ages as a means of settling disputes in scriptural exegesis. To resolve conflicts of interpretation a procedure was adopted in which the defender of a thesis would state his case, and then his opponent would offer a *prima facie* proof of the opposing thesis. The defender would then make a concession, but by positing a crucial distinction, would nullify the objection, after which the opponent would either contest this distinction or accept it and then go on to challenge the new premise.

Such dialectical thinking was crushed in the later Middle Ages, and was totally eclipsed with the rise of Protestantism, the counter-reformation and the rise of the mechanistic world-view. Descartes opposed dialectics in his effort to conceive knowledge in relation to the isolated individual subject and to provide an unquestionable foundation for all knowledge. This subjectivist turn was brought to fulfilment in the philosophy of Kant who revived the concept of dialectical reason, but reduced it to a way of affirming apparent contradictions. He argued that by positing the necessary distinctions of meaning, both of the opposing sides could be accepted. Then Hegel rejected Kant's approach for failing to acknowledge the existence of genuine contradictions in reality, and reformulated dialectics into an account of the self-movement of thought, identified with reality. This self-movement takes place through a process of *Aufhebung* by which inadequate ideas generate their negation, which is then overcome by a further negation, which at the same time affirms the opposing principles. As a procedure for analysing the historical development of ideas and forms of life in the *Phenomenology of Spirit* and in the historical lectures, this conception of dialectics proved extremely fruitful. However when used to elaborate a categorial scheme in

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13. For a history of dialectics see Ronald H. McKinney, 'The Origins of Modern Dialectics' in *Journal of the History of Ideas*, Vol.44, No.2, 1983 pp.179-190.

14. Reported from Aristotle's lost *Sophist* by Diogenes Laertius VIII; see G.S. Kirk, J.E. Raven and M. Schofield, *The Presocratic Philosophers*, 2nd ed., Cambridge: Cambridge University Press, 1983, p.278.

15. Aristotle, *Topics*, I 2, 101a25-101b4.

the *Logic*, this procedure congealed into a closed system. Despite his concern to exhibit a 'logic of process', Hegel's orientation was towards the eternal.[16] As Mikhail Bakhtin described this form of dialectics: 'Take a dialogue and remove the voices ..., remove the intonations (emotional and individualizing ones), carve out abstract concepts and judgements from living words and responses, cram everything into one abstract consciousness - and that's how you get dialectics.'[17] In returning to the tradition of dialectics it is necessary to jettison completely its association with the search for eternal verities and to return to the Ancient spirit of dialectical thinking as critical and creative dialogue - incorporating into this Hegel's socio-historical dialectics. And in doing so it is necessary to reject Platonic realism in favour of conceptualism.

To overcome prevailing assumptions and to justify a return to dialectics the starting point taken here is not in a conception of the subject as the bearer of knowledge, but in a theory of the nature of the world, in a conception of humans as processes of becoming within an active, dynamic nature always beyond their full comprehension; as embodied subjects who are essentially social, and through whom the world is, at least to some extent, being brought to consciousness of itself, its uniformity, its creativity, and that it is able to become conscious of itself.[18] In opposition to the idea of enquiry as the accumulation of knowledge conceived of as bits of information, the ultimate aim of all enquiry is taken to be 'understanding'.[19] The ability to confirm particular propositions, which has a place in the process of enquiry, must always be understood as secondary to and as an extension of this. Understanding, as the word implies, is a mode of being in the world by which the world becomes in some degree intelligible, a way of experiencing our world as at least a partially comprehensible reality. One struggles for understanding as a participant in a social tradition, even if one is rebelling against traditional assumptions, and advances in understanding always involve a struggle to overcome the limits of one's tradition, including its language. As Whitehead put it: 'Words and phrases must be stretched towards a generality foreign to their ordinary usage; and however such elements of language be stabilized as technicalities, they remain metaphors mutely appealing for an imaginative leap.'[20] To advance understanding is not to know the eternal but to produce theories from the perspective of which new aspects of the world can be revealed and made intelligible and the achievements and limitations of all rival theories can be comprehended.

Participating in the struggle for understanding raises individuals above the flux of their own immediate becoming in the world, which is what Plato validly recognized to be important; but this is achieved not by discovering the eternal but by participating in the creation of a temporal order transcending the perspectives of individual subjects. This involves fusing experiential horizons, thereby expanding the intellectual community, not only between contemporaries, but also between those who have expressed themselves in the

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16. On this, see Michael Rosen, *Hegel's Dialectic and its Criticism*, Cambridge: C.U.P., 1982.

17. M.M. Bakhtin, *Speech Genres & Other Late Essays*, tr. Vern W. McGee, ed. Caryl Emerson and Michael Holquist, Austin: University of Texas Press, 1986, p.147.

18. In giving the privileged place to metaphysics over epistemology, to being over the subject, I am following Whitehead, Heidegger, Merleau-Ponty, Rom Harré and Roy Bhaskar, although the position defended here differs in some ways from the ideas of all these thinkers.

19. That the great achievements of science can only be understood as advances in understanding has been argued in two papers by Maurice A. Finocchiaro: 'Cause, Explanation and Understanding in Science: Galileo's Case', in *Review of Metaphysics*, Vol.29, 1975, pp.117-128; and 'Scientific Discoveries as Growth of Understanding: The Case of Newton's Gravitation' in T. Nickles (ed.) *Scientific Discovery, Logic and Rationality*, Dordrecht: Reidel, 1980, pp.235-255. However it is implicit in much of the anti-positivist tradition of epistemology, particularly in Toulmin, Polanyi and Kuhn, and was argued for by Alfred North Whitehead in *Modes of Thought*, [1938] N.Y.: Free Press, 1968, Lecture Three, 'Understanding', pp.42-63. It was also argued for by Émile Meyerson who was commended for this by Einstein.

20. Whitehead, *Process and Reality*, 1978, p.4.

past and those who will struggle for understanding in the future.[21] This takes place within institutions, the nature of which is to some extent constrained by a larger social context. As Hegel argued, the achievements in philosophy or science in any era are only possible through the stand-point provided by the 'Objective Spirit' of that era, and they are only fully comprehensible in terms of that stand-point. As participants in the development of understanding it is necessary to acknowledge that our engagement in its development takes place within contexts which provide specific possibilities and problems for understanding, but precisely through this acknowledgement it is possible, at least to some degree, to overcome the constraints of, and to change our situations.

Twentieth Century Epistemology: From Logical Empiricism to Dialectics

Most of the critics of logical empiricism in the twentieth century have been explicitly or implicitly in the tradition of dialectics, and have contributed to this tradition. It has been developed explicitly by a number of Hegelian Marxist thinkers, notably Lukács, Goldmann, Adorno, Sartre and Merleau-Ponty and implicitly by theorists of hermeneutics and theorists of cultural development. However the most telling critics of logical empiricism have been historians of science and historically oriented philosophers of science, and these critics have contributed most to reformulating knowledge in accordance with the tradition of dialectics.[22] Disputes within the philosophy of science led to an evolution of ideas similar to the dialectical scheme described by Hegel in the beginning of the *Phenomenology of Spirit.*[23] The effort to ground knowledge in sense experience or observed objects through ostensive definitions and logically proper names gave way to a focus on propositions, statements or descriptive sentences as the primary epistemological units. The subsequent failure to distinguish empirically meaningful propositions by some criterion of cognitive meaning shifted the focus of interest to conceptual frameworksr. The problems generated by the considerations of the relationship between different conceptual frameworks and any conceptual framework and the world led to the realization that the interesting questions about the rationality of scientific inquiry can only be understood in terms of the conflict of theories, paradigms, research programmes and research traditions in their historical development. The study of this historical development has revealed the close relationship between science and its socio-economic and cultural contexts, which in turn can only be comprehended from the perspective of a totalizing world-view, that is, a theory of history, a philosophical anthropology, a philosophy of nature, all founded on a general theory of being. This evolution transformed our understanding of science - although there is now a new generation of philosophers of science who are reworking the lower stages in this dialectic.[24]

The most influential logical empiricists were the logical positivists of the Vienna Circle. According to the original members of this group, the aim of science is to accumulate and

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21. The notion of 'fusion of horizons' is developed by Hans-Georg Gadamer in *Truth and Method* [1960] N.Y.: Crossroads, 1984, passim.

22. I have argued in Gare, '"After Philosophy" After Speculative Metaphysics' that Alfred North Whitehead was a major inspiration for this development.

23. This accordance has been noted by Richard Bernstein. See *Praxis and Action*, London: Duckworth, 1972 p.24n. and *Beyond Objectivism and Relativism*, p.75ff.

24. Recent philosophers of science have been preoccupied with the opposition between logical empiricism, constructivism and realism. For a review of these developments, see Richard Boyd, 'Introductory Essay', *The Philosophy of Science*, ed. Richard Boyd, Philip Gasper, and J.D. Trout, Cambridge, Mass.: M.I.T. Press, 1991.

order knowledge to enable predictions to be made.[25] They argued accordingly that valid scientific knowledge is analysable into singular existential statements reporting sense-experiences, but is organized as systems of mathematically expressible laws generalizing on observed regularities to enable people to calculate the probability of having any future sense-experience. Mathematics was held to be a deductive scheme reducible to logic (actually, to logic and set theory), and theoretical entities to be nothing more than heuristic devices to support the mathematics. By only accepting what has been observed in controlled experiments, science is able to accumulate certain knowledge about the world, expressible in laws of successively greater generality, and to thereby improve people's ability to make predictions. No other knowledge is accorded any significance, and metaphysics can be assigned to the scrap heap. As Rudolph Carnap claimed: 'metaphysics can make no claim to possessing a scientific character.... *Philosophy is to be replaced by the logic of science* - that is to say, by the logical analysis of the concepts and sentences of the sciences, for *the logic of science is nothing other than the logical syntax of the language of science*.'[26]

The rigourous efforts to justify this position revealed its inadequacy as a theory of knowledge, as an account of science and as an account of metaphysics. Efforts to develop logical positivism forced its major proponents to recognize the problematic nature of sense-experience and that there is more to theories than generalizations, eventually resulting in the acceptance by most of them of the reality of both objects of perception and theoretical entities.[27] However the anti-positivist philosophers have gone far beyond this, inverting the relationship between theories and the apparatus of prediction, arguing that it is theories, understood as the means to make the world intelligible, which are primary. This new notion of theory is spelt out by David Bohm:

> The word 'theory' derives from the Greek '*theoria*', which has the same root as 'theatre', in a word meaning 'to view' or 'to make a spectacle'. Thus, it might be said that a theory is primarily a form of *insight*, i.e. a way of looking at the world, and not a form of *knowledge* of how the world is.[28]

Sense-experience could no longer be regarded as the ground from which knowledge is built, or as simply the point of departure and point of return for a predictive apparatus. Rather, one of the most important aims of science is to enrich experience. As Bohm put it: 'science is *primarily* an activity of extending perception into new contexts and into new forms, and only secondarily a means of obtaining what may be called reliable knowledge.'[29] Such extension of perception involves the use of technologies of observation made possible by scientific theories. It is through science and technology that people are able to *see* the structure and dynamics of molecules and galaxies. Whether it is physicists in their laboratories or ecologists in the wilderness, the scientifically literate (unless they are under

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25. For an illuminating history of twentieth century philosophy of science up to the mid-70s see Frederick Suppe 'The Search for Philosophic Understanding of Scientific Theories' in Frederick Suppe ed., *The Structure of Scientific Theories*, 2nd ed., Urbana: University of Illinois Press, 1977, pp.3-241. The picture painted of logical positivism oversimplifies the work of the Austrians, particularly when Otto Neurath's contribution is considered, but Suppe fully captures the spirit of Anglo-American logical empiricism.

26. Rudolf Carnap, *The Logical Syntax of Language*, [1934] tr. Amathe Smeaton, London: Routledge & Kegan Paul, 1937, p.xiii.

27. This is not to say that all philosophers have abandoned logical empiricism. In philosophy departments dominated by analytical philosophy, philosophers still defend induction. For a modern logical empiricist account of science, see Ronald N. Giere, *Understanding Scientific Reasoning*, New York: Holt, Rinehart and Winston, 1979. Modern logical empiricism underpins the development of decision theory.

28. David Bohm, *Wholeness and Implicate Order*, London: Routledge & Kegan Paul, 1980, p.3f.

29. David Bohm, 'Science as Perception-Communication', in Suppe ed. *The Structure of Scientific Theories*, pp.374-391, p.374.

the influence of logical empiricism) should see more and have a richer experience of the world, than ignoramuses.

This development of experience cannot be understood only in relation to individuals; it is essentially social. Scientists are involved in a struggle to reveal the limitations of and go beyond what has been perceived in the past and to validate their own observations and theories in the eyes of others, communicating them (making them common) by defining them in propositional form to relate them to what has been commonly experienced in the past. As Bohm argued: 'scientific research does not consist of *first* looking at something and then communicating it. Rather the very act of perception is shaped and formed by the intention to communicate, as well as by a general awareness of what has been communicated in the past, by oneself and by others.'[30] The technologies of observation have been increasingly designed to facilitate communication, often inscribing a visible, quantified record of the observed situation. It is generally only in communication that the whole meaning of what has been observed is comprehended.

The study of theories, particularly at their inception, has revealed them to be based on analogies or metaphors.[31] These do not represent reality but are the means for making sense of the world, serving as foundations or 'hard cores' of 'research programmes'.[32] The world is seen as something (as an organism, a mechanism or a complex of force fields, for instance), and is made sense of accordingly; it is not just represented as having certain characteristics. There is no such thing as access to the world as it is independent of any metaphors, and major advances in understanding involve successive reinterpretations through new metaphors of the world as it had been interpreted by old metaphors. Such metaphors define the objects of scientific enquiry,[33] radically restructuring the perception of situations, creating new questions and largely determining the nature of the answers. For instance, as Judith Schlanger pointed out, when the technological metaphor of regulation is adopted in the study of cells, this 'establishes the field for which it sets the boundaries and is the coordinator.'[34] Even that which cannot be comprehended in terms of these metaphors is defined and understood in terms of them. For instance once the analogy of cybernetics is assumed in the attempt to understand the brain, its inadequacies are described in terms of this metaphor: as the impenetrable 'black boxes' of the brain, or as 'the mysterious nature of human encoding and decoding'. This is because it is only through the metaphor that there is something to think about. As Schlanger commented: 'The cybernetic analogue provokes and instigates its own theoretical elaboration.'[35] The use of metaphors can no longer be seen as merely a heuristic device for formulating predictions; it is central to science. It is the finding of regularities in nature which must be seen as an heuristic for the deployment of metaphors.[36] It is necessary to regain the sense of science as the imaginative and creative

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30. Loc. cit.

31. As Richard Boyd argued, 'metaphors are *constitutive* of the theories they express...' ('Metaphor and Theory Change' in Andrew Ortony ed., *Metaphor and Thought*, Cambridge: C.U.P., 1979, pp.356-408, p.360.) For a general study of analogies in science together with a review of other work in this area, see W.H. Leatherdale, *The Role of Analogy, Model and Metaphor in Science*, Amsterdam, 1974. The most important philosophers of science to analyse the role of analogies/metaphors have been Mary Hesse and Rom Harré.

32. The terms 'hard core' and 'research programme' derives from Imre Lakatos, *The Methodology of Scientific Research Programmes. Philosophical Papers Volume 1*. ed. John Worrall and Gregory Currie, Cambridge: Cambridge University Press, 1978. However it is unlikely that Lakatos would have seen the hard cores of research programmes as being related in any way to analogies or metaphors.

33. Gaston Bachelard pointed out the importance of object construction in science, using the existence of theoretically constructed objects of inquiry as opposed to common-sense objects as the defining characteristic of a true science.

34. Judith Schlanger, 'Metaphor and Invention,' *Diogenes*, vol.69, 1970, p.21.

35. Ibid. p.26.

36. As argued by Romano Harré, *The Principles of Scientific Thinking*, London: Macmillan, 1970.

use of metaphor, and to overcome the deadening effect of metaphors which are no longer recognized as such; it is necessary to recognize the profundity of Nietzsche's insight into what is taken to be truth:

> What then is truth? A movable host of metaphors, metonymies, and anthropomorphisms: in short, a sum of human relations which have been poetically and rhetorically intensified, transferred, and embellished, and which, after long usage, seem to a people to be fixed, canonical, and binding. Truths are illusions we have forgotten are illusions; they are metaphors that have become worn out and have been drained of sensuous force, coins which have lost their embossing and are now considered metal and no longer coins.[37]

Through elaboration, metaphors are articulated into frameworks of concepts. To 'conceive', deriving from the Latin *concipere*, means 'to take hold, to take to oneself, to take in', that is to perceive (from the Latin *percipere* - to grasp) some aspect of the world and to appreciate its relevance to other things perceived and conceived - and concepts, from *conceptus*, are the means for such 'grasping together' and 'taking in'.[38] Thinking of cognition in these terms frees us from the conception of knowledge as a reflection or representation of reality - and the corresponding tendency to treat abstract concepts as concrete entities - what Whitehead called the 'fallacy of misplaced concreteness'. Efforts to conceive the world, including ourselves, reveals it as more - and more complex and interdependent - than the metaphors and conceptual frameworks which are used to grasp it; it is the 'unprethinkable Being' which is before all thought and presupposed by all thought and all enquiry.[39] The adequacy of such conceiving will be partly a function of the coherence with which concepts and their relations can be formulated and partly a function of what they reveal or fail to reveal of the world. For instance to define something as an acid is not just to identify and classify a kind of being which will always act in a certain way, which for instance will always dissolve metals. It is to relate it to an integrated framework of concepts, which means that the potentialities or powers of this kind of being, and the conditions required to realize them, can be recognized and explained in terms of 'atoms', 'valency', 'chemical bonding', 'electron', 'electrical charge', and so on, all of which allow the specific nature of acids to be distinguished from everything else.[40] The coherence of this framework ultimately derives from underlying metaphors from which these concepts originate and the articulation of these to make sense of specific phenomena. Such a framework is required to enable each individual to be comprehended and appreciated as an individual in all its uniqueness in relation to everything else in the world, and in relation to the world as a whole.

The articulation of metaphors into conceptual frameworks and the elaboration of concepts is a long, laborious process, essentially social in its nature. While the formulation

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37. Friedrich Nietzsche, 'On Truth and Lies in a Non-Moral Sense' in *Philosophy and Truth: Selections from Nietzsche's Notebooks of the Early 1870s*, ed. and tr. Daniel Breazeale, New Jersey: Humanities, 1990, p.84.

38. This view of concepts as means which only become objects of thought when the mind reflects on its own operations goes back to Thomas Aquinas at least. Those philosophers who reject the notion of concepts often assume that they are and always have been understood as ideas or representations in the mind. See for example Hilary Putnam, 'The Meaning of "Meaning"', in *Mind, Language and Reality: Philosophical Papers, Volume II*, Cambridge: Cambridge University Press, 1979, pp.215-271, p.218ff. For a defence of 'concepts' against criticisms from Quine, Witgenstein, Putnam and Kripke, see Tyler Burge, 'Concepts, Definitions, and Meaning", *Metaphilosophy*, Vol.24, No.4, 1993, pp.309-25.

39. As Schelling argued (echoing Aristotle in Zeta and Eta of *Metaphysics*) there is an *'unvordenkliches Sein'* (unprethinkable Being) - before all thought and presupposed by all thought. This view is shared by the 'existentialists' from Kierkegaard onwards, and by Whitehead, Heidegger and Merleau-Ponty.

40. See R. Harré and E.H. Madden, *Causal Powers*, Oxford, Basil Blackwell, 1975, Ch.1 for a defence of this view.

of a particular concept (such as 'acid') might begin with a characterization in terms of immediately observable properties, science only advances through the development of theoretical concepts, originating in metaphors, then made more precise through being defined in relation to each other and in their application in efforts to understand the world. The nature of such formulation and elaboration can be seen in the development of the notion of field on which much of modern physics is based - from Leibniz's notion of the active monad (based on the analogy of mind), to Boscovitch's notion of point centres of power to attract and repel, to Priestley's rejection of points and reformulation of the notion of attraction and repulsion in terms of regions, to Faraday's application of this notion in his efforts to comprehend electricity and magnetism. In Faraday's work, the notion of field was still very vague, and was described in terms of mechanical metaphors and through the metaphorical use of such terms as 'tension', 'power' and 'force', and was frequently buttressed by the notion of a mechanical aether. The concept of field became increasingly better defined as the relationships between the electric field and other electromagnetic properties were more clearly specified. Then when Maxwell introduced the concept of the displacement current, it became possible to conceive light in terms of fields and to formulate Faraday's ideas in terms of a set of mathematical equations. While Maxwell himself was committed to explaining fields in terms of an aether, the recognition by Lorenz and Herz that the aether was not required by Maxwell's equations led to further fruitful lines of research, culminating in the development by Einstein of the general theory of relativity.

The idea of using metaphors and concepts to make the world intelligible could still be interpreted in terms of transcendent subjects acting like executives in deploying abstract concepts to comprehend a previously uninterpreted world.[41] But the use of metaphors and the development of concepts and the associated conceptualization of the world take place through active, bodily engagement within a socially shared world which is itself active, which is always already partially understood, and of which people are part. It is only against the background of a pre-predicative experience of the world in relation to our bodily engagement in it, and through the generalization of body schemas, that it is possible to explicitly deploy metaphors and concepts.[42] The development of the capacity to construe the world in new ways through new metaphors and concepts is at the same time the development of a mode of being in the world and of relating to others, a development of embodied subjects as the situated, social beings through whom the world is becoming conscious of itself. And as already noted, it is generally associated with the development of the technology of experiments, informed by theoretical concepts, which mediates experience of the world. Thus, knowledge is always situated and thereby provisional. As Merleau-Ponty argued:

> As long as I cling to the ideal of an absolute spectator, of knowledge with no point of view, I can see my situation as nothing but a source of error. But once I have recognized that through it I am geared to all action and all knowledge which can have a meaning for me, and that it is gradually filled with everything which can exist for me, then my contact with the social in the finitude of my situation is revealed to me as the point of

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41. Only if conceptual frameworks are understood in this way is the argument of Donald Davidson valid (in 'On the Very Idea of a Conceptual Scheme', *Inquiries into Truth & Interpretation*, Oxford: Clarendon Press, 1984, pp.183-198). On this see Alasdair MacIntyre, 'Relativism, Power and Philosophy' in *After Philosophy*, ed. Kenneth Baynes et.al., Cambridge, Mass.: MIT Press, 1987, pp.385-411, esp. p.387.

42. The nature of this has been described by Mark Johnson in *The Body In The Mind: The Bodily Basis of Reason and Imagination*, Chicago: University of Chicago Press, 1987.

> origin of all truth, including scientific truth. And since we have an idea of truth, since we are in truth and cannot escape it, all I can do is define a truth in the situation.[43]

Michael Polanyi, and Thomas Kuhn have further advanced this insight. Polanyi argued that while scientific knowledge involves continual transcendence of the limitations of individual perspectives, it is still irreducibly personal. It involves an 'indwelling' in the world such that each particular is perceived or known explicitly in terms of a background which is known tacitly. There is a 'from-to' relation in all perception and all knowledge - we attend from the tacitly comprehended background to what interests us.[44] To illuminate what this involves, Polanyi compared knowing to what is involved in using an instrument such as a rake, and to understanding a sentence. Using a rake we 'indwell' in the rake so that it becomes an extension of our bodies, and our attention comes to be focused not on our hands manipulating the rake, but on the end of the rake. We attend from our hands and bodies and the perceptual background to the end of the rake and its relation to the task at hand. In understanding a sentence we have to 'indwell' in the meaning of each word and attend from these to focus on the meaning of the whole sentence, while to focus our attention on the meaning of any individual word in a sentence, we must 'indwell' in and attend from the meaning of the whole sentence. Extending this to science, the physiologist studying a body must 'indwell' in or attend from physiological theory as a means to 'indwell' in or attend from the organism to comprehend any part of the organism. It is only because of such indwelling that the physiologist dissecting an organism is able to make sense of what he is focussing on. But similarly we 'indwell' in or attend from the parts of the organism to focus on it as a functioning whole. Polanyi argued that such indwelling and tacit knowing is involved to some degree in knowing all phenomena in nature - even the solar system. While Polanyi does not promote the term, what he is showing is that science aims at 'understanding' rather than 'knowledge', and he has shown what understanding is. From this perspective, theories articulated as conceptual frameworks to provide new insights should be seen as means to indwell in the world more fully. The importance of the tacit dimension of science is implicitly recognized in the work of Thomas Kuhn who shown the role of mastering exemplars - concrete problem-solutions, to gain such tacit knowledge.

In this context, the explicit formulation of propositions, including facts, must be seen as part of the process through which people develop their understanding of the world, to identify what observations are worth making, to communicate what they perceive and to dispute or negotiate with rival claims to knowledge or understanding - rather than as an end in itself, and the status of propositions can only be properly understood in terms of the intentions of those who present them. A proposition is, as the term suggests, a proposal, a bringing forward for consideration and exploration, and that a conjectured state of affairs be supposed to be the case. And facts are not what is in the world to which propositions conform if they are true, but propositions for which overwhelmingly compelling reasons have been produced for what they propose be supposed to be the case (at least for the time being), thus disposing people to think and act in new ways.[45] As the etymological root of the word fact (from *facere* - to make) suggests, a fact is something made, and its significance and status as such can only be judged by knowing the purpose for which it was

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43. Maurice Merleau-Ponty, 'The Philosopher and Sociology' in *Phenomenology, Language & Sociology*, ed. John O'Neill, London: Heinemann, 1974, p.106; translation modified. A very similar view was defended by Whitehead, and later by George Herbert Mead in *The Philosophy of the Act*, ed. Charles W. Morris, Chicago: University of Chicago Press, 1938.

44. Michael Polanyi, *Personal Knowledge*, Routledge & Kegan Paul, London, 1958. See also Polanyi, *Knowing and Being: Essays by Michael Polanyi*, ed. Marjorie Grene, University of Chicago Press, Chicago, 1969, esp. 'The Logic of Tacit Inference.'

45. For an overwhelmingly convincing argument that facts are nothing but 'true' propositions, see David Mitchell, *An Introduction to Logic*, 2nd ed., London: Hutchinson, 1964, pp.109-15.

made.[46] An assertion by Aristotle purporting to be a fact cannot be evaluated simply in terms of its accordance with what is held to be fact by modern science. It must be evaluated in terms of Aristotle's intentions in formulating it, his conflicts with other philosophers, and in terms of its role in the research and dialogue through which the potentialities and limits of Aristotle's research programme were revealed. And 'true', having its etymological roots in notions of 'fidelity' and 'trustworthy' (as in 'a "true" knight'), would suggest that truth in science might best be characterized as defining the quality of those propositions and ways of understanding the world which we can rely upon.

Mathematics, Logic and Language

With this conception of knowledge it is necessary to reconceive the nature and role of mathematics. In the seventeenth century the applicability of mathematics to nature was seen in Pythagorean or Platonistic terms with mathematics understood as a transcendent realm of eternal truths and nature seen as being a mathematical order, while for logical empiricists, mathematics came to be seen as a system of tautologies useful for ordering knowledge to facilitate its storage and recovery and to make predictions. But the view of mathematics required to sustain these conceptions of the relationship between mathematics and the world has been undermined. Frege's effort to ground arithmetic in logic which inspired later efforts to conceive all knowledge as a logical structure was shown by Russell to be flawed. It implied that there is a class of all classes which are not members of themselves, which if it is not a member of itself, must be, and if it is a member of itself, cannot be. This is Russell's paradox. Gödel then showed that a non-trivial formalised system necessarily includes propositions the truth of which cannot be demonstrated in terms of the system, and that it is impossible to demonstrate the non-contradictory nature of such a system within the terms of that same system. The efforts to demonstrate the logical coherence of mathematics revealed the impossibility of such demonstrations, undermining the certainty of mathematics.[47]

The nature of mathematics and its efficacy for science can be better appreciated by examining the way it was generated and has been developed. Saunders Mac Lane argues that different mathematical structures are grounded in and are elaborations of different basic human activities: counting, measuring, shaping, forming, estimating, moving, calculating, proving, puzzling and grouping.[48] This is why mathematics is applicable to the world. While this does capture both the early history of mathematics and how children begin to enter the mathematical realm, it does not account for how mathematics has developed beyond its elementary stages. To understand this it is necessary to turn to the work of Imre Lakatos on the history of mathematics.[49] Through his study of the development of Euler's theorem on polyhedra, Lakatos showed that far from being a discovery of eternal truths, the development of mathematics is itself a dialectical process of conjecture and attempted refutation, requiring much work to search for counter-examples, to elaborate concepts and proofs, to integrate these into a coherent system, and then to modify this system to deal with counter-examples. This process is essentially social, ideas being developed through an on-going dialogue between mathematicians in which theorems are proposed, and then

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46. That idea that facts are constructed by the scientific community has recently become very popular, but it was cogently argued for by Ludwik Fleck in *Genesis and Development of Scientific Fact* (tr. F. Bradley & T.J. Trenn, Chicago, Uni. of Chicago Press, 1979) which was first published in 1935.

47. See Morris Kline, *Mathematics: The Loss of Certainty*, Oxford: O.U.P., 1980, esp. Ch. XII.

48. Saunders Mac Lane, 'Mathematical Models: A Sketch for the Philosophy of Mathematics', *American Mathematical Monthly*, Aug. Sept. pp. 462-472. See also George Lakoff, *Women, Fire and Dangerous Things*, Chicago and London: The University of Chicago Press, 1987, Ch.20.

49. Imre Lakatos, *Proofs and Refutations*, Cambridge: Cambridge University Press, 1981.

definitions, proofs and refutations are proposed, revised and modified. In this process mathematical concepts are developed through negotiation and renegotiation, evolving to transcend and constrain each individual who participates in the development of mathematics. The greatest advances in mathematics are achieved by utilizing the concepts developed in one branch to interpret another. For instance the major innovation of the Ancient Greeks was to interpret arithmetic through geometry. Descartes opened a new era in mathematics by interpreting geometry through algebra, which facilitated the development of calculus. From Cauchy to Weierstrass mathematicians concentrated on reinterpreting all branches of mathematics through arithmetic, which was then followed by the reinterpretation of all branches of mathematics through logic and set theory. In short, the realm of mathematics is a social construction based on the utilization of forms of cognition developed in practical experience as metaphors, articulated through negotiation and renegotiation into coherent frameworks of concepts, theorems, lemmas, proofs and refutations, and developed through a spiralling process of successively utilizing one branch of mathematics to interpret others. Like all metaphors, mathematical ideas are enduring structures of potential operations generated by and then constraining mental activity, rather than a set of eternal Platonic truths. And it is not as though mathematics is developing towards a fixed, eternal, logically coherent system which could guarantee certainty of logical deduction, the essential requirement of mathematics to fill the role prescribed for it by the logical empiricists.

Abandoning the fixation on eternal truths and focussing instead on mathematics as a social activity overcomes Russell's paradox. Once a class is seen as a theoretical object formed by a process of collecting, reflexivity becomes no more paradoxical than it is for the proverbial barber who has been told to shave all people who do not shave themselves. The barber shaves those who have not shaved themselves, and then at that time being one of those who have not shaved themselves, shaves himself. Similarly when conceiving a class as formed by collecting all classes which are not members of themselves - up until the time that the last such class other than itself is collected it is not collected, so it then collects itself.

Within the scheme of the new philosophy of science, branches of mathematics as systems of integrated concepts with relatively clearly defined principles of operation and transformation can be understood as important means to supplement and refine the non-mathematical metaphors and conceptual frameworks of theories, thereby deepening understanding and facilitating the drawing of necessary conclusions and thereby the making of predictions.[50] For instance the development of the Cartesian coordinates, and following this, the development of the calculus, provided a way of refining the mechanistic concepts of matter and motion - particularly acceleration, and revealing all the implications of these concepts. Similarly, Maxwell was able to develop mathematically the concepts of electric and magnetic fields of the mathematically illiterate Faraday, and thereby was able to go beyond him and demonstrate that electromagnetic fields could generate waves which would travel at 186,000 miles per second, the velocity which had already been measured as the velocity of light, and to postulate the existence of radio waves. In the twentieth century C.H. Waddington's work on epigenesis which led him to develop the notions of 'epigenetic landscapes', 'time paths (chreods)', 'self-stabilization along such paths (homeorhesis)' and 'switches', inspired René Thom to develop his catastrophe theory (an aspect of differential topology) in terms of which such notions have been refined and applied to new areas. More recently, Bohm, Hilley and others have attempted to clear up the chaos in quantum

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50. This conception of the role of mathematics in science has been defended by Mary Hesse, by Cliff Hooker and by David Bohm. See David Bohm, 'Quantum Theory as an Indication of a New Order in Physics' in Bohm, *Wholeness and Implicate Order*, London: Routledge & Kegan Paul, 1980, pp.111-171.

mechanics by using holography as an analogy to develop an intuitive notion of non-localizable order, and then developed this notion through algebraic topology.

What then can be said about the apodictic logic which has been at the core of the logical empiricists' research programme? To begin with it must be acknowledged that considerable advances have been made in formal logic. In the twentieth century the ideal of formality and preoccupation with the procedures for making deductions have been pushed to the extreme, producing structures of propositions floating above the material world precariously anchored to it by a few rigid designators, occasionally breaking away in vast self-enclosed nets to become the whole of reality for the desiccated minds of their creators. But successes in the development of logic has been almost entirely in formalizing of valid deductive inferences and analysing and interpreting the nature of this formalization, and even these successes must be qualified by the limited success of logic in dealing effectively with probabilities, causal relations, psychological attitudes, mass terms (such as 'fire' or 'snow'), verbs of action and adverbs. Efforts to formalize inductive inferences have proved unsuccessful,[51] and deductive logic is not creative. It helps us present thoughts already thought out; it does not help us think up thoughts.[52] In fact by presenting old ideas in a forbiddingly formalistic manner, logicians have frequently inhibited the development of new ideas. Even its contribution to mathematics is questionable, and Lakatos has criticised the axiomatization of mathematics for disguising its creativity. It should be borne in mind that it was only by overthrowing the intellectual reign of the logicians that people such as Kepler, Galileo, Descartes and Newton were able to establish the new world-orientation of mechanistic materialism.[53]

Furthermore, developments within logic itself have forced a recognition of the impossibility of the project of reducing knowledge of the world to a timeless set of logical relations between true propositions.[54] These developments suggest that logicians are not discovering the universal structure of relations between propositions which reflect the world, but are making explicit and clarifying the forms of implication associated with different ways of conceiving the world - beginning with the way of conceiving the world presupposed in the culture in which formal logic is being developed. The applicability of different logics is dependent upon prior metaphysical commitments which provide the impetus for their development and the means for their interpretation,[55] although developments in logic can free us from old metaphysical assumptions or elucidate metaphysical positions, and problems in logic associated with particular ontological commitments can be taken as evidence against them. Thus Whitehead's development of a logic of relations was an attempt to transcend the substantialism implied by the medieval rendering of Aristotle's logic. Prior's tensed logic is applicable in a Newtonian world, Quine's extensional logic in a world conceived of as a space-time plenum, Vaughan Pratt's dynamic logic, dealing with the successive realization of chains of possible worlds, is appropriate to a world conceived of as consisting of discrete processes, and Routley's/Sylvan's intensional, relevance logic to an anti-reductionist conception of being in

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51. This is by no means a universal conclusion. See for instance Brian Skyrmes, *Choice and Chance: An Introduction to Inductive Logic*, 2nd ed. Chicago Circle: University of Illinois Press, 1975.

52. This is Aristotle's view of logic. See *Sophistical Refutations*, 165a38-165b11. On the place given by Aristotle to syllogistic logic, see Jonathon Barnes, 'Aristotle's Theory of Demonstration' in *Articles on Aristotle*, ed. Jonathon Barnes et.al., London: Duckworth, pp.65-87. See also John Herman Randall Jr., *Aristotle*, N.Y.: Columbia University Press, 1960, p.51ff.

53. Thus it was noted by William and Martha Kneale in *The Development of Logic*, Oxford: O.U.P., 1962, pp.298-378 that there was a veritable Dark Age in logic from the fifteenth century to the beginning of the nineteenth century.

54. On this see David Bloor, *Wittgenstein: A Social Theory of Knowledge*, London: Macmillan, 1983, Ch.6; and Cornelius Castoriadis, *Crossroads in the Labyrinth*, [1978] tr. Kate Soper and Martin H. Ryle, Brighton: Harvester, 1984, pp.208-220.

55. As Whitehead argued: '... logic presupposes metaphysics.' *Modes of Thought*, p.107. At the same time Whitehead suggests that the abstractions of logic will never be adequate for the complexity of the world.

which individuals only exist in relation to their environment and constituents, but are irreducible to either of these.[56] Recently Nicholas Rescher has provided the outline of a process semantics for logic.[57]

The limitations of formal logic and the liberating potential of advances in the field were obscured until recently by developments in the philosophy of language, particularly in USA. In response to the failure of logical positivists to give an objectivist account of scientific knowledge, philosophers of language strove, in accordance with the tradition of Platonism, to describe the relationship between logic, language and the world and to characterize meaning and reference so as to exclude all 'subjective' elements.[58] It was argued that meaning is based on, or is reducible to, reference and truth, that there is an objectively correct way to associate terms represented by arbitrarily defined signs with things, and that truth consists in a correspondence between propositions or sentences and states of affairs in the world.[59] But the proponents of these ideas have been blind to the freedom of language and thought from reference,[60] and to the background knowledge and understanding involved in the use of language, even when no more is involved than referring and making inferences. More fundamentally, they have been blind to the role played by the body, image schemas, metaphors, metonymy and imaginative projection and to the importance of focusing, scanning, superimposition, figure-ground reversal and reflexivity in the development of cognition and in using language. And these doctrines have led them to dogmatic assumptions about the nature of the world. In order to fit the world into their dessicated philosophy of language, the world is assumed to consist of entities with fixed properties and relations holding among them at any instant, and to be divided up into natural kinds consisting of sets defined by the essential properties shared by their members. Complex properties of entities are assumed to be logical combinations of primitive properties.

Work in the philosophy of language, particularly in the area of cognitive semantics, is forcing philosophers to recognize the centrality of metaphor and metonymy in language, the importance of background understanding, and it is forcing them to question such assumptions about the world. In doing so it is contributing further to the development of a dialectical theory of knowledge. George Lakoff has summed up the findings of cognitive semantics:

> Meaning is based on the understanding of experience. Truth is based on understanding and meaning. Innate sensory-motor mechanisms provide a structuring of experience at two levels: the basic level and the image-schematic level. Image-schematic concepts and

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56. On the relationship between logics and theories of being see Susan Haack, *Philosophy of Logics*, Cambridge: Cambridge University Press, 1978, Ch. 9. Vaughn Pratt's dynamic logic is described in V.R. Pratt, 'Logic of Processes', manuscript dated November 29, 1977 and Krister Segerberg, 'Applying Modal Logic', *Studia Logica*, Vol.XXXIX, 2/3, 1980, pp.275-295. Richard Sylvan and Val Plumwood have described the relationship between their intensional logic and ontology in Val and Richard Routley, *Social Theories, Self Management, and Environmental Problems*, Don Mannison et.al. eds, *Environmental Philosophy*, RSSS, A.N.U. Press, 1980, pp.217-332, esp.239-250. Richard Sylvan has addressed the issue of process more recently in an unpublished paper, 'Process and Action: Relevant Theory and Logic', 1992.

57. Nicholas Rescher, "Appendix: Process Semantics", *Process Metaphysics: An Introduction to Process Philosophy*, N.Y.: State University of New York Press, 1996, pp.175-182.

58. Hilary Putnam's, 'Reference and Truth' in *Realism and Reason: Philosophical Papers, Volume 3*, Cambridge: C.U.P., 1983, pp.69-86, gives a good overview of mainstream philosophy of language. This tradition has also been briefly characterized, and severely criticised by Richard Rorty in *The Mirror of Nature*.

59. The most influential doctrines of such objectivist semantics have been the causal theory of reference where the meaning of terms are seen to be given by an act of naming, and the truth conditional theory of meaning of sentences. The truth conditional theory of meaning was first proposed by Carnap who argued: 'To know the meaning of a sentence is to know in which of the possible cases it would be true and in which not.' (Rudolf Carnap, *Meaning and Necessity*, Chicago: University of Chicago Press, 1947, p.10.)

60. For a sustained attack on the reference theory of truth and meaning, see Richard Routley, *Exploring Meinong's Jungle*, Canberra: Philosophy Dept., R.S.S.S., A.N.U.

> basic-level concepts for physical objects, actions, and states are understood directly in terms of the structuring of experience. Very general innate imaginative capacities (for schematization, categorisation, metaphor, metonymy, etc.) characterize abstract concepts by linking them to image-schematic and basic-level physical concepts. Cognitive models are built up by these imaginative processes. Mental spaces provide a medium for reasoning using cognitive models.[61]

Different logics are themselves founded on, can only be made sense of, and must be evaluated in terms of the experience of embodied engagement in the world, of body schema, of imagination and of metaphors. Traditional and classical logic are elaborations of the metaphor of spatial containment and exclusion, while modal logic (dealing with necessity, impossibility and possibility) adds an extra dimension through the metaphor of force and barriers or absence of barriers to it.[62] After studying the role of metaphor in the language of science, Richard Boyd rejected prevailing theories of reference, arguing that it is: 'essential that one adopt a *dynamic* and *dialectical* conception of reference, in contrast to conceptions of reference which present *synchronic*, *piecemeal*, and *nondialectical* idealization of the relation between individual words and features of the world.'[63] So called 'literal' meanings are not simply denotations but are frozen metaphors. Scientists who are advancing science are always struggling to free people from the assumption that terms simply refer to what there is in order to extend the limits of prevailing language.

Showing the 'relativity' of theories, the perceptual world, concepts, experimental design and technology, facts, mathematics and logic to each other revealed the incommensurability of theories from the point of view of logical empiricists; that is, the impossibility of comparing opposing theories point by point or through an ideal, theory neutral language based on symbolic logic supposedly representing states of affairs in the world. But this does not mean that theories cannot be compared. Once the creative potential of language is acknowledged, it can be seen that the barriers to communication assumed by logical positivists simply do not exist. As Paul Feyerabend pointed out: 'Philosophers insist on stability of meaning throughout an argument while scientists, being aware that speaking a language or explaining a situation means both *following* rules and *changing* them, are experts in the art of arguing across lines which philosophers regard as insuperable boundaries of discourse.'[64] The rationality of science can only be properly understood in socio-historical terms in relation to the struggles between proponents of competing theories and research programmes to establish a 'ratio' between different domains of experience, experiments, metaphors, concepts, insights, forms of thinking and opposing theories. It requires competing research programmes for the inadequacies and limitations of each research programme to be revealed.[65] And in the process of proposing, developing and comparing research programmes, the criteria of valid inference itself change.[66] In other words, the rationality of scientific progress is dialectical.

Dialectics

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61. George Lakoff, 'Meaning and Mental Representations', in Umberto Eco, Marco Santambrogio and Patrizia Viola eds, *Meaning and Mental Representations*, Bloomington and Indianapolis: Indiana University Press, 1988, pp.119-154, p.150.

62. These metaphors have been explicated by Johnson, *The Body in the Mind*, pp.'s 38ff. and 63f.

63. Boyd, 'Metaphor and Theory Change', p.381.

64. Paul Feyerabend, *Farewell to Reason*, London: Verso, 1988, p.272.

65. Paul Feyerabend in *Against Method*, London, Verso, 1978, Ch.3, argued that without a diversity of competing theories, the limitations of theories are invisible.

66. On this, see Stephen Toulmin, *The Uses of Argument*, Cambridge: Cambridge University Press, 1968, esp. p.257.

Dialectics first and foremost implies dialogue, although it also implies other things, notably the absence of any element of experience, knowledge or reasoning which can be taken as the absolute foundation on which all knowledge is built or in terms of which it can be judged. It implies that the advance of understanding can only be achieved through the critical examination, confrontation and appreciation of the different points of view of people who are engaged in the world trying to make sense of it without any absolute reference points. Dialectics is opposed to both the attempt to reduce the development of knowledge to the mechanical application of a method and to relativism, since both of these exclude dialogue - methodologism by denying the assumptions underlying any method, and relativism by denying the possibility of mediating between ways of thinking and living based on different assumptions. Dialogue is essential to expose and comprehend the assumptions underlying all claims to knowledge, to reveal differences in assumptions and to open the possibility of replacing these assumptions, of developing radically new starting points to transcend old problems; and also, at the same time, to appreciate diverse points of view. The participants in such dialogue are embodied subjects, and they participate from the stand-point provided by their socio-historical situation. Scientific knowledge is essentially social not in the sense that what the majority accepts is true, but in the sense that individuals only make judgments as participants in forms of life, usually embedded in material transformations of the world, in which there is some degree of fusion of horizons between members. Rather than theories, concepts, mathematics, methods, experiments and facts rigidly and logically implying or excluding each other, what we have is people working as theoreticians, conceptual analysts, mathematicians, methodologists, experimenters and logicians all aware of and guided by the activities, endeavours, achievements and conflicts between others, and striving in their own particular work to throw light on these problems and controversies and thereby to make their own distinctive contribution to understanding the world. Only insofar as individuals understand to at least some extent the work of others and the proponents of opposing ideas are they in a position to judge some ideas as superior to others and to contribute to research. To talk about progress in scientific knowledge from a stand-point outside such common understanding is meaningless, and when such fusion of horizons breaks down, as it is arguably doing at present in many areas of science,[67] the notion of scientific progress is an insupportable myth.

Dialectical rationality is relational to begin with in the sense that the meanings of concepts are understood in relation to and in opposition to each other, as Plato argued, and in the Hegelian sense that advances in knowledge can only be understood by defining their achievements in relation to the ideas transcended. Knowledge advances not by moving towards a full and final truth which pre-exists all enquiry, but by revealing and overcoming the failures and limitations of old ways of thinking and conceiving the world. As Kuhn argued:

> Can we not account for both science's existence and its success in terms of evolution from the community's state of knowledge at any given time? Does it really help to imagine that there is some one full, objective, true account of nature and that the proper measure of scientific achievement is the extent to which it brings us closer to that ultimate goal? If we can learn to substitute evolution-from-what-we-do-know for evolution-towards-what-we-wish-to-know, a number of vexing problems may vanish in the process.[68]

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67. This is argued by David Bohm and F. David Peat in *Science, Order and Creativity*, Toronto: Bantam Books, Ch.2.

68. Thomas Kuhn, *The Structure of Scientific Revolutions*, 2nd ed., Chicago: University of Chicago Press, 1970, p.171.

The reasons why such theories must be regarded as advances can only be fully comprehended in the context of the particular situations in which new theories are proposed.[69] It is impossible to evaluate them in terms of some absolute criteria because major advances in knowledge transcend old assumptions and create new ways of arguing, changing the standards of relevance and proof. They advance our understanding of understanding and what is involved in achieving it. The superiority of the new theories is only revealed by the comprehension they facilitate of the achievements and limitations of the theories transcended. As Alasdair MacIntyre pointed out:

> Wherein lies the superiority of Galileo to his predecessors? The answer is that he, for the first time, enables the work of all his predecessors to be evaluated by a common set of standards. The contributions of Plato, Aristotle, the scholars at Merton College, Oxford and Padua, the work of Copernicus himself at last all fall into place. Or to put matters in another and equivalent way: the history of late medieval science can finally be cast into a coherent narrative.... What the scientific genius, such as Galileo, achieves in his transitions, then, is not only a new way of understanding nature, but also and inseparably a new way of understanding the old sciences way of understanding... It is from the stand-point of the new science that the continuities of narrative history are reestablished.[70]

Dialectical rationality is also relational in that the meaning of the enterprise of striving for knowledge and understanding only makes sense in relation to social practices of particular forms of life, which in turn only make sense in terms of broader social and cultural contexts of which they are part. Wittgenstein made this point when he argued:

> "So you are saying that human agreement decides what is true and what is false?" - It is what human beings say that is true and that is false; and they agree in the *language* they use. That is no agreement in opinions, but in forms of life.[71]

But this is only the most basic agreement constituting the enquiring community as a form of life. The scientific community as a whole is underpinned by common assumptions about what science is, what are the goals of science, about what have been its major achievements, about what place science has in society, and about the nature of the world in general. Such assumptions are not only institutionalized; they are embodied in the transformations of the material world - in buildings, laboratories, technology and experimental apparatuses. This community is in turn subdivided into a multiplicity of disciplines and sub-disciplines constituted by more specific shared commitments, including technologies, symbolic generalizations, models (analogies and ontologies) and exemplars: the concrete problem solutions accepted by these communities as paradigmatic.[72] It is the condition for the possibility of science that people are socialized, through education and apprenticeships, into such forms of life.

The precedence given to certain discourses, organizations and individuals to adjudicate truth claims is an essential constituent of the order of power within society. This is the point made by Foucault who argued:

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69. Support for this contention is provided by the detailed analyses of scientific reasoning made by Dudley Shapere in *Reason and the Search for Knowledge*, Dordrecht: Reidel, 1984, Part III.

70. Alasdair MacIntyre, 'Epistemological Crises, Dramatic Narrative and the Philosophy of Science' *Monist*, Vol. 60, 1977, pp.453-472, pp.459-60 & 467.

71. Ludwig Wittgenstein, *Philosophical Investigations*, tr. G.E. Anscombe, 3rd ed., Oxford: Basil Blackwell, 1968, 241.

72. See Thomas S. Kuhn, *The Essential Tension*, Chicago: University of Chicago Press, 1977, p.297ff.

> Each society has its regime of truth, its 'general politics' of truth: that is, the types of discourse which it accepts and makes function as true; the mechanisms and instances which enable one to distinguish true and false statements, the means by which each is sanctioned; the techniques and procedures accorded value in the acquisition of truth; the status of those who are charged with saying what counts as true.[73]

In the forms of life in which scientific ideas are formulated, communicated and legitimated, the relationship between power and knowledge is indissociable.[74] To begin with, there are the power structures and struggles within scientific laboratories, within research institutions, within cultural fields and discursive formations and within the organizations which sustain these. People struggle for power within disciplines for teaching positions, the means for research, to choose what research to do, for positions in different research establishments, for the brightest students and research assistants, and for the means to disseminate ideas and to ensure that they are seriously considered. This includes the struggle for the appointment of former students to teaching institutions and for the editorships of the most respected journals. There are also struggles over the power structures within disciplines, between existing disciplines over status and finance, and to establish and legitimate new disciplines, and struggles within and between institutions of learning and research. Such struggles involve complicated interpersonal and institutional manoeuvring, the formation of alliances, the accumulation and deployment of symbolic capital, and the construction of mythologies (presented as histories) to legitimate the claims to authority, and thereby the power of different groups of researchers to carry out research and promote their ideas.[75] These structures of power and power struggles are then intimately related to the broader political and economic contexts which constrain what sort of research and teaching institutions can be legitimated in the eyes of those who ultimately control or supply finance. Finally there are the broader cultural processes, from the ideological power struggles within and between discursive formations such as those studied by Foucault, to the ideological struggles affecting whole societies and civilizations focussed on by Hegelian and Marxist historians of science, which limit what will be tolerated or even understood by anyone striving for legitimacy.[76]

The pervasive nature of these power struggles and their social contexts has given rise to the problem of the relationship between the internal history of science - the development of ideas themselves, and the external history of science - the history of the external conditions which have led to the production of scientific ideas. In general it appears that certain external conditions are conducive to major intellectual advances: the existence of a diversity of competing intellectual centres with a major centre but without centralized control, tied together into a single network - as occurred for instance in Ancient Greece, Renaissance

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73. Michel Foucault, *Power/Knowledge*, ed. Colin Gordon, Brighton: The Harvester Press, 1980, p.131.

74. On this see Pierre Bourdieu, 'The specificity of the scientific field and the social conditions of the progress of reason' in *Social Science Information*, Vol.14, No.6, 1975, pp.19-47; Bruno Latour, *Science in Action*, London: Open University Press, 1987; Bruno Latour and S. Woolgar, *Laboratory Life: The Social Construction of Scientific Facts*, London and Beverly Hills: Sage, 1979; and K.D. Knorr-Cetina, *The Manufacture of Knowledge: An Essay on the Constructivist and Contextual Nature of Science*, Oxford: Pergamon Press, 1981.

75. For an excellent study of this see Pnina Abir-Am, 'Themes, Genres and Orders of Legitimation in the Consolidation of New Scientific Disciplines: Deconstructing the Historiography of Molecular Biology' *History of Science*, Vol.23, Part 1, No.59, 1985, pp.73-117 and 'Essay Review: How Scientists View Their Heroes: Some Remarks on the Mechanism of Myth Construction' in *Journal of the History of Biology*, Vol.15, no.2. Summer 1982, pp.281-315.

76. One of the best theoretical - and polemical statements on this project, see Bob Young, 'Science *is* Social Relations' in *Radical Science Journal*, Vol.5, 1977, pp.65-118. For a general survey of such analyses see Michael Mulkay, *Science and the Sociology of Knowledge*, London: George Allen & Unwin, 1979. For some of the best works in this area see *Radical Science Journal* which has now been renamed *Science as Culture*.

Italy, eighteenth century France and nineteenth century Germany.[77] But these conditions do not account for the nature of the intellectual advances. These can only be accounted for through the dialectics of internal and external conditions. In terms of post-Hegelian dialectics, power relations and broader social dynamics are not merely non-rational influences on the creation and legitimation of ideas. They also have a rationality, closely associated with the rationality of the development of explicit ideas, which can be investigated and evaluated. The forms of life of a society embody world-orientations incorporating metaphors, generally elaborated by using social relations as a metaphor for nature then using nature as a metaphor for understanding society, thereby legitimating its institutions, organizations and social movements. Forms of life can be evaluated in terms of the success or failure of the explicitly developed ideas which are engendered by and produced within them to make the world intelligible and as means to confront, mobilize people and resolve the problems of these forms of life. Where it becomes impossible to develop the ideas required to properly comprehend the world and its problems within the forms of life of a society, then the limits of these forms of life are revealed, and this must be faced up to and society transformed accordingly. In attempting to advance beyond a particular set of ideas it is not only important to cast past ideas into an historical narrative, but also the forms of life - the institutions and socio-economic formations which have produced these ideas, and the successes, problems and failures of these forms of life. This project only becomes fully intelligible in relation to a philosophy of history, a conception of humanity, and ultimately, as part of metaphysics.

Dialectics, Metaphysics and Science

Radically opposed to the conceptions of knowledge based on the classical logic of Bertrand Russell, dialectical rationality is oriented towards achieving a comprehension of the whole. This relational conception of knowledge oriented towards the totality is also associated with a far greater concern with contradictions between diverse knowledge claims and between theories, experiments and social practices than is the case with theories of knowledge centred on formal deduction. The dialectic of understanding involves both a struggle to grasp each individual in its uniqueness and a struggle to attain a comprehensive perspective, a process which by its very nature can never be complete. Individuals as participants in the struggle to understand the world can only make provisional commitments to particular ways of conceiving the world in the struggle to deepen understanding. Lucien Goldmann pointed out the significance of this:

> Both rationalism and empiricism are ... opposed to dialectical thought, for this affirms that there are never any absolutely valid starting points, no problems which are finally and definitely solved, and that consequently thought never moves forward in a straight line, since each individual fact or idea assumes its significance only when it takes up its place in the whole, in the same way as the whole can be understood only by our increased knowledge of the partial and incomplete facts which constitute it. The advance of knowledge is thus to be considered as a perpetual movement to and fro, from

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77. On this, see Joseph Ben-David, *The Scientist's Role in Society*, Englewood Cliffs: Prentice-Hall Inc., 1971, and Randall Collins, 'On the Sociology of Intellectual Stagnation', *Cultural Theory and Cultural Change*, ed. Mike Featherstone, London: Sage, 1992.

> the whole to the parts and from the parts back to the whole again, a movement in the course of which the whole and the parts throw light on each other. [78]

This movement between wholes and parts is characteristic of both efforts to understand particular situations and to understand the world as whole. What counts as a part is determined from the perspective of the whole, while the whole must be defined as such from the perspective of the parts which compose it. Thus science is articulated into various domains, each defined by some problem (the inexplicable existence of some kind of order which needs to be accounted for, for example) which theories are required to solve together with the information relevant to the effort to solve this problem, or by a theory with its associated objects and relevant information entailing a research programme to elaborate it.[79] But what counts as problematic in the first place is largely determined by other domains and their relationships, which also determine which theories can be plausibly entertained. The endeavour to grasp the relationships between and to put in perspective all domains, to achieve a comprehensive understanding of the world as a whole is speculative philosophy, and what speculative philosophy elaborates is a metaphysics.

Speculative metaphysics, by elaborating categorial schemes, strives to make intelligible the relationship between each and every entity, component and aspect of the world by defining the generic features of the primary being or beings of the world, as opposed to the characteristics of what is merely an aspect or part of something else. The problem is to obtain a unity of understanding through a theory of being or beings which puts all particular domains into a coherent perspective, and thereby provides science with a grand research programme. Metaphysics must define the basic characteristics of the beings which particular sciences are to investigate, enabling each science to define its domain in relation to other domains in terms of the kinds of being it is investigating. In doing this, it must also show that it is possible for these 'objects' to be understood, provide a general characterization of what it means for them to be understood, and a general direction for attaining this understanding. After the question: What is being? the most significant questions for attaining such a general perspective are: What is the nature of the cosmos (how did it originate, how is it developing, what are the principles operating within it and what is the relationship between its elementary components)? What is life? and What is humanity? In terms of the notion of humanity, it is then necessary not only to provide answers to such questions as what is worth striving for, how should we live, and how should society be organized, but also to account for the possibility of humans attaining an understanding of the nature of being, of the cosmos, of life, and of themselves and the point of their existence. Any metaphysical system which cannot account for the comprehensibility of the world and the existence of beings who can comprehend it (which is the case with both mechanistic materialism and field theory) is self-contradictory. The importance of any particular research can be judged by how basic are the questions which it illuminates. The development of research programmes, whether dealing with the nature of being as such or with more specific issues, generates new problems, and thereby opens up new domains, inspires the development of new theories, and thereby leads to the development of new research programmes.

Virtually all the most significant advances in science have been engendered by the struggle to attain a coherent conception of the nature of the world. Where enquiry has been divorced from concern with broader questions and been reduced to a means to develop

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78. Lucien Goldmann, *The Hidden God: A Study of Tragic Vision* tr. Philip Thody, London: Routledge & Kegan Paul, 1964, p.4f.

79. The nature of domains and their formation has been studied by Dudley Shapere in 'Scientific Theories and Their Domains' in Suppe ed. *The Structure of Scientific Theories*, pp.518-565.

technology, as in the medieval Arab world, in France after the French revolution and in Stalinist Russia, or ghettoised into separate domains as in late medieval scholasticism, understanding has stagnated or regressed. The advances in knowledge achieved during antiquity and in the medieval world were only possible because the Greeks had articulated coherent conceptions of being which could serve as the foundations for research programmes to attempt to understand all aspects of the world. Without such conceptions of being there would have been no way to begin enquiry, no way to work out the important questions to put to nature. The revolution in the seventeenth century was first and foremost a metaphysical revolution, and Galileo for one claimed that he had spent as many years thinking about philosophy as months thinking about mathematics. The development of science since then has only been possible because of the coherent metaphysics which was articulated at that time.[80] Chemistry, biology and psychology have successively been advanced on the basis of this theory of being. But while the advance of science has generally involved the transcendence of all concepts deriving from Aristotle: phlogiston, entelechies and so on, the mechanistic ontology has been largely undermined in physics by the alternative theory of being - field theory - which has its roots in the ideas of Leibniz. And as I will go on to argue, both these theories of being are now under attack from a science based on the process view of the world. Thus, as opposed to logical empiricists such as Carnap and Ayer who defined science in opposition to metaphysics, the historical evidence suggests that it is the effort to investigate and explain the world in terms of a coherent metaphysics which defines them as scientific, and the present balkanization of disciplines and fragmentation of discourse in which the underlying metaphysical assumptions are being lost sight of and confused, must be regarded as a corruption and degeneration of science.

While hack scientists can ignore their taken for granted assumptions, metaphysics is vital to more creative scientists. This was clearly revealed at the biological conferences at Belagio organized by C.H. Waddington. The physicist David Bohm summed up the conclusions of one of these conferences:

> I think the most important aspect of the interchange is the emergence of a common realization that metaphysics is fundamental to every branch of science. Metaphysics is ... something that pervades every field, that conditions each person's thinking in varied and subtle ways, of which we are not conscious. Metaphysics is a set of assumptions about the general order and structures of existence ... It seems clear that everybody has got some kind of metaphysics, even if he thinks he hasn't got any.

He then went on to point out the implications of this:

> ... the practical 'hard-headed' individual has a very dangerous kind of metaphysics, i.e. the kind of which he is unaware... Such metaphysics is dangerous because, in it, assumptions and inferences are being mistaken for directly observed facts, with the result that they are effectively riveted in an almost unchangeable way into the structure of thought... [W]hat is needed is a the conscious criticism of one's own metaphysics, leading to changes where appropriate and, ultimately, to the continual creation of new and different kinds. In this way, metaphysics ceases to be the master of a human being

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80. As clearly demonstrated by Ivor Leclerc in *The Nature of Physical Existence*, London: George Allen & Unwin, 1972. See also the work of Alexandre Koyré.

> and becomes his servant, helping to give an ever changing and evolving order to his overall thinking.[81]

The relationship between science and metaphysics is clarified by the Robin Collingwood's logic of question and answer.[82] Developing ideas from both Plato and Hegel, Collingwood elaborated this logic in opposition to the logic of Russell and Whitehead, arguing that this was a valid characterization of the rationality of both scientific and historical investigation, and using it to reveal the different levels of assumptions dominating historical eras. To defend this logic, Collingwood argued that the validity of any proposition can only be understood and judged when the question it is attempting to answer is understood. Each question presupposes a set of assumptions which in turn are answers to other questions. For instance, the search for the type of virus making someone ill presupposes that types of illness are due to viruses, which in turn is a theory based on other assumptions about the nature of organisms and their normal functioning. The ultimate assumption underlying this research is that all events, in this case, becoming ill, have some cause. This is a metaphysical assumption.

Such metaphysical assumptions cohere as categorial schemes which are held together by what were referred to by the eighteenth century German philosopher Lichtenberg as *paradeigma*.[83] Lichtenberg argued that in physics puzzling phenomena are made intelligible by relating them to some standard form or process which we must accept as self-explanatory.[84] Since a theory of all that is must ultimately account for the world in its own terms rather than in terms of something else, such *paradeigma* are an unavoidable part of metaphysics. However with metaphysical revolutions, these *paradeigma* are brought into question and replaced. For instance, Aristotle's metaphysics, being based on the analogy of organisms, took organic growth and a stationary state in relation to the earth as paradigmatic, not in need of explanation, and the starting point for explaining everything else. It was for this reason that it was assumed that base metals were evolving into some higher form, and that all that is necessary to transmute base metals into gold is to find the conditions which would hasten this development, while the motion of a thrown object after it had lost contact with its mover was seen as something which had to be explained. However with the metaphysical revolution of the seventeenth century with the elaboration of the analogy of a machine, inert matter located in space and moving according to fixed laws of motion through time came to be taken as paradigmatic. Uniform motion in a straight line was then not something to be explained, but the starting point for explaining everything else, while organic growth came to be seen as something which had to be explained in terms of the arrangement and motion of bits of inert matter and the forces of attraction and repulsion between them. However in terms of mechanistic materialism, such forces of attraction and repulsion were inexplicable. With the adoption of field theory, fields of force became paradigmatic, and the real problem came to be accounting for the existence of particle-like centres of force within the fields. Such *paradeigma*, founded on basic metaphors and encoded in the basic categories of cultures, are assumed by whole eras. No

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81. David Bohm, 'Further Remarks on Order' in C.H. Waddington ed. *Towards a Theoretical Biology: 2 Sketches*, Edinburgh: Edinburgh University Press, 1969, p.41f.

82. See R.G. Collingwood, *An Autobiography*, Oxford: Oxford University Press, 1939, Ch.5 and *An Essay on Metaphysics*, Oxford: Oxford University Press, 1940, p.23ff.

83. This concept has been developed by Stephen Toulmin in *Foresight and Understanding*, London: Hutchinson, 1961 and *Human Understanding* Vol.1, Oxford: Oxford University Press, 1972, p.106f.

84. These are closely related to what Imre Lakatos regarded as the 'hard core' of scientific theories, and also to what Gerald Holton called 'themata'. See Lakatos, *The Methodology of Scientific Research Programmes*, p.48 and Gerald Holton, *The Scientific Imagination: Case Studies*, Cambridge: C.U.P., Ch.1.

investigation of any sort can escape these metaphysical assumptions since they are presupposed by all questions.

Metaphysics and Society

The acceptance of *paradeigma* plays a major part in the process of embodiment of categories into the social practices of society. The transformation from a view of the world in which all entities are growing to a world in which all entities are naturally in uniform motion unless acted on by an external force, and in which every event has an identifiable cause, was associated with the transformation of society and the development of practices devoted to the total control of nature and people. The possibility of total control required such a *paradeigma*. However with the world seen as composed of bits of inert matter there were still limits to such control. In Newtonian physics, atoms are immutable and can only be rearranged. To hold out the possibility of absolute control it was necessary to reconceive the world in a way which would enable these bits of matter to be seen as derivative - the view of the world defended by the field theorists. As I have shown in earlier chapters, such assumptions about the physical world are inseparable from assumptions about people, social relations and ideals of social order. The categories of mechanistic materialism have developed as constituents of and as constitutive of social life in capitalist societies, and are presupposed not only in inquiry, but also in decision-making, in deliberate action and in the language of justification.

While Collingwood gave no place to the actual development of metaphysical systems, there is no reason why this logic of question and answer should not be extended to asking and answering questions about the nature of primary beings in answer to developments and conflicts in and between different domains of science and with other domains of social life. The dialogue associated with the development of understanding must take place at a number of different levels, ranging from those associated with highly specific questions within particular research programmes or domains, through those associated with assumptions specific to such programmes and domains, to the epistemological and metaphysical assumptions underlying the entire scientific endeavour, and finally to the metaphysical schemes underlying ethics, politics, the social order and civilization itself. The form of rationality involved in metaphysics is no different from, and is inseparable from, the form of rationality involved in particular sciences. In each case, comprehension is developed through the elaboration and articulation into conceptual frameworks of metaphors in competition with or in relationship to other metaphors in the struggle to understand the world and its anomalies.[85] But there are unique problems in the development and justification of such metaphysical schemes, because as the foundation for total conceptions of the world, nothing can be simply assumed. As Hegel succinctly summarized the problem:

> Philosophy misses an advantage enjoyed by the other sciences. It cannot like them rest the existence of its objects on the natural admissions of consciousness, nor can it assume that its method of cognition, either for starting or for continuing, is one already accepted... We can assume nothing dogmatically; nor can we accept the assertions and assumptions of others. And yet we must make a beginning: and a beginning, as primary

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85. On the nature of metaphysical thinking, showing the central role of analogies, see Dorothy Emmet, *The Nature of Metaphysical Thinking*, London: Macmillan, 1966. See also Whitehead, *Process and Reality*, Ch.1. Whitehead refers to 'descriptive generalization' rather than the elaboration of analogies.

> and underived, makes an assumption, or rather is an assumption. It seems as if it were impossible to make a beginning at all.[86]

The solution to this problem is to justify the assumptions on which the starting point is based by the system which is developed from it. As Hegel put it:

> The very point of view, which originally is taken on its own evidence only, must in the course of the science be converted to a result - the ultimate result in which philosophy returns into itself and reaches the point with which it began. In this manner philosophy exhibits the appearance of a circle which closes with itself, and has no beginning in the same way as other sciences have.[87]

But being a closed, internally consistent circle is not enough by itself. The statement: 'All statements but this are absurd' starts and finishes with itself in an entirely consistent way, but gets nowhere. As noted previously, while there may be no Archimedean point on which knowledge claims can be built, the quest for understanding inevitably reveals the limits of this quest, that, as Schelling argued against Hegel, there is an '*unvordenkliches Sein*' (unprethinkable Being) before all thought, presupposed by all thought, and ultimately beyond the full grasp of thought. Before any enquiry we are always already engaged in a world shared with others which is already partially understood, and this understanding of the world and its limits are presupposed by such enquiry. Proponents of metaphysical systems cannot avoid relating their speculations to their prior understanding of the world as they have previously engaged in it. They are impelled to be reflexive towards their erstwhile assumptions and to acknowledge that they themselves are part of an on-going struggle with others to make sense of this world. This means that metaphysicians must come to terms with rival efforts to advance understanding, including rival metaphysical systems and the claims made by them. To retain their plausibility a metaphysical system must account for the achievements and reveal the limitations of these rivals, or at least provide a research programme for doing so. Furthermore, to escape the charge that philosophy itself is idiosyncratic, such encompassing cannot stop at the productions of philosophers. Metaphysicians must also come to terms with scientific ideas, with conceptions of the world embodied in social relations, in forms of life and institutions, and in all other symbolic productions, including art, literature, history, ceremonies, religious practices, and so on.

To avoid the idiosyncrasy of conceiving the world from the point of view of one culture or from one geo-socio-historical situation, metaphysicians must accept the task of achieving a critical perspective able to comprehend the achievements and limitations of all other cultures, both those co-existing and those of past societies. While obviously this task could never be complete, a contribution to this has been attempted in this work by showing the role played by metaphysical assumptions in the evolution of European civilization and the influence of Neoplatonist metaphysics in the dynamics of Russian society; and from a very similar perspective it is what Joseph Needham has accomplished in far greater depth for China in his monumental study, *Science and Civilisation in China*. But most importantly, a metaphysical system must come to terms with the way the world is presently understood. It should provide a critical perspective on the present era and the metaphysical assumptions which underlie it. Through engaging with conceptions of the world embodied in current social practices and institutions and offering modifications of or alternatives to these, metaphysical schemes can then become more than simply theories or grand research programmes; they can become world-orientations which can challenge, and if successful,

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86. G.W.F. Hegel, *Hegel's Logic*, tr. William Wallace, 3rd ed. Oxford: Clarendon, 1975, § 1, p.3.

87. Ibid. § 17, p.23.

replace the foundations of civilizations. By providing concepts which can mediate people's relations in practices and institutions in new ways they have the potential to become incorporated as new forms of life, as the foundations for new social formations, and ultimately civilizations, with dynamics of their own.

It follows from the historical analyses of civilizations in this work and its precursor that there are two further ways in which it is necessary to dissent from Hegel's characterization of metaphysics. Firstly Hegel's assumption (which he himself occasionally questioned) that there is an end point to philosophy, a final system capable of a complete vision of the world which can be captured in a system of logic, and such that all earlier philosophies can be seen as mere stages on the path to this end point, must be rejected. There is no justification for such an assumption. One can only hope to achieve a way of understanding the world to which a provisional commitment can be made on the basis of its demonstrated or promised superiority over all known rivals. But earlier ideas are not just stage-posts on the way to one's own conception of the world, even if one does successfully transcend their limitations. Although it is important for the justification of a philosophy that it be shown to provide a perspective on the past, each philosophy is a more or less successful effort to come to grips with its age, and must be regarded as an end in itself in this regard. Furthermore while it might be possible to provide a philosophy fully adequate to the present, it can be expected that such ideas will also be shown to be limited and will be transcended in the future. Thus rather than conceiving of a metaphysical system as a circle which closes on itself, a metaphysical system should be regarded as a spiral which begins with a set of assumptions in terms of which the world, including the history of philosophy (and the history of science), is investigated, and which eventually explicates and validates these, but which at the same time reveals their provisional nature, thereby providing the point of departure for new efforts to achieve a comprehensive understanding of the world.

Secondly, while Hegel has acknowledged that metaphysical systems are not simply ideas entertained about the world but are embodied in the institutions of societies, and that consequently the ideas of metaphysical systems are intimately related to the way society is organized, he has maintained a division between theory and practice by arguing that metaphysics is simply the bringing to full consciousness of forms of thinking which have already been developed within practices and partly brought to consciousness within art and then in religion. It is the final coat of icing on the cake. It can therefore never be a guide to action. As he put it:

> ...it is only when actuality is mature that the ideal first appears over against the real and that the ideal apprehends this same real world in its substance and builds it up for itself in to the shape of an intellectual realm. When philosophy paints its grey in grey, then a shape of life has grown old. By philosophy's grey in grey it cannot be rejuvenated but only understood. The owl of Minerva spreads its wings only with the falling of the dusk.[88]

As opposed to this, and also to the dialectics of orthodox Marxists who underplay the importance of theory, I have argued here for the indissociability of theory and praxis, and for the capacity of metaphysics to go beyond prevailing forms of thought and praxis and thereby to reveal the limitations of the metaphysical assumptions which dominate them. As well as serving to make the world intelligible, a metaphysical system must articulate the problems and aspirations of people and reveal to them how such problems can be overcome and how their aspirations can be realized. In earlier chapters of this work the nature of this

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88. G.W.F. Hegel, *Hegel's Philosophy of Right* tr. T.M. Knox, Oxford: Clarendon, 1952, p.12. This conservatism also derives from the assumption of the identity between being and thought, since this allows no gap between the real and the rational.

dialect between metaphysics and action has been shown: how in the early Middle Ages a version of Neoplatonic Christianity served to unify society and then to provide the means whereby the church was able to achieve ascendancy over secular rulers, how in the seventeenth century mechanistic materialism was able to provide a coherent perspective on both the social and natural world to provide the rising bourgeoisie with a new basis for interpreting the past and legitimating their struggle for political power, and how Neoplatonic Marxism provided the ideological means for the radical intelligentsia and the proletariat to gain and maintain power in the Soviet Union. In opposition to Hegel and vulgar Marxists it has been argued that the picture is closer to that drawn by Whitehead:

> [Metaphysics] is the most effective of all the intellectual pursuits.... It is the architect of the buildings of the spirit, and it is also their solvent:- and the spiritual precedes the material. Philosophy works slowly. Thoughts lie dormant for ages; and then, almost suddenly as it were, mankind finds that they have embodied themselves in institutions.[89]

To be developing an alternative metaphysical system is to be challenging the existing power relations and forms of legitimation in society. It is not simply to be developing a set of ideas but to be developing a mode of being and engaging in the world. To comprehend such a system is to at least be open to the possibility of changing one's mode of being in the world and thereby of radically changing oneself. To change one's mode of being in the world is to see different possibilities, to evaluate the world differently, and to realign oneself in relation to the different tendencies within society and nature. A system opposed to the dominant metaphysics and the social order based upon it must also provide the conceptual foundations, at least in crude form, for a new society. This is what Neoplatonic Christianity did at the end of the Dark Ages, what mechanistic materialism did in seventeenth century Britain and what Neoplatonic Marxism did in twentieth century Russia. And so a metaphysical system must ultimately be evaluated also as an orientation for action, in terms of its success in mobilizing people for action and in terms of the success of their actions, as the constituents for new relations between people and between humans and nature, and in terms of how successful the socio-economic order based on these relations is. It is only when the new social order incorporating the world-orientation of a metaphysical scheme is established that the potentialities and limitations of this scheme will be fully revealed, and this will then provide a point of departure for the development of a new metaphysical scheme, a new comprehensive conception of the world.

The Present Work as a Metaphysical System

Against this background it is now possible to explicate the systematic structure underlying the present work. From the beginning of this work a conception of humans as embodied subjects participating in the creative becoming of their society, of humanity and of nature has been assumed. To bring into focus the opposition between this set of assumptions and those which now dominate the modern world, I have focused on the environmental crisis. This not only is the most important practical problem confronting humanity, but it highlights the most significant features of modern civilization: its blindness to the environmental conditions of its existence, and what must be regarded as its most acute cultural and philosophical problem - its nihilism. If philosophy cannot provide compelling reasons for people to confront environmental problems, to do something about the ten to fifteen million people who die each year from starvation, to concern themselves with the

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89. Alfred North Whitehead, *Science and the Modern World*, [1925], New York: Mentor 1964, p.viif.

whole future of humanity, then it can provide no reason for anything. Yet mainstream philosophy was shown to be impotent in the face of such questions, and it was this which justified a thorough investigation into the formation of European culture. This investigation revealed the roots of both the destructive orientation to the world and the nihilism of Western civilization in metaphysical assumptions of mechanistic materialism, assumptions which evolved out of Platonism and which have culminated in Darwinian evolutionary theory and information theory, and which have been incorporated into institutions and into the very bodies of people as modes of being-in-the-world. The form of Marxism which triumphed in the Soviet Union (at the expense of the 'process Marxism' of Bogdanov and the *Proletkul't* movement), did not provide an alternative to this culture, or a solution to the problems confronting humanity. The full development and defence of Bogdanov's process conception of the world is required if what has proved fruitful within Marxism is to be salvaged.

All these analyses have assumed a conception of the world as a process of creative becoming, and the study of the development of Western and Eastern European civilizations has not only been designed to reveal the need for a metaphysical revolution, but has been an attempt to develop this alternative. The remainder of this work will be an explicit formulation and defence of process philosophy. A series of categories will be outlined and attempt made to show the validity of the process conception of being through an examination of developments within the natural sciences. It will then be show how humanity can be understood on the basis of this new science in a way which transcends the problems which have plagued philosophy for the last three centuries: specifically, the relationships between mind and body, free will and determinism, knowledge and reality, subjectivity and objectivity, facts and values. This conception of humanity will be used as the foundation for a new ethics, political philosophy and the sciences of humanity. This new vision will not only make the environment a central theme of life in the context of humanity's process of self-creation, but will overcome the nihilism of the modern world. In the last chapter the problem of action and how people, both individually and collectively, can act to change the world and to establish an environmentally sustainable, post-nihilistic civilization, will be considered explicitly. However metaphysics cannot end with a discussion of action; ultimately, process philosophy must be developed and validated in action - as an orientation for action against the present order and as the basis for new forms of relationships between people, between individuals and society, and between humanity and the rest of nature.

6

PROCESS METAPHYSICS

Process metaphysics originated in the West with Heraclitus. Heraclitus argued that: 'All things are passing and nothing abides'; and that: 'Nothing is, everything is becoming.'[1] The world is in flux, a process of becoming in which whatever is, is an enduring pattern of activity, an island of stability which can only maintain itself through constant interaction with the background flux and other patterns of activity.[2] A conception of the world similar to this has been common in China and is virtually embodied in Chinese language. For example the idea of process is implicit in the commonly used term *ch'i* which means 'the directed and structured expression of movement', a notion difficult to express in English. The notion of endurance within flux is beautifully conveyed by Li Po, one of China's greatest poets:[3]

> Petals are on the gone waters and on the going,
> And on the back-swirling eddies,
> But today's men are not the men of the old days,
> Though they hang in the same way over the bridge-rail.

In the West, by contrast, this conception of the world has been held only among those rebelling against the dominant order; for instance among the peasants in the Middle Ages who celebrated the carnival, laughter and the cycle of birth, death and regeneration in defiance of the petrified seriousness of the Church. The conception of the world as a process of creative becoming was also an important theme among the radical Neoplatonists. In the sixteenth and seventeenth centuries the Hermetic philosophers or Nature Enthusiasts were concerned to develop such a conception of the world to justify their view that humans are capable of transforming society to create a new harmony between people and with nature. While Descartes and Newton rejected such ideas, Leibniz attacked Descartes and Newton and, drawing on Chinese thought as well as ideas of the Nature Enthusiasts, developed a conception of the world as essentially active and in process of becoming. Later in the eighteenth century France the conception of nature as active was defended by Diderot. Then in Germany, Herder, Goethe, Schelling and von Humboldt, all to some extent influenced by Leibniz, conceived nature, individuals and societies as processes of becoming, though they tended to see such becoming as actualizing predetermined ends. Much of Hegel's philosophy

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1. Plato *Cratylus* 402a8 and *Theaitetus* 152e1.

2. This is fundamentally opposed to the doctrine that all change is illusion (Parmenides) and the doctrine that process is nothing the activity of and changing relations between substances (atomism). The doctrine that there are real processes which are more than the activity of substances, and the doctrine that there are processes, but these are actualizing eternal forms which are the true reality (Platonism), are aslo opposed, partly because, as I have tried to show, they lead to the second, and ultimately to the first of these doctrines - the 'block universe'. On these divsions, see Nicholas Rescher, *Process Metaphysics: An Introduction to Process Philosophy*. N.Y.: S.U.N.Y. Press, 1996, p.2.

3. From *'Poem by the Bridge at Ten-Shen'*, *Ezra Pound Translations*, [1926] N.Y.: New Directions, 1963, p.193.

accords with a process view of the world, although these aspects are ultimately subordinated to the eternal logical structure of the Absolute. Both Marx and Nietzsche defended the primacy of becoming in their very different attacks on reified abstractions.

In the twentieth century the most significant proponents of process philosophy in the West have been Bergson, Alexander, Whitehead, Collingwood, Ushenko, Sheldon, Hartshorne, Lawrence, Pols, Cobb, Griffin, Capek and Leclerc, while in the Soviet Union Mikhail Bakhtin and his circle were outstanding exponents of the primacy of becoming. There have also been a number of philosophers whose ideas accord with process philosophy, notably the early pragmatists: Peirce, James, Dewey and Mead, the Monists in Germany, Bogdanov in Russia, anti-mechanistic systems theorists such as von Bertalanffy and Ervin Laszlo, some phenomenologists, most notably Heidegger, Merleau-Ponty, and Merleau-Ponty's former student, the political philosopher Castoriadis. There has recently been a resurgence in process metaphysics in USA, Nicholas Rescher being the most notable figure in this.[4] Some of the work of the post-structuralists can be seen as a struggle to come to terms with the idea that the subject is not a substance but a process, and Deleuze embraced the works of Bergson and Whitehead. Perhaps most importantly, a number of scientists and mathematicians have embraced and developed the categories of process philosophy in their work, the most well known of these being David Bohm, Ilya Prigogine, C.H. Waddington, Charles Birch, Roger Sperry, Brian Goodwin, Mae-Wan Ho and René Thom. There are also a variety of anti-reductionist scientists closely aligned with process philosophy, including some dialectical materialists, both in the West and in the former Soviet Union. In most of these cases the thinkers involved in the promotion of these ideas have been concerned to oppose the nihilism deriving from the mechanistic view of the world.

Process philosophy can thus best be understood as the development of that tradition of thought which has exalted life in opposition to the mainstream of Western culture. It is the tradition which has refused to accept either the victory of mechanistic thinking or the social order based upon it. But as such it has been a tradition without great influence. And as Nicholas Rescher put it:

> ... process philosophy is no more than a glint in the mind's eye of certain philosophers. ... All that we really have so far are suggestions, sketches, and expressions of confidence. The work of actually developing the process doctrine to the point where it can actually be compared with other major philosophical projects ... still remains to be done.[5]

The Categories of Process Metaphysics

To develop process philosophy it is necessary to elaborate and defend a categorial scheme to oppose the categories which dominate people's present thinking. 'Categories' are here defined as the most fundamental concepts for understanding the world, or equivalently, as Whitehead defined them: 'tentative formulations of the ultimate generalities.'[6] They are

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[4] See Rescher, *Process Metaphysics.*

[5]. Nicholas Rescher, *Baffling Phenomena and Other Studies in the Philosophy of Knowledge and Valuation*, Savage, Maryland: Rowman & Littlefield, 1991, p.88.

[6]. Alfred North Whitehead, *Process and Reality*, [1929], corrected edition, David Ray Griffin and Donald W. Sherburne eds., N.Y.: Free Press, 1978, p.8. This is different from, but is also a development from Aristotle's, Kant's and Hegel's understanding of categories. On the history of the concept of categories culminating in the work of Whitehead, see A.Z. Bar-On, *The Categories and the Principles of Coherence*, Dordrecht: Martinus Nijhoff, 1987, esp. the 'Extensive Summary of the Exposition', pp.5-17.

the concepts which define the nature and generic characteristics of primary being (or beings), in terms of which (or at least in relation to which) all other concepts must ultimately be understood, and which are presupposed by every proposition. This presents the problem of how categories themselves are to be defined.

The problem of defining categories has been avoided by most philosophers - who have merely striven to eliminate inconsistencies and to refine and reconstruct the relationships between categories already dominating thought. Kant in his later work and Neo-Kantians typify this approach, as do the 'analytic metaphysicians' of recent Anglo-American philosophy. Most analytic philosophers, under the influence of Frank Ramsey, attempt to reduce the number of categories by showing how some can be reduced to others. They ignore the problem of how the more fundamental categories are to be understood, or reduce this to a problem of the survival of forms of life based upon them.

The philosophers who have most squarely confronted the problem of defining categories are the Neoplatonist thinkers, from Plotinus to Hegel. It was the early Neoplatonists, following Iamblichus, a student of Plotinus, who argued that since forms can only be defined in relation to each other, the ultimate, identified with God, is unknowable except by negative definition. Hegel, under the influence of Fichte's effort to deduce the categories of Kant's philosophy, attempted to solve this problem by deducing a categorial scheme 'dialectically', beginning with the most empty category (Being), and then by revealing the limitations of each category in turn, generating a series of categories to eventually arrive at the ultimate category, the absolute Idea which contains all previous determinations, and includes our consciousness of it: the ideal union of objective reality in its essential features with the human world of thought. He conceived this dialectical deduction of categories to be possible only after they had already been revealed or developed through the evolution of society and of science. It was designed to exhibit the conceptual structure familiar to us, and to be constructive only to the extent of filling in the gaps of this structure. This approach not only freezes our understanding of the world at its present state of development (after making a few refinements), but it makes the necessity involved in this dialectics very ambiguous, and few people have been convinced by this aspect of Hegel's philosophy.[7]

The solution to the problem proposed here is based on the dialectical epistemology outlined in the previous chapter and has a number of dimensions. Firstly, it is necessary to acknowledge that new categories are developed from within the culture of an already functioning community. To borrow and build upon an analogy from Otto Neurath, if developing our knowledge is like repairing a boat at sea, then developing a new categorial scheme is like repairing the keel of the boat. It is much more difficult, but it does not require a standpoint completely outside one's culture. Rather, it involves confronting the problems of one's culture by drawing on its resources, giving old terms new meanings which can be at least partially defined through existing language. Secondly, it is possible to generate these new meanings through the elaboration of an analogy (what Whitehead called 'descriptive generalization').[8] This involves applying forms of cognition which have developed in a domain with some autonomy within the prevailing culture to domains from which in the past these forms of cognition have been excluded. By counterposing a new analogy in this way to the analogy underlying the dominant categories it becomes possible to transcend these categories (though achieving this generally requires an historical study of the way the prevailing categories were originally articulated and why they came to be adopted). Thirdly, it is possible to further refine these categories by defining them in opposition to, and through

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7. Uwe Petersen is attempting to revive and carry through Hegel's project. His work is not yet published.

8. In this I am following Stephen C. Pepper's *World Hypotheses*, Berkeley: University of California Press, 1942. Pepper contrasted his own conception of categories with Whitehead's in the introduction to *Concept and Quality: A World Hypothesis*, LaSalle: Open Court, 1966.

a critical analysis of, the categories they have been designed to replace or transcend and to the categories of rival categorial schemes. Ultimately this should involve casting past and rival schemes into an historical narrative from the point of view of the new categories. Fourthly, categories can be further developed through their application and associated elaboration in the comprehension of particular situations and by their incorporation into practices. Rather than thinking of concepts as fully definable through other concepts, concepts should be seen as being ultimately grounded in discourses and the practices associated with them. Meaning should not be seen as finally fixed but as forever open to further development (and possibly, replacement) both through reflection and through practices in the struggle to come to grips with and to act effectively within the world. Finally, in relation to process philosophy, formulating a categorial scheme does not involve a completely new beginning. Peirce, Bergson, Whitehead and those influenced by them have already done much to conceptualize the world as a process of creative becoming, and they have strongly influenced the sciences. Concepts proposed by these philosophers have been selected and refined through their applications within science. Process philosophers today are participating in the on-going development and refinement of concepts which have already proved themselves in a number of areas.

It follows from this that it is not possible to precisely specify and delimit which concepts are fundamental and which are derivative. What is more important is to define only a sufficient number of concepts as can be easily grasped, kept in mind, and then deployed in any situation to displace those concepts which are at present dominating people's thinking.[9] The most important concepts to displace, those inherited from the seventeenth century revolution in thought, are space (the receptacle of matter), time (during which matter changes place in space), matter (identified with body and the occupancy of space), and motion (identified with locomotion of matter through space over time). The categories which are proposed to define the nature of the cosmos as a process of creative becoming consisting of a multiplicity of emergent processes, each being in a complex relation to other co-existing processes and having some degree of autonomy from all others, and to define the nature of these emergent processes, are: activity, order and becoming; process, structure and event; cause; and spatio-temporal position.[10]

The most important problem for process philosophy is: How can 'becoming' be described? As Nietzsche noted of European languages, 'Linguistic means of expression are useless for expressing "becoming".'[11] The European originator of process philosophy, Heraclitus, used the analogies of both fire and flowing water to elaborate his conception of the world. However to free our thinking from the Parmenidean notions which subsequently came to dominate Western culture, Bergson suggested that we must transcend visual analogies altogether and think in terms of auditory analogies. Only in this way is it possible to fully comprehend the nature of becoming (always characterized by duration), of change which is more than changing relationships between elements, of creative emergence

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9. Whitehead lists forty-five categories, something for which he has been often criticised. See Andrew J. Reck, 'Process Philosophy, A Categorial Analysis', *Tulane Studies in Philosophy*, Vol. XXIV, 1975, pp.58-91, p.63f.

10. In my efforts to develop these categories I have been most influenced by Aristotle's *Metaphysics*, by Whitehead;'s *Process and Reality*, by Ivor Leclerc;'s *The Nature of Physical Existence*, London: George Allen & Unwin, 1972 and *The Philosophy of Nature*, Washington: Catholic University of America Press, 1986, and by the works of David Bohm, Milic Capek, Howard Pattee and Edward Pols. It should be noted here that while influenced by Whitehead, I have aligned myself with Pols and Leclerc (and also with the Bergsonian philosopher, Capek) against orthodox Whiteheadians in taking compound entities (what Whitehead refers to as 'societies of actual occasions') as primary beings and in rejecting Whitehead's 'pan-experientialism' - taking 'feeling' as a category. Following Pols I have also rejected Whiteheadian characterization (opposed by some of Whitehead's interpreters e.g. Christian) of pure potentialities as 'eternal objects' which 'ingress' in actual occasions, and the implicit tendency to reduce efficient causation to material causation. My aim has been to encompass everything which Whitehead recognized as important while avoiding the problematic aspects of his categorial scheme.

11. Friedrich Nietzsche, *The Will to Power*, tr. Walter Kaufman, N.Y.: Vintage, 1978, § 715, p.380.

constrained by the conditions of this emergence without being determined by them, of individuality within continuity, of order which is prior to the existence of space, and of space as emerging through the ordering of change. Bergson's arguments have been further developed by Milic Capek, and the auditory analogy has been explored in great depth by Victor Zuckerkandl.[12] In elaborating these categories this analogy will be assumed rather than Whitehead's 'mind' analogy.

The first categories to be defined (the categories of the ultimate - into which all primary beings can be analysed)[13] are activity, order and possibility. These are required to define the other categories without being presupposed by them. As such they are the most difficult categories to define. The second categories (the categories of existence), process, structure and event, characterize what exists as primary beings in the world. The third categories (the categories of explanation), of causation, pertain to the explanation of all that has existed, does exist and could exist, while the fourth categories (the categories of ultimate potentiality), of spatio-temporal position (where space and time are shown to be inseparable from each other and ontologically derivative), are the most fundamental concepts defining potential relationships between actual or potential existents.

The Categories of the Ultimate

'Activity' (corresponding to 'creativity' in Whitehead's philosophy - 'the ultimate behind all forms, inexplicable by forms, and conditioned by its creatures') can be equated with the 'energy' of modern science, while giving this concept a new meaning - or at least a more definite meaning since the notion of energy has never had a clear meaning in physics.[14] In terms of the auditory analogy, the very being of sound is activity. Actuality, that is existence, is activity; non-activity is non-existence. N unchanging substratum of activity need be supposed. It is in this sense that 'activity' can be understood, and then identified with 'energy'. The concept of 'energy' derives from the Greek *energeia*. Aristotle, who gave *energeia* its technical meaning, meant by it: 'enacting of form'. As such this concept is closer to what I define as 'process' than what I refer to as 'activity'. 'Activity' corresponds more closely to the concept of *kinesis* as it was used by the early Presocratic philosophers, meaning the eternal motion pervading everything, without this motion being understood, as it came to be after Parmenides, as a property of some unchanging being or beings.Aristotle redefined the original concept of *kinesis*, bringing it closer to its original meaning by allowing entities to be self-moving, but this concept is still different from the one being defended here. Aristotle defined *kinesis* as incomplete process towards some goal which ceases when the goal is reached, in opposition to *energeia* which is a completed act.[15] This ties the notion to an end in a way which I wish to avoid. As the term is to be understood, activity has more affinities with Aristotle's concept of matter or *hyle*: that which is formed, which is the potency to be reformed and which is the principle of individuation of forms, but which is unknowable in itself (as distinct from the way matter came to be understood in the Renaissance and after). In fact 'activity'

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12. See Milic Capek, *Bergson and Modern Physics*, Dordrecht: Reidel, 1971 and Victor Zuckerkandl, *Sound and Symbol: Music and the External World*, tr. Willard R. Trask, Princeton: P.U.P., 1969, esp. Ch.'s XII-XVIII.

13. This division of categories follows Whithead, except that Whitehead's 'Categoreal Obligations' is replaced by 'Categories of Ultimate Potentiality'. However the categories themselves are different.

14. Whitehead, (*Process and Reality*, p.20). On Whitehead's concept of creativity, showing its relationship to the concept of energy, see Dorothy Emmet, 'Creativity and the Passage of Nature' and Friedrich Rapp, 'Whitehead's Concept of Creativity and Modern Science' in *Whitehead's Metaphysics of Creativity*, ed. Friedrich Rapp and Reiner Wiehl, N.Y.: S.U.N.Y. Press, 1990. For a critique of Whitehead's concept of creativity, along with the concept of 'eternal object', in each case for implying some reality more basic than 'actual occasions', see Edward Pols, *Whitehead's Metaphysics*, Carbondale: Southern Illinois University Press, 1967. It is to avoid this that I have used the term 'activity'. For a history of the concept of energy, see Yehudi Elkana, *The Discovery of the Conservation of Energy*, London: Hutchinson, 1974.

15. See *Metaphysics* 1048b28-35.

can be understood as an identification or conflation of the Milesian (and Heraclitean) concept of *kinesis* and Aristotle's notion of *hyle*.

Order is perhaps the most difficult category to define. Whenever anyone thinks about anything they are assuming order - its unity or diversity, its quantity, its quality, its endurance, its composition and its context, and of the spatio-temporal order in which it participates and is located. To gain some idea of the notion of order it is necessary to free oneself from such assumptions of order, to imagine each type of order which is normally assumed - ceasing to exist, including the endurance of things and space-time itself. Such complete absence of order can be defined as flux. Any order in this flux can then be seen as some type of constraint which differentiates it, and in doing so makes possible other types of order. And in fact, when this starting point is taken, it becomes evident that all order is facilitating constraint. For instance in thinking of sound and the different types of constraining which occur with the becoming of a piece of music, the ordering of activity can be seen as any constraining or modulation of the sound which differentiates it into identifiably similar aspects, or which constrains such differentiated aspects into similarly different aspects.[16] Through the constraining of sound notes emerge, which makes possible their ordering into melodies, which in turn can be ordered into symphonies, and so on. This notion of order corresponds in some ways to the notion of *eidos* ('idea' or 'form') in Greek philosophy, though it is narrower in meaning and is defined in such a way as to facilitate analysis. As in the philosophy of Aristotle, it must be conceived as immanent within the world, as its 'definiteness'. It is more general than the basic concepts of mechanistic materialism and field theory, the proponents of which must be regarded as attempting to explain all order in the world in terms of particular types of order: the motion of unchanging matter, or extensive force fields. The way such a conception of order provides a basis for analysis can be seen by considering what is involved in the generation of extension. Extension can be understood as the order generated through the emergence and transformation of potentialities for independence and interaction, and locomotion as change of position can be seen as a particular type of ordering whereby potential relations for independence and interaction are changed in an orderly way. A line can be then understood as a similar difference in point positions. The generation of a circle can be understood as similar differences between similar differences in point positions, and a spiral, with three dimensions, as simultaneously three separate similar differences of point positions.[17] In each case, the order makes possible further ordering to generate new types of order.

Ordering activity implies an opposition between that which now exists and that which could be, that which is possible. Possibilities, defined in opposition to impossibilities, include, but are not exhausted by, the potentialities of processes, including the powers for ordering and liabilities for being ordered, which are or can be produced and which can be realized or undermined in the becoming of the world.[18] Referring back to the auditory analogy, potentialities in this sense are the 'oriented tension' or 'directed anticipation' in a piece of music which constrains without determining its becoming. The notion of potentiality corresponds to the Greek notion of *dynamis* - in the more traditional sense of a power only inherent in something without being manifest and in Aristotle's more specific

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16. For an elaboration of a conception of order in terms of similarities and differences see David Bohm, *Wholeness and the Implicate Order*, London, Routledge & Kegan Paul, 1980, p.115ff. and David Bohm and F. David Peat, *Science, Order, and Creativity*, Toronto: Bantam, 1987, pp.104-191. Whitehead has defined order differently, and I have not used his concept.

17. See Bohm, *Wholeness and the Implicate Order*, p.116f.

18. 'Potentiality' is offered here as the basis for an alternative to the 'eternal objects' of Whitehead's categorial scheme, an alternative which avoids the dualism to which Whitehead's philosophy is prone. On the debate surrounding Whitehead's category of 'eternal objects', see Bart F. Kennedy, 'Whitehead's Doctrine of Eternal Objects and Its Interpretations', *Tulane Studies in Philosophy*, Vol.XXIII, 1974, pp.60-86. This debate is not reviewed here, but the position supported is that which is against Whitehead's Platonism. Most of Whitehead's 'eternal objects' are here equated with 'structures'.

sense of potentiality only illustrated in its realization - the concept which was virtually eliminated in the deterministic mechanical conception of the world and by field theory. But there are other possibilities which are not actual potentialities. These are the potentialities of potentialities, and the potentialies of potentialities of actual potentialities, and so on. The realm of possibilities, which includes the entire realm of mathematical objects, is equivalent to Whitehead's notion of 'eternal objects', but in opposition to Whitehead I have included this concept under the categories of the ultimate to highlight their derivate status as the product of analysis of primary beings rather than being primary beings.

The Categories of Existence

The category of process is meant to characterize primary being or an actual entity, *ousia* - that which exists in the full sense rather than through analysis or derivatively. A process can be defined as an ordering activity which is to some extent (although never entirely) an immanent cause of its own becoming, a self-ordering activity in which activity constrains itself and reproduces these constraints.[19] So, to 'be' in the primary sense is to be a process (although it is also possible for there to be a background of unordered activity unknowable in itself, but knowable as the condition for the emergence and continued existence of processes - for example, the vacuum in quantum field theory), and everything else must be understood as a part of or as an aspect of some process or processes, or an aspect of the relationship between processes.[20] As such 'process' corresponds to the place given to 'substantial form' in medieval Aristotelian metaphysics (conceived as the outcome of a process),[21] and to 'actual occasion' in Whitehead's metaphysics. This notion of process is designed to replace the post-Renaissance category of self-subsistent matter or body conceived of as essentially inert, along with the associated categories of space and time which have also been conceived as primary beings within the mechanical view of the world, the concept of motion (or more accurately, locomotion) which on this view is taken as derivative, and the concept of attractive and repulsive forces which is accepted as a necessary but incoherent addition to the mechanical world-view. A process is that which in Aristotle's terminology has in it its own source of movement, or in Whitehead's terminology, that 'which constitutes its own becoming'[22]. Assuming the underlying auditory analogy, along with Whitehead I wish to stress both the durational nature of this becoming and interdependence of primary beings. But in opposition to Aristotle and Whitehead, the idea that primary beings must be actualized in some completed end is rejected. Rather, primary beings are identified with processes of becoming, whether such becoming completes itself in some definite end, or endures indefinitely, as protons well might. The notions of 'formation'

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19. I have used the term 'process' to emphasise my rejection of Whitehead's temporal atomism in favour of Capek's notion that becoming is 'pulsational' (also argued for by Leclerc), and my acceptance of Pols' and Leclerc's inclusion of compound actualities as primary beings (in accordance with Aristotle's metaphysics). On the importance of recognizing composite entities as primary beings, and the intellectually disastrous consequences of failing to do so, see Leclerc, *The Philosophy of Nature*, Ch.10, 'The Physical Existent as Compound Actuality', pp.130-138.

20. Following the auditory analogy, what is is the unfinished durational becoming of a process or processes, not the product of a process. Jorge Luis Nobo's distinction between the 'becoming' of an actual occasion from its 'being' (in *Whitehead's Metaphysics of Extension and Solidarity*, Albany, NY: State University of New York Press, 1986) is here rejected, whether or not it is the correct interpretation of Whitehead.

21. It is possible to interpret Aristotle to accord with the position being defended here by construing what he meant by actualized form as forming activity. See Emerson Buchanan;, *Aristotle's Theory of Being*, Cambridge, Mass.: University, Mississippi, 1962 and John Herman Randall;, *Aristotle*, N.Y. and London: Columbia University Press, 1960, p.129ff. See also L.A. Kosman, 'Substance, Being, and *Energeia*' in *Oxford Studies in Ancient Philosophy*, Volume II, Oxford: Clarendon Press, 1984, pp.121-149.

22. Whitehead, *Process and Reality*, p.23. What I have called 'process' corresponds roughly to what Whitehead; called 'the concrescence of an actual entity or occasion'.

(as in 'socio-economic formation'), 'structuration' and 'organization', understood as the activities of generating (and possibly 'transforming'), a form, a structure or an organism, are virtually equivalent to the category of process.

By focussing on ordering as an activity, the relationships between different processes and the emergence of new composite processes as primary beings become comprehensible. What is involved in any enduring causal relationship is always additional constraining of activity so that processes relating to other processes are different than processes not relating to these processes. Emergence and hierarchical ordering can then be seen as self-ordering activities coming to be or being involved in further ordering, that is, being further constrained, as parts of higher level processes which are the ordering activity creating and reproducing these, and other, constraints. Under these circumstances the constituent processes of the supervening process are changed by the environment produced by the emergent process so that they act to constitute the emergent ordering activity and thereby to produce and reproduce this environment and thereby these constraints.[23] It is possible for supervening processes to emerge which are the ordering of the emergence of a sequence of such emergent processes, or involving the ordering of even more complex relationships between and transformations of processes.

Ordered potentialities for ordering produced and maintained by processes (or which could be produced and maintained by processes) are 'structures'.[24] While 'structures' are then derivative from processes as something produced, they are also derivative from processes which might actualize these potentialities. Thus 'structure' also corresponds to what Whitehead designated as the 'potentiality [of an actual entity] for "objectification" in the becoming of other actual entities', where '"objectification" refers to the particular mode in which the potentiality of one actual entity is realized in another actual entity.'[25] In other words, as ordered potentialities for ordering, structures cannot be understood only in terms of being maintained and produced by processes. They must also be understood as such in relation to processes which could realize these potentialities through their own becoming - frequently, but not always, involving their 'objectification'. However no distinction is made here between whether the ordered potentialities for ordering generated by a process are potentialities which could be realized by processes other than the generating process, or whether the potentialities could be realized by the process which generated them. Structures, while being particular are also in a sense universal, since they can be identified by their substitutability in the becoming of processes, including processes of cognition. It is through identifying such potentialities and their relationships that processes of becoming can be analysed - and also evaluated. As such I take 'structures' to be equivalent for the most part to Plato's and Aristotle's 'forms' and Whitehead's 'eternal objects',[26] or, as Whithead

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23. This makes sense of what Whitehead had claimed in *Science and the Modern World* that 'the plan of the *whole* influences the very characters of the various subordinate organisms which enter into it.' *Science and the Modern World*, [1925] N.Y.: Mentor, 1964, p.76. On this, see also Whitehead's *Adventures of Ideas*, [1933], N.Y.: Free Press, 1967, p.199. This notion of emergence contrasts with that ultimately defended by David Blitz in his history of the notion of emergence (which strangely excludes Whitehead's contribution), *Emergent Evolution*, Dordrecht: Kluwer, 1992.

24. The distinction between potentialities produced by processes and those which could be produced corresponds to Whitehead's distinction between 'real' potentialities and 'general' potentialities, that is, potentiality 'relative to some actual entity', as opposed to 'the bundle of possibilities ... provided by the multiplicity of eternal objects.' (*Process and Reality*, p.65). However unlike Whitehead I am privileging 'real' potentialities over 'general' potentialities, with the latter being conceived of as potentialities of potentialities.

25. Whitehead, *Process and Reality*, p.23.

26. Roy Sellars argued that eternal objects "are, then really expressions of operations and discriminations made possible by the similarity of things." (Roy Sellars, 'Philosophy of Organism and Physical Realism', *The Philosophy of Alfred North Whitehead*, ed. Paul Arthur Schilpp, 2nd ed., La Salle: Open Court, 1951, p.432). I am generalizing this and holding that such operations and discriminations are real aspects of the becoming of all processes, not merely cognizing humans, and that there are also unrealized possible, and even impossible operations and discriminations.

occasionally referred to these, 'patterns'. What are described as forms by Georg Simmel in sociology, and by D'Arcy Thompson in biology, and following him, by Brian Goodwin, are also structures as defined here.

Most of what people identify in the world as existing 'things' are 'structures'.[27] For example, a tree must be regarded as a process of becoming which is durational. What we normally identify as a tree at a particular time as a 'thing' is its structure, the ordered potentialities produced and maintained by this process of becoming: the potential to maintain shape, impenetrability, opacity etc. - which then are realized as such in the process of becoming of not only other processes, but also by the tree itself as the necessary condition of its becoming. However not all structures are 'things', namely those which are not objectified. Examples of unobjectified structures are the cognitive structures referred to by Piaget which can be regarded as ordered potentialities to order action and experience produced, maintained and developed by organisms in interaction with their environments, and social structures which are the potentialities maintained by social processes for various types of interaction between people and organizations.

Along with processes and structures there are also events, such as the coming into being or the destruction of structures and processes, 'decisions' by processes to take one path of development rather than another, significant changes within or differentiated activities of processes, and contingent interactions between processes. Events must always be understood in relation to structures and processes, and it is not possible to completely analyse processes into events.[28] Regularities in the relationship between events should be seen in relation to structures and as manifestations of processes.

The Categories of Explanation

To explain something is to identify its causes.[29] The notion of cause has a long and complex history. The term derives from the Latin *causa* which was a translation of the Greek *aiton* or *aita*. This term referred to the voluntary action of an agent for which he or she could be held responsible. It was originally applied in legal contexts but was generalized to refer to any action designed to bring about an event or state of affairs. This was then applied by analogy to nature, first to events produced by people designed to get nature to do things for them (for instance, lighting a fire to cook food), and then as a simple explanatory principle as when lightning is seen as the cause of fire. It was this notion of causation which was developed systematically by Aristotle who analysed it into four aspects: the material cause, the efficient cause, the formal cause and the final cause; the material cause being the matter involved in the process, the efficient cause the exercise of power, the formal cause the form aimed at by this action and the final cause the reason for aiming at this form. In describing biological growth efficient, formal and final causation tended to be conflated.

However with the birth of modern science there was a radical break with Aristotelian concepts. It is widely assumed that final causes were excluded from scientific explanation. However the Pythagorean Platonism of the major proponents of the 'new philosophy' in the seventeenth century excluded not only final causes but also efficient causes. The notion that power is exercised in causation was replaced by the notion that inert matter moves according to formal principles or laws. The failure to grasp this change in thinking led some philosophers to conflate formal and efficient causation. Thus, cause was defined by Hobbes

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27. As Whitehead argued: '... "potentiality for process" is the meaning of the more general term "entity" or "thing"...' (*Process and Reality*, p.41).

28. This point has been argued convincingly by Dorothy Emmet in *The Passage of Nature*, London: Macmillan, 1992.

29. In focussing on cause here I am departing radically from Whitehead, and also from his own analysis of cause in terms of prehensions.

as 'the aggregate of all the accidents both of the agents how many so ever they be, and of the patient, put together; which when they are all supposed to be present, it cannot be understood but that the effect is produced at the same instant...'.[30] But this would imply that each cause and effect, and therefore all causes and effects, must occur instantaneously. There can only be one instant. The incoherence of treating the exercise of power or natural necessity as a logical necessity in this way paved the way for David Hume to argue that the world consists of atomic events without any relation between them but that they follow each other in a regular way. The laws of nature are then conceived as simply the means for making predictions from one event to another.

Where the world is conceived of as a multiplicity of semi-autonomous self-producing processes, causation can best be seen to consist of, firstly, immanent causation (that is, the process of self-creation) consisting of supervening causation whereby constituent processes or activities are constrained to produce and reproduce the environment which constrains them, and efficient causation or action on the rest of the world, and secondly, conditional causation (the production of the conditions of any process's existence) which on the emergence of a process differentiates into environmental causation, the environmental conditions of a process - ultimately extending to the entire past of the universe, and material causation, the maintenance of the constituents of the process (although these are not always entirely separable). The notions of immanent and conditional causation are complementary, with each instance of causation being characterizable as either an immanent or a conditional cause depending on from which individual they are being defined in relation to. For instance, an auto-catalytic chemical process within an organism made possible by the environment provided by the organism and essential to its continued existence can be regarded as a partially self-ordering process and thereby an immanent cause in relation to its own becoming, and at the same time as a conditional (material) cause in relation to the organism's continued existence and an efficient cause in relation to other components of the organism affected by it, while the organism is both a conditional (environmental) cause in relation to this chemical process and, in relation to itself, an immanent cause supervening over, that is, constraining this process. Structures and events should be seen as causes or effects only insofar as these are understood in relation to processes and their immanent and conditional causation. Structural causation, the more basic or these, is an aspect of conditional causation, the production of potentialities by processes which are causes insofar as they are utilized by one or more processes in its or their self-formation. Causation cannot be understood as the production by a process, structure or event of an effect, since the effect must be seen as itself an active response of or appropriation by a process,[31] as part of its coming into being or of its becoming. A causal relation between events must be seen as first, presupposing the existence of structures, and more basically, processes which produce and utilize these structures in their becoming.

This complex notion of causation reintroduces and extends the notion of causation as activity realizing potentialities. It emphasises that the very existence of anything must be self-creating activity. In this sense it is closest to Aristotle's notion of causation as applied to the growth of organisms, in which material, formal and final causation are fused. It differs in its emphasis on the actual process of becoming as distinct from the realization of an end (this is accentuated by the distinction between ordering and structure), and through the introduction of the notion of environmental causation pertaining to the relation between any activity to its context, and ultimately, thereby, to the entire past of the entire universe. Where

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30. *The English Works of Thomas Hobbes* ed. Sir William Molesworth, London: John Bohn, 1939, Vol. 1, 'Elements of Philosophy Concerning Body' Ch.IX, p.121.

31. What Whitehead captured with his conception of actual occasions as consisting of 'prehensions' (*Process and Reality*, p.19).

change of position is concerned, that is, locomotion, this should not be regarded as a state of inactivity as in Newtonian physics, but as an aspect of acting, of immanent causation.

Also in accordance with Aristotle's notion of causation, causation must always be understood as durational.[32] This view has been elaborated by Edward Pols:

> The power is exerted in and through a time-unit, and it cannot therefore be isolated as an exercise of power unless we take the whole time-unit into consideration. Any present moment of that time-unit is like a Bergsonian durée, carrying with it its past as qualifying it, and carrying it with it as a means to its own completion... The end of the action is already present in the beginning, and as the action develops, its beginning and all its past phases are carried with it. What exists at any moment of the action - any temporal 'point' in it - is an abstraction, for the time of the entity's action is not composed of discrete instants. And what exists in any period of the action short of the totality leaves us equally unable to isolate the action.[33]

While such causation is potentially divisible in that it is possible to divide it, it is actually indivisible in the sense that in a shorter period than this duration the 'exercise of power' does not exist.[34] This also is fully intelligible if referred back to the analogy of a piece of music which ceases to be that piece when it is divided; and this leads to another point. Different causal activities require different durations.[35] This is extremely important in hierarchical relations where, as in a melody where the ordering of notes must be of a longer duration than the individual notes, the immanent causation of higher level processes must have longer durations than the processes ordered by them.

The Categories of Ultimate Potentiality

With these categories of activity, order, potentiality, process, structure, event and cause defined in a preliminary way, it is now possible to redefine the concepts of position, space and time, rejecting the conception of space and time as the self-subsistent, continuous receptacles within which things are located for a relational notion of space-time. That is, 'position' can be defined as the set of actual and potential causal relations of entities to each other, while 'space-time' can be conceived as emerging or becoming as an order of such causal relations between such positions.[36]

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32. Aristotle, *Nicomachean Ethics*, 1174a20. As Collingwood pointed out in *The Idea of Nature*, [1945] Oxford: Oxford University Press, 1960, p.20ff., this resolves Zeno's paradoxes.

33. Edward Pols, 'Power and Agency', *International Philosophical Quarterly*, Vol.11, 1971, pp.293-313, p.297. For an account of Bergson's ideas from which this analysis derives, see Capek, *Bergson and Modern Physics*, esp., p.195-201.

34. As Whitehead put it, 'in every act of becoming there is the becoming of something with temporal extension; but ... the act itself is not extensive, in the sense that it is divisible into earlier and later acts of becoming which correspond to the extensive divisibility of what has become.' (*Process and Reality*, p.69.)

35. By following Bergson and Bergsonian philosophers such as Capek here rather than Whitehead (along with Bergson's 'pulsational' rather than 'atomic' notion of becoming and Leclerc's acceptance of compound entities as primary beings), it is possible to avoid the problem which has vexed Whitheadian philosophers of the status of the past and of how completed actual occasions (the concretum-superject) can affect future actual occasions. According to the present scheme, it is always co-present processes which affect each other, but as durational, at least one of these temporally extends to the beginning of the universe, and processes which are past are part of the extended duration of at least one and usually many presently becoming processes.

36. This notion of space-time corresponds to, but is different from, Whitehead's notion of the 'extensive continuum' or 'extension' as 'one relational complex in which all potential objectifications find their niche' and as 'the most general scheme of real potentiality, providing the background for all other organic relations.' (*Process and Reality*, p.66 & 67). Whitehead differentiates extension, which corresponds to Plato's receptacle, from time and space in a way I have not.

This idea is difficult to comprehend when conceived in terms of visual analogies but becomes clearer when the world is conceived in terms of auditory analogies.[37] In the process of extensive becoming of music, the past is that which has been formed, the future is open and yet to be established, and space, rather than being an order of places external to each other, is an order of co-existing but actually or potentially interacting regions which have emerged from a dynamic world as emergent processes have differentiated themselves and achieved some degree of autonomy. In this, in contrast to Newtonian metaphysics where time is virtually reduced to a dimension of space, time is basic and space is derivative. Space-time, as an order of potentialities for independence (space) and interaction (time), becomes or emerges from a process of extensive becoming with the emergence of semi-autonomous sub-processes. It is continually produced and reproduced with the becoming of both the supervening process and the emergent sub-processes. The past can be defined as what a process, structure or event is or can be causally influenced by, and the future as the realm of what it can causally affect, while distance can be defined in terms of the duration required for there to be an interaction. The duration of the becoming and the extensiveness of processes are only comprehensible in terms of and with the emergence of space-time but, as such, must be recognized as the condition for this emergence.

Conceiving of space-time in this way opens the possibility of there evolving a number of space-time orders. There is no reason to assume that space-time as an order of potentialities must be of any particular dimension, and three-dimensionality can be conceived as a particular constraining of activity. Since all processes, and the space-time orders they generate, are locatable within the space-time produced by the universe as a whole, it is necessary to acknowledge this as the most basic space-time. However it would be a mistake to disregard the reality of the sub-orders of space-time which have emerged and continue to emerge. The potentials for interaction between various levels of sub-processes cannot be adequately understood without taking into account the limited divisibility of the extensive becoming of any process, and the relationship between different orders of divisibility.[38] It is necessary to acknowledge that space-time has been articulated in a number of ways and to pay due regard to this articulation. Thus while galaxies co-exist and interact within cosmic space-time, the nature and co-existence of stars can only be fully understood in terms of galactic space-time produced by galaxies, geological processes in planetary space-time, life processes in ecological space-time, organic processes in life space-time, personal life in terms of a complex of social space-times, perception and action in personal or inter-personal space-time, and so on.[39]

Process Philosophy as a Grand Research Programme

Adopting the categories described above involves overthrowing the reigning paradeigmas and replacing them with a more abstract paradeigma. The notion that there are things conceivable as primary beings characterized by a simple location in space and time, the central assumption of mechanistic materialism, is abandoned. But even more fundamentally, process philosophy rejects the assumption that there is an ultimate order of positions external to each other, a notion which is still assumed by field theory. It is necessary to assume as a starting point (that is, all that is taken to be not in need of any

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37. The fullest characterization of time and space through auditory analogies is provided by Victor Zuckerkandl, *Sound and Symbol*, Princeton: Princeton University Press, 1969, Ch.s XII-XVIII.

38. This notion is more in accordance with Whitehead's earlier ideas. See for instance Whitehead's discussion of multiple durations in *Concept of Nature*, [1920] Cambridge: Cambridge University Press, 1978, esp. p.59.

39. An argument somewhat along these lines has been made in relation to time by J.T. Fraser; in *The Genesis and Evolution of Time*, Amherst: The University of Massachusetts Press, 1982.

explanation) a complete absence of order, with both dependence and independence of different parts of the universe being taken as problematic. This means that order emerging within the universe, since it cannot be explained entirely by pre-existing order, must be explained at least in part as self-causing. Along with defining the basic objects particular sciences must concern themselves with, providing the basic concepts in terms of which explanations must be formulated, and prescribing the basic forms such explanations must take, the categories of a process philosophy must also provide a very general direction for particular research endeavours. This programme should encompass the grand research programmes of mechanistic materialism, field theory and formism, accounting for their successes, but going beyond all these to account for their failures and to open up new dimensions of the world for investigation.

To begin with, the categories defined provide a way of characterizing the basic 'theoretical objects' to be investigated. These are not 'things', nor force fields, nor forms, although each of these have a derivative place. Ultimately, all systematic enquiry must be seen to be concerned with the nature of and the relationships between processes. There are some difficulties here, since to begin with, the world is known through actualizing its potentialities, and it is as actualized potentialities, that is, through events and structures, that processes are first known. To penetrate beyond apparent reality, beyond events and structures to the reality of 'primary beings', it is necessary to explicitly identify which entities are processes, that is, which entities are to some degree self-creative, and to identify the relationships of dependence and independence between them; that is, their spatio-temporal positions and their causal relations - in particular, the conditional causes of their existence - their environmental causes and their material causes. In mechanistic thought, the environmental conditions tend to be simply assumed, while in field theory, the environmental cause is taken as the whole of reality. Once the conditional causes are understood, the next thing to focus on is efficient and supervening causation, that is, the powers and liabilities of processes both in relation to their environments and to their constituents given specified conditional causes. Field theorists tend to focus only on potentialities for supervening causation and so represent the world as consisting of force fields, while mechanistic materialists tend to focus only on potentialities for efficient causation and so represent the world as consisting of discrete 'things'.

The role of experiments in science needs to be reconceived accordingly. Experiments are designed to actualize potentialities (create new states of affairs) through various forms of causal intervention with a controlled environment (which deluded logical empiricists into believing that science is about discovering predictable relationships between observed events), and thereby to reveal the full range of potentialities or structures of enduring entities. Sometimes experiments are designed at the same time to reveal the relationships between the constituent or environmental structures which make revealed potentialities or structures possible. However in terms of the categories outlined above even this is not enough. Such investigation should be taken as the means to determine the nature of the ordering activity which maintains and accounts for the existence and transformations of structures, sub-structures and environmental structures.

Trying to characterize the nature of each self-ordering activity or process raises a number of problems. It is usually thought that intelligibility requires either an account of an entity in terms of its constituents, or an account of the effect of a whole on its parts. Each of these efforts generates problems. In the first case, the constituents themselves would have to be comprehended in terms of their constituents, and so on either *ad infinitum*, or until the ultimate constituents are discovered. In either case comprehension must ultimately be based on constituents which are themselves not comprehended, which would seem to throw into doubt any intelligibility attained. In the second case, the whole in terms of which any particular differentiation is understood must itself be accounted for in terms of some larger

whole in order to be intelligible. This must go on *ad infinitum*, or there must be some ultimate whole; and the same problem arises.

To some extent this problem is avoided by proposing a number of different elementary entities, either particles or fields, which can then be defined in relation to each other; for instance defining the electrical charge of quarks as a proportion of the electrical charge of leptons, or the strength of a field as a proportion of the strength of another field. However this means that the existence of such ratios must themselves be unintelligible. Another possibility is to allow both means of attaining intelligibility, so that ultimate entities are made intelligible as an effect of some whole, while the ultimate whole is made intelligible in terms of its constituents. However this merely hides the problem unless wholes are more than the effects of their constituents and constituents are more than manifestations of wholes. The problem then is to specify the existence of individuals over and above both relations to wholes and relationships between constituents, although not being completely independent of either of these. But if such individuals exist, they cannot be made entirely intelligible in terms of either wholes or constituents. How then are individuals to be understood?

This problem can be overcome by recognizing that there are two other aspects to understanding ordering. Firstly, ordering is not merely a relation between wholes and parts, but is a durational activity. The notion of an individual which is both more than the effects of its constituents and the wholes of which it is part, yet which is not independent of either of these, can be made sense of when durations are considered. An individual can then be seen as a semi-autonomous pattern of differentiating activity through which the structures of constituent and environmental processes are constituted and realized as such over a duration. Explanations of individuals in terms of constituents and environments is essentially an account in terms of the potentialities or structures produced by constituent and superordinate processes which are the conditions for the individual. The individual cannot be conceived separately from these; but then neither can potentialities or structures be conceived independently of the individuals for which they are potentialities and through which these potentialities are realized. The individual itself also generates potentialities or structures which are realized by both itself and its constituent and environmental processes, and these processes are constrained in their becoming by what potentialities are produced by the individual.

How then is this differentiating activity of an individual comprehended? As I have pointed out, it is only as actualized potentialities, that is, through the objectification of processes, that they can be identified. The relationship between the knowledge of objects and knowledge of durational activity is such a problem that Bergson accepted a dichotomy between two forms of knowledge without any possible reconciliation between them. Duration was seen to be accessible only through intuition. Avoiding this solution brings us to the second aspect of understanding ordering. That is, it is necessary to recognize the role of 'indwelling' in attaining intelligibility. The development of understanding of each individual involves 'indwelling' in the process itself, so that while focal awareness is directed at environmental and constituent structures, there is a development of subsidiary awareness of the ordering activity of the individual through which these potentialities are actualized. In this way the objectified potentialities of constituents or the environment can be recognized as just that, as potentialities being actualized by processes in their becoming. It must be the goal of science to facilitate such indwelling and to overcome the fixation on events and 'objects'.

Having allowed for these two aspects to understanding of ordering, it is then possible to consider another two aspects of ordering. It is not only changing relationships between unchanging constituents of an individual, and between an unchanging individual to a changing whole of which it is a part which are significant for understanding an individual,

but also the changing of the individual's constituents and the changing of the individual through participating in a whole which are important. In fact, such changing is likely to be a more significant aspect of any individual than those forms of change focussed on by atomists and field theorists. By thinking in terms of auditory analogies and by allowing for the role of indwelling whereby parts of durations are immediately grasped in terms of the unfinished becoming of the whole of which they are parts, such durational changes can be understood as possible prior to spatial differentiation.

The successful understanding of the nature of particular processes in such terms (including their durational aspects) should then provide the basis for comprehending the complex inter-relations between types of processes. However the research programme of process philosophy cannot aspire to total understanding of the world, as the world is acknowledged from the beginning to be both irreducibly complex and creative. The development of understanding involves identifying, characterizing and analyzing the different islands of stability within the flux, and can only provide predictions in limited contexts, and except in rare or artificially constructed cases, it can reveal only trends and tendencies.

Mathematics, Scientific Laws and Reality

Paul Davies has noted that 'the [post-classical] physicist's image of reality is rooted in a sort of meta-universe of mathematical objects and relationships that are concrete, eternal and totally dependable, while the Universe is nebulous, shifting and unpredictable.'[40] So it is the mathematically expressible laws of physics which are taken as real, while the Universe itself is granted only a shadowy, secondary existence. From the perspective of process philosophy, reality is the nebulous, shifting and unpredictable Universe, and mathematically described laws should be seen as having only a derivative status which nevertheless facilitate understanding of the real world. What is the relationship between these two realms?

As Cantor showed, all mathematics can be characterized in terms of set-theoretical logic, and presupposes that: '"what is - what can be thought" is capable and must always be capable of being fully and distinctly defined, composable and decomposable into totalities definable by universal properties and comprising parts defined by particular properties.'[41] No matter how far afield one ventures in mathematics, this same logic presides, and nothing would change by switching to multivalued logics or fuzzy sets. Mathematics deals with what is definite. Genuine becoming - order in the process of emerging out of disorder, the emergence of new types of partially autonomous individuals and the death of such individuals - essential features of a world of activity and of processes, cannot be fully captured by mathematics. So, the success of mathematics must be seen in a new light. Rather than seeing mathematics as defining and describing the nature of primary beings, mathematics in science should be seen as defining and mapping potentialities or structures, including structures of structures, etc., and their possible transformations, which are created, sustained and transformed by processes. As Whitehead argued, 'mathematics is concerned with certain forms of process issuing into forms which are components for further process.'[42] Mathematics is important to science 'as the search for infinitely rich and diverse patterns of

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40. Paul Davies, 'Law and Order in the Universe,' *New Scientist*, 1634 (Oct. 15th, 1988): 58-60, p.60.

41. Cornelius Castoriadis;, *Crossroads in the Labyrinth*, [1978] tr. Kate Soper and Martin H. Ryde, Brighton: Harvester Press, 1984, p.210.

42. Alfred North Whitehead, *Modes of Thought*, p.92. Whitehead argues that when we say 'twice three is six' we are not uttering a tautology, but are describing the process which issues from two forms of three in the form of 'six', which is then a potential for other processes beyond itself. On Whitehead's philosophy of mathematics see Murray Code;, *Order & Organism*, N.Y.: State University of New York Press, 1985.

order...'[43], that is, for the search for and analysis of structures, whether 'realized' or merely possible. The movement in the twentieth century towards seeing mathematics as the study of structures,[44] where 'structures' are understood as both part of reality and as abstractions from reality dealing with possible relations beyond any exemplification, can be interpreted to support this contention.

This must change the way laws of science are understood. The mathematically expressed 'laws' of nature should be seen as 'mappings' of potentialities (which includes powers and liabilities) and their changes (the structures of structures), while reality itself as a process of becoming should be recognized as indefinite - gaining definition only in becoming the potential for processes or activities (measurement being one case of becoming such a potential).[45] Laws should be recognized as abstractions which take for granted the existence of processes and their environmental and material conditions. The potentialities and their changes which they map are usually only fully realized in situations created by carefully constructed experiments in which initial conditions, the existence of components and the environment, which cannot be accounted for in terms of the laws, can be controlled. The fundamental laws of science are the mappings of what are the most universal potentialities of being and their changes, and there is no reason to suppose that more specific laws (such as laws in chemistry or biology), as specifications of the potentialities and changes of emergent processes which constrain these universal potentialities, will be deducible from fundamental laws.

The laws of science are 'eternal' or 'transcendent' because they pertain to potentialities - whatever has come to exist must eternally have been a potentiality in some sense. However granting eternal status to the laws of science even in this sense is somewhat misleading since potentialities are only such for the becoming of the processes themselves or for other processes which utilize them. The laws of nature should be seen as having emerged with the becoming of the universe - the fundamental laws with its origin, more specific laws with processes which emerged later, as processes emerged for which the universe itself and then these emergent processes were utilizable for other processes. And in some cases, where the potentialities revealed by laws are utilizable only by humans, and then only after they have been revealed as potentialities by science, the formulation of these laws should be seen as having partially created these potentialities.

Claiming that mathematics and mathematically expressed laws pertain to potentialities does not mean that mathematics cannot illuminate processes of becoming; but it does imply that it can only do so indirectly - by mapping out existing potentialities of processes and showing what potentialities will be realized in different circumstances. Furthermore it means that mathematical analysis and description cannot take the place of causal analysis and description, and ultimately, 'indwelling' in the processes of becoming of the world as the

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[43] As Ralph V. Norman, Jr. put it in his explication of Whitehead in 'Whitehead and "Mathematicism"', *Alfred North Whitehead: Essays on his Philosophy*, ed. George L.Kline, Englewood Cliffs: Prentice-Hall, 1963, pp.33-40, p.34.

[44]. On the concept of structure in mathematics, see Jean Dieudonné, 'The Difficult Birth of Mathematical Structures (1840-1940)' in *Scientific Culture in the Contemporary World*, V. Mathieu and P. Rossi (eds), Milano: Scientia, 1979. For a view of the relationship between mathematical structures and physical reality similar to that proposed here (but with the dynamic aspect omitted), see James Franklin, 'Mathematics, Necessity and Reality', *Australasian Journal of Philosophy*, Vol. 67 (1989), pp.286-94.

[45]. The different theories of the laws of nature are described and analysed by Alfred North Whitehead; in *Adventures of Ideas*, [1933], London: Free Press, 1967, pp.103-139. Whitehead distinguishes between the doctrine of immanent law, according to which regularities are seen as expressions of the nature of beings, the doctrine of imposed law (associated with Galileo, Descartes and Newton) according to which regularity is imposed from outside beings, the positivistic doctrine of law as observed order of succession, and the doctrine of law as conventional, that is, allowing for the possibility of some choice between different abstract schemes to interpret nature. For a defence and elaboration of Whitehead's own notion of scientific law see Ann Plamondon;, 'Whitehead and the Philosophy of Science' in John B. Cobb Jr. and David Ray Griffin eds, *Mind in Nature*, Washington: University Press of America, 1978, pp.112-115.

starting point and ultimate goal of science. The application of mathematics, to be successful, always presupposes indwelling by means of non-mathematical causal theories, and as a goal, mathematical prediction must always be subordinated to the goal of achieving a better understanding of the world as a process of creative becoming in this sense.[46]

46. The different place of causal accounts and scientific laws in science, and the primacy of causal accounts for understanding reality, see René Thom, *Structural Stability and Morphogenesis*, tr. C.H. Waddington, Reading, Mass.: W.A. Benjamin, 1972, p.5, Rom Harré & E.H. Madden, *Causal Powers*, Oxford: Blackwell, 1975; and Nancy Cartwright, *Nature's Capacities and Their Measurement*, Oxford: O.U.P., 1989.

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PROCESS METAPHYSICS AND THE NATURAL SCIENCES

Modern science originated in the seventeenth century with the development of the mechanistic view of the world, and while it is acknowledged that it breaks down at the extreme macro and extreme micro levels, it is still Newton's mechanics which is the ultimate point of reference for all science. Theories not comprehensible as developments of Newton's mechanics are presented as though only the mathematical formalism and the predictions facilitated by it are of significance.[1] But advances in the natural sciences over the last hundred years, particularly in physics itself, have invalidated the metaphysical assumptions of classical science. This has led to the odd situation described by David Bohm where:

> ... just when physics is moving away from mechanism, biology and psychology are moving closer to it. If this trend continues it may well be that scientists will be regarding living and intelligent beings as mechanical, while they suppose that inanimate matter is too complex and subtle to fit into the limited categories of mechanism.[2]

It is these developments in the physical sciences which led Ilya Prigogine to claim that 'we are in a period of revolution - one in which the very position and meaning of the scientific approach are undergoing reappraisal - a period not unlike the birth of the scientific approach in ancient Greece or of its renaissance in the time of Galileo.'[3]

The significance of the present state of science has been disguised until very recently, not only by its positivistic interpretation, but also by what can only be described as the corruption of science by poor pedagogy, over-specialization and over-industrialization.[4] To begin with, science is presented to students as a body of knowledge which is merely being added to by practicing scientists. So while most theories in physics have replaced particles as the fundamental material entities of the universe with fields, these are still treated in accordance with the Newtonian mechanics as being determined by laws of motion plus initial conditions. Consequently for most physicists the goal remains, as Leon Lederman, director of the Fermi National Accelerator near Chicago, put it: 'to explain the entire universe in a single, simple formula that you can wear on your T-shirt.'[5] Overspecialization has further blinded scientists. While the cutting edge of each domain of science has broken

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1. On this, see Jean-Marc Levy-Lebond in 'Ideology of/in Contemporary Physics' in Hilary Rose and Steven Rose, *The Radicalisation of Science*, London: Macmillan, 1976, pp.136-175.

2. David Bohm, 'Some Remarks on the Notion of Order' in *Towards a Theoretical Biology, 2 Sketches*, ed. C.H Waddington, Edinburgh: Edinburgh University Press, 1969, p.34.

3. Ilya Prigogine, *From Being to Becoming*, San Francisco: Freeman, 1980, p.xiif.

4. For an account of this corruption see Mark Chargaff, *Heraclitean Fire*, N.Y.: Rockefeller University Press, 1978; and Jerome Ravetz, *Scientific Knowledge and its Problems*, Harmondsworth: Penguin, 1973, esp. Ch.2.

5. Cited by Paul Davies, *The Cosmic Blueprint*, London: Heinemann, 1987, p.13.

out of the mechanistic framework of concepts and the ideals of explanation associated with it, scientists presuppose ideas from related disciplines which have been superseded decades ago. Most scientists are therefore ignorant of how all the specific developments within different domains cohere and undermine the prevailing reductionist ideal of science. Consequently the domination of everyday life by mechanistic categories of thought in terms of which recent advances in science make no sense continues almost unquestioned. Instead of seeing science as invalidating these categories, science is presented as moving away from concrete experience towards levels of abstraction which are the exclusive province of the scientific elites. Finally, the harnessing of science to industry has reinforced poor pedagogy and overspecialization and discouraged efforts to think of science as anything but a means to advance technology. Science is now almost completely dominated by administrators concerned to ensure that what scientists produce is economically profitable.[6] My contention is that once mechanistic categories are brought into question, modern science becomes comprehensible as a revolution in progress, a revolution in which our conception of the world and our place within it are coming to be understood in terms of a metaphysics of process.[7]

Within physics the major advances beyond mechanistic categories are based on three basic theories: relativity theory, quantum theory and thermodynamics. What is most significant about these theories is that while they were developed independently of each other to deal with different problems, as far as predictions go they dovetail together without conflict in the explanation of a vast variety of phenomena. This harmony between the theories is frequently not obvious and is only revealed by careful analysis which invariably reveals how the validity of each theory must be accepted to defend the validity of the others. For instance a thought experiment proposed by Einstein to invalidate quantum theory was shown by Bohr to be invalid because it had not taken into account the implications of relativity theory. All efforts to invalidate the second law of thermodynamics by working out the more arcane implications of the general theory of relativity have been shown to have overlooked some feature of the general theory itself. Yet conceptually these theories are not easily reconcilable with each other, even in the ontological status ascribed to the objects of the theories. What I hope to show is that if relativity theory, quantum theory and thermodynamics are interpreted through process philosophy, there is hope that they can be conceptually reconciled. This will require of scientists that they acknowledge the primacy of becoming, the irreducibility of complexity, and that humans as conscious agents are part of the world.

Relativity Theory

Relativity theories, that is, the special theory of relativity developed from the theory of electro-magnetism and the general theory of relativity designed to explain gravity, are essentially developments of field theory, the conception of being according to which the world does not consist of discrete bits of matter but of continuous force fields.[8] While the concept of force field has much in common with notions of Stoic physics, the modern concept evolved through Leibniz's criticism of Newton's notion of a duality between force

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6. On this, see David Dickson, *The New Politics of Science*, Chicago: University of Chicago Press, 1988.

7. That this is the case has been argued in a number of works, most notably Prigogine *From Being to Becoming* and Ilya Prigogine and Isabelle Stengers *Order Out of Chaos*, Toronto: Bantam, 1984; David Bohm *Wholeness and the Implicate Order*; Erich Jantsch *The Self-Organizing Universe*, Oxford: Pergamon Press, 1980; and Paul Davies, *The Cosmic Blueprint*. See also the anthology edited by John B. Cobb, Jr. and David Ray Griffin, *Mind in Nature: Essays on the Interface of Science and Philosophy*, Washington D.C.: University Press of America, 1978.

8. For a history of the theory of fields see Mary Hesse, *Forces and Fields*, London: Sheed and Ward, 1963.

and matter, Boscovitch's dynamism (an attempt to reconcile Leibniz and Newton) in which explanation is ultimately in terms of point centres of power, Priestley's rejection of point centres and his description of nature in terms of active forces alone, Faraday's elaboration of Priestley's ideas to describe electrical and magnetic phenomena, Maxwell's mathematical treatment of Faraday's ideas, and the jettisoning by Herz and Lorenz of the notion of ether by which Maxwell had tried to give a mechanical explanation of force fields. While field theory, like mechanistic materialism, is deterministic and ultimately leads to the Parmenidean conception of the universe as an 'iron block', its development in the theories of relativity decisively undermines many other central features of the mechanistic conception of the world. To begin with, the special theory of relativity emancipates the theory of electro-magnetism from classical physics by invalidating the idea of an underlying ether supporting wave motion, conceiving mass as a function of velocity, thereby revealing the equivalence of energy and mass (given in the famous formula $E=mc^2$), eliminating the concept of a rigid body, while defining simultaneity, space and time in terms of interactions at the speed of light c (held to be constant in all inertial reference systems).

The special theory of relativity is generally taken to support a field conception of being in which the laws of nature will be continuous field variables defining points in the field in terms of the whole. This Parmenidean view of the world appears to be reinforced by the geometrical representation of relativity theory in the Minkowski diagram, since this seems to imply that what is taken to be future and what past is relative to what reference system happens to be chosen. However the special theory of relativity can also be interpreted in terms of, and thereby be shown to provide support for, a process conception of the world.[9] Without going into all the arguments for and against the different interpretations, there are three ways in which understanding of the world can be deepened when it is interpreted in this way.

Firstly, the theory of relativity reveals how all knowledge of the world is situated within a process of becoming. In the Minkowski diagram an inertial frame of reference t is represented by a world-line or world-tube with the light cone ABC representing the future and the light cone DBE the past. ABD and CBE represent the 'elsewhere', the region which cannot interact with B in any way.

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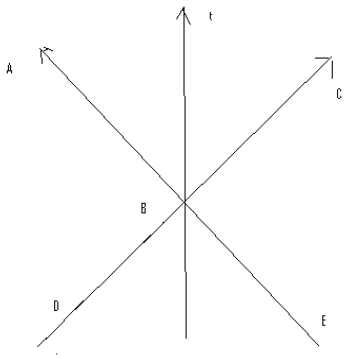
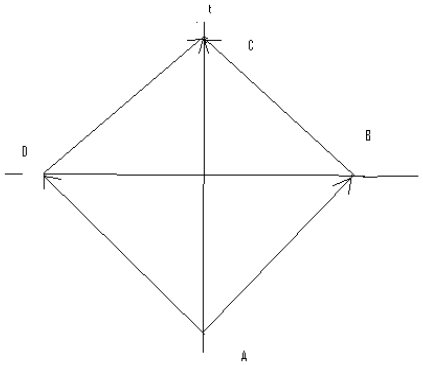
9. The special theory of relativity was interpreted in these terms by Whitehead, and more recently by David Bohm in *The Special Theory of Relativity*, N.Y.: W.A. Benjamin, 1965 and by Milic Capek in *The Philosophical Impact of Contemporary Physics*, Princeton: Van Nostrand, 1961 and 'The Myth of Frozen Passage: The Status of Becoming in the Physical World' in *Boston Studies in the Philosophy of Science*, Vol.2, N.Y.: Humanities Press, 1965, pp.441-463.



While this diagram is usually interpreted to mean that time is nothing but a dimension of space, it actually reveals the primacy of becoming and the relativity in the concept of space. In all frames of reference the order of causal succession is absolute, while in any frame of reference the future, that which can be causally influenced from a situation, is separated from the past, that which can be known about or which can causally influence the situation, by the four dimensional wedge of the 'elsewhere'. It is no longer possible to define the present as a simultaneous juxtaposition of points, and this virtually destroys the traditional notion of space as a timeless order spread out under events. Further reinforcing the primacy of the notion of becoming, the diagram reveals the impossibility of completely predicting the future. The region in the light cone ABC will be influenced by what happens 'elsewhere', and it is impossible to work out completely what will happen elsewhere from what happened in the past.

Secondly, the special theory of relativity suggests how a spatio-temporal order emerges. According to the theory there is a Lorenz contraction in the direction of relative motion in the ratio of $\sqrt{1-v^2/c^2}$ (where v is the velocity of relative motion and c is the velocity of light) which implies that at the speed of light there is no spatial separation between the emission and absorption of a quantum of light, and no passing of time. This implies that if all activity were unordered, space and time would have no meaning. Spatial and temporal features emerge with the ordering of activity, as is revealed by the following Minkowski diagram.



In this, AB and AD represent light rays in primary contact, while ABC and ADC represent light rays in secondary contact. Two primary contacts in the same direction combine to give a time-like interval or duration AC while two oppositely directed contacts such as AD and AB give rise to a space-like interval or extension DB. However before it is possible to talk of time and space as such, it is necessary to refer to relations between ordering activities which are such extensive durations. Space-time can then be thought of as the order of the potentials for interaction between such entities. The Minkowski diagram should then be seen not as a representation of a space-time plenum but as a map of these potentialities. What is past is that which can in principle be known about, while what is in the future is that which can in principle be causally influenced. It is in relation to such potentialities and actual interactions that the notion of extensive duration takes on its full meaning.

Since it is the ordering of activity into patterns of relations which produces a spatio-temporal order, it is no longer possible to conceive of these relations in terms of locations specified in terms of a set of continuous Cartesian co-ordinates. Rather than being an external system in terms of which things in the world can be measured, spatio-temporal relationships must be understood topologically, with things defined in relationship to each other. A most fundamental relationship of this kind is containment where one process is a constituent of another and is therefore contained within the extensive becoming of the superordinate process. A number of constituent processes ordered into such a process can then be understood as 'in' the spatio-temporal order of the whole process, but the spatial and temporal order in which they are 'in' is created by their ordered interaction. In the incomplete process of becoming of the superordinate process, space-time is the potential for interaction between semi-autonomous sub-processes. The continuous space-time order of the universe comes into being through the articulation of the world into a multiplicity of hierarchically ordered processes. Measurement can only be the establishment of ratios between structures produced by processes.

Thirdly it is possible to develop a better understanding of energy as activity and its relation to matter and mass. To clarify this notion it is necessary to draw a distinction between outward activity as in the change in position of a body and inward activity such as the thermal motion of constituent molecules which cancel each other out on a large scale. This distinction is relational since what is outward activity at one level is inward activity at a higher level. Mass can be understood as the sum of both inward and outward activity. The outward activity increases mass in a straightforward way which is easily calculated from

Einstein's equations. But the rest mass can also be seen as due to the velocity of movement; of inward activity. For instance a major component of the rest mass of an atom is contributed by the velocity of the electrons. This leaves only the problem of the rest mass of such elementary constituents which can be neither points nor rigid objects. If rest mass is defined as inward activity then it follows that where there is no rest mass, there is no inward activity and all activity is outward. This is true of all forms of radiation which travel at velocity c in all frames of reference, and so can never be considered at rest. This suggests that where there is a velocity of less than c, this is due to an inward reflecting of activity cancelling out the velocity of outward activity, and the creation of elementary particles or entities can be thought of as a relatively invariant pattern of inward activity with no substratum apart from this activity.

Such a conception of elementary particles is supported by relativistic quantum mechanics of electrons where, according to Dirac's equations, electrons travel at the speed of light in trembling movements called *Zitterbewegungen*. The average velocity is then less than the speed of light and corresponds to a spiral path which gives rise to the phenomena associated with electron 'spin'. The annihilation of an elementary particle, as for instance when an electron collides with a positron, can be thought of as a breaking down of the inward ordering releasing activity in a purely outward form as radiation. The nature of the rest mass of such an entity can be clarified by means of one of Einstein's thought experiments. A box of radiant energy in thermodynamic equilibrium produces a radiation pressure on the walls. If it is accelerated, the radiation on the rear wall will gain more momentum than the radiation which reflects off the front wall will lose, producing a resistance to acceleration which is the characteristic manifestation of what we call mass. An elementary entity conceived as the ordering of outward energy inward is analogous to such a box. A 'state of motion' due to the inertia of such a body can then be seen as an aspect of the activity of this body relating both to itself and to the rest of the universe.

With the distinction between inward and outward activity it is possible to define potential energy as inward activity which can be converted to outward activity. In terms of the above analysis of the nature of elementary entities and the nature of their rest mass, the diminishing potential energy of a body being accelerated in a gravitational field, that is, a falling body, corresponds to decreasing inward activity in the body as defined from an inertial system which is manifest in a lowering of its rest mass as it falls.

The general theory of relativity was developed to deal with accelerating frames of reference, and thereby to deal with the relationship between inertial and gravitational mass. This was achieved by replacing the Euclidean space-time of the Minkowski diagram with Reimannian curved space-time. Using tensor-calculus, Einstein then represented gravitational phenomena, and ultimately hoped to represent matter itself, as space-time curvature. The general theory of relativity has become central to the development of theories of the cosmos, especially with the realization that an adequate formulation of general relativity requires the universe to be seen as expanding and that gravity has played a central role in differentiating the universe into stars and planets, galaxies, clusters of galaxies and clusters of clusters of galaxies throughout its expansion. While the general theory has served as the starting point for efforts to unify science in terms of field theory,[10] the theory can equally be interpreted in terms of process philosophy with space-time being conceived as derivative from causation rather than as a representation of a Parmenidean plenum.[11] The

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10. For a defence of this, see A. Mercier, H.J. Treder and W. Yourgrau, *On General Relativity Theory*, Berlin: Akademie - Verlag, 1979.

11. The beginnings of an argument along these lines was made by John A. Winnie, 'The Causal Theory of Space-Time' in J.S. Earman et. al. eds, *Minnesota Studies in the Philosophy of Science*, Vol. VIII, 1977, pp.134-203. These arguments have been extended in a paper by Adrian Smith, 'The Causal Structure of Space-Time' circulated at a conference of the Australasian Philosophy Association at Newcastle in August, 1981.

idea that the universe had a beginning and developed through a process of differentiation and integration is fundamentally in accord with the view that the universe is a process of creative becoming such that the future is not contained in the past. This view could only be invalidated by a theory able to predict the nature and time of each and every differentiation which has occurred in this becoming.

Classical field theory with its Parmenidean implications foundered on the discrete nature of energy, the phenomenon around which quantum theory is built. Since any satisfactory reunification of the theory of gravitational fields with the rest of physics must be quantized, it is to quantum theory that we must now turn.

Quantum Theory

Quantum theory had its origins in problems of radiation. Its most revolutionary feature was its postulation of a fundamental discreteness in the world in opposition to the assumption of continuity in change in both classical mechanics and classical field theories. The theory has since been extended as the theory of the micro-world: the structure of atoms and the nature of chemical bonding, the interaction between radiation and matter, and the nature of the elementary constituents of the universe; and it is now playing a central role in the development of theories of cosmology.[12] The major efforts in theoretical physics over the last fifty years have been devoted to developing theories which unite quantum and relativity theories: as relativistic quantum theories and as quantized field theories. The most important achievement in this regard was the development of quantum-electrodynamics (QED), beginning with Dirac's equations for a relativistic quantum theory and culminating in Feynman's formulation of it in terms of path integrals. This approach has been successfully developed by Glashow, Weinberg and Salam to include weak forces, revealing these to be manifestations of electro-magnetism. There is also a quantum field theory of strong forces: quantum chromodynamics, formulated on the model of QED as a gauge field theory, and efforts are being made to develop a grand unified theory which will relate the strong force to the electro-weak force. The ultimate aim is presented as the development of a unified theory which will at the same time unite all the forces, including gravity, and be a theory of the elementary entities of the universe. These are the supergravity theories. However a new contender to unify physics has emerged with the superstring theories, which reject the idea of elementary particles and replace them with strings.

While it is generally accepted that quantum theory has been a remarkably productive research programme, there is little consensus on how it should be understood. While this is partly due to the nature of the formalism, it is also due to its inconsistent formulations. As Ted Bastin wrote, scientists 'habitually work with a jumble of elements taken from a variety of different conceptual frameworks none of which, singly, is adequate to present the facts that are known, and each of which is partly or even largely incompatible with the rest.'[13] For instance while the Born interpretation of the wave or *psi* function, according to which waves are seen as referring to the probabilities of finding particles in particular places, can be adopted to interpret scattering experiments, interference experiments require the wave to be seen as a physical phenomenon. And while the entities associated with quantum theory are usually spoken of as particles, with quarks and leptons represented as the ultimate building blocks of the universe, the notion of a particle is incomprehensible in terms of quantum field

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12. For the history of the beginnings of quantum theory see Max Jammer, *The Conceptual Development of Quantum Mechanics*, N.Y.: John Wiley and Sons, 1974. For a brief account of the development of modern particle physics see J.E. Dodd, *The Ideas of Particle Physics*, Cambridge: Cambridge University Press, 1984.

13. Ted Bastin, 'Introduction' to Ted Bastin ed., *Quantum Theory and Beyond*, Cambridge: Cambridge University Press, 1971, p.8f.

theories. In these theories, the so-called ultimate building blocks of matter are treated as points in the fields. Such contradictions are avoided by representing the formalism of quantum theory positivistically as simply the means for making correct predictions. But the kind of mathematics used in a scientific theory already implies a way of conceiving the world, and the confusion in quantum theory also exists its mathematical formalism - as C.A. Hooker has pointed out.[14] Furthermore, when it comes to speculations and experiments on elementary entities and their interactions or to speculations on the origins of the universe based on quantum theory, scientists immediately become realists. In the face of this situation, Feynman could do no more in his famous lectures than comment 'we must be careful not to attribute too much reality to the waves in space. They are useful for certain problems, but not for all.'[15]

To overcome this confusion it will be necessary for any proposed interpretation of quantum theory to confront six unique implications of the theory. The first is that, as in relativity theory, the observational situation has to be taken into account, and no independent 'reality' can be abstracted from it. The properties of 'objects' exist in a twilight state of 'superposition' until they are measured. Second, the quantum of action is indivisible. Transitions between stationary states are discrete, with systems moving from one state to another without passing through intermediary states. Third, matter has a wave-particle duality, behaving in some cases more like a wave, at others more like a particle, but always in certain ways like both together. Fourth, it is impossible to predict in detail what will happen in each individual observation, implying some degree of indeterminacy in the world. Fifth, a particle travelling between two points travels through all possible paths between them simultaneously. Sixth, particles that are millions of miles apart can affect each other instantaneously.

Given the prevailing formalism, the most coherent interpretation of quantum mechanics is Niels Bohr's complementary theory. It is associated with a Neo-Kantian (Wittgensteinian) position according to which science is only concerned with what we can say about the world, but in addition it is argued that what we can investigate and describe cannot be combined into a coherent picture. Among other things, it is necessary to use concepts from both mechanistic materialism (the particle) and field theory (the wave) in a complementary way to investigate and interpret the quantum domain. As Bohr put it:

> ... the impossibility of combining phenomena observed under different experimental arrangements into a single classical picture implies that such apparently contradictory phenomena must be regarded as complementary in the sense that, taken together, they exhaust all well-defined knowledge about atomic objects.[16]

In this it is recognized that humans are actors within the world striving to make it intelligible. Science is then not a description of reality itself, but reality in particular experimental situations in which the experimental situation must be treated as a whole. The idea of abstracting the experimental object from the experimental apparatus is rejected as irrelevant. This means that quantum theory cannot be held to describe a reality independent of experimental situations, and the rejection of this form of realism is essential to account for situations in which quantum theory implies a violation of the principle that inter-actions

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14. C.A. Hooker 'Metaphysics and Modern Science' in C.A. Hooker ed. *Contemporary Research in the Foundations and Philosophy of Quantum Theory*, Dordrecht: Reidel, 1973, pp.174-304.

15. Richard P. Feynman, Robert B. Leighton and Matthew Sands, *The Feynman Lectures on Physics: Quantum Mechanics*, Reading: Addison-Wesley, 1965, 3-9.

16. Niels Bohr, *Essays 1958/1962 On Atomic Physics and Human Knowledge* N.Y.: John Wiley, 1963, p.25.

cannot occur at faster than the speed of light (the Einstein-Rosen-Podolsky paradox).[17] J.S. Bell revealed the theoretical possibility of experimentally testing whether quantum theory was in fact valid in such situations, and the predictions of quantum theory were experimentally validated by A. Aspect and his colleagues in 1982.[18]

However Bohr's arguments that the phenomena together exhaust well-defined knowledge is misleading. While each of these phenomena are understood deterministically, it is also well-defined knowledge that using the two forms of description together implies an indeterminacy in the world, that the world is in some sense genuinely creative, and that the experimenter participates in this creativity. And Bohr's arguments that it is impossible to go beyond the concepts of classical physics to take this into account are invalid. If two deterministic theories of being turn out to be unsatisfactory in isolation but usable when treated as complementary to each other, it is oddly conservative to believe that a non-deterministic theory of being could not be developed which would account for the distinguishing features of the quantum domain, including the extent to which the domain is predictable. Such a belief suggests a poverty of imagination. Furthermore the makeshift way of combining the two theories of being, pressing fragments of the particle and the field schemes into service blindly as the situation demands, has manifest itself in problems and limitations in the developments of quantum theory. Since there is no way to introduce extended structures into relativistic quantum theory, particles are treated as points. But this leads to infinite energies in calculations which can only be removed by a mathematically and physically *ad hoc* 'renormalization' procedure. And while theorists speak glibly of quantisation procedures to represent the change from continuity to discreteness, there is no comprehension of why this should occur or what are its ramifications. In grand unified and super-gravity theories the existence of infinities have not yet been shown to be renormalizable, and as quantum theory advances, problems are increasingly being left unaddressed. As Christine Sutton complained in a popular study of elementary particle physics:

> Why ... is electric charge quantized, with the proton's charge the same size (but opposite sign) as the electron's? This comes down to asking why the quarks have charges of 2/3 and 1/3, and leptons have charges 0 and 1 in units of e, the charge of an electron. Electroweak theory does not say what these charges should be; they have in effect to be inserted 'by hand'. Moreover the masses of all the quarks and leptons are quite arbitrary, as are the strengths of the interactions...[19]

After revealing the confusion of the mathematics of quantum theory, C. Hooker concluded that:

> ... quantum mechanics demands either a new conceptual-ontological scheme (a revision of the two conceptual schemes more thoroughgoing even than their logic) or the abandonment of quantum mechanics as a hopelessly bastard offspring of an attempted marriage of the two great classical theoretical structures, doomed forever to a jerrymandered interpretation in terms of one of them.[20]

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17. See Bernard d'Espagnat, *In Search of Reality*, N.Y.: Springer-Verlag, 1983, esp. Ch.4.

18. A. Aspect, P. Grangier, G. Roger, *Physical Review Letters*, Vol.49, Dec. 1982, p.'s 91 and 1804.

19. Christine Sutton, *The Particle Connection*, N.Y.: Simon and Schuster, 1984, p.163.

20. C.A. Hooker 'Metaphysics and Modern Science' in C.A. Hooker ed. *Contemporary Research in the Foundations and Philosophy of Quantum Theory*, Dordrecht: Reidel, 1973, pp.174-304, p.270.

In the light of this state of affairs it is to approaches which break with traditional ontologies which must be looked at.

One of the most important developments in this respect is the attempt by the theorists at Birkbeck College, London University, originally under the leadership of David Bohm, to develop a non-localizable hidden variable theory. Non-localizable hidden-variable theory has been explicitly formulated in terms of process philosophy. It is a theory of the quantum domain which accepts the role of the scientist in the world and the indivisibility of the experimental situation, but takes these features to be characteristics of the world which must be explained. In this theory, the quantum mechanical wave-function becomes an actual field, but with unusual properties. The particles and waves acknowledged in present quantum theory are seen as manifestations, 'relevated' by particular experimental arrangements, of the more basic non-local order of the quantum field. This provides a coherent conception of the quantum domain in which what are generally taken to be 'things' are seen as emergent processes within the becoming of the universe. As Bohm described his theory:

> What we are suggesting ... is that all matter is to be understood as a relatively autonomous and constant set of forms built on and carried by the universal and indivisible flux ... Such material forms have a certain subsistence, in the sense that under appropriate conditions they can continue with a certain limited possibility for stable existence. However they are not to be regarded as substance, which would be completely stable, permanent and not dependent on something deeper for their continued existence.[21]

The universal flux, the 'holomovement' as it is elsewhere described by Bohm, is an undivided whole, not in the sense that it is indivisible, but in the sense that division has no meaning in relation to it. Associated with this, Bohm developed his concept of a new type of order, the non-local 'implicate' order, by using the hologram as an analogy.[22] Holograms are such that if a photographic plate is illuminated by a laser beam, the eye will see from a range of possible viewing points a three dimensional structure as though looking through a window. But the order in the photographic plate is not localized. If only a small part of the plate is illuminated the viewer will still see the whole structure, but with less sharply defined detail and with less possible points of view, as though looking through a smaller window. There is an order 'implicated' non-locally in the whole plate which is 'explicated' by illuminating it. But this analogy is slightly misleading because it is static rather than dynamic, and to emphasise the dynamic nature of the becoming of the holomovement Bohm and his colleagues have used an auditory analogy. In doing so they have tried to show how the causation involved in this becoming cannot be comprehended in terms of a chain of events, but must be understood as a 'formal' cause, corresponding to what I have described as immanent causation. This generates localizable particle-like phenomena. As they described this:

> Let us begin by considering a musical theme. The order of successive notes in such a theme evidently cannot be understood as dynamically determined. Rather the entire theme is a single whole form, which is perceived directly as such. One theme may then be followed by another in a developing structure, which in turn constitutes a higher order form, and this sort of development can go on further to indefinitely higher levels.

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21. David Bohm, 'The Implicate of Enfolded Order: A New Order for Physics' in *Mind in Nature: Essays on the Interface of Science and Philosophy*, eds. John B. Cobb Jr. and David Ray Griffin, Washington: University Press of America, 1978, p.40.

22. See David Bohm, *Wholeness and the Implicate Order*, London: Routledge & Kegan Paul, 1980, Ch.'s 5 & 6.

> ... The development of themes in successive stages is then like a particle which is first in one quantum state and then in another etc. As there is no dynamical cause of successive quantum themes, so there is no dynamical cause of successive quantum states. Rather the whole order and form of the development is the cause. ... We compare the many-particle system to an orchestra (each particle to an instrument). When the whole orchestra is playing one theme all the instruments are related in an essential way... We thus obtain an analogy to the nonlocal correlation implied by the many-body wave function... A new process can now be envisaged in which the orchestra is playing together as a whole (i.e. in nonlocal relationship) begins suddenly, as part of the whole structure of the composition, to break up so that each instrument plays independently (i.e. solo) in a way that is not related to how the others are playing. This is our analogy for the spontaneous process of localization of states.[23]

This conception of the quantum reality has been formalized using algebraic topology.[24]

Ideas complementary to this which also accord with the categories of the metaphysics of process have been developed by Geoffrey Chew. Chew has proposed what he calls a 'bootstrap model' to explain hadrons (strongly interacting particles such as the proton and neutron).[25] Rejecting the idea that nature can be analysed into fundamental entities, Chew has argued that hadrons are temporarily stable configurations which result from the interaction of processes. These may transform themselves into each other, help other hadrons in their transformations, appear as composite particles, constituents of other particles, or binding forces. While the actually unfolding process chains and the resulting process webs are unpredictable, they obey certain rules based on the single principle of self-consistency. Whatever comes into being has to be consistent with itself and with everything else, so that the set of hadrons 'pulls itself up by its own bootstrap'. Recently Chew and his colleagues have been able to obtain results consistent with the achievements of its main rival research programme, Gell-Mann's quark model of hadrons, again through the use of algebraic topology.

The most recent fashion in theoretical physics is superstring theory.[26] Rejecting both the conception of particles and of fields as the fundamental entities of the universe, superstring theorists are trying to unite the general theory of relativity or gravity theory with quantum theory by conceiving of the universe as composed of spatio-temporally oscillating and vibrating 'strings'. The 'elementary particles' can then be thought of as different modes of oscillation or vibration so that electrons, gravitons, photons, neutrinos etc. can be seen as different harmonics (like different musical notes) of a fundamental string.[27] As yet this theory is in the early stage of its development. There is little conceptual understanding of what the mathematics is about while the mathematics has not been sufficiently mastered to provide definitive tests of the theory. However, along with non-local hidden variable theories of quantum mechanics and bootstrap theories, work on superstring theories clearly manifests the growing dissatisfaction with the dominant theories of being and the struggle to develop alternatives in which the world is seen as consisting of patterns of activity.

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23. A. Baracca, D.J. Bohm, B.J. Hiley and A.E.G. Stuart, 'On Some New Notions Concerning Locality and Nonlocality in the Quantum Theory' in *Il Nuovo Cimento*, Vol.28 B, No.2, 11 Aug. 1975, pp.453-465, p.458.

24. The best description of what is involved in this formalization is B.J. Hiley, 'Towards an Algebraic Description of Reality' in *Annales de la Foundation Louis de Broglie*, Vol.5, 2, 1980, pp.75-103.

25. See *Zygon*, Vol.20, No.2, June 1985 on this, particularly the article by Chew.

26. On this see P.C.W. Davies and J. Brown eds, *Superstrings: A Theory of Everything?* Cambridge: Cambridge University Press, 1988; and E. David Peat, *Superstrings and the Search for The Theory of Everything*, Chicago: Contemporary Books, 1988.

27. As Edward Witten and John Ellis have put it, *Superstrings: A Theory of Everything?* p.93 & p.153.

Thermodynamics

Thermodynamics originated in Jean-Joseph Fourier's mathematical description of heat flow in solids in 1811.[28] Here a physical theory had been created which was just as mathematically rigourous as the mechanical laws of motion, yet remained completely alien to the Newtonian conception of the world. In 1824 Carnot, who was concerned with the efficient use of fuel in engines, formulated the principle of irreversibility: that fuel once used, disappears as fuel forever. Mayer (1842) and Helmholtz (1847), influenced by the *Naturphilosophen* who, under the influence of Leibniz, had postulated the existence of a universal *vis viva*,[29] proposed that the various sciences of heat, mechanics, chemistry, electricity and biology could be united by the principle of energy conservation. According to this scheme, 'energy' is merely transformed by various physical, chemical and biological systems. Then in 1850 Clausius formulated Carnot's principle from the new perspective provided by the conservation of energy, and the science of thermodynamics came into being. In 1865 in the process of generalizing the principles of irreversibility from technology to cosmology, Clausius coined the term 'entropy' and explicitly formulated the first two laws of thermodynamics. In opposition to classical mechanics which was still thought to govern the behaviour of the elementary constituents of the world, the new science of thermodynamics dealing with large aggregations of atoms or molecules implied an asymmetry in the relationship between the present and the future and the present and the past. The universe was seen to be running down to a 'heat death' in which all energy would be uniformly distributed throughout the universe.

Later in the century, Bolzmann attempted to reconcile thermodynamics with mechanics by explaining the thermodynamic properties of gases in terms of the behaviour of atoms or molecules.[30] Although he was only concerned with systems moving towards equilibrium, and he himself acknowledged that he had not reconciled thermodynamic systems to mechanics, his research project was in accordance with the reductionist tendencies of the mechanistic conception of the world. As a consequence, the phenomena of thermodynamics have been widely held to be epiphenomena produced by the mechanical laws governing the elementary constituents of the universe, and of significance only because of our ignorance of individual constituents. Thus a recent textbook on thermodynamics defined a thermodynamic system as 'a system in which there *are so many relevant degrees of freedom that we cannot possibly keep track of all of them*.'[31]

However the whole research programme of mechanistic reductionism was revealed to be impossible by Bruns and Poincaré. They showed the so-called 'many-body problem' or 'three-body problem' to be insoluble; that is, that it is impossible to analyse a system containing more than two bodies in terms of deterministic equations of motion describing each body (in terms of co-ordinates and momenta) in the system.[32] The interactions between all the bodies were shown to be more than the sum of the interactions between each of them. As Prigogine and Stengers put it: 'Nature as an evolving, interactive multiplicity thus

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28. For an account of the history and state of thermodynamics see Prigogine *From Being to Becoming* and Prigogine and Stengers *Order Out of Chaos*.

29. See Thomas S. Kuhn, 'Energy Conservation as an Example of Simultaneous Discovery' in *The Essential Tension*, Chicago, University of Chicago Press, 1977, pp.66-104.

30. For the history of this see Yehuda Elkana, 'Bolzmann's Scientific Research Program and its Alternatives' in Y. Elkana ed. *The Interaction Between Science and Philosophy*, Atlantic Highlands, N.J.: Humanities Press, 1974, pp.243-279.

31. J.R. Waldram, *The Theory of Thermodynamics*, Cambridge: Cambridge University Press, 1985, p.2.

32. This issue has been lucidly described by Prigogine and Stengers in *Order out of Chaos*, p.70ff. Poincaré's proof is recounted in Ivar Ekeland, *Mathematics and the Unexpected*, Chicago: University of Chicago Press, 1988, Appendix 1.

resisted its reduction to a timeless and universal scheme.'[33] Later developments of thermodynamics have brought this home, forcing people to recognize that thermodynamic phenomena are genuinely emergent features of the universe. In 1931 Onsager formulated the first general relations in non-equilibrium thermodynamics. On this foundation Prigogine and his colleagues formulated principles to describe far from equilibrium states, inaugurating a new era in thermodynamics. The central concern of non-equilibrium thermodynamics is the study of the generation of new order in thermodynamically far from equilibrium systems: the dissipative structures which, feeding on negative entropy maintain continuous entropy production and dissipate the accruing entropy.[34]

Far from equilibrium thermodynamics most clearly reveals the necessity of conceiving the world as a process of creative becoming. It deals with the emergence of types of ordering through the amplification of fluctuations which, once established, have a dynamics of their own beyond the conditions of their emergence which then constrain the rate and way in which negative entropy is dissipated. Typical examples of this are the turbulence which develops in a laminar flow of liquid (as for instance when a tap is turned on until turbulence develops in the flow of water) and the cellular convection patterns which develop when a liquid is being heated at one end and cooled at the other. Each of these increase the rate of creation of entropy. Dissipative structures have also been revealed in chemical reactions which exchange energy and matter with the environment and are auto- or cross-catalytic. In these there can be a multiplicity of types of order: temporal organization as in a limit cycle, stationary inhomogeneous structures, spatio-temporal organization as in a wave form, and localized structures. In all these cases a large number of molecules manifest a coherent order over a large region and period of time. Unlike equilibrium structures which are uniquely determined by their environmental parameters, dissipative structures are involved in cycles of activities in which, if the systems are large enough, they establish their own boundaries and undergo state transitions autonomously. In terms of the categorial framework outlined in the previous chapter such 'dissipative structures' are processes which have structures; it is 'processes' as self-ordering patterns of activities which 'do' things.

While the work of Prigogine and his colleagues has been concerned with the emergence of order from disorder, this has been complemented by studies of how determinate systems generate indeterminacies, a field which has become widely known through the development of chaos theory.[35] Chaos theory enables systems which were once only describable through statistics to be conceptualized by a form of mathematics which reveals why determinate systems develop unpredictably. When the notions of dissipative structure and chaos are combined, a picture emerges of a world consisting of both indeterminate and determinate processes, with neither being more basic than the other. Any appearance of determinate order must be seen as emerging from an indeterminate order (or disorder) at one level while generating unpredictable outcomes at another level.

Combined with the breakdown of the reductionist project with the developments of relativity theories and quantum mechanics, these developments in thermodynamics have inaugurated a new era in science concerned with the emergence of new levels of order, the relationship between microscopic and macroscopic order, and with complexity.[36] Such

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33. Prigogine and Stengers, *Order Out of Chaos*, p.72f.

34. See G. Nicolis and I. Prigogine, *Self-Organization in Non-Equilibrium Systems* New York: Wiley, 1977. For a summary of the work on this subject see also Ilya Prigogine, 'Order Through Fluctuation: Self-Organization and Social System' in Erich Jantsch and Conrad H. Waddington eds, *Evolution and Consciousness*, Reading Mass.: Addison Wesley, 1976, pp.93-133.

35 On this see Nina Hall ed. *The New Scientist Guide to Chaos*, Harmondsworth: Penguin, 1991.

36. See for example H. Harken, *Synergetics: An Introduction*, 3rd ed., Berlin: Springer, 1983; E. Frehland ed. *Synergetics - From Macroscopic to Microscopic Order*, Berlin: Springer-Verlag, 1984; Giorgio Careri, *Order and Disorder in Matter*, tr. Kristin Jarratt, Reading: Benjamin/Cummings, 1984, and Davies, *The Cosmic Blueprint*. On the science of complexity see John L. Casti, *Complexification*, London: Abacus, 1994.

notions provide a bridge between the science of the animate and the inanimate world. Life forms can be conceived as complexes of dissipative structures emerging from indeterminate physical and chemical processes and generating in turn indeterminate biological processes. While entropy initially appeared to be an anthropocentric concept, defined only in terms of potentiality for human purposes, the concept of dissipative structures, themselves defined in terms of the transformation of negative entropy into entropy, enables negative entropy and entropy to be defined in terms of potentiality for dissipative structures, of which humans can then be seen as a kind. Humans, cognizing, analysing, experimenting on, and engaging with or utilizing negative entropy, must be seen as themselves ordering activity within nature in relation to which potentialities and the processes which generate and maintain them must be defined. This finally invalidates all efforts to reduce thermodynamics to mechanics. As Prigogine and Stengers wrote:

> ... irreversible processes have an immense constructive importance: life would not be possible without them. The subjective interpretation [of thermodynamics] is therefore highly questionable. Are we ourselves merely the result of our ignorance, of the fact that we only observe macroscopic states?[37]

Process Philosophy and the Life Sciences

Mechanistic materialism is even more firmly entrenched in the life sciences than in the physical sciences. This follows a long history of struggle into the twentieth century by mechanists against the surviving concepts of Aristotelian biology as espoused by the vitalists. Opposing notions such as those of Claude Bernard who argued: 'As long as a living being persists, it remains under the influence of ... [a] creative force, and death comes when it can no longer express itself'[38] the German biologist Virchow argued in 1845 that: 'The new medicine ... has shown that life is nothing more than the sum of the phenomena which proceed from general physical and chemical (that is to say mechanical) laws. It denies the existence of an autocratic Life or Healing Force.'[39] The most important advance of the mechanistic approach was the development of Darwin's theory of evolution which offered an explanation for the appearance of complex order in the world in purely mechanistic terms.[40] This theory; was bolstered by Mendelian genetics, population biology and then by the development of molecular biology which described the mechanism of inheritance chemically in terms of the replication of DNA. It has been reformulated through these as the 'synthetic theory' of evolution.

The essence of the synthetic theory is the Darwinian notion that more complex organisms have descended from less complex organisms, and that this process is explained by the way populations produce more descendants than will survive, by the variability of these descendants, and by this variability affecting their chances of survival. Following Weissman (1885), inheritance and variation are seen to derive from the germ plasm which is

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37. Prigogine and Stengers, *Order Out of Chaos*, p.125.

38. Claude Bernard, *Introduction to the Study of Experimental Medicine*, cited by Stephen Toulmin and June Goodfield, *The Architecture of Matter*, London: Hutchinson, 1962, p.335.

39. Cited by Everett Mendelsohn in 'Revolution and Reduction', Y. Elkana ed., *The Interaction Between Science and Philosophy*, Atlantic Highlands, Humanities Press, 1974, p.415.

40. As argued by G. Montanelli in 'From Aristotle to Democritus via Darwin', Francisco Jose Ayala and Theodosius Dobzhansky eds, *Studies in the Philosophy of Biology: Reduction and Related Problems*, London, Macmillan, 1974, pp.3-19. The major orthodox history of biology and the development of evolutionary theory is Ernst Mayr's *The Growth of Biological Thought: Diversity, Evolution and Inheritance*, Cambridge, Mass.: Harvard University Press, 1982.

held to be continuous from generation to generation, unaffected by the body or environment of the organism. This germ plasm, conceived as genes and DNA, is taken as the sufficient cause of biological form. The adult organism, the phenotype, is represented as a complex of discrete traits produced by the genes and the environment. Correspondingly, the theory focusses on populations of genes and fitness of genotypes. Sewell Wright was the most important instigator of this approach. Dobzhansky later redirected attention from the fitness of individual genotypes to the fitness of populations of genotypes, but genes remained at the core of the theory. This is evident in, and basic to, the work of the sociobiologists. For instance E.O. Wilson wrote:

> Natural selection is the process whereby certain genes gain representation in the following generations superior to that of other genes located at the same chromosome positions. When new sex cells are manufactured in each generation, the winning genes are pulled apart and reassembled to manufacture new organisms that, on the average, contain a higher proportion of the same genes. But the individual organism is only their vehicle, part of an elaborate device to preserve and spread them with the least possible biochemical perturbation. Samuel Butler's famous aphorism, that the chicken is only the egg's way of making another egg, has been modernized: the organism is only DNA's way of making more DNA.[41]

Further developments in bio-chemistry and molecular biology have continued to advance the reductionist programme of the synthetic theory. The general view of most biologists was summed up by the Nobel laureate J. Lederberg in 1970:

> A few eccentrics aside, the whole community of contemporary science shares the view that the laws of nature apply to nonliving and living matter alike. All of us who investigate the chemistry and physics of living organisms pursue our work as if organisms were complex machines, and we find man to exhibit no tissues or functions that would except him from this way of analysing human nature.[42]

However there are alternatives to the mechanistic view of life which are not vitalist. The most important of these have been inspired directly or indirectly by process philosophy. In 1931 a group was formed in Cambridge centred around Waddington, Needham, Wrinch, Bernal and Woodger.[43] Waddington and Needham in particular had been strongly influenced by both Whitehead and D'Arcy Thompson, and all had been somewhat influenced by a lecture given by Bukharin in England in 1931 defending Engels' anti-reductionist philosophy of science. These scientists formulated a physicalist but anti-reductionist research programme which they called 'physico-chemical morphology.' While the Rockefeller Foundation was willing to finance this programme, they were unable to gain the support of Cambridge University and in 1938 the group disintegrated. However Waddington continued his research in biology, advancing the field of epigenesis - the study of the genesis of form and the differentiation of cells, and showing its implications for evolutionary theory. Forced out of Cambridge he established himself at Edinburgh, and before he died he organized four major symposia, the contributions to which he edited and

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41. Edward O. Wilson, *Sociobiology: The New Synthesis*, Cambridge Mass.: Harvard University Press, 1975, p.3.

42. J. Lederberg 'The Perfection of Man' in *Nobel Symposium 14: The Place of Value in a World of Facts*, Stockholm: Almquist and Wiksell, 1970, p.55.

43. For a study of this group see Pnina G. Abir-Am, *The Biotheoretical Gathering in England, 1932-38 and the Origins of Molecular Biology*, Ph.D. thesis, Universite de Montreal, 1983 and 'Recasting the Disciplinary Order in Science' in *Humanity and Society*, Vol.9, No.4, November 1985, pp.388-427.

published in four volumes between 1968 and 1972 as *Towards a Theoretical Biology*. Most of the participants at these symposia, together with a number of other biologists, have continued to develop ideas implicitly or explicitly in accordance with the process view of the world, and these provide a framework for interpreting other unorthodox developments in biology.

The conception of life promoted by these biologists is gaining increasing prominence as the prevailing reductionist research programme is failing. [44] The reductionist programme has always suffered from its fundamental incoherence. If the organism as a functioning whole is conceived to be a mere epiphenomenon of the genes or DNA, then what is it that is being explained? Evolutionary theory becomes a mere tautology in which the fitness of a gene or sequence of DNA, defined by the fact that it survives, is used to explain its survival. Any attempt to overcome this tautology must return to the issue of what evolutionary theory is about - the existence of complex forms of life. If such complex forms are mere collections of chemicals no more significant than any other, then to talk of evolution is meaningless. If they are more than this, what is the relationship between the genotype and the phenotypic forms? As it stands, orthodox evolutionary theory explains biological form solely by tracing genealogies. This is like explaining why the earth is following an elliptical trajectory around the sun by the fact that it did so last year.

If some minimal status is granted to the phenotypes, and fitness is defined in terms of the propensity for survival of the phenotypes or their traits, then the orthodox theory does become a testable hypothesis. But such a theory would lead one to expect evolution to occur gradually. This has not been born out by the evidence. S.J. Gould in particular has argued that the palaeontological evidence points to a punctuated equilibrium in which periods of rapid evolution are followed by long periods of stability.[45] There is no way for the orthodox theory to account for this.

Giving meaning to evolutionary theory and trying to account for such observations requires recognition of the holistic dynamics of living processes, from the DNA to species and eco-systems. These dynamics are dependent upon their environments and constituents, but not reducible to them. This does not involve an extra force, a 'life force' for instance, over and above physical processes but 'immanent causation' involving additional constraints, where such constraints are conceived as 'simply some additional regularity or order which is not explicitly found in the initial conditions.'[46] Such constraints are evident first in the complex relationship between the genotype and the phenotype, particularly as manifest in epigenesis. Secondly they are evident in the on-going organization of organisms. This appears to involve hierarchical ordering based on entrainment of oscillations, and involves features irreducible to molecular biology. Thirdly they are evident in the teleological and subjective aspects of organisms. Ideas in theoretical biology, philosophical biology and ethology, when interpreted in terms of process philosophy, support each other and suggest the impossibility of accounting for evolution without taking the purposeful striving of individual organisms into account.

Emergent constraints became evident through work which undermined the view that the genotype in any particular organism is inviolable and can only be changed over generations

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44. See B.C. Goodwin, N.J. Holder, C.C. Wylie eds, *Development and Evolution*, Cambridge: Cambridge University Press, 1983; M.W. Ho and P.T. Saunders eds *Beyond Neo-Darwinism*, London: Academic Press, 1984, and J.W. Pollard ed., *Evolutionary Theory*, Chichester: John Wiley & Sons, 1984. Elliot Sober has examined many of the conceptual issues in evolutionary theory in *The Nature of Selection*, Cambridge Mass.: MIT Press, 1984.

45. S.J. Gould and N. Elridge, 'Punctuated equilibria: the tempo and mode of evolution reconsidered', *Paleobiology*, 1977, Vol.3, pp.115-151 and S.J. Gould 'The meaning of punctuated equilibrium and its role in validating a hierarchical approach to macro-evolution', in R. Milkman ed. *Perspectives on Evolution*, Massachusetts: Sinauer Associates, 1982, pp.83-105.

46. H.H. Pattee 'Physical Theories of Biological Co-ordination' in Marjorie Grene and Everett Mendelsohn eds, *Topics in the Philosophy of Biology* Dordrecht: Reidel, 1976, p.161.

through selection - revealing the fallacy of Weismann's hypothesis and making it impossible to treat the phenotype as merely an expression of the genotype. Barbara McClintock demonstrated the existence of moveable genetic elements in maize by their genetic effects which could not be accounted for by previous models of mutation. McClintock's observations have been supported by new experimental techniques which have shown the genome to be itself a highly complex self-organizing system in interaction with the dynamics of the organism as a whole.[47] This may account for both the inheritance of some acquired characteristics and for rapid changes in DNA in particular circumstances.

Since the DNA complement of each cell in a multicelled organism is the same, this raises the question of how differentiation of cells occurs, and in particular how this differentiation gives rise to coherent structures such as limbs, eyes, nerves, and so on. This obviously cannot be accounted for simply in terms of DNA. In actual fact DNA cannot divide or do anything except as part of the highly organized processes of life, even at the cellular level, and the linear scheme of DNA producing RNA which in turn produces protein is nothing but fiction. Even in protozoa the role DNA plays is more like that of a set of instructions read according to the requirements of the functioning organism than encoded information mechanically producing proteins to constitute the organism. The activation and de-activation of the different parts of DNA is dependent upon a complex of interacting feedback systems based on the production of enzymes which catalyse or inhibit the synthesis of different proteins. In metazoa differentiation of cells leads to the establishment of emergent dynamics through which cells and the part played by DNA are constrained in their development by their position within the total organism.

While such epigenesis is not yet fully understood, a number of facets have been revealed. Most importantly it has been shown how the development of the organism is canalized along different paths. These have been described by Waddington as 'chreods' (time-paths) and the self-stabilization along these paths as 'homeorhesis', corresponding to the notion of homeostasis as self-stabilization at a point. For instance the development of a piece of tissue is canalized to form a limb, and then canalized to form a fore-limb or hind-limb. If before the canalization to hind-limb tissue, tissue from the hind limb is grafted onto the fore-limb region, the disturbance will be buffered out and the tissue will develop into part of a normal fore-limb. If this transplantation is made after canalization to hind-limb tissue, it will develop as hind limb tissue, but in accordance with its position in the fore-limb. For instance if tissue from the thigh of a bird is transplanted to its wingtip, it will develop into toes and claws.

The questions then arise of how morphogenetic fields operate, how do individual cells gain the positional information which enables them to develop in the appropriate manner, and how are individual cells able to respond to this positional information. There is no reason to think that there is only one means for achieving this, but there is evidence that a major role is played by fluctuations or oscillations. This could explain the differentiation into fore-limb and hind-limb tissue which cannot be entirely explained in terms of gene activation, since the behaviour of transplanted tissue rules out the existence of genes for the fore-limb or for the hind-limb. As C.H. Waddington wrote:

> We could not have a 'neural plate substance, a fore-limb substance, a hind-limb substance' etc. but neural plate, fore-limb or hind-limb oscillatory patterns, which could be regarded as analogous to musical themes or chord sequences. The later phases of

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47. See Howard M. Termin and William Engels, 'Moveable genetic elements and evolution'; Christopher A. Cullis, 'Environmentally induced DNA changes'; and Edward J. Steele, Reginald M. Gorczynski and Jeffrey W. Pollard, 'The somatic selection of acquired characters' in Pollard, ed. *Evolutionary Theory*; and M.W. Ho and P.T. Saunders, 'Beyond Neo-Darwinism - An epigenetic approach to evolution,' *Journal of Theoretical Biology*, 1979, Vol.78, pp.573-591.

> differentiation into the various cartilages, bones, muscles, etc., must certainly involve the 'activation' of different structural genes controlling the proteins in these different sorts of cells; but we could interpret these changes as similar to the development of the initial themes according to the conventions of some school of classical music composition.[48]

When differentiation is conceived in this way then it is possible to account for the field effects which enable cells to determine their position in the organism. The neighbouring cells act as temporal templates which entrain the oscillations of the cells according to their position in the organism.[49]

Clarificatory evidence of the oscillatory ordering of epigenesis has been supplied by the study of the slime mould which transforms itself from a community of protozoa into a single, multi-celled organism. The isolated cells (between 10 and 100,000) which develop from spores exude the chemical acrasin at increasing rates as the food supply is depleted, while at the same time becoming more sensitive to this chemical. The increased production destabilises the homogeneous solution producing a far from thermodynamically equilibrium state which generates dissipative structures in the form of oscillations. A certain critical wavelength exists which determines the spatial distribution of the cells. The cells oriented by this wavelength then aggregate, eventually forming a structure in which some cells become rich in cellulose and develop into a foot or base while others rise above it and become rich in polysaccharides. The mass on top eventually develops as a fruit, producing a large number of spores. Predictions of the behaviour of individual cells based on the theory of dissipative structures have been verified by Keller and Segal.[50]

In more complex organisms there is a multiplicity of such patterning activities occurring simultaneously, with the different morphogenetic fields constraining each other. The constraints generated by the dynamic inter-relations between these fields have been investigated by Brian Goodwin, among others, and have been shown to account for many of the characteristic features of the structures of adult organisms.[51] On this basis, Goodwin argued: 'Organisms are not aggregates of elements, whether molecules, cells, organs, skeletal or other components, whose random variation results in an unconstrained variety of forms. They are self governed wholes governed by laws describing spatial and temporal organization such that processes of biological change involve constrained transformation, whether ontogenetic or phylogenetic.'[52] Such ordering precludes any simple relation between the genes and the phenotype. In such self-organizing activity the genes are, as Waddington argued, merely 'the pebbles in the concrete' and as such are 'almost irrelevant to the engineering of the bridge.'[53]

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48. C.H. Waddington, 'Cellular Oscillations and Development' in C.H. Waddington ed. *Towards a Theoretical Biology 2 Sketches*, Edinburgh: Edinburgh University Press, 1969, pp.179-83, p.180f.

49. Since Waddington, such processes have come to be much better understood. On this, see Stuart A. Kauffman, *The Origins of Order: Self-Organizatin and Selection in Evolution*, N.Y. and Oxford: O.U.P., 1993.

50. See Ilya Prigogine, 'Order Through Fluctuation' in Jantsch and Waddington, eds, *Evolution and Consciousness*, p.107ff.

51. For an account of this work see B.C. Goodwin, *Analytical Physiology of Cells and Developing Organisms*, London, Academic Press, 1976; and Brian Goodwin, *How the Leopard Changed its Spots*, London: Weidenfeld and Nicolson, 1994. See also papers in *Development and Evolution* ed. B.C. Goodwin et.al., Cambridge: Cambridge University Press, 1983 and *Dynamic Structures in Biology* ed. Brian Goodwin, Atuhiro Sibatani and Gerry Webster, Edinburgh: Edinburgh University Press, 1989.

52. Brian C. Goodwin, 'Changing from an evolutionary to a generative paradigm in biology', Pollard ed. *Evolutionary Theory: Paths into the Future*, pp.99-120, p.113.

53. C.H. Waddington, 'The Theory of Evolution Today' in Arthur Koestler and J.R. Smythies eds, *Beyond Reductionism*, London: Hutchinson, 1969, pp.357-95, p.371f.

Acknowledging the existence of chreods and a more complex relation between the genotype and the phenotype gives another dimension to evolution, the possibility of genetic assimilation. Whether an organism develops along one chreod or another is dependent upon both the genes and the environment. A change in the environment can lead to an adaptation by some organisms so that development occurs along a different chreod. If this adaptation is beneficial, those organisms which are capable of switching chreods in response to environmental stress will be selected for, and there will be a concentration of genes in the population facilitating this switch. This can result in the development within individual offspring of the new chreod without the environmental stress. The stress produced phenotypic alteration becomes assimilated by the genotype and the acquired characteristic becomes hereditary. In this way the population of organisms is able to imitate Lamarckian evolution. Waddington has demonstrated such an effect with fruit-flies, many of which will develop shorter wings in higher than normal temperatures.[54] Selecting and breeding from these eventually produced short winged fruitflys.

Both while organisms are developing and after they have reached maturity they are engaged in a perpetual process of self-maintenance and self-realization directed by internally defined criteria of stability and organization. They are involved in self-creation or, as Maturana and Varela described it, 'autopoiesis'.[55] Self-creation in the organism has two fundamental dimensions. While it involves a struggle by the organism to maintain itself as a distinct unit, it must differentiate itself in order to meet requirements which cannot be met in the same place or simultaneously. For instance in a single cell, chromosome replication must involve temporal differentiation, and since ribosomes cannot occupy the same place as DNA, a nuclear zone is required involving a spatial differentiation. This means that the stability of self-creation cannot be the classical type in which a system is stable in relation to a point, but must be a dynamic stability in which there is a spatio-temporal differentiation.

The central feature of this form of organization is that it involves hierarchical levels of constraints of a particular kind. For instance in the cycle of events by which organisms reproduce themselves there must be a supervening order to coordinate the temporal differentiation by providing phase information for the relative timing of such events as DNA replication and cell division. In a crystal there is a structural hierarchy characterized by a permanent loss of degrees of freedom. This involves constraints too rigid to be important in biological coordination. On the other hand liquids and gases involve too few constraints. What is missing in both these cases is a recognizable 'function'. A function is, as Howard Pattee pointed out, 'a process in time, and for living systems the appearance of time-dependent functions is the essential characteristic of hierarchical organization.'[56] With this function the constraints must be variable and imposed on only select degrees of freedom of the constituent processes or entities. These are called 'non-holonomic' constraints because they can only be described by equations which relate coordinates to the trajectories, but cannot be derived from the ordinary equations of motion and the initial conditions of the system.

Such hierarchical ordering can be achieved on the basis of oscillations generated by states of far from thermodynamic equilibrium. Such oscillations allow for both hierarchical ordering and ordering through entrainment, as with the epigenetic ordering of morphogenetic fields described above. The central feature of hierarchical ordering is that 'levels of control must be distinguished by different time constants' (that is, the relaxation

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54. Ibid. p.374.

55. Humberto R. Maturana and Francisco J. Varela, *Autopoiesis and Cognition: The Realization of the Living*, Dordrecht: Reidel, 1980.

56. H.H. Pattee, 'The Problem of Biological Hierarchy' in Waddington ed. *Towards a Theoretical Biology: 3 Drafts*, Edinburgh: Edinburgh University Press, 1970, p.127.

times or times required for the variables to reach a steady state after a 'small' disturbance).[57] If two systems have very different relaxation times, the variables of the faster system can be regarded as always being in a steady state relative to the time required for significant changes to occur in the slower system, while the variables of the slow system will enter into the equations of motion of the fast system as parameters of the environment rather than as variables. In this way the genetic system can be seen as constraining the epigenetic system, and the epigenetic system the metabolic system.[58] A.S. Iberall has shown entrained oscillations to be ubiquitous in organisms.[59] They include the bio-electric nervous cycle, the endocrine systems, the heat balance system, water cycles and so on. The time scales of these were shown by Iberall to vary greatly but to be such as to be able to be entrained in chains so that each oscillation comes to form a coherent part of a whole system. Research in this area has made rapid advances in recent years associated with the advances in non-linear thermodynamics, virtually transforming biology.[60] Such research suggests that it is oscillations which account for the distinctive characteristics of life, and life has been redefined accordingly by Iberall:

> Thus life is tentatively defined as any compact system containing a complex of sustaining non-linear limit cycle oscillators, and a similar system of algorithmic guiding mechanisms, that is capable of regulating its interior conditions for a considerable range of ambient environmental conditions so as to permit its own satisfactory preservative operation; that is capable of seeking out in the environment and transferring and receiving those fluxes of mass and energy that can be internally adapted to its own satisfactory preservative operation; that is capable of performing those preservative functions for a long period of time commensurate with the 'life' of its mechanical-physical-chemical elements...[61]

The Emergence of Awareness

This conception of life provides the basis for reconciling the science of biology with philosophical biology and ethology, achieving an intelligible notion of what it means to be a purposefully acting agent.

The central notion underlying philosophical biology is that what distinguishes living from non-living beings is that they define their environments in terms of themselves, thus constituting these environments as fields of potentialities or worlds and themselves as subjects.[62] Thus the philosophical biologist Helmuth Plessner has defined life in terms of positionality. Whereas non-living things have a position, an organism takes its place in the environment, arises in it, is dependent upon it, and yet is opposed to it.[63] In a similar vein, Maurice Merleau-Ponty argued that:

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57. Ted Bastin, 'A General Property of Hierarchies' in Waddington ed., *Towards a Theoretical Biology: 2 Sketches*, pp.252-265, p.256.

58. See B.C. Goodwin, *Temporal Organization of Cells: A Dynamical Theory of Cellular Control Processes,* London: Academic Press, 1963, p.20f; and *Analytical Physiology of Cells and Developing Organisms*, Chs 1,2 & 3 and p.190f.

59. A.S. Iberall, 'New Thoughts on Bio-Control' in Waddington ed. *Towards a Theoretical Biology: 2 Sketches*, pp.166-177.

60. For recent developments of this area see Leon Glass and Michael C. Mackey, *From Clocks to Chaos: The Rhythms of Life*, Princeton: Princeton University Press, 1988; Kauffman, *The Origins of Order*; Goodwin, *How the Leopard Changed its Spots.*

61. Iberall, 'New Thoughts on Bio-Control', p.168.

62. This is how George Herbert Mead defined teleological objects in *The Philosophy of the Act*, ed. Charles W. Morris, Chicago: University of Chicago Press, 1938, p.301ff.

63. Marjorie Grene, *Approaches to a Philosophical Biology*, N.Y.: Basic Books, 1969, p.74f.

> We speak of vital structures ... when equilibrium is obtained, not with respect to real and present conditions, but with respect to conditions which are only virtual and which the system itself brings into existence; when the structure, instead of procuring a release from the forces with which it is penetrated through the pressure of external ones, executes a work beyond its proper limits and constitutes a proper milieu for itself.[64]

Developing such ideas, Hans Jonas argued that life is characterized by three basic features. First, it is a metabolism with a double aspect, 'denoting on the side of freedom, a capacity ... to change its matter, ... [while] equally the irremissible necessity for it to do so.' Second, it must attain this matter from outside itself. It must thereby be 'turned outward and toward the world in a peculiar relatedness of dependence and possibility' thereby referring 'beyond its given material composition to foreign matter as needed and potentially its own.' Third, 'there is an inwardness or subjectivity involved in [this] transcendence, imbuing all the encounters occasioned in its horizon with the quality of felt selfhood, however faint its voice.'[65]

These descriptions of life would be little more than suggestive and their relationship to theoretical biology would remain vague so long as the world were understood in terms of the categories of mechanistic materialism. However, these descriptions become intelligible when the categories of process metaphysics are assumed, and can thereby be integrated with ideas developed in theoretical biology, ethology and neurophysiology. There have been two major obstacles standing in the way of making purpose and subjectivity intelligible - conceiving of causation in such a way that self-creation is incomprehensible, conceiving of space as a container such that the parts of beings extended in space are seen as externally related to each other, and seeing time in spatial terms, thereby eliminating real becoming from the world. All these obstacles are overcome by the categories of process metaphysics.

To begin with, primary beings are understood as processes, defined as self-ordering activities essentially durational in their nature. This means that whatever is identified as a primary being must be seen as an immanent cause of its own becoming. In the case of a living being, the constraints or constraining associated with its immanent causation are non-holonomic, involve a number of levels, and apply not only to constituent processes but also to interchanges of the organism with its environment. And first through the evolution of species, then through the development of cognition in individual organisms, there is an ordered development of such hierarchies of constraints. Further, space-time itself must always be seen as becoming, with the future never being entirely determined by the past and potentiality thereby being a real part of the world, with spatio-temporality defined as an order of potentialities maintained by superordinate processes for co-existence and interaction between actual or potential sub-processes.

On this basis, the possibility of a multiplicity of spatio-temporal orders must be allowed for, with many being the condition for the existence of others. It has been noted that in biological organization, supervening causes are of long duration compared to constituents. To subdivide them durationally is to destroy them, as would the subdivision of a melody destroy it as a melody. The existence of supervening causes constraining the interaction between the organism and the environment generates a spatio-temporal order of potentialities for constituent sub-processes associated with this exchange. But it is in terms of the durational supervening causation of the higher level ordering of the organism that this space-time is defined. This implies that the ordering activity of this supervening causation transcends this space-time. It is this which allows it to be conceived of as a final cause, not through being seen as an event in the future affecting the present, but by forcing a

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64. Maurice Merleau-Ponty, *The Structure of Behaviour*, [1942], tr. Alden L. Fisher, Boston: Beacon, 1967, p.145f.

65. Hans Jonas, *The Phenomenon of Life: Towards a Philosophical Biology*, Chicago: University of Chicago Press, 1982, p.83f.

reconception of the notions of event, the future, the present and the past. It involves a causation which is indivisible in terms of the spatio-temporal order of the potentialities of the sub-processes associated with exchange between the organism and the environment which is defined in terms of it.

In this scheme of things, the organism as an unfinished process of becoming consisting of such supervening causation must then be seen (or rather, understood, since appreciating reality as becoming requires 'indwelling') as constituting or construing its environment as a field of potentialities for it, that is, as a spatialized world, by temporally transcending the immediacy of this environment. This implies the opening of a temporal horizon in which the simple flowing passage of change is transformed by defining the present as that in which past tensions or desires have been satisfied or frustrated, and in which there are existing tensions or desires which may be satisfied in the future. This subjective space-time is not to be counterposed to real space-time. It is a real emergent order. The organism in its environment thereby becomes an embodied subject in a world, a world which is constituted in progressively more complex ways as it strives to come to terms with its environment. That is, organisms conceived in terms of theoretical biology based on process metaphysics can be understood to be essentially as they have been described by philosophical biologists.

While being less concerned with the nature of subjectivity than philosophical biologists, ethologists' conceptions of life have generally accorded with their ideas and the process view of the world while allowing for more detailed analyses of the diversity of life-forms. The initial direction of ethology was given to it by Jacob von Uexküll who analysed the constitution by animals of their worlds, focussing on how the perception world and the action world of organisms are related through function circles (for food, for enemies, and so on) to constitute first their surrounding worlds, and then through the coordination and relating of perception and action in different function circles, to inner worlds. By studying the function circles of each organism he revealed the distinctive worlds of different organisms, showing how 'there are as many surrounding worlds as animals.'[66] While few ethologists share von Uexküll's vitalism and anti-evolutionism, the effect of his influence has been that in their study of the nature of action and perception, ethologists have examined and come to understand the vast variety of life-worlds of organisms, and the diverse means by which these are constituted. They have defined awareness and thought in terms of such constitution, and in this way they have revealed the various stages which have led to the complex, social, open textured worlds constituted by humans.[67]

One of the most fruitful theoretical analyses of the stages of development of forms of action and cognition is that of Piaget. Piaget's developmental epistemology of humans was an extension of his original studies in biology, and he returned in later years to apply the ideas of developmental epistemology to the study of the development of cognition in organisms.[68] The basis of his theory has been the conception of the cognitive function as an extension of organic regulations, constituting a differentiated organ which regulates exchanges with the environment. The principle of this organization is the generalization of schema or structures of interpretation and action from one situation to another, assimilating the environment to the organism's schema, and at the same time accommodating these

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66. Jacob von Uexküll, *Theoretical Biology*, London: Kegan Paul, Trench, Trubner & Co., 1926, p.176.

67. See Konrad Lorenz, *Behind the Mirror: A Search for a Natural History of Human Knowledge*, tr. Ronald Taylor, London: Methuen, 1977; W.H. Thorpe *Animal Nature and Human Nature*, London Methuen, 1974; and Donald R. Griffin, *The Question of Animal Awareness: Evolutionary Continuity of Mental Experience*, N.Y.: The Rockefeller University Press, 1976; *Animal Thinking*, Cambridge Mass.: Harvard University Press, 1984; and *Animal Minds*, Chicago: University of Chicago Press, 1992.

68. Jean Piaget, *Biology and Knowledge: An Essay on the Relations Between Organic Regulations and Cognitive Processes*, tr. Beatrix Walsh, Chicago: University of Chicago Press, 1971.

schema to the environment.[69] New developments can also be made through association and integration of such schema, a process which Piaget illustrated:

> ... the edible snail Helix Pomatia L. lays its eggs in the ground a few centimetres below the surface. Not having much intelligence, it is doubtless incapable of foreseeing the advantages of behaving in this way; so we cannot point to any anticipation in what it does. However, (a) it takes shelter from the sun and cold beneath stones, etc.; (b) it is capable of generalizing this protection schema in times of intense cold to the point where it will even bury itself in winter; (c) it has a tendency, no doubt hereditary, to hibernation, and shuts itself up in its shell, blocking the entrance with some epiphregmatic secretion (accumulated mucous); (d) moreover, it lays eggs, and one can well imagine that it will never confuse them with any excretion, so that, however rudimentary its perceptions may be (proprioceptive as well as exteroceptive), it takes these eggs into its sphere of conservation as soon as it lays them. Thus the tendency to lay eggs below the ground could be seen as the result of coordination or assimilation of the laying schema into the schema for self-protection or sheltering in the ground.[70]

Piaget's work raises the question of the nature and ontological status of such schema. This is a difficult concept, and like the concept of 'field' in nineteenth century physics, is still in the process of being elaborated. Schema are generally defined as cognitive structures, and thereby as self-regulating systems of transformations which are neither reducible to their constituents, nor characterizable in terms of executive agency controlling constituents. However when defining the ontological status of such schema, there is a clear failure to distinguish between what is potential and what is actual, and then to treat potentialities as actualities. Thus schema are treated as entities which assimilate, or accommodate to, other entities (environmental data). This reification leads to such problems as accounting for how any organism can attain any awareness of what is not assimilated to schema, and thereby how it is possible for schema to develop.

Such problems can be avoided if schema are conceived to be 'structures' as previously defined; that is, as ordered potentialities - the potentialities to order the interaction of the organism with its environment, where such ordering activity involves the capacity to apply to new situations a transformation of the relationships between what is elementized in previous cognitive activity. There are then two actual processes involved in cognition, each to some extent immanent causes of their own activities, one in which cognitive potentialities are realized in particular situations, and another of relatively much longer duration whereby cognitive potentialities are created, maintained, developed and integrated into hierarchies. These must be understood in terms of radically different temporalities. But then what is to be made of the notion that cognitive schemas are generalized, through assimilation and accommodation, from situation to situation? This terminology can be retained so long as the notions of assimilation and accommodation are reinterpreted as the activity of ordering the interaction of the organism with its environment, and the activity of developing the nature of this ordering and the potential for future ordering. This then avoids the dualism on which possible objections to Piaget's position could be based. It now becomes a matter of considering the nature of the different types of ordering involved.

How then is such cognitive development related to physiological development? The central nervous system is an essential means by which multi-celled organisms regulate interaction and exchanges with the environment and is the precondition for the emergence

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69. The most thorough analysis of the concepts used by Piaget remains Hans G. Furth, *Piaget and Knowledge: Theoretical Foundations*, 2nd ed. Chicago: Chicago University Press, 1981.

70. Piaget, *Biology and Knowledge*, p.240.

of consciousness, but consciousness is more than the central nervous system. It is the emergent ordering which actually constrains the functioning of the nervous system. One version of this view has been argued for by Roger Sperry:

> ... conscious awareness, in the present view, is interpreted to be a dynamic emergent property of cerebral excitation. As such, conscious experience becomes inseparably tied to the material brain process with all its structural and physiological constraints. At the same time the conscious properties of brain excitation are conceived to be something distinct and special in their own right. They are 'different from and more than' the collected sum of the neurophysico-chemical events out of which they are built... Although the mental properties in brain activity, as here conceived, do not directly intervene in neuronal physiology, they do supervene. This comes about as a result of higher level cerebral interactions that involve integration between large processes and whole patterns of activity. In the dynamics of these higher level interactions, the more molar conscious properties are seen to supersede the more elemental physio-chemical forces, just as the properties of the molecular supersede nuclear forces in chemical interaction.[71]

However while Sperry tries to represent consciousness as an emergent feature of the functioning of the brain, the position defended here is that consciousness is only intelligible as an emergent feature of the organism with a central nervous system in interaction with its environment, involving a multiple levels of constraining activity and correspondingly, complexity of temporalities. While only offering some brief comments on the emergence of the mind, C.H. Waddington offered a more satisfactory theoretical starting point when he suggested that:

> ...if you think of the brain as a system of sets of circuits through which currents are passing, this concept involves both the past and the future, since the loops can control the incoming signals which go into the brain and thus influence the effect they will have on future actions. We therefore seem to have, even in the simplest act of perception, both the past and the future incorporated into an active participation with the outside world.[72]

Whether or not he was influenced by Waddington, this is the idea developed in depth with great subtlety by Gerald Edelman.[73]

Once awareness and purposeful behaviour have been reintroduced as an intelligible emergent feature of the world, another dimension can be added to evolution. This is the dimension recognized by Baldwin and Lloyd Morgan at the turn of the century and rediscovered more recently by Hardy and Waddington. These biologists recognized that in evolution form follows function, and function is established through the initiative of the organism. Hardy illustrated this with the example of blue-tits which learnt to open the tops of milk bottles with their beaks, a skill which spread rapidly throughout Europe. Hardy pointed out that if the bottles were to be provided with successively thicker tops, those tits with more effective beaks for opening the bottles would be more likely to survive. In this way there would be an evolution within the tit population towards specialized tin opening

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71. R.W. Sperry 'A Modified Concept of Consciousness' in *Psychological Review*, Vol.76, 1969, p.533f.

72. C.H. Waddington, *Biology, Purpose and Ethics*, Worcester, Mass., 1969, p.25.

73. Edelman's arguments are summarized in *Bright Air, Brilliant Fire: On the Matter of the Mind*, London: Allen Lane, 1992. His most important ideas are more fully developed in *The Remembered Present*, N.Y.: Basic Books, 1989.

beaks. Hardy argued on this basis that it is not random mutation and selective pressure which are the main causative factors in evolution, but:

> ... the restless, exploring and perceiving animal that discovers new ways of living, new sources of food, just as the tits have discovered the value of the milk bottles... It is adaptations which are due to the animal's behaviour, to its restless exploration of its surroundings, to its initiative, that distinguishes the main diverging lines of evolution; it is these dynamic qualities which led to the different roles of life that open up to a newly emerging group of animals in that phase of their expansion technically known as adaptive radiation - giving the lines of runners, climbers, burrowers, swimmers, and conquerors of the air.[74]

However organisms do not struggle for survival in isolation, but as members of communities, as members of species and as members of ecosystems. Each of these has irreducible dynamics which must be taken into account by evolutionary theory. In relation to communities it is necessary to consider the forms of communication and cooperation which have developed. In relation to species it is necessary to consider the various forms of reproduction which have emerged to produce phenotypes able to survive within various environments or to transform these environments to facilitate their survival. And then it is necessary to consider the various forms of dependence and interdependence within ecosystems and between ecosystems which generate the conditions which enable individual organisms, communities and species to survive. Each of these dynamics is irreducible to any other, yet each is the conditional cause of the others. It is the dynamics of eco-systems which have been studied in greatest detail.

Ecology

Ecological theory is in a fairly chaotic state.[75] It consists of 'several disparate bodies of theoretical ecology stemming from roots in pre-ecology and early formal ecology which are not well integrated with each other.'[76] Nevertheless, there has been a tendency for ecological theory to oscillate between a holistic organicism and an individualistic reductionism. In the first decades of the century ecology was predominantly organismic, with interactions among members of an association of organisms being compared by C.C. Adams in 1913 to 'relations existing between the different cells, organs or activities of a single individual.' He went on: 'The physiological needs and states of an association have as real existence in individual animals as similar needs in the cell or cells which compose the animal body.'[77] Such views were further developed by Clements and his followers under the influence of the biogeography of Humboldt and Grisebach and Herbert Spencer's scheme of evolution through successive stages of differentiation and integration. After the Second World War this organismic approach was transmogrified into systems ecology and supplemented with notions taken from thermodynamics and information theory. However the use of organic analogies in ecology had been attacked in the 1930s by Gleason, who summed up his

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74. A.C. Hardy, *The Living Stream*, London, 1965, p.192f.

75. For the history of ecology see Donald Worster *Nature's Economy: A History of Ecological Ideas* [1977], Cambridge: Cambridge University Press, 1985; Sharon E. Kingsland, *Modelling Nature: Episodes in the History of Population Ecology*, Chicago: University of Chicago Press, 1985; or Robert P., McIntosh, *The Background of Ecology: Concept and Thoery*, Cambridge: C.U.P. 1985. For an excellent short history see Robert P. McIntosh, 'The Background and Some Current Problems of Theoretical Ecology', *Synthese*, Vol.43, 1980, pp.195-255.

76. MacIntosh, 'The Background and Some Current Problems of Theoretical Ecology', p.212.

77. C.C. Adams, *Guide to the Study of Animal Ecology*, N.Y., Macmillan, 1913; cited by MacIntosh, p.209.

position in 1975: 'Far from being an organism, an association is merely the fortuitous juxtaposition of plants. What plants? Those that can live together under the physical environment and under their interlocking spheres of influence and which are already located within migrating distance.'[78] While such arguments were ignored at the time, after the Second World War Gleason's approach, elaborated by population biologists, came to predominate. This triumph has been represented by Simberloff as the triumph of materialism and probabilism over essentialist idealism.[79]

However both these branches of ecology have been brilliantly attacked by Richard Levins and Richard Lewontin in 'Dialectics and Reductionism in Ecology.'[80] Here they argued for a position which 'views the whole as a contingent structure in reciprocal interaction with its own parts and with the greater whole of which it is a part. Whole and part do not completely determine each other.' The ecological community is 'an intermediate entity, the locus of species interactions, between the local species population and the biogeographic region.'[81] Levins and Lewontin assign five general properties to ecological communities. First, the community is a whole in interaction with the lower- and higher-level wholes, while not being completely determined by them. Second, some of the properties at the community level are definable for that level and are interesting objects of study in their own right. Third, the properties of communities and the properties of constituent populations are linked by many-to-one and one-to-many transformations. This means that there are many possible ways in which the integrity of the whole can be maintained, and many ways in which the parts can adapt to the conditions created by the dynamics of the whole. Fourth, law and constraint are interchangeable. While in physics the boundary conditions within which lawful action is manifest are generally ignored as irrelevant, in ecology the boundary conditions are just as much the object of interest as the lawful behaviour. Fifth, species interact, either directly, as in the predator-prey relation, symbiosis or aggression, or indirectly through alteration of the common environment.

Levins and Lewontin were both participants at the conferences organized by Waddington. While they were inspired primarily by Engels' *Dialectics of Nature* to stress emergence, partial autonomy and interdependence, the way they have developed their ideas leads to a complete accord with the process conception of being. The forms of relationships they have focussed on can be seen as instances of the complex relationships between immanent and conditional causation. Their work both develops and facilitates the clarification of the process conception of the world.

However process philosophy also points towards other lines of research. To begin with, it is a simple matter to extend the analyses of Levins and Lewontin to include the world ecosystem as a whole, the 'biosphere' as first Eduard Suiss, then Vladimir Vernadskii called it, or 'Gaia' as James Lovelock and Lynn Margulis more recently have called it.[82] If there is anything distinctive about the biosphere as an ecosystem, it is the extent to which interaction

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78. H.F.. Gleason, 'Delving into the History of American Ecology', *Bulletin of the Ecological Society of America*, Vol.56, 1975, p.i.

79. D.S. Simberloff, 'A Succession of Paradigms in Ecology: Essentialism to Materialism and Probabilism', *Synthese*, Vol.42, 1980, pp.3-39.

80. This paper originally appeared in *Synthese*, Vol. 43, 1980, in reply to the reductionist attack on organic holism by Simberloff in 'A Succession of Paradigms in Ecology.' It has been reprinted in a revised form in Levins and Lewontin, *The Dialectical Biologist*, Cambridge: Harvard University Press, 1985, pp.132-160. Levins has recently published a book with the Harvard University Press developing further this position and its mathematical formalism.

81. *The Dialectical Biologist*, p.136.

82. The best overview of the Gaia hypothesis is contained in Peter Bunyard and Edward Goldsmith eds, *Gaia: The Thesis, the Mechanisms and the Implications*, Camelford, Cornwall: Wadebridge Ecological Centre, 1988. This contains a history of the concept by Jacques Grinevald, 'Sketch for a History of the Idea of the Biosphere' and a number of contributions by Lovelock and Margulis.

is based on alteration of the common environment. Suiss, Vernadskii and Lovelock have been pre-eminently concerned with geological, chemical and atmospheric transformations of nature by life processes. The biosphere is taken to include all those geological, atmospheric and biological processes and cycles through which organisms maintain and transform the conditions for life on Earth, and Lovelock has argued that to conceive the biosphere in this way requires that Earth be thought of as a living organism. Beyond this, when the focus is on self-maintaining order, a freer notion of what there is, is possible. It is no longer necessary to think of the object of analysis as a discrete entity consisting of parts. It is possible to acknowledge that organisms are simultaneously or at different times participants in a number of ecological processes. Another dimension to this anti-reductionist position can then be added by considering the different temporalities of the different processes of life and their relationships. Some processes, for instance the development of the composition of the atmosphere with its layer of ozone, or the reproduction of certain species of trees, require very long durations in comparison with other life processes, and this is significant for understanding their relationships of autonomy and interdependence. Recent work has been undertaken along these lines by R.V. O'Neill, D.L. DeAngelis, J.B. Waide and T.F.H. Allen.[83]

Allowing for such non-reductionist dynamics and complex relations in DNA production, in epigenesis, in cognitive development and in ecosystems, a basis is provided for explaining the punctuated equilibrium in species evolution as revealed by palaeontology. In times of stress the organism as a whole can affect its DNA to produce rapid increases in mutation rates. Epigenesis and cognitive development involve dynamics which limit the possibilities of transformation and guarantee that transformations will be in quantal leaps. While mature ecosystems are capable of preventing any new lines of development establishing themselves, they are subject to collapse after which rapid speciation involving quantal leaps can occur. These principles can operate from the smallest ecosystems to the biosphere.

The Becoming of Life

With such emergent dynamics and inter-dependence it is necessary to redefine the very meaning of evolution. Evolution can no longer be conceived to be simply about differences between organisms and the variety of their adaptive characteristics. It is necessary to consider evolution as part of a general theory of life and its distinctive processes, ranging from the biosphere to particular biochemical processes. Along these lines Brian Goodwin has called for and outlined 'a new conceptual scheme from which both evolution and development emerge as essential aspects of biological process.'[84] According to this scheme:

> The actualization of specific morphological and behavioural patterns in organisms by the action of particular genes and environments on the space-time order of the developing organism described by the laws of organization of the living state is the biological process of creation. The exploration of the potential set of forms defined by these laws, by changes in genes and in the environment, is the process of evolution; while the generation of individual entities of specific form from this set is development. A biology based upon a generative paradigm focuses on these processes of biological creation as the central and distinctive features of the living condition, and sees the actual

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83. R.V. O'Neill, D.L. DeAngelis, J.B. Waide and T.F.H. Allen, *A Hierarchical Concept of Ecosystems*, Princeton: Princeton University Press, 1986. See especially Chapter 5: "Some Elements of Hierarchy Theory" which considers the theoretical issues, and Chapter 7 "Ecosystems as Hierarchies of Species" in which the theory is applied to ecological systems.

84. Goodwin, 'Changing from an Evolutionary to a Generative Paradigm', p.99.

> history of organism (their contingent evolution) as intelligible only in relation to the logic of creative process.[85]

It is within the creative process of becoming of the biosphere that organisms have evolved and developed their awareness of the world and themselves. This cannot be conceived simply in terms of individual organisms, but must be seen in terms of life, the complex of dissipative structures emerging from the thermodynamically far from equilibrium situation maintained by the sun, the development of ecosystems sustaining diversities of species within which awareness has emerged and developed, first through species and communities and then through individual members. Humanity has emerged as part of this creative becoming of life.

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85. Ibid. p.118. For the further development of this approach, see Goodwin, *How the Leopard Changed its Spots*.

8

HUMANITY AS AN EMERGENT PHENOMENON WITHIN NATURE

Over the last three hundred years humans have come to be conceived of as either mechanical parts of a mechanical nature, or as virtually super-natural beings who live in a world of culture.[1] The conception of humans as mechanisms derives originally from Hobbes and has been developed in political, ethical, psychological, and most importantly, in economic theory. Counterposed to this has been a tradition which in various ways has striven to fill the gap in our understanding of social life between the State and the individual, the neglect of which, it is argued, has rendered political, ethical, psychological and economic thought superficial.[2] It is this 'humanistic' tradition which has stressed culture, human creativity and 'meaning', but then for the most part ignored the natural conditions of life. There are exceptions to this beginning with J.G. Herder who upheld the notion of creative humans as part of nature by proposing an anti-mechanist conception of nature; but such thinkers have not been taken seriously. Now the mechanistic conception of humans is invalidated by the failure of mechanistic materialism in the natural sciences, while a theory of knowledge adequate to the physical sciences together with the process conception of being, provides a foundation for the humanistic tradition. As Ortega y Gasset asserted: 'In order to speak then, of man's being we must first elaborate a non-Eleatic concept of being as others have elaborated a non-Euclidean geometry. The time has come for the seed sown by Heraclitus to bring forth its mighty harvest.'[3] Humans can now be conceived as culturally constituted creative agents *within* nature.

The humanistic tradition can best be understood against the background of the achievements of Hegel in synthesizing all previous social and political theory through developing a coherent foundation for the conception of humans as creative participants in the becoming of the world; and the subsequent disintegration of his system.[4] This provides an historical perspective in which the relationships between different approaches to the study of humanity can be seen as either one-sided developments of Hegelian ideas, or as reactions to Hegel's limitations. My contention is that process philosophy provides an interpretation of these developments, enabling them to be evaluated and re-integrated into a unified research programme, bridging the gap between the natural and the social sciences, the sciences and the humanities, knowledge and evaluation, and the objective realm and the

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1. This dualism even exists in geography where one would expect the opposition to be overcome. See J.J. Johnston, *Geography and Geographers*, 2nd ed., London: Edward Arnold, 1983, esp. p.175.

2. On the origins of this anti-mechanistic tradition, see B.A. Haddock in *An Introduction to Historical Thought*, London: Edward Arnold, 1980.

3. Jose Ortega y Gasset, *History as a System*, tr. Helene Weyl, [1941], N. Y.: Norton, 1962, p.203.

4. A similar argument, but with different emphases, has been made by Rudiger Bubner in 'On Hegel's Significance for the Social Sciences' in *Hegel and the Sciences*, ed. Robert S. Cohen and Marx W. Wartofsky, Dordrecht: Reidel, 1984, pp.143-160.

subjective realm. Humans will be able to see themselves as self-creative participants in the becoming of nature and society, and the development of their understanding as the world becoming conscious of itself. As Marx prophesied: 'Natural science will... subsume the science of man just as the science of man will subsume natural science: there will be one science.'[5]

To accord with the Heraclitean conception of being, humanity must be understood as an emergent process or complex of processes within nature, as part of the biosphere, the complex of dissipative structures which has emerged in the thermodynamically far from equilibrium situation maintained on earth by the sun. Living entities are processes which define their environments as their worlds, worlds in which they are then sensuously engaged - attracted and repulsed by it, taking it in, incorporating it and excreting it, transforming it and being transformed by it. This characterizes both human individuals and human societies. As Richard Adams wrote: 'societies operate as dissipative structures; they are continuities of form that are constituted by the very flow of energy that is expended (i.e. converted) in the process of acting out the behaviours and doing the work (from both human and non-human sources) that is carried out in the context of social relationships.'[6] So, as Serge Moscovici argued:

> Man's single-handed conflict with nature should be seen as a confrontation *within* nature... The notion that nature is inhuman and man unnatural is totally invalid. No part of man is or ever was closer than any other to an ever-changing nature.[7]

However while humanity is a form of life, not all life is humanity. So what is distinctive about humanity? Humans cannot be distinguished from other animals by their using tools or having a culture which develops from generation to generation. Ethologists have shown that many kinds of animals have these characteristics.[8] The evolution of humanity has involved the simultaneous emergence of a complex of interdependent processes and structures.

The Hegelian Concept of Humanity

The importance of Hegel is to have characterized the most distinctive features of this complex. Hegel rejected Kant's notion of the preformed ego, the 'I' represented as a pure unity relating to itself. Instead Hegel portrayed the ego as the result of the development, from immediate sensitivity to self-awareness, then to self-consciousness gained through a reciprocity of perspectives in interpersonal relationships, and finally to universality through participation in ethical and cultural life. He characterized this formative process as part of three interdependent dialectical patterns: symbolic representation which operates through the medium of language; interaction on the basis of reciprocity which operates through moral relations; and the labour process which operates through the tool.[9] It is through

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5. Karl Marx, 'Economic and Philosophical Manuscripts', in *Karl Marx: Early Writings* tr. Rodney Livingstone and Gregor Benton, Harmondsworth: Penguin, 1975, p.355.

6. Richard N. Adams, *Paradoxical Harvest*, Cambridge: C.U.P., 1982, p.17. Adams has further developed his ideas on this in *The Eighth Day: Social Evolution as the Self-Organization of Energy*, Austin: University of Texas, 1988.

7. Serge Moscovici, *Society Against Nature: The Emergence of Human Societies* tr. Sacha Rabinovitch, Hassocks: Harvester Press, 1976, Introduction.

8. See for instance Jane van Lawick-Goodall, 'The Chimpanzee' in Vanne Goodall ed., *The Quest for Man*, London: Phaidon, 1975.

9. See G.W. F. Hegel, *System of Ethical Life and First Philosophy of Spirit*, tr. H.S. Harris and T.M. Knox, N.Y.: S.U.N.Y. Press, 1979, pp.205-253. These lectures, given at Jena in 1803/4 and again in 1805/6, have been critically examined by Jürgen Habermas in 'Labour and Interaction: Remarks on Hegel's Jena *Philosophy of Mind*, in *Theory and Practice* [1971] tr. John Viertel, London: Heinemann, 1974, pp.142-169. The threefold division derives ultimately from the Pythagorean division

participating in these dialectical patterns of culture that human organisms transcend their particularity and unite with the universal to gain the identity required to be able to use the word 'I'. As Hegel put it in *The Phenomenology of Mind*:

> ... self-consciousness is only something definite, it only has real existence, so far as it alienates itself. By doing so, it puts itself in the position of something universal, and this its universality is its validity, establishes it, and is its actuality.[10]

While most philosophical anthropologists abjure the terms used by Hegel, they have nevertheless acknowledged the validity of the duality within human awareness between the immediacy of engagement in the world and the transcendence of this immediacy whereby the individual comes to reflect upon itself as a particular instance of a universal phenomena.[11] For instance Helmuth Plessner distinguished humans from non-humans by their eccentric positionality. Humans take up a position in the world as do other organisms to become embodied subjects, but as subjects they also take a perspective outside their bodies to experience themselves as physical beings among others.[12] Along similar lines, but emphasising the social nature of this eccentric perspective, George Herbert Mead argued that human becoming is characterized by a continuous dialectic between the 'I' as creative subject and the 'me' which derives from appropriation by individuals of the perspective of the 'generalized other' towards themselves.[13]

The possibility of this duality can to some extent be explained in naturalistic terms compatible with the process conception of being through the genetic epistemology of Jean Piaget. Piaget was concerned to explain the development of cognition from early childhood to adulthood, with particular concern to explain the emergence of the capacity to do science. To do this he represented the development of cognition as the adaptation of structures or schema of interpretation and action to assimilate environmental data in order to engage effectively in the world, producing a hierarchy of cognitive structures, with higher levels in this hierarchy operating on the lower levels of cognitive activity. Each structure was represented as a self-regulating system of transformations which compensates for internal and external imbalances and develops beyond itself into more advanced structures. Piaget traced this development through the elaboration of the most basic forms of sensori-motor intelligence tied to the content of specific sensory inputs and motor actions, through pre-operational intelligence in which schema are dissociated from particular content, through concrete operational intelligence in which schema develop to allow for operations independent of environmental interaction, to formal operations in which operations are performed on operations, as occurs in mathematical thought. This whole process was represented as taking place through the continuous development, differentiation and integration of schema which leads from a subjective, unintegrated, body-centred activity to a practical separation of means and ends and the development of a logic of action, to the capacity to retrace a cognitive route (to see that if a liquid is poured from one container to another that it can be poured back again, and that therefore there must be a conservation of liquid), to the capacity to think mathematically. This development was seen to involve a

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between lovers of wisdom, lovers of honour and lovers of gain. In later works Hegel subordinated this trichotomy to the division between Subjective, Objective and Absolute spirit, but the earlier division was not totally abandoned.

10. G.W.F. Hegel *The Phenomenology of Mind*, tr. J.B. Baillie [1931], New York: Harper & Row, 1967, p.514f.

11. For an account of the development of philosophical anthropology see Axel Honneth and Hans Joas, *Social Action and Human Nature*, [1980] tr. Raymond Meyer, Cambridge: Cambridge University Press, 1988.

12. See Helmuth Plessner, '*De Homine Abscondito*', *Social Research*, 1969, Vol.36, pp.497-509; and *Laughing and Crying*, tr. James Spencer Churchill and Marjorie Grene, Evanston: Northwestern University Press, 1970, Ch.1.

13. George Herbert Mead, *Mind, Self and Society*, ed. Charles W. Morris, Chicago and London: University of Chicago Press, 1934.

growing decentration from immediate experience, that is, from the experience of immediate engagement in the world, which is itself to some extent transformed by this decentration. The process of this development of cognition was described by Piaget in the terminology of Waddington's theory of epigenesis: '... intellectual growth contains its own rhythm and its "chreods" just as physical growth does.'[14]

A number of criticisms can and have been made of Piaget's ideas (apart from the obvious one forcefully made by Vygotsky that it is asocial, and the one that was made in the previous chapter, that Piaget has hypostatized structures rather than treating them as ordered potentialities).[15] It appears from empirical studies that cognitive development is less 'tidy' than Piaget implies, with different levels of intelligence co-existing at any time. And a central tenet of Piaget's doctrine, that all abstract thinking is built on structures developed through practical engagement in the world, is refuted by examples of people with severe cerebral palsy who have shown themselves capable of a high levels of intellectual achievement. Such examples suggest either that the developments described by Piaget have to a considerable extent been 'genetically assimilated', or that there is more than one way for intelligence to develop. More fundamentally, Piaget has not understood the cognition of children in their own terms but as defective stages on the way to scientific cognition - which itself is understood in an excessively formalistic manner. As a consequence of this, he has focussed on cognitive structures in abstraction from the child's fragmentary, but global experience of the world. This is associated with basic omissions from Piaget's conceptualization of cognition. Without seeing such achievements as articulations of this global experience, Piaget is left with no means of understanding the relationship between each achievement, the relationship between abstract thought and global experiences characteristic of emotion, empathy and imagination, the use of metaphor and metonymy and the construction of narratives. He has ignored forms of intelligence beyond 'formal operations' (exemplified by mathematical thinking), namely 'dialectical' thinking - the capacity to question assumptions, to consider alternative assumptions, to use metaphors to see the world in entirely new ways, to change focus from parts to wholes and from wholes to parts so that they are seen relationally, to produce and understand narratives, and perhaps most fundamentally, to recognize explicitly the global experience of the world which is always assumed implicitly as that which is articulated by all particular determinations, whether concrete or abstract.

These criticisms can be accommodated, and it is possible to reformulate Piaget's ideas so as to avoid the hypostatization of 'structures'. Reformulated, it is the organism in interaction with its environment which develops the capacity to generalize types of ordering activity to new engagements with the environment, while at the same time developing the potential of this activity. In the case of the emergence of new levels, this involves the development of the capacity to order the ordering activity associated with more immediate involvement in the world. This reformulation at the same time has the advantage of emphasising the contingency of the world the organism is attempting to come to terms with and the limitations of all cognitive activity and explicit knowledge in this regard, and allows Piaget's concepts to be refined by taking into account the durational nature of any ordering activity and the different spatio-temporal orders associated with different types of ordering activity.

The durational nature of cognition is particularly important in explaining decentration. The concept of decentration cannot be made sense of if the stream of consciousness is conceived as a linear sequence of events. Consciousness involves a multilinear becoming and requires the ontology of process philosophy to be made intelligible. For instance the

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14. Jean Piaget, *Biology and Knowledge*, tr. Beatrix Walsh, Chicago: Uni. of Chicago Press, p.21.

15. Many of these have been accepted by Piaget himself, who until is death in 1980 was continually revising his ideas. On this, see Hans G. Furth, 'Piaget's New Model,' *Piaget and Knowledge*, 2nd ed., Chicago: University of Chicago Press, 1981, Ch.15.

sensori-motor differentiation of actions into means and ends implies a durational cognitive activity transcending this differentiation. More significantly, reversibility of operations generates the capacity to constitute the environment as entities which are instances of classes, enabling the world to be constituted as the enduring background of ordered relationships between entities to all particular perceptions and actions. This ability implies the emergence of a new spatio-temporal order, which is then consolidated with the development of formal operations. This is the condition of the individual standing outside immediate becoming to constitute itself as a unity in relation to the world. As Nathaniel Lawrence argued:

> The smooth slippage of closed events in a continuous progression along a time line is not adequate to the facts. Consciousness accumulates large patches of temporality into a variety of 'nows' of many sizes. It synthesizes them in a great many ways ... and thereby generates the raw materials from which many abstract meanings for time can be derived: mathematical, physical, perceptual etc. In short, the conveyor belt metaphor of temporal sequence does not accommodate to the multiple modes of arrest and synthesis by which consciousness establishes both its open-ended quasi-identity and the continuous summation of the world-in-relation-to-consciousness.[16]

The subject is not an enduring substance, but a process of becoming continually forming itself within the context of nature, culture and social forms, in which every act must be supported by a self-conception which is an enduring expectation which will only be confirmed by what the subject discovers itself to have been standing for.

Cognitive development only takes place in the context of social relations of some sort, yet it is the precondition for the complex and diverse forms of human social relations. It is through these social relations that the individual is constrained to achieve this decentering of consciousness, and it is through them that some degree of reintegration of the individual becomes possible. This brings us to the dialectical patterns of cultural development.

With the characteristic penchant for reductionism of the Western intellectual tradition, each of the three dialectical patterns of culture identified by Hegel has been used by different thinkers as the sole basis for explaining the development of society. As Jürgen Habermas pointed out:

> *Ernst Cassirer* takes the dialectic of representation and makes it the guiding principle of a Hegelianized Kant interpretation, which at the same time is the foundation of a philosophy of symbolic forms. *Georg Lukács* interprets the movement of intellectual development from Kant to Hegel along the guide-line presented by the dialectic of labour, which at the same time guarantees the materialistic unity of subject and object in the world-historical formative process of the human species; finally, the neo-Hegelianism of a thinker such as *Theodor Litt* leads to a conception of the stepwise self-development of spirit which follows the pattern of the struggle for recognition.[17]

However such thinkers have succeeded in advancing our understanding of different aspects of these dialectical patterns, and to capture their achievements, these will be redefined in broader terms: as the dialectic of orientation, as the dialectic of recognition and as the dialectic of power.

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16. Nathaniel Lawrence, 'The Illusion of Monolinear Time' in James M. Edie, Francis H. Parker and Calvin O. Schrag ed.'s, *Patterns of the Life-World*, Evanston: N.W.U.P., 1970, pp.298-314, p.309f.

17. Habermas, 'Labour and Interaction', in *Theory and Practice*, p.157f.

Before examining these dialectical patterns of culture in detail, a number of points can be made about the unique nature of such processes. These patterns are dialectical because they are based on people as conscious agents creating themselves. As such, they cannot be understood simply in terms of individuals, nor as emergent processes transcending individuals, but must be understood as processes through which individuals emerge to become semi-autonomous participants in the on-going creative becoming of these patterns, which are semi-autonomous from these individuals. Furthermore, individuals are struggling for goals which are neither final ends nor simply potentialities for achieving these, but are simultaneously both ends desired and potentialities for pursuing further ends. Orientation, recognition and power thus have, as Derrida has noted in relation to desire in general, a deferred quality; it is never possible to actually achieve these as final states, as final resting points. The potentialities produced are potentialities both of the dialectical patterns themselves and of individuals participating in them, and the becoming of the patterns and of the individuals who emerge in this becoming is endless. Associated with this, dialectical patterns have no definite boundaries, either temporal or spatial. Although there is considerable spatial differentiation of social activity insulating people from each other, all dialectical activity relates itself, even if only through exclusion, to all potential participants. Finally, dialectical activity carries with it the possibility of critical reflection and transcendence. To be participating in these dialectical patterns is to be at least provisionally committing oneself to certain evaluative stances within these patterns, and to be at least tacitly aware that such stances are incompatible with other possible stances, and that one's own stance is therefore questionable. So as Hegel saw, the dialectic of representation carries with it the tendency for people to transcend limited, one-sided forms of thinking and replace them with forms of thinking which come nearer to grasping the whole in its complex diversity, the dialectic of recognition tends to reciprocity, carrying with it a tendency to generate social relations which extend recognition and respect to more and more people, and the dialectic of labour tends to generate more effective technologies and organizations.

The Dialectic of Orientation

The most influential anti-mechanist social theory in recent years has been associated with the attempt to explain society in terms of the dialectic of symbolic representation. However this project has fragmented with various facets being examined in isolation, delimited as distinct and self-contained fields of study. Those dominated by the mechanistic world-orientation tend to focus on the power of language to designate things or to represent states of affairs; those inspired by the tradition deriving from Herder and von Humboldt have focussed on the creative expression of the individual subject (or as in the case of Heidegger, of the world); those inspired by the tradition of hermeneutics have focussed on the process of interpretation of texts, while the structuralists have focussed on the internal organization of conventional sign systems. Concern with what is expressed, with advances in comprehension and its relation to representation has been for the most part been the preserve of the philosophy of science. It is to reconcile these various approaches that it is suggested that the dialectic of symbolic representation be reconceived as the dialectic of orientation.

So conceived it is possible to see how this is generated and maintained. The decentering of experience at the pre-operational level of intelligence is associated with the emergence of imagination, the capacity to produce and think in signs which facilitate cognitive activity independent of the immediate situation and which can be appreciated as signs for others, and associated with this, a growing awareness of others with a different perspective on the world. This leads children to distinguish their own perspectives (and intentions based on

these) from those of others and to distinguish all perspectives from the world itself, revealing the questionability of their own viewpoints, and raising questions about the relationship between these to the viewpoints of others. This engenders (or augments) a curiosity, and an impetus, facilitated by the development of the capacity to communicate by signs, for children to express themselves to validate their own perspectives and experiences in the eyes of others and to relate their own perspectives and experiences to those of others.[18] Through participating in language and other sign systems, appreciating the expressions of others and gaining affirmation of their own views, the surrounding world comes to be experienced as common world, a reality shared with others about which stories can be told and about the nature of which people can speculate. Children are induced in this way to participate in and to contribute towards defining a social imaginary world transcending their immediate experience in terms of which they can locate themselves and which can serve as a reference point for discourse, or at least for the achievement of a reciprocity of perspectives. Further decentration leads at least some people in some societies to a conscious struggle to explore the limits of their understanding and the means to achieve it, and to strive to articulate a conception of the world valid from the perspective of a 'generalized other', to strive to see the world from a perspective shared not only with those around one, but with all anonymous contemporaries, with all predecessors and successors. It is through the reproduction of this struggle and through the ensuing communicative activity, that a community beyond the immediate experience of each individual becomes imagined as reality, providing the context of 'subject positions' within which each communicative act can take its place and be made sense of.

Signs are both the condition of and are generated, reproduced and developed in this struggle for orientation. Peirce defined a sign as 'something which stands to somebody for something in some respect or capacity.'[19] In a similar vein Whitehead wrote: 'the mind is functioning symbolically when some components of its experience elicit consciousness, beliefs, emotions, and usages, respecting other components of experience. The former set of components are the "symbols," and the latter set constitute the "meaning" of the symbols.'[20] However what a sign stands for is never simply given, but is in some sense a construct. A sign can be a thing (structure), event or process encountered in nature or society, it can be a communicative act, or it can be an entity designated or produced by such an act. According to Peirce, signs can be classified (not necessarily exclusively) into indexes, icons and symbols.[21] An index refers to that which it denotes through being causally related to it, as smoke is causally related to fire or a footprint to an animal. An icon refers to that which it denotes merely by virtue of its own character which it possesses whether or not the object denoted actually exists. Examples are images, diagrams and metaphors. A symbol is defined by Peirce as a conventionally defined sign which would lose its character as a sign if there were no interpretant.

The structuralists have focussed their attention on what Peirce called symbols, that is, on sign systems, the conventional codes which specify the relationships between sets of perceptually distinct phenomena to enable the production and interpretation of communicative acts. One of their most important achievement was to have shown how many other sign systems than language are involved in communication; that all actions and the material products of actions, 'that all the various non-verbal dimensions of culture, such

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18. This process has been analysed by Stephen Strasser in *The Idea of a Dialogal Phenomenology*, Pittsburgh: Duquesne University Press, 1969.

19. *Philosophical Writings of Peirce*, ed. Justus Buchler, New York: Dover, 1955, p.99.

20. Alfred North Whitehead, *Symbolism: Its Meaning and Effect*, [1927], N.Y.: Fordham University Press, 1985, p.8.

21. One of the problems with the whole field of semiotics is the absence of any consensus on definitions. On this see Umberto Eco, 'Symbol' in *Semiotics and the Philosophy of Language*, Bloomington: Indiana University Press, 1986.

as styles in clothing, village lay-out, architecture, furniture, food, cooking, music, physical gestures, postural attitudes such as buildings, gardens, forms of dress and so on are organized in patterned sets so as to incorporate coded information in a manner analogous to the sounds and words and sentences of a natural language.'[22] Structuralists have also revealed the ordered nature of sign systems, the patterns of oppositions between signs, and the relationship between and role of metaphor and metonymy - or as Lévi-Strauss reformulated these, paradigmatic associations and syntagmatic chains, in communication. But they have tended to reify the order they have found, treating it not as potentialities facilitating communication and action but as something existing in its own right which not only delimits what can be expressed and understood, but which determines what people say and do. As Lacan argued that people do not speak, they are spoken; they do not think, they are thought.[23]

Poststructuralists in the last two decades have attacked this reification of sign systems. However the underlying principles on which the structuralist reification is based had already been effectively criticised in Russia in the 1920s by Bakhtin, Medvedev and Volosinov, without this attack having led to the relativistic bind of post-structuralists such as Derrida. Volosinov opposed Saussure's abstraction from language of a synchronic system of signs, arguing that language is not an inert system of norms to which a speaker must conform to be understood. What is of interest to the speaker is the adaptability of linguistic forms to express new meanings in concrete contexts, while understanding the speaker's utterance is not simply the recognition of form but involves understanding, from within particular concrete contexts, of its meaning. As he put it:

> ... the constituent factor for the linguistic form, as for the sign, is not at all its self-identity as signal but its specific variability; and the constituent factor for understanding the linguistic form is not recognition of 'the same thing,' but understanding in the proper sense of the word, i.e., orientation in the particular, given context and in the particular, given situation - orientation in the dynamic process of becoming and not 'orientation' in some inert state.[24]

This criticism can be generalized to all other sign systems and in essence corresponds to Bourdieu's criticism of structuralist anthropology.[25] For Bourdieu, the patterns of oppositions evident in the practices and products of societies are not fixed structures which organize the way people act, but are the outcome of people's creative efforts to act from situation to situation in accordance with their *habitus*, that is, their:

> *dispositions*, structured structures predisposed to function as structuring structures, that is, as principles of the generation and structuring of practices and representations which can be objectively "regulated" and "regular" without in any way being the product of obedience to rules, objectively adapted to their goals without presupposing a conscious aiming at ends or an express mastery of the operations necessary to attain them and,

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22. Edmund Leach, *Culture and Communication*, Cambridge: Cambridge University Press, 1976, p.10.

23. Jacques Lacan, *Écrits*, London: Tavistock/Routledge, 1980, p.69. For a critique of this, see J.P. Sartre, 'Replies to Structuralism' in *Telos*, Vol.9, 1971, p.113.

24. V.N. Volosinov, *Marxism and the Philosophy of Language* [1930] tr. Ladislav Matejka and I.R. Titunik, N.Y. and London: Seminar Press, 1973, p.66.

25. See especially Pierre Bourdieu, *Outline of a Theory of Practice*, Cambridge: Cambridge University Press, 1977, p.22ff.

> being all this, collectively orchestrated without being the product of the orchestrating action of a conductor.[26]

The patterns of oppositions noted by structuralists are simply by-products of such practical efforts.

Structuralists and poststructuralists alike have given scant attention to what must be recognized as a central aspect of the dialectic of orientation: what is being communicated (etymologically: made common) in communicative activity. John Austin pointed out that only a minor part of communication is stating what is the case. Communication is articulating the world into consciousness to create a meaningful public space, and is in part creative of relations between people, between individuals and society, and between humans and their environment. Among other things, communication involves defining immediate situations, including the relationship between those engaged in communication, defining, questioning and redefining the broader context of such situations, producing or reproducing narratives, speculating, expressing emotions, attitudes and intentions, forming more enduring relationships (as in making a promise, swearing allegiance, or simply becoming friends), and negotiating, arguing a case, or drawing attention to the communicative act itself or to assumptions (such as the meaning of terms or the conventions of narrative construction) which make communication possible.[27] Where communication is concerned with the nature of the world and with revealing its significance, then the speculative attainment, development, affirmation and criticism of shared assumptions, interpretive schemes and ideals and showing when their deployment is appropriate is more fundamental than, and is the condition for, reporting states of affairs. Such interpretative and evaluative schemes range from those associated with body schema and practices, the habitus, to explicitly formulated conceptual frameworks, and from schemes associated with comprehending particular situations to world-orientations and grand narratives.

Communication characterizing the nature and significance of the world is usually associated with practical activity and often is understood only practically within particular situations, facilitating the coördination of people's actions and lives and the comprehension of each other's situations, actions and significance. It is primarily through the metaphorical generalization of schemes of interpretation from context to context, from society to nature and back again and their embodiment in the physical world, in social relations and in people's *habitus* that cultures gain their coherence, a coherence which is usually reinforced through a dominant metaphor or thematic motif articulated and integrated into a dominant narrative. However there are few cultures which are so primitive or degenerate that at least some of its members do not devote at least some of their time to criticising and trying to overcome the contradictions and limitations of received beliefs, interpretations, forms of thinking and narratives, and to explicit efforts to construct alternatives to define and express themselves and their relationship to the world.[28] It is through such efforts that we have gained a heritage of a diversity of speech genres, worlds of mythology, song, dance, poetry and novels, of sculpture, architecture and other artworks, and critical traditions of history, philosophy, logic, mathematics and science.

Jürgen Habermas argues that there are three (or four) validity claims implicitly raised and reciprocally recognized with every speech-act - in relation to cognition that the propositional content of a speech-act is true, in relation to interaction that the performative component is correct, and in relation to expression that intentions are being expressed

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26. Ibid., p.72.

27. Austin suggested that there might be as many as 10,000 different linguistic functions performed by speech acts.

28. On this, see Geoffrey Samuel, *Mind, Body and Culture*, Cambridge, C.U.P., 1990.

sincerely.[29] Occasionally he has included also the claim that what is said is intelligible. These validity claims, Habermas argues, are an inescapable aspect of all communicative acts, although in non-verbal acts they are less well defined. However beyond these validity claims (if these claims are indeed universal) there are more basic claims. To speak is to give expression - though never complete expression - to tacitly presupposed schemes of interpretation, modes of being in the world and forms of life with standards defining what is the appropriate way for people to live and to act.[30] It is being implicitly claimed that these schemes of interpretation, modes of being, forms of life and standards presupposed by and expressed in such speech-acts are appropriate and adequate to the situation, and that they are consistent with other interpretative schemes accepted as valid. While schemes, modes of being and standards can be questioned, they can only be transcended by being replaced. The total abandonment of all standards is inconceivable. Nihilism is itself the product of standards (for instance, of what is to count as an 'objective' attitude to the world).

The relationship between individual efforts at orientation, communicative acts or utterances, narratives, speech genres, texts, cultural fields, discursive formations, various types of media, systems of signs and enduring schemes of interpretation, involve multiple spatio-temporalities. Expressive acts (although not necessarily expressions, e.g. writings) are of a short duration by comparison with the evolution of stories, genres, cultural fields, discursive formations, schemes of interpretation and sign systems. By participating in dialogue or in other forms of communication people are both constrained and facilitated by past communication, narratives, speech genres, existing cultural fields and discursive formations and a hierarchy of enduring interpretive schemes and sign systems which make it possible for them to communicate, while participating in the spatio-temporal order of the evolution of each of these.

The Dialectic of Recognition

While it has been less common, efforts have also been made to theorize social dynamics solely in terms of the dialectic of recognition.[31] Many of the symbolic interactionists inspired by G.H. Mead saw people's behaviour as being virtually determined by the criteria of acceptability of the significant others and reference groups in terms of which they defined themselves and their significance. Thus the criminologist Edwin H. Sutherland argued that 'A person becomes delinquent because of an excess of definitions favourable to violation of law.'[32]

As with the other dialectical processes, the dialectic of recognition is engendered by the development of the individual within a social context.[33] To begin with, infants do not conceive themselves as separate beings at all. As Heinz Remplein argued of the original condition of children: 'Above all, there is lacking the split between I and you that gives a

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29. See Jürgen Habermas, *Communication and the Evolution of Society* [1976] tr. Thomas McCarthy, London: Heinemann, Beacon Press, 1979, p.58.

30. On this, see Charles Taylor, *Human Agency and Language: Philosophical Papers 1*, Cambridge: C.U.P., 1985, 'Language and Human Nature', pp.215-247.

31. See Tamotsu Shibutani, 'Reference Groups as Perspectives' in Jerome G. Manis and Bernard N. Meltzer ed.'s. 2nd ed., Boston, Allyn and Bacon, 1972, pp.160-170; and Howard S. Becker *The Outsiders*, Glenco, Illinois: The Free Press, 1963 for two of the best symbolic interactionist analyses. These works are developments of the research programme of G.H. Mead as formulated in *Mind, Self and Society*, ed. Charles Morris, Chicago: Chicago University Press, 1934.

32. E.H. Sutherland, *Principles of Criminology*, 5th ed. Chicago: Lipincott, 1955, p.78. See also Daniel Glaser, 'Criminality Theories and Behavioural Images' in Jerome G. Manis and Bernard N. Meltzer, *Symbolic Interaction*, 2nd ed. Boston: Allyn and Bacon, pp.482-497.

33. For one of the best analyses of this see M. Merleau-Ponty's study 'The Child's Relations with Others', in *The Primacy of Perception*, ed. James M. Edie, Evanston: North Western University Press, 1964.

characteristic tension to the experience of the adults.'[34] As the original fragmentary consciousness of the child's body becomes integrated to form a precise corporeal schema there emerges a global consciousness of the body's position in the world. This self-awareness immediately creates an imbalance in experience which leads to the recognition of others as autonomous beings which enables the child to see an image of itself in the responses of others to it, and to identify with this image. Characteristically, where such pronouns are available, children first refer to themselves by name, then by the pronoun 'me'. The use of the pronoun 'I' or its equivalent is a later stage of development and indicates an individuation (the nature and extent of which varies between cultures) of the experience of becoming consequent to the reflexive constitution and recognition by the child of itself as one embodied consciousness among others.[35]

This individuation is, and usually remains precarious since it is founded on the development of a conceptualized self which derives from and is dependent upon recognition and affirmation by others, but involves the assertion of independence against these others. This generates the original desire to be recognized by others which expresses itself in simultaneous wilfulness and the quest for attention. The conceptualized self and the conception of others develops reciprocally by relativizing particular others in relation to others in general. The 'you' first becomes 'mother', then becomes 'a' mother along with other mothers. The 'you' which was unique in the original dyad becomes 'the' other in reference to 'me'. By a process of successive identifications, the struggle for recognition is then generalized from significant others to reference groups, and with some people, at least in some societies, to a generalized other, the point of view which is defensible in an open court of reason. This struggle for recognition engenders the participation by individuals in the 'moral order', the order of symbols, status relations, moral notions and narratives through which people, the roles they play and their actions are recognized as significant and are granted respect or disdained.

Of particular importance for the entry into and the constitution of this moral order are narratives. People are only able to orient themselves socially through being told stories which enable them to understand and take up their positions within the stories which are being lived out. As Alasdair MacIntyre pointed out:

> I can only answer the question "What am I to do?" if I can answer the prior question "Of what story or stories do I find myself a part?" We enter human society, that is, with one or more imputed characters - roles into which we have been drafted - and we have to learn what they are in order to be able to understand how others respond to us and how our responses to them are apt to be construed. It is through hearing stories ... that children learn or mislearn both what a child and what a parent is, what the caste of characters may be in the drama into which they have been born and what the ways of the world are. Deprive children of stories and you leave them unscripted, anxious stutterers in their actions and in their words.[36]

As participants within these stories and having attained some degree of identity as a consequence, some individuals is some societies are launched on a quest for coherence in their judgements and actions. This involves individuals representing themselves to each other and to themselves as unfinished autobiographies or narratives. In formulating these

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34. Heinz Remplein, *Die Seelische Entwicklung des Menschen Im Kindes - Und Jungendalter*, 14th ed. Munich, 1966, p.184; translated and cited by Strasser, *The Idea of a Dialogal Phenomenology*, p.84.

35. On this see Rom Harré, *Personal Being*, Cambridge Mass.: Harvard University Press, 1984, Ch.4. Harré refers to the individuated, embodied subject as the 'self.'

36. Alasdair MacIntyre, *After Virtue*, 2nd ed., (Notre Dame, Notre Dame University Press, 1984), p.216.

autobiographies people define themselves in terms of commitments to a hierarchical order of projects, ranging from short term projects such as fulfilling the expectations of the role or roles they are immediately engaged in, to the projects through which they define the significance of their lives. In this way people's autobiographies are related to the biographies of others and the histories of social formations: families, communities, organizations and cultural, social and political movements, and at least tacitly, to the narratives through which classes, nations and civilizations define themselves and their place in the world.[37] Through the quest for coherence in their own lives people are aroused to search for coherence in the moral order, and beyond this, in the history of their families, communities, classes and nations, and in the history of civilization and humanity itself.

Through this some people acquire and develop the capacity to question and reformulate this moral order and the narratives of the social orders which represent and legitimate it. While it is possible for a society to be composed of institutions, organizations and groups embodying different and incommensurable ideals and values so that there is no coherent moral order, the tension generated within individuals struggling for coherent identities guarantees that in all but the most oppressive societies there will be at least some impetus towards achieving such cultural coherence. It is to this impetus that in Western societies we owe a heritage of universalist moral notions, a history of ethical thought devoted to refining and justifying these notions (although it is only with modernity that these notions have been abstracted from politics and theology), histories of classes, nations, civilizations and of humanity, a number of competing grand narratives of progress, and an array of institutions and organizations which incorporate such notions at least as ideals.[38]

As with the dialectic of orientation this dialectic of recognition also involves the emergence of a spatio-temporally transcendent order, or complex of orders, created and sustained by the struggle for recognition and respect. Participation in these enables people to transcend their immediate being in the world, enabling them to achieve the reflexivity required to integrate their disparate engagements in the world into the unity of themselves as unfinished stories or biographies, and thereby to become active moral agents. By internalizing the viewpoint of different reference groups, individuals who remain with their own subjective, immediate stream of time consciousness simultaneously incorporate the intersubjective time dimensions of these orders.[39] Their actions and lives are in this way raised from their particularistic immediacy to become part of the spatio-temporally transcendent processes of becoming of different moral orders, and in this way, formulated as narratives, they take on an objective significance transcending the contingent existence of their biological existence. The sense of being someone with a significance which endures through diverse activities in diverse contexts is only attainable at the point of intersection of such multiple spatio-temporal systems of social experience.

The Dialectic of Power

The most enduring form of anti-mechanistic social theory has been based on the elaboration of the dialectic of labour. As Habermas pointed out, Lukács, and following

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37. The most profound work on narratives comes from Paul Ricoeur. On the relationship between narrative and identity see Ricoeur *Oneself as Another*, tr. Kathleen Blamey, Chicago and London: The University of Chicago Press, 1992.

38. Of course this is contested by Nietzsche in *The Genealogy of Morals*. However it is possible to accept the argument of Nietzsche and his followers that *ressentiment* of the weak has been a driving force behind the development of ethics without accepting the argument that this has been the only driving force.

39. See Katherine Mary Tillman, 'Temporality and Role-Taking in G.H. Mead' in *Social Research*, Vol.37, 1970, pp.533-546. Mead's analysis of this problem, which is indebted to both Hegel and process philosophy, overcomes many of the problems the French post-structuralists (notably Derrida and Lacan) have grappled with. For an account of problems of the post-structuralists in this regard, see Peter Dews, *The Logics of Disintegration*, London: Verso, 1987, particularly Ch.3.

Lukács, many of the Western Marxists influenced by Marx's early works, have seen humanity as creating itself through its humanization of nature. Developing control of nature, developing 'the forces of production', involves not only developing technology, that is, knowledge, skills and instruments (including buildings and roads as well as tools and machines), but also forms of social organization to coordinate people's activities, distribute products, educate people to participate in such organizations, and control people to ensure they play a productive role in all this, or at least do not disrupt it. To capture all these dimensions it is necessary to reformulate the dialectic of labour as the dialectic of power. Under this rubric it is necessary to consider both theories of technology and theories of power. This covers an enormous range of issues and debates, not all of which can be considered here.[40] The central problem in all these is defining what power is.

In terms of process philosophy all processes manifest power, as both a potential and in their activity, in maintaining their existence. It is the capacity to produce, and the production of, additional ordering in the world, and is the very be-ing of any process. The dissipative structures which develop in thermodynamically far from equilibrium situations are particular types of self-ordering activity in which power is the capacity to order and the ordering of the flow-through of usable energy and materials (that is, stable forms of energy). Animals as complex dissipative structures are unique in that their self-ordering activity involves defining their environments as worlds in relation to themselves and correspondingly, involves the development of awareness, appetites and aversions, and the power to order their engagement with their worlds accordingly. The distinctively human form of power is essentially cultural (presupposing and involving both of the other dialectical processes - without being reducible to them), and it can only be understood in relation to (although it is not entirely reducible to) institutions. That is, it involves transcendence by organisms of their immediacy to appreciate that their actions, tools and other instruments are such not only for themselves but also for others.

The theory of power which comes closest to acknowledging all this is that offered by Richard Newbold Adams. According to Adams:

> Everything in the environment of man is composed of energy forms and processes and can be measured in terms of the amount of energy that is potentially available for conversion or is being converted. ... In dealing with social power ... we are concerned not so much with the rate of flow or conversion as with *the control that one actor, or party, or operating unit exercises over some set of energy forms or flows*, and, most specifically, over some set of energy forms or flows *that constitute part of the meaningful environment of another actor*.[41]

In later work Adams emphasised that the control that matters most is control over the triggers which begin processes of energy transformation.[42] Control was defined as 'making and carrying out decisions about the exercise of a technology', and technology defined as 'a set of knowledge, skills and materials ... necessary to alter the order (i.e., space-time relations) of some set of energy forms or achieve an energy conversion.'[43]

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40. On the philosophy of technology see the anthology *Philosophy and Technology*, ed. Carl Mitcham and Robert Mackey, N.Y.: Free Press, 1983 (which does not include any work of Martin Heidegger or Don Idhe). On the range of theories of power see Stewart R. Clegg in *Frameworks of Power*, London: Sage, 1989.

41. Richard Newbold Adams, *Energy and Structure: A Theory of Social Power*, Austin: University of Texas Press, 1975, p.12.

42. Richard Newbold Adams, *The Eighth Day: Social Evolution as the Self-Organization of Energy*, Austin: University of Texas Press, 1988, p.47ff.

43. Adams, *Energy and Structure*, p.13f.

While having the virtue of identifying the central features of power and what is of central importance in power struggles, this theory takes as unproblematic the existence of forms of energy, and also the operating units as centres of action. Martin Heidegger in his study of technology defined technology as a way of revealing, criticising modern technology for revealing nature, and ultimately people themselves, as nothing but standing reserves, as merely things or forces to be controlled or utilized for controlling something else. Contrasting this with the ancient Greek understanding of technology, he argued that modern technology blinds people to the responsibility of nature for the bringing forth of products.[44] Adams has not entirely freed himself from this perspective despite his conception of humans as themselves energetic processes and part of nature. It is necessary to recognize that nature itself is active, bringing into being the forms and flows of energy, including humans, which together generate the products associated with human agency.

Before humans can play a part in this they must be formed through culturally constituted social relations. Only through socialization (itself a transformation of energy) do individuals become effective agents. As Stephen Clegg argued, developing an insight of Foucault:

> ...all forms of agency will be an achievement of control produced by discipline. Consistency, coherence and memory of self as such are not given but learned and accomplished. The agency of a person is no less an achievement of discipline than is that of an organization.[45]

In fact both the ability and the desire to achieve power is engendered by the symbolic constitution of the individual in the context of social institutions. It is within a social context the child develops its own capacity to manipulate the world and to decentre itself from its immediate involvement in the world. In so doing it develops the capacity to recognize the outcome of its actions, to use tools (while recognizing them as such) and to create things - while losing the experienced unity with its mother's power. It then becomes aware that its activities, creations and its very being as an entity within the world have a symbolic dimension and are subject to the interpretation and action of others. The child is thereby made aware of its own contingency and the limitations of its power. Others not only threaten the child and limit it physically, particularly its access to what it desires, but have the capacity to reduce it to an instrument of their own projects. However at the same time the child is socialized, trained and educated into an inter-world of shared praxis, of tools and other instruments - knives, hammers, shovels, roads, buildings, weapons, machines, factories, processes of production - together with codes of conduct, social roles, institutions, organizations and economic, political and cultural fields which constrain and thereby coordinate individual actions and activities, and a shared social imaginary through which all these are defined as such and understood. These enable the child at least to some degree (as the precondition of its staying alive and later, reproducing) to participate in society's power - its capacity to regulate (and its activity of regulating) in precise ways the transformations of potent energy.

The individual in being designated a particular subject gains access to and is able to appropriate the products of this activity - the reordered and accumulated potent energy, particularly food, clothing and shelter, and instruments - associated with these transformations. In this way a possibility is opened up by society, and at the same time an impulsion is generated in the individual, to realize this possibility, of participating in the control not only of the surrounding world for the immediate future, but of the conditions of

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44. Martin Heidegger, 'The Question Concerning Technology' in *The Question Concerning Technology and Other Essays*, N.Y.: Harper, 1977.

45. Clegg, *Frameworks of Power*, p.188.

life. The constant reproduction of the quest by people for such power generates the production, development and transformation of not only means to live and instruments of production, but also technological know-how, organizations and fields[46] which order the interactive processes between people and with nature, thereby maintaining and developing enduring social structures of power.

As in the other dialectical processes, individuals who emerge through their participation in the processes of controlling the world then become active agents in the transformation of structures of power. There is more potential for conflict in the dialectic of power than in other dialectical processes - over who will have access to the means of production, over how things will be done, who will do the work and who will get the products and other benefits of organized action, over who will have the opportunity and means to reproduce themselves, over whose aspirations and goals will be taken most into account in decisions, who will define the agenda what issues will be raised and considered when decisions are made, over which roles people will occupy and especially who will occupy the main positions of power in organizations, over how people will be organized and which power structures will prevail, over what channels of communication will be created, who will control access to these channels, who will be granted the means to develop ideas and be granted the authority to define reality. These conflicts spill over into and profoundly affect the other dialectical processes.

The forms of power achievable by individuals or organizations are also radically different. There is a vast difference between being able to use tools or other instruments, having skills in interpersonal relationships, being able to influence the actions of others, having privileges and access to products of consumption, having money and the means to acquire more money, having social connections, cultural capital and symbolic power (the ability to command respect for one's views), and having political power (being able to participate in the decision-making of the community, of organizations or of the State). Then there are complex power relationships and struggles between between individuals and organizations, from primary groups to nation States to transnational companies and supra-national political institutions, and between organizations and between fields. These can be very complex. Within individual organizations, even those committed to well-defined goals, there are invariably sub-groupings to some extent in conflict with each other, and within any society there are vast numbers of organizations, institutions and fields with varying degrees of stability and permanence, often with overlapping memberships, with organizations struggling within fields to maintain themselves and to define and realize their goals.

Through the diversity of power struggles there is at least some impetus towards a general augmentation of the power by humans over the conditions of their existence, or at least some aspect of these conditions. Since to be engaged in such a dialectic is to be committed to achieving power, the forms of power which augment everyone's power will generally meet with less resistance than other forms, and those organizations which develop their power will tend to prevail over those which do not. The dialectic of power is, like the dialectics of orientation and of recognition, a social phenomenon which must be understood in terms of a relationship between individuals and instruments, economic, political and cultural organizations, institutions and fields which durationally transcend to various degrees the particular activities and lives of individuals, being both the condition and the result of their struggles.

The Inter-Relationships Between Dialectical Processes

46. The notion of 'field' as a concept to analyse power (characterized as different kinds of 'capital') has been developed by Pierre Bourdieu.

While each of these dialectical processes has its roots in the diremption within social relations brought about by the growing decentering of experience, and all dialectical processes are involved in each and every action, expression and creation of each and every person, each dialectic has its own unique dynamics irreducible to the dynamics of the others. Each of these can be seen as a conditional cause of the others, thereby making possible a multiplicity of complex dynamic relationships. This provides a research programme of tracing these interdependencies and their developments, and much of Hegel's *Phenomenology of Spirit* can be understood as undertaking this programme. For instance Hegel's most famous analysis: that of the relationship between Master and Slave in Ancient societies, begins as an account of a struggle for recognition.[47] The Master subdues the Slave, forcing him to recognize and subordinate himself to the will of the Master. In this way the Master should be successful in his struggle for recognition. However in reducing the Slave to a thing and treating him as an instrument, the recognition obtained is deprived of any significance. The Slave on the other hand can see in the Master something to aspire to. But beyond this, the Slave in constant fear of death is shaken from concern with his particular existence to take the point of view of the universal, and at the same time in being forced to work for the Master gains mastery over nature and impresses himself upon it. By creating a standing reflection of himself as a universal being, the Slave becomes such a being and gains self-substantiation in a way which is denied to the Master, whose relationship to nature is mediated by the Slave. Through such analyses, which were augmented by the division between Subjective, Objective and Absolute Spirit, Hegel tried to interpret history as the progressive actualization of the World Spirit in which it struggles, through a series of forms of Objective Spirit, to create the material and social conditions to develop consciousness of itself in art, religion, and finally philosophy - the realm of Absolute Spirit. And in the process of developing this research programme Hegel formulated his ethics and political philosophy.

However the consequence of rejecting Hegel's general Neoplatonic scheme has been that very few thinkers have tried to consider all dialectical processes simultaneously. Most of those examining the relationships between dialectical processes have been concerned with explaining one scheme, and occasionally two, in terms of another. The most thoroughly analysed relationship has been that between the struggle for power and symbolic activity, a relationship examined by first by the Marxists, and then by a diversity of schools in a diversity of countries. For instance the Hegelian Marxist, Lucien Goldmann, examined literature against the background of the dialectic of labour and the class conflicts associated with this.[48] Berger and Luckmann developed a phenomenological approach to analyse the struggle for power as primarily a struggle to define reality in general and situations in particular.[49] Marshall Sahlins examined the dialectical relationship between power relations and symbolic action, drawing on the work of the structuralists in an effort to transcend the tendency towards a reductionism to practical interests by Marxists, ecological anthropologists and Berger and Luckmann, while Abner Cohen examined the same relationship to transcend the reductionism of the structuralists.[50] Foucault's examination of the relationship between power and knowledge is a further example of the study of this relationship. Much of the work of the symbolic interactionists is an attempt to explain

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47. Hegel, *The Phenomenology of Mind*, p.234ff. This is developed further in *Philosophy of Mind*, §433-§435.

48. See Goldmann, *The Hidden God* for a study of the work of Pascal and Racine as expressions of the world-view of members of the *Noblesse de Robe* during the early stages of capitalism.

49. Peter L. Berger and Thomas Luckmann, *The Social Construction of Reality*, [1966] Penguin, Harmondsworth, 1972.

50. Marshall Sahlins, *Culture and Practical Reason*, Chicago: University of Chicago Press, 1976; Abner Cohen, *Two Dimensional Man*, Berkeley and Los Angeles: University of California Press, 1976.

conceptions of the world in terms of the struggle for recognition,[51] anthropologists have analysed the struggle for power as a means to gaining honour and Rom Harré has argued that in advanced capitalist societies, the struggle for respect is irreducible to practical concerns.[52] Pierre Bourdieu's research program is essentially a reductionist study of cultural activity in terms of the dialectic of power mediated through the dialectic of recognition, but he then provides a place for the dialectic of orientation as an emergent through his concept of the cultural field, and more specifically, through his concept of the scientific field. It is rare for social theorists involved in such studies to acknowledge that the different dialectical processes have their own autonomy, and very rarely do they recognize more than two semi-autonomous dialectical patterns.

However it is not the limitations of social theory following the breakdown of Hegel's system which are most important, but the achievements which in one way or another transcend Hegel. Two traditions which originated in Hegel have gone beyond his achievements. The first is the Marxist tradition and the second the existentialist. In advancing beyond Hegel, these traditions have to a considerable extent contracted their field of comprehension and lost some coherence in doing so.

Marxism and Emergent Social Dynamics

As was pointed out in Chapter 9, Marx was not an entirely consistent thinker. He mediated between different traditions and never managed to formulate his ideas in terms of a coherent conception of being. In considering Marx as an advance on Hegel it is those aspects of Marx consistent with a process view of the world which I am concerned to defend. But to defend these aspects of Marx's thought it is necessary to unravel the incompatible strands in his work and to show which are the most significant ideas. To begin with, Marx belonged to the Young Hegelian movement which reformulated Hegel's system to unleash its critical potential. The Neoplatonism of this early phase was partially transcended by adopting the economic reductionism of the Scottish school of historians, and then both these positions were transcended in Marx's most important achievement, his analysis of capitalism. But what was involved in this study of capitalism? What is always taken to be Marx's central thesis is that in some sense or other the economy is basic to understanding society. But corresponding in part to the confusion of ontologies underlying Marx's work, he formulated this thesis in three distinct ways, two of which are blatantly incompatible.

The first way in which the economy is held to be basic is in the sense that the labour process is 'the necessary condition for effecting exchange of matter between man and Nature; it is the everlasting Nature-imposed condition of human existence, and therefore is independent of every social phase of that existence, or rather, is common to every such phase.'[53] As such the productive process is the metabolism of society, and as with the study of organisms, everything else must be understood in relation to it. The second sense in which the economy is basic is clearly distinguished from the first and pertains fully only to capitalism. As Marx wrote:

> It is not the unity of living and active humanity with the natural, inorganic conditions of their metabolic exchange with nature, and hence their appropriation of nature, which

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51. See papers by Blumer and Shibutani in the anthology edited by Arnold M. Rose, *Human Behaviour and Social Processes*, Boston: Houghton Mifflin, 1962.

52. Rom Harré, *Social Being*, Oxford: Blackwell, 1979.

53. Karl Marx *Capital* Vol.1, tr. Samuel Moore and Edward Aveling [1887], Moscow: Progress Publishers, 1974, p.179.

> requires explanation or is the result of historic process, but rather the separation between these inorganic conditions of human existence and this active existence, a separation which is completely posited only in the relation of wage labour and capital.[54]

This is the sense in which the market is seen to have developed as an emergent process to transform people, reproducing the relations of production which reduces people to labour power to be bought and sold as a commodity, and then to have developed according to its own immanent dynamics to dominate the whole of society, and ultimately, of the world. The third sense is a form of technological determinism. As Marx argued in *The Poverty of Philosophy*: 'In acquiring new productive forces men change their mode of production; and in changing their mode of production, in changing the way of earning their living, they change all their social relations. The hand-mill gives you society with the feudal lord; the steam-mill, society with the industrial capitalist.'[55]

This third sense of the primacy of the economy, the technological determinist sense, the sense which is generally taken as synonymous with Marxism, provides a general scheme of history which is designed to explain both developments in different types of society and the movement from one type of society to another.[56] It is the standard reductionism deriving from the Scottish historians and is ultimately rooted in mechanistic materialism. It presupposes that the egoistic conception of humans deriving from Hobbes is valid for all societies. But if all history could be explained so simply, then there could be no emergent dynamics. There would be no object, no autonomous dynamics of capitalism to be explained by Marx in his major work: *Capital*. Furthermore this reductionism is inconsistent with the conception of humans as creative social beings which underlies Marx's critique of capitalism and which is required to justify any optimism about the future. Thus the third sense in which the economy is held to be primary is incompatible with the second sense, which is the central theme of Marx's work, and therefore must be rejected by anyone who accepts Marx's central arguments, quite apart from all the empirical evidence against it. This leaves the first and the second sense to be considered, each of which fully accords with the process view of humanity as an emergent process within nature and of society itself as consisting of emergent processes.

The first sense in which the economy is held to be primary does not contradict Hegel's philosophy. Marx's position in this regard can be seen as a development within the framework of the Hegelian system which underplays the dialectic of recognition and the dialectic of representation in favour of the dialectic of labour (and is associated with efforts to explain the dialectic of representation reductionistically in terms of the dialectic of labour). It is the second sense of the primacy of the economic in which Marx transcends the framework of Hegel's analysis because it implies that capitalism is developing according to laws transcending the dialectical rationality of human becoming. These laws describe the tendencies of a process which emerges from and then constrains the dialectical processes. Although, as was pointed out in Chapter 9, there is a dialectic of economic categories presupposed in the development of capitalism which is associated with the development of contradictions in the economic system, the laws of capitalist development are more like the laws of the physical world than dialectical patterns of becoming. The dynamics of the economy confront people as a second nature, and the tendencies described by these laws could just as well lead to the destruction of humanity as to the realization of humanity's highest potentialities. It was merely a contingent fact that the tendencies in capitalism at the

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54. Karl Marx *Grundrisse*, tr. Martin Nicolaus, Harmondsworth: Penguin, 1973, p.489.

55. Karl Marx, *The Poverty of Philosophy*, [1947] Moscow: Progress Publishers, 1973, p.95.

56. For a relatively rigorous defence of this vulgar Marxism see G.A. Cohen, *Karl Marx's Theory of History - A Defence*, Oxford: Clarendon, 1978.

time in which Marx was writing were producing the conditions which could have facilitated the creation of a new form of society in which people's alienation from their creative powers and from society could have been overcome. The fact of the emergence of a process within and transcending the dialectical patterns of becoming of society makes it impossible to accept the teleological view of history of Hegel since, as was suggested in a previous chapter, emergence implies a genuinely open future - since what emerges is not completely determined by the conditions of its emergence.

But if there is one emergent process within culture, there is no reason why there cannot be others. This is one of Georg Simmel's central insights:

> Whenever life progresses beyond the animal level of culture, an internal contradiction appears... We speak of culture whenever life produces certain forms in which it expresses and realizes itself... But although these forms arise out of the life process, because of their unique constellation they do not share the restless rhythm of life, its ascent and descent, its constant renewal, its incessant divisions and reunifications... They acquire fixed identities, a logic and lawfulness of their own; this new rigidity inevitably places them at a distance from the spiritual dynamic which created them and which makes them independent... This characteristic of cultural processes was first noted in economic change.[57]

Simmel's research programme involved identifying and analysing the nature, generation and reproduction of these forms. William Mc'Neill's analysis of the emergence of 'microparasitism' and 'macroparasitism', Lewis Mumford's analysis of the emergence and dynamics of cities, Bourdieu's analysis of the dynamics of economic, political and cultural fields, Michel Foucault's identification of emergent discursive formations: the asylum, the clinic, the prison and so on, Robert Michels' analysis of the iron law of oligarchy in political parties, the work of various Marxists who have identified and revealed emergent tendencies in both non-capitalist and late capitalist socio-economic formations, the work of Wallerstein and his colleagues in describing the concentration of economic and political power and the differentiation of the world-system of capitalism into cores, semiperipheries and peripheries, and the accounts of Flannery, Rapaport and Bunker of the tendency of dominant social systems to 'hypercoherence', to increase control, to use up more and more available energy, until a stage is reached where they have so much power that they can survive while contributing little or nothing to the systems on which they are dependent - until they destroy these systems, the conditions of their own existence,[58] can all be interpreted as studies of emergent social forms or processes in accordance with this research programme. And by so interpreting these analyses and their theoretical objects it becomes possible to overcome difficulties within these analyses and to show their relevance to each other. For instance it is possible to account for the identity of discursive formations over time - something which was a major problem for Foucault, to represent the differentiation of the world-system as only a tendency of one process among others - thereby allowing for the vast variety of responses to the expansion of capitalism by different regions, and to allow for greater complexity in the economy itself than Marx or all but a few of his followers have considered - allowing for the partial autonomy of and interaction between local, national and international economies, for the emergence of new semi-autonomous forms of State and

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57. Georg Simmel, 'The Conflict in Modern Culture', in Donald N. Levine ed. *George Simmel on Individual and Social Forms*, Chicago: University of Chicago Press, 1971, pp.375-393, p.375f.

58. Kent V. Flannery, 'The Cultural Evolution of Civilizations', *Annual Review of Ecology and Systematics*, Vol.3, 1972, pp.399-426 based on the work of Rapaport. This notion has been further developed by Stephen Bunker in *Underdeveloping the Amazon* and used to characterize the core zones of Western capitalism. It could be equally applied to the Soviet bureaucracy.

non-State institutions associated with modern capitalism, and so on. All these emergent processes can then be evaluated according to their effects on other processes.

To explain such emergent processes it is necessary to refer back to the three dialectical processes as conditional causes. Ultimately it is because the world exists in a state of far from thermodynamic equilibrium, and because this has given rise to a world ecosystem which maintains the conditions for human life that complex social structures have been able to form, and all emergent social processes are dissipative structures reproducing themselves by maintaining, and being able to maintain, a flow-through of useful energy and materials. However it is because such emergent processes provide and reproduce the conditions for at least a large number of people to orient themselves, to gain a sense of their own significance and to gain some control over their lives that people accept and conform to the constraints imposed by these emergent processes. Such conformity can be reinforced by the differentiation of people's situations within these processes. For instance in capitalism, the bourgeoisie are provided with the best means to orient themselves, to gain respect and to control the conditions of their existence, but must maximize the profits of their enterprises to avoid declining into the proletariat, who in turn must work hard to avoid ending up in the reserve army of unemployed. Where some people refuse to conform, there are always others lower down striving to move up in society willing to conform to and defend the system in their place. But emergent processes are not entirely explicable in terms of their material and environmental causes. They must be to some extent recognized as immanent causes irreducible to the conditions of their emergence, and they must to some extent be explained in their own terms, as Marx attempted to explain capitalism as an emergent, self-reproducing ensemble of social relations based on the universalization of the commodity form to produce and reproduce capital and wage-labour.

The conception of society in which a number of semi-autonomous processes are recognized leads to the problem of understanding the relationship between these diverse processes, which in turn requires a study of different spatialities and temporalities associated with these processes.[59] Bourdieu's analysis of the relationship action and field and between different fields makes an important contribution to understanding the relationship between different emergent processes, especially if the economy and the political realm are treated as fields. However it has been the historians of the Annales school who have analysed the significance of different spatialities and temporalities in such relations, emphasising the distinction between, as Braudel described it, 'the conspicuous history which holds our attention by its continued and dramatic changes - and that other, submerged history, almost silent and always discrete, virtually unsuspected either by its observers or its participants, which is little touched by the obstinate erosion of time.'[60]

Althusser in his effort to transcend the limitations of Hegelian Marxism also acknowledged these different temporalities in history, writing: 'As a first approximation, we can argue from the specific structure of the Marxist whole that it is no longer possible to think the process of the development of the different levels of the whole *in the same historical time*... On the contrary, we have to assign to each level a *peculiar time*, relatively autonomous and hence relatively independent, even in its dependence, of the "times" of the other levels.'[61] But in his proposed scheme for examining society Althusser simply accepted the traditional scheme of orthodox Marxism, which may have been valid when applied to

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59. The importance of spatio-temporal order has long been recognized in geography and architecture. Recently Anthony Giddens has developed ideas on this subject. See Anthony Giddens, *The Constitution of Society*, Cambridge: Polity Press, 1984, Ch.3.

60. F. Braudel, *The Mediterranean and the Mediterranean World in the Age of Philip II*, (2 volumes) Vol. 1. tr. S. Reynolds, London: Collins, 1972, p.16.

61. Louis Althusser and Etienne Balibar, *Reading Capital* [1968] tr. Ben Brewster, 2nd ed., London: N.L.B., 1977, p.99f.

nineteenth century capitalism, as timelessly valid for all forms of society. He went on to argue that: 'we can and must say: for each mode of production there is a peculiar time and history, punctuated in specific way by the development of the productive forces; the relations of production have their peculiar time and history punctuated in a specific way; the political superstructure has its own history...; philosophy has its own time and history...; scientific formations have their own time and history, etc...'[62] But it makes virtually no sense to distinguish between mode of production, relations of production and political superstructure in, for instance, the Kabyle studied by Bourdieu, and it is highly suspect in late twentieth century capitalist societies where political organization and relations of production are so intimately involved in much of the advanced forms of production.[63] And the distinction between philosophy and science is of recent origin. There was nothing like it in the seventeenth century.

When fully developed, the possibility of emergence of processes within social dynamics must lead to a rejection of such preconceptions about the differentiations within society. The specific nature of such differentiations themselves have histories which must be examined in each society, showing the relationships between each semi-autonomous process at different levels, from small groups to the dynamics of civilizations. As Braudel wrote: 'History accepts and discovers multidimensional explanations, reaching as it were, vertically from one temporal plane to another. And on every plane there are also horizontal relations and connections.'[64] And elaborating on this elsewhere: 'Some structures, because of their long life, become stable elements for an infinite number of generations: They get in the way of history, hinder its flow, and in hindering it shape it. Others wear themselves out more quickly. But all of them provide both support and hindrance. As hindrances they stand as limits ("envelopes," in the mathematical sense) beyond which man and his experiences cannot go.'[65]

Elsewhere he recognized a multiplicity of spatial orders inter-related with such temporal orders.[66] Thus a society must be understood more as an ecosystem of processes (and the structures maintained by them) with analogous relations to those revealed in ecology by ecologists such as Levins and Lewontin. Such processes incorporate ways of conceiving the world in terms of which people define themselves and act purposefully, frequently develop according to dynamics which transcend and constrain the dialectical processes, and at the same time are processes within nature and must be understood in relation to geographical and ecological conditions of humanity. These processes are often in conflict with each other, and such conflict can eventually lead to the destruction of one process by another which is dependent upon it for its very existence. The concepts of conditional and immanent causation provide a means to understand and clarify such a multiplicity of relationships of partial dependence and autonomy, and often partial conflict, between the different human processes and between these and other natural processes; and also what a spatio-temporal order is (an order of potentialities for coordinated interaction such that this facilitates and is constrained to maintain these potentialities), how different processes generate different spatio-temporal orders, and the significance of this for understanding the inter-relationships between processes.

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62. Ibid. p.99f.

63. As Boris Frankel has argued in *Beyond the State?* London: Macmillan, 1983, Ch.'s 1,2 & 3.

64. Braudel, *The Mediterranean and the Mediterranean World in the Age of Philip II*, p.16.

65. Fernand Braudel, 'History and the Social Sciences' in *On History*, tr. Sarah Matthews, Chicago: Chicago University Press, 1980, pp.25-54, p.31.

66. Fernand Braudel, *Civilization and Capitalism 15th-18th Century*, (3 volumes) Vol. III, *The Perspective of the World*, tr. Siân Reynolds, London: Fontana, 1985, I, 'Divisions of Space and Time in Europe', pp.21-88.

Existentialism and the Individual

The development of the notion of emergent processes presents the problem of what is the relationship between these emergent processes and the underlying dialectical struggles of and between people. The fact of emergence, by undermining the notion of history as a teleological unfolding of an inner essence, whether of the World Spirit or of humanity, suggests a different conception of the place of the individual in the world than that implied by Hegelian or Hegelian Marxist thought. Individuals can no longer be reduced to vehicles of this unfolding moved by the 'cunning of reason.' Neither can they be reduced to cyphers of social structures constructed by a process of 'interpellation' as Althusser and his followers (including Foucault in this regard) have represented them. Individuals can be seen as emergent processes from, and within, nature, culture and society, and as participants in the process of becoming of the world. Marx's critique of Hegel is intimately related to the existentialist critique, and each can be seen to be compatible with the other when interpreted from the perspective of process philosophy.

The existentialist critique of Hegel began with Schelling's later philosophy and was further articulated by Kierkegaard, who had attended Schelling's lectures (along with Engels, Burckhardt and Bakunin, among others) in 1841. Kierkegaard was troubled by how in Hegel's system 'the existing subjectivity tends more and more to evaporate.'[67] Consequently he focussed on the individual as a contingent subject perpetually becoming, with all the uncertainty and anxiety entailed by this. Rejecting Hegel's faith that the finitude of existence could be transcended by taking the perspective of the Absolute, that philosophy could escape 'from the weary strife of passions that agitate the surface of society into the calm region of contemplation...'[68] Kierkegaard argued:

> The principle that the existing subjective thinker is constantly occupied in striving, does not mean that he has, in the finite sense, a goal toward which he strives, and that he would be finished when he had reached this goal. No, he strives infinitely, is constantly in the process of becoming.[69]

Similar sentiments were expressed by Nietzsche.

While Kierkegaard was responding to Hegel, his abstraction of the individual subject from the world reflects the underlying dominance of the mechanistic world-view.[70] In terms of process philosophy, the individual as a process of becoming is intelligible as an emergent process within the world. Through participation by the sensitive organism in the dialectical processes of culture and the various semi-autonomous processes of society, the organism is individuated as a subject, and this individuation consists in the emergence of the capacity, inherent in the nature of the different dialectical processes, to reflect on the conditions of its existence, to take responsibility for its conception of the world, to choose which others to regard as significant, and to strive to live life accordingly, modifying or transforming relationships of power in the process. That is, the individual has the capacity (cultivated in some societies, suppressed in others) to develop a mind.[71] The mind is not a substance. To

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67. *Kierkegaard's Concluding Unscientific Postscript*, tr. David F. Swenson and Walter Lowrie, Princeton: Princeton University Press, 1968, p.112.

68. G.W.F. Hegel, *The Philosophy of History*, tr. J. Sibree [1899] New York: Dover, 1956, p.457.

69. *Kierkegaard's Concluding Unscientific Postscript*, p.84.

70. This is argued by Karl Löwith in 'Man Between Infinities', in *Measure: A Critical Journal*, Vol.1, 1950, pp.297-310. See also Hans Jonas, 'Gnosticism, Existentialism, and Nihilism', *The Phenomenon of Life*, Chicago: Chicago University Press, 1966.

71. One of the most disorienting aspects of the modern Western world is the abandonment of a culture which promoted the development of mind and its replacement by a culture which severely suppresses its development.

make up one's mind is to interpret one's situation and to commit oneself to projects accordingl.y, . To have a mind of one's own is to have developed one's understanding, to have established one's convictions about the nature of the world and oneself, to be able to formulate effective projects of action in accordance with these convictions and to judge what projects are worth striving to realize, and to have gained sufficient self-mastery to persist against obstacles in the effort to realise these projects. 'Mind' so conceived, is in accordance with common usage as well as the ontology of process philosophy, a structure, that is, the potential to order activity in a way which cannot be entirely understood from the physical, biological, cultural and social conditions of one's existence, since it involves new constraints on activity not present in these conditions. Freedom as the potential for self-determination is a function both of the development of mind and the nature of the individual's situation, and there is no guarantee that it will be achieved. Children are born in chains, and the challenge of life is liberation; but this liberation is always socially, culturally, biologically and physically situated.

The nature of human consciousness has been examined most systematically by the phenomenologists and those influenced by them, including the poststructuralists and 'hermeneuticists' (although their work builds upon the work earlier philosophers such as Dilthey, Bergson and William James). The founder of the phenomenological movement, Edmund Husserl, was concerned to transcend both naturalistic reductionism and relativism by developing philosophy into a rigourous science. This was to be devoted to obtaining apodictic knowledge by applying a presuppositionless method to examine and describe lived experience. This science was to be more fundamental than the natural sciences, and to reveal the natural sciences as just one creation of the Spirit among others. In this project, Husserl failed. But in doing so he transcended mechanistic categories and developed a set of concepts based on a view of human consciousness as intentional (as always consciousness of something) and as temporal, as a process of becoming inseparable from its world which is constituted by it and which is transformed as part of its own development. These concepts, and the research program they engendered, enabled Heidegger and the existentialists to examine in a systematic way themes which had only been touched on fragmentarily by Kierkegaard and Nietzsche.

In developing this research programme, phenomenologists have investigated the lived experience of being in the world - that is, the *umwelt* (the surrounding world), the *mitwelt* (the world shared with other people), and the *eigenwelt* (the 'self-world'), describing consciousness in a way which is consistent with the work of the philosophical biologists discussed in the last chapter. From this perspective they have examined what it means to be embodied, the temporality and spatiality of being-in-the-world, what is involved in being with, confronting and forming relations with other people, the experience of meaning in the world and of the associated claims of the world upon one, the nature of acting and being engaged in action, both as an individual and with other people, and the nature of emotions, imagination and self-deception.[72] They have analysed the structures of the socially created, 'inter-world', the world of physical constructions - buildings, roads, furniture, instruments, works of art, and so on, of the meanings sedimented in these creations, of the typified expectations and responses of people, of designated roles and statuses, of institutions, rules, regulations and laws, that is, the world within which people are habitually engaged; and they have examined the complex spatio-temporal organization of this life-world and its impact on individuals. These analyses have facilitated the study of the contradictions in the social world and the experience of alienation, the study of social commitments, joint praxis,

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72. Maurice Merleau-Ponty's *Phenomenology of Perception*, [1946] tr. Colin Smith, London: Routledge & Kegan Paul, 1962 is one of the most profound of these works, but there are many others, including those of Sartre, Ingarden, Schutz, Strasser, Ricoeur, Natanson, Laing and Esterson.

the formation of groups and revolutionary movements and the crystallization of institutions.[73] Ideas developed in such investigations have been further elaborated in psychology, psychiatry and the social sciences.[74] Such work has produced a notion of humanity as essentially creative, characterized not so much by the ability to produce a culture but by the ability to transcend old cultural forms. As Merleau-Ponty argued, 'What defines man is not the capacity to create a second nature - economic, social or cultural - beyond biological nature; it is rather the capacity of going beyond created structures in order to create others.'[75]

A deeper understanding of this creativity has been achieved by Paul Ricoeur through his work on narrative. For Ricoeur, narrative is the fundamental structure of the experience of time; its ultimate referent is lived time. There are three dimensions, or forms of mimesis, in narrative. Firstly life itself is an inchoate narrative. It 'prefigures' narrative. It is for this reason that we have a pre-understanding of what human action is, of its semantics, its symbolism, its temporality. The second aspect involves the representation of action according to specific rules of emplotment, that is, the making of a structure to interpret and organize, that is, to 'refigure' this pre-understanding. Through the activity of emplotment a quasi-world of action and characters is generated. Innovations are made by inventing plots by means of which 'goals, causes, and chance are brought together within the temporal unity of whole and complete action.'[76] A complete action can consist of a number of other actions, and it can be the action of an individual - from some particular achievement to having lived a whole life, or of a group, such as winning a war, founding a nation or establishing or destroying a civilization. The third aspect is the reception and actualization of that structure. People are confronted with and drawn into the quasi-world, distancing them from their own life-worlds, revealing and challenging their taken for granted horizons of expectations. They are provided with room to manoeuvre, to think about the way they live and to appropriate the new structure to organize or 'refigure' their own actions and lives. Such creative refiguration can involve all three dialectical processes and is particularly important for integrating both the individual and group identities formed by these processes.

Process philosophy (which through the indirect and direct influence of Bergson was one of the most important starting points for the development of phenomenology, and also the hermeneutics of Ricoeur) provides a naturalistic and physicalist justification for, and interpretation of, the concepts developed by the existential phenomenologists and hermeneuticists, and reunites these ideas with the natural sciences and the human sciences to conceive humans as conscious participants in the process of becoming of nature, culture and society, simultaneously obviating the problems in both Anglo-American and French philosophy of mind.[77] Accordingly process philosophy justifies in a naturalistic way the existential philosophy expounded by Merleau-Ponty:

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73. See Jean Paul Sartre, *Critique of Dialectical Reason*, [1960] tr. Alan Sheridan-Smith, London: New Left Books, 1976. For a lucid account of this see R.D. Laing and D.G. Cooper, *Reason and Violence: A Decade of Sartre's Philosophy*, London: Tavistock Publications, 2nd ed. 1971.

74. See for example Rollo May et. al. ed.'s, *Existence: A New Dimension in Psychiatry and Psychology*, N.Y., Basic Books, 1958 for a representative selection of existential phenomenological psychiatry. For a review of such psychiatry see Herbert Spiegelberg, *Phenomenology in Psychology and Psychiatry*, Evanston: N.W. Uni. Press, 1972. For the whole range of the human sciences see Maurice Natanson ed. *Phenomenology and the Social Sciences* 2 volumes, Evanston: Northwestern University Press, 1973.

75. Maurice Merleau-Ponty, *The Structure of Behaviour* [1942] tr. Alden Fisher, Boston: Beacon Press, 1967, p.175.

76. Paul Ricoeur, *Time and Narrative*, (3 volumes), Chicago: Uni. of Chicago Press, Vol.I, ix.

77. While Anglo-American philosophy of mind generally takes mechanical nature as the point of departure and then struggles to find a place for the conscious subject, French philosophy of mind has traditionally taken the unitary ego as the point of departure and then criticised this, trying to find a place for desire, the unconscious, and occasionally nature. For an approach which does formulate the philosophy of mind in terms of a theory of being which allows for real emergence, which takes the

> As its name suggests, existential philosophy consists of taking as one's theme not only knowledge or consciousness understood as an activity which autonomously posits immanent and transparent objects but also existence, i.e., an activity given to itself in a natural and historical situation and as incapable of abstracting itself from that situation as it is of reducing itself to it. Knowledge finds itself put back into the totality of human praxis, as it were, given ballast by it. The 'subject' is no longer just the epistemological subject but is the human subject who, by means of a continual dialectic, thinks in terms of his situation, forms his categories in contact with his experience, and modifies this situation and this experience by the meaning he discovers in them. In particular this subject is no longer alone, is no longer consciousness in general or pure being for itself. He is in the midst of other consciousnesses which likewise have a situation; he is for others, and because of this he undergoes an objectivation and becomes generic subject... Man no longer appears as a product of his environment or an absolute legislator but emerges as a product-producer, the locus where necessity can turn into concrete liberty.[78]

However while recognizing both that humans are part of nature and that they have very distinct qualities which make them significant beings for the world as a whole, humans cannot be represented as the end product of evolution. As was pointed out in the previous chapter, the concept of evolution is itself problematic, and cannot be conceived of as a process of development to higher and higher levels. Evolution involves the development of ecosystems, ranging in size from those associated with microscopic environments to the world as a whole, consisting of from a few to vast diversities of species, many of which play essential roles in maintaining these ecosystems. Such developments frequently lead to dead ends, catastrophes and reversals in the fortunes of different life forms. The average life span of each species in this process is about three million years, and there is no reason why humanity should not be eliminated in due course. Many species become extinct because they destroy the environmental conditions of their existence. A unique feature of humanity is that people are capable of understanding and changing the processes through which they are destroying the conditions of their existence. Unlike other species, the extinction of humans will be their own responsibility.

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individual as emerging from both nature and social relations, and which critically examines both French and Anglo-American philosophies, see Rom Harré, *Personal Being*, Oxford: Blackwell, 1983.

78. Maurice Merleau-Ponty, 'Marxism and Philosophy' in John O'Neill ed. *Phenomenology, Language and Sociology: Selected Essays of Maurice Merleau-Ponty*, London: Heinemann, 1974, pp.174-185, p.182f.

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ETHICS, POLITICAL PHILOSOPHY AND THE SOCIAL SCIENCES

In the early chapters of this work it was shown how it is impossible to even think clearly about environmental problems from within the framework of concepts prevailing in Western societies. It was shown that Marxism does provide a framework for analysing the cause of environmental destruction (despite many of Marx's own views), that Marxists are correct to identify the immanent dynamics of world capitalism as the immediate source of most of the world's present environmental problems; but in practice, the failures of orthodox Marxists have revealed the extent to which Marx failed to fully transcend the forms of thinking of Western civilization, and of capitalist society in particular. Neoplatonic and mechanistic themes within Marxism have negated much of its liberating potential. Something more is required. Process philosophy provides such a new starting point - for understanding the world, for judging the significance of life, for deciding how to live and how to act, for evaluating and creating institutions and for working out political goals and strategies.

According to this philosophy, human subjects are socio-cultural beings, part of and within the world, some of the beings through which the world has attained and is attaining consciousness of itself. The goal of enquiry is understanding, an 'indwelling' in the world such that the world becomes intelligible. The importance of abstract forms of thinking, the development of which has been a major achievement of the culture of Western civilization, is recognized; but the nihilistic effects of ignoring the level of abstraction involved and taking abstractions for reality, the 'fallacy of misplaced concreteness', are avoided by reconceiving what it involves. Rather than being seen as a transcendence of the changing sensible world to arrive at knowledge of what is eternal - whether of forms, of the laws of nature, or of facts and logical relations, abstraction can be seen as part of the process of creating the means for deeper understanding of the world. There is no reason why understanding so conceived should not lead to an appreciation of the world's significance, and to an appreciation of the relative significance of its different constituents.[1] And where the primary focus is on the becoming of all that is, it is impossible to understand beings without appreciating their intrinsic value. From the 'universe of death', as Coleridge described the world of mechanistic science, a science based on process philosophy will lead closer to the way the world was experienced by Wordsworth when he wrote:

> ... all
> That I beheld respired with inward meaning.

The framework of mechanistic concepts has not only been effective as a means to understand the world. The metaphor of mechanism has also provided the ideal for people to conform to, despite the dogma of the disjunction between questions of how the world is and

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1. On this, see Michael Polanyi; and Harry Prosch, *Meaning,* Chicago: University of Chicago Press, 1975.

how the world ought to be. In arguing for a process view of the world based on an auditory analogy, it is not only being argued that this is the best metaphor to make the world intelligible; it is being argued that this should serve as the root metaphor of the ideals for people, society and humanity to strive for. Music should replace the machine as the dominant thematic motif of civilization. However with this new metaphor there is no longer any reason for regarding its dual role as the basis for interpretation and the basis for evaluation as inconsistent. Advancing understanding is itself participation in the creative becoming of the world, while the way the world is understood orients people for action in relation to this becoming. This process involves the development of concepts which then mediate people's interactions with each other and with the rest of nature, and is thereby a major aspect of their self-creation. Human societies are seen as processes of becoming within nature, and individuals are seen as becoming autonomous selves through their participation in the cultural dynamics of their societies. Individuals emerge as more than the conditions of their emergence, as beings capable of critically reflecting on and thereby developing their cultural heritage and of acting according to their subsequent convictions; and like melodies in a symphony, the contribution they make to society, to humanity and to nature remains a part of these even after they have ceased to exist as active individuals. With each thought and action people are creating themselves, their community and the world; and the lives they lead are an indelible contribution to the becoming of the world.

The version of process philosophy proposed here is not being presented as the eternal truth, but as the means for the fullest comprehension of the world of the present age, of its achievements, problems and limitations and of the possibilities open to it. It is presented as itself historically situated, as a contribution to an on-going dialogue, providing a provisional orientation to the world which must continually be tested, both as the basis for extending our understanding of the world and as the basis for action, and which at least in its present form will itself be transcended in the future. The basic scheme of a philosophy of process has been outlined in previous chapters, and it has been shown how it is required to overcome the fragmented nature of modern science and how it provides the basis for a new conception of life and humanity. In the final two chapters this scheme will be articulated, showing how it can provide the foundations for a new ethics, political philosophy and science of humanity, an orientation for living, for social, political and economic action, for a world-wide environmental movement, and ultimately, for a new, post-European, post-nihilistic world civilization. It provides a basis for articulating the aspirations of people able to contribute to the achievement of this new world order, affirming the most important ideals of Western societies and of the tradition of Marxism: the heroic moralism and the unfettered search for truth of the West and the quest for a just social order within which people will be able to reappropriate their creative powers, the basic ideal of Marxism, while at the same time undercutting the opposing tendencies of both, the tendencies toward domination, purely instrumentalist thinking and nihilism which have been generated by the pursuit of these ideals. By facilitating this, process philosophy provides a starting point for confronting environmental problems. However this will require the transformation of these ideals, the way culture is divided into its different realms of discourse, and the meaning of many of the most significant terms in common discourse.

Some idea of what a world founded on process philosophy would be like can be gained from an existing society in which people already conceive the world as a process of becoming, the Fipa of Tanzania.

The Fipa of Tanzania

The Fipa worked out in practice the implications of a process conception of being for life and have embodied this as a habitus. Although they are a relatively small society, they provide an image of a real alternative to the prevailing forms of human life. Their achievements are sufficient to reveal the potential for humanity if such a world-orientation were to be adopted.

Based on an underlying metaphor of the struggle to control a python, the Fipa see the universe as a multidimensional structure bound together through the common theme of a unitary process of the inner darkness of the non-intellectual self and the outer darkness of wild nature being changed by being brought into relation with Fipa humanity, which is itself changed in this never ending process. In this, the development of the individual and human society are seen as interdependent aspects of a single process, central to which is the development of understanding through communication. As the ethnographer of the Fipa, Roy Willis, wrote: 'In speech the self emerges as originator and constructor - of meaning. Which is to say that in the process of verbal communication the human individual achieves self-definition. In the act of giving which is the speech-performance, the giver also receives - of himself.'[2] Through this speech there is a continuous expansion of common understanding which unites humanity. As Willis observed:

> The Fipa intuition of the world and human nature as essentially process... has the consequence that the intellectual picture of the universe is always provisional... Instead of the maintenance and extension of social distinctions and cognitive categories, we find Fipa constantly seeking to subsume existing discriminations and categories within more inclusive and fundamental concepts. The constant expansion of intellectual apprehension into the opaque areas without human society and within the human individual tends to unify the individual and collective experience and transcend differentiating characteristics of human beings and external nature.[3]

To maximise the potential for this communication, the Fipa have organized their villages in concentrated, but formally unstructured settlements which increases physical proximity between people.

However it is not only through speech that the individual achieves self-definition. It is also achieved through the work by which nature is continually in the process of being domesticated. The inspiration to work is neither simply self-interest nor moral obligation, since Fipa see themselves as participants in a community of reciprocal interests. This view of things has produced a strong work ethic, but it is very different from the work ethic developed in Western Europe. Willis contrasted the two:

> Calvinism partakes of the dualism inherent in Western culture in opposing its ultimate value, the spiritual salvation of the individual, to the individual's social action in the world, which is seen as a means to this ultimate end. This dualism, is, however, transformed by historical development into its opposite, in which a dominant rational materialism encroaches into a diminishing area of human 'spiritual autonomy'. In contrast the monistic Fipa world view sees the development of the individual and human society as interdependent aspects of a single life process; there is thus no possibility of a structural transformation of the Fipa world view towards a domination of human beings by reified abstractions, such as Western man has notoriously suffered. Instead we see, in

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2. Roy Willis, *Man and Beast*, Frogmore, Paladin, 1975, p.89.

3. Ibid. p.123.

> the nineteenth century apogee of Fipa culture, peace and industry in association not with a grim-faced Puritanism but with a vivacious and sociable populace.[4]

While this work ethic involves a striving for control over life, the aim is not to subjugate the world. The idea of reducing nature to a mechanical order is totally alien to the Fipa. The process of domestication of the world is an unending one. As Willis pointed out: 'The python image represents an immortal antagonist without and within; it also appears as a giver and creator of life... meaning emerges endlessly from the process of interaction between the known and the unknown, intellect and force, familiar and strange.'[5] The Fipa have never believed they could transcend this becoming. As one of their sayings points out, while you are making your clothes, the clothes you are wearing are wearing out.

The Fipa notion of human community as in the process of becoming has led to a refusal to make blanket judgements about foreign ethnic groups or to judge individuals by the external marks of ethnic identity, and by the recognition of strangers as potential contributors to the on-going dialogue by which community is formed. On the other hand when they have been attacked, the Fipa have responded courageously. In the nineteenth century they were sandwiched between two expansionist African imperialisms, Bemba and Nyamwezi. They willingly made the sacrifices necessary for self-defence, but did not develop a chauvinistic hostility to their opponents. They combined 'the maintenance of territorial security through a strong military force with a consistently non-aggressive foreign policy.'[6]

The explanation for the extraordinary qualities of the Fipa lies in their way of conceiving themselves. Willis considered the possibility that Fipa society could be explained in terms of environmental conditions, but pointed out that the Nyamwezi who live in a similar physical environment and have a similar millet based economic system have a different social organization. He concluded: 'Our analysis leads us to suppose that these facts reflect basic values projected by the structure of Fipa cosmology, rather than any innate ethical superiority in Fipa humanity.'[7]

From Instrumental to Creative Rationality

To begin the reorientation involved in conceiving humanity as a creative participant in the becoming of the world it is necessary to reconceive the nature of human action. The concepts in terms of which people have come to define themselves are such as to make it difficult to conceive of effective action which is not based on treating nature and people as mere instruments, as things to be dominated. Thus Habermas argued in opposition to Marcuse's proposal for a non-oppressive science and technology: 'The idea of a New Science will not stand up to logical scrutiny any more than that of a New Technology, if indeed science is to retain the meaning of modern science inherently oriented to possible technical control. For this function, as for scientific-technical progress in general, there is no more "humane" substitute.'[8] Process philosophy has provided the basis for a new science. It will now be shown how it can provide the basis for a new conception of action and technology.

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4. Ibid. p.127.

5. Ibid. p.124.

6. Ibid. p.127.

7. Ibid. p.127.

8. Jürgen Habermas, *Toward a Rational Society*, tr. Jeremy J. Shapiro, London: Heinemann, 1971, p.88. This conviction underlies all Habermas's work.

People comprehend the world and define their situations by means of concepts. Most of these concepts are simultaneously evaluative and descriptive. 'Yellow' is unusual in being merely descriptive, while 'good' is very unusual in being purely evaluative. Concepts, such as 'chair', 'table', and 'boat', evaluate as they describe.[9] To refer to something as a chair, for instance, is to designate it as something good to sit on. There are also evaluative concepts which define people, their relationships and their actions or activities, and the basic structure of the ethical process through which people accord and are accorded recognition, are respected or disdained, is an order of such concepts. For instance the concept of 'ship's captain' is not only linked to other concepts (such as 'ship', 'shipping company', 'crew', 'cargo', 'passengers'), facilitating the achievement of a common orientation, the coordination of action and the creation and sustaining of organizations and institutions by defining ends to be achieved and revealing how to achieve these, but also implies status and what actions are appropriate for justifying this status. If someone is a ship's captain, he ought to maintain order on ship, ensure the ship's safety, and so on, even under adverse circumstances. There are also concepts, including the concept of 'concept', which enable individuals to reflect on and evaluate the adequacy of the concepts and conceptually constituted social processes within which they are participating. The concept of 'good' is the most important of these.

Such concepts are underpinned, though not necessarily in an entirely coherent way, by more basic concepts and by the general world-orientation dominating society. In capitalism it is through money that people, roles and actions are designated as significant. The role of captain is important because ships make a profit, which means that it is worth exchanging money for labour-power which can function in the role of captain. The status of money in society in turn is sustained by the conception of humans as egoistic individuals who only enter into association with others because it is in their selfish interests to do so, and by the notion of economic progress as improved efficiency engendered by the struggle between egoists mediated by a monetary economy. 'Economic progress' is then sustained in a broader context in which it is seen as part of 'evolutionary progress'.

Practical reason is essentially bound up with such concepts, and always involves simultaneous participation in each of the dialectical processes of culture. People act by defining themselves within situations or negotiating such definitions in terms of the concepts available to them and then responding to the experienced claims made by these situations upon them by formulating projects which they then strive to realize. This generally involves acting in accordance with the implications of these concepts, becoming through their actions and achievements what they have defined themselves as being. For instance ships' captains are expected to put the safety of their passengers before themselves. For a captain to define such a situation involves experiencing this claim upon him calling for the appropriate action. The captain who subordinates his concern for his own safety to that of his passengers in a situation of great danger thereby becomes a 'real' captain. To fail to so act would be to become a coward, and thereby a 'poor excuse' for a captain. Simultaneously, people are defining themselves through narratives: as unfinished autobiographies formulated in terms of such conceptually defined roles and evaluations, relating themselves, their histories and their ambitions and projects to the unfinished biographies of others and to the histories and goals of social formations - from families to civilizations, which are also constituted by such concepts and narratives.[10]

Such autobiographical, biographical and historical self-definition is generally defined in relation to some general ideal of good order in the world. The ideal in most business enterprises in Western countries is to control everything, to make everything, both nature

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9. This point has been well made by Julius Kovesi in *Moral Notions*, London: Routledge & Kegan Paul, 1967.

10. David Carr has analysed the close relationship between the structure of human action organized by projects and the structure of narratives in *Time, Narrative, and History*, Bloomington: Indiana University Press, 1986.

and people, serve as predictable instruments for achieving extrinsically defined ends.[11] This ideal is an expression of the metaphor of a machine. In all machines the whole is explained by the motion of the parts, while at the same time parts and their movements are evaluated according to their degree of subordinated to the ends to be achieved by the machine. The actions of a ship's captain should be directed towards the subordination of both himself, the crew and the ship to the goal of transporting cargo or passengers, moving them from one location to another. It is by virtue of the efficiency achieved by such subordination that economic enterprises are seen to maximize profits and so survive, grow and to contribute to economic progress - essentially the total instrumentalization of the world for the maximum production of commodities.

This is not to say that people function as cyphers of their cultures, acting out the logical implications of concepts embodied in institutions and society. Fulfilling the expectations made upon them requires effort, and people succeed in mobilizing themselves to different degrees. As Aristotle argued, the degree of success is largely a function of upbringing, of how habits have been inculcated in people. People embody ways of conceiving the world and orientations for action as a habitus. They must then struggle to maintain the integrity of this habitus in an active world shared with others, and there is an inevitable creativity involved in the application of concepts to new situations, in the negotiation of shared definitions, and in the way individuals relate to the organizations of which they are part and to their own actions. As social beings choice is almost unavoidable because people are active in different roles which make competing claims upon them (for instance, in being both a ship's captain and a father), there is almost always a dissonance between conceptualizations pertaining to spatio-temporally broader contexts and those associated with more immediate situations which must be reconciled (such as between factors pertaining to honour and those pertaining to physical well-being), words can be understood differently by different 'reference groups', there are always rival ways of conceptualizing the world and rival definitions of each situation and of each organization and institution, and there are always contradictions in the culture with which individuals must come to terms (for instance between the ideal of getting rich and the ideal of upholding the standards of one's profession). Also, it is to some extent open to individuals to decide which others and whose definitions of reality and of themselves they will take seriously, and which of their actions to identify with - whether to regard particular actions as fully expressing what they are, as means to be able to do what they most identify with, or as merely play-acting. Finally, concepts define reality in opposition to other possibilities, and in doing so reveal these possibilities, thereby freeing individuals to reject all claims made upon them by situations as conventionally defined simply to express their autonomy.

Beyond this, concepts are never entirely adequate to grasp or define the complexity and emergent novelty of the experienced world. It is possible that all proposed definitions of reality are radically defective, and people may experience all sorts of meanings and engender effects, either within themselves, in others or in the world, which are unanticipated and incomprehensible in terms of the concepts by which they have defined the world and themselves. In response to such situations people are able to critically reflect on received ways of understanding the world and to redefine old or develop new concepts, and by defining social relations in terms of these concepts, to bring into life new social forms. This is what occurred both when law and when money were first instituted. By instituting 'law' in the early Middle Ages as a signification having a common meaning, it became possible to

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11. On how this ideal is put into practice in ITT under the management of Harold S. Geneen see Richard Tanner Pascale and Anthony G. Athos, *The Art of Japanese Management*, [1981] Harmondsworth: Penguin, 1986, Ch.3. This is contrasted unfavourably with Japanese management practices as exemplified by Matsushita (based on a world-orientation closer to process philosophy).

reformulate social relations, to see in social conditions the need for legal codification and alteration, and then to institute a manifold of reorganizations, redeterminations and reformations of already present social significations in society.[12] The same sort of process occurred with the introduction of money - and we are still wintering the extension of the commodity form associated with this institution. Such reconceptualizations are not confined to social relations. When nature came to be defined as an economic resource, a whole new set of relations between humanity and the world was brought into being.

In earlier chapters it was shown how environmental problems within Western civilization have revealed the radically defective nature of the concepts institutionalized or 'incorporated' within it. Having established an alternative metaphysical basis for understanding the world, and thereby having provided an alternative thematic motif to unify culture, these defective concepts can be replaced by alternatives which explicitly acknowledge the creativity involved in human becoming and the becoming of the rest of nature. When the world is conceived of in terms of an auditory analogy as a durational process of becoming, the end can no longer be thought of as what comes at the end of history. The good to be aimed at by individuals and society must pertain to the whole duration of becoming, whether this be of an individual's life, of a society, of humanity, or of nature.[13] If the notion of progress is maintained, then this must be understood in relation to the improvement of the spatial and temporal whole, just as each instrument and each note or melody in a symphony must be evaluated by a composer in terms of both its intrinsic quality and whether it contributes to the whole piece of music. This is inimical to the reduction of any part or any stage in this extensive durational becoming to a mere means to an end to come later. The nihilism which, as Nietzsche noted, is the eventual outcome of such an instrumentalization of the present, of defining the significance of life in terms of a purpose to be realized in the future - which is forever put off and which eventually fades into nothingness, is thereby avoided.[14] This change in thinking must be articulated into everyday life, into interpersonal relations, and into productive activity. It is no longer acceptable to think of action in terms of a sharp division between means and ends; defining situations and acting on the basis of such definitions, but must be seen as self-creation, a contribution to the world along with the end products of such activity.[15] And the end products of activities themselves must not be taken as what is valuable in action, but, as Marx argued in the *Grundrisse*, as new potentialities, the significance of which are only realized in later activity by being consumed, used or appreciated.

This is not to say that all activity is on one plane of becoming. Some activities participate only in short durational processes, while other activities also participate in long durational processes of greater significance to the becoming of the world. But no plane of becoming can be reduced to nothing but an instrument of another (for instance biological becoming to cultural becoming) without corrupting it.

In this scheme of things the instrumentalist notion of rationality must be rejected and replaced with a 'creative rationality'. If the world is a process of becoming consisting of a multiplicity of inter-dependent, semi-autonomous sub-processes of becoming, treating it as a collection of predictable objects to be used efficiently is to fail to acknowledge the reality of creative becoming and of the processes which maintain the ordered potentialities which

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12. The creative emergence involved in this has been stressed by Cornelius Castoriadis; in *The Imaginary Institution of Society*, tr. Kathleen McLaughlin, Cambridge: Polity Press, 1987.

13. This extends Aristotle's argument in the *Nicomachean Ethics* that 'Happiness ... requires ... a complete lifetime.' 1100a4-5. Also 1098a18.

14. See Friedrich Nietzsche, *The Will to Power*, §666.

15. Cornelius Castoriadis has argued for such a change in the concept of technique in *Crossroads in the Labyrinth*, [1978] tr. Kate Soper and Martin H. Ryle, Brighton: Harvester, 1984, pp.229-259.

people identify as objects. It involves a failure to see that one's projects, or one's society's projects, are at the same time part of the becoming, or at least affect the conditions for becoming, of other processes with some autonomy of their own, and that one, or one's society, can be a constituent of these processes. By contrast creative rationality involves recognizing that in one's thoughts and actions one is creating oneself as a participant in the becoming of a world consisting of self-creating processes with various degrees of autonomy, stability and dependence. In defining the world in terms of concepts one has consciously committed oneself to, one is forming a relationship and thereby contributing to the world's becoming. To conceive the world as a mere instrument is in fact to create a relationship between oneself and the rest of the world which debases it to a mere instrument; a debasement which is likely to have unforeseen and unfortunate consequences. Practical rationality must be understood in relation to such defining, as establishing a 'ratio' between each situation defined and the rest of the world, between the concepts in terms of which the world is defined and rival concepts, and between the different projects revealed as possible through defining situations in terms of these concepts. Being rational is deliberately defining the world and the potentialities and significance of the co-becoming participants associated with one's own self-creation in terms of the most discursively defensible concepts presently available, and acting accordingly, thereby 'realizing' these concepts in one's action and life. This requires a recognition of the continuously creative nature of this becoming in which one is participating, and of the possibility and the likelihood of emergent novelty. So rather than treating actions, objects and events as simply means for attaining distant ends, actions must always be seen as changing the conditions for the becoming of processes in the future, opening up and closing off different potentialities of one's own and of other processes.

Once rationality is understood as creative rather than as instrumental, the idea of power and control can be redefined, and it can be seen to make sense to say that total control is not a desired end. Gaining total control over the world would mean destroying its autonomy and creativity. For instance it is imaginable (although highly unlikely) that the self-regulating and creative dynamics of the world ecosystem by which its stability is maintained could be replaced by artificial mechanisms - and in fact it was seen in a previous chapter that some Soviet thinkers called for such control. This would mean that the continued survival of humanity and other life forms in the world would be dependent on the continual monitoring and manipulation by humans of the conditions required for this survival. On a smaller scale this is in fact the situation which has been produced with the development of forms of agriculture which are dependent on farmers to continually control levels of water and fertilizer and to administer pesticides. This is the enslavement of people to their control mechanisms rather than an augmentation of their power. It is better to live in a world which is not under such instrumental control, which has dynamics of its own to maintain the conditions favourable to human life.[16] The control to be aimed at by creative rationality then should not be seen as the reduction of the world to a mechanical order to serve human purposes, but as the creation of the structures which will facilitate the shaping by people of their lives. To have power is to have the means to develop ones understanding of the world and oneself, and to be situated within structures through which this understanding can be spontaneously and creatively expressed.

It is in terms of these new notions of action, of rationality, of progress and of power or control that ethics, political philosophy and the struggle for the liberation of life must be reformulated.

A New Ethics

16. This point has been well argued by Stephen R.L. Clark in 'Gaia and the Forms of Life' in Robert Elliot and Arran Gare, *Environmental Philosophy*, St. Lucia: University of Queensland Press, 1983, pp.182-200.

In the epilogue to *The Phenomenon of Life*, Hans Jonas argued that:

> Ontology as the ground of ethics was the original tenet of philosophy. Their divorce, which is the divorce of the "objective" and "subjective" realms, is the modern destiny. Their reunion can be effected, if at all, only from the "objective" end, that is to say, through a revision of the idea of nature. And it is becoming rather than abiding nature which would hold out any such promise.[17]

In this work such a reunion has been attempted by defending and elaborating a process view of the world, of life and humanity. The implications of this reunion for ethics can now be spelt out.

In formulating ethics in terms of process philosophy, the very nature of ethics must be reconceived. Within the framework of mechanistic materialism the individual consciousness is seen as an inexplicable intrusion into a meaningless world of moving matter. Almost all ethical thought since the seventeenth century has been coloured by this way of viewing things. Consequently ethics has come to be conceived in terms of an opposition between self-interest understood as the natural tendency of a self-reproducing mechanism to reduce everything to instruments for its survival and for the satisfaction of its appetites, and morality conceived of as constraints designed to avoid the destructive consequences of this egoism, justified by the reason or feelings of individual subjects. For the most part, this has led to the separation of ethics from other realms of discourse and to an almost exclusive concern with the rightness or wrongness of particular actions or kinds of action. With the conception of humans as creating themselves through appropriating and developing their cultural heritage it should be clear just how pathological is a society which assumes that people are moved by appetites and aversions and which takes concern for others as problematic. A process view of the world justies a reversion to the more embracing conception of ethics of Plato and Aristotle. It situates people as creative processes of becoming within a meaningful natural, cultural and social world and focusses attention what kind of life should be lived within this world. The fundamental ethical questions become: What is a good life? What sort of contribution is it best to make to the unfinished becoming of culture, society, humanity and the world? What sort of being is it most worthwhile for individuals to strive to become? Hence, ethical action cannot be treated separately from economic or political action. Furthermore it is not sufficient to provide merely abstract determinations of what is the good life. People are always already participating in an institutionalized moral order which defines the significance of their actions and lives, and it is necessary that this be taken as a starting point. Ethical theory must concern itself with the way people and actions are accorded recognition and respect or disdain within society, with how structures of recognition are maintained and how they can be changed. Ethics immediately raises the political question: Does the existing social order, including the structures of recognition sustained by it and sustaining it, facilitate the attainment of the highest forms of life? Ethical philosophy cannot be detached from political philosophy, or from economic, social or political science.

If it is possible to give a simple answer to the question What is a good life? it would be 'a fulfilling (or fulfilled) life'. But what is a fulfilling life? No one could possibly think of his or her life as fulfilling unless it had some meaning.[18] As Nietzsche succinctly put it: 'If we have the why of life, we can put up with almost any how. Men do not strive for happiness;

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17. Hans Jonas, *The Phenomenon of Life: Towards a Philosophical Biology*, [1966] Chicago: University of Chicago Press, p.283.

18. As Viktor Frankl has argued in *Man's Search for Meaning*, N.Y.: Pocket Books, 1984.

only Englishmen do that.'[19] Process philosophy allows that the world and people's lives as part of this world can have meaning. Through their participation in the dialectics of orientation, recognition and power, through their struggle to understand the world and their place within it, to achieve relationships of mutual recognition, and to gain control over their destinies and to live according to their convictions, people are becoming part of a temporal order transcending their organic existence, thereby raising the immediacy of their situations to a different plane of becoming to achieve identities as significant human beings within the world. Such a conception of humans implies an abandonment of the opposition between self-interest and social responsibility. The self only emerges through relations to others, and these social conditions are logically prior to self-interest. Self-formation and commitment to others are indissociable. As Rabbi Hillel put it:

> If I am not for myself, who will be for me?
> If I am for myself only, what am I?
> If not now, when?

Assuming a process world-orientation in which the becoming of humanity is understood in terms of a creative rationality, the project of finding algorithms for deciding correct courses of action must be abandoned. What is required is a return to the ethics of virtues, as called for by Alasdair MacIntyre,[20] with the main task being the development of a framework of concepts, defining what is virtuous and vicious, by which people can orient themselves in their self-creation. Such a framework can be developed by taking existing concepts and redefining them to accord with a process world-orientation. As defining the quality of actions or of life these are not to be conceived of as imperatives in the sense of constraints on self-interest, but modes of being or becoming required to live a good life. At the same time these should not be seen only in relation to individuals, but should be seen as candidates for defining a new moral order. Three concepts in particular can be redefined and developed for this purpose: justice, duty and integrity.

Justice and Injustice

Justice can be defined as the appropriate recognition and acknowledgement, in action, thought and feeling, of the nature and thereby the meaning and significance of all beings and the relationships between them. This is a development of the ancient Greek notion of justice rejected by Plato. More particularly it is a development of the ethical philosophy of William Wollaston as formulated in *The Religion of Nature*. Wollaston argued: 'That whoever acts as if things were so, or not so, doth by his acts declare, that they are so, or not so; as plainly as he could by words, and with more reality.' and that: 'No act (whether word or deed) of any being, to whom moral good or evil are imputable, that interferes with any true proposition, or denies any thing to be as it is, can be right.'[21] For instance to punish a person who is innocent is, by that action, to imply that the person is guilty. This contradicts the true state of affairs and is therefore wrong. Injustice, as a failure to acknowledge the nature and significance of beings affected by one's actions, always involves such falsehoods.

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19. Friedrich Nietzsche, *Twilight of the Idols*, [1889] tr. R.J. Hollingdale, Harmondsworth: Penguin, 1968, 'Maxims and Arrows', §12.

20. Alasdair MacIntyre, *After Virtue*, 2nd ed. Notre Dame: University of Notre Dame Press, 1984.

21. William Wollaston, 'The Religion of Nature Delineated', Section I, 1025-6 in L.A. Selby-Bigge ed. *British Moralists*, Oxford, Clarendon Press, 1897, p.362. For an account of the misrepresentations of Wollaston see Joel Feinberg, 'Wollaston and his Critics', *Journal of the History of Ideas*, Vol.XXXVIII, No.2, 1977, pp.345-352.

Similarly, to take the property of another without reason is by that action to define the other's property as one's own, denying the true state of affairs.

However justice should not be thought to pertain only to action. It should extend to what is thought and what is felt. Injustices are committed merely by failing to recognize the true nature of beings, quite independent of any action towards them - which is why clearing the name of a dead person can be a legitimate struggle for justice. Drawing out the implications of this, justice requires of people that they critically examine their conceptions of the world, particularly those conceptions which are institutionalized, to ensure that they do justice to everything. Then it is necessary to have the appropriate emotional responses to be just. To take pleasure in the undeserved failure of another, or to resent their deserved success, is also unjust. And considered as a virtue, being just requires the capacity to work out compromises between opposing claims of justice, and to give equal consideration to and to keep everything involved in situations in proportion. As the ancient Greeks recognized, proportion or balance (*sophrosyne*) is of paramount importance for justice. Without such proportion, the quest for justice can easily turn into oppression. Yet it is impossible to provide purely formal criteria for achieving such balance.

This notion of justice captures the essence of rival theories of justice without being reducible to them. It acknowledges Plato's view of justice as each thing keeping to its appropriate place since this must follow from actions based on the appropriate recognition of all beings and the relationships between them. It encompasses Aristotle's definition of justice as that which preserves and promotes the well-being of the social and political community,[22] and it accords with Thomas Aquinas' definition of justice as 'a habit whereby a man renders to each one his due by a constant and perpetual will.'[23] Rights claims associated with contracts, explicitly formulated or implied, can be acknowledged as part of justice as defined above, as can non-contractually based legal rights; but these cannot be the whole of it. If contracts are made, these must be recognized by relevant actors, but claims for justice can still be made upon people without contracts having been made, while legal rights other than contracts must be embedded in some notion of justice transcending the notion of rights to have any moral force. Kant's criterion for defining justice, i.e., that: 'Every action is just that in itself or in its maxim is such that the freedom of the will of each can coexist together with the freedom of everyone in accordance with a universal law'[24] can also be acknowledged to have some validity. However it provides only the negative conditions for freedom. Such a formalistic criterion based on the acceptance of a total separation between knowledge about the nature of the world and practical reason, cannot capture every aspect of justice.

Justice so conceived goes beyond these doctrines, requiring of people sensitivity, consideration, imagination and compassion to understand the situations and perspectives of other beings - whether human or non-human, and breadth of understanding to appreciate the past causes and present dynamics responsible for existing conditions and to appreciate all the effects of actions. It also requires insight to avoid the distorting effects of self-interest, jealousy, resentment, malice, envy, arrogance and laziness, of projecting onto others the dissociated elements of oneself or one's group, of transferring onto others one's past forms of personal or social relationships, of using unjust acts of others to legitimate one's own injustices, of defining others to effect rigid boundaries in group experience, and so on.[25]

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22. Aristotle, *Nicomachean Ethics*, Bk V, 1129b18-19.

23. Thomas Aquinas, *The Summa Theologica*, II-II, Question 58.

24. Immanuel Kant, *The Metaphysical Elements of Justice*, [1797] tr. John Ladd, Indianapolis: Bobbs Merrill, 1965, p.35.

25. Projection and transference are recognized by psycho-analysts as playing a major role in psychodynamics. However they are just as pervasive in the cultural dynamics of groups, as for instance when powerful, aggressive nations see quite powerless nations as threatening their security. The phenomenon and consequences of maintaining strong experiential boundaries have

And it requires judgement to balance different claims to justice, taking into account different social pressures to distort judgements.

It is the notion of justice which Simone Weil upheld when she pointed out the radical difference between calls for justice and assertions of rights.[26] The connotations of claims to rights reveals the meaning context within which the modern concept of rights was developed, a society of egoistic individuals in commercial relationships.[27] To call for justice for oneself, on the other hand, is to request that what one is, what one's situation in the world is, what are one's needs, what one has suffered, what efforts one has made and what are one's potentialities, particularly one's potentialities to be hurt on the one hand, and on the other to contribute to 'the common good of one's communities',[28] be understood in all their uniqueness, appreciated, and taken fully into account. Similarly when calling for justice for other people, for one's community or for other life forms. And while demands for rights are assertions of the primacy of the individual over the community, calls for justice affirm the reality of community, including the community of members of ecosystems. As John Finnis has pointed out: 'the objective of justice is ... the common good, the flourishing of all members of the community'.[29] To ignore a claim to a right is an offence against the individual only; to ignore a claim to justice is an offence against the entire community.

A number of points have been raised against Wollaston's views, and to defend the notion of justice presented it is necessary that these be examined. Joel Feinberg argued that Wollaston has provided no basis for distinguishing the significance of the falsehoods implied by different actions.[30] For instance no distinction is drawn between treating a person as a post and treating a post as a person. While the latter might appear inappropriate, it would not appear to be morally wrong except where such treatment resulted in failure to act appropriately elsewhere. For this reason it is necessary to have an underlying epistemology and ontology which allows for distinctions of significance to be made between kinds of beings. This was provided by the philosophies of Plato and Aristotle, but not by empiricism and mechanistic materialism. However process philosophy also provides a basis for such judgements. Where knowledge implies understanding, that is, 'indwelling' in the world and in the specific entities understood, and these entities are understood as processes of becoming, it is impossible to understand the world without appreciating its intrinsic significance and of each entity within it, of the differences between non-life and life, between plant life and animal life, and between animal life and human life; and thereby the difference between action on a post and action on a person. This does not mean that the conception of entities (humans, organisms or ecosystems) following from a process world-orientation enables people to deduce in any but a general way how people should act towards them. Rather, as explanations within the sciences are not determined by metaphysical assumptions but are only acceptable if they are intelligible in terms of generally defensible metaphysical schemes, so the more particular concepts by which people define their situations and orient themselves for action are only just if they accord with the basic nature of entities as comprehended in terms of the most defensible metaphysical scheme. Thus, practices or actions which conceive people as mere objects to be manipulated or as nothing but labour power to be bought and sold, deny people their essential humanity.

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been described by Mary Douglas; in *Purity and Danger: An analysis of the Concepts of Pollution and Taboo*, London: Routledge & Kegan and Paul, 1966.

26. See p.46 of this work.

27. The evolution of the Roman and medieval notion of *'jus*' to the notion of 'right' developed by Hobbes, from 'the fair' to 'a liberty to do something', is described by John Finnis in *Natural Law and Natural Rights*, Oxford: Clarendon, 1984, p.206ff.

28. Ibid. p.164.

29. Ibid. p.174.

30. Joel Feinberg, 'Wollaston and his Critics', *Journal of the History of Ideas*, Vol.XXXVIII, No.2, 1977, pp.345-352.

From the perspective of process philosophy, they do not do justice to their potentialities and are therefore unjust.

An older argument against Wollaston comes from Hume who argued that:

> ...there is an evident reasoning in a circle. A person who takes possession of *another's* goods and uses them as his *own* in a manner declares them to be his own, and this falshood [sic] is the source of the immorality of injustice. But is property, or right, or obligation intelligible without an antecedent morality?[31]

But assuming a pre-existing morality is not a problem in itself. All human activity and ethical theorising originates from within a cultural tradition containing a moral order. This was only seen as a problem as such by Hume because of his basic commitment to a view of humans according to which the existence of such an order is unintelligible. However Hume has pointed to a real difficulty with Wollaston's approach: that he has provided no basis for critically evaluating the received moral order or for resolving conflicts between opposing ways of conceiving things. But again, by defending a dialectical theory of knowledge in opposition to both logical empiricism and relativism, construing the goal of enquiry as understanding, and providing a theory of being which allows that beings in the world have different significance and that humans have potentialities worth realizing, such a basis is provided. If there is any dispute over evaluative ethical concepts, the dialectical approach implies that it is enough to settle arguments that reasons can be provided to convince people to choose between accepting or rejecting their validity, or that one definition or application is superior to another, while the process view of the world provides a framework and ultimate reference point for such arguments. Ultimately, dispute resolution requires the construction of a narrative from the perspective of one ethical position which reveals both the achievements and failings of rival ethical positions.

On such a basis it is also possible to criticise the institutions of society for being unjust. While forms of life which ascribe property rights in such a way that nature is reduced to a mere instrument and people are defined in terms of their ownership of property can be regarded as just if the world is nothing but a Darwinian struggle for survival, these must be condemned as unjust if the process view of evolution is successfully defended. All life forms must then be ascribed intrinsic significance with a dynamics of their own which should be respected, and people treated as creative processes of becoming with the potential to form communities based on mutual recognition of each other's significance. Similarly, if socio-biologists are right then it is proper to maintain gender relations which deny 'femininity' and thereby respect to women who strive to develop their full potential to participate in economic, political and cultural life, but totally unjust if the process view of humans is correct. Such institutional criticism is central to Marx's *Capital* where the categories defining right economic behaviour and constituting the forms of life in capitalist society were implicitly, but nevertheless savagely criticised on the basis that they define humans, who Marx conceived to be creative social beings, as nothing but labour power to be bought and sold as a commodity. Marx's analysis provides a model for further critiques, particularly of the assumption by economic institutions of economic categories which do not do justice to nature, to those excluded from the economic system and to future generations. A socio-economic formation in which nature and people are defined by institutions as nothing but resources to be used efficiently is essentially unjust.

Duty and Corruption

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31. David Hume, *A Treatise of Human Nature*, London: Dent, 1962, Bk III, Pt. 1, Sec. 1, Vol.2, p.171n.

This brings us to the notions of duty and corruption. Most of the more important actions within societies are undertaken by people acting in the context of and as representatives of traditions, institutions and organizations. These always embody ways of defining the world, ideals and goals to be striven for; and institutional roles are defined in relation to these. The most important ethical concepts in relation to traditions and institutional or organizational behaviour are those of duty and corruption. In accordance with process philosophy the notions of duty and dutiful can be redefined to imply a less moralistic and more activist stance than is usual. 'Duty' has unfortunate connotations of being an obligation which must over-ride self-interest. To avoid this, duty can be redefined as the behaviour required to become a 'real' member of one's profession and the traditions which uphold these (for example, putting one's passengers before oneself to become a real ship's captain), with what is required extended to taking responsibility for the traditions and institutions within which one is participating. Rather than 'dutiful' simply defining individuals as those who fulfil, or at least strive to fulfil, the expectations of their roles, it can be redefined to require that they also appreciate the traditions (including their histories) sustaining their institutions and organizations and understand or strive to understand and evaluate the significance of their roles within these.

'Corruption' can be defined as the failure of people to do their duty. Action as a participant in an institution or organization and as part of a tradition is corrupt not only when just role expectations are not conformed to, but also when these role expectations and the goals and ideals of the institution or organization have not been questioned by individuals. Action deliberately not conforming to role expectations and institutional or organizational ideals and goals which are seen as unjust is not corruption but subversion. The ideals and goals of institutions and organizations are always open to revision, and there should be constant arguments between different people, acknowledging the traditions they have inherited, to define or redefine their ideals and goals. It is such arguments which constitute traditions. As MacIntyre put it: "A living tradition ... is an historically extended, socially embodied argument, and an argument precisely in part about the goods which constitute that tradition."[32] Subversion can at the same time be upholding traditions by constructive reformulation of institutions or organizations around revised or different ways of conceiving the world and around reformulated ideals and goals.

Integrity and its lack

Finally we come to the concept of integrity. Integrity means wholeness. It is the measure of the coherence or 'narrative unity' one's life gains through striving as far as one's abilities will allow to be just to the world and to oneself in action, thought and feelings as a member of traditions, institutions and organizations, and through one's commitment to justice however adverse the circumstances.

Justice, duty and integrity are closely related concepts. While integrity requires that one do one's duty, doing one's duty requires that one act justly. But the notion of justice pertains not only to one's relationships others, but also to oneself. To do oneself justice one must accord in thought and practice appropriate recognition of what one is, of one's human nature, of one's needs, of one's appetites and aversions and of one's unique abilities. This requires the appropriation and participation in the development of one's cultural heritage, including one's traditions, institutions and organizations, the fullest possible development of one's understanding and awareness of the world, of oneself and of one's particular situation and that of the institutions and organizations within which one is participating, and action on

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[32] Alasdair MacIntyre, *After Virtue*, 2nd ed., Notre Dame: Notre Dame University Press, 1984, p.222.

this basis to make the fullest contribution to the becoming of the world. Succeeding in this, creating in oneself in the duration of one's lifetime a process of objective significance, is achieving integrity.

Since a life of integrity is a genuine form of emergence within the world involving the coming into being of emergent constraints not in the physical, biological, cultural or social world, it is not easy to convey an understanding of what it is to live such a life. Perhaps one of the best efforts in this direction was made by Erik Erikson who wrote of the person with integrity:

> Although aware of the relativity of all the various life styles which have given meaning to human striving, the possessor of integrity is ready to defend the dignity of his own style against all physical and economic threats. For he knows that an individual life is the accidental coincidence of but one life cycle with but one segment of history; and that for him all human integrity stands or falls with the one style of integrity of which he partakes.[33]

However this needs to be complemented by an account of what it means to lack integrity. This has been superbly characterized by Miroslav Holub in his poem *Polonius*:[34]

Behind every arras
he does his duty
unswervingly.
Walls are his ears,
keyholes his eyes.

He slinks up the stairs,
oozes from the ceiling,
floats through the door
ready to give evidence,
prove what is proven.
stab with a needle
or pin on an order.

His poems always rhyme,
his brush is dipped in honey,
his music flutes
from marzipan and cane.

You buy him
by weight, boneless,
a pound of wax flesh,
a pound of mousy philosophy,
a pound of jellied
flunkey.

And when he's sold out
and the left-overs wrapped
in a tasselled obituary,

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33. Erik H. Erikson, *Childhood and Society*, [1965] Frogmore: Triad/Paladin, 1977, p.241f.

34. From *Miroslav Holub: Selected Poems*: tr. Ian Milner and George Theiner, Harmondsworth: Penguin, p.73f.

a paranoid funeral notice,

and when the spore-creating mould
of memory
covers him over,
when he falls
arse-first to the stars,

the whole continent will be lighter,
earth's axis straighten up
and in night's thunderous arena
a bird will chirp in gratitude.

Unlike the notion of self-actualization, integrity cannot be construed to justify treating the rest of the world as a means to one's own development. In this regard the process view of integrity is entirely in accordance with the ideas of Viktor Frankl who argued:

> By declaring that man is a responsible creature and must actualize the potential meaning of his life, I wish to stress that the true meaning of life is to be found in the world rather than with man or his own psyche, as though it were a closed system. By the same token, the real aim of human existence cannot be found in what is called self-actualization. Human existence is essentially self-transcendence rather than self-actualization.[35]

While integrity involves developing one's potentialities, this must be in response to the claims of the world upon one, as a significant contribution to the becoming of a world which must be understood, both in practice and on reflection, to have a significance beyond one's own life. The aim in life should be to find a goal worthy of one's abilities.

As noted, the quest for integrity is always undertaken in a world of institutions with pre-defined roles, ideals and goals, and in such institutional contexts, integrity and duty are indissociable. Institutionalized roles embody ideals, and some minimal integrity is required to live up to these ideals in the face of outside pressures or in the face of problematic situations. However such embodied ideals may be indefensible, and questioning these ideals and living one's life according to one's judgements, struggling against the pressures of established definitions and enduring the ensuing retribution, social invalidation and hardship, requires considerable courage, effort and fortitude. Acting and living with integrity requires a struggle for self-mastery, strength of character and the cultivation of that strength. It requires the development of the ability to measure oneself not against those around one but against the 'generalized other', perhaps totally unembodied in the present, at least among one's acquaintances, and then to live according to this measure despite the opinions of those around one.

The impulse to achieve integrity can be identified with conscience. The etymological meaning of conscience is 'with knowledge' or 'with deliberation' and implies the claim of the world revealed by understanding and deliberation. In relation to the 'court of conscience' of the casuists in the Middle Ages it was associated with the effort to direct action in accordance with the fullest possible knowledge. With the Reformation, conscience was internalized as a part of the heroic moralism of Western culture. This conscience reached its highest development in the ethical thought of Rousseau and Kant. But associated with the advance of nihilism and the decline of this moralism, conscience has been redefined as the subjective experience of constraint produced by the accidents of one's upbringing. The

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35. Viktor E. Frankl, *Man's Search for Meaning*, [1963] tr. Ilse Lasch, N.Y.: Pocket Books, 1984, p.175.

notion of conscience, like that of integrity, seldom enters into the discourse of moral philosophers. With process philosophy both the rational, emotional and the social dimensions to conscience are restored. It can be understood as the impulse to live in accordance with justice, to do one's duty and thereby to attain and maintain one's integrity. It is the impulse to become human.

The quality of integrity is a function of the extent of the context people take into consideration in defining themselves and choosing how to live. As Voznesensky wrote in *Antiworlds*:[36]

> In finding their truths, lives vary in daring:
> Worms come through holes and bold men on parabolas.

People who define their lives only in relation to their place of work, a local group or community and who strive for integrity within this context without any concern for the relationship of this community to the rest of the world can achieve only a very limited integrity. The highest degree of integrity requires a struggle to consider what contribution one's life is making not only to one's immediate community, but also to one's society, to humanity, to life itself and the whole of nature, understood not only in terms of one's contemporaries, but also in terms of the entire history and the entire past and future of the world, and then to live in the light of this understanding. Striving for greater integrity involves placing constraints on what one will do and how one will act. It will inevitably make life far more difficult, bringing one into conflict with those around one. It will involve more failures and detours, and in terms of the prevailing criteria, one's life will appear far less successful than it might otherwise be. But then one's life will not be merely an expression of biological processes and cultural and social forces. One will be self-causing and one's life will take on a greater meaning in relation to the broader, longer durational and more significant processes within which one will be authentically participating.

Achieving integrity requires all that justice and duty require - consideration, compassion, sensitivity, imagination and perspective, and almost always - courage. It is by recognizing that one's integrity is one's authentic contribution to the becoming of the world, and seeing one's present life and actions from the perspective of the end of one's life, and one's whole life from the perspective of the totality of the world's becoming, that such courage can be gained. Integrity therefore requires above all else the development of one's understanding of the world and of oneself.

Ethics and the Environment

The concepts of justice, duty, integrity and their opposites finally provide a language for bringing questions about our relations to other life forms, ecosystems and future generations, the relationship between the wealthy and the poor of the world, the nature of built-up environments, and so on, into the realm of rational ethical discourse. It has been argued that underlying the environmental crisis is the domination of Western society by a mechanistic world-orientation, that mechanistic materialism is invalid and that the world can best be understood as a process of creative becoming within which we are semi-autonomous participants. Underlying the environmental crisis is the basic injustice of falsely assuming in the way society is organised, in its major institutions and in people's most important activities, that the world is a mechanical order of things. It is this which Peter Singer was reacting against when he protested against the treating of animals 'like machines that convert

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36. 'Parabolic Ballad', tr. W.H. Auden, from *Antiworlds: Poems by Andrei Voznesensky*, ed. Patricia Blake & Max Hayward, London: O.U.P., 1967, p.49.

low-priced fodder into high-priced flesh...'[37] But this injustice is also evident in treating life forms (individuals, communities, species, ecosystems) as though they existed in isolation without intrinsic significance, rather than as intrinsically valuable participant processes in inter-dependent, self-stabilizing communities and ecosystems. Further injustices are perpetrated by regarding people of other nations or classes as nothing but competitors in a struggle for survival and the poor of the peripheral zones of world economy (along with the unemployed of the core zones) as merely the losers in this struggle, in denying the significance of different cultural traditions throughout the world and seeing them as merely obstacles to 'economic progress', in acting as though future generations were merely the collection of people who might exist in the future, and in creating forms of life which define people as egoists whose ultimate end is nothing more than satisfying their appetites, social climbing and being entertained.

As institutional actors, those who have the courage to re-evaluate the state of the world must confront the corruption of the dominant institutions of society, and then must strive to reorganize them - particularly those associated with the economy. In terms of mechanistic materialism the economy is the circulation of money through which goods and services are exchanged for the factors of production, and progress is anything which increases the number of goods and services involved in this exchange, while in terms of process philosophy the economy of society is its 'household management', the organization of the metabolism of society, especially its interaction with its environment, and progress is improving the conditions for civilization, for the highest forms of relationships between people and for the life of culture, while at the same time preserving and contributing to 'the integrity, stability, and beauty of the biotic community'.[38] It is necessary to evaluate the functioning of the economy according to whether it is based on a just conception of all elements of and in the environment, of the participants in the production process and their relationships, of people of different locations, nations and regions, and of future generations. The economic system of capitalism is based on unjust conceptions of all of these and is having disastrous effects as a consequence.

However the concepts proposed here are not only means to enable people to define what is right and wrong, or even to evaluate institutions. They are proposed as the basis for an alternative moral order and as the foundation for an alternative social order. Part of the function of such a moral order is to enable individuals to define the significance of others and to work out who to align themselves with and who to oppose. But at least as important, especially in the face of a society hostile to one's ideals, an alternative moral order provides one with the means to define the significance of one's own life and actions independently of the opinions of those surrounding one. Environmentalists in the modern world are now in a somewhat similar situation to Hamlet - aware that something is radically wrong but confronted by a general consensus that everything is in order. Herbert Marcuse wrote of the modern condition:

> A comfortable, smooth, reasonable, democratic unfreedom prevails in advanced industrial civilization, a token of technological progress. Indeed, what could be more rational than the suppression of individuality in the mechanization of socially necessary but painful performances; the concentration of individual enterprises in more effective, more productive corporations; the regulation of free competition among unequally

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37. Peter Singer, *Animal Liberation*, N.Y.: Avon Books, 1975, p.94.

38. Aldo Leopold;, *A Sand County Almanac*, Oxford: Oxford University Press, p.224.

> equipped economic subjects; the curtailment of prerogatives and national sovereignties which impede the international organization of resources.[39]

The reasonability of this is vouchsafed by the dominant world-orientation, grounded in the mainstream of science, embodied by individuals as a habitus and in the major institutions of modern society, and providing the concepts which mediate people's relationships and in terms of which they define their goals. Consequently all that appears to be important is the comfort, wealth and entertainment provided by technical progress. But a vast range of apparent problems suggest something is rotten in the state of the world. Examination of each of these problems reveals them to be interconnected, and deeply connected to the mechanistic world-orientation which denies their significance. The situation confronting the affluent is whether to drift through life along the easiest path, or whether to look behind particular problems to their deeper causes and to critically examine the beliefs and attitudes which have come to be taken as self-evidently valid. Ultimately the question is whether they will remain cyphers for prevailing social forces, or whether they will live their lives with integrity. Confronted with this choice, those who have faced up to environmental problems might well sympathise with Hamlet's lament:

> The time is out of joint; O cursed spite,
> That ever I was born to set it right![40]

An alternative moral order based on concepts such as justice, duty and integrity is required to give people the strength to attempt this task and begin the struggle to create a new social order.

Political Philosophy

In the present age the liberal political philosophies on which Western political institutions were originally based have lost their relevance. The development of the world economy with its transnational corporations transcending the control of national governments together with the complexity of and inter-relationships between communities, economic organizations, the consciousness industry and military, legal, penal, educational, welfare and political institutions have left the concepts of liberal democratic thought - 'public realm versus private realm', 'freedom', 'democracy', 'liberty' etc. - virtually without content,[41] while the States of most countries are unable to deal with the social, economic and environmental problems confronting them. This has been recognized by Marxist theorists of the State, but such theorists have simply analysed these problems as 'the crisis of the State'. They have not proposed any solutions. This reflects one of the great defects of Marxism - its absence of a political philosophy.[42] But the conscious regulation of material production according to a settled plan called for by Marx and his followers can only mean that economics should be subordinated to politics. It is the failure by Marxists (apart from

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39. Herbert Marcuse, *One Dimensional Man*, Boston: Beacon Press, 1966, p.1.

40. Shakespeare, *Hamlet*, I.v.188.

41. This is not to say that these concepts do not have rhetorical force; they underlie and are used with considerable effect by the New Right - but not to gain anything which could be called freedom, democracy or liberty, but to effect the subordination of everyone to an international economy dominated by giant transnational financial, manufacturing, and agribusiness organizations.

42. Marx argued that: 'The life-process of society, which is based on the process of material production, does not strip off its mystical veil until it is treated as production by freely associated men, and is consciously regulated by them in accordance with a settled plan.' (*Capital*, Vol.1, Moscow, Progress Publishers, 1974, p.84.) How do these radical individualists settle on a plan?

Habermas and Bobbio) to realize this and to think through its implications which more than anything else is responsible for the Marxist tendency towards authoritarianism.[43] The proposed solution by some anarchists and environmentalists to the failures of both liberal-democratic and Marxist practices - that the State be abolished or ignored and society broken up into small, independent, self-subsistent communities is totally unrealistic in the light of present problems, the present population of the world and the power structures already in existence.[44] As Boris Frankel has cogently argued, what is necessary to confront current problems is not the contraction of States, but their expansion - albeit in a quite different form than at present.[45] The question which must be faced is how to organize political, social and economic institutions and processes so as to decentralize power and avoid the tendencies of organizations to become self-serving at the expense of the people they purport to serve - while still dealing with issues transcending local concerns. The philosophical problem is to reformulate or create new political concepts to enable people to think about the political problems facing the world.

There have been five great political philosophers in European history: Plato, Aristotle, Thomas Aquinas, Hobbes and Hegel. Hobbes was the political philosopher who provided a new starting point to replace the synthesis of Platonic, Aristotelian, Stoic and Judaic thought - of which Aquinas had been the foremost exponent - and provided the starting point for modern social contract theories of rights, utilitarianism, economic theory and Social Darwinism. Hegel is the philosopher who, by incorporating ideas from Montesquieu, Herder, Rousseau and Kant (the four next most significant political philosophers in European history), produced an historicist reformulation of Platonism (incorporating some elements of Aristotle's philosophy) to meet the challenge of Hobbesian philosophy. This he defended firstly through his metaphysics, and then through a narrative of world-history formulated from the perspective of this metaphysics in terms of which the achievements and limitations of all past political thought and political forms were evaluated. Rejecting the atomic individualism of social contract theorists and utilitarians, Hegel argued that humans are essentially socio-politico-cultural beings, that societies formed through history embody a rationality and that individuals only become fully human, only become rational, free individuals and recognize themselves as such, through participating in the ethical life of society.

In modern societies, societies which have finally reached the stage of rationality whereby all individuals are recognized as free, such freedom is gained through the family in which the ethical spirit has its immediate substantial existence in its natural universality, then in civil society, the realm of formal universality in which people, with their property protected, in producing and exchanging goods to satisfy their own needs, satisfy the needs of each other. However Hegel argued that while this is an order of interdependence in which the self-interested pursuit of each contributes to the welfare of all, a free market tends to concentrate wealth and pauperize large sections of the population if left to itself. It must be constrained by corporations organized on the basis of each trade to give isolated and competing producers the chance of a communal life and recognition of their trade. However corporations themselves are not enough, and civil society, along with the family, has to be ordered into a larger, more cohesive unity: that of the State (essentially the nation-State), the self-conscious ethical substance in which the family principle and civil society are unified and particular self-consciousnesses are raised to consciousness of their universality. To

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43. This tendency was recognized by Michael Bakunin in *God and the State* published in 1882. Norberto Bobbio is one of the few Marxists to address the issue. See *The Future of Democracy*, tr. Roger Griffin, ed. Richard Bellamy, Cambridge: Polity Press, 1987.

44. See Rudolf Bahro;, 'Dare to Form Communes', *Building the Green Movement*, London: Heretic Books, 1986, pp.86-91.

45. Boris Frankel, *Beyond the State?: Dominant Theories and Socialist Strategies*, London: Macmillan, 1983.

utilize the concepts developed above, the State, insofar as it is a 'real' or 'true' State, is the ordering activity or process and the structures produced and maintained by them whereby the common good is defined and is made to prevail over particular interests and in which individuals, by willing this good, become and are recognized and recognize themselves as free agents. It is the process whereby justice as the proper recognition of each person is objectified in institutions. In the modern State *every* person is recognized and recognizes themselves as free agents.

Given that the uncontrolled operation of markets will lead to the destruction of the world ecosystem and that efforts to replace markets by planning have failed it is this Hegelian model of a market economy subordinated to institutions committed to justice and the common good which must be aimed at. While Hegel's basic Neoplatonic framework and some details of his political philosophy are open to question, the great achievement of Hegel was to have redefined in a more defensible way Plato's and Aristotle's psychological, social and political insights and shown how to reconcile Herder's notion of life as social self-expression with Kant's notion of the autonomous rational will, while still granting a place to the functioning of the market.[46] But from Karl Marx to Karl Popper, Hegel's political philosophy has been attacked for its theoretical assumptions and has been identified with oppressive developments in politics. This has led to a failure to appreciate Hegel's achievements, and it is this more than anything else which has contributed to the triumph of Hobbesian thought. What is proposed here is that the theoretical attacks on Hegel can be obviated and those aspects of his thought which might give sustenance to oppressive political tendencies avoided - while at the same the problems and complexities of the modern world can be confronted and his ideas extended to deal with the environment, by reformulating his political philosophy through process philosophy.

One of the main problems in Hegel's political philosophy is that it provides no way to evaluate the forms of thinking embodied in the existing State. In this regard Hegel left people in the lurch, claiming that the philosopher is only able to reveal the rationality of history after the dust has settled. Hegel's followers who did grant a place to reason in guiding reformist or revolutionary action failed to provide an attractive vision of the future. Either they confined reason to a purely critical role, or less commonly, represented this end as static and formal. The effect of their ideas was to lead to all the past and the present being viewed as mere instruments for the realization of an ideal.

To overcome this problem Hegel's philosophy needs to be supplemented by Aristotle's. Aristotle's political philosophy provides a way of evaluating the institutions and organizations of and forms of thinking embodied in societies, and thereby for developing programmes of political reform. For Aristotle, ethics and politics are indissociable. His *Nicomachean Ethics* was devoted to working out what is the highest good for humans, the ultimate end which is desired for its own sake and for which all other ends are means, while his *Politics* was devoted to working out how societies should be organized to enable people to realize the highest good. While one might disagree with Aristotle's conclusions as to what the highest good for humans is and disagree with his analysis of how the highest good can be achieved, it is difficult to conceive of a better formulation of the relation between ethics and politics, and how to conceive the fundamental problem of political philosophy.

The answer given to the first and most fundamental question: What is the ultimate end of life? will depend on what conception of humans and their place in the world is argued for. Aristotle argued that the ultimate end of life is spiritual well-being (*eudaimonia*) which is achieved by the 'activity of the soul in conformity with excellence or virtue, and if there are

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46. For a defence of Hegel on these grounds, showing his relevance for the present, see Charles Taylor, *Hegel and Modern Social Theory*, Cambridge: C.U.P., 1979.

several virtues, in conformity with the best and most complete.'[47] On the basis of his metaphysics and corresponding conception of the nature of humans, he argued that the highest virtue is the activity concerned with theoretical knowledge or contemplation. In relation to politics he then argued that the ideal polis is one 'which has virtue sufficiently supported by material resources to facilitate participation in the actions which virtue calls for.'[48] In terms of the metaphysics and corresponding conception of humans defended here, people are striving to orient themselves, to live and act in a way which deserves and receives recognition and respect from people who are themselves worthy of respect, and to gain sufficient control over the conditions of their existence to shape their lives according to their understanding and convictions. If the process view of the world is valid, societies should be judged according to whether they facilitate the achievement of these ends.

The ultimate political aims should therefore be to promote cultural vitality (corresponding to the dialectic of representation), justice (corresponding to the dialectic of recognition) and liberty (corresponding to the dialectic of power).[49] Cultural life can be understood as the communicative activity in which, through dialogue, literature, art, drama, architecture and other forms of communication, people's cultural heritage is appropriated by each generation and developed, ways of understanding, experiencing, modes of being in the world and forms of life are revealed and appreciated, tried out and questioned, further developed or replaced, and problems of localities, organizations, nations, humanity and life are defined and projects of action are formulated, elaborated and publicly evaluated. It is through such cultural life that people, individually and collectively, orient themselves. The most important measure of success in this is the degree to which people are able to construct coherent and convincing grand narratives which relate all particular orientations and projects, to commit themselves to such grand narratives and to define their own lives in relation to them.

Concomitantly, achieving justice can be understood as each individual, whether human or non-human, being given appropriate recognition in thought and action, in social practices and institutions. Cultural life is a condition for achieving this, but it also requires empowerment of people, the economic and political security to pursue justice and the means to gain redress against injustices.

Liberty can then be understood as the condition in which people can live justly and thereby attain integrity. This requires not only freedom from constraints, but also the means for people to appropriate their cultural heritage and the power to participate in decisions affecting the future of their societies and to act on the basis of their reasoned convictions. For there to be liberty, societies must provide their members with economic security, with the education necessary for them to be able to participate in the cultural life of society, with media to communicate their ideas, with occupations in which they can realize their highest potentialities to contribute to society and the world, and with the means to participate in defining and redefining the goals and values of the social formations within which they are participating.

This notion of liberty is opposed to the doctrine of negative liberty formulated in terms of mechanistic materialism by Hobbes who argued that: 'Liberty, or Freedome, signifieth (properly) the absence of Opposition'[50]. It accords with the notion of positive liberty

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47. Aristotle, *Nichomachean Ethics*, I, vii, 1098a16.

48. Aristotle, *Politics*, VII i 1323b38.

49 Taking the dialectical patterns of culture as the locus for the evaluation of all aspects of society corresponds to Habermas' defence of communicative action associated with the life-world as the reference point for the evaluation of systems of purposive-rational action.

50. Thomas Hobbes, *Leviathan*, Harmondsworth: Penguin, 1968, Ch.XXI, p.261. For an examination of the relationship between Hobbes and his predecessors in this regard see Quentin Skinner, 'The Idea of Negative Liberty', in *Philosophy in History*, ed. Richard Rorty, J.B. Schneewind and Quentin Skinner, Cambridge: C.U.P., 1984, pp.193-221.

proposed by Montesquieu (and then taken up and developed by Rousseau, Kant, Hegel and Marx) who argued that political liberty: 'does not consist in an unrestrained freedom. In governments ... liberty can consist only in the power of doing what we ought to will'.[51] Negative liberty is important not in itself but as a condition for achieving positive liberty. Cultural life, justice and liberty must be seen as mutually dependent, though irreducible to each other. Existing institutions should be evaluated and preserved, transformed or abolished according to whether and how much they facilitate cultural life, justice and liberty.

With this conception of politics, the environment must be given central place: as the condition for the continued maintenance and reproduction of society and for the realization of humanity's highest ends, and as consisting of non-human life forms with a significance in their own right. If justice is to be done, all this must be appropriately recognized in political, economic and personal life. The most important form of justice in terms of which any society and every institution in society must be evaluated is in its relation to its environment.

Generativity and Decadence

However there is an important insight embodied in Plato's philosophy which to some extent was lost sight of by Aristotle. This is that people are moved to action by having a vision of how society ought to be - a 'utopia', and some notion of what it means to fall away from this ideal. For Plato the good polis or society, that is, the form in which all societies are striving to participate, is the just society, one in which those dominated by their intellect rule over those dominated by their spirit, who in turn rule over those dominated by their appetites. While few are attracted to the static ideal portrayed by Plato, his description in Book VIII of *The Republic* of what is involved in falling away from justice, in the advance of decadence, has been one of the most powerful images affecting European political life (with later Rome generally being taken as the model of decadence).[52] Plato's account of the difficulty experienced by those oriented towards achieving higher ends when confronted with the low cunning of the street-wise, his account of the development of militarism as those dominated by intellect are displaced by those dominated by spirit, of their replacement in turn by those questing for wealth and the corrosive effect this has on people's attitudes to life, of the rejection of all constraints when those who are dominated by their appetites reject all discipline paving the way for the triumph of tyranny, should not be taken as a description of reality (as Aristotle took it to be) but as a powerful analysis of a very real tendency.

Ideals of how societies should be have almost always been represented as static. But all static societies are repulsive, and the greatest oppression in the world has resulted from the tendency to see the present as a mere instrument for some future state. Hegel attempted to solve this problem by historicising Plato. Following Herder, he represented people as having their national genius manifest in their religion, their polity, their ethics, their legislation, and their science, art and mechanical skills. People are inspired to bring to fruition the potentiality of their nation, to realize freedom by recognizing, believing in and willing what is common to the whole (in effect, participating in and living according to Rousseau's General Will). This freedom is objectified in the State which unifies and directs the nation. But people lose their dedication to the State as its contradictions and irrationalities are revealed. By the time the ideals underlying the State have been brought to full consciousness by philosophers they are no longer able to inspire people. The society

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51. Baron de Montesquieu, *The Spirit of Laws* tr. Thomas Nugent, New York: Hafner, 1966, XI, 3, p.150.

52. Contributors to the notion of decadence include Vico, Montesquieu, Gibbon, Hegel, Spengler and Toynbee.

becomes decadent and a new nation invigorated by a new, as yet inarticulate vision comes to dominate the stage.

Hegel rejected the idea that philosophy could play any part in this process, and without a new vision for society being provided by philosophers, economists and Social Darwinists have been able to foist on people their vision of the ideal society as a perfect machine. Decadence and social vigour have come to be understood simply in terms of the opposition between self-indulgence on the one hand and militarism and machine-like efficiency on the other. The only mobilization of people's potentialities conceivable has come to be the mobilization to conquer and dominate other people and the mobilization of people for industry. Vigour has come to be identified with the growth of Gross National Product and the rise of economic power to dominate other nations, and at least in Anglophone nations, decadence is equated with failure to reduce everything to instruments for economic development. Plato has been well and truly stood on his head. The ideal has been equated with what for Plato was the triumph of the most base, and people have been blinded to the possibility of anything beyond this. And these values are driving humanity inexorably towards the complete destruction of the environment.

The process view of the world as defended and elaborated here (at this particular juncture in history) provides the possibility of constructing an alternative vision of what societies could be and thereby an ideal to judge societies by, and the basis for accounting for tendencies to decadence - while avoiding the Platonist tendency to represent the ideal as a static form to be realized in the future. To begin with it is necessary to acknowledge that the world is a process of creative becoming without any definite end, and then to reformulate political ideals on this assumption. I propose that the 'generative' society by taken as the ultimate ideal. The generative society is not a static final state, but the structure which cultivates and provides the conditions for the fullest development of the potentialities of its members to participate in the creative becoming of society, of culture, of humanity and of nature. A generative society is a society in which has an active cultural life as people struggle to orient themselves, in which people have liberty, and in which people are successfully struggling to make justice prevail, a society in which people have the conditions for and are struggling to deepen their understanding, heighten their awareness and extend their consciousness of the world, to confront society's and the world's problems and to express this in their work and lives. This end to be aimed at is not a future state, but the quality of the unfinished duration of society's and the world's becoming. The present as part of the whole duration of society and the world cannot be reduced to a mere means for realizing this end.

However, while not reducing the present to an instrument of some future state, the cultural life of generative societies will engender, integrate, criticise and reformulate narratives defining the past, present and future of the world. In this way people will come to experience themselves as participants in unfinished stories, integrated into communities with common destinies and visions of the future worth striving to realize. Such visions of the future are required not only to overcome the present, but also to augment it. As Paul Ricoeur argued in his defence of utopia *Lectures on Ideology and Utopia*:

> The utopia puts in question what presently exists... The intention of the utopia is to change - to shatter - the present order ... Even while the utopia's intent is to shatter reality, though, it also maintains a distance from any present reality. Utopia is the constant ideal, that toward which we are directed but which we never fully attain. ...

> [T]he death of utopia would be the death of society. A society without utopia would be dead, because it would no longer have any project, any prospective goals.[53]

The progress of decadence can be described in opposition to this as beginning with the decay of dialogue and the disintegration of narratives, particularly broader narratives defining the history and goals of humanity, of civilization or of the nation as people contract their horizons, both spatially and temporally, cease to strive for an orientation to life beyond their immediate situations, and cease trying to understand and justify what they are doing - becoming hostile to any fundamental questioning of their lives, goals or ways of thinking. In intellectual life, metaphysics is replaced by sophistry, scholasticism, or analytic philosophy, the quest for understanding is replaced by the meaningless accumulation of facts and the quest for technological control, and the struggle to organize experience into coherent narratives is abandoned. Following this, the actions through which people strive to attain a sense of their significance cease to be defined from the perspective of the 'generalized other', or in relation to a grand narrative and come to be measured in terms of their impression on others. People strive for status rather than to live worthwhile lives. As people lose their sense of justice and injustice, what is and is not corrupt, political decisions come to be based on compromises between people with power - and the powerless are forgotten and trodden under foot. Institutions and organizations cease to be questioned and evaluated for their contributions to life in general and become progressively more self-serving - or serve only the interests of their pre-eminent office holders. Since status without any general perspective to justify it can only be defined in opposition to those who are deprived of it, people's struggles for recognition take the form of dividing people into winners and losers. This generates increasingly complex interpersonal, social and political games which are usually unproductive and frequently destructive. As social relations become increasingly disaffirming and frustrating, games are oriented towards achieving power over others, and as a consequence, power, wealth and income are concentrated. Games take the form of 'winner-takes-all', losers gain nothing. People are no longer able to fulfil themselves, they are characterized by anxiety, frustration, free resentment and free floating malice. They become more aggressive and violent, particularly towards those designated as 'pollution' by exclusive groups. Deviousness, 'rat cunning' and moral cowardice become habitual. As people lose sight of even the most pressing problems of their society, social crises proliferate. In this final state of decadence, people's creative potentialities cease to be cultivated, and no other potentialities are acknowledged than the most basic capacities to consume, to serve as instruments and to win out in power struggles, either civil, economic or military. In such circumstances cynicism appears clever, and idealism as a sign of feeble-mindedness. Those who do manage to rise above the prevailing condition, who do strive to orient themselves through a broader perspective and who struggle to meet the challenges confronting their societies, are isolated. Demagoguery, scheming and brute force become the order of the day. If society does not disintegrate entirely it comes to be totally dominated by the dynamics of emergent processes beyond people's intentions or even comprehension - for instance, the dynamics of the global market.

With the conception of humans that has been defended the tendency noted by Hegel for major societies to embody an ideal which people strive to realize, and for successive social orders to embody forms of thinking which are more rationally coherent and which acknowledge a progressively greater proportion of the population as free, can be explained. People do require ideals to orient themselves, and are inspired by ideals which provide an orientation for action which enables them to achieve a sense of their significance. The

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53. George H. Taylor, "Editor's Introduction" in Paul Ricoeur, *Lectures on Ideology and Utopia*, N.Y.: Columbia University Press, 1986, p.xxi.

revelation of contradictions is disorienting, preventing people attaining the sense of the unambiguous significance of their lives for which they are striving. Under these circumstance fewer people will be inspired to serve the institutions representing such ideals. And a society sinking into decadence will be less able to survive challenges to its power. On the other hand new groups of people struggling for power will usually only be successful against established power groups when they are able to formulate their struggles in terms of more coherent visions of the world which acknowledge the significance of more people than the world-orientation of their opponents.

But there is more to it than this. Ideas only begin to become important forces when disparate groups are struggling to overcome the conflicts which divide them in order to challenge the power of others. This is what was shown to have been the case in early medieval Europe and in early modern Europe, and at various times in the history of Russia. Furthermore, while the incoherencies of ideals can count in part for the decay of societies, there are also tendencies within all human organizations towards corruption and decadence quite apart from the inadequacies of the ideals which they incorporate. In other words, while ideals must be recognized as important, the tendencies towards generativity and decadence in societies are more complex than Hegelians have allowed. While from the perspective of process philosophy it is possible to explain the tendency towards greater rationality and freedom in society, there is no justification for believing in the necessity of such advances, nor for the belief in a final end state for which all previous history is only the means. It is likely that there will be periods of chaos and violence between generative eras, and there is no guarantee that on the collapse of one generative era a new generative era will emerge from the resulting chaos. The identification of the sequence of social formations with the march of divinity, or humanity, towards its final self-actualization, must be rejected.

World Politics and the Problem of Representation

One of the central problems of political philosophy, particularly in the present, is what is to be taken as its object of analysis. Both Plato and Aristotle took the polis as their object for political philosophy, Aquinas took the whole of Christendom and the relationship of this to kingdoms, while Hobbes and Hegel took the autonomous nation-State. This reflects the context within which these political philosophers were developing their ideas. Focussing on the complexity of modern institutions and the way people are controlled by them Foucault and various postmodernists argued for a rejection of the traditional notion of sovereignty and called for political activity to be directed to local sites rather than to control of the State,[54] while Marxists and environmentalists have revealed political problems which transcend all national boundaries, implying that only by addressing the global situation can political action be of any significance. Such a global outlook was originally taken by Kant who, in his *Perpetual Peace*, called for a 'league of peace', and this call for an internationalist orientation was revived by one of Hegel's students, Friedrich Carové. Carové argued that the ultimate realization of rationality in history was not the nation-State of Prussia (or USA) but an international State, and in particular an international legal system in which every individual in the world is recognized as a free agent. Beyond this he argued that the ultimate actualization of the ideal of an ethical community in which the free self-conscious Spirit would feel entirely at home demands the absorption of the political State into the association of humanity in a divine, fraternal community, involving the creation of a unified, world-wide public consciousness which would allow each and every individual to comprehend the

54. Michel Foucault, *Power/Knowledge*, ed. Colin Gordon, Brighton: Harvester Press, 1980, esp. 'Truth and Power', pp.109-133.

whole variety of human expression as revelations of people's own divine faculties, capacities and powers.[55]

There is no reason to choose between these two perspectives, or to dismiss concern with the State. Foucault and the postmodernists and environmentalists, Marxist world-systems theorists, Kant and Carové are all correct in identifying political problems at different levels than the nation-State, although not in the conclusions often drawn from these analyses that the domains which they have identified could be the sole locus of political and cultural action. By formulating political philosophy in terms of process philosophy a basis is provided for dealing with politics (which can then be conceived as the process of defining and redefining the goals, ideals and values to be realized by and within any social formation, and of attempting to realize these) at a multiplicity of levels without assuming that any one level is pre-eminent. However to relate each level to each other and all to the world community as a whole it is necessary to work out how to represent people at different levels of organization.

One of the most important problems arising from this is to work out what is representation and how effective representation can be achieved in a world of enormous complexity. In *The New Science of Politics*, Eric Voeglin defined a representative as 'a person who has the power to act for a society by virtue of his position in the structure of the community, without specific instructions for a specified business, and whose acts will not be effectively repudiated by the members of the society.'[56] This definition leaves it open how such representation is possible and what it means to be properly represented. To comprehend this, representation must be seen as simultaneously involving each of the dialectics of culture: that of orientation, of recognition and of power. To begin with, representation is an essential part of the struggle for orientation and for recognition, and must be evaluated in terms of its success in this regard. Representation is part of the process by which groups of people are defined and define themselves as being communities with specific problems, aspirations and significance. It is the condition for a potential community to become a reality. However to succeed in becoming a reality, the community must be represented as part of the whole of reality, as part of a general order of things so that they can identify their own lives within, and orient themselves to, the world at large. And as Kenneth Boulding (following Fred L. Polak) has argued: 'there is a great deal of historical evidence to suggest that a society which loses its identity with posterity and which loses its positive image of the future loses also its capacity to deal with present problems, and soon falls apart.'[57] Future and past generations must be represented to properly represent people in the present. Similarly people require an identity with the environment, particularly in the immediate vicinity, and should be represented as part of local, regional and global ecosystems.

Having representatives will not in itself guarantee proper representation. For this to be achieved, representatives must have a perspective on the world (which must include accurate knowledge and continued access to appropriate information - but which is not reducible to these) which defines the past and articulates the concerns and aspirations of the individuals or groups represented and which can be expressed and integrated into whatever decision-making or actions the representative is involved in. This requires of this particular perspective that it be able to be related to the broader perspectives on which political decisions are made. Relating perspectives to decision-making, and relating perspectives to each other is achieved by constructing narratives - histories defining the achievements and failures of past projects, defining the problems of the present, and projecting a future to be

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55. For a study of Carové see John Edward Toews, *Hegelianism*, Cambridge: Cambridge University Press, 1980, pp.134-140.

56. Eric Voeglin, *The New Science of Politics*, Chicago: The University of Chicago Press, 1952, p.37.

57. Kenneth E. Boulding in Herman E. Daly (ed.) *Toward a Steady-State Economy*, San Francisco: Freeman, 1973, p.129.

realized. The development of perspectives and their integration into narratives is then the most important condition for achieving real representation. The condition for the development of such perspectives is not just free speech, but unbiased media able to support and communicate the development and criticism of perspectives, educational institutions which take as their prime goal not vocational training but the development of understanding of the world - of people's ability to define themselves by appropriating and participating in the development of their cultural heritage, and an active cultural life in which the general public is engaged in defining itself historically, questioning, developing and replacing prevailing perspectives and the projects based upon them.

Representatives must also be effective, they must have the power to ensure that all they represent is taken into consideration, that their perspectives are incorporated into political decisions. The problem is to ensure that representatives have some redress when they perceive their representees to be unjustly done by, while limiting their power to impose unjust decisions on others. That is, the structure of the community must be such that all can be effectively represented. So long as one group, for instance large, transnational corporations, are able to hold societies to ransom, then large numbers of people in society will be inadequately represented.

To achieve representation in a complex world requires the encoding of perspectives in impersonal laws - as Rousseau, Kant, Hegel and Carové among others have argued. Such laws represent the people whose interests are taken into account by them, and who can then make claims which will be backed up by the State. But quite apart from these laws providing means for those with political power to oppress people, legal systems tend to become self-serving, and to subordinate people to their own ends. The only hope of checking such corruption is by keeping alive the idea of justice as something to which all government and legal processes must always be subordinated, and maintaining a critical process of review supported by an active and critical cultural life to expose when and where government and legal processes are unjust; and only those purported laws which are just should be accepted as laws.[58] This requires the subordination of the abstractions of law to the narratives by which people define themselves and their struggle for justice.

However even if all these conditions were met, there would still be no guarantee that people would be justly represented. So long as there are representatives there will always be a tendency towards corruption. To begin with, it is the ruthless, those people unhindered by integrity, who are able to dominate institutions, and representatives have a tendency to usurp symbolic power from the groups they purport to represent. Such purported representatives may then not only fail to express the concerns of the group from which their symbolic power derives, but may contribute to decisions and processes directed against the concerns of this group. Such usurpation can be institutionalized and then disguised, producing a form of fetishism.[59] For instance priests usually do not define themselves as representing the people who believe in their religion, but as representing God, although their status as priests would amount to nothing if nobody but they themselves believed in the doctrines of their religion. Such fetishised usurpation is present where-ever social processes are reified, where civil servants present themselves as representatives of the State, where the ruling class present themselves as representatives of the Nation, or where revolutionaries present themselves as representing History or the Proletariat. Such usurpation is usually associated with an impersonalization of the symbolic role. Thus the Pope presents himself not as

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58. Aquinas wrote: 'As Augustine says: "that which is not just seems to be no law at all", wherefore the force of law depends on the extent of its justice.' *Summa Theologica*, I-II, Qu.95, Second Article.

59. The nature of this has been brilliantly analysed by Pierre Bourdieu, 'Delegation and Political Fetishism' in *Language and Symbolic Power*, tr. Gino Raymond and Matthew Adamson, ed. John B. Thompson, Cambridge: Polity Press, 1991, pp.203-219.

exercising his power but as the medium through which God expresses Himself, the bureaucrat presents him or herself as a mere instrument of the State, and the revolutionary as an instrument of history or of the proletariat. In a society where such fetishised representation is widespread, there is a downgrading of individuals, and with this, of the life of dialogue essential to achieving and maintaining genuine representation. If individuals purport to represent only themselves, they are seen as representing no-one, and the significance of inquiry and dialogue through which people are struggling to develop their understanding of the world, the essential condition for the development of adequate perspectives and for the critical review of institutions, is denied proper recognition - or worse, if this involves questioning of those whose symbolic power is fetishised, as anathema.

The structure of representation which is most likely to be successful and to avoid such corruption is one which decentralizes power so that laws are enacted and decisions made at the most spatially and/or functionally proximate centre of decision-making at which all those most affected by decisions can be represented, yet which can at the same time effectively represent particular concerns at 'higher' levels of organization when necessary (where 'higher' simply designates the broader scope to be considered). And it is necessary to acknowledge once and for all the correctness of Montesquieu's view on the need for a division of powers, to have a plurality of structures which can act as checks on each other to counter the tendency for the most ruthless to take control of organizations and for organizations to become self-serving and oppressive. To succeed in this, it is necessary to go far beyond the division between the executive, the legislature and the judiciary and to develop federated systems of government, different forms of economic enterprise (as market socialists such as Alec Nove have proposed), politically oriented trade and professional unions, media free from control of governments, press barons and advertisers, open civil services where civil servants are free to publicly criticise their superiors and where policy proposals are published - as in the Swedish civil service, education systems with autonomy from government and economic pressures - preferably ones in which a diversity of institutions compete with each other as in nineteenth century Germany, an independent legal system recognizing the subordinate status of laws to justice and which is really accessible to all, and so on. These should be organized so that it is possible and in the interests of members of each institution to expose the corruption of members in both their own and in other institutions.[60] To facilitate decentralization it is necessary to have procedures for putting forward ideas and problems for consideration and for challenging decisions and censuring corrupt representatives at each level of organization both from higher levels (which represent broader interests), and lower levels (which represent more particular concerns). Also, to avoid the tendency for energy rich regions to dominate energy poor regions (as has occurred in Brazil, for instance), it is necessary that the personnel and funding for organizations in any region come directly from that region, and that these organizations have the power to stop economic enterprises based elsewhere operating in their region. The challenge is then how to design organizations which decentralize power and provide for initiative and review from different levels, while retaining the capacity to coordinate lower levels or related organizations to respond to more universal and longer term problems. Again, the most important means for achieving this challenge is an active cultural life in which shared perspectives are developed and maintained, perspectives formulated as narratives which show how the present has developed from the past and which articulate particular concerns and relate these to broader concerns of society and

60. On the conditions which prevent or facilitate corruption, see Stephen Bunker, *Underdeveloping the Amazon*, Ch.7, 'Collaboration, Competition, and Corruption in Two Colonization Projects', pp.190-197.

humanity so that people, at each level of an organization and in related organizations, can understand each others' points of view, ambitions and projects and balance claims to justice.

With this notion of representation it is possible to further elaborate on the nature and conditions for generative and decadent societies. A generative society can be seen as one which justly and effectively represents through the narratives being lived out by its members both as individuals, as members of organizations and in political decision-making processes other individuals, the diversity of groups of people sharing significantly similar situations, other organizations, society as a whole and other socieities, future generations, humanity and the biotic community, so facilitating the fullest development of the potential of the society, its individual members and the rest of the biotic community. Decadence corresponds to a failure of representation, which manifests itself when people in society, particularly those committed to justice and to living with integrity, are not represented or can no longer identify with those who purport to represent them and can no longer get their particular concerns taken into consideration and catered for, and when future generations, the rest of humanity and the environmental conditions for life are not taken into consideration. Genuine political struggles can be seen as essentially struggles for representation (rather than merely the struggle for power within the existing order), and the rise and decline of societies is the consequence of both the success or failure of different people in these struggles and of the structures of representation which they create. The struggle against decadence requires the formulation of perspectives on the world and the integration of these into narratives in which people can see themselves represented, and leaders who, embodying such perspectives, can effectively articulate the interests and aspirations of people and inspire them to struggle to realize the goals projected by these narratives in practice, to crystallize these narratives in institutions and thereby to transform society. At present, the problem is that, through a process of political integration and exclusion in the core zones of the international capitalist system, less and less people are being effectively represented by the narratives of progress and the institutions which dominate the world, while future generations and the environment are scarcely represented at all. What is now required is a world-wide struggle to represent the entire population of the world, together with all future generations as a community within the biotic community of which humans are part, and through the construction of a new grand narrative, the articulation of this into a sufficient number of levels and divisions to effectively represent each individual, each local community, each group, nation and region in the context of this global community, both human and non-human.

The Human Sciences

In working out how to act and how to live, in challenging and attempting to alter the existing orientational, ethical and power structures of society, and in formulating political goals and planning political action, it is necessary to consider what is possible. To reveal the possibilities of making justice prevail, of achieving proper and effective representation, it is necessary to understand the present state of affairs, how existing orientational, ethical and power structures are maintained and reproduced by the complex of social practices, institutions and economic, social and political processes already involved in the dynamics of the social world, ranging from the local to the international level, and the relationship between each of these and the present state and dynamics of the rest of nature. It is necessary to understand these dynamics to reveal when, where and by whom action to improve the world could be effective. Being effective should not be understood simply in terms of gaining power, but in terms of what relationships between people and between humans and nature could be made to prevail. It is necessary to consider not only what

oppressive forms of relationships could be overcome, but also what structures of orientation, recognition and power could be created and maintained and which of these would be most likely to ensure that inquiry and communication would be cultivated, justice achieved, effective representation gained, worthwhile ends realized and tendencies towards corruption minimized. Success will require the creation of an image of the future together with the specific goals which must be attained to realize it, based on an understanding and critical evaluation of existing processes and structures making up society. This critical understanding of the world should enable individuals and groups to define their problems and aspirations, to consider each structure of communication, recognition and power and each emergent social process and complex of processes, in terms of whether and how they facilitate or prevent the achievement of their own particular goals, the goals of their community and the goals of humanity. To this end, ethics and political philosophy should be integrally related to efforts to understand these complex relations, to orienting people for action and for life, to providing the means by which individuals could be understood and could understand themselves in relationship to the complex order of society.

There are two rival ways in which people have attempted to deepen their understanding of society, the tradition of historical and fictional narrative construction which proceeds by attempting to construct coherent narratives about agents, both individual and collective, and the human sciences which attempt to explain and predict social phenomena through abstract models. Narratives are implicitly evaluative and are means to orient people for action, while the abstract models of the human sciences facilitate a deeper appreciation of the semi-autonomous dynamics of social and economic processes. To grasp the complexity of humanity while at the same time orienting people for action it will be necessary to transcend the opposition between these two modes of understanding, and this is made possible by process philosophy.

As shown in the previous chapter, process philosophy provides a conceptual framework for overcoming the divisions between the humanities and the sciences, between the human sciences and the natural sciences, and between theory and practice. Central to process philosophy is the concept of becoming, the reality of which is better captured by narratives than abstract models. While it is necessary to abstract out individual social processes to understand their particular dynamics, process philosophy requires that such abstraction always be acknowledged as such, and that abstract models never be identified with reality. To do so is to commit the 'fallacy of misplaced concreteness' - to fail to acknowledge the level of abstraction in ones thinking. The disciplinary boundaries formed by such abstractions are so at odds with the complex interdependencies within society that the general population are being blinded by prevailing social science rather than informed by it. As James O'Connor argued: 'as social theory becomes more specialized, the economy, society, and polity become more unified... Hence, never before has it become so essential to invent, however crudely and provisionally, a method which combines historical interpretation, ideology critique, political economy, economic sociology, and political sociology.'[61] By conceiving the goal of science as the development of understanding, and by providing a unified conceptual framework for abstractly analysing the relationships between the dynamics of the physical world, the biological world and the complex of processes which make up the social world, and which can then situate conceptually and analyse the structures of the life-worlds of people, process philosophy provides a basis for a thermodynamically and ecologically based socio-cultural political economics which could put in context the abstact analyses of specific processes and relate all these, together with the problems of the world, into an integrated historical narrative which would also situate individual and collective agents. Through such a narrative, people, conceived of as situated,

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61. James O'Connor;, *Accumulation Crisis*, Blackwell: Oxford University Press, 1984, p.vii.

but partly self-creative processes of becoming within the becoming of the world, as participating in this becoming with each thought and action, could be provided with the means to extend and deepen their understanding of themselves as potential agents of this becoming.

At most, three broad disciplinary boundaries might be regarded as acceptable within the human sciences: the study of culture, a broadly conceived human ecology, and psychology, although even these would be related through philosophical anthropology and be in constant interaction; and all studies of humanity would be historical, while all history would be theoretically informed. Since the defining feature of humans, being the condition of both complex institutions and individualism, the study of culture or cultures must be regarded as the pre-eminent human science. 'Human ecology' dealing with the structures or institutions and emergent processes associated with people's transformations of their physical, biological, socio-cultural environments, encompassing geography, political economy, sociology, politics and law,[62] would assume a conception of humans, but continually revise this in the light of advances in the study of culture and psychology. Psychology would conceive its object of study, the individual subject, as being essentially biological, cultural and social as well as personal, and therefore incapable of being totally abstracted from the study of culture and the dynamics of societies.[63] These sciences would conceive people, from individuals to humanity as a whole, firstly, in the broader perspective of the world ecosystem as a complex of dissipative structures ultimately maintained by the condition of far from thermodynamic equilibrium produced by the sun, in which all power is ultimately control over the transformations of usable energy, and secondly, historically as a narrative or complex of narratives of institutions, traditions and emergent social processes through which humans have been formed and have transformed themselves and their environments to create the present world-order.[64]

Respecting such interdependencies would not involve reducing the complexity of social reality to manifestations of one holistic process. Social reality cannot be reduced to a single plane of becoming. As Foucault argued (reflecting the influence of Braudel, and ultimately, of Bergson):

> It's not a matter of locating everything on one level, that of the event, but of realising that there are actually a whole order of levels of different types of events differing in amplitude, chronological breadth, and capacity to produce effects. The problem is at once to distinguish among events, to differentiate the networks and levels to which they belong, and to reconstitute the lines along which they are connected and engender one another.[65]

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62. The study of money-making and spending - chrematistics - must be placed in a broader context and evaluated in terms of this broader context. For some advances in this direction see André Gorz;, *Critique of Economic Reason*, tr. Gillian Handyside & Chris Turner, London: Verso, 1989.

63. This is the form of psychology argued for by Rom Harré in *Social Being*, Oxford: Blackwell, 1979 and *Personal Being*, Oxford: Blackwell, 1983 - anticipated to some extent by Vygotsky.

64. Such an ecological economics has been in the making for over a century without gaining institutional recognition. See Juan Martinez-Alier, *Ecological Economics*, Oxford: Blackwell, 1987. A milestone in its development was Nicholas Georgescu-Roegen;'s work, *The Entropy Law and the Economic Process*, Cambridge: Harvard University Press, 1971. See also Herman E. Daly, *Steady-State Economics*, San Francisco: Freeman, 1977, and Narindar Singh (*Economics and the Crisis of Ecology*, 2nd ed. Delhi: Oxford University Press, 1976), and Herman E. Daly and John B. Cobb, Jr. *For the Common Good: Redirecting the Economy Toward Community, the Environment, and a Sustainable Future*, Boston: Beacon Press, 1989. I am at present attempting to reformulate and synthesize ideas from institutional economics, political economics, global economics and bio-economics through process philosophy.

65. Michel Foucault, *Power/Knowledge*, tr. Colin Gordon et. al. Brighton: Harverster Press, 1980, p.114.

It is consequently impossible for either history or the science of humanity to give a transparent representation of social reality as a totally predictable order. And it cannot presuppose a privileged perspective within this process of becoming of humanity. In place of prevailing economics which tacitly presupposes the perspective of governments and businesses in the economic centres of the world, the new historical political economy should enable people to define and orient themselves to the world from their own particular situations, whether they be businessmen, workers, peasants or unemployed, males or females, representatives of governments in core, semi-peripheral or peripheral regions of the world, representatives of international or local organizations, or whatever.

Presupposing that humans are cultural beings and that the science of humanity is itself is cultural activity, this human science would be explicitly evaluative, with evaluation being grounded in the conception of humans and their place in nature assumed as the hard core of a research program. But developed according to a dialectical theory of knowledge, this conception of humanity would be seen to be open to question, to revision or to replacement, rather than, as with the assumptions about humanity of prevailing human science, being presupposed. This would reincorporate questions of evaluation into the realm of rational discourse. With the process conception of humanity as the reference point for evaluation, in place of 'economic man' and the Social Darwinian notion of progress through the survival of the fittest, the science of humanity would firstly evaluate social formations in terms of their contribution to the stability and resilience of the world's ecosystems, their sustainability, and then in terms of the quality of the life-worlds generated by them. Social relations, institutions and emergent social processes would be judged in terms of the justice of the conceptualizations of the world embodied and reproduced by them, in terms of how they facilitated or failed to facilitate the attainment by people of recognition and respect, and in terms of the conditions being provided to people to participate in the shaping of their destinies.

By subordinating abstract models and analyses to narrative, such a science of humanity would also orient people for action. Georg Lukács argued:

> As long as man concentrates his interest contemplatively upon the past or the future, both ossify into an alien existence. And between the subject and the object lies the unbridgeable 'pernicious chasm' of the present. Man must be able to comprehend the present as a becoming. He can do this by seeing in it the tendencies out of whose dialectical opposition he can make the future. Only when he does this will the present be a process of becoming, that belongs to him.[66]

According to the process view of the world the complete separation of theory from practice is impossible. The science humanity should facilitate deeper 'indwelling' within the world so that its significance and the significance of different possible projects can be judged. Beginning with the assumption that science is part of the orientational structure, the on-going dialogue through which people are developing their understanding of themselves and their place in the world, process philosophy supports Jürgen Habermas's contention that it is impossible to comprehend the social world without evaluating the validity claims being made by social actors.[67] A science of humanity, including history, based on process philosophy would be concerned to reveal unjust forms of thinking and the forces engendering and reproducing them to liberate people from ideological mystification. Its aim

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66. Georg Lukács, *History and Class Consciousness*, tr. Rodney Livingstone, London: Merlin Press, 1971, p.204.

67. Jürgen Habermas, *The Theory of Communicative Action*, [1981], tr. Thomas McCarthy, (2 vols), Vol.1, Boston: Beacon Press, 1984, pp.102-141. This is also argued by Charles Taylor, 'Understanding and Ethnocentricity', *Philosophy and the Human Sciences: Philosophical Papers II*, Cambridge: C.U.P., 1985, Ch.4.

would be to provide people with better means to understand themselves and their motives, to reveal what ends are worth striving for, and to provide people with the means to articulate their aspirations. It would aim to enable people to better comprehend the different tendencies within the world, the extent to which their own ends are being frustrated or facilitated by these, and what part they could play in furthering or inhibiting these tendencies. Trying to illuminate the present in the light of the past, it would aim to contribute to the construction of the future. That it, it would aim to provide a narrative emplotments through which people could refigure their lives. The development of such a science of humanity would be part of the self-formation of humanity.

This would require more than just exposing the failings of the existing order. One only refutes what one replaces. And as Rom Harré pointed out: 'people create themselves and their patterns of interaction by virtue of the psychological and social theories to which they subscribe.'[68] This new science of humanity would be providing people with new ways to conceive themselves, their society and the world to replace those being revealed as defective. It would replace the categories of existing economic theory, the 'forms of existence' of capitalist societies by concepts consistent with a process view of the world.[69] 'Labour-power' would be replaced as the dominant concept defining work relationships by concepts which acknowledge the full needs and potentialities of people as creative, social agents, and the dynamics and intrinsic value of other forms of life. Podolinski's energy theory of value and correponding theory of surplus value, with qualifications, could replace the neo-classical concept of exchange value; and Daly and Cobb's concept of 'Index of Sustainable Economic Welfare'[70] and Oldak's concept of 'gross social wealth', or some equivalent, would replace the notion of 'gross national product' as the ultimate reference points for evaluating economic performance, thus situating the monetary system within the environment and bringing into focus the real contribution of economic activity to the conditions of life - both human and non-human. With such concepts, mining, cutting down trees and the destruction of agricultural land would be recorded as costs and loss of wealth, while activities which are at present excluded from national accounts would be accorded value. A sharp distinction would be drawn between regenerating sources of usable order - such as sunlight, climatic systems, rivers, species, ecosystems, people etc. which alone should be designated as resources (from the Latin *resurger* - to rise again), and usable order which has been saved up - such as concentrations of minerals, oil etc., are rightly designated 'reserves' (from the Latin *reservar* - to save up), and currency given to the concept of ecocide - the destruction of resources and dissipation of reserves so defined. Other concepts would then be reformulated to accord with this new way of thinking.

However it is not only particular concepts which would be transformed, but along with these, the image of society. There will always be an image of society dominating any community, and this will always function to some extent as an ideal. Process philosophy would replace the analogy of the machine which underlies prevailing economic thought with an auditory analogy to enable society to be understood as a creative process of becoming within nature. At the same time it would promote some variant of Wallerstein's notion of world-system, since quite apart from its role in revealing the causes and extent of economic exploitation, political oppression and environmental destruction, such an image of the entire world is required to construct a world community.

Through analysis of the tendencies within the existing societies, such a science of humanity could mobilize people to replace prevailing concepts and images by revealing the commonality of interests between those who are oppressed by the present system, by

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68. Rom Harré, *Personal Being*, Oxford: Blackwell, 1983, p.24.

69. For some developments in this direction see Daly and Cobb, *For the Common Good*.

70. Ibid. 'Appendix'.

presenting an image of the future worth striving for, and by giving some idea of the paths which people, individually and collectively, could take to help realize this future. And as Marx argued, the validity of social theories can only be judged by whether people take them up and define the world accordingly, and then by whether the promise of these theories, the potentialities they purport to reveal, are realized in action: 'Man must prove the truth, i.e., the reality and power, the this worldliness of his thinking in practice.'[71]

Policy and Strategy Formation

One of the most important requirements for representing people and for transforming society is systematically formulating and evaluating political and economic policies and programmes. Formulation of policies and programmes is usually based on mechanistic assumptions in terms of neo-classical economic theory in which the economy is treated as a closed system, driven by greed, tending towards equilibrium, and in which nature is treated as nothing but a passive resource. Evaluation is generally based on some version of cost-benefit analysis. Cost-benefit analyses were criticised in Chapter 2 for their assumption of a mechanistic conception of the world, and deriving from this, their assumption that the world can be understood as the sum of all its states of affairs and events. Self-organization processes with their immanent dynamics are ignored. Such analyses cannot take into account the complex interdependencies of reality and replaces democratic procedures by a managerial approach to decision-making in which decisions are taken on the basis of pseudo-scientific quantification procedures. But an alternative strategy and policy-making procedure has been developed which accords with the conception of people orienting themselves primarily through narratives, which assumes a dynamic, active world, and which tends to democratize decision-making rather than concentrating it in the hands of 'experts'. This is 'retrospective path analysis' developed by Cliff Hooker.

Retrospective path analysis consists in firstly the selection of macro-economic goals by considering a variety of end-points forty to fifty years in the future, and then secondly examining various paths to the desired future state. However there is no reason why this cannot be extended to considering goals for the whole of civilization several centuries into the future, and considering a variety of sub-goals for achieving these. This procedure departs from the normal approach in calculating a course of action retrospectively from some future date, specifying 'those key transitions in social structure and functioning generally which, taken in proper sequence, will lead from the present to the desired future social condition.'[72] Such an approach focuses attention on the conditions necessary for achieving the desired future states, on the tendencies inimical to the realization of such ends, and on the crucial societal decisions at the branchpoints of different possible paths of development.

Retrospective path analysis accords with the way people generally formulate and commit themselves to projects. Projects formulated and acted on in this way have essentially the same structure as narratives and allow for a complex structure of sub-projects as sub-narratives. Formulating such projects would provide people with unfinished stories or complexes of stories to situate themselves within as creative agents. Decision-making would require recognizing the limits of knowledge, taking into consideration how much room for manoeuvre is given to different actors during the process of reaching desired ends. Decisions would be constantly open to re-examination and reformulation. Furthermore,

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71. Karl Marx, 'Theses on Feuerbach', 2.

72. Clifford A. Hooker, 'Scientific Neutrality versus Normative Learning: The Theoretician's and Politician's Dilemma', in David Oldroyd ed., *Science and Ethics*, Kensington: New South Wales University Press, 1982, pp.8-33, p.17.

since the way people think can and should be included as one of the ends to be aimed at, people's way of thinking and relating to each other and to the world could be incorporated into the path analysis. This means that retrospective path analysis would avoid the tendency to reduce other people who are to be involved in striving to realize ends into instruments. It would open up for democratic discussion the question of what sort of future we want, and open to question what sort of people we wish to become and what sort of relationships between people we should be developing. This would require a fundamental questioning of what kind of beings we are, what is our place in the cosmos and what are our potentialities. Such a decision procedure would contribute to transforming people's attitudes from a mechanistic world-orientation to a process world-orientation, from seeing themselves as beings standing outside the world trying to control it to experiencing themselves as processes of becoming actively participating as cultural beings in the becoming of the world. People would become responsible agents creating themselves through forming and reforming the narratives defining themselves and their place in the world.

Retrospective path analysis accords with and would reinforce the need for a new science of humanity based on process philosophy. While cost-benefit analyses implicitly assume an instrumentalist form of rationality and a crude positivistic theory of science in which knowledge amounts to the ability to predict the probabilities of the occurrence of different future states and events, retrospective path analysis is consistent with the notion of creative rationality and the ethical notions associated with it, and requires the development of the form of human science being proposed - one which facilitates analyses of the diversity of and complex inter-relationships between processes, and which subordinates such analyses to historical narrative. The full development of such a social science would provide the means for situating policy analyses within the broader socio-cultural dynamics of particular societies, of civilizations and of humanity as a whole over different durations, and take into account, consider and balance the different claims to justice of acting upon such policies. It is such a form of policy formulation and of human science which is required to confront the present environmental and cultural crises in all their complexity.

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TOWARDS AN ECOLOGICALLY SUSTAINABLE CIVILIZATION

Given the dynamics of the existing economic and political organization of the world, putting a stop to environmental destruction and maintaining a sustainable world-economy can only be achieved by creating a new social, political and economic world order. In the light of the analyses offered in this work it should now be a straightforward matter to describe in broad outline what kind of new order will be required: a drastic reduction of social inequality throughout the world and in each country, the decentralization of political power, and a radical revaluation of nature and community. The world-system of regional exploitation needs to be destroyed, and international relations rebuilt on the basis of justice in the relationships between people and between humanity and nature. Population growth needs to be checked by eliminating the poverty, insecurity and ignorance which generates it. Sustainable life-styles and forms of agriculture should be preserved or developed to replace forms which degrade the environment. For those in the economic core zones where people have achieved the material conditions for a decent life, lifestyles which use up the minimum amount of reserves and which preserve resources, which slow down the dissipation of entropy rather than hasten it, need to be promoted. This will require the transformation of the moral structures of societies so that people are accorded recognition when they contribute towards such changes and participate in such lifestyles, and despised otherwise.

The biggest problem in achieving this will be to overcome the autonomous dynamics of international capitalism, to liberate the Third World from its subjugation and exploitation and to develop new politico-economic structures throughout the world which redistribute power. Markets need to be insulated from each other in order to prevent regional exploitation and to undermine the dynamics of international capitalism, and it will be necessary to put an end to or prevent the formation of markets altogether in those areas of the world only capable of supporting in a sustainable way subsistence modes of production. Breaking the domination by the economic core zones, transnational finance, agribusiness and global manufacturing organizations and the comprador classes who serve as agents for them, while at the same time representing those interests and concerns which transcend national boundaries, will require the unification of major regions of the world.[1] Within these regions each nation needs to centralize power to control the market and to deal with those issues affecting the nation, the broader region and humanity, while decentralizing power to ensure against the blindness of bureaucracies and the tendency for metropolises to exploit peripheral regions.

While the unique histories and qualities of each locality, country and broader region need to be taken into consideration, the kind of economic system most likely to enable people in the industrialized West to control their destinies in accordance with the long term interests

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1. The need for such regional struggles for independence as a means of overcoming international exploitation has been argued for by Dudley Seers in *The Political Economy of Nationalism*, Oxford: O.U.P., 1983.

of humanity and nature, is some variation of the market socialism argued for by Alec Nove - with economies consisting of centralised state corporations (which should include all military equipment manufacture), socialised enterprises (state or socially owned with full autonomy and with management responsible to the work-force), co-operative enterprises (of which Mondragon is an exemplary example),[2] small-scale private enterprises subject to clearly defined limits (which would include the family farm), and individuals (e.g. artists, freelance journalists and plumbers).[3] However there should be far more regional containment of markets, particularly for capital, than advocated by Nove, and markets should never be more, or be conceived as more, than instruments to decentralize power and decision-making and to provide enough competition and freedom for individual enterprise to stimulate creative effort and guard against corruption and 'bureaucratization' of organizations.

It should be recognized that the market mechanism can only function properly for some goods and services, and that the market by itself is not an efficient or proper means for allocating returns to factors of production. The market mechanism is blind to the medium and long-term future, and blind to the intrinsic value of nature and people. An unhindered pricing mechanism will not lead to the best use of reserves and resources because people in the future, let alone plants, animals and ecosystems, cannot bid on the market. If it is allowed to operate unhindered for labour it debases people, reducing them and their creative activity to commodities, it creates insecurity and it leads to the concentration of income and wealth, all of which corrupt the ethical and political life of society. And if the pricing mechanism is allowed to operate unhindered for capital it is temporally unstable, tending to concentrate income, wealth and power, producing cycles of booms and depressions, and spatially unstable, tending to concentrate the means of production in small regions which is disastrous for the people outside these regions and catastrophic for the world's environment dominated by these regions. The operations of the market will not support efforts to address long-term problems which will only benefit future generations - whether these be efforts to conserve reserves and preserve resources, to reafforest land, to reduce pollution, or advance our understanding of the world. The common good, the distribution of and rewards to factors of production and meeting long term problems, need to be recognized as ethico/political problems. The market should always be subordinated to ethically based political institutions with the power and the will to take longer-term perspectives and to ensure that justice prevails in people's relationships to each other and to nature.

Developing such a new ethical, political and economic order will involve a long and complex struggle. To achieve the necessary changes, a fundamental, world-wide cultural transformation will be required. The former premier of the Soviet Union, Mikhail Gorbachev, arguing that the development of armaments is no longer the means to security, pointed out: 'This is a totally new situation which signifies a break with the traditions, the way of thinking and the patterns of behaviour, which have developed over centuries, and even over millenia.'[4] These same traditions, ways of thinking and patterns of behaviour also have to be changed to overcome the environmental crisis. Changing the way people understand themselves and incorporating a new way of thinking into society, as both the condition for addressing the major problems of the age and the condition for changing the social and political order of the world, is the most difficult task of all. However while it is almost unimaginably difficult and will take perhaps centuries to achieve, it is a task which

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2. For an excellent study of Mondragon, see Henk Thomas and Chris Logan, *Mondragon: An Economic Analysis*, London: George Allen & Unwin, 1982.

3. Alec Nove, *The Economics of Feasible Socialism*, London: George Allen & Unwin, 1983.

4. Michail Gorbachev, *Selected Speeches and Articles*, 2nd ed., Moscow: Progress Publishers, 1987, pp.213-224, p.219.

should now be regarded as absolutely essential if humanity, and most other life-forms on earth, are to survive.

To begin the struggle for such a massive transformation it will be necessary to work towards the establishment of what the Italian Marxist Antonio Gramsci called an alternative hegemonic culture to oppose the hegemony of the increasingly nihilistic culture of international capitalism. It will be necessary to make the immediate economic and political crises afflicting capitalism a central issue in the struggle to establish and develop this alternative hegemony, since the effects of such crises are so all pervasive that no social movement which fails to confront them can be taken seriously. However these crises should be shown to be related to the broader context of the environmental crisis, and the alternative hegemonic culture, to be effective, needs to be based on a new world-orientation articulated into a new grand narrative transcending Eurocentricism and anthropocentricism, a grand narrative which redefines the past and projects a new future, and relates all individuals, all organizations, all communities and all societies to the struggle to realize this future. Furthermore, a movement devoted to reforming the world needs to gain more than the mere allegiance of people willing to fight for new institutions and new power relations. Through this struggle it is necessary for people to change the way they experience the world, the way they understand themselves and their place in the world, how they relate to each other, the way they live and the way they organize themselves. The new way of conceiving things, the new world orientation and new grand narrative need to be incorporated into the autobiographies and broader narratives by which individuals and communities define themselves. Ultimately they need to be incorporated into their mode of being in the world as a habitus which can challenge the prevailing habitus with its mechanistic world-orientation. It is necessary to begin the process of embodying a new world-orientation into social relations, organizations, institutions, the built-up environment, and language itself.

Hegemony and Alternative Hegemony

The concept of hegemony is one of the most fruitful and influential concepts developed within Marxism.[5] It was originally used by Plekhanov and other Russian Marxists in the 1880s in their call to the working class to lead an alliance with the peasantry to overthrow Tsarism. This involved transcending limited economic concerns and developing a national approach to fight for the liberation of all oppressed nationalities, classes and groups. The strategy was taken up and developed by Lenin in opposition to the passive 'economism' and 'class reductionism' of the Mensheviks, and the success of the Bolsheviks under the leadership of Lenin was based on this strategy. However it was Gramsci who in the 1920s transferred a term which had only been used in formulating strategy into a concept of analysis, and developed the notion of cultural hegemony.

In developing this concept it is likely, although difficult to prove, that Gramsci was influenced by the ideas of Bogdanov.[6] Bogdanov had set up workers' academies in Italy between 1909 and 1911, following which, Tasca, Gramsci's early mentor in the Socialist Party, advocated a program of education and cultural development for the working class. In 1919, paralleling the *Proletkul't* movement in the Soviet Union, Tasca, Gramsci and

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5. For the concept of hegemony see Antonio Gramsci, *Selections from the Prison Notebooks*, ed. and tr. Quentin Hoare and Geoffrey Nowell Smith, New York, International Publishers, 1971, passim. See also Christine Buci-Glucksmann, *Gramsci and the State*, tr. David Fernbach, London: Lawrence and Wishart, 1980; Roger Simon, *Gramsci's Political Thought*, London: Lawrence and Wishart, 1982; Carl Boggs, *The Two Revolutions*, Boston: South End Press, 1984; Ernesto Laclau & Chantal Mouffe, *Hegemony & Socialist Strategy: Towards a Radical Democratic Politics*, tr. Winston Moore and Paul Cammack, London: Verso, 1985; and Joseph V. Fermia, *Gramsci's Political Thought*, Oxford: Clarendon Press, 1987.

6. On this, see Zenovia A. Sochor, 'Was Bogdanov Russia's Answer to Gramsci?', *Studies in Soviet Thought*, Vol.22, 1981, pp.59-81, esp. p.60.

Togliatti founded a journal, a weekly review of socialist culture. To highlight the importance of culture, Gramsci extended the term 'hegemony' to include all the practices of the capitalist class in attaining and maintaining State power. He argued that in class rule, force is only the last resort, that a class can only gain and retain power by leading ideologically and politically. Hegemony is then a relation not of domination by means of force, but of consent by means of political and ideological leadership. It is the organization of consent.

Developing the concept of class hegemony enabled Gramsci to reveal how entrenched the organization of consent can be. Hegemony is not achieved through a few intellectual ideas, but is integrated into people's lives through civil society. As one interpreter summed up Gramsci's notion of hegemony:

> It is a whole body of practices and expectations, over the whole of living: our senses and assignments of energy, our shaping perceptions of ourselves and our world. It is a lived system of meanings and values - constitutive and constituting - which as they are experienced as practices appear as reciprocally confirming. It thus constitutes a sense of reality for most people in society, a sense of absolute because experienced reality beyond which it is very difficult for most members of the society to move, in most areas of their lives. It is, that is to say, in the strongest sense a 'culture', but a culture which has also to be seen as the lived dominance and subordination of particular classes.[7]

The social relations of civil society, embodied in the great variety of organisations making up civil society, are at the same time relations of power just as much as, though in a different way than, the coercive relations of the State. The State is then redefined as civil society plus political society; in other words, hegemony protected by the armour of coercion. On the basis of this analysis, Gramsci argued that the tasks ahead of Marxists in Western Europe were considerably more difficult than those which had faced the Bolsheviks in Russia. Western Marxists have to overcome not only the coercive State, but civil society through which capitalists organize consent and disperse their power. Thus, in comparing Tsarist Russia and the West, Gramsci wrote: 'In Russia the State was everything, civil society was primordial and gelatinous; in the West, there was a proper relation between State and civil society, and when the State trembled a sturdy structure of civil society was at once revealed.'[8] What is required in the West is not a war of manoeuvre, but a war of position, demanding enormous sacrifices by infinite masses of people. This involves developing an alternative culture to the hegemonic culture of the ruling class.

In developing this point, Gramsci took Lenin's rejection of economism and class reductionism further, along lines already chartered by Bogdanov, arguing that in its struggle for hegemony the proletariat must undergo moral and intellectual reform and develop an ideology to bind together diverse social elements. It should combine the interests of other classes, groups and movements with its own interests so as to create a national-popular collective will. To do this it needs to overcome all the narrow, corporate prejudices of a fundamental class and make all necessary compromises in political and economic programmes in order to build up and sustain a bloc of social forces with a common world-view. There must be 'a cultural-social unity through which a multiplicity of dispersed wills, with heterogeneous aims, are welded together with a single aim, as the basis of an equal and common conception of the world.'[9]

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7. Raymond Williams, *Marxism and Literature*, Oxford: Oxford University Press, 1977, p.110.

8. Gramsci, *Selections from the Prison Notebooks*, p.238.

9. Ibid. p.349.

Such a unity could not be attained by adopting Marxism in a pure form. It was seen to be necessary to formulate a more complex synthesis of class objectives with popular-democratic themes that have arisen out of the unique and original history of each country. To achieve this it is necessary to engage in critical reflection on the existing ideological complex. Such reflection should not be left to groups of intellectuals. It is something that everyone should be involved in. As Gramsci argued:

> It is essential to destroy the widespread prejudice that philosophy is a strange and difficult thing just because it is the specific intellectual activity of a particular category of specialists or of professional and systematic philosophers. It must first be shown that all men are 'philosophers', by defining the limits and characteristics of the 'spontaneous philosophy' which is proper to everybody.[10]

The question is whether individuals are to allow their philosophy to be imposed on them, or whether they are to consciously and critically work out their own conception of the world and 'take an active part in the creation of the history of the world...'[11]

Such philosophizing should not be seen as a contemplative activity, 'but also and above all as a cultural battle to transform the popular "mentality" and to diffuse the philosophical innovations which will demonstrate themselves to be "historically true" to the extent that they become concretely - i.e., historically and socially - universal.'[12] Gramsci believed that it is in situations of crisis and engagement that people are most able to overcome their intellectual passivity and to work out their own conception of the world. Correspondingly, philosophizing should not aim to make a fresh start, but should begin by differentiating and changing the relative weight of the elements of the old ideology, while reorganising the new ideological system around a different central unifying principle to form a coherent, critical conception of the world. If the old ideology was genuinely popular, then it is necessary to preserve at least some of its elements in the new system, even if slightly altered in the process. Only in this way is it possible for the ideas and aims of a revolutionary class to become deeply rooted among the people. Political action can only be successful by drawing on the cultural heritage of the nation. However, unlike Bogdanov, Gramsci did not offer an alternative cosmology which could achieve this, and simply took for granted Marx's grand narrative of proletarian liberation.

Gramsci Today

Gramsci's main work was written in prison, and his writings were reflections on the failure of Marxists and on the success of the fascists at a crucial conjuncture of history. They were meant to provide guidance for the future. We are now in a similar, though more significant conjuncture to that of the 1920s and early 30s. To begin with, the world is facing an economic crisis. Unemployment has already risen dramatically over the last two decades, although this has been disguised by its irregular growth, with big increases occurring at approximately eight year intervals. Unemployment in the O.E.C.D. countries rose in the recession of 1967 to 5 million, in the recession of 1973-75 to 15 million, and in the recession of 1982 to 32 million.[13] We can expect unemployment to go far higher, as it is

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10. Ibid. p.323.

11. Loc.cit.

12. Ibid. p.348.

13. Andre Gunder Frank, *Critique and Anti-Critique*, N.Y.: Praeger, 1984, p.231.

already in the Third World. Morocco, for instance, already has an unemployment rate among able-bodied men between the ages of 15 and 64 of over 60%.[14]

There are a number of causes of this state of affairs. To begin with, there has been a revolution in technology which has generated in advanced capitalist nations both a big increase in productivity and increased unemployment. The founder of the science of cybernetics, Norbert Weiner, anticipated that the development of information technology would cause a depression more severe than that of the 1930s. As he argued:

> Let us remember that the automatic machine ... is the precise economic equivalent of slave labour. Any labour which competes with slave labour must accept the conditions of slave labour. It is perfectly clear that this will produce an unemployment situation, in comparison with which the present recession and even the depression of the thirties will seem like a pleasant joke.[15]

So far only a small proportion of the potential for saving labour through computer-chip technology has been exploited. It has been calculated by a computer scientist at Carnegie-Mellon University that by the year 2010 the number of people employed in manufacturing in the United States will drop from 26 million to 3 million.[16]

However the development of technology is only part of the problem. John Kenneth Galbraith concluded his book *The Great Crash of 1929* published in 1954 by listing the five weaknesses of the US economy in the 1920s which had an especially significant bearing on the ensuing depression. These were the growing inequality of income distribution, the bad corporate structure (due to the growth of holding companies and investment trusts), the bad banking structure, the dubious state of the foreign balance, and the poor state of economic intelligence.[17] All these weaknesses, which were patched up during the 1940s, 50s and 60s, are emerging again. There has been a massive redistribution of income and wealth to the wealthy, with the richest 1% of the US population increasing their share of national wealth from 20.8% in 1949 to 34.3% in 1983, compared with 36.3% in 1929.[18] Through a spate of takeover activity on a colossal scale, corporate structures are weak and there has been a decline in productivity.[19] International finance has undermined almost all the controls on banking which were put in place after the Great Depression. In his book *The Financial Revolution* published in 1986, Adrian Hamilton described how 'larger and larger institutional savings are chasing fewer and fewer investment outlets. The major manufacturing industries are contracting. The Third World has been shut off from new funds. The funds within the system are moving in faster circles, chasing the marginal profit that they can glean from their own movement.'[20] John Maynard Keynes, pondering on the causes of the Great Depression, had noted that 'Speculators may do no harm as bubbles on a

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14. See Susan George, *A Fate Worse Than Debt*, Harmondsworth: Penguin, 1988 for a description of the economies of the Third World nations.

15. Norbert Weiner, *The Human Use of Human Beings: Cybernetics and Society*, Boston: Anchor Press, 1954, p.220.

16. David Dickson, *The New Science of Politics*, 2nd ed., Chicago: The University of Chicago Press, 1984, p.51.

17. John Kenneth Galbraith, *The Great Crash 1929*, [1954], Harmondsworth: Penguin, 1984, p.194ff.

18. See Ravi Batra, *The Great Depression of 1990*, Schwartz and Wilkinson, 1987, p.118, and Lester C. Thurow, *The Zero-Sum Solution*, Harmondsworth: Penguin, 1987, p.122ff.

19. The deleterious effects of corporate takeovers have been examined in Alan Auerbach ed., *Corporate Takeovers: Causes and Consequences*, Chicago: University of Chicago Press, 1988; and David Ravenscroft and F.M. Scherer, *Mergers, Sell-Offs and Economic Efficiency*, N.Y.: Brookings Institute, 1988. See also 'Corporate Finance: Do Mergers Work?', *The Economist*, 17-23 December, 1988, pp.68-70. On the general effects of this on the U.S. economy see S. Melman, *Profits Without Production*, N.Y.: Knopf, 1983.

20. Adrian Hamilton in *The Financial Revolution*, Harmondsworth, Penguin, 1986 p.235. See also 'A Survey of America's Capital Markets' in *The Economist*, 11-17th June, 1988, after p.56.

steady stream of enterprise. But the position is serious when enterprise becomes a bubble in a whirlpool of speculation. When the capital development of a country becomes a by-product of the activities of a casino, the job is likely to be ill-done.'[21] Hamilton has shown that the whole world economy has become one great casino for the super-rich. One outcome of this has been the corruption and collapse of Thrifts in USA which it is estimated will cost the public from $US500 billion to $US1.4 trillion over the next 40 years.[22] There are also massive trade imbalances between nations exacerbated by the absence of stable exchange rates and by the debt crisis in the Third World (with Third World debt in 1988 standing at $US1.2 trillion). This debt, which is forcing countries to compete with each other to increase exports, thus forcing down prices, is having much the same effect as Germany's reparation payments in the 1920s which undermined not only Germany's economy, but the economies of the victors whose industries were undermined by cheap imports from Germany. And to top all this off, the discipline of economics has come to be dominated by the same sort of pre-Keynesian neo-classical ideas fetishizing the market which prevailed in the 1920s. As Lester Thurow concluded his study of the discipline: 'Economics is in a state of turmoil. The economics of the textbooks and of the graduate schools not only still teach price-auction model but is moving towards narrower and narrower interpretations. The mathematical sophistication intensifies as an understanding of the real world diminishes.'[23]

These problems are reinforced by fundamental transformations in the international economic order.[24] Transnational business organization have grown to such an extent that they are not merely uncontrollable by national governments, but through their control of media and investment are able to dominate governments. One consequence of this is the breakdown of the international regulation of trade resulting in what amounts to trade war, with each country struggling to increase its exports over imports. The success of Japan, West Germany and Taiwan in this struggle relative to the United States and more significantly, almost all the semi-periphery and periphery of the world economy has led to enormous instability and will prevent a repetition of the Keynesian strategy of President Reagan where massive expenditure on armaments lifted the world out of the recession of 1982. Secondly, growth of transnational corporations has forced nations and workers throughout the world to compete with each other to reduce taxes and wages to retain investment, while the growth of international finance has virtually destroyed the power of governments to regulate their economies.[25] Many States have now lost or abandoned sovereignty over their national economies, and the welfare organizations built up after the Second World War are being dismantled.[26] Thirdly, while there was much poverty in the 1920s and 30s one could still believe that this could eventually be overcome through

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21. John Maynard Keynes, *The General Theory of Employment, Interest and Money*, [1936], London: Macmillan, 1964, p.159.

22. For a review of studies of this, see Michael M. Thomas, 'The Great American Shambles', *The New York Review of Books*, Jan. 31st, 1991, Vol.XXXVIII, No.3, pp.30-33.

23. Lester C. Thurow, *Dangerous Currents: The State of Economics*, Oxford University Press, 1983, p.236. See also Paul Ormerod, *The Death of Economics*, London: Faber and Faber, 1994.

24. Charles P. Kindelberger in his book *The World in Depression, 1929-1939*, Harmondsworth: Penguin, 1986 focussed on the instability of the international economic order rather than on the conditions within countries. However the list of causes of the depression he gave in the concluding chapter also characterizes the present situation. A good overview of the state and trends of the world-economy can be gained from R.J. Johnston and P.J. Taylor eds, *A World in Crisis*, Oxford: Blackwell, 1986 and Susan Strange ed., *Paths to International Political Economy*, London: George Allen & Unwin, 1984.

25. In effect the predictions of Stephen Hymer; made in the early 1970s have proved correct and the consequences have been even worse than Hymer predicted. See Stephen Hymer, 'Internationalization of capital and international politics: a radical approach', in Edward J. Nell ed., *Growth, Profits & Property: Essays in the Revival of Political Economy*, Cambridge: Cambridge University Press, 1980, pp.189-203.

26. See Scott Lash; & John Urry;, *The End of Organized Capitalism*, Cambridge: Polity Press, 1987, Ch.7 onwards for a detailed study of this.

continued economic growth. The environmental crisis has undermined this assumption. As Dudley Seers pointed out:

> We are entering a period in which resource limits can no longer be ignored, nor can the interests of different sections of the world be assumed compatible: to solve one country's problems may well be to aggravate those of another... The [economic] crisis is not just a cyclical downturn nor even ... the slack phase in a hypothetical Kondratieff cycle... [It is] the culmination of a period of increasing strains on the world's productive structures, natural resources, and political systems. Thus a swift rise in world output would soon reveal shortages in oil, various minerals, and food, and increased international tension...[27]

This prediction is clearly borne out by boom in commodity prices from 1987 to mid-1988, a period in which metal prices more than doubled.

Finally, as in the 1920s there is a cultural crisis (but without generating the corresponding intellectual and artistic creativity). The nihilism of Western culture is increasingly manifesting itself, expressing itself in decadence, the growth of organized and unorganized crime, an inability to face up to and mobilize against the problems of society, exhaustion and fragmentation of intellectual life, and the embracing of simplistic, irrationalist ideologies. The stresses of this cultural crisis have in turn undermined the ability of individuals to cope with life. As James O'Connor argued:

> Capital's passion, money in search of more of itself, is unregulated by public conscience, institutionalized morality, or the state. The individual is bereft of a trustworthy social superego; neither capital nor the state can administer the passions and conscience. The individual is thus isolated, not merely materially and socially, but emotionally, a 'stranger in the crowd.'... In this cauldron of uncertainty and insecurity, a world where most people are encouraged to aspire to the banal, the routine, the scheduled, personality crisis erupts.[28]

The booming drug culture is a manifestation of this crisis.

Revamping Gramsci: The Environmental Crisis and Process Philosophy

In the face of this crisis, Gramsci's project of developing an alternative hegemonic culture to unify opposition to the existing order should be recognized as more important than ever. However, in the light of what has been argued in this work, it is necessary to re-evaluate the whole focus of those struggling against the oppression of the existing socio-economic order. It is necessary to go beyond Gramsci in what is to be made the central unifying principle around which the culture of the alternative hegemony is to be organized. What is required is a return to the project of Bogdanov and his supporters. If the problems of and oppression within the world are to be effectively confronted, then the environmental crisis should be the focus of a world-wide alternative hegemonic civilization, and my contention is that the unifying principle of this alternative culture should be a new metaphysics and cosmology, that of process philosophy. And for this to be articulated into

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27. Seers, *The Political Economy of Nationalism*, p.1. Seers is not alone in holding this view. See papers in Daniel Yergin and Martin Hillenbrand eds, *Global Insecurity*, Penguin: Harmondsworth, 1983.

28. James O'Connor, *The Meaning of Crisis*, Oxford: Blackwell, 1987, p.177.

guidance for action, it is necessary to elaborate in terms of it a new grand narrative projecting a new future.

The environmental crisis has destroyed the central tenet of those apologists for the existing order, that present suffering is necessary for economic progress which will eventually make everyone better off. There is no reason at all to believe that the present era of economic crises will usher in a new era of prosperity. The pressure on individuals and societies to increase production to overcome unemployment and international debt are not only oppressive, they are driving humanity to the destruction of the conditions of its continued existence. Environmental degradation is implicated in all oppression in the world and vice versa; changing our relationship to the environment to overcome the environmental crisis will only be possible by overcoming all major forms of economic, social, political and cultural oppression. It is no longer the expropriation of surplus value from workers which is the most oppressive aspect of capitalism, but its monopolization of control over the world's reserves and resources, its wasting and destruction of these combined with the exclusion of more and more people both from access to them and from participation in economic life.

It is now essential that present economic policies extolling the unleashing of market forces be abandoned and that economies of all nations be brought under democratic control. Nations peripheral to the world economy in particular need to liberate themselves from the economic core regions in order not only to overcome the oppression of their people, but also to conserve and preserve the world's environment, while people in all nations need to struggle against the fetishism of commodities to create environmentally sustainable forms of life. Stephen Bunker has made this point well:

> Dominant classes depend on their societies' total environment; in this sense they depend on the organization of other classes' adaptation to the environment. The clearest lesson of class relations in the Amazon is that dominant groups which impoverish the rest of society ultimately impoverish themselves. Only when human communities with balanced exchange relations exist is it possible for social organization to adapt to its total environment in ways which sustain both human community and the ecosystem itself.[29]

Environmentalism as the struggle against ecocide thus can unify all struggles against oppression. It is simultaneously a symbol for the untenability of the existing economic and political organization of the world, a symbol against oppression throughout the world, both within and between nations, a symbol for the inter-relatedness and interdependence of the human community and of other life forms, and a symbol affirming all life, providing the foundation for a new vision of the future. It is this which the West German Greens recognized, and which made their achievement important for the rest of the world. As Werner Hülsberg wrote in the conclusion to his study *The German Greens*:

> The real contribution of the West German Greens, ... is that they understood and grasped the ecological question not just as another question and not as a political neutral task but rather as the decisive question, the acid test, of *left-wing politics*.... The ecological question has become today a symbol for the general dissatisfaction with a model in which traditional politics is only capable of following the dictates of economic interests and in which science has become a whore on sale to the highest bidder. The

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29. Stephen Bunker, *Underdeveloping the Amazon*, Urbana and Chicago: Illinois University Press, 1985, p.252.

ecological question presents us with the need for a new emancipatory model of eco-socialism.[30]

Nationalism versus Globalism?

In a world in which even most national governments in the economic centres have failed to effectively confront their own environmental problems it is hardly likely that actions taken by international organizations will have much success unless backed by local organizations. Correspondingly, while it is necessary for people to act locally, purely local action ignoring the broader context affecting local issues is unlikely to do more than slow down the rate of environmental destruction. Those struggling against global environmental problems can only succeed by developing strong organizations committed to the conservation and preservation of the environment which can effectively represent local environmental concerns within broader national, regional and international forums. Environmentalists will have to struggle for representation of the environment in local, national, regional and global politics; to use the environment as a focus to mobilize people to liberate themselves from and then to control the destructive imperatives of the world economy. This will require the fostering of an environmentalist, 'internationalist' nationalism.

The promotion of such nationalism is required to recreate the sense of community and personal identity required for effective action, to overcome the rootlessness of people which is depriving them of the will to struggle for anything. In the modern world radical political movements, including Marxist movements, have only ever been successful where they have been more or less explicitly fused with local cultural traditions as nationalist movements, and nationalism has been central to the struggles of every other country which has been at all successful in overcoming its subjugation by the world-market. Only by cultivating nationalist sentiments will it be possible to mobilize people to bear the costs of the struggle for regional control over economic life, to generate concern by people for justice for their compatriots, to inspire them to develop more austere forms of life which conserve reserves and preserve resources, and to develop institutions powerful enough to tackle broader environmental problems. Only through nationalistic struggles will the hold of the consumer oriented culture of the economic cores be broken, forms of relationships between people transcending commodity fetishism be developed, the organizational basis and the cultural conditions for confronting the long-term problems associated with the environment be created, and the possibility of transcending capitalism altogether be revealed. The point is that except for intellectuals, pure cosmopolitanism is too rarefied an orientation in the struggle for justice. Most people need to feel that they will be recognized and taken into account at a more immediate level before they will define their own lives in terms of this struggle.

To begin with, nationalism should continue to be fostered in the Third World. Third World people need to struggle through local, national, and also regional organizations to preserve their own environments from exploitation by the economic core regions. What is particularly required in the unification of regions, such as Latin America and Africa, to oppose domination by North America and Western Europe. Given the location of most environmental destruction in the Third World, this struggle for liberation should be recognized as the most important struggle of all.

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30. Werner Hülsberg, *The German Greens*, London: Verso, 1988, p.219f.

What role, then, should environmentalists prescribe for the affluent nations of the world in the world-economy? Should their main concern be to provide for the impoverished of the Third World by striving to make the world into one vast Welfare State as Willy Brandt has proposed?[31] Or should their main concern be to orient themselves towards preserving their environments by reducing economic output and reducing their consumption? In the late 1970s in the tradition of most humanitarian thinkers, Ervin Laszlo made the point that: 'The World Bank calculated that hard-core world poverty could be erased by an investment of one dollar per barrel of oil used between now and the end of the century. Some one billion people would be lifted from abject and inhuman conditions to a life worthy of human beings. Such funds are comparatively modest and they could easily be raised. They equal the yearly incremental expenditures of the world's privileged classes on tobacco, alcohol, and cosmetics.'[32] But thinking in such terms offers further legitimation for the drive for continued economic growth in the affluent nations, since this can then be represented as the means for overcoming poverty in the Third World. And apart from the unlikelihood of further economic growth leading to any greater generosity towards the Third World from the affluent countries, there is no reason to believe that government aid to Third World countries will solve the problem of poverty.

In most cases, foreign aid from the governments of the core zones to the Third World has further entrenched existing oppressive power structures, while solutions foisted on Third World governments by benevolent international agencies have been singularly unsuccessful. When affluent people try to extend their own organizations and policies into areas which are socially simple, energy poor and devoid of organizations and institutions which can match the organizational strength of such agencies, these agencies have facilitated their own and the peripheral societies' permeability to and exploitability by nationally and internationally dominant classes. Those people who have overcome their poverty have been those who have relied on their own efforts, and people outside these regions could not have directed their struggles. As Denis Goulet argued on the basis of a study of strategies for development in Guinea-Bissau: 'Paradoxically, the lesson of greatest importance is that the best model of development is the one that any society forges for itself on the anvil of its own specific conditions.'[33] So, as James Lamb argued:

> Development should be a *struggle* to create criteria, goals, and means for self-liberation from misery, inequity, and dependency in all forms. Crucially, it should be the process a people choose, which heals them from historical trauma, and enables them to achieve a newness on their own terms.[34]

This has been the secret of the success of Kerala in India, Algeria, Eritrea and Zimbabwe.[35] For such reasons Dudley Seers who spent much of his life as an adviser to Third World governments, opposed foreign aid to developing countries.[36] The only aid likely to be

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31. See Willy Brandt et. al. *North-South: A Programme for Survival*, London: Pan Books, 1980. Also Willy Brandt, *World Armament & World Hunger*, London: Gollancz, 1986.

32. Ervin Laszlo, *The Inner Limits of Mankind*, Oxford: Pergamon Press, 1978, p.46.

33. Denis Goulet, 'Looking at Guinea-Bissau: A New Nation's Development Strategy', Occasional Paper no.9: Overseas Development Council, March 1978, p.52, cited by Charles K. Wilber and Kenneth P. Jameson in 'Paradigms of Economic Development and Beyond' in Charles K. Wilber ed. *The Political Economy of Development and Underdevelopment* 3rd ed., N.Y.: Random House, 1984, pp.4-25, p.22.

34. James J. Lamb, 'The Third World and the Development Debate' *IDOC - North America*, January-February 1973, p.20, cited ibid. p.23.

35. On the success of Zimbabwe see Paul Harrison, *The Greening of Africa*, London: Paladin, 1987, pp.87-97.

36. Seers, *The Political Economy of Nationalism*, p.156. Some detailed support for Seers' views is provided by Marcus Linear, *Zapping the Third World: The Disaster of Development Aid*, London: Pluto Press, 1985 and Jon Bennett in *The Hunger*

effective is aid put at the disposal of the poor; that is aid 'disposed of locally, by the poor countries' poor themselves, on their own terms and in support of local work, education and the meeting of basic needs, thus benefiting development from below.'[37] Only such aid should be supported.

The primary goal of people in the affluent core economies should be the termination or radical reduction of the economic links between their countries and Third World economies, and an end to the exploitation of Third World reserves and resources, to the importation of agricultural products and timber. As Stephen Bunker argued: 'Ultimately the need is to slow the flow of energy to the world centre.'[38] This struggle should not be thought of in purely altruistic terms. It should be seen as part of and linked to the struggle to stop the bankrupting of farmers, the deindustrialization of regions, unemployment and the impoverishment of people in these core zones. To avoid exploitation, to escape the vicissitudes and pressures of the international capitalist system and to gain democratic control over their economies, to turn the advantages of improved technology to bettering the conditions of life, regions, whether local, national or broader geographical areas, should as far as is possible aim at economic self-sufficiency.[39] As John Maynard Keynes argued in 1933: 'Ideas, knowledge, science, hospitality, travel - these are the things which should of their nature be international. But let goods be homespun whenever it is reasonably and conveniently possible, and above all, let finance be primarily national.'[40] With recent developments in technology, such localization of production for most goods is now more possible than ever. The task ahead of people in the economic core zones and semi-peripheries is to create steady-state economies for their own benefit, for the benefit of people in the Third World, for the benefit of all future generations and for the benefit of all other life-forms.

Nationalism is the only ideological weapon with the potential to combat the forces of international capitalism to achieve such control.[41] Justice will be achieved through the development of a reformulated nationalism, or it will not be achieved at all and victory will pass to those demagogues of the extreme right willing to incite exclusive groups to violent struggle for what reserves and resource are left.

What is Nationalism?

Nationalism has a bad name among radicals. In the past it has been linked with imperialism, wars of aggression and with the persecution of minorities, and at present it is associated with the ethnic violence in the Balkans and Eastern Europe. So just what is nationalism? And how can it be utilized by environmentalists?

Nationalism is essentially 'a territorial ideology',[42] while modern States are territorial political institutions. Nations are both cultural and political phenomena. As Benedict

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Machine, Cambridge: Polity Press, 1987, Ch.3, 'Aid: the Poisoned Gift?'. As Bennett; argued, 'Aid as a political weapon is not always covert: indeed, it could be argued that all *official* aid is simply an extension of foreign policy and a means of entrenching economic dependency.' (p.84.) and 'Aid is, in fact, a transfer of money from Northern tax-payers to Northern private companies...' (p.104f.) Bennett's criticisms are not directed against private aid organizations.

37. Erik Dammann, *Revolution in the Affluent Society*, tr. Louis Mackay, London: Heretic Books, 1984, p.44.

38. Bunker, *Underdevelopment in the Amazon*, p.253.

39. This has been forcefully argued by Herman R. Daly and John E. Cobb, Jr. in *For the Common Good*, Boston: Beacon Press, 1989.

40. John Maynard Keynes, 'National Self-Sufficiency' in *The Yale Review*, Vol.22, 1933, p.758.

41. As Dudley Seers has argued in *The Political Economy of Nationalism*.

42. This definition is developed by James Anderson, 'Nationalism and Geography' in *The Rise of the Modern State*, ed. James Anderson, Brighton: Wheatsheaf Books, 1986, pp.115-142, p.116.

Anderson has argued, the nation is 'an imagined political community' which is created through being imagined.[43] There are three component parts to the doctrine of nationalism: that the people of a region should be self-determining, that they have a unique national character which should be fully expressed, and that each nation contributes its special genius to the common fund of humanity. Historically, the 'nation', or rather 'community of nations' has succeeded ethnic groups, and then world religions, as the focus of social integration beyond the biological family, and nations are now the major actors in grand narratives of humanity's progress. Nationalism, affirming the community of people in a region, relates their traditions and their future, provides people with an identity and forges a common destiny for its members. Nationalism, as a narrative or unfinished story of the people of a region, serves to coordinate people's actions and lives, to mobilize them for action, and to legitimate the institutions of the State. It serves the State by strengthening the institutional relationships between the State and civil society, by furthering the internal unification of culturally and economically diverse regions into a more homogeneous State territory, and it divides one political community from another, in many instances determining the geographical boundaries of the State. Conversely, by affirming the existence of a community, nationalism legitimates claims by people for just representation by the State, that the State will itself be just and that it will put to rights injustices perpetrated against its members. As John Breuilly argued on the basis of his exhaustive examination of the history of nationalism: 'an effective nationalism develops where it makes political sense for an opposition to the government to claim to represent the nation against the present state.'[44]

Nationalism has taken a variety of forms.[45] Nationalism emerged in Spain, England and France as the merchant classes of these societies struggled for political representation in the new absolutist States which had emerged from the late feudal kingdoms. While this nationalism developed through the cultural unity engendered by the development of new print-languages, culture was not an issue in its development, and the nations involved were assumed to correspond to the territorial boundaries of the State. Such nationalism was identified with the democratization of government. The growth in power of England and France was a stimulus for the development of two other forms of European nationalism - the separationist nationalism of Ireland, Belgium and Norway, and the unificationist nationalism of Italy, Germany and Poland. In each of these cases the promotion of national cultures was central and preceded the emergence of national States. Outside Europe, nationalism first developed among European colonies in the struggles for independence, then a 'reform' nationalism developed in countries threatened by European imperialism, notably in Japan, Turkey and China. Towards the end of the nineteenth century and culminating in the Second World War, European nationalism was extended to include the working class in the community of the nation, but at the same time, at least among the major powers, it became more authoritarian and expansionist. It came to be associated with a rejection of the right of every nation to political self-determination and independence and the assertion of the privileged position of one's own nation - the 'chosen nation'.[46] However there were other European States in which a new reform nationalism developed to mobilize people against the vicissitudes of the world capitalist economy without this chauvinist quality. Such reform nationalism, associated with the development of the social or liberal corporate States, became increasingly influential among small European nations after the Second World

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43. Benedict Anderson, *Imagined Communities: Reflections on the Origin and Spread of Nationalism*, London: Verso, 1983, p.14.

44. John Breuilly;, *Nationalism and the State*, Manchester: Manchester University Press, 1985, p.382.

45. See ibid.

46. This development was recognized by Rodolf Hilferding. See *Finance Capital*, [1910] tr. Morris Watnick and Sam Gordon, London: Routledge & Kegan Paul, 1981, esp. p.335.

War.[47] There also emerged at this time a post-colonialist nationalism in the Third World, in some cases serving to unify inherited political divisions, in others to separate regions from inherited State structures or to combine regions across State boundaries. A new set of nationalist movements have emerged within Europe striving for independence from old States, for instance Scotland, Flanders. Croatia and Estonia are successful examples of this. And finally there has developed in the Third World a new form of nationalism aimed at uniting broader regions such as South America, Africa and the Islamic countries into a united struggle against domination by the First World.

While the fostering of nationalism has led to greater justice and vast improvements in the quality of life of those who are united by it, nationalism is also associated with tendencies to deny justice to racial minorities and outsiders. It is these destructive tendencies of nationalism which have been used to justify the claim of cosmopolitan intellectuals that nationalism is essentially pathological. But are double standards and their consequences inevitable? Benedict Anderson has argued that they are not. He reminds us that far from being a concomitant of nationalism, racism is a throwback to notions of class: 'The fact of the matter is that nationalism thinks in terms of historical destinies, while racism dreams of eternal contaminations, transmitted from the origins of time through an endless sequence of loathsome copulations: outside history. ... The dreams of racism actually have their origin in ideologies of class, rather than in those of nation: above all in claims to divinity among rulers and to "blue" or "while" blood and "breeding" among aristocracies.'[48] The ideology of nationalism is more consistent with quest for universal justice. One case which illustrates this relationship is the nationalism promoted in the 1930s in Sweden.

Up until the 1930s, Sweden was dominated by the export oriented sector of the bourgeoisie. This group was defeated during the Great Depression when the workers in alliance with farmers' interest groups and the home market fraction of the bourgeoisie gained power. In 1932, the Social Democratic Party gained control of parliament, and until recently retained this almost continuously. But even more importantly, the Swedish Confederation of Trade Unions first united the working class, then transcended its narrow concerns with working class incomes to represent the interests of all those oppressed by economic developments. It was the prototypical case of the success of a Gramsci type alternative hegemony, based on a fusion of socialist and traditional ideas, succeeding in becoming the dominant hegemony. This success was achieved by forging of a left-wing form of nationalism.

Winton Higgins described the response of the Swedish labour movement to the Great Depression: 'Alone among Western labour movements, the Swedish movement took the Depression as the cue to mount an all-out assault on the organising principle of bourgeois politics, the theory and practice of economic liberalism.'[49] It then began developing general policies for the whole nation based on maintaining full employment, equalizing wages, and controlling levels of investment: 'It has developed a practice of national policy formation and implementation outside the framework of the state, and thus is also partly extra-parliamentary party and partly alternative state apparatus.'[50] Transcending working class particularism, the labour movement recast Swedish political culture through the concept of 'peoples' home' (*folkshemspolitik*). Gören Therborn described the role of this concept:

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47. On this see Peter Katzenstein, *Small States in World Markets*, Ithaca: Cornell University Press, 1985.

48. Benedict Anderson, *Imagined Communities*, p.136.

49. Winton Higgins, 'Unemployment and the labour movement's breakthrough in Sweden' in Jill Roe ed. *Unemployment*, Sydney: Hale & Iremonger, 1985, pp.105-124, p.105.

50. Winton Higgins, 'Working Class Mobilization and Socialism in Sweden', Paul Boreham and Geoff Dow eds, *Work and Inequality*, Melbourne: Macmillan, 1980, p.156.

> The Peoples' Home had an implicit connotation of 'family' - rather than 'house' - of family community and equality with 'no favourites or stepchildren'. It connoted common concern and caring for each other and had its focus on society rather than on the state and particular institutions. It is noteworthy and testifies to the tactical skill and success of the SAP, that the notion turned out quite compatible with a reaffirmation of classical working class demands in the fields of social policy.[51]

This universalism transcended the notion of individuals' social rights, and replaced it with a *Weltanschauung* of national solidarity. In accordance with this, Alva Myrdal presented the case for social security not as a question of social insurance, but as a question 'of social policy, as a productive social policy - as common investment by the nation in its future welfare - with its accentuation of family policy and of preventative measures.'[52]

Associated with this internal policy, the Swedes under the Social Democratic Party aligned themselves with the oppressed of the world and to institutions promoting internatational justice, and more consistently and successfully addressed environmental problems than virtually any other nation (with the possible exception of Denmark). Despite their cold climate, they now use only one half as much energy per head of population as people in USA.[53]

Environmental Nationalism and Process Philosophy

Process philosophy provides the philosphical basis for such an environmentalist 'internationalist' nationalism. As we have seen, the development of nationalism first requires a struggle for cultural independence and a sense of cultural identity in the regions in which people live. For such reasons Dudley Seers argued for the development of national cultures. He called for education in the traditional arts subjects, arguing that 'the centre-piece of education is history, the history of the nation *in relation to its continent and the world*, ranging right up to the present.' And he argued for 'making people familiar with their nations cultural heritage - myths, fables, songs, dances, carvings and sculpture, buildings, etc. - which expresses national experience and can help inhibit the growth of cultural dependence.'[54] But while these are important, such an education by itself is too passive. There is no reason to suppose that the culture of any region in its existing form will be adequate for what is required of it. Education should induce people into an on-going dialogue so that they can become critical participants in the development of their cultural heritage, and define their own lives in terms of this participation.[55] To achieve this it is necessary to see cultural development and nationalism in terms of a theory of culture, a grand narrative, a cosmology, and a general philosophy.

In terms of process philosophy, the culture of a region is part of the process of a people's self-creation, part of their on-going struggle (with varying degrees of success) to orient themselves, practically and theoretically, in relation to nature, to each other, to their society

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51. G. Therborn, 'The working class and the welfare state', 5th *Nordic Congress of Research in the History of the Labour Movement*, Murikka: Finland, August, 1983, p.20.

52. Cited ibid. p.23.

53. On the Swedish effort to address environmental problems see Peter Bunyard, 'Sweden: Choosing the Right Energy Path?' *The Ecologist*, Vol. 16, No.1, 1986, pp.24-28. In 1988 laws were passed to phase out battery hens, and to improve the living conditions of cattle and pigs.

54. Seers, *The Political Economy of Nationalism*, p.105.

55. For an illuminating study of education and its problems and what is required to overcome them and to induct students in this way see Basil Bernstein, 'On the classification and framing of educational knowledge' in *Class, Codes and Control*, St Albans: Paladin, 1973, pp.227-256.

and its institutions and to people of other regions; to recognize and appreciate nature's, their own and each others' uniqueness, significance and potentialities, and to realize these potentialities. The primary means by which people do this is through the construction of narratives. Cultural diversity is required to appreciate unique situations, to explore diverse possibilities and reveal the limitations of different modes of existence. Each culture is a contribution to life and to the culture of humanity, as part of the world's and humanity's self-creation, not entirely determined by past and present conditions, yet dependent on environmental and material conditions, including the cultures of others in the past and in the present. The unique significance of each local culture and all its subcultures (and the people embodying and developing this culture), can be fully appreciated, but still criticised from this perspective, allowing individuals to assimilate aspects of other cultures to their own. The study of the local environment is part of the development of culture, and by fostering a recognition of the relationship of society to its environment in the past and present, nationalism can be fused with the commitment to conserving and preserving the integrity of this environment. By seeing cultural development in terms of process philosophy, the struggle for national independence can be seen as a struggle within nature and for nature, as part of the world's becoming conscious of itself in all its diversity to reveal and realize its potentialities.

Process philosophy also provides a means to integrate cultures. It provides a framework of concepts which can facilitate far more efficiently than prevailing concepts an understanding by individuals of their place within the world. It enables individuals to easily comprehend the major advances in the natural sciences, allowing them to understand their place in the natural world, enables them to grasp the complexities of societies and the international socio-economic order, and legitimates the central place of narratives in orienting people. In this way process philosophy should enable people to see through the illusions purveyed by the priests of the hegemonic culture, the 'scientific experts', whether these be orthodox natural scientists, economists or experts in cost-benefit analysis. Most importantly, it should enable the members of a region to see their common interests, the relationship between these and the future of their environments, and between their own environments and the world ecosystem while still recognizing and appreciating diversity.

Nationalism can then be redefined as the commitment by a regional community to justice within and for the region, to preserving and developing its potentialities. Above all, as the ultimate condition of all potentialities, nationalism should involve a commitment to preserving and conserving the local environment. For these commitments to mean anything they must be incorporated into the narrative defining the nation - the unfinished story which provides the ultimate reference point for all its communities, organizations and institutions to define and legitimate themselves and their projects.

By providing a way of thinking about one's place in the world which neither atomizes the world nor dissolves each part into the totality, process philosophy makes it possible to formulate a multi-levelled nationalism, to acknowledge the significance and partial autonomy of one's local community while seeing this as participating in a national community which itself has a partial autonomy, which is in turn participating in a broader regional community (for example, Western Europe, the Islamic world, Africa or Latin America) with some partial autonomy, which again is participating in a world community which is more than the sum of all the particular communities which compose it. Individuals can then be simultaneously nationalistic in relation to their local region, to their country, and to a major region of the world, while at the same time being committed to international justice and to the subordination of national interests to the interests of humanity and to the health of the bio-sphere. The question then is one of justice, of appropriately acknowledging the uniqueness and significance of each level of the community. Environmental nationalism should then be seen as the struggle to maintain, to transform or to create power structures,

from the local to the international level, which appropriately recognize the people of regions, their future generations, their non-human forms of life and the general environment, and to effectively articulate the needs, concerns, potentialities and aspirations of all these life forms.

Cultural Inertia and Creative Rationality

The transformation of society from one socio-economic formation to another on an international scale will be a long drawn-out process in which opposing social forms will co-exist, and in which there will be failures, retreats and regressions as well as successful advances by those struggling for a more just order. As Marx argued in *Capital*: 'epochs in the history of society are no more separated from each other by hard and fast lines of demarcation than are geological epochs.'[56] A world-wide social and cultural transformation is something which will have to be struggled for over centuries, and in which even successful struggles in any individual's lifetime can only be regarded as contributions to this struggle. Furthermore, it is only through people recognizing this, and recognizing that life in the present cannot be reduced to a mere means for the realization of a new world-order that this struggle is likely to succeed.

One of the major concerns of this work has been to reveal the nature and dynamics of cultures, and in so doing, to reveal their inertia and what is involved in major cultural transformations. It has been shown how the Christianity which developed in the early Middle Ages was built on previous modes of being in the world, and the intellectual revolution associated with the development of mechanistic materialism was already foreshadowed by, and was actually an articulation and an expression of, previous developments in social practices. In Russia where more radical changes were made over a relatively short period, these required a tremendous effort. Through the whole of the nineteenth century the élite of the intelligentsia struggled to develop the world-orientation and associated mode of being in the world required to overthrow Tsarist rule, and much of the turmoil following the Revolution was produced by the struggle to change the habitus of the rest of the population. And to a considerable extent this transformation, which was not entirely successful, was only possible because of the resonance between the Orthodox Christianity of Russia and the Neoplatonic aspects of Marxism, the pre-existing model of Western European dynamism continually brought home by the threat of domination by Western Europe, and the propensity of Russian culture to invert itself. The main reason for the difficulty in effecting cultural change is the way particular modes of conceiving the world are embodied in practices and institutions, with all practices in societies resonating with and thereby supporting each other, requiring of individuals that they conceive themselves and their relationships in a certain way to get on in the world. Ways of conceiving the world are embodied not only by individuals and their social relations and practices, but also by modes of production, institutions, organizations, and by the transformations of the physical world.

However once the instrumentalist form of thinking deriving from the mechanical world-orientation is abandoned there appears to be grounds for hope that radical cultural changes can be effected, at least in the long-run. Instead of focussing solely on gaining positions of political power and achieving specific, pre-defined political goals, an approach is revealed in which a broader front is available for action. By changing focus in this way, it becomes clear that far more people can and must play a part and be involved in a wide variety of tasks to effect the requisite changes in society.

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56. Karl Marx, *Capital*, Vol.1, Moscow: Progress Publishers, 1974, p.351.

The essence of the conception of power which emerges from process philosophy is that it is both the potentiality for and the actuality of self-creation as co-becoming with a multiplicity of other inter-dependent, semi-autonomous processes in the process of becoming of the world. To be in control of the world is not to reduce everything to instruments. It is to be able to live and act rationally, where rationality is understood as creative rationality, the ordering principle of the self-formation of people. Creative rationality involves striving to think and act justly, recognizing in thought and action the nature, dynamics and significance of all processes related to one's life. The ends of actions should not be defined in abstraction from these other processes and should always take into consideration the conditions being created or destroyed for other actions and for other processes. In effect, one (or one's group, organization, nation etc.) should see oneself as a participant within an ecosystem, a system of 'homes' of all individuated processes of becoming which make up the process of becoming of the world, and all one's actions in terms of what difference they make to this system.

This means that activity directed to changing the world should not be conceived as an engineering task to erect a preconceived model of how things ought to be; it is activity aimed at establishing and increasing the power and influence of practices, social relations, institutions and the products of activities embodying one form of thinking over those which embody another. Firstly it is necessary to challenge and replace the dominant stories defining individuals, communities, organizations, nations and civilization. It is necessary for individuals to change their habitus in the same way as the Russian intelligentsia forged a new habitus in the nineteenth and early twentieth centuries. Beyond this, it will be necessary to look for, or create niches within which the theoretical ideas, interpersonal relationships, practices, ways of living, relationships to the physical environment, and organizations embodying the process conception of the world can be established and made to flourish, and which in so doing can provide further niches for other process oriented research, relationships, practices, lives and organizations to establish themselves. The aim should be to develop these in such a way that they eventually undermine and displace the practices, relationships, ways of living, institutions and organizations embodying the mechanistic world-orientation.

This will be a multi-dimensional struggle. All action is simultaneously a participation in a multiplicity of processes - natural, biological, social and cultural - each of which has a different temporal rhythm. Each action and each life has significance far beyond what is generally recognized by one dimensional instrumentalist rationality. A life, or even an individual action, can at the same time be personal event, a political event, and a creative participation in the long durational dynamics of a culture through its symbolic significance, particularly if by such a life or such an action the way reality is normally defined is challenged. Through their actions and by the lives they lead, people are defining and redefining the meaning of history. This is what Merleau-Ponty was trying to convey when he argued:

> History is the judge - not History as the Power of a moment or of a century - but history as the space of inscription and accumulation beyond the limits of countries and epochs of what we have said and done that is most true and valuable, taking into account the circumstances in which we had to speak.... What [people] expect of the artist or politician is that he draw them towards values in which they will only later recognize their own values. The painter or politician shapes others more than he follows them. The *public* at whom he aims is not given; it is a public to be elicited in his work. The others of whom he thinks are not empirical 'others', nor even *humanity* conceived as a species; it is others once they have become such that he can live with them. The history in which the artist participates ... is not a power before which he must genuflect. It is the

> perpetual conversation woven together by all speech, all valid works and actions, each according to its place and circumstance, contesting and confirming the other, each one recreating all the others.[57]

To free themselves from the prevailing social perspectives and to reveal to themselves and to others the possibility of reconceiving the world, it is important that people actively participate in social struggles for a better world. The very fact of being part of a political struggle makes possible changes in perspectives and attitudes, especially if the struggle is well chosen and well organized. This seems to have been one of the main reasons for the success of the German greens. People should not be disheartened by the limited chances of achieving any particular goal. Actions, or even lives, which at the time appeared to have failed totally, as examples have entered the transcendent temporal order of the symbolic realm, acquired a symbolic significance which has influenced people for thousands of years, and changed the course of history.

Alternative Policies: Towards a New Grand Narrative

While it is necessary to think of the struggle for a new order as a long term endeavour, to become a political force in the present it will be necessary to articulate the problems and aspirations of people in the short term with those of the intermediate and long term, the problems and projects of local areas with broader regional and world problems and projects, the immediate problems and goals of individuals and groups with national problems and goals and with the problems and goals of humanity. What is required is the construction of a new grand narrative, a new story of humanity's transformations in which people can identify themselves in history in relation to the rest of the world, including the environment, and take up a position in the struggle to realize short, intermediate and long term goals of their communities, organizations, nations and of humanity.[58] The grand narrative should evaluate people of the past in terms of the nature of their relationship to their environment and project a future of an environmentally sustainable civilization, while showing how problems confronting people in the present are related to environmental degradation, and how overcoming this relates to their own aspirations. It it is necessary to elaborate this so that all actors, whether individuals, organizations or nations, can identify and situate themselves, and evaluate all other actors.

Developing this will require the use of retrospective path analysis and the concepts of the ethics, political philosophy and science of society based on process metaphysics. In terms of these it is necessary to work out what form of world-society and civilization could provide the best conditions for people to live in while preserving the environment. This can be posited as something to be aimed at several hundred years in the future, and the paths which need to be taken from our present situation to realize that goal can then be examined. In the light of this general project, it should be possible to consider each region in the world and for each nation to consider in more detail what paths they need to take if humanity is to achieve a sustainable world-order. In this way it should be possible to formulate national and broader regional goals for a hundred years or so into the future, and then to consider how different locations, institutions and organizations can be developed to realize these goals. These goals should be developed as part of nationalistic endeavours to provide the

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57. Maurice Merleau-Ponty, *Humanism and Terror: An Essay on the Communist Problem*, tr. John O'Neill, Boston: Beacon Press, 1969, p.188f.

58. On what is required to construct a new grand narrative see Arran Gare, *Postmodernism and the Environmental Crisis*, London: Routledge, 1995, Ch.5.

conditions within each country for people to contribute as much as their abilities will allow to their nation, to humanity and to life itself.

It is then necessary to examine the immediate problems of societies and of individuals from within this general framework to relate these to the broader problems of civilization and the world ecosystem. It is particularly necessary to identify forms of oppression which are preventing the realization of such national goals and the long term goals of humanity so that attempts to overcome these can be integrated with nationalism, with humanism and with the endeavour to preserve the world ecosystem. As each more local and immediate goal and path is worked out, this should then enable broader and longer term goals and their associated paths to be revised. Developing an image of the future in this way should involve a constant shifting of focus between the general and the specific and between the short term and the long term.

However the most important task for the immediate future is to address the existing series of economic crises and their causes, and to formulate solutions to these in accordance with the long run interests of humanity and of life. What is required is nationalist struggles to wrest back control over the economies of regions from the destructive dynamics of international capitalism, to gain democratic control over the financial institutions, transnational manufacturing and agribusiness companies which are at present destabilizing the world-economy, breaking down democratic institutions and creating economic and political pressures which are forcing people to wreck their environments to stay alive. To overcome this crisis in a way which contributes to overcoming the more basic problems of environmental destruction, which contributes to creating a sustainable world-order based on just relations between people and nature, environmentalists should support the erection of economic barriers to break up the world economy and to control the flow of capital, and promote the development of democratic institutions able to plan for the long term future which can subordinate the functioning of the market to long term national and international interests. In this way they can work towards redefining the nature of economics from the promotion of money-making to managing, preserving and developing the national household, with the environment - the foundation of this household - at the centre of concern.

Although what can be achieved in different countries will vary, environmentalists should spearhead the attack on the policies and the institutional changes effected over the last two decades by the champions of unfettered greed. They should identify and strive to unite all those classes and class fractions suffering under the new hegemony of international capitalists. In the immediate future environmentalists should strive for the reduction in power of shareholders in companies relative to stakeholders, which eventually should involve the decentralization and democratization of industry. As technology reduces the requirements for labour, policies should be formulated to ensure that unused labour is employed to improve the environment. To free people from the tyranny of the market, to promote a 'professional' orientation to work (so that people can achieve a sense of identity from their profession rather than from their income, wealth and level of consumption), to put an end to conspicuous consumption and to allow some people to devote their lives to the long-term problems of humanity, general income distribution policies should be formulated with a small range of income distributions, with guaranteed minimum incomes and with maximum incomes - that is, 100% marginal taxation beyond a certain level. The aim should be to reduce the level of material throughputs in the economies of the affluent nations in a way which does not cause hardship to the poor by eliminating wastage, simplifying life, and radically reducing the incomes of the wealthy, particularly of the financial and administrative parasites who now dominate the world.

In this endeavour it is necessary to create and maintain an image of and a sense of belonging to a just community committed to realizing people's potentialities, a community

with which people can identify, commit themselves to, and look to for support. In opposition to the ruling hegemonic ideology it is necessary to develop an image of nations as 'people's homes' committed to recognizing the significance of all its members, its future generations, and its environment. Environmentalists should attack the ideological despotism of administrators and pedants and strive to reorganize research and education to counteract the nihilistic decadence which is now undermining civilization. They should launch a sustained attack on all those disciplines where academic power-brokers, politicians and institutions have uncritically assumed the mechanistic world-orientation, which have been indoctrinating students in nihilism and preventing people from reformulating research or teaching in accordance with more defensible metaphysical assumptions. Then in place of the over-specialized, vocationally oriented, soul destroying education of today, education devoted to developing people's understanding and their abilities to participate in the cultural, political and economic life of society, should be promoted. The image of the future articulated in the struggle against the hegemonic culture should be promoted not for a particular class or nation, but as a future for all members of society, for all humanity and for all life.

Conclusion

This work began by showing the extent of the environmental crisis and its roots in the nihilism of European culture. Efforts to confront environmental problems from within the framework of this culture reinforce the forms of thinking responsible for environmental destruction. This culture dominates the minds and lives of people so completely that the view that the world is devoid of significance, that the only end worth striving for is attaining power over the world for the satisfaction of appetites, has come to appear as realism. The Marxism of the Soviet Union was shown to be a response of Eastern society to the more aggressive culture of Western Europe, a response which led it to use Marxism to appropriate the domineering Western orientation to the world. This produced the same problems. It was shown there does not yet exist a fully developed framework of ideas in terms of which environmental problems in all their complex diversity, and the nihilism which underlies the failure to deal with them, can be adequately understood and confronted. To address this, a version of process philosophy has been outlined and it has been argued that if it were fully developed, this could provide such a perspective for individuals, for the environmental movement and for governments, in the West, in the East, and in the peripheries of the world economy. Thereby it could provide the basis for a world-wide cultural revolution beyond European civilization which could serve as the foundation for a new world order.

This does not mean that with the development of this new conception of the world it will be a simple matter to deal with environmental problems. With the entrenchment in society of old conceptions of the world, with the enormity of the problems, the situation could still seem virtually hopeless. The comfort with which the privileged can live if they conform to the system compared to the insecurity of those who take up causes, the high-technology machinery of oppression available to defenders of the status quo, the powerlessness of those who lose their place in the rat race, the likelihood of failure in any particular project, the general discouragement and disdain, or worse, total non-recognition for genuine opposition to the dominant culture, leads easily to the conclusion that it is not worth the effort. But the task remains and will remain, how to transform humanity so that it contributes positively to the life rather than undermining the conditions of its own existence.

Process philosophy reveals the general approach and direction which it is necessary to pursue if there is to be any hope in the long run. And it is the long run which should be considered. If the analysis presented here is right, the world will in the immediate future

become increasingly oppressive and violent. This oppression and violence is likely to be with us for a long time. How long will depend upon how long it takes people to change their conceptions of themselves and their place in the world, both in theory and in practice. Efforts in the present, even if they fail in their immediate goal, are contributions towards this cultural revolution.

There is always a tendency to under-estimate the achievements of those working towards a better world. Such people are in opposition to most of the existing power élites, and therefore subject to being defined by the establishment with a vested interest in denying their significance. But also, and perhaps more importantly, creative work is participation in processes of long duration, while destruction tends to be rapid. Consequently what is really creative tends to be invisible against a background of violence, oppression and destruction. Part of the importance of the process view of the world is that it emphasises the durational nature of becoming and thereby reveals more clearly the reality of such long-term creative efforts.

For similar reasons there is also a tendency to overestimate the success of the ruthless, those unhindered by scruples or concern with justice. Machiavelli's case for dismissing justice as the crowning political virtue has come to be accepted as a truly hard-headed view of politics, especially since it has been supported by social Darwinists and vulgar Marxists. This is true not only of the New Right, but also of most of the Left. But the crude Darwinian theory of evolution on which Social Darwinism is based is invalid, and Machiavelli's own life was hardly a great success. The success of most people and societies which have followed Machiavelli's principles have in fact been short-lived. The evolutionary theory deriving from process philosophy implies a different evaluation of ways of living. To begin with, a place is given to choice, and secondly, to emergent levels of ordering beyond their conditions of emergence. In the case of humans, rationality and justice are comprehensible as real features of human becoming. Humans have the choice of living according to justice or living according to egoistic principles in which everything and everyone are reduced to instruments, and they will be selected in the struggle for survival accordingly. If those who choose to live for justice prevail and a world community based on the commitment to justice for all emerges, there is good reason to believe that in the long run humanity will establish a sustainable relationship to its environment. If those who choose to live on Social Darwinian principles prevail, there can be little hope for the long-term future of humanity.

However there are good grounds for believing that those people who do choose to live justly will prevail in the long run and succeed in changing society accordingly. Those who strive for justice are more likely to be able to support each other, while those who struggle for domination will eventually come into conflict and destroy each other. In communities in which justice prevails as a habitus the creative potentialities of its members can more easily be realized and thereby contribute to the society, those with ability are provided with stronger reasons to apply themselves to the benefit of society, and there is far less time wasted in conflict. A community which also accords due recognition to the processes constituting its environment is similarly more likely to endure. It is societies which have been more just which have endured in the past, and where the modern world is concerned, it is not the societies which have extolled the ruthless pursuit of self-interest and which have developed instrumental and mechanistic thinking furthest which have been most successful, even in terms of the criteria of the culture of these societies. Despite their better geographical and strategic positions, since the Second World War the economies of Anglophone nations have been steadily out-performed by those nations founded on more just relations between their members. Sweden had (until economic rationalists gained power) a far healthier economy than USA. So while the future might look bleak in the short term (which of course is no small matter), evolutionary theory based on process philosophy justifies the hope that justice will prevail in the long term.

In conclusion to their work *Order Out Of Chaos*, Ilya Prigogine and Isabelle Stengers remarked: 'It is quite remarkable that we are at the moment both of profound change in the scientific concept of nature and the structure of human society as a result of the demographic explosion. As a result, there is a need for new relations between man and nature and between man and man.'[59] They then went on to point out that the ideas of physical sciences expounded by them, the ideas of instability and fluctuation in a world of processes, were also relevant to the social world. They pointed out that:

> This leads both to hope and a threat: hope, since even small fluctuations may grow and change the overall structure. As a result, individual activity is not doomed to insignificance. On the other hand, this is also a threat, since in our universe the security of stable, permanent rules seems gone forever. We are living in a dangerous and uncertain world which inspires no blind confidence... [60]

Environmentalism provides the focus for those people rising to the ultimate challenge of the age, and to the greatest challenge in human history. There is reason for hope that the future belongs to these people; but there is always the possibility of total failure, either of a World War which will obliterate all their efforts or the successful entrenchment of a global ruling class committed to augmenting their levels of consumption come what may. In taking up the challenge, in taking the courage to risk their careers, their security, and in some cases, their lives, environmentalists are proving that life is more than satisfying appetites, petty vanities and a grubby struggle for money and status. They are revealing through their own lives the significance of all life. In doing so they are creating a community transcending national boundaries, transcending the confrontation between East and West and between North and South, a community of all those who strive to live for what is highest in life. The gathering strength of this community will, hopefully, transform the world, creating the conditions for all life, human and non-human, to flourish. But even if these people fail, even if the world is reduced by nuclear war to a lifeless desert, their lives will still be an achievement, a great and indelible contribution to the universe.

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59. Ilya Prigogine and Isabelle Stengers, *Order Out of Chaos*, Toronto: Bantam, 1984, p.312.

60. Ibid. p.313.