

# Market against Environment

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Since the Second World War the disruption of the natural and social environment, especially in the industrialised countries, has proceeded at an accelerating pace. If the deterioration of the quality of life could be quantified, it could probably be shown to be intensifying at a far higher rate than increases in population or GNP. In Tokyo it has already become necessary to install automatic warning systems which halt production temporarily in those firms whose waste products contain highly dangerous materials, and the population is discouraged from physical exertion at times of extreme air pollution.<sup>1</sup>

It is no coincidence that the intensification in pollution should occur at this time – for scientific research and the development of new, untested technologies have reached such proportions that their effects determine the quality of life. The systematisation of the theory of management and operational research, both in the private and public sector, will hardly be able to stop this process. I shall attempt to examine its different but interrelated causal elements: population growth, economic growth, development of new technologies and modern management techniques. First, however, we need to consider briefly a fact which is often neglected in the present environmental discussions: namely, that industry and technology have always endangered the working conditions and health of the factory worker. The early socialists of the 19th century realised this as clearly as did Marx and Engels. The social implications – long hours of work, unemployment, bad housing, child labour, etc. – of industrial change in the 19th century were felt by millions. There was also extensive air and water pollution in the cities. The improvement of the quality of life is thus by no means a new objective for trade unions, but should be seen as an extension of the traditional tasks and aims of trade unionism. What has changed radically are the nature and proportions of the environmental

disruption and the resulting deterioration of the human condition. On the other hand, the problems of his social environment which were the prime concern of the worker in the 19th century are still central objectives of trade union activity.

The question arises whether the battle to protect and improve the quality of our natural and social environment also needs to be fought by trade unions. To answer this, we must first understand how the present ecological crisis arose and what means are necessary to combat the deterioration of the environment.

### **Causes of the ecocrisis**

In arriving at a diagnosis of the present environmental disruption the economist can easily be misled by a number of prevalent partial explanations. Until recently the problem was largely ignored, then denied and finally dismissed. Now it is frequently explained by the rapid growth of population, urbanisation, the 'affluent society'; or by technology in general. Especially popular today are mathematically formulated extrapolations to the effect that we simply cannot afford an exponential growth in affluence and technology. While these factors have contributed to environmental disruption, they offer no satisfactory explanation of the catastrophic increase in pollution.<sup>2</sup> Global data obscure the specific causal relationships that we are seeking. We need empirical studies of the environmental problem and more sophisticated statistical methods. The economist needs to have a clear picture of the causes and degree of the disruption of the ecological equilibrium which industrial activity, including the choice of technology and location in terms of market costs and returns, have brought about.

In order to understand the ecological impact of economic activity we must view both the economy and the environment as open systems that stand in reciprocal relationship to each other. Modern technology and production are capable of destroying ecological equilibria by the emission of waste products and toxic substances. The ecological systems, which have hardly been studied in the physical sciences and have been totally ignored by economists, are highly complex circulatory systems, held in an unstable equilibrium by a continuous cycle of chemical reactions of various sorts. The quality of the human environment as well as productivity depends on the ecological equilibrium. If this equilibrium is threatened so are production and human existence.<sup>3</sup>

The present catastrophic deterioration of the environment is far greater than could be expected from the global rates of population and economic growth. Thus it must be seen primarily as the result of economic decisions and a system of entrepreneurial accountancy which have paid little or no attention to the destructive tendencies and negative effects of production on the ecological equilibrium. If the production factors, which have their origin in post-war and Cold War attitudes to science and technology, have led to increases in production and productivity, and are therefore regarded as 'successful' in terms of the market calculus, then it must also be seen that in the light of the destruction of ecological equilibria and the deterioration of the quality of human life they have been an ecological failure, which in some cases, such as in Japan and the United States,

appears to have reached a state of ecological bankruptcy.

Hence, in order to understand the causal processes of environmental disruption we should concern ourselves with the radical transformation of technology and the way in which new processes are applied without taking account of their effect on the ecological system, rather than considering global rates of growth. For this we need both empirical and theoretical research, as well as differentiated statistical measurements that are not simply based on aggregates. The research must not be restricted to industry, but must include agricultural production as well. As a simple example: the average consumption of beer has risen only slightly in the past 10-20 years. Yet the production of disposable bottles has increased greatly over the same period (by 595% between 1950 and 1967). Thus the greater 'affluence' achieved with a more convenient 'packaging' of the article has been bought at the price of a deterioration of the environment, while the actual consumption of the article itself has been roughly constant. On top of this, the consumption of energy and use of toxic substances in the manufacture of the 'disposable' bottles has also increased.<sup>4</sup>

Moreover, the accelerated deterioration of the environment can largely be ascribed to the introduction of identifiable inputs and products which have been introduced without due consideration of the negative effect on the ecosystem. This procedure is in harmony with the application of a principle which until now has not been seriously questioned: the principle of the market economy, i.e. the minimisation of costs, or the maximisation of net profits, expressed in monetary terms. All important decisions in agriculture, industry and the public sector are taken in accordance with this principle. Thus, returnable bottles were replaced by disposable ones, cotton and wool by synthetic fibres, soap by detergents, wood and bricks by steel, aluminum, concrete and plastics. Motor cars and heavy lorries are replacing rail traffic, thus adding to pollution and causing traffic congestion. In addition the use of tetra-ethyl lead in the modern combustion engine has greatly increased the lead levels<sup>5</sup> in the atmosphere, while levels of nitrogen oxides has risen sevenfold.

In agriculture we have increased the yield per acre with the aid of fertilisers and insecticides,<sup>6</sup> although we now know that part of these substances cannot be assimilated by the soil and endanger the water supply. Since the social cost of pollution are shifted to third persons, and society at large, and since the use of chemicals is obviously profitable, they continue to be widely used.

In industry modern organisational techniques and the improved flow of information is used to apply the market calculus more effectively in decision-making. But since only market values are used, which offer no criteria for the evaluation of environmental factors, these procedures offer no way of resolving the ecocrisis. On the contrary, the crisis points to the limitations of present economic theorising. It shows that the market economy offers no guarantees against the destruction of the environment, its attempts at evaluation of environmental factors in monetary terms are wholly inadequate. We are therefore forced to reconsider the premises of the concept of economic rationality.

## **Economics of environmental protection**

Before discussing some aspects of effective environmental policies, I wish to comment on the problem of the relative distribution of social costs among different income groups. This should be of interest to the trade union movement, but, more generally, it also has a bearing upon the formulation of criteria for environmental politics. Social costs in the form of air and water pollution, noise, slums, etc., are shifted onto third persons, other production units and society at large. Here we are faced with relations that differ radically from those determined by the market. The latter are more or less voluntarily determined, while the relations between production, environment and the individual are highly involuntary, with negative effects that are often not fully understood by the individual, but which he cannot escape. What is happening takes place 'behind his back', without offering him a possibility of weighing advantages and disadvantages against each other. In short, environmental relations are highly one-sided relationships forced on the individual.

Whenever social costs are shifted onto the economically and politically weaker sections of society without compensation, a redistribution of the costs of production, hence of real income, is involved. During the first Industrial Revolution it was undoubtedly the industrial proletariat which carried the burden of social costs, in low wages, long hours, high accident rates, social insecurity, etc. The present environmental dangers threaten all sections of the population but in unequal measure. The higher and middle income groups are able to evade the worst impact of pollution, noise and traffic chaos by moving to suburbs in the green belt areas, or to smaller towns, or by the installation of air-conditioning, etc. The poorer sections and the ghetto population have no means of evading the unhealthy working and living conditions, and are more exposed to noise, traffic chaos and pollution, with far less possibilities for recreation. For example: the concentration of toxic substances such as carbon monoxide and sulphur oxides is ten times higher in cities than in the country. In the city centres of the United States, which are more heavily populated by blacks and other minority groups, these toxic levels are much higher than in the suburbs. Similarly the lead content in the blood of city dwellers (in Cincinnati, Los Angeles, Philadelphia) increased noticeably during 1962-69 and higher concentrations were found among inhabitants of the city centres than among suburbanites. It is estimated that there are over 400,000 cases with abnormal lead content in the blood in the U.S.A. alone. Lead poisoning in children in New York City in 1970 was found in 2649 cases by a survey based on a sample of 87,000 children.<sup>7</sup>

Discussions of, and attempts at, environmental protection and control lie within a fairly wide spectrum ranging from more or less verbal 'solutions' to far-reaching controls and prohibition of damaging factors of production, restructuring of technology, control of siting and spacing of industrial complexes. There are both 'minimalists' and 'maximalists'. The former attempt to answer the problem by general suggestions and indirect controls while the latter claim that it is already impossible and too late to save the situation by an effective environmental policy.

All attempts to protect the environment within the framework of a market economy must be considered to be in the first category. To these we may also count all attempts to pass off the ecocrisis as falling within the province of public relations departments.<sup>8</sup>

The maximalists include those who maintain that only a radical cutback in the rates of growth can stem the tide of ecological destruction; they base their analysis on exponential growth rates or are inclined to shift the responsibility for reduction in growth onto the underdeveloped countries with high population increases. Between these two extremes there lie a gamut of proposals,<sup>9</sup> such as the improvement of information available to the market, the assignment of monetary values to environmental factors, or the sale of rivers and areas of natural beauty to private firms who would then see to it that their private property rights are protected or compensated for increase of pollution and deterioration. Most of these attempts are based on an extension of the price system to environmental problems, as are proposals for financial incentives to effect protection of the environment. One step further go suggestions of taxation and effluent charges with the revenues set aside for the restoration of the damaged areas. These proposals reflect a desire to prevent at all costs the application of environmental policies making use of direct controls which may upset the market system. Their aim seems to be to handle the ecocrisis without policies which are believed not to be compatible to the market system.

The danger to the environment, however, demands the formulation of environmental goals for the improvement of the quality of human life. Such goals and their realisation are social aims, directed toward the satisfaction of collective needs. The market cannot be relied upon to satisfy these needs; on the contrary, as we have pointed out the market creates self-destructive tendencies, especially in the presence of the application of dangerous technical processes. The market does not offer an adequate evaluation of these collective needs and social goods; it neither defines the necessary social aims nor their relative importance or their order of priority relative to other social objectives and constraints. Its norms and aims are based upon private net profit – this is the given aim of private enterprise economies. Hence these aims are not under discussion; they are clear and given *a priori* and can be expressed in monetary units. In this sense they are not ‘problematical’.

Environmental goals, that is, the maintenance of essential ecological equilibria, are not given, nor are they inherent to the market system – therefore they have to be defined and must be built into the economic system from outside, i.e. by society. The formulation of these aims and the determination of their relative importance as well as their practical implementation represent new tasks and new problems for economic theory and economic policies. Upon their solution depends the successful handling of the problems raised by the ecological crisis.

In the light of the above diagnosis of the causes of the deterioration of environment I consider the following steps in the development of a realistic programme of environmental politics and control as essential:

1. The systematic, quantitative determination of basic ecological relationships and their disruption by specific techniques applied in modern industrial production. The results of such a continuous process of ecological stocktaking should be expressed in the form of *environmental indicators*.
  2. The formulation of environmental *norms* or standards as practical goals of a sociopolitical programme of environmental protection.
  3. The conscious social direction of science and research towards the systematic development of less dangerous techniques which place a smaller burden on the environment than our present methods of production.
  4. The development of effective political and economic controls realise these goals.
  5. The replacement of current cost-benefit analyses by a more comprehensive assessment which is capable of measuring total costs and benefits to society as a whole.
  6. The assessment of the total economic effects of measures of environmental control, on costs, employment productivity and the structure of production.
  7. The incorporation of the politics of environmental control and improvement of the quality of life into the democratic process and democratic decision-making.
- To discuss these seven steps separately:

1. In the first place a systematic quantitative study of ecological relationships must be achieved through regular observation and measurement of changes in atmospheric conditions, water supply etc. A formulation of environmental goals is possible only in the light of precise knowledge of the natural environment, its power of self-regulation and the limits of its tolerance levels. In this category we place observations of population densities and their trends, as well as of limits on the availability of basic resources, and precise knowledge of pollution resulting from specific technological processes and products. Before developing an effective process of ecological decision-making, we must be able to determine with some accuracy the level of pollution caused by specific inputs and outputs. Such pollution coefficients can be calculated only as averages, because of local differences. Commoner rightly asserts that we need an inventory of ecological effects for all branches of production and advocates the calculation of 'pollution price tags' for the most important products.
2. The second step would consist of the establishment of environmental norms, i.e. the determination of appropriate limits of maximum tolerance levels of concentration of contaminants, as well as minimum standards for the maintenance of human health and wellbeing. These are physical standards or limits beyond which any further disruption becomes a threat to man. They need not be fixed uniformly or permanently; on the contrary, they should be established on the basis of existing data and be changed in the light of new knowledge and experience. Furthermore, they will have to be adapted to existing means (including the level of technology). In short, environmental norms are minimum requirements and as such, require a social evaluation and need to be sanctioned in our political decision-making process.
3. A conscious social direction of scientific research toward environmental control goes far beyond the development of cleansing techniques, filtering installations,

etc. It must include the development of technologies and products which do not impair the environment, or at least do so to a lesser degree than present methods. This includes processes aimed at an efficient use of raw materials and sources of energy, both from the point of view of minimization of costs and the reduction of the volume of damaging waste products. Equally important is the systematic development of techniques based on the recycling of waste products.

Until now these problems have received very little attention. Private expenditures on techniques for the reduction of environmental disruption still run at a fraction of the total research expenditure and are only a small percentage of expenditure on advertising and public relations. In other words a much greater part of public funds must be channeled into this type of research. At present the total expenditure on the development of less disruptive technology is minimal when compared to the resources used on space research and armaments.

4. There is an urgent need for the effective application of direct and indirect controls in order to achieve environmental goals; some direct controls will have to be applied with a view to securing the immediate cessation of production of materials which are shown to endanger health and even life. This applies particularly to substances which may have genetic or cancer generating effects. In some cases this may necessitate the closure of existing production lines, as has already happened in Japan. Furthermore, direct controls of siting through licensing systems must be considered. Industry may be compelled to set aside a percentage of total profits for the development of new and environmentally less dangerous techniques, and these can be encouraged through incentives or through legislation.
5. Cost-benefit analysis will need to be made more comprehensive by the consideration of environmental factors such as the physical damage caused or expected in industrial processes. These are rarely expressible in monetary terms, but lend themselves to a socio-political evaluation – see also 6 and 7. In any case many attempts to express environmental costs in monetary terms either through direct calculation of the social cost or indirectly by calculation of the costs of controls or by using the individual's willingness to pay for environmental control, appear to be problematical. Environmental needs do not only represent public needs but constitute basic physical requirements for such things as clean air, water, health and tranquility, which cannot be articulated in market terms or monetary units. Any attempt to do so seems to me to be an inadmissible re-interpretation of these needs in monetary terms and an evasion of the problem of social decision-making. The individual's willingness to pay for the cost of satisfying these needs is distorted by the unequal distribution of income and the resulting unequal purchasing power of different sections of the population. There is thus a need for a socio-political evaluation of benefits and costs outside the framework of the market economy.
6. The evaluation of the cost and economic effects of environmental control can only partly be done in monetary terms.<sup>10</sup> Without neglecting the cost problem it

seems necessary to warn against a tendency of overestimating the total cost, and in particular the cost to some industries, expressed as a percentage of their total production. According to American estimates most polluting industries would face costs arising from environmental controls running at far less than 1% of their total production, and only for the main polluters (paper and metal processing and chemical industries) is the percentage above 1%. They seem to be roughly equivalent to the cost of a 5% wage increase. Of course different firms would have different increases of costs, and some would be unable to maintain production at present levels without price increases or subsidies. But these firms are now shifting the social cost of their production onto third parties, and thus would merely be compelled to bear the total cost of their production. Furthermore, smaller firms would often be harder hit than large companies. Hence there exists a real danger of a further concentration of industrial production. Problems of shifting additional costs through higher prices will differ from industry to industry and will depend on the specific structure of the market.

It seems much more important to consider the effect of controls on the level of employment, and the GNP. Here there seems no general and uniform answer. But it seems clear that rising costs may cause a decrease in production and give rise to unemployment, another social cost. On the other hand the manufacture of equipment to reduce environmental deterioration as well as the development of new technologies will provide additional sources of employment. Though this does not imply that, as is claimed, labour set free by new modes of production will automatically be re-employed. It does at least point to some compensating factors. The traditional composition of the total product will change but not necessarily its level. On the other hand the quality of life and of the environment would improve due to more effective controls. It is misleading to maintain that either the employer or the employee would be hardest hit by new environmental controls; it is as meaningless to say that the taxpayer or consumer are hardest hit. Problems of the incidence and distribution of costs can only be assessed in the light of a quantitative analysis, which takes into account the manner in which the additional financial funds are raised. In addition, what needs to be analysed is not only the costs and their distribution, but also the nature and quantity of the social benefits that accrue from the lessening of environmental disruption. To divert attention from these benefits or delay the introduction of practical measures on the ground of the uncertainty of their costs would be a totally one-sided approach.

7. The incorporation of the politics of environmental protection and improvement of the quality of life into the democratic process seems to me to be one of the most important aspects we have to face. Environmental policies involve in the first place the protection of collective goods as well as the satisfaction of elementary human needs, which are endangered by the application of modern technology and the destruction of ecological equilibria. To this effect the achievement of practical goals is a primary objective; the solution of technical



problems by the efficient use of existing means is subsequent to this. The formation of social decisions regarding environmental aims seems to me to be central to the problem. Environmental norms are social aims, which should be determined by the participation of all in the democratic process. These are new social tasks and require political decisions which demand a greater degree of public participation. So far large parts of the population, which are directly threatened by environmental disruption, have had no opportunity to participate in the formulation of economic policy.<sup>11</sup> In the formulation of environmental aims it becomes both possible and necessary to effect such participation through public discussion and a mobilisation of public opinion. The question of the 'risk' we are prepared to take regarding the health and survival of humanity, or what sacrifices and danger we are prepared to accept, is a question of public and political morality. It is true that the risk of the increase in cancer, or genetic dangers, inherent in exposure to radiation can only be estimated very approximately on the basis of scientific data, but the question whether we are prepared to assume such risks cannot be decided on a 'scientific' basis. In short, it is not a matter for experts, but a political and moral question, i.e. a matter of public judgment. The same is true of other environmental decisions. Furthermore, the judgment of individuals immediately concerned (consumers, residents, workers and citizens in general) is highly relevant in deciding whether they are prepared to tolerate a nuclear power station or pollution of water or air in their vicinity. Of course here again, as in all democratic decision-making processes, there is a lack of information, and the information itself may be 'polluted'. Hence it is absolutely essential that there should be maximum publicity in order to clarify both the causes and dangers of pollution. This does not only involve new tasks at all levels of education, but for citizens in general, and particularly for the trade union movement. These tasks lie in the mobilisation of public opinion and in the creation of an active consciousness of the need for environmental norms in the representation of public interest on all executive bodies of environmental control. As long as this representation is absent, there is danger that even the best control systems will be undermined by vested interests and 'experts'.

The deterioration of the environment calls for a radical change of our traditional notions of determining what is economically justified. It calls for a basic modification of economic calculation, it poses at various levels the question as to the need of establishing institutions and new methods of economic controls designed to safeguard the ecological balance and the quality of life. In this sense the crisis of the environment contains all the elements for a radical change of our prevailing forms of economic organisation. If we do not succeed in redirecting the development of science and technology and in shaping productive activities in a manner adapted to the maintenance of some ecological balance and the quality of life, it is likely that the disruption of the physical and social environment will reach critical proportions the full impact of which will surpass the implications of the First Industrial Revolution because it would put in question the very

foundations of human life and survival. It is correct that man, just as other organisms, is able to adapt himself to a deteriorating environment but such an adaption requires longer periods of time than are at our disposal in view of the rapid development and change of modern technology. Moreover, man's capacity to adapt is limited quite apart from the fact that a life with gas masks, as envisaged by the Director of the Japanese Research Institute for Environmental Control for the inhabitants of Tokyo, would represent a dehumanization and alienation of man which transcends all traditional meanings of these terms.

### Footnotes

1. Recently 50 Osaka students were overcome by nausea at a basketball match, after failing to hear an air pollution warning signal. According to the director of the Tokyo Environmental Research Institute it may be necessary for the inhabitants of Tokyo to wear gasmasks as protection against acute bronchial diseases within ten years. Traffic wardens, etc., already wear air filter devices. Peter Smith, Japan: Economic Dream Ecological Nightmare, *The Ecologist* 18; Dec. 1971 pp 17-18.
2. It is indeed possible that population and production growth has provided the last straw for exceeding the tolerance limits in ecological cycles whose maintenance is essential for the maintenance of all life, including human life. These relationships are considered by few economists.
3. These ecological processes which yield organic building materials necessary for the preservation of life and reproduction, are self-steering: they are circular processes established over millions of years, which man has disturbed to some extent in the past, but has never been, as now, in a position to destroy. Modern technology has created the impression of freeing man increasingly from his dependence on nature, and her limitations, but this has now been proved by the ecocrisis to be a fatal illusion. Barry Commoner, *The Closing Circle*, New York 1971, p.14.
4. Commoner and two colleagues at the Centre for the Biology of Natural Systems at Washington University have calculated the annual growth rate of hundreds of products during the last 25 years have introduced rankings. They show that the production (and use) of environmentally dangerous substances increases faster than that of essential goods. The latter do not increase much faster than the population, though there have been new goods and changes in quality To achieve this the production of synthetic fibres has increased by 5,980%, mercury by 3930%, plastics by 1960%, nitrogen fertilisers by 1000%, aluminum by 680%, pesticides by 390%. Ibid. p.143.
5. Commoner, *op cit.* p.169. Detailed studies show that 90% of all car journeys are over less than 10 miles.
6. In Illinois consumption of nitrogen increased from 10,000 tons in 1945 to 600,000 tons in 1966. Average yield of corn per acre increased from 50 bushel in 1945-48 to 70 bushel in 1958 using ca. 100,000 tons of nitrogen. In 1965 500,000 tons were needed to increase the average yield by another 20 bushel (to 90) per acre. That is to say in intense agriculture average yields per acre can be raised by disproportionate additional inputs of fertilisers. Ibid. p.84.
7. The incidence of lung cancer is 37% higher in cities of more than 1 million inhabitants than in cities housing 1/4 to 1 million. See Commoner *op cit.* pp. 134/5. See also *Environmental Quality*, Second Report, Washington, 1971, pp. 189-200 and Paul C. Craig and Edward Berlin, The air of poverty, *Environment*, 13, No.5, June 1971, pp.2-9.

8. The state of this ‘environmental control’ is reflected in a study (in which the 500 largest American firms were asked to name *one* project reflecting their social responsibility for environmental quality. 200 firms failed to reply, 100 could not mention any project, 100 named old and irrelevant projects, and only 50 had projects that answered the description, while the other 50 had borderline projects in hand. cf. Herbert Gross, *Beratungsbrief*, 39, Dusseldorf 1970 pp.4-5. An example of misleading advertising is the by now notorious photograph issued by a paper factory in the USA purporting to show a clean river downstream from the factory. In fact the picture showed the river 50 miles upstream! *Ibid* p.5.
9. An attempt at a comprehensive and detailed discussion of the methods of environmental control is given in K.W. Kapp, *Implementation of Environmental Policies*, in United Nations Development and Environment, Mouton, The Hague 1972.
10. OECD estimates show that the costs of environmental control would run at 5-6% of GNP in developed countries. Such estimates are still as problematic as estimates of social costs which are placed at 16 billion dollars spent on air pollution alone in the U.S.A. One must remember that these are very partial estimates. Global cost estimates have the disadvantage of omitting unit costs (e.g. per motor car mile, etc.) and give a misleading impression of prohibitive costs. Cf. M.H. Hyman, ‘Timetable for Lead’ *Environment*, 13, no.5, 1971, pp. 14-23.
11. cf. Jurgen Habermass, *Technik und Wissenschaft als ideologie*, Frankfurt 1969, pp.77-79. Habermass discusses the ‘depoliticisation’ of the general public and their elimination from the formulation of economic policies.

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General Secretary



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