

CONTENTS

15. THE FRUSTRATION OF SCIENCE	207
16. SUMMARY AND IMPLICATIONS	228
17. TOWARD A NEW SCIENCE OF POLITICAL ECONOMY	244

APPENDICES

I. Work Injury Frequency Rates and Severity Averages, Major Manufacturing and Nonmanufacturing Groups, 1947	265
II. Total Number of Industrial Injuries and Injury Rates in the Mineral Industries in the United States, 1931-1948	266
III. Estimated Number of Work Injuries, by Extent of Disability, in the United States, 1936-1948	267
IV. Estimated Costs (millions of dollars) of Work Injuries, 1941-1948	268
V. Relative Life Expectancy of Different Sheet Metals in Pittsburgh and in a Smoke-Free Atmosphere	269
VI. Amount of Dust Deposited per Square Mile in Different Localities	270
VII. Estimate of Some Annual Costs of Air Pollution in Pittsburgh (1913)	271
VIII. Relative Importance of Pollution Abatement, Classified According to Drainage Basins	272
IX. Approximate Degree of Exhaustion of Economically Available Mineral Resources in the United States, as of 1944	273
X. Character of Timber Cutting in the United States, 1945	275
XI. Estimated Annual Losses Caused by Floods, 1903-1946	276
XII. Number of Retail Stores and Sales by Size Groups for 1939, 1935, and 1929	277
XIII. Advertising Expenditures in the United States, 1929-1948	278
XIV. Advertising Costs per Dollar of Net Sales, Distribution Expense per Dollar of Net Sales, and Percentage of Advertising to Total Distribution Costs for Specified Commodities, 1939	279

281

INDEX

INTRODUCTION TO THE 1971 EDITION

WHEN *The Social Costs of Private Enterprise* was originally published, it aimed at a critique of the theory and practice of business enterprise. The book intended to expose the existence of costs not accounted for in entrepreneurial expenses and to show that conventional economic theory failed to take adequate if any account of those social costs that confront us today in the form of a serious deterioration of man's natural and social environment. My central thesis was and has remained that the maximization of net income by micro-economic units is likely to reduce—particularly under conditions of rapid and uncontrolled technological change—the net income (or utility) of other economic units (both producers and consumers), and that the conventional measurements of the performance and “growth” of the economy in terms of national income indicators are inadequate and hence misleading. They leave out of account important social costs of production borne by third persons and future generations. In fact, in their present form, national income indices not only fail to subtract these social costs, but include money spent to repair the damages caused by productive activities of the past and present. Under these circumstances, conventional economic theory has a tendency to conceal rather than to elucidate the sequence of events in the actual world of affairs: its definition of and search for levels of equilibrium under static conditions and its measurement of the growth of the economy do not constitute an adequate theoretical representation of the economy. Nor are they relevant for the formulation of general criteria of rational choice or for the evaluation of the investment and the production patterns in the market economy; nor do they secure the maintenance of a reasonable relationship between economic growth and

an environment compatible with requirements for human health, well-being, and survival.

These long-neglected problems and hard facts have been cited by critics and dissenters from the mainstream of economic thought for more than a century. They are finally attracting world-wide attention, after having been allowed to reach the point of an environmental and ecological crisis in many countries. I am convinced today, as I was when this book was written, that the disruption of man's environment and the social costs resulting from productive activities are among the most fundamental and long-term issues mankind has ever faced. Their implications may well turn out to be as far-reaching as some of the problems raised by nineteenth-century social reformers and socialist critics who concentrated their attention on exploitation, poverty, and economic instability. Ultimately the disruption of man's environment may reveal itself as our most crucial problem, exceeded in overall significance only by the urgent necessity of guaranteeing human survival in an age of nuclear weapons. Just as the new techniques of warfare call for new international institutions, the phenomena of environmental disruption and social costs as well as the urgency of devising effective means of control call for a radical change of the present institutionalized system of investment and decision-making by private firms and public agencies with regard to the choice of investment and production patterns.

Before turning to the practical implications of social costs and environmental disruption, the author may be permitted to offer some comments to those readers whose attention is drawn to the subject by the current discussion of the environmental crisis. The extraordinary intellectual, political, and legislative activities¹ cur-

¹ We mention only a few of the many national and international activities that have dealt with specific aspects of environmental disruption and social costs: The UNESCO Conference on the Utilization and Conservation of the Biosphere, Paris 1968; The Colloque Internationale contre les Pollutions organisé by the International Association for World Law, Royan 1970; The

tently under way in an effort to come to terms with our environmental crisis are, of course, a belated recognition of the social costs incurred in the course of an unprecedented expansion of production and population during the last three decades. These activities may create the impression that we are well on the way to successfully coping with the problems of environmental disruption. Actually, there are several reasons to doubt this.

The success of any program of environmental control depends ultimately on a correct analysis of the manner in which social costs are incurred, on the adequate assignment of responsibilities for them, as well as on the effectiveness of the practical and institutional measures adopted to overcome them, and finally on the adequacy of the funds appropriated. A superficial and hence incorrect analysis is likely to lead to ineffective measures of control, and even a correct program will see its chances of success jeopardized by the allocation of inadequate funds and the lack of appropriate institutional arrangements.

One word of caution: The increasing use of the terms "environment" and "ecology" in recent discussions of social costs is to be welcomed, provided these terms are interpreted in a sense suffi-

International Symposium on Environmental Disruption in the Modern World: A Challenge to Social Scientists, Tokyo 1970, sponsored by International Social Science Council, Paris. In addition there will be the Intergovernmental (East-West) Conference on the Protection and Improvement of the Environment in Prague (1971) and the U.N. Conference on Environment in Stockholm (1972). Among the legislative steps there are the Clean Air Act (1963) and the Clean Water Act (1965) in the United States. Japan and other countries have installed monitoring services designed to measure the degree of air and water pollution in critical areas, and the city of Tokyo can even boast to have introduced the first daily air pollution forecast service. Individuals, citizen groups, and governmental agencies have endeavored to mobilize the traditional legal and administrative machinery, with varying degrees of success, in an effort to seek redress for specific damages suffered and to protect property rights negatively affected. Lawyers are raising the question whether and how the common law and the substantive content of constitutional provisions could be used or extended to establish a fundamental right to a clean environment. Cf. David Sive, "The Environment: Is it Protected by the Bill of Rights?" *Civil Liberties*, August 1970.

ciently broad to include not only the impairment of the physical environment but the impairment beyond certain definable threshold levels of the aggregate of all external conditions and influences affecting the life and development of human beings, human behavior, and hence society. Only in this way will it be possible to counteract the widespread but false impression that we are confronted only with a problem of ecology in the narrower physical sense of the word. Even if we succeeded in purifying the air and water in and around large urban agglomerates, we would still not have come to terms with the important social costs that arise from the impairment of the human factor. Twenty or thirty years ago, it was still correct to say that the social costs of air and water pollution had attracted less attention than the impairment of the human factor, which had found recognition by workmen's compensation acts and social insurance schemes. Today the situation seems to be reversed. The current emphasis on ecology and environment may lead to a neglect of some of the much older, direct human costs of production and economic growth which find their expression in death and disabling injuries from industrial accidents and chronic occupational diseases, as well as technological unemployment, poverty, and physical and mental burdens caused by rapid structural changes and uncontrolled economic growth. Neither the existing industrial safety legislation nor "safety on the job" campaigns nor workmen's compensation for accidents have been able to prevent the officially recorded rate of industrial accidents from rising by 23 per cent between 1958 and 1967. Unofficial estimates place the current number of annual accidents at 4 million in the United States (exclusive of 500,000 cases of workers disabled by occupational diseases). As one lawyer in a compensation case of silicosis is reported to have put it: "With a maximum liability of only \$12,500 plus medical and funeral expenses it has been so inexpensive to disable or kill a man . . . that it has not been worthwhile to clean up."² Work-

² *Newsweek*, August, 17, 1970, p. 45.

men's compensation acts and social security legislation are notoriously insufficient, and are progressively made more inadequate by built-in secular inflationary pressures. Added to this must be the distribution of sickness, disability, and unemployment and the continued social stratification in general, which particularly affect the more vulnerable racial minority groups, seasonal workers, and "guest-workers" in the most economically advanced countries. The market mechanism is apparently unable to eliminate these arbitrary and discriminatory conditions. On the contrary, it seems to re-create and perpetuate them. In addition, there are the adjustments forced upon specific groups of the working population by structural changes, particularly in periods of rapid technological advances. Among the victims have been above all farmers and retailers, who have been forced to abandon their activities and residences without adequate—or even any—compensation and who have reached threshold levels of psychological frustration and despair in some countries. Even more significant, although less noticed and less explored, are those human costs of modern competitive production and consumption that find their expression in the pathology of everyday life in all affluent societies. The symptoms of this psychic and psychosomatic pathology are all around us—they are reflected in functional disturbances of various sorts, from psychic strain and stress to premature neuro-circulatory diseases, arteriosclerosis, fatigue, and insomnia, as well as neurosis in general. These symptoms have become part of our social environment; they play a manifest role in the increasing social disorganization, irrationality, and violence of contemporary life. To dismiss these phenomena as "noneconomic" because they occur outside the market complex is possible but neither ingenious nor tenable in view of the fact that, apart from their obviously human aspect, they have a price for both the individual and society.

The analysis of social costs raises important problems of definition and measurement that cannot be discussed within the

present context.³ It should be emphasized that the statistical data and estimates used in this book to illustrate the magnitude of the social costs are not only out of date but inadequate. They should be understood in terms of what they were intended to do—to illustrate the nature and kind of losses and to show the reader that even these far-from-satisfactory estimates are of such a magnitude as to make it imperative to bring them into the open. Even today our statistical data are inadequate; there is as yet no agency that gathers and publishes data on social costs in any systematic way. For this reason it would be highly desirable to collect sets of data that would make it possible to measure or estimate in both real and monetary terms the social costs and losses arising in a profit-oriented system of investment and production. Such data could then be used to correct and reconstruct the inadequate and misleading system of national accounts which is currently used to measure the performance and growth of the economy. But quite apart from the availability of reliable estimates of social costs, it is safe to say that the disruption of the environment and the resultant social costs have a tendency to increase both absolutely and relatively as production and consumption and hence factor input and residual waste increase, and as these wastes are emitted or dumped into the environment without adequate prior treatment and prior assessment of the consequences.⁴

The principal pollutants of the atmosphere in the United States have been estimated to reach 125 million tons per year, consisting primarily of carbon monoxide (52 per cent), oxides of sulphur (18 per cent), and hydrocarbons (12 per cent). The major sources of these pollutants are transportation (59.9 per cent), manufacturing (18.7 per cent), and generation of elec-

³ They have been dealt with in some detail in two articles by the author: "Social Costs and Social Benefits—A Contribution to Normative Economics," in *Verhandlungen auf der Arbeitstagung des Vereins für Sozialpolitik*, E. v. Beckerath et al., eds. (Berlin: Gesellschaft für Wirtschafts- und Sozialwissenschaften, 1963), pp. 183–210; and "On the Nature and Significance of Social Costs," *Kyklos*, XXII (1969), 334–47.

⁴ Cf. K. William Kapp, "Environmental Disruption: General Issues and Methodological Problems," *Social Science Information*, IX, No. 4, 15–32.

tricity (12.5 per cent).⁵ In addition there are emissions of solid wastes (refuse), food wastes (garbage), and rubbish which are estimated to reach a volume of 320 million tons a year.

Current estimates of the amounts that would have to be spent during the remainder of the century in order to provide for moderately clean air and water and the disposal of accumulating waste products place these costs at \$275 billion.⁶ Government estimates place the annual property damage caused by air pollution alone at \$11 billion, exclusive of the decline in real estate values in affected neighborhoods. None of these data makes allowance for the fact that some of the pollutants represent potentially valuable and recoverable resources, such as the sulphur contained in the harmful sulphur dioxide emitted into the atmosphere.

The Social Costs of Private Enterprise undertakes to diagnose the causes that tend to give rise to the disruption of our physical and social environment. It views the causal chain within the context of the organizing principles of a system of business enterprise in which investments take place for and in accordance with their expected net revenues. The author holds the view that the institutionalized system of decision-making in a system of business enterprise has a built-in tendency to disregard those negative effects on the environment that are "external" to the decision-making unit. Even if an individual firm intended (and would be in a financial position, as many oligopolists obviously are) to avoid the negative effects of its applied technology, it can do so only by raising its costs; that is, by deliberately reducing its profit margin and its profit-earning capacity. Hence, a system of decision-making operating in accordance with the principle of investment for profit cannot be expected to proceed in any way other than by trying to reduce its costs whenever possible and by ignoring those losses that can be shifted to third persons or to society at large.

⁵ Committee on Pollution, *Waste Management and Control* (Washington, D.C.: National Academy of Sciences, 1966), Publication 1400, p. 11.

⁶ James J. Hanke and Harold D. Kube, "Industry Action to Combat Pollution," *Harvard Business Review*, Sept.–Oct. 1966, pp. 49–50 and *passim*.

Predictably, this critical view, which runs counter to the pre-suppositions and biases of conventional economic analysis, has not met with general approval. Thus, various alternative explanations for the occurrence of social costs have been advanced. These have one thing in common: to exonerate the principle of investment for profits from any causal connection with environmental disruption. Some economists fall back upon Marshall's concept of externalities or speak generally of "market failure" when they are faced with the problem of social costs. Others identify technological and industrial change as factors responsible for social costs. More recently, the growth and increasing density of the population as well as natural factors such as climate and topography are held responsible or co-responsible. Finally, by showing that public utilities, public enterprises, governmental agencies, and even planned economies have not been immune to environmental disruption, the current discussion of our environmental crisis (with some notable exceptions) conveys the impression that environmental disruption and social costs are simply an inevitable concomitant of industrial civilizations in general, and are independent of economic institutions and the principle of investment for profits which guides the process of allocation and hence determines the investment and production pattern. In this way, the critical implications of the theory of social costs are in danger of being neutralized and rendered innocuous. It cannot be emphasized too strongly that these attempts reflect the continued vitality of old biases and preconceptions in economic analysis, which in turn support ineffective policies of control and protection of the environment against the devastations caused by uncontrolled productive activities and economic growth.

The process of causation that gives rise to social costs is indeed a complex one. While stressing the institutional factor, *The Social Costs of Private Enterprise* did not ignore the interplay of physical, technical, and climatic factors and the cumulative and self-reinforcing character of the causal process. Nor did we argue that social costs do not occur in pre-capitalist societies or could

not occur under alternative forms of social organizations. It was clearly pointed out that the growth of population and the increasing density of settlement could not but upset the earlier ecological balance. The reader will find repeated references throughout the book to this complex and cumulative interaction of a great variety of physical, technical, climatic, and demographic factors. Nor did the author deny that public utilities, public enterprises, and public agencies are contributing to the destruction of the environment and are responsible for social costs. But the reader will also find the following passage which is indicative of the manner in which the author dealt and would still deal with the assignment of responsibility for the outcome: "If the farmer fails to [adapt his methods of cultivation to the natural environment] and if rapid erosion sets in as a result of a combination of natural factors and farm practices, it is obviously the latter which must be considered as the cause of the devastation of the land and not the rainfall or the steepness of the slope" (p. 132). This reasoning also applies *pari passu* to all factors such as climate, topology, population, technology, etc., which in combination tend to contribute to air and water pollution as well as to other forms of environmental disruption and social costs.

The process of production—i.e., the choice of factor inputs and the determination of what is to be produced according to the principle of investment for profit—proceeds without an adequate prior assessment of the actual costs and consequences, including a host of "side-effects" which from the narrow and hence false perspective of the individual firm are regarded as "external" costs or benefits. This micro-economic method of assessing costs and consequences of investment decisions from the point of view of the individual firm has always been the crux of the matter. It is this method that accounts for the serious social costs that have been incurred in the past as well as for the continued failure to subject the production and allocation processes to an assessment of their total consequences—both costs and benefits. The lack of such an assessment and control of investments (choice of factor

inputs) and production (choice of outputs) with regard to their possible social costs and benefits implies not only an inefficient use of resources, but makes it possible for some to obtain income by causing damage to others—a fact that for equity reasons alone would seem to call for far-reaching changes in the manner in which investment (i.e., allocation and production) decisions are to be made.

There is no doubt that municipalities and public authorities may also contribute to the disruption of the environment. Even socialist planning agencies may act in a similar way under certain conditions. Does this refute our central thesis? If municipalities and public or planning authorities set the stage for an impairment of the environment—when they attract industries in order to increase their tax income regardless of possible negative effects—they sacrifice the quality of the environment for revenues by choice; that is, their action is similar to that of a private firm operating in accordance with the principle of investment for profit. Both try to maintain an artificial, purely formal short-run financial solvency by ignoring social costs. Some of the current attempts to render public decision-making more “rational” in terms of market costs and returns carry the danger that this disregard of some or all of the negative effects of decisions may become even more general and typical. Instead of reducing the incidence of social costs, such attempts are likely to increase them.

Before turning to some practical conclusions, it will be useful to present a general outline of the causal chain that gives rise to environmental disruption and social costs. Human action—both individual and public decisions—takes place within and has repercussions on our natural (and social) environment. This environment is itself a complex composite of structures, each of which is subject to specific regularities or organizing principles. If these regularities are not known or deliberately ignored at the time when the allocation and production decisions are made, the consequences of the decision will differ from what was originally

aimed at. Furthermore, the interaction of the socio-economic with the physical and biological spheres is much more complex and much less explored than the operation of any of the various systems which the conventional academic disciplines have isolated for separate study. If we want to understand the causal process, it is evident that its analysis cannot be carried on successfully in terms of one or the other of the compartmentalized social, physical, and biological disciplines. Neither social nor natural scientists, nor engineers, nor public health experts—trained in their limited disciplines and familiar only with their narrow concepts and theories—are able to focus attention on the whole relevant pattern of interaction. It is true that we still lack a theory and/or science capable of elucidating the mode and outcome of the complex interaction of several systems. Hence, our knowledge of the causes and extent of environmental disruption is incomplete and will probably continue to remain incomplete for the foreseeable future. In other words, we will have to act on the basis of imperfect knowledge, as we have done in the past and may have to do, though to a lesser extent, in the future.

However, we do know that the process of causation is complex and circular and, as such, has a tendency to become cumulative unless deliberate action is taken to arrest or redirect it. For instance, air and water pollution are not merely the result of, and are not proportionate to, the volume of production and the emission of residual waste products. They are also governed by the interaction of a whole series of variables which may react upon one another. Thus, waste products of various kinds react not only upon each other but also upon other elements in the environment, and in this way give rise to additional toxicological effects on plant, animal, and human life, with delayed but cumulative consequences on human health. The actual rate of air and water pollution is at any given time governed by such intervening environmental variables as wind velocities and direction, topography, temperature inversions, stream flows, and water temperatures. In addition,

there are points beyond which any further discharges of pollutants cause not constant but disproportionate changes and damages.⁷ To this must be added the fact that there are interdependencies between different kinds of environmental disruption and social costs. Thus the magnitude of air pollution in and around large cities stands in circular and cumulative relation to the breakdown of the suburban transport system, which induces people to use their automobiles over congested traffic lanes while the transport system first deteriorates and finally goes bankrupt.

These complex circular interdependencies with their cumulative effects may also serve to illustrate the important fact that both the impairment *and* the quality of the environment (and of society) must be understood as aggregates. For the effect in terms of damage to human health, vitality, and actual experienced discomfort caused by any particular type of environmental disruption is always a function of the combined effects of all sources of disruption, which may include, in addition to air and water pollution, factors such as excessive noise; urban concentration; long hours spent in travel to and from work in metropolitan areas under chaotic traffic conditions; inadequate, congested transport facilities with high accident and death rates; and inadequate time for leisure and recreation.

This general pattern of causation must be kept in mind in approaching the urgent task of elaborating general principles for the control and minimization of social costs. Viewed from the perspective of conventional economic theory, it may appear sufficient to aim at internalizing the social costs into the cost accounts of the individual firm. By holding the individual firm responsible for the total costs caused by its productive activities (including its production of specific goods, as, for instance, automobiles), it

⁷ "Up to a certain level of concentration, disposal of wastes, disfigurement of the landscape, and congestions are, at worst, local irritations. Air and water and earth room can absorb a lot without great damage. Beyond that point, real trouble ensues. Differences of degrees of frequency and concentration create differences in kind." H. Jarrett, ed., *Environmental Quality in a Growing Economy* (Baltimore: Johns Hopkins Press, 1966), pp. ix-x.

might be assumed that the social costs will be minimized and the disruption of the environment be avoided or at least kept under control. This principle of internalization of social costs guides some proposals designed to prevent these costs by such indirect methods of control as the levying of fines on producers who pollute, of penalties according to the volume of effluence, or of offering incentives (e.g., tax reductions or subsidies) to producers in order to induce them not to pollute. In the light of the accumulated evidence of the last twenty years and in view of the circular and cumulative character of the pattern of causation discussed above, there is reason to question the adequacy of these indirect methods of controls. Such methods may be helpful in specific cases, but as a general rule they are of doubtful value and effectiveness. They seem to be unreliable both as to their efficacy and efficiency; they leave the decision of control to individual units, they are slow to take effect and difficult to administer, and hence their results are uncertain. Moreover, a fine or incentive of a given amount will affect different producers in varying degrees, depending on their financial resources, their profit expectations, and their fiscal liabilities in terms of tax rates and tax brackets. While they may be effective in one case, they may be totally ineffective in another.

The whole appraisal of what is to be done in terms of market costs and market returns suffers from one additional inherent weakness: the fact that the information and valuations provided by actual market systems in terms of entrepreneurial outlays and returns do not possess the "objective" relevance and validity which economic theory tends to attribute to or claim for them. Prices of factor input and of final products in actual markets are the result of a host of "distortions" resulting from the very interdependencies that give rise to social costs, as well as from existing inequalities in income distribution and prevailing conditions of unequal market power. For this reason particularly, it is important to insist that the issue of environmental control must not be sidetracked by the argument that its costs will be

prohibitive or may not be warranted in terms of the monetary benefits obtainable therefrom. Nor must we permit ourselves to be intimidated into inaction by questions of who pays and whether all the necessary information has been fully assembled.

In view of the circular and cumulative pattern of causation and the far-reaching interdependencies that give rise to social costs, it appears to us that the progressive deterioration of the environment (both natural and social) calls for more fundamental steps and measures than those hitherto envisaged. In fact, the phenomena of environmental disruption and social costs compel modern industrial societies and the social sciences to face the question of whether the principle of investment for profits is not in need of some fundamental amendments. What is put in doubt by the phenomena of social costs is the entire complex of decision-making, including particularly the choice of technology and factor inputs as well as the determination of output patterns based only on a comparison of market costs and returns from the perspective of the micro-economic unit. Indeed, what is needed is an evaluation of the total costs and total benefits of investments (including those related to research and development) from a broader and more comprehensive macro-economic perspective than that which has guided the system of business enterprise since it freed itself from the medieval and mercantilist controls. What is called for is not a return to these earlier controls but an assessment of the implications of alternative technologies for the maintenance of human life, evaluated by objective standards of human health and well-being. This is the problem of social minima, not only in terms of individually and socially tolerable levels of concentration of pollutants, but in terms of necessary and desirable conditions for life, including, for instance, settlement and production densities in specific localities. In other words, instead of a search for *remedies*, an effective approach to the solution of the environmental crisis calls for prior assessment and control of the "input mix" and output pattern with a view to preventing social costs and the impairment of the environment

before they occur. So far no comprehensive assessment and subsequent control of the techniques and the design of production have ever been carried out, except perhaps in the food and pharmaceutical industries and in the use of atomic energy. In this context the burden of proof that a new technology, a new product, a new process, and a particular input (and output) pattern are safe would have to rest in principle upon the producer and not upon the damaged person or society. Institutionalized agencies would have the function and responsibility to anticipate, appraise, and judge beforehand the hazards and benefits of alternative technologies, techniques, and locations. On the basis of such an assessment it would be possible to direct investments with respect to both permissible choice of factor inputs and the location of specific industries, in accordance with criteria that take account of the full range of the costs and consequences of new techniques for the individual and society as well as the world community. We cannot enter here into a more detailed discussion either of the methods of evaluating costs and benefits or of the institutional implications of such a program. Suffice it to say that the latter would indeed be far-reaching and radical. To control technological change, to select the factor input and output patterns, to plan investments accordingly, and to determine the location and concentration of production implies a radically new form of decision-making and planning by institutions responsible to the community and society. It calls for a replacement of the present micro-economic point of view by a macro-economic perspective in evaluating the optimal use of resources in terms of social objectives and consequences. The absolute necessity of taking account of social costs and environmental disruption rather than any other factor will compel the industrial society to replace the individual allocation and investment decision, the private choice of technology, and the selection of the site of production by new forms of social economic planning more responsive to human needs and social requirements than the traditional micro-economic calculus employed by independent economic units.

This brings us finally to the related question of the broader implications of social costs and environmental disruption for economic science and of the relevance of conventional economic theory as a framework for the analysis of the rationality of production in contemporary industrial societies. We believe that an adequate treatment of the problems raised by social costs and environmental disruption would require a radical change of the nature and scope of economic theory. Our emphasis on the need for prior assessment of the consequences of new technologies and new factor inputs may serve to make this clear. Of course, it may be argued that rational action and decision-making have always called for deliberate forethought about the consequences of human action, including its possible side-effects. In this sense it may be felt that our emphasis on the need for such an assessment is nothing fundamentally new and can easily be assimilated into the traditional ends-means dichotomy and the analysis of rational choices as practiced by modern economic theory. Such, however, is not the case. For let us consider for a moment the full meaning of what we hold to be the key to rational choice and action in the light of the problems raised by social costs and environmental disruption. A pre-investment appraisal of the consequences of different technologies and alternative allocation patterns goes beyond any merely instrumental evaluation of the fitness and efficiency of "given" means to "given" ends. Such an assessment would indeed give rise to a dynamic and thus more relevant concept of rationality than that which conventional static economic theory has used until now. For the prior assessment not only provides the information required for the choice of alternative technologies and techniques (including the location patterns) but also for the evaluation of alternative goals. In fact, only by a deliberate pre-assignment of the consequences of alternative technologies and techniques available for the attainment of public and private goals (including their possible side-effects) can we hope to secure the information necessary to appraise and revise our public goals and private objectives. In short, assessment of

alternative technologies and allocation patterns is the prerequisite of a deliberate choice among alternative objectives. Ultimately, only an appraisal of our goals and a prognosis of the consequences can give us an idea of the full range of the choices before us. But this is merely another way of saying that both means and ends are brought within the purview of scientific analysis, and that the traditional distinction of "given" means and "given" (postulated) ends cannot offer an adequate framework for the analysis of rational action. Rational action is much more than the adaptation of given technologies to given goals; it must be understood as a continuous process of adjusting ends to means and means to ends in the light of their fullest possible range of consequences. This dynamic notation of rationality is in open contrast not only to the ends-means dichotomy which serves as a basis for the systematization of economic science, but also to the way in which the micro-economic firm pursues its goal of profit maximization. Here the end is indeed "given" and never questioned, with the result that, so long as a particular line of action appears profitable (or more profitable than any alternative), evaluated by private cost-benefit calculation, it will be continued or preferred. Hence, even the oligopolistic business unit does not consider the full range of choices offered by modern technology. This is illustrated, for instance, by the fact that, instead of developing a new engine and a new type of automobile designed to minimize the pollution of the atmosphere and to increase the safety of the driver, automobile manufacturers have devoted the major part of their "Research and Development" expenditures to purposes they consider more profitable in terms of their micro-economic calculations of net returns. This has meant frequent restyling, a multiplication of brands and body frames, new gadgets, and built-in obsolescence—all in an effort to increase sales rather than introduce improved means of transportation which reduce air pollution and offer greater safety.

This frustration of science and technology, to which I have devoted a separate chapter, will probably be overcome only if we

are prepared to shift all basic research—and particularly those fields related to the prevention and control of environmental disruption by new technology—to research agencies operating under public auspices. For instance, instead of developing a "better" commercial pesticide, it may be safer to have public agencies and experiment stations turn their attention to the development of new plant varieties with greater inbred resistance to insects and pests.

As far as the adequacy of conventional economic theory for the elucidation of social costs and environmental disruption is concerned, the last twenty years have brought no new departures. Despite considerable changes and refinements, neither micro- nor macro-economic analysis seems to have evolved in a manner as to make them more relevant for the theoretical treatment of the phenomena of social costs. Both micro- and macro-economics fall back upon the formal concepts of "externalities"⁸ and of cost-benefit analysis, but the fact of the matter is that the theoretical presuppositions and logical framework of pure economics from which these concepts are derived are too narrow and too static to be useful for the study and interpretation of the cumulative processes that give rise to environmental disruption and social costs.

The mainstream of economic analysis still avoids placing man, with his actual needs and requirements, in the center of its theoretical considerations. It has continued to consider only market prices and effective demand, irrespective of whether the latter is manipulated by sales promotion and advertising, as a basis for the evaluation of the rationality of the allocation process. In fact, conventional economic theory refuses to distinguish between less important and more important human needs; as long as it continues to do so, and does not make man the measure of all things,

⁸ *The Social Costs of Private Enterprise* also made use of the Marshallian concept of externalities. For a more recent discussion of the inadequacy of the concept, see K. William Kapp, "On the Nature and Significance of Social Costs," *Kyklos*, XXII (1969), 334-47, and "Environmental Disruption and Social Costs: A Challenge to Economic Theory," *Kyklos*, XXIII (1970), 833-48.

it will be unable to evolve and widen its scope. Our models have become more abstract, more mathematical and quantitative, and their relevance for the elucidation and treatment of the impairment of man's social and natural environment and the quality of society has decreased rather than increased. The reformulation of basic concepts, the broadening of investigation in order to include the substantive human needs and social minima—in short, the "humanization" of economic analysis called for by the phenomena of social costs—remain on the agenda for the future.

Indeed, the need for a "humanization" of economics is becoming more urgent by virtue of the fact that a number of new sources of social costs and environmental disruption not specifically dealt with in this book have made their appearance. Here we shall list only the following: the potential and actual dangers (e.g., in terms of gene damage and mutation) resulting from a contamination of man's environment by radioactivity and heat generated by nuclear reactors; the potential and actual damages caused by certain pesticides; the harmful effects on human health by any prolonged, repeated, and severe exposure to high-intensity noise from industrial sources and air traffic; increased stress due to overcrowding and urban living conditions; the growing environmental disruption caused by the disposal of solid waste and garbage (particularly of the non-degradable type), which according to some estimates may double in volume every ten years in such cities as New York and Tokyo; the rising volume of marine pollution due to underwater production and large-scale ocean transportation of petroleum (with such serious dangers as blow-outs of wells, ruptures of pipelines, collision and wreckage of tankers, as well as the polluting effects of dredging operations for tin, diamonds, oyster shell, sand, and gravel); and finally the progressive absorption of free space and open landscapes, together with the increasing physical decay and aesthetic deterioration of our urban and rural environment by apparently remunerative but unnecessary advertisements of all sorts.

In view of the magnitude and the character of the threats and

INTRODUCTION

the values at stake, social costs and environmental disruption may be considered the principal contradiction within the system of business enterprise. By making it necessary for modern industrial society increasingly to replace the individual investment decision—including the choice of technology and site, and indeed of the whole allocation and output pattern—by public assessment and measures of control, social costs and environmental disruption may well become the principal driving forces of institutional change in the foreseeable future.

K. WILLIAM KAPP

Institut für Sozialwissenschaften
University of Basel, Switzerland
August 1970

PREFACE

THE MAIN PURPOSE of this book is to present a detailed study of the manner in which private enterprise under conditions of unregulated competition tends to give rise to social costs which are not accounted for in entrepreneurial outlays but instead are shifted to and borne by third persons and the community as a whole. Thus, the present study deals at the same time with a specific technical economic question and with broad issues of social philosophy and economic knowledge. The technical question involved is whether our concept of costs is not incomplete and apparently in need of correction. The broader issues of social philosophy and economic knowledge which the analysis of the social costs of production raise become clear only if we view the phenomenon of social costs within the framework of the basic premises of classical political economy and of the proposition still found in neoclassical economic thought that perfect competition tends to maximize output and the want-satisfying power of available scarce resources. To present a brief outline of this framework is the purpose of the first chapter. The second and third chapters are designed to provide a general introduction to the detailed analysis of social costs by describing the general meaning of social costs and examining the contributions of those economists who have questioned the validity of the main trend of neoclassical economic thought, and in this context have dealt with the phenomenon of social losses and social waste. The threads of these theoretical arguments are then brought together in the concluding chapters, which are designed to summarize the results of the detailed analysis of social costs contained in the main part of the book and to draw a number of theoretical and methodological inferences from them.

The basic idea of the present study was first advanced in a highly tentative manner in the author's attempt to deal with the problem