



# MATERIAL CONCERNS

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POLLUTION,  
PROFIT AND  
QUALITY OF LIFE

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TIM JACKSON

ROUTLEDGE



# MATERIAL CONCERNS

Pollution, profit and quality of life

*Tim Jackson*



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## MATERIAL CONCERNS

We are living in a material world. This is not just a comment on affluence in the consumer society. It is also the starting point for a critical examination of human development on a finite planet. We depend on material resources to survive. But the way in which we consume those resources has a potentially damaging impact on our environment. The increasing burden of environmental pollution presents us with a crucial challenge. Should we pursue economic development and risk environmental degradation? Or should we protect the environment and jeopardise our standard of living? *Material Concerns* sheds a new light on this time-honoured conflict; and by doing so provides a vision of what lies beyond it.

The approach is that of preventive environmental management. This strategy places the highest emphasis on reducing to a minimum the quantity of materials used to supply useful services to humanity. The book describes the technological tasks involved and illustrates them with numerous examples. It also highlights the importance of commercial innovation and elaborates a new conception of the 'service economy': profitability is based on the provision of services rather than the throughput of material goods. Ultimately, the author argues, we must re-examine the principles which underlie our modern society.

*Material Concerns* is essential reading for all those interested in the environmental problem. In a clear and accessible way it presents the scientific principles which govern material transformations, and the economic principles which govern material transactions. *Material Concerns* proposes a new and compelling thesis about our interaction with the environment. In doing so it reveals an exciting new arena for human development in which environmental management goes hand in hand with improving quality of life.

**Tim Jackson** is Research Fellow at the Centre for Environmental Strategy, University of Surrey, and an Associate of the Stockholm Environment Institute.

# PREFACE

As the title suggests, this book is mostly about the material basis of the world in which we live. Over the course of the last two centuries, that basis has undergone some fairly radical changes which, taken together, constitute a revolution in the relationship between human society and its natural environment. This is especially true of the so-called ‘developed’ nations which have built considerable wealth from advanced industrial economies. But industrialisation is also the aspiration of almost every other country in the world. So the evolution witnessed during this period of extraordinary change is really global in extent.

Industrialisation has not come without a price, however. It relies on continued access to limited material resources. It imposes increasingly demanding burdens on the environment. These are – in part – the material concerns to which the title of this book alludes. The prospects of global warming, ozone depletion, pollution of water supplies, soil degradation, deforestation, desertification (and so on) have haunted the progress of civilisation and now threaten to undermine economic development. Many people acknowledge the urgency of these problems and the need for action. But there is a fundamental division over the appropriate response.

Some point to the enormous benefits which the industrial economy has provided: increased life expectancy, reduced manual drudgery, better education, and technological advances in health care, transport and communications. They see economic growth as crucial for the translation of these benefits to the global population and the development of new technological solutions to environmental problems. They argue that wealth is critical to the improvement of environmental performance.

## PREFACE

Others insist that the pursuit of economic wealth and the indomitable rise in material expectations are the root cause of environmental degradation. They point to the increased material throughput of the industrial economies and the disproportionate burden placed on limited resources by the wealthy nations. They believe that radical measures are needed to curb environmental emissions and restrain economic expansion.

The idea that environmental protection and economic development are in natural opposition to one another has emerged as a common assumption, almost a defining characteristic of the dispute. One side has used this assumption to argue for better environmental protection and reduced economic activity. The other has used the same assumption to argue for increased economic activity with which to pay for environmental protection.

Two elements within a complex dialogue are beginning to disturb this well-established division of views.

The first is the suggestion that the industrial economy is showing signs of internal stress. Saturation of Northern markets, the growth of global competition, and systemic rises in unemployment levels have troubled the developed nations during the latter part of the twentieth century. It no longer seems as clear as it used to do that an economic system predicated on continued growth is viable.

The second element is the arrival of what might be called 'preventive environmental management'. Proponents of this emerging approach insist that it is possible to protect the environment without jeopardising economic competitiveness. They cite evidence of firms which save money and reduce pollution simultaneously. They talk of redesigning industrial policy to benefit both the environment and the economy. The idea that you can profit from improved environmental performance has gradually eroded the simplicity of the early debate and offered the promise of new kinds of solution to the underlying conflict.

How far can this new approach take us? To what extent is it feasible to implement the necessary changes within the existing economic system? How will they affect the behaviour of companies, governments and individuals? Must we change the system itself to accommodate these new ideas? Does preventive environmental management impose limits which will eventually constrain our development? Most fundamentally,

## PREFACE

will these new strategies deliver an acceptable level of environmental protection, without jeopardising human welfare?

These are among the questions which I have set out to examine in this book. The task is a frighteningly complex one, partly because it needs to draw on a very wide knowledge base. So the first chapter in the book starts out in the realms of pure science: ecology, physics, thermodynamics. The middle ground over which the book travels is largely technological. In fact, I have attempted to relate the discussion to practical examples from start to finish.

On the other hand, this is not a traditional technical textbook. Economics must play an absolutely vital role in the reorientation of industrial society, because it has played an absolutely vital role in the development of that society. But history, philosophy and psychology also creep into the discussion with a kind of uncanny persistence, as the book develops. We are not simply technological creatures living in an advanced industrial economy. We are complex human beings enmeshed in an intricate historical and social framework. Realistic solutions to systemic problems will not be found without paying attention to the breadth and depth of that underlying framework.

A part of my aim in this book is to guide the reader through at least a part of this complex network of interrelated intellectual disciplines. Each of them is important to a full understanding of the problems facing us. Each of them has a role to play in our search for solutions. But this is not just a guidebook. In fact, I am seeking to convey a very particular thesis about the reinvention of the industrial economy.

The starting point for that thesis is a recognition that the environmental concerns of the late twentieth century are material to the future of the industrial economy, and possibly to the survival of the human species. Much of the book is dedicated to the search for practical ways of reducing the material impacts of human activities. Throughout the book, however, I am also attempting a specific critique of the economic model which drives this material system. Towards the end of the book I will present a vision of human development which provides something of an alternative to what many would regard as the prevailing wisdom. Perhaps ironically, this vision has at its heart the idea that we have placed an undue emphasis on the material dimensions of human society. Material concerns are not, at the end of the day, the limit of human experience.

## PREFACE

Inevitably, not everyone will agree with the thesis I am presenting. Inevitably also, there are aspects of the discussion which I have not been able to accord the weight which perhaps they deserve. Nevertheless, it is my belief that the breadth and scope of the reflections in this book are vital to a successful solution of the environmental problems which face the world today.

*Tim Jackson*  
*University of Surrey, June 1995*



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This book has evolved from a research project carried out by the Stockholm Environment Institute into industrial environmental management. The aim of that project was to draw together experts in the field from all over the world, and to pool their technical and visionary expertise in such a way as to draw out a coherent and detailed picture of the new 'preventive' environmental strategy. A previous publication (Jackson, 1993) has collected together the individual technical contributions which furnished the basis for that task. This book attempts to provide an overview of the emerging vision, in a form which is accessible to a wider audience. Because it has been written by a single author, it is inevitable that this vision will remain to some extent personal. At the same time, I have attempted in what follows to synthesise some kind of consensus from the individual contributions to the SEI project and could not proceed without expressing my profound gratitude for the intellectual input of those who have contributed to that consensus.

My thanks are due to all those who participated in two international workshops on preventive environmental management, and contributed to the technical papers which formed the basis for this work. I am indebted to Dr Brian Wynne, Research Director at the Centre for the Study of Environmental Change in Lancaster University (CSEC) for his collaboration in the early stages of the project, and to all those at SEI who made that project possible: Professor Gordon Goodman, who provided the initial stimulus for action, Professor Michael Chadwick for his unwavering personal and intellectual support, Dr Lars Kristoferson for his expert advice and guidance, Arno Rosemarin and Heli Pohjolainen for their expertise in the publication

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# LIVING IN A MATERIAL WORLD

## Rough guide to a lonely planet

### INTRODUCTION

We are living in a material world. To say this is not just to say that the affluent consumer societies of the Western world are excessively materialistic. It is not just to claim that our priorities and our values have become increasingly embedded in the ownership of material possessions. These claims may be true, and at a later stage of this book, I shall examine that possibility further. But there is something much more basic involved in saying that we live in a material world.

Many of our most vital needs are essentially material ones: food, water, shelter, clothing and fuel. We survive as human beings by cultivating crops to convert to foodstuffs, manufacturing textiles to turn into clothing, excavating clay, sand and rock to build homes for shelter, mining coal and oil and gas to provide us with warmth, light and mobility, and extracting metals from ores to make the machinery and appliances we need to do all this.

In fact, there is a sense in which life itself is a fundamentally material concern. All biological organisms require energy to maintain life. Some organisms (green plants) are able to obtain this life energy directly from the sun. Many organisms (including human beings) have to obtain life energy by feeding on other material organisms. The process of digestion converts food into faeces, and releases energy. This energy allows us to maintain our complex biological structure, to forage for food, to reproduce the species, and to defend ourselves against predators. Without these material inputs and outputs we simply could



not survive. So to say that we are living in a material world is to say something fundamental about the interaction between human society and its environment.

These days, of course, the scale and complexity of our material interactions are vastly increased over those of earlier societies, and over those of other biological organisms. The material requirements of 'advanced' industrial societies extend far beyond the survival needs of food, warmth and shelter. There are now growing demands for a wide range of material goods from aerosols to aeroplanes, cosmetics to computers, and vinyls to videos.

In spite of this complexity, there are two aspects of the industrial economy which relate it directly to other more 'primitive' societies, and indeed to the social organisation of other biological species. The first aspect is the common aim of survival. The second is the common set of physical laws which govern behaviour in all material systems. This common physical basis is so critical to the interaction between the human species and its environment that we must gain some understanding of it, right at the outset, before we can proceed with the investigations. The aim of this first chapter is to provide that understanding.

### A THUMBNAIL SKETCH OF THE INDUSTRIAL ECONOMY

A simplified picture (Figure 1) will help to place some elementary structure on the complexity of the industrial economy. It is clear from the diagram that there is a more or less linear flow of materials through the system. Material resources extracted from the environment at one end of this flow are processed in various ways to provide goods and services within the economy, before flowing out of the economic system back into the environment as emissions and wastes.

There is an important distinction between two different types of resource inputs. The first type of resource is called **renewable** resources. These resources are provided on a continuous basis by the flow of certain kinds of materials and energy through the environment in well-established cycles. Renewable resources include many timber and forest products and agricultural products of various kinds.