Preface

For many years now, there has been an increasing emphasis in schools and universities to make the curriculum more relevant, to develop transferable skills and to increase the enterprise content of science and engineering courses.

This is to be applauded, but what about the science content of the courses? What we would like to suggest is that there is also real value in trying to connect science to business and that this should not be overlooked in the surge to connect business to science. Science, we suggest, is far too important just to be left to the scientists and our objective is to bring some of the fundamental rules of science to your fingertips so that you are more able to manage your business more successfully.

All of science is too large a prospect and we will be limiting ourselves to looking at disorder. We will be looking at how people in organisations attempt to manage, limit and avoid disorder. Most of our examples are from business, but our ideas are equally applicable in other organisations such as government departments or charities.

We use the word 'attempt' to raise the question in your minds that the task is not completely possible. You can try to manage disorder, but will you succeed? We raise the query with some certainty because there is a natural law at work that unremittingly changes useful energy into less useful forms and increases the state of disorder.

Scientists know about this natural law and some call it the second law of thermodynamics. They have also coined a word, 'entropy', as a measure of disorder, to help them define what is going on. We shall introduce entropy into our analysis and broaden its use well beyond thermodynamics.

We hope to show you that there is real science at the heart of management science. Managing disorder, ensuring creativity and innovation,

taking risks, making trade-offs—all need to be done in the context of an underlying entropy vector.

What on earth, you might well ask, is the entropy vector? We can give our answer in two words. Read on. We hope that if you do, you will discover a way of making sense of seemingly unrelated business issues and be able to develop for yourself a framework within which to make future judgements and decisions.

Let us be clear: we are not saying that just one law of physics explains all management behaviour. Nor are we giving a set of rules that can be applied to all situations with the guarantee of success. The second law of thermodynamics on its own will not explain management behaviour and you would not be able to predict 'what happens next' by applying it. What we suggest is that by recognising the resonance between science and business, you will have a better grasp of management behaviour and a better chance to get the decisions right.

You may feel that 'entropy vector' is a curious and obscure phrase. But what did you originally understand by 'quality circles'? Was it something that could only be drawn with a good quality compass and a sharp pencil? And what about intellectual capital? A big city like Paris or Prague where philosophers gather?

Entropy is enshrined in the second law of thermodynamics and, as a natural law, ensures that life is varied, surprising and unpredictable. It forces us to expect the unexpected, and whilst the label that scientists have given it (the second law of thermodynamics) is a real yawn, entropy itself is anything but. In our experience, go-ahead managers say they find their jobs exciting. It is the excitement of entropy. Some managers, particularly in the sales department, see competition as the enemy. It is entropy, not the competition, that they actually need to worry about.

Entropy is the degree of disorder or chaos that exists or is created. There is a scientific basis to this and scientific links between effort, efficiency, risk and waste. Non-scientists may groan at the word 'entropy' but the other words—'effort', 'efficiency', 'risk' and 'waste'—are well known to all in business. We realise that for some, any science is too much science—but hang in there! There is no gain without some pain and we promise to keep it simple.

We have aimed to make the chapters stand alone so that you can dip into the book, although of course, you stand a better chance of following our discussion if you read Chapter 1, the signposting chapter, first.

We must all learn to manage and control change and there is plenty of social, technical and business change going on. In this book, we will be suggesting that a clearer understanding of entropy and the choices it

presents will assist in that management of change—or, as we put it, in order to manage disorder you need to control the entropy vector.

The theme of controlling the entropy vector pervades the whole book. Go ahead! Find out what we are talking about. Take a trip along the entropy vector. Life will never be the same again.