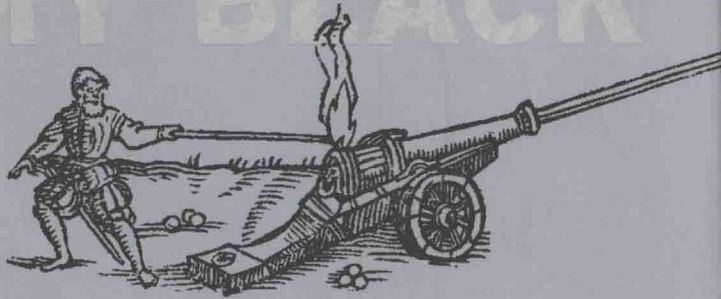




THE POWER OF KNOWLEDGE

How Information and Technology Made the Modern World

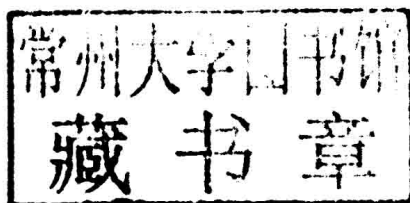
JEREMY BLACK



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For
Kate Davison

Preface

THIS IS AN APPROACH to world history from a distinctive perspective. It looks at the role information has had in the unfolding of the past. The understanding of what information is, and how it can and should be used, emerges as a major theme in cultural, intellectual, political, social and economic history. The use of information helps mould societies, but, in turn, information – and, in particular, the institutions and social practices that acquire, use and retain it – helps determine the understanding and employment of information. As a result, this book focuses on the relationship between information and society. In doing so, it concentrates on the last half-millennium because it shows how the changing understanding and use of information were important to the onset, character and development of the modern age. Change, both within and between societies, is considered in particular in terms of the synergies between information and power. Moreover, these relationships help constitute the modern world and provide important clues to the future.

Information, power and modernity, of course, are movable feasts, each difficult to fix in a definition that makes sense across cultures and periods, let alone all cultures and all periods. You may think you know them when you see them, but others will have a different view. Therefore, to write about information, power and modernity together, to consider their interrelationships, and the significance of the latter, may seem doubly problematic. In graphical terms, what are the axes?

The problematic character of the subject is even more apparent if the intention is, as here, to link the question of the relationship between information and modernity to the rise of the West. Both topic and discussion lead to difficult, indeed troubling, issues of cultural bias, notably so of teleology and triumphalism. These problems are stated at the outset because readers need to be aware of them. They are relevant to the conceptual, methodological and historiographical questions raised by this book.

The tendency, in recent decades, has been to address the rise of the West by both problematising and qualifying it. Problematising this rise has entailed drawing attention to what are variously presented as the harsh, distorting and negative aspects of Western power including Western intellectual assumptions and cultural programmes. Qualifying this rise has meant focusing on the degree to which Western power and its strategies were heavily dependent, for implementation and sometimes ideas, on non-Western societies, groups and concepts. Moreover, qualification of Western power also arises by emphasising the degree to which non-Western societies long remained resilient in the face of Western power, while remembering that both West and non-West are abstractions, each of which comprehends significant variations, geographically, chronologically and thematically. Thus, the topic and methods of world history, a subject greatly advanced in recent decades, challenge traditional definitions and accounts of the rise of the West.

Allowing for these points, and without any sense of triumphalism, it was, nevertheless a case of victorious Western forces in Beijing, Baghdad and Constantinople at times between 1860 and 1922, and not vice versa. Western power rose not only to unprecedented heights for the West, but also for the rest of the world, with empires created on which the Sun never set. Spain was the first of these empires, with the establishment of its colony in the Philippines in the late 1560s, and the nomenclature was fixed by naming this archipelago after Philip II of Spain.

The relationship between this global power of the West and the Western ability to impose its information systems on the rest of the world seems clear; but the more general linkage of information, modernity and Western power invites discussion. That discussion is the particular subject of this study.

Information systems are significant because information is 'constructed', that is, collected, systematised and utilised according to predetermined categories. Thus 'description' is also construction. Information, indeed, covers the spectrum from raw 'data' to systems of 'knowledge'. Each is also a 'construct' in its own way. Moreover, assumed binaries, such as ideology and belief versus information, need to be considered in terms of such 'constructs' and also with reference to the overlapping stemming from the degree to which information is not readily distinguished from a range of related and often overlapping terms and concepts. These include data, science, knowledge, propaganda and rumour. Moreover, in discussing information technologies, there is a conflation of the message and the medium caused by their mutual dependence.

The significance of information also partly lies in its importance for the cultural development of the human species, and this form of development has occurred far faster than biological evolution. The ability to learn language was

crucial to cultural development and, just as language offered information, so information was expression through language. A mathematical dimension was also present, although this was more significant for intellectual development than for broader cultural trends. At the same time, as a cultural product (rather than simply as an expression of technological possibilities), information lacks the precision or rational clarity that might be anticipated: it is both contested as a category and part of the sphere of debate and contention. This sphere incorporates the topics covered in this book.

In writing this book, I have incurred a large number of debts. First and foremost are those to other academics. I have read more widely for this book than for any of my other works and, in doing so, have moved far from the (often misleading) comfort blanket of familiar or semi-familiar sources and literatures. At every stage, I have been fascinated by the intellectual richness of what I have encountered. The challenge in an academic world that is truly wide-ranging is to glimpse and understand more than a tiny fraction of the scholarship available. If I have not succeeded, the faults are all mine and not those of others, but reading widely has given me many opportunities to think across disciplinary and other barriers. Already, I am aware that the interest and content of my teaching have been enhanced, and the long-held relationship between research and teaching seems fully vindicated.

I am particularly thankful to those who have taken the time in busy schedules to comment on the whole or parts of earlier drafts: Nick Baron, Tim Black, John Blair, Cynthia Brokaw, Lucille Chia, Kai-wing Chow, Malcolm Cook, Alan Forrest, John Gascoigne, Bill Gibson, Nelson Gray, Paul Harvey, Eddy Higgs, Ian Inkster, Angus Lockyer, Derek Partridge, Kaushik Roy, Ken Swope, Peter Waldron, Peter Wiseman, Tony Woodman and Neil York. I have also benefited from discussions with George Efstathiou, Sarah Hamilton, Tim May and Bob Higham. They are not responsible for any errors that remain, and do not necessarily agree with all my arguments.

I am very grateful to those who have supported this research: the Leverhulme Foundation and the University of Exeter. The grant of one of the Foundation's Major Research Fellowships has been crucial to the success of this project from its inception. I am most grateful to Geoffrey Parker and Brian Blouet for acting as my referees and to the Foundation's assessors. The university has proved a very supportive environment.

I have benefited greatly from the opportunity to travel widely, which has provided important perspectives. I would like to thank those who helped with my visits to Antigua, Belgium, Belize, Canada, Colombia, Costa Rica, Cuba, France, Germany, Honduras, India, Italy, Japan, Malaysia, Mexico, Qatar, Singapore, Sri Lanka and the USA. The opportunity to conceive and present a programme on the Industrial Revolution for the BBC proved most rewarding.

I am delighted that this book has appeared with Yale University Press, a publishing house that has handled my most significant works. I would like to pay testimony to over twenty-five years of friendship with Robert Baldock, a prince among publishers.

I see education as the trust between the generations, and particularly so with the subject to history. Education for me focuses on helping others develop their individual potential. The range and ambition of this book reflect that approach. I introduce and discuss ideas not in any sense that readers should necessarily agree but so as to stimulate their thoughts and views.

So also with friends and their central importance in my life alongside family. Friendship reflects our own past, and offers companionship and zest in the present, and hope for the future. I have been very fortunate in my friends, and none more so than with former students who have become friends. Indeed, two students from Durham days in the 1980s, Patrick Deane and Glenn Hall, are close friends who have helped in dark moments in my life. I record and celebrate my friendships with dedications in my books. Indeed, Robert Baldock is one dedicatee. I am particularly proud of former students who have not only become friends but have also followed an academic course. Kate Davison is not only a special person but also a former student with a diamond-sharp mind who has gone into the eighteenth century. This book is dedicated to her in the hope that she will throw light on that most fascinating of periods. That she currently works on laughter in eighteenth-century England is apt as she brings smiles to so many.

Contents

<i>Preface</i>	<i>ix</i>
BACKGROUND	
1 Introduction	3
2 A Global Perspective	28
THE EARLY-MODERN	
3 The West and the Oceans	53
4 Renaissance, Reformation and Scientific Revolution	82
5 Government and Information	120
THE EIGHTEENTH CENTURY	
6 The West in the World	143
7 Enlightenment and Information	173
8 Enlightenment States?	201
THE NINETEENTH CENTURY	
9 Information and the New World Order	237
10 The Utilitarian View	261
11 The Bureaucratic Information State	290
TO A CHANGING PRESENT	
12 Information and the World Question	315
13 Information Is All	337
14 A Scrutinised Society	367

	LOOKING AHEAD	
15	Into the Future	397
16	Conclusions	407
	<i>Notes</i>	413
	<i>Index</i>	458

BACKGROUND

Introduction

HOW WE UNDERSTAND the world is a measure and forcing-house of intellect, but also a definition of capability, and thus power – the power to know, to analyse, and to plan and act employing both knowledge and analysis. This book will take information as a cause, measure and product of power, and show how the relationships between information, modernity and power changed, and how these changes made the modern world. This book therefore discusses the relationship between information, and its use notably to affirm and strengthen power, and the making of a modern world in which Western analytical methods and concepts based on the acquisition, analysis and flow of information have played a central role.

Information, modernity and power are porous categories, necessarily so in the case of this book to allow it to encompass the variety of working definitions by period, area and topic. Thus information covers flows of information and the media of information exchanges, such as printing presses, telegraphs and the Internet, as well as categories and uses of information. The latter are frequently discussed in terms of ‘know-how’, technical knowledge and scientific knowledge. These differing forms of information overlap and interact, not least as information expands and changes with use.

In a historical context, the search for, acquisition and assessment of information, and the development of information systems, throw light on the inter-related categories, issues and questions of comparative capability, the rise of empires and the eventual success of the West (Christian European civilisation) in the nineteenth century in becoming the wielder of global power and, more significantly, the dominant source of concepts and practices used there and elsewhere. Today, there is an emphasis on the extent, quantity, speed and range of information as characteristics of the present state of humanity. Great powers are now in part defined by their unprecedented information reach, notably their ability to develop and deploy space-based systems that interact in real

time with Earth-users; and this unprecedented capability adds a new definition to the understanding of imperial strength. The USA dominates current capability, but the attempts of other powers and would-be powers, notably Russia, China, Japan and the European Union, to acquire and/or develop these capabilities are notable.

The very definition of criteria and values of power was bound up in the rise of the West, as was that of the criteria and values of information and its classification. Existing and, even more, increasing knowledge of the outside world led to pressure on the existing typologies and analyses by which information was understood, acquired, organised, presented and utilised. A classic Western assessment took the form of cartography (mapmaking). In 1973, the International Cartographic Association defined a map as 'a representation, normally to scale and on a flat medium, of a selection of material or abstract features on, or in relation to, the surface of the earth or a celestial body'. Such a definition consigns non-scale maps to a second-class status, an approach that underrates non-Western cartographic traditions.

The World Question

Accounts of the rise of the West frequently offer teleology and, sometimes, triumphalism or, worse, determinism. In contrast, to take the 'realist' side, there is a need to understand the potential of non-Western empires into and in the eighteenth century, and, in the case of China and Burma, into the early nineteenth. This point leads to an assessment favouring the idea that (in information and power) the West gained a relative advantage that it was able to use successfully only relatively late and, then, with a sharp divergence from non-Western capability. This divergence was heavily dependent on contingent factors, notably those responsible for the rise of Britain's global power, as well as the particular political problems of China in the nineteenth century. Moreover, the very period of divergence saw an attempt by non-Western powers to close the gap, especially so in the case of Japan, which in 1904–5 was able to defeat Russia.

A focus on a relatively late divergence is different from the more conventional alternative of a process of steady divergence between West and non-West from the fifteenth century. The latter period was nevertheless significant as the age of the Western Renaissance, of mapping employing a rectangular grid, of the spread of printing using movable metal type and a press, of Western 'new monarchies', and of successful Western voyages of exploration to the Americas and South Asia.

Chronology is not the sole issue. In addition, as an instance of the presentism that is so potent in history, at once in the past and accounts of the past, any

discussion of the causes of the rise of the West can lead to vexed controversy. The response to Niall Ferguson's *Civilization: The West and the Rest* (London, 2011), a somewhat congratulatory account of this rise, amply illustrated this point. Clear-cut accounts of Western proficiency invite critical debate, indeed hostile discussion, and notably in the present context. These accounts are held to reflect unwelcome and misleading ideas about Western cultural superiority.¹

Part of the problem in this debate is the belief that responsibility for the present and, separately, the prognosis for the future can be established by allocating blame for the past.² In practice, linkages between past, present and future are more problematic and less clear-cut than such a practice suggests. However, interpretations emphasising cultural causes of developments do tend to place a stress on deep history, notably because of the tendency to take an essentialist view of culture.

Two recent issues have pushed this question of the validity of deep history to the fore. First is the relative (not absolute) decline of the West vis-à-vis East Asian societies, an issue that emerged with the rise of Japan from the 1960s and, more clearly, with that of China from the 1990s. Second is the supposed 'clash of civilisations' between the West and Islam, a theme of Samuel Huntington's problematic book of that name. Both issues are important in the modern world, although, despite assertions to the contrary, they are not necessarily the central themes of human development, and certainly not in comparison with the rapid and unprecedented rise in the world's population, which reached seven billion in late 2011 and is projected to rise by another billion in the next eleven years.

The extent to which topics of current concern can be profitably discussed in terms of developments centuries ago is unclear, and there is certainly no fixed relationship between past and present. For example, the modern, international, capitalist, democratic, widely trading character of Japan today was scarcely prefigured by the isolated Japanese state of the seventeenth and eighteenth centuries and, although values have been traced from one to the other, this process has also been contested. Nor does a largely rural Middle East, under Ottoman (Turkish) imperial rule from the 1510s to the 1910s, viewed in a context, from the late seventeenth century, of expanding rival empires, necessarily provide much guidance to the urban, overcrowded, self-determining and quasi-democratic region of today, although there are significant links in terms of the difficulties of establishing and sustaining a viable civil politics.

Similarly, to focus on the subject of information, linking the geocoding of the current GIS (Geographical Information System) used for surveillance and cruise missiles with the earlier assignment of formalised street addresses, allowing individuals to be located, is to join very differing contexts and purposes of information. At the same time, in both instances there is a common theme of

power, and it is not automatically helpful to differentiate the uses of power between states from those within them.

Despite real or apparent discontinuities in these and other cases, there is nevertheless a chronological coherence to the issue of modern power thanks to the very theme of Western potency, albeit a coherence that is very rough at the chronological, geographical and thematic edges. This potency was scarcely a question for much of the world's population prior to the sixteenth century but, thereafter, there was a growing awareness of Western power and, in some circumstances, a need to react to it. If the history of China in the sixteenth, seventeenth and eighteenth centuries does not revolve around this impact, nevertheless there were Western traders in Macao from the 1520s and Western bases on Taiwan in the seventeenth century (until 1662). Although defeated there by the Chinese in the mid-1680s, the Russians had advanced into the Amur Valley, and they remained on the Sea of Okhotsk and in eastern Siberia.

More profoundly, Western developments in theoretical and applied science in the sixteenth to eighteenth centuries were not matched elsewhere. These developments certainly owed much to origins in earlier non-Western achievements, notably Islamic mathematics and the major contributions of Islamic scientists between the ninth and eleventh centuries, especially under the patronage of the Baghdad-based Abbasid caliphs.³ The Islamic world proved important to the transmission of the intellectual world of Classical Greece. The closure of the School of Athens in 529 by the Byzantine emperor Justinian reflected a concern about the heretical consequences of Aristotelian thought. However, the tradition continued in Sasanid Persia (224–642), an empire that included Baghdad and much of modern Iran, before influencing the Muslim Abbasid empire after the Sasanids were overthrown by Arab invaders. Many of Aristotle's (384–322 BCE) works were translated into Arabic there in the early ninth century, as were other Classical works, such as those of the Greek medical writer Galen (c. 130–201). Moreover, there were important advances in science in Baghdad, including the development of experimental chemistry in the ninth century by Jabir Ibn Haiyan.

However, Muslim fundamentalism affected free thought in Baghdad from the mid-ninth century. Moreover, a similar tension was seen elsewhere: for example, in Morocco and al-Andalus (Andalusia) in the eleventh to thirteenth centuries. At the same time, translations of Aristotle and other Classical writers helped ensure that the Arab world served as an important source of ideas for Western Christendom. Latin Arabists proved significant for this cultural transmission. Furthermore, influences continued. For example, Arab visual culture and optics affected the Renaissance, as in the work of Biagio Pelacani.

A focus on earlier advances in the Islamic world does not address the issue of the capabilities and human capital that the West acquired through