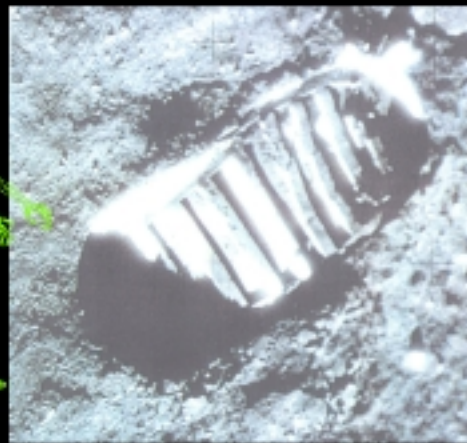
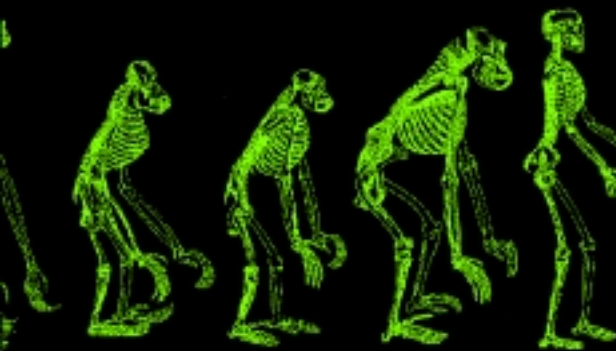




# TIME AND THE SHAPE OF HISTORY

PENELOPE J. CORFIELD



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SHAPE OF HISTORY

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YALE UNIVERSITY PRESS  
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## Preface

This book takes a new look at the shape of history, as viewed in the context of long-term time. As a historian, I found myself over the years growing increasingly dissatisfied with the way that studies of the past are habitually subdivided into many short and often disconnected periods. I wanted to return to the very long term, but in a different way. Not finding any book that answered my questions, I decided to write one myself. It has been an absorbing process that has led me into enjoyable new terrain, far from my research home-base in the study of eighteenth-century Britain. The outcome has turned into a study that is addressed to all who are interested in the past and its intersections with the present, without any limitation of period or place.

Themes of history and time are not, of course, subject to any professional monopoly. They are studied within so many subject-disciplines, from astronomy to zoology, that historians may indeed appear to be crowded out of the field. After all, Stephen Hawking's phenomenal *Brief History of Time* (first published in 1988) is the work of a physicist with a special interest in the origin of the cosmos and how it can be understood. But these great themes are, fortunately, inexhaustible and open to all. There is always more to debate, whether about time or about history or, as in this study, about the shape of history in time.

Two of the twentieth century's outstanding historians helped to trigger my interest in the question of whether and how it is possible to fit the details together to reveal a bigger picture. These seminal figures were E. P. Thompson, an extraordinary polymath of literature, theory, history and the European campaign for nuclear disarmament, and my uncle Christopher Hill, who grounded his faith in human equality upon the seedbeds of historical change. Debating the rights and wrongs of Marxism(s) and post-Marxism(s) with them over many years was an education in itself. Both would no doubt disagree with my arguments in return – but not with my

belief in the illuminating power of history. This book is therefore an indirect but appreciative acknowledgement of valued friendships and intellectual stimulus.

Thanks for unflagging support and interest also go most warmly to my immediate family; and to many friends and colleagues for providing advice, criticisms and references. All the many comments that I have received on *Time*, the universal theme, have been most welcome, including especially significant exchanges with Humayun Ansari, Sarah Ansari, Vera Bacskai, Sam Barnish, Caroline Barron, Michael Bennett, Margaret Bird, Hugo Blake, John Broad, Alison Brown, Arthur Burns, Zbigniew Ciechanowicz, Mary Clayton, David Clemis, Sean Creighton, Martin Daunton, Michael Drolet, Beverley Duguid, Maaria Farooqi, Paolo Ferrari, Helgard Frölich, Andrew Gibson, Suzanne Gossett, Warwick Gould, David R. Green, Edmund Green, Uriel Heyd, Tim Hitchcock, Peregrine Horden, John Hodgkins, Julian Hoppit, Ahuvia Kahane, Sarah Knott, Kazuhiko Kondo, Reinhart Koselleck, Xabier Lamikiz, David Lewis, Takao Matsumura, Chris Mounsey, Rudolf Muhs, Tadashi Nakano, Avner Offer, Caroline Ogilvie, David Ormrod, Christina Potter, Dave Postles, Roland Quinault, Adam Roberts, Raphael Samuel, Daniel Snowman, Dan Stone, Rosalind Thomas, Benjamin Thompson, Tzu-Chen Yang; and a physicist friend who travels incognito.

The participants at numerous research gatherings around the world have given pertinent comments and criticisms. My cordial thanks to all of them and, in particular, to those at the Royal Historical Society/Royal Society Conference on 'Time: History, Science and Commemoration' in Liverpool (September 1999); and at the Millennial Conference on 'Old Histories – New Beginnings' at University College Chichester (February 2000). The continuing programme of London University's (very long) Long Eighteenth-Century Seminar also provides an ideal research workshop for debates, both formal and informal, about the art and craft of being a historian.

Throughout this project, unobtrusive help has been forthcoming from the staffs of many research libraries, including the various London University libraries, Oxford's Bodleian Library, Nuffield College Library, and the curators of the specialist collection of the British Dental Association Library. Above all, the staff teams in the British Library's Rare Books room have patiently supplied mountains of books on an array of subjects, from tantric sex to men on the moon, and have made working in Rare Books a rare pleasure.

Thinking and writing time is greatly treasured by authors. Special thanks go therefore to Nuffield College, Oxford, for the award of a research fellowship in 1999, when this study was largely planned; and to Royal Holloway, University of London, for a timely period of study leave, when much of the writing was done. In addition, I am grateful for the intellectual companionship of my

academic colleagues, and for the perpetual stimulus of Royal Holloway's history students. They will recognise some of the themes that follow.

True gratitude goes as well to Robert Baldock of Yale University Press for wise counsel. He has encouraged, doubted and advised upon appropriate changes to the text, in perfect editorial style. And his colleagues at the Press have been superbly professional. Patrick O'Brien, the doyen of world historical studies, has also provided a judicious mixture of support and scepticism. From his expert vantage point, David Lightfoot gave important advice on the history of languages. Richard Fisher and Tony Morris also offered tonic encouragement, as friends within the publishing world who recognise the travails of book-making. And Sunil Chhatralia not only empathised with my theme but kindly produced illustrative materials for this book and for my *Timeframes* website.

Three anonymous readers for Yale University Press produced, at crucial points in the writing process, trenchant critiques of early drafts of an overlong and overexcited text. This behind-the-scenes labour of collegial support should not go without a public expression of gratitude. Their responses, which helped me transform every chapter for the better, confirm the maxim that 'opposition is true friendship'. Hearty appreciation in this regard goes also to Jacqueline Eales and Susan Whyman for their detailed line-by-line critiques, and especially to Amanda Goodrich for invaluable advice not only on the book's contents but also upon its presentation.

There remains only the agreeable task of recording my last and first thanks, and the dedication of this book, to my fellow time traveller – all of which go, incontestably, to Tony Belton.

*Penelope J. Corfield*  
*Battersea, London*  
*April 2006*

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# Starting Points

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### What this book sets out to do

Historians cannot stop the clocks to put time under the microscope, any more than philosophers or physicists can achieve such a feat. This study accordingly does not start by probing one specific moment and then working outwards. Instead, it examines the shape of history (and not just human history) in time, as it has been considered over the long term. The justification for this longitudinal approach is because that is the way temporality operates, 'in the long', just as space coheres laterally, 'in the round' – both space and time being, of course, simultaneously and integrally linked in what physicists know as space-time.

History has been envisaged in many long-term guises. Does it mark a process of deep-rooted continuity? Or, instead, one of gradual progress? Or one of persistent decline? Or, if avoiding the value-laden terms 'progress' and 'decline', does history consist of unending gradual change, neither systematically for better nor perennially for worse? Or, if pure continuity and gradualism seem inadequate for all the eventualities, does history instead unfold via a series of dramatic breaks? Or perhaps in a sequence of graduated stages? Or, alternatively, do events occur disconnectedly, in a miscellany of random fluctuations? The life-as-jumble viewpoint was once defined succinctly as 'one damned thing after another'. But even that verdict, it may be noted, contains a minimalist message of a sort. Or does history display none of those patterns? Or, by contrast, some elements of all, or some, of them?

Help in answering these questions comes not only from assessments of specific case studies but also by drawing upon the immense repertoire of ideas about the shape of history, as viewed in the long term, that have been formulated within history, science, philosophy, world religions, literature and everyday cultural traditions. Some of the examples that are discussed in the chapters that follow are well known, even if others are not. And, no doubt, readers can think of many more. That should be the case, because there is always more history, past and present, to study, as restless time continually creates more – and as new events and/or new evidence encourage new perspectives upon the past. Nonetheless, the diversity is not so great that it is impossible to find any common ground. The different traditions 'speak' to one another. Out of the many different interpretations, a finite number of organising 'shapes' do emerge again and again; and it is these that have become the major themes for analysis in the following chapters.

Here it may be added that the essential focus is upon this-worldly experiences and interpretations. Teachings from the world's great religions provide a particularly rich corpus of ideas about historical trends and meanings; and such views are considered respectfully at relevant points. However, readers

will not find it hard to detect that the assumptions in this study are based upon a secular liberalism. The discussion therefore does not seek to debate the theological validity or spiritual value of beliefs in life or lives *beyond* time, but concentrates upon what can be learned about the shape or shapes of history in this world and within daily lived time.

Having noted that, another starting assumption can also be mentioned briefly. The quest to investigate patterns of history past and present is not intended to imply a passive or fatalistic view of the role of individuals (whether acting singly or collectively) within such patternings. People are not just pawns in a greater game over which they have no control. On the contrary. The sum of what happens, in the eras in which humans live, contains the sum of all human actions and inactions, multiplied by the multifarious factors outside and beyond human control. This study is therefore written in the firm conviction that a better understanding of the dimensions of history, past and present, provides a better understanding of the scope for people to live their lives.

### Who are 'we'?

Themes relating to time have a potential relevance that is universal. However, there are many meanings that can be attached to the experience of temporality, so that too much human togetherness should not be assumed. Bearing in mind the diversity of individual and cultural responses, this study generally avoids all collective statements, such as 'we think this' or 'we find that'. Invoking collective pronouns in that manner can easily become a covert form of special pleading, encouraging assent by implying that all reasonable men and women will endorse a common viewpoint. That is not always the case; and the arguments in the following chapters do not imply that either.

There are some occasions, however, when it is appropriate in a study with global themes to refer to all people, as one species. In this book, therefore, the personal pronouns, 'we', 'us', 'ours' are used infrequently but, when they are, it is specifically in contexts that are understood to apply generically and non-controversially to all fellow humans. An example is 'we talk', which is a species indicator of *Homo sapiens*, even though not all individuals actually do so.

The resulting discussion is offered as part of a world conversation, to all who are or who seek to be students of history. Examples are cited from specific times and places, but the underlying themes are ones with a general application. We all carry around various assumptions about the past and how it relates to the present. What those are and might be are the subjects of discussion here.

### Starting definition of time

Time refers both to long duration and to continuously unfolding change within that duration. The resultant combination is a uniquely dynamic process, which stretches to embrace the immense reaches of the past, the immediate here-and-now of the fleeting present, and the potentially vast expanses of the future. The elasticity of temporality is impressive but it operates nonetheless within a detectable framework. Time can accordingly be measured, whether in terms of specific spans of time (a day, a month, a year, a millennium) or in terms of micro-moments, such as the instant when this sentence began to be written, in the first nanosecond of half an hour past midday on a specific date in May 2005.

Tellingly, too, the term is used with many colloquial variations to invoke a subjective awareness of temporal unfolding, that intersects with human hopes and fears. So it is possible to talk of ‘gaining time’ or ‘making time’. Or ‘doing time’ or ‘wasting time’. Or even, on the part of bored people idling restlessly with nothing to do, ‘killing time’, although no one so far has managed to strike a fatal blow.

Two effective terms, previously not much used but now coming into wider currency, capture the twin perspectives of the immediate moment and the experience of the long term. The *synchronic* indicates everything that occurs more or less simultaneously at a synchronised moment in time. It stands proxy for any set of contemporary circumstances that all happen together or virtually together. To give a practical example, mechanical engineers in the twentieth century invented synchromesh gearing, to smooth the process of changing gears at speed into a near-immediate friction-free synchronisation. By contrast, the *diachronic*, which literally means during or through-time, refers to any protracted span of time, from years to millennia. This term therefore stands proxy for the long term – and, from a human perspective, refers especially to the great temporal span that stretches far beyond an individual’s personal experience.

To historians, it is axiomatic that the synchronic is always in the diachronic – in that every short-term moment contributes to a much longer term. And the converse is also true. The diachronic is always in the synchronic – in that long-term frameworks always inform the passing moment as well. To invent a new word on a par with synchromesh, the seamless linkage of the momentary with long duration could be termed *diachromesh*.

Together, these different diachronic/synchronic perspectives combine to allow a full view of time, not just as it seems at any split second but as it also operates when the split seconds accumulate massively and inexorably to become millennia.



### Starting definition of history

Terminology can famously stretch to cover many meanings and the term 'history' has imperceptibly become elasticated. It can refer to the unfolding past generically; and/or to the study of the past as a specific subject of inquiry; and/or, much more loosely, to whatever are taken to be the meanings or 'messages' of the past. There are many possibilities – from history as narrative or story to history as myth, history as morality tale, history as national pride, history as heroic destiny, history as group therapy, history as autobiography, history as applied methodologies, history as record, history as judge, history as avenger, history as betrayer, history as a compound of lies and villainy, or history as mess and muddle.

Those who doubt the value of studying the past often enjoy quoting, above all, the famously snappy verdict associated with Henry Ford, the US impresario of the new mass automobile. 'History is bunk,' he was reported as saying in 1916. Later chided for this remark under cross-examination in the witness box, Ford partially retracted: 'I did not say it was bunk. It was bunk *to me*.' His revised view, however, did not manage to obliterate the terse impact of the original dictum. Indeed, it remains in circulation almost one hundred years after its first avowal, testifying paradoxically to the power of historical memory to retain information through time. Ford's debunking phrase accordingly remains available for repetition by those who want to rubbish elements of the past, or to snub those who study the past, while his wording simultaneously represents a certain type of brisk businessman's no-nonsense anti-traditionalism – which is very much part of history.

Throughout this book, these overlapping usages are disentangled by varying the terminology. When used without any further qualification, the term 'history' is here taken to refer to the entire past or, as dictionaries specify, the 'aggregate of past events in general' (and not just events in the human past). It embraces anything or everything up to and including the immediate micro-moment before 'now', as well as the legacies of earlier times that survive into the present. Such a definition in itself contains multitudes. It is at once 'up close and personal' and far, far distant in time and place. Meanwhile, when the intention is to refer to 'history' in a more specific sense, then amplified phrases are used such as 'the study of history', 'the meanings of history', 'the evidence of history' and so forth. The general point is to differentiate between, on the one hand, the past as *the subject* of retrospective analysis and, on the other hand, *the many and varied interpretations/studies of the past* that are generated by all who look back on things that have 'gone before'.

That said, it should be noted that some sceptical theorists prefer instead to define history simply as 'what historians write'. This was said to me, dismissively,

by a colleague in 2001, when I told him of the subject of this book. It is a viewpoint which assumes that 'the past is dead' and is completely inaccessible to later generations. The sceptics further point out that a silent redrafting occurs, when one era in time is described in the language of another.

Thus, in one way, historians are outwardly flattered as the 'creators' and 'designers' of history. Yet, at a deeper level, they are being debunked, with the implication that they merely invent their 'stories' freely as they write their books. Such an assumption implies that there is no external evidence against which historians check, reference and debate their arguments – and the assumption would further mean that there would be no way of telling whether one study of history is more reliable or plausible than any other. The only criteria for judgement would become aesthetic ones: who tells the better story? And, since readers often disagree, there could be no way of deciding between their differing verdicts. One story would be as potentially good as any another. So – to take an extreme example – it would become hard to find grounds upon which to refute the claims of Holocaust deniers.

Therefore 'history' is not merely created or designed by historians but 'history' as the unfolding past is what historians write *about*. And their own books, once launched into the world, join that vast panorama of things that have happened. Moreover, as already noted in the preface, the historians have no professional monopoly. The past is investigated by physicists – like Stephen Hawking – who debate the origins of the cosmos, as well as by archaeologists, astronomers, botanists, biologists, geologists and geographers, to name just a few. No study begins from a blank mind, outside time, so historians share rather than invent history. Even more importantly, too, ideas about the past, especially the human past, do not emerge just from the world of scholarly research. Collective memories, stretching well beyond each passing generation, circulate attitudes, beliefs and emotions about things that have gone before, generating communal repertoires that are both commemorated and contested. There is always an interesting interaction (including mutual feedback and, sometimes, opposition) between scholarly assessments and popular attitudes, as seen in the diversity of media representations of history. But here again none has a monopoly in generating or circulating viewpoints about the past.

Thinking beyond the immediate moment, both retrospectively and prospectively, is a human characteristic. It is part of a shared and living process of *diachromesh*. Thus 'history' as the past – including all that has gone before, up until the micro-moment before the present moment, and including the legacies of the past in the present – is something that appertains to all.

### A note on calendars

This study adopts a secularised version of the Christian calendar, which currently forms the international standard. It is used in its 'Gregorian' format, as reformed by Pope Gregory XIII in 1582 and as now minutely adjusted by astrophysicists to synchronise measured time with the geophysical time of the universe. Under this system, dates are counted both backwards and forwards from year 1. Hence there is no 'zero' standing outside time. Traditionally, the first year AD (*Anno Domini* or year of the Lord) is taken as marking the first year of Christ's life, while 1 BC was the last year before Christ. In recent years, however, a secularised version of the nomenclature is slowly emerging into use for cross-cultural overview studies. The framework chronology remains unchanged but the period BC is represented as BCE (before the Common Era) and the period AD becomes CE (the Common Era). It is not a terminology that pleases everyone – but its application is intentionally global.

Times past in this study are thus specified, when appropriate, as occurring either before or in the Common Era (BCE/CE). But a special notation is not required in all cases. So dates that appear without further qualification can be taken as referring to the most recent two thousand+ years of history – the Common Era (CE) in which we now live.

Translations from the Christian calendar into other global calendars are also routinely possible, although differing definitions of the year-length mean that calculations are often complex. Taking one date as an exemplar, the first day of January 2000 CE has various alternative designations. In Japan, it marks the ending of the eleventh year of Heisei (the Imperial regnal year). In the zodiac-based system as celebrated in traditional Chinese popular culture, it occurs within the Year of the Hare. In the Muslim world, it falls within the lunar year 1421 of the *Hijra* (Latin *Hegira*) dating from Muhammad's migration to Medina. In the Hindu notation, the year is 1922 of the Saka Era. And, in the Jewish calendar, it is year 5761, as counted from the designated start of the world (*Anno Mundi*). As these examples imply, many people are accustomed to using more than one calendrical system at the same time. The dates in this study, while cited in the international standard, are therefore potentially convertible into all parallel notations.

These popular calendars, it may be noted, all operate with manageable numbers. For their own specialist purposes, the world's astronomers also share a common counting system which focuses upon successive twenty-four-hour spans. Each day-and-night has its own separate notation, with fractions to mark subdivisions. The sequence starts at midday on 1 January 4713 BCE in the classical Roman (Julian) calendar, counting backwards and forwards from

then. Midnight GMT on 31 December 1999 CE thus appears as Julian number J 2,451,544.50. Totals such as these, however, remain far too large for easy reference or daily use, other than by specialists.

Theoretically, too, it would be possible to start a year-count from the scientifically calculated origin of the universe some 13 to 15 billion years ago (defining a billion as a thousand million), and then to scroll forwards from that. It would offer a daily reminder of the vast extent of past time. So 2000 CE would equate to Cosmic Year 15,000,002,000 plus or minus an error range of 1–2 billion. Yet such a formulation entirely lacks user-friendliness, so that for daily use it is more convenient to rely upon historically created calendars, as scientifically updated by the global research community, and now adopted within an international framework. The plurality of usages among different communities makes it clear that the details of time measurement are matters of social convention. Nonetheless, the very fact that these differing systems can all be converted from one into another shows that there is also a singular process at work, within which all interpretations of the past are shaped.

### How the book is organised

Historical themes interpreted longitudinally form the subject of this study. Such an arrangement means that the book as a whole is not organised primarily by chronology, although some sections are. Instead, each chapter discusses a different aspect of the developing argument so that, taken together, the chapters act as separate spokes in a collectively turning wheel.

Highlighted examples of ways of ‘shaping’ history are also inserted as short self-contained sections. These case studies, *indicated with a distinctive type-face*, bridge between the chapters, acting as chapterlinks that hold the turning spokes together. Particular themes that are discussed are: time travel; time cycles; time lines (or long-term trends); time ends (apocalypses); time names; time pieces (or time measurement); and human responses to ‘time power’. For readers without any background in the formal study of history, these bridging sections or chapterlinks, which are located at the end of each main chapter, offer possible starting points. For all comers, meanwhile, the overall argument runs throughout the book, unfolding in the sequence in which it was written (and rewritten).

How history is located within a temporal framework of cosmic time is the subject of the first chapter. Various debates and definitions are reconsidered. And the assumption that there are no constants within the cosmos – a viewpoint sometimes (wrongly) associated with Einstein and relativity – is

rejected. After that, three chapters (2–4) examine three central and interlocking dimensions of history. These are identified as continuity (persistence; tradition), gradual change (evolution) and all forms of rapid, frictional and discontinuous change (turbulence; upheaval; revolution).

Human interpretations of long-term trackways through time are then analysed in the second half of the book. Chapter 5 looks at ‘ages’ in history and calls for a rethink about ‘modernity’, which has become overused, while chapter 6 explores stage theories, which divide historical time into tidy stages as a way of looking back at the past and sometimes forecasting the future as well. Such divisions are suggestive about long-term changes but can lead to crude categories that then become stretched too thin. For example, ‘capitalism’ as a stage in world history (like its pairing with ‘modernity’) is thus revealed as overdue for a critical reconsideration. Chapter 7 returns to reassess the longitudinal ‘shapes’ of history, arguing for a threefold approach. And the final chapter 8 considers how the intertwined components of continuity and different forms of change apply to human experiences, of the past, present, and anticipated futures.

Halting the journey at the very end is a brief coda. It revisits the general argument about the importance of understanding how we frame our knowledge of both past and present in time, since such knowledge is our invaluable collective resource for living in time. The overall argument focuses upon the multi-dimensional shape of history. But the linkages in my view flow both ways. Thus my final speculation is that the shape of history, viewed ‘long’, also throws light upon the shape of time – not only in its synchronic meshing but also in its diachronic power.

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## CHAPTER I

# History in Time

To situate history in the long term entails having a view upon time. Its dynamic force provides the unfolding framework within which things both continue from the past and also change. Time's three perspectival states of past, present, and potential future remain fixed in their successive sequencing. Yet the eras to which they apply are always being updated. As that happens, more history is generated daily for humans to consider.

This consistent temporal flux means too that interpretations are perennially liable to adaptation in the light of altered circumstances. The here-and-now, poised at the fulcrum of retrospection and anticipation, changes all the time, whilst always remaining Now. 'And do not call it fixity,/Where past and future are gathered,' as T.S. Eliot, the twentieth century's most famed poet of temporality advised in his elegiac *Four Quartets*.<sup>1</sup> The immense power of the present, however intensely felt – 'quick now, here, now, always' – does not erase the mental awareness of 'before' and 'after': 'Only through time time is conquered.'

So history's complex unfolding has to be understood within an even more complex temporal process that ceaselessly welds duration and change, persistence and flux. Pervading this universe, it is known as cosmic time. And it has – uniquely – the capacity for auto-renewal, as each present moment both lives and dies simultaneously.

Assumptions about the shape of the past are therefore linked with assumptions about time as the framework power. One striking visual representation of this is seen, for example, in the Aztec calendrical map of the Five World Regions (*see* illustration 1). It was devised in fifteenth-century Mexico to provide a summary of cosmic history. The designs at the four cardinal points, N, S, E and W, indicate four past eras (N is located on the left, E at the top). Each time zone is protected by two tutelary gods standing by an emblematic tree, topped with a great perching bird.<sup>2</sup> At the centre is the fifth era, which represents the present. Here dwells the celestial fire-god, sustained at the heart

[To view this image, refer to  
the print version of this title.]

1 The fifteenth-century Aztec calendrical map shows the present, sustained at the heart of Five World Regions of Time, each with its own tree of life and tutelary gods.

of all that has gone before. So a complex and dynamic past is rendered as also orderly and explicable, leading from then to now, via the patterned dots that mark the days.

Of course, not all communities by any means visualise history within such a structured plan. Nonetheless, the challenge to find some way of understanding time, and the past in relation to time, is one that confronts all who live within unfolding temporality. So there has emerged a global case history of approaches and problems, which are ripe for re-examination.

### **History and Defining Time**

In the first place, it is right to consider whether it is possible for humans stuck in the here-and-now to investigate something as vast and strange as cosmic

time. The Scottish philosopher and famed sceptic David Hume once warned sharply that it is hard to range mentally beyond our immediate sense-data: 'Let us fix our attention out of ourselves as much as possible: Let us chase our imaginations to the heavens, or to the utmost limits of the universe; we never really advance a step beyond ourselves.'<sup>3</sup> How, then, can any one generation of humans, limited in time and place, make any valid comment about times past and long ago?

However, Hume's prohibition is not as limiting as it might at first seem. As creatures of the universe, we are ourselves temporal as well as spatial beings. Time is therefore not a purely external phenomenon that is completely 'beyond' us.

Humans have access to the workings of temporality in many ways. Time not only surrounds us, as something that can be studied, measured and debated, but it also inheres within us, in the form of our subconscious body clocks, our genetic timetabling and our capacity to live in time. Accordingly, we recognise temporality *de facto*, even without having an agreed explanation or full definition. Even young children can be taught to 'tell' the time, without any special lessons in science, philosophy or the study of history being undertaken either by the learners or the teachers.

Such a state of familiar-unfamiliarity was noted long ago, in one of the most celebrated comments ever made on this subject. The fourth-century Christian theologian St Augustine asked himself rhetorically: 'What then is time?' And he answered with a paradox: 'Provided that no one asks me, I know. [But] if I want to explain it to an enquirer, I do not know.'<sup>4</sup>

For most ordinary purposes, an Augustinian intuitive response is quite sufficient. In fact, it is notable that people very rarely express anxiety about 'what is time?' (as opposed to the more common 'where are things going?') even though it might be thought worrying not to know about the essential medium in which we live. But it is so basic that it readily appears as a 'given'. Nonetheless, that has not stopped people from also cogitating about the subject. And there are plentiful external clues, as well as our internal time signals. For example, the light of the stars sends visual messages about their own past via long trajectories of sparkling luminosity.<sup>5</sup> While we see these in the present, we can calculate their earlier history. So our own sense-data, plus the effort of thought, can move us mentally beyond our own eras. Within planet earth's immediate vicinity, meanwhile, the sun is another marker of longevity. It is calculated to be approximately halfway through its life cycle, with sufficient power to last for at least another five billion years before it evolves into a red dwarf. By careful study and calculation of such stellar evidence, astronomers can apply a range of data to the complex task of telling the age of the universe.



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