



N° 7 Illustration et discours scientifiques. Une perspective historique

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Beholder of All Ages:

The History of the World in a French Mappemonde

A chart published in 1750 by Jean-Louis Barbeau de la Bruyère (1710-1781) attempted to map historic time against location (**fig. 1**). The author's *Explication*, published some time after 1760, offers this startling remark:

Seroit-ce trop dire, que Dieu qui s'appelle dans les Ecritures, Consector Seculorum, & qui a créé l'Homme à sa ressemblance, le met en état par ce Plan, & autres semblables, de voir d'un coup-d'œil tous les Siècles passés, comme présents devant lui ?

Would it be too much to suggest, that God who is called in Scripture, the Beholder of all Ages, and who has created Man in His image, enables Man by this Plan, and others like it, to see, at one glance, all the Centuries that have passed, as though present before him¹?

¹ J. L. Barbeau de la Bruyère, *Explication Générale de la Mappemonde Historique*, Paris, Hérisant, [1750]), p. 38. This is catalogued at Dijon as '[1750]' but contains an internal reference to a 1760 publication. Copy in the Bibliothèque Municipale Dijon: Fonds Ancien 12990 CGA. The phrase *Consector Seculorum* is taken from Ecclesiasticus, one of the seven Deutero-Canonical books found principally in Catholic Bibles. The context in the Latin Vulgate is:

18. ... *et exaudi orationes servorum tuorum*

19. *Secundum benedictionem Aaron de populo tuo: et dirige nos in viam justitiae, et sciant omnes qui habitant terram quia tu es Deus **consector saeculorum**.*

The Challoner revision of the Douai-Rheims Bible (1750) translates this in English as:

18. ... and hear the prayers of thy servants,

We sense the ambition — and the hubris — of a chart that claims to offer to humankind the same view of all history that hitherto only God has enjoyed, epitomising Enlightenment aspirations for human knowledge. The chart in question was named a *mappemonde* — the *Mappe-monde historique ou carte chronologique, géographique et généalogique des états et empires du monde* — a title that emphasises the totalising aims of the project. A *mappemonde* in that period was a pair of circular maps presented together to show the whole world as two hemispheres (fig. 2), but this chart maps the world and time differently, as will become apparent. The word *mappemonde* was also used metaphorically in this period by d’Alembert in the *Discours Préliminaire* to describe the knowledge structure of the *Encyclopédie*². He used it to emphasise that publication’s systematic organisation and completeness. Completeness was a watchword for many authors and publishers at that time, though Barbeau is caustic about publications that claim to be complete world histories when they omit newly discovered peoples and even great empires³. Later in the century, the word *mappemonde* would be extended facetiously to a face covered in lines or scars⁴ and even to the eroticised body⁵, but in the 1750s the predominant use of the term was in a strictly cartographic sense.

Barbeau’s ambition was to map all of the known world combined with all of time since the Flood. In his commentary *Idée et Usage de cette Carte*, printed in the side panels of the chart itself, he sets out a plan to show: ‘*tous les Royaumes, Empires, Républiques & grands Peuples qui ont figuré sur la Terre depuis la Dispersion des Hommes après le Déluge jusqu’à présent*’ (all the Kingdoms, Empires,

19. According to the blessing of Aaron over thy people, and direct us into the way of justice, and let all know that dwell upon the earth, that thou art God **the beholder of all ages**.

² J. le R. D’Alembert, ‘Discours Préliminaire’, in *Encyclopédie ou Dictionnaire raisonné des sciences, des arts et des métiers*, 28 vols, Paris, Braisson, David, Le Breton, Laurent and Durand, 1751, vol. 1, pp. *i–xlv*, p. *xv*. [Available on the site of the ARTFL Encyclopédie Project](#) (Accessed 9 May 2015).

³ J. L. Barbeau de la Bruyère, *Explication Générale de la Mappemonde Historique*, *Op. cit.*, p. 36.

⁴ F. de Quevedo, *Oeuvres choisies de don François de Quevedo, Traduites de l’espagnol*, [La Haye], 1776. [Available on Gallica](#) (Accessed 9 May 2015), p.150.

⁵ A.-R. A. de Nerciati, *Les Aphrodites ou Fragments thali-priapiques pour servir à l’histoire du plaisir*. Place of publication claimed as ‘Lampsaque’ (the alleged birthplace of Priapus) on title page. 1793. Various references. [Available on Gallica](#) (Accessed 9 May 2015).

Republics and great Peoples which have appeared upon the Earth since the Scattering of Man following the Deluge down to the present time⁶). All this was to be achieved within a single view. His opening words are, ‘*On voit ici du premier coup d’œil...*’ (Here are seen at first glance) and he goes on to claim that the dynamic processes associated with nations — their birth, growth, their different circumstances, duration, dismemberment and end — are ‘*réduits, avec ordre & précision, en un seul corps; de manière que c’est ici comme le Tableau Politique de l’Univers*’ (concentrated, with order and precision, into a single entity; in such a way that we have here a Political Portrait of the whole World⁷). Barbeau’s assertion, that vast extents of territory and periods of time can be made visible under a single all-encompassing view, becomes an increasingly common claim for chronographic visualisations, suggesting that the eye can effect rapidly what the intellect can only achieve with difficulty⁸.

Prior traditions in depicting historic time

Rosenberg and Grafton⁹ offer an indispensable survey of ‘cartographies of time,’ presenting timewise visualisations created over several centuries down to the present day. While eighteenth-century chronographics in general, and Barbeau’s in particular, demonstrate a strong cartographic impulse¹⁰, two prior traditions emerge strongly in Rosenberg and Grafton’s study: the typographic and the pictorial.

The typographic tradition developed from the list. Lists, rather than natural language, dominate the corpus of early writing. Important among these

⁶ J. L. Barbeau de la Bruyère, *Mappe-Monde Historique, ou Carte Chronologique, géographique et généalogique des États et Empires du Monde*, Paris, 1750. British Library Maps K.Top.4.46.2. Explanatory rubric on the chart.

⁷ J. L. Barbeau de la Bruyère, *Mappe-Monde Historique*, *Op. cit.* Explanatory rubric on the chart.

⁸ S. Boyd Davis, ‘May not duration be represented as distinctly as space? – geography and the visualisation of time in the early eighteenth century’, in David Beck (ed.) *Knowing Nature in Early Modern Europe*, London, Pickering and Chatto (in press), pp. 119-137, p. 127.

⁹ D. Rosenberg and A. T. Grafton, *Cartographies of Time: a History of the Timeline*, New York, Princeton Architectural Press, 2010 *passim*.

¹⁰ S. Boyd Davis, ‘May not duration be represented as distinctly as space? – geography and the visualisation of time in the early eighteenth century,’ *Op. cit. passim*.

are annals, event-lists and king-lists¹¹. In a simple list, events are named, and maybe dated, in sequential order, and are organised on the page as a row or column. A list tells us about order only: a significant advance in representational capacity is the table or matrix. This makes it possible to coordinate multiple lists in time, showing not only sequence but synchrony. A landmark is Eusebius’s Chronicle of c300CE, which synchronised Christian history with that of the Pagans and Jews in a series of parallel columns¹². There may have been earlier examples. Feeney speculates that such a parallel listing, synchronising Athenian archons with Roman consuls, might have occasioned Cicero’s enthusiastic ‘*explicatis ordinibus temporum uno in conspectu omnia uiderem*’ (with the ranks of times deployed, with one overview I could see everything¹³). Such matrices still fail to offer two important pieces of information: the intervals between events and an overall sense of scale. Some attempts were made to create tables that would overcome this problem. Helvicus not only argued for tabular alignments of events to bring out the ‘Synchronism of Famous Men, renowned either for their Vertues or their Villanies’¹⁴ but also organized his tables so that equal durations occupied equal amounts of paper, introducing blank rows in his table in order to achieve this: *Præcipuum, quod in hoc Systemate spectavi, est annorum a Mundo condito ad nostra Tempora usque per æqualia Centenariorum et Decadam spacia distributio, ob excimium usum, qui inde resultat* (The main goal I aimed at in this treatment is an equal distribution of years between the Creation and our time in intervals of 100 and 10 years, because it is so useful¹⁵). Every double-page spread of his first folio edition represents 100 years, making it easy for the reader to estimate intervals between dates. The argument about whether equal time ought to occupy equal space would

¹¹ J. Goody, *The Domestication of the Savage Mind*, Cambridge University Press, Cambridge, 1977, p. 80.

¹² D. Feeney, *Caesar’s Calendar: Ancient Time and the Beginnings of History*, Berkeley, CA, University of California Press, 2007, p. 29.

¹³ D. Feeney, *Caesar’s Calendar... Op. cit.*, p. 28.

¹⁴ C. Helvicus [Helwig], *The Historical and Chronological Theatre*, London, 1687, n.p.

¹⁵ C. Helvicus [Helwig], *Theatrum Historicum*, Giessæ Hessorum [Gießen], Hampel, 1609, n.p. British Library General Reference Collection, 747.c.22.(1).

continue indefinitely. Blair in the preface to his *Chronology and History of the World*¹⁶ singled out the uniform timescale in Helvicus’ tables for praise ‘because they give a more united View of the Collateral Succession of different Kingdoms.’ Blair’s instructions to the bookbinder also make clear the importance to him of synchronism: ‘...be careful to make the black Lines in one Plate stand exactly opposite to the black lines on the Plate which corresponds to it, that each may appear as if it was one continued Line, otherwise the whole Use of the Tables will be lost¹⁷.’ On the other side of the argument, the introduction to an English edition of Lenglet du Fresnoy’s *Chronological Tables of Universal History* complained at Blair’s style of tabular chronology, which ‘must always have this inconvenience, that the same, or nearly the same space upon paper being allotted to one year as to another, some barren years will have blank columns, and some years crowded with events, cannot be fully dilated and displayed¹⁸.’ The tension between the desire for what we might now call ‘big data’ and the limitations of printed paper or other physical substrates explains many of the hard choices that the authors and publishers of chronologies had to grapple with until the advent of digital media. It will become clear that Barbeau’s *Mappe-monde* used a distinctive approach to the question of temporal scale.

We can imagine that lists and tables, whether densely packed or spaced in proportion to intervals of time, arose naturally through the increasingly sophisticated layout of writing, and later of typography. In some senses the use of layout and space on the page can be seen as a metaphor for the historic time represented, and in particular, we might regard the direction of reading, down or across the page, as metaphorically representing the direction of time, from the earliest events to latest. However, it is almost certainly not conceived in

¹⁶ J. Blair, *The Chronology and History of the World, from the Creation to the year of Christ, 1753, illustrated in LVI tables*, London, 1754. From the Preface, n.p.

¹⁷ *Ibid.* From the Preface, [7].

¹⁸ T. Flloyd, Preface to an English edition of: N. Lenglet Dufresnoy, *Chronological Tables of universal history, sacred and profane, ecclesiastical and civil; from the creation of the world, to the year one thousand seven hundred and forty-three*, 2 vols, ‘Translated from the last French edition, and continued down to the death of King George II.’ Vol.1, London, 1762, p. vii.

metaphorical terms by the authors of these texts — surely it just seems to them the obvious way to lay out lists and tables? Inheriting a particular scroll or codex format and a particular writing direction according to their culture, every author assumes that his is the right way to put time into a tablet, scroll or page. Practicalities of layout and printing will also have their effect. There is good evidence that writing-direction affects the orientation along which time is conceived as flowing¹⁹, an important example of the reflexive influence of visual representations on the concepts they represent, further discussed below.

If in the textual mode authors are generally unaware of the role of metaphor in their thinking, in the pictorial mode there is often a conscious attempt to find a suitable graphic metaphor. Within the pictorial tradition, history is assigned various figurative shapes, including chains, trees, the hand, the body, architecture and animals²⁰. An important influence was the Biblical account of ‘Daniel’s Statue’ — Daniel’s interpretation of a statue seen by Nebuchadnezzar in a dream as a sequence of ages (Daniel II, 1-49), with its vivid imagery of a head of gold, chest and arms of silver, belly and thighs of bronze, legs of iron, and feet of iron and clay, subsequently interpreted as images of actual historical eras. Indeed this passage is explicitly referenced by Barbeau in his *Explication*²¹. The use of such pictorial imagery is also familiar from the *ars memoria*’s use of striking visual images that act as memorable emblems for abstract concepts — in Bacon’s words, ‘what is sensible always strikes the memory stronger, and sooner impresses itself than the intellectual²²’. A few years before Barbeau, another pioneer of chronographics, Martignoni, was highly dependent on visual metaphor, and discussed it painstakingly in his own lengthy *Explication*, remarking that,

¹⁹ Summarised in S. Boyd Davis, ‘History on the Line: time as dimension,’ *Design Issues* 28(4), Autumn 2012, pp. 4-17.

²⁰ D. Rosenberg and A. T. Grafton, *Cartographies of Time: A History of the Timeline*, *Op. cit.*, pp. 39, 50, 57, 51, 55, 80, 91.

²¹ J. L. Barbeau de la Bruyère, *Explication Générale de la Mappemonde Historique*, *Op. cit.*, p. 17.

²² Bacon, *De Augmentis Scientiarum* quoted in F. Yates, *The Art of Memory*, London, Pimlico, 1966 reprinted 1992, p. 358.

Plusieurs Hommes sçavans, se sont proposé la même fin en d'autres matières, & par de semblables inventions ils ont facilité le moyen d'apprendre, ce qu'il y a dans le Monde de plus curieux & de plus utile. Ils ont, par exemple, imaginé des Arbres, pour représenter les Généalogies; des Cercles, pour faire comprendre les mouvemens des Cieux; des Animaux, comme des Ours, des Lions, des Beliers, des Dragons &c., pour faire connoître les Etoiles, leurs influences & leur situation; d'autres Arbres & des Charriots, pour expliquer quelques parties de la Logique & de la Métaphisique: J'ay même vû la Théologie, Reine des Sciences, figurée dans un Dessin, par des Cercles, des Quarrez & des Triangles.

Several learned men have had the idea of achieving the same end in other matters, and by similar inventions they have eased our manner of learning those things in the World which are most interesting and most useful. They have, for example, imagined Trees to represent Genealogies; Circles to enable the movements of the Heavens to be understood; Animals such as Bears, Lions, Rams, Dragons etc. to understand the Stars and their influences and location; others, Trees and Chariots to explain certain parts of Logic and Metaphysics: I have even seen Theology, queen of the sciences, represented in a Design by Circles, Squares and Triangles²³.

Apparently nervous about the idea of visual analogy, despite its long prior tradition in representing history, Martignoni points out that God himself uses similes and images, as does the Church:

Deplus il semble, que ce n'est pas aux Hommes, à qui on doit l'invention de cet Art, mais à Dieu même, lorsqu'il signifie Soy-même, les Ames, son Regne, par des similitudes & des figures; comme d'une Vigne & de ses ramaux, d'un Arbre, d'un Trésor, d'un Champ &c. Avant cela le même Dieu avoit révélé à la Sinagogue par d'autres figures, tout ce qui luy devoir arriver; & même l'Eglise se sert des signes & des figures, pour représenter les Histoires sacrées, & tout ce qu'il y a de plus salutaire & de plus Saint.

What is more it seems that it is not to Man that we owe the invention of this art, but to God himself; since he signifies Himself, Souls, and his Reign by analogies and imagery; such as a Vine and its branches, a Tree, a Treasure, a Field etc. Before that, the same God had revealed in the Synagogue by other images all that was due to befall him; and even the Church uses signs and images to present Sacred History, and all that is most salutary and most Holy²⁴.

When Martignoni mapped historic time in 1718, he did so in a distinctly figurative manner. His *Imago Romani Imperii* (fig. 3) is in a significant sense an *imago*, a portrait of history rather than a diagram. But if one is to make a picture — or any other visualisation — of time, what should time look like?

²³ G. A. Martignoni, *Explication de la Carte Historique de la France et de l'Angleterre*, Rome, Rossi, 1721. British Library General Reference Collection C.106.f.19. n.p.

²⁴ *Ibid.*

Depiction and visualisation

Elsewhere²⁵ I have characterised the component processes of visualisation, here summarised in a simple linear diagram (fig. 4).

$$O \rightarrow I \rightarrow M \rightarrow V \rightarrow P$$

Fig. 4. A linear diagram of the transformations involved in creating any depiction or visualisation, from the objectives *O* to the final rendered picture *P*, via the idea *I*, model *M*, and view *V*.

O represents the objectives of the visualisation in question, the purposes that it serves. These may be many and complex. The objectives may be tacitly shared by a culture rather than consciously held by the maker or makers of the visual artefact. They are the work’s *raison d’être*. In this simplified linear model, the objectives *O* are transformed into an idea *I*, some as-yet-unresolved notion of an analogy or metaphor for the thing or concept to be visualised. This notion of transformation, derived from MacDonald-Ross and Waller²⁶, occurs at every stage where there is an arrow in the diagram above: at no point should it be imagined that one stage is automatically, transparently or completely transferred to another. To give an example, the idea *I* might be that of a tree. The objectives *O* will be very different, dependent on the context. We might, as in the case of the Tree of Jesse and other genealogies, use a tree to represent the topology of family relationships. We might wish to indicate where a tree can most effectively be pruned as an ornamental garden specimen. We might show the kinds of timber that should be selected for particular functions in ship-building. Or we might evoke the sublime character of a landscape by depicting a storm-lashed oak. The general idea *I* is resolved into a model *M*, some particular instantiation, some more or less specific tree. If it is to function iconically to represent all possible trees, it may be anonymised as far as possible: *M* will be relatively abstract. If on the other hand it is to denote

²⁵ S. Boyd Davis, ‘A Schema for Depiction,’ in K. Van der Waarde and P. Westendorp (eds.). *Visible Language* 41 (3). Special issue on Visual Metaphors in User Support, 2007, pp. 280-300.

²⁶ M. Macdonald-Ross and R. Waller, ‘The Transformer Revisited,’ *Information Design Journal* 9.2 & 3, 2000, pp. 177-193.

some particular specimen, characteristic features are certain to be included; perhaps it is even recognisable as a portrait of some particular tree. As we move towards a graphic image, the model M alone is not enough. It must be viewed from a particular angle, projected in particular ways onto the picture-plane: this constitutes the view, V . Even now, another transformation must occur, as that particular view is rendered in chosen ways as a picture P , for example by adopting particular media such as engraving or painting, by preferring tone or colour, by using drawn lines or stippled textures, and so forth. Whether the final ‘picture’ functions diagrammatically or figuratively, each aspect derives ultimately from the objectives.

Ontology | Epistemology

$O \rightarrow I \rightarrow M \rightarrow V \rightarrow P$

Fig. 5. The linear diagram O to P divided to represent, approximately, the ontology and epistemology of whatever domain is in question. The ontology seems to those who hold it to be essentially ‘how things are’, while the means of expressing the apparent reality constitute the epistemology.

Applying this model of visualisation to historic time, a number of issues emerge. The objectives O and the idea I can be thought of as expressing the ontology of whatever will be depicted. They comprise a set of beliefs and assumptions about ‘reality’. They seem to those who hold them to be just ‘how things are’. The model M , view V and picture P comprise the corresponding epistemology — the means by which that ontology can be represented (**fig. 5**). Of course in the case of time, the reality in question is intangible and invisible, making it even more susceptible to differences in conceptualisation than if we were dealing with a graspable referent such as a tree or a chair. Time has been variously conceived as static and as moving, as irregular and as uniform, as linear and as cyclic. A given culture may hold two or more models of time together, using them for different purposes, such as a linear model to identify reigns, typically using a sense of before and after, or a cyclic model to plan agriculture, using seasonal landmarks. Time’s very existence is debated, not just

in metaphysics but in physics²⁷. Both Bergson²⁸ and Benjamin²⁹ object to the image of time as a uniform, quasi-spatial container in which events are situated the way buildings are placed along a highway. They see this as the dominant ontology of time, and one that they wish to challenge. More recently, work in the digital humanities has also questioned the ‘scientific’ ontology of time as too ruler-like, certain and linear to house the uncertainties and subjectivities of humanities scholarship³⁰. The question of time’s very existence is raised in a different way by Gell³¹ when he asks whether all cultures do in fact have a model of time: he suggests that while a society may have a model of the relationship between events, between now and the past, between the past and the future, etc., it may not necessarily have a model of time *per se* at all. In summary, time, even historical time, is not ‘out there’ in some universally agreed form, waiting to be depicted. It will be conceptualised in particular ways, which will tend to lead to particular representations. In a given culture, a particular ontology will dominate, to the extent that it is largely taken for granted as simply ‘how time is.’

It has been suggested by various authors³² that the eighteenth century is the period when our modern conception of time, as a continuous, uniform space in which events are situated, emerges in mainstream European culture. This is the very spatialisation of time that later offends Bergson and Benjamin.

²⁷ J. Barbour, *The End of Time: the Next Revolution in Our Understanding of the Universe*, London, Weidenfeld and Nicholson, 1999., and L. Smolin, *Time Reborn: from the Crisis in Physics to the Future of the Universe*, New York, Houghton Mifflin Harcourt, 2013.

²⁸ H. Bergson, *Time and Free Will: an Essay on the Immediate Data of Consciousness*. Trans. F.L. Pogson, 1913, republished 2001 by Dover, New York.

²⁹ W. Benjamin, *On the Concept of History*, [1940], Trans. Dennis Redmond 2001. Available on this [site](#) (Accessed 9 May 2015).

³⁰ J. Drucker and B.P. Nowvieskie, ‘Temporal Modelling: Conceptualization and Visualization of Temporal Relations for Humanities Scholarship’ *ACH/ALLC 2003 Conference*, pp. 26-28. Text available as a Word document on this [site](#) (Accessed 6 May 2015).

³¹ A. Gell, *The Anthropology of Time: Cultural Constructions of Temporal Maps and Images*, Oxford, Berg, 1992, p. 23 *passim*.

³² D. Feeney, *Caesar’s Calendar...*, *Op. cit.*, p. 8; R. Poole, *Time’s Alteration: Calendar Reform in Early Modern England*, UCL Press, London, 1998, p. 2 and D. Rosenberg, ‘Joseph Priestley and the Graphic Invention of Modern Time,’ *Studies in Eighteenth-Century Culture* 36(1), 2007, pp. 55-103.

Parallel arguments have been made about the earlier emergence of clock time. In the medieval period, the notion of what constitutes an hour shifts from adjusted portions of an unequal day and night to the uniform one-twenty-fourths of a day measurable by clocks³³. The effects of clockwork on thought have been traced in relation to the emergence of capitalism by Mumford³⁴, in metaphors of regulation in medieval writing by Mason Bradbury and Collette³⁵, in narrative and the emerging novel of the seventeenth century by Sherman³⁶, in the emergence of nationality by Anderson³⁷, and in eighteenth century cosmology by Bolter³⁸, to cite only a few examples. This widely remarked influence of clock mechanism on concepts of passing time offers an immediate warning of the extent to which forms of representation alter the thing they claim to represent. The epistemological tools available have an influence on the ontology (fig. 6). How reality simply seems to be, is altered by the means for representing it.

Sometimes attempts may be made to force a new ontology by redesigning the representation. The rotation of the shadow on a sundial gave the later mechanical clock its rule for being correctly ‘clockwise’, a sense of correctness which was then exported to the southern hemisphere, even though there the shadow on a sundial turns the opposite way. Such cultural forcing was resisted in 2014 by the regime of Morales in Bolivia, which shifted to ‘anticlockwise’ clocks to promote non-imposed values³⁹, an attempt to reconstrue the epistemology to recover a marginalised ontology.

³³ G. Dohrn-van Rossum, *History of the Hour: Clocks and Modern Temporal Orders*. Trans. Thomas Dunlap, Chicago, University of Chicago Press, 1996, p. 19.

³⁴ L. Mumford, *Technics and Civilization*, New York, Harcourt, Brace & Co., 1934, pp. 12-18.

³⁵ N. Mason Bradbury and C.P. Collette, ‘Changing Times: the Mechanical Clock in Late Medieval Literature,’ *The Chaucer Review* 43(4), 2009, pp. 351-375.

³⁶ S. Sherman, *Telling Time: Clocks, Diaries, and English Diurnal Form, 1660–1785*, Chicago, University of Chicago Press, 1996.

³⁷ B. Anderson, *Imagined Communities: Reflections on the Origin and Spread of Nationalism* (Revised and extended. ed.), London, Verso, 1991.

³⁸ J.D. Bolter, *Turing’s Man: Western Culture in the Computer Age*, Chapel Hill, University of North Carolina Press, 1984.

³⁹ S. Jones and S. Shahriari, ‘Bolivia turns back the clock in bid to rediscover identity and “southernness”’, *The Guardian*, 25 June 2014.

$O \rightarrow I \rightarrow M \rightarrow V \rightarrow P$

$O \leftarrow I \leftarrow M \leftarrow V \leftarrow P$

Fig. 6. The technologies and traditions bound up in the epistemology of a domain in turn affect its ontology. The understanding of how ‘things really are’ is altered by the means of representation.

One aspect of the ontology of ‘all’ time that remained more or less constant throughout the period under discussion was its estimated overall duration of 6,000 years, despite the many controversies over the details — ‘that learned Noise and Dust of the Chronologist’ as Locke termed it⁴⁰. The order of magnitude was hardly ever in doubt. Soon however a number of disturbances would occur. Growing awareness of the antiquity of continuous Chinese civilisation would undermine confidence in the West’s claims over the totality of history. The theories of Hutton and others would push the origins of the Earth back by thousands, and later millions, of years. The new model of ‘all time’ would force changes to the representation of universal histories: at the most basic level, it simply became impossible to map time linearly to a reasonable number of engraved sheets. Fortunately for Barbeau and his contemporaries, all of time was still of a just-manageable scope, best illustrated by the *Chronographie ou Description des Temps* of Barbeau-Dubourg⁴¹ which mapped on a linear scale all time from the Creation using 16.5 metres of paper. Finally, a further disturbance, of particular significance to French chronographers, would be the resetting of the origin of the calendar to a new Year 1 during the Revolution⁴². In this connection, McCallam⁴³ points out the political weight attached to new forms of measurement at this period, including the conscious

⁴⁰ J. Locke, *Some Thoughts Concerning Education*, London, Churchill, 1693, p. 217. British Library General Reference Collection 1030.f.1.(3).

⁴¹ J. Barbeau-Dubourg, *Chronographie ou Description des Temps* (Chronography or Depiction of Time), Paris, 1753, explanatory booklet and chart. [Available on Gallica](#) (Accessed 9 May 2015). Barbeau-Dubourg used the term *Chronographie*, which has had a variety of meanings, to differentiate his visual approach from text-dominated *Chronologie*, a distinction continued in the present article.

⁴² M. Shaw, *Time and the French Revolution: a history of the French Republican Calendar, 1789-Year XIV*, Martlesham, Boydell & Brewer, 2011.

⁴³ D. McCallam, ‘Metrology: the Body as Measure in Les Liaisons Dangereuses,’ *Eighteenth-Century Fiction* 27(1), 2014, pp. 83-104.

modernism of the shift to new forms of mensuration in the eighteenth century, set against the inherited arbitrariness of seigneurial measures. This increased emphasis on uniform measurement is at one with the increased admiration, generally in radical circles, for mechanism and mechanical metaphors⁴⁴.

Homogeneous, empty time

The conceptualisation of Time as uniform and dimensioned in ways that are analogous to Space can be traced to the Cartesian conception of number as mappable to a line — a number-line — and to space when extended over two or more dimensions. The writings of Descartes, particularly the *Compendium Musicae* of 1619, are suffused with the ideas of clear representation, of grasping magnitudes at a glance, and specifically of line-lengths which correspond to number⁴⁵. In the posthumous *Regulae* of 1684 we find Descartes claiming that there is a graphical equivalent to any variable quantity: ‘the infinite multiplicity of figures is sufficient for the expression of all the differences in perceptible things⁴⁶’. Once number takes the form of a dimensioned line in the seventeenth century, time follows. Eighteenth-century writers wrote enthusiastically of the novel Newtonian shift to seeing time as a dimension: ‘absolute, true, and mathematical⁴⁷’. D’Alembert’s article on chronology for the *Encyclopedie* opens with the quotation: *In tempore, dit Newton, quoad ordinem successionis, in spatio quoad ordinem situs locantur universa* (‘All things, said Newton, are placed in time as to order of succession; and in space as to order of situation⁴⁸’) which could be a model for Barbeau’s *mappemonde*.

⁴⁴ S. Boyd Davis, ‘Time Machines. Technology and the “Death of Art History”’, *Proceedings of the 26th Conference of Computers and the History of Art (CHArt)*, British Computer Society, London, 10-11 November 2010, ed. A. Bentkowska-Kafel and T. Cashen. [PDF document available on this site](#) (Accessed 9 May 2015).

⁴⁵ S. Gaukroger, *Descartes: an Intellectual Biography*, Oxford, Clarendon Press, 1995.

⁴⁶ Quoted in S. Gaukroger, *Descartes: an Intellectual Biography*, *Op. cit.*, p. 162.

⁴⁷ I. Newton, *Mathematical principles of natural philosophy* (*Philosophiae Naturalis Principia Mathematica*), Book 1, Scholium, Symonds, London, 1687 (1803). British Library General Reference Collection, 958.c.25.

⁴⁸ J. le R. d’Alembert, ‘Chronologie’, in *Encyclopédie ou Dictionnaire raisonné des sciences, des arts et des métiers*, 28 vols, Paris, Braisson, David, Le Breton, Laurent and Durand, 1753, vol. 3,

If the ontology of time increasingly proposed a continuous, uniform dimension or space, the old typographic tradition could be seen as too dependent on the discrete chunks of the paragraph, the table and the page for its expression. Figurative metaphorical depiction was an even less appealing option, dealing hardly at all in dimensions but in symbolic *loci*. Yet a ready-made solution was at hand: geography, and its visual representation cartography. It offered visual metaphor, now readily transferrable from space to time. All around lay the desirable visual achievements of cartography in the form of instruments, globes, charts and atlases. Expertise, materials, and production systems already existed within the cartographic profession and associated trades, just waiting to be adapted to the domain of historical time. Once time is considered as spatialised, or at least analogous to space, the epistemological apparatus of global space — geography and its visualisation cartography — are perhaps inevitably called upon to represent it. And if time is routinely spatialised in this manner, then time even in the abstract comes to take on the spatialised character derived from those representations: the ontology is altered.

Yet cartography potentially yielded two alternative forms of expression. It could on the one hand be conceived as a *depiction* of territory. To this category belongs the map as a portrait of geographical features — as seen in Martignoni’s *Imago Romani Imperii* (fig. 3). The author’s explanation for this chart, first rehearsed in the *Saggio*⁴⁹ and then expanded in two parallel works, the *Explication*⁵⁰ and *Spiegazione*⁵¹, dealing with chronologies of France and England and of Italy and Germany respectively, makes several strong claims for visualisation, including the opportunity to see a large extent of history in summary (*voir en abrégé*), to interrogate the chart in three different ways (*avec un*

pp. 390–400, on p. 390. [Available on the site of the ARTFL Encyclopédie Project](#) (Accessed 9 May 2015).

⁴⁹ G.A. Martignoni, *Saggio di un’Opera di Nuova Invenzione Intitolata l’Immagine dell’Imperio Romano*, Rome, Rossi, 1717.

⁵⁰ G.A. Martignoni, *Explication de la Carte Historique de la France et de l’Angleterre*, *Op. it.*

⁵¹ G.A. Martignoni, *Spiegazione della Carta Istorica dell’Italia, e di Una Parte della Germania*, Rome, Rossi, 1721.

triple moyen d'apprendre les histoires), to take pleasure from its use (*qui puisse faire plaisir à l'esprit*), and to unburden the memory (*soulager la mémoire*). As one would expect on looking at the chart, the explanations make repeated calls upon the metaphor of rivers of time, which are used to represent the ideas of the beginning, growth, diminution, end and extent (*l'origine, l'accroissement, la diminution, la fin, la grandeur*) of kingdoms and regimes. In Martignoni's *Imago*, each of these characteristics is *depicted*, as though each were an aspect of a river snaking through a terrain.

Alternatively, rather than borrowing cartography's pictorial aspects, its emphasis on mensuration and its representational codes could be rethought for the purpose of mapping time, as Barbeau did in 1750.

Barbeau de la Bruyère and the dimensions of time and space

Rosenberg⁵² writes persuasively on the significance and influence of Joseph Priestley's 1765 *Chart of Biography*⁵³ and 1769 *New Chart of History*⁵⁴. Certainly, Priestley in the *Chart of Biography* seems to have been the first to use a drawn or printed line consistently to represent the lifetime of each individual — a clear shift to a view of time as continuous and susceptible to arithmetic mapping, with no significant figurative element. Time, Priestley argues, has a natural fit with the idea of a line⁵⁵. But a claim can also be made for Barbeau as a pivotal figure in the emergence of modern visualisation. We know that Priestley was influenced by Barbeau's chart, though he may only have known its pirated English version by Jeffreys, who described his own publication as 'done from the French with considerable improvements'⁵⁶. When Priestley first

⁵² D. Rosenberg, 'Joseph Priestley and the Graphic Invention of Modern Time', *Op. cit.*

⁵³ J. Priestley, *A Chart of Biography*, London, n.p., 1765. British Library General Reference Collection 611.1.19.

⁵⁴ J. Priestley, *A New Chart of History*, London, Johnson, 1769. British Library Cartographic Items Maps *999.(137).

⁵⁵ J. Priestley, *A Description of a Chart of Biography*, Warrington, n.p., 1764, pp. 5-7. British Library General Reference Collection 10604.aa.11.

⁵⁶ T. Jeffreys, *A Chart of Universal History, etc. (Done from the French with considerable improvements)*, London, Thomas Jeffreys, 1750. British Library General Reference Collection 9005.i.4.

saw Barbeau/Jeffreys’ chart, he objected to the mapping of both time and geography to a single two-dimensional surface (Priestley 1764:8)⁵⁷, preferring the linear simplicity of his own *Chart of Biography*, but a few years later when he created his own *New Chart of History*, he used one dimension for time and the other for place just as Barbeau had done. He claimed its superiority over Barbeau/Jeffreys’ chart in terms of exactness, use of colour and of scale, choice of the direction for time (lateral rather than vertical), and his selection of historical events for inclusion⁵⁸. Nevertheless, Priestley agreed that ‘the general plan of the French chart is excellent’, and suggested that ‘it is past all dispute that a few minutes’ inspection of that chart will give a person a clearer idea of the rise, progress, extent, revolutions and duration of empires than he could possibly acquire by reading⁵⁹ — a strong claim for the newfound power of this form of visualisation.

Barbeau was the son of a timber-merchant, who from the age of five exhibited a prodigious memory. He was described by a contemporary as *une bibliothèque vivante* (a walking library)⁶⁰. Hérisant’s short obituary claims that as a child Barbeau would hide at the top of the woodpiles in his father’s yard in order to read free of the attentions of his mother, who wanted him to continue in the family business. Fortunately he acquired some education at the college that faced the timber-yard, enabling him to progress to the Collège Mazarin⁶¹. Throughout his life he was apparently unable to fully develop his talents as a result of working on other authors’ publications to make a living. Deberre repeats a story that Barbeau’s work on the five-volume *Bibliothèque Historique de*

Barbeau did not agree with these improvements, objecting that the colours ‘have been changed in such a way that they mean nothing and have no system’ (*on a changé les Couleurs, de façon qu’elles ne désignent plus rien, & qu’il n’y a point de système*) and that his name did not appear). Barbeau de la Bruyère, *Explication Générale de la Mappemonde Historique*, *Op. cit.* on p. 331 footnote.

⁵⁷ J. Priestley, *A Description of a Chart of Biography*, *Op. cit.* p. 8.

⁵⁸ J. Priestley, *A Description of a New Chart of History*, London, Johnson, 1770. British Library General Reference Collection 304.d.27.

⁵⁹ J. Priestley, *A Description of a Chart of Biography*, *Op. cit.* pp. 5, 7.

⁶⁰ L.T. Hérisant, *Notice Historique sur la Vie et les Ouvrages de M. Barbeau de la Bruyère, Mort en 1781*, (adapted from his article for the *Mercure de France*. N° 4. 26 Janvier 1782), Paris, 1782, p. 8. John Rylands Library Richard C. Christie Printed Collection 46 d 17 (14).

⁶¹ L.T. Hérisant, *Notice Historique sur la Vie...*, *Op. cit.* p. 2.

la France, nominally edited only by de Fontette, caused his death from exhaustion⁶². He was described as *un savant trop peu connu* (a scholar too little known) a state of affairs attributed to *sa modestie genereuse* (his generous modesty)⁶³.

Originally attracted to the Church, Barbeau’s tastes shifted to geography and history in Holland, which he first visited in 1735, spending over 15 years there and apparently admiring the hard-working tradition of the people⁶⁴. From there he brought to Paris several charts that were of use to *M. Bouache de l’academie des sciences* (Philippe Buache, 1700-1773). He is said to have lived with Buache for about twenty-three years, which would have given him ample opportunities to observe many aspects of cartography⁶⁵. Buache was a member by marriage of the Delisle cartographic dynasty⁶⁶, chief hydrographer to the state, *premier géographe du roi*, and a defender of mapmaking against the twin pressures of cost-cutting and plagiarism. No doubt Barbeau studied both finished maps and the arts of cartographic engravers in his time there. It is claimed that Barbeau was the author of the erudite parts of Buache’s works⁶⁷. Hérissant goes so far as to suggest that Barbeau was the major contributor to several works for which the state-funded Buache was famed (*on doit à la mémoire du Savant modeste la justice de déclarer qu’il a en la plus grande part aux différens Ouvrages qui ont fait la réputation du Savant pensionné*)⁶⁸.

Barbeau is thus strongly connected to cartographic practice, and might well, on mapping historic time to the page, have adopted the pictorial approach from cartography favoured by Martignoni. However, he interpreted cartography in a very different way. His chart in fact connects the new

⁶² E. Deberre, *La Vie Littéraire à Dijon au XVIII^e siècle*, Paris, Picard, 1902, p. 186.

⁶³ L. T. Hérissant, *Notice Historique sur la vie...*, *Op. cit.*, pp. 1, 3.

⁶⁴ *Ibid.*, p. 2.

⁶⁵ *Ibid.*, p. 2.

⁶⁶ M. S. Pedley, *The Commerce of Cartography: making and marketing maps in eighteenth century France and England*, Chicago, University of Chicago Press, 2005, p. 110.

⁶⁷ L. P. de Bachaumont, M-F. Pidansat de Mairobert, B-F-J. Mouffle d’Angerville, *Mémoires Secrets pour servir à l’histoire de la République des Lettres en France*, Volume 20, London, John Adamson, 1783, on p. 48.

⁶⁸ L.T. Hérissant, *Notice Historique sur la Vie...*, *Op. cit.*, p. 3.

cartographic fashion to the old typographic tradition, though he modifies both significantly. He assisted, after the death of the Abbé Lenglet du Fresnoy in 1755, in re-editing the latter’s *Tablettes Chronologiques*, traditional tabular books of historic chronology published in 1763⁶⁹ and 1778⁷⁰, and must have been familiar with two earlier publications by Lenglet, the 1729 *Méthode pour étudier l’Histoire*⁷¹ and the accompanying *Tables Chronologiques*⁷², which appeared when Barbeau was nineteen. The four folio sheets of Lenglet’s *Tables* together comprise a matrix of roughly synchronised columns of dates, two sheets for dates before the birth of Christ, and two for dates after. They distribute kingdoms by column, and dates by row, with the earliest dates at the top. Lenglet claims that his is *une méthode que je présente autant aux yeux qu’à l’esprit* (a method that I present as much to the eyes as to the intellect)⁷³, which suggests a striking visual design, though in fact the layout harks back to the many tabular, typographic productions of earlier years. In particular, the widths of the columns are more or less arbitrary, being dictated by the amount of information they need to contain, and the vertical intervals are not arithmetic, simply listing one event after another regardless of the time elapsing between. Barbeau would subtly but significantly rework this design on a more rigorous, a more arithmetic, basis, true to both aspects of his own description: ‘*ordre & précision*’ (order and precision)⁷⁴.

⁶⁹ N. Lenglet du Fresnoy, *Tablettes chronologiques de l’Histoire Universelle*, Paris, 1763. British Library General Reference Collection 592.a.24. and 592.a.25.

⁷⁰ N. Lenglet du Fresnoy, *Tablettes chronologiques de l’Histoire Universelle. Nouvelle édition, ... augmentée par J. L. Barbeau de la Bruyère*. Paris, 1778. British Library General Reference Collection 681.a.16. and 303.c.19.

⁷¹ N. Lenglet du Fresnoy, *Méthode pour étudier l’histoire. Nouvelle édition*, 4 vols., Paris, Gandouin, 1729, Vol. 1, p.108. [Available online on Gallica](#) (Accessed 9 May 2015).

⁷² N. Lenglet du Fresnoy, *Tables Chronologiques de l’Histoire Universelle*, Paris, Gandouin, 1729. British Library General Reference Collection 747.c.22.(2.) [incorrectly catalogued as *Tablettes*; should be *Tables*].

⁷³ N. Lenglet du Fresnoy, *Méthode pour étudier l’histoire. Nouvelle édition, Op. cit.*. [Available online on Gallica](#) (Accessed 9 May 2015).

⁷⁴ J. L. Barbeau de la Bruyère, *Mappe-Monde Historique, ou Carte Chronologique, géographique et généalogique des États et Empires du Monde*, Paris, 1750. British Library Maps K.Top.4.46.2. Explanatory rubric on the chart.

In 1750 Barbeau produced his *Mappemonde*, described later as a *carte ingénieuse & vraiment nouvelle, où il a su réunir en un seul système la géographie, la chronologie & l'histoire* (an ingenious and truly new chart in which he knew how to unite, within a single system, geography, chronology and history)⁷⁵. Although Barbeau’s design is entitled *Mappemonde*, it is clearly not an ordinary map and indeed his *Explication* immediately asserts, as Lenglet also had done, that for a historian to be familiar with geography is a prerequisite. For that purpose he recommends maps by Delisle and Buache⁷⁶. There was a long tradition, dating back at least to Chytraeus in 1563, of regarding chronology and geography as the two ‘eyes of history’⁷⁷, a tradition explicitly referenced by Barbeau who erroneously attributes its origin to Cicero⁷⁸. After a *court préliminaire* (short preparation) in geography, one is ready to make use of the *Mappe-monde*. Barbeau immediately establishes the principle on which the chart is constructed:

1°. Les Divisions Géographiques, marquées au haut de la Carte avec les noms des Pays, & continuées jusqu’au bas par des Lignes perpendiculaires. Ces Divisions forment ainsi pour chaque Pays une Colonne, où se voient indiqués les Evenemens principaux, & les Révolutions, depuis les premières Peuplades faites après le Déluge jusqu’à présent.
2°. Les Divisions Chronologiques (qui ont rapport aux Temps ou aux Années) tracées par des Lignes horizontales, qui partent des chiffres marqués aux deux côtés de la Carte; laquelle est divisée de cette seconde manière par longues Bandes, selon les espaces de Temps ou de Siècles.

1st. The Geographic Divisions, indicated at the top of the Chart by the names of Countries, and continued down to the bottom of the Chart by perpendicular Lines. These divisions form thus for each Country a Column in which can be seen marked the principal Events and Revolutions, from the first Tribes created after the Flood down to the present time.

2nd. The Chronological Divisions (which relate to Ages or to Years) marked by horizontal Lines springing from the numbers shown on two sides of the Chart;

⁷⁵ L. P. de Bachaumont, M-F. Pidansat de Mairobert, B-F-J. Mouffle d’Angerville, *Mémoires Secrets pour servir à l’histoire de la République des Lettres en France*, *Op. cit.*, p. 47.

⁷⁶ J. L. Barbeau de la Bruyère, *Explication Générale de la Mappemonde Historique*, *Op. cit.*, p. 7.

⁷⁷ S. Boyd Davis, ‘May not duration be represented as distinctly as space? – geography and the visualisation of time in the early eighteenth century,’ *Op. cit.*, p. 121.

⁷⁸ Barbeau de la Bruyère, *Explication Générale de la Mappemonde Historique*, *Op. cit.*, p. 5.

which is thus divided a second time by long Bands, corresponding to the spaces of Time or of Centuries⁷⁹.

The phrase *espaces de Temps* is noteworthy. Time is now space, and the whole chart captures in two dimensions *la Géographie & la Chronologie, c'est-à-dire, la Science des Lieux & la Science des Temps* (Geography and Chronology; which is to say, the Knowledge of Places and the Knowledge of Dates)⁸⁰. On reading Barbeau’s *Explication* an important difference from Lenglet’s *Tables* stands out: the emphasis on measurement. Though Barbeau does not say so explicitly, we are essentially dealing with a coordinate space. When describing the representation of each regime, he makes clear that the width shows the region’s extent, and the height the duration (*La largeur marque son étendue, & la hauteur sa durée*)⁸¹. He emphasises the underlying geographic basis: *la Géographie de tous les Ages en étant comme la base & en déterminant toutes les Colonnes, il ne peut y avoir d’interruption. Comme chaque Pays a été habité depuis les premières Peuplades faites après le Déluge, les Dominateurs n’ont point manqué: ils ont seulement changé* (since the Geography of all Ages serves as foundation and determines every Column, there can be no interruption. As each Country has been inhabited since the first Peoples created after the Flood, Rulers have never been wanting: they have simply changed)⁸². The result is that every point on the surface has a meaning, indicating in context both geographic and temporal extents, which are treated as essentially similar phenomena.

Like the earlier Martignoni, Barbeau suggests that — his design being visual rather than textual — it supports more than one form of interrogation.

⁷⁹ *Ibid.*

⁸⁰ *Ibid.*, pp. 5-6.

⁸¹ Barbeau later confesses that the ‘extent’ is actually also affected by the relative importance of the geographic entities, which he excuses on the grounds of the very different amounts of data: *Cependant il est bon d’avertir, que si l’Europe occupe dans cette Carte plus d’étendue que l’Afrique & l’Amérique, qui sont dans la réalité plus grandes qu’elle; c’est qu’on ne la considère ici que selon ce qui est connu de son Histoire, dont on a beaucoup de monumens, au lieu qu’on en a peu sur l’Afrique & l’Amérique* (However, it is right to note that, if Europe in this Chart occupies a greater extent than Africa and America, which in fact are far larger than it, it is because it is considered here only in terms of what is known of its History, of which there are many memorials, while there are very few of Africa and America), Barbeau de la Bruyère, *Ibid.*, p. 7.

⁸² *Ibid.*, p. 37.

He cites Biblical authority (Acts 17:26) for his combining genealogy (which in fact appears hardly at all), time and geography⁸³. He rather undermines his claim for the primacy of the visual by providing long narrative explanations of various histories traceable in the *Explication*. Some of this narrative is genuinely explicatory, enabling best use of the chart by a detailed walk-through of two columns, those for France and Spain. Downwards investigation of the changes in each of those two kingdoms over time is described in detail, and then *Les autres peuvent se suivre de même, pour remarquer les Révolutions de chaque Pays, depuis les plus anciens Temps, jusqu'à présent*. (The others can be followed in the same fashion, to discover the Revolutions in each Land, from the most ancient Times to the present.)⁸⁴. As expected, the chart may also be explored horizontally: *En suivant une des Lignes horizontales d'un bout à l'autre, on voit l'état de tous les Pays du Monde dans chaque Siècle, ou dans une certain Période de Temps; par exemple à la Naissance de J.C.* (Following one of the horizontal lines from one end to the other, we see the condition of every Country in the World in each Century, or at a particular Period in time; for example, at the Birth of Christ)⁸⁵

Barbeau confronts the problem that, while on the globe countries may have multiple neighbours, in his chart the two-dimensional disposition has necessarily been compressed into a single dimension: *Un Pays dans un Plan Géographique, confine quelquefois avec quatre ou cinq. Dans ce Plan il ne peut avoir que deux Voisins, l'un à droite & l'autre à gauche. Il a donc fallu opter, & mettre aux deux côtés d'une Colonne les Peuples voisins qui ont eu des liaisons fréquentes, ou de plus grands traits historiques communs.* (A Country in a Geographical Map shares its borders sometimes with four or five others. In this Chart it can have but two Neighbours, one to its right and one to the left. We have therefore been obliged to place on either side of each Column the neighbouring Peoples with which it has had frequent relations, or the strongest historical connections)⁸⁶.

⁸³ *Ibid.*, p. 14.

⁸⁴ *Ibid.*, p. 12.

⁸⁵ *Ibid.*, pp. 12-13.

⁸⁶ *Ibid.*, p. 19.

He suggests that the benefits of the chart more than outweigh this *inconvenient inevitable* (unavoidable deficiency). A partial solution is to use colour to reunite those elements which have become separated: *Mais l’objet principal de cette Mappemonde Historique, étant l’Histoire Universelle, on s’arrêtera ici à une autre manière de la considérer, & c’est par rapport à cela que des Couleurs y ont été mises.* (But the principal object of this Historical World Map being that of Universal History, we will pause here to consider it in another way; and is in relation to this that the Colours have been applied)⁸⁷. Barbeau explains that Empires have for the most part been coloured solid, so that they can be more easily distinguished at a glance, with only eight colours used⁸⁸. Other Empires less central to Barbeau’s interest, together with the dependencies of the solid-coloured Empires, have coloured inlining in place of block colour⁸⁹.

Barbeau tries as far as possible to ensure that countries that in geographic reality adjoin are also adjacent as columns, and uses the width of each column to denote the size of the territory: *En rapportant la largeur de ces Empires aux Divisions Géographiques, qui déterminent les Colonnes de la Carte, il est aisé de voir l’étendue de ces Empires & les Pays qu’ils possédoient, sous les noms de la Géographie Moderne* (By relating the size of these Empires to the Geographical Divisions which determine the Columns of the Chart, it is easy to see the extent of these Empires and the Lands they possessed, under their modern geographical names)⁹⁰. *Leur Durée est aisée à calculer, en faisant attention à l’Année marquée au commencement de ces Empires, & à celle qu’on trouve à la ligne qui les termine* (Their Duration is easy to calculate, if one pays attention to the Year marked at the beginning of each Empire, & that which is shown for the line where it ends)⁹¹.

The effectiveness of Barbeau’s design stands out when we consider, for example, the Roman Empire. It proved too difficult to render all the parts of

⁸⁷ *Ibid.*, p. 13.

⁸⁸ *Ibid.*, p. 15.

⁸⁹ *Ibid.*, p. 19.

⁹⁰ *Ibid.*, p. 15.

⁹¹ *Ibid.*, p. 17.

the Empire contiguously in the chart, but a uniform solid tint, reinforced by the prominent lettering ‘*Empire des Romains*’ extending across all its parts, enables its extent to be identified (fig. 8). Not only does the size and impact of the Roman Empire emerge clearly as a series of graphic blocks, in addition its extent at different periods is easily read-off by tracing a horizontal row across the chart and observing how many blocks and of what size occur in any given time period. Similarly, as Barbeau promises, the fate of individual regions and regimes can be traced vertically — for example, the short-lived Roman rule over the Dacians and longer rule over Illyria (fig. 9).

Martignoni’s design is similarly dominated by Rome — that is the essential point of his *Imago* — but his is essentially a rhetorical narrative approach. Attempting to investigate any constituent parts of the story, the reader soon becomes lost. Take, for example, the early history of the Eastern Empire (fig. 10). It is near impossible to discover the narrative of sub-regions such as Turcomania and Curdistan (Kurdistan); indeed, the ‘river’ representing this geographic or cultural grouping seems to flow counter to the direction of time, which elsewhere flows from the perimeter of the upper part of the chart down to the perimeter of the lower part that represents the present day. Little can be discerned concerning either the temporal or geographical extent of this or other regimes. How, for instance, are we to read the temporal relationship between the triple tributaries of the Asian, European and African Ottomans? Essentially Martignoni’s diagram comprises a series of vivid graphic gestures that are hard to interrogate and yield little to analysis.

Barbeau used as his engraver Desbruslins, who had engraved the maps for du Fresnoy’s *Méthode* and the plates for the *Tables Chronologiques*, and who often worked for Delisle and Buache. Martignoni used as his engraver Tasnière, whose work is dominated by pictorial rather than schematic output. Though Martignoni and Barbeau seem to share objectives *O* and an idea *I*, in which cartography is repurposed as chronography, their model *M* is quite different. The one favours the characteristic figurative images of places and geographic features, the other the mensuration and symbolic codes, the

arithmetic-mechanical model, of distances and durations. Each exploits his conceptual and visual borrowings from cartography quite differently, as their views V are finally rendered as pictures P , arriving at very different designs from apparently similar premises.

Triumph of the new visualisation?

The pictorial cartography of Martignoni harks back to a long tradition of figurative metaphorical shapes for history, while Barbeau de la Bruyère introduces the order and precision of the arithmetic-mechanical aspects of cartography. Surprisingly, it is Martignoni who adopts a linear scale for time, with equally spaced concentric lines in the upper part representing each of the centuries from the founding of Rome to the birth of Christ, and again in the lower part from the birth of Christ to the year 1700. Barbeau, for all his focus on mensuration, uses a total of four different scales. In his *mappemonde*, a given interval of paper represents first 100 years and then, as we recede into the past, 200, 250 and 500 years. This creates a kind of perspective where more distant time occupies less space than recent times. In some respects, this is eminently practical, since there is almost always more data available for recent times than for the distant past, and the nearest time is likely to be of the most detailed interest. But it was a feature strongly disliked, both by Priestley who explicitly picks out the non-linear timescale of the Barbeau/Jeffreys’ chart for criticism, and by Barbeau-Dubourg who does not. The latter’s principal objection to non-uniform scales is the confusion created by the differing scales of geographic maps and the need to work compasses-in-hand in order to be sure of estimating distances or periods correctly⁹². Priestley’s objection is similar, specifically that comparisons of durations in different periods becomes too difficult without a constant scale⁹³. There is no doubt that comparison of the

⁹² J. Barbeau-Dubourg, *Chronographie ou Description des Temps* (Chronography or Depiction of Time), *Op. cit.*, p. 7.

⁹³ J. Priestley, *A Description of a Chart of Biography*, *Op. cit.*, p. 8.

temporal extents of empires from different periods of history is significantly undermined by the non-uniform scaling in Barbeau’s *mappemonde*. United by correspondence and by a mutual friendship with Benjamin Franklin, Barbeau-Dubourg and Priestley speak with one voice on the need for uniform timescales, and put their principles into practice in their 1753 *Description des Temps* and 1764 *Chart of Biography* respectively.

One might assume at this point that the triumph of the arithmetic-mechanical approach to mapping time had arrived — originally derived from, but increasingly independent of, cartography. Yet in the mapping of history, the reliance on striking visual images, in the manner of Martignoni and his predecessors, would remain. In fact, neither of the prior traditions was expunged by the arithmetic-mechanical view. Textual lists and tables remained, and still remain, the most common means of representing chronologies, largely because they are economic in invention and use of space. Pictorial elements would also persist, such as in Strass’s *Strom der Zeiten* (1804), where the figuration of histories as flowing streams is more in evidence than any numeric qualities, and so on via Willard’s *Temple of Time* (1846) into the multiple metaphorical shapings of time in Adams’ *Synchronological Chart* (1871) and beyond. Emma Willard (1787-1870), referring to her own *Temple of Time*, describes such an image as ‘a design whose beauty and grandeur naturally attract attention.’⁹⁴ The arithmetic-mechanical approach never overthrew the desire for such images. However, it did offer a new alternative, one leading into the long tradition not only of chronographics but of data visualisation more broadly down to the present time. In the process, it helped to both disseminate and reinforce a new ontology of historical time as something uniform, mathematical, and susceptible to mapping.

⁹⁴ E. Willard, *The Temple of Time, Willard’s Map of time: a companion to the Historic guide*, New York, A. S. Barnes & Co, 1846.

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