

## Barrington Atlas of the Greek and Roman World: the Cartographic Fundamentals in Retrospect

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### Background

In time, space or purpose, the prospect of any close link between the *Barrington Atlas of the Greek and Roman World* [1] and the *Historical Atlas of Canada* [2] might seem remote indeed. As editor of the former, however, I instantly realized otherwise when first encountering the reflections of the director (Dean) and two editors of the latter (Cole Harris, Holdsworth) on their experience published in *Editing Early and Historical Atlases: Papers given at the 29<sup>th</sup> annual conference on editorial problems, University of Toronto, 5-6 November 1993*. [3] Naturally, to learn that in a quite different field others before you had wrestled with similar dilemmas, and had chosen to resolve them in broadly similar ways, is not enough to place your own choices beyond reproach. But such a discovery does offer reassurance; it acts to relieve a depressing sense of isolation, and demonstrates that your own painful choices need no longer be regarded as merely idiosyncratic.

At first glance, to be sure, when set against the *Historical Atlas of Canada* and most other modern atlases, the *Barrington Atlas* may well seem out of step with current trends: it emerges from a historical field where for decades there had been no more than scant regard for cartography, [4] and it presents maps of physical and cultural landscape rather than of themes. Among scholars of classical antiquity worldwide, it was in fact the leading North American professional organization in the field, the American Philological Association, which first specifically articulated the need to reintroduce the cartographic dimension to the study of ancient history. The recommendation dates to 1980, and stems from a specially commissioned effort to identify research tools of outstanding potential value to the discipline, but lacking at that date:

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“We come, finally, to an area of extremely great importance, where the state of our tools is utterly disastrous, cartography. There is hardly anything more important to understanding ancient history than a clear conception of the terrain on which its events took place. But the best available maps, the old Kiepert ones, are virtually unavailable, and nothing really useful has become available for most areas in the last few decades. The *Tabula Imperii Romani* proceeds at a snail’s pace, parcelled out among the modern countries its sheets cover (not always those where the best scholars for the purpose are found) and appearing, when it does, in different styles everywhere. A concerted attempt to produce a uniform series of maps which show both the topography – with all the sophistication of modern cartography – and the ancient toponyms – with the accumulated knowledge of classical scholarship – would be immensely valuable.” [5]

Heinrich Kiepert (1818-1899), to whom the recommendation refers, had been the most active cartographer of the Greek and Roman world in the nineteenth century, and the production of the great atlas, *Formae Orbis Antiqui*, which he intended to be the climax of his life’s work was even

continued after his death by his devoted son and fellow cartographer, Richard (1846-1915). Nonetheless, only just over two-thirds of its planned comprehensive coverage had been completed on the latter's death; nothing more was issued. [6] The maps never achieved wide circulation, and by 1980 they were hopelessly outdated in many key respects. A wealth of new discoveries and advances in scholarship had occurred during the intervening sixty-five years. Moreover even at the small scales typically adopted, the grasp of physical landscape reflected for many regions – especially elevations inland – was limited, indeed sometimes non-existent (aerial mapping lay in the future). For production, the strong preference was still for printing from an engraved copperplate rather than resorting to lithography.

Between World War I and 1980, fresh initiatives for mapping the Greek and Roman world were badly lacking, so that in fact the last completed major classical atlas remained the even older *Atlas of Ancient Geography Biblical and Classical*, edited by William Smith (1813-1893) and published by John Murray, London, in 1872-1874. This remarkable work, however, was so rare as to be all but forgotten after World War I. [7]

The one initiative to hold out some promise was that cited in APA's recommendation, the *Tabula Imperii Romani* (TIR), an international project to map the Roman empire. Proposed by O.G.S. Crawford in England at the end of the 1920s, it was a visionary scheme to mark Roman cultural data on physical bases furnished by the relevant fifty-six sheets of the (then developing) International Map of the World series at 1:1,000,000 scale (IMW). This TIR project is still ongoing in fact, [8] and it has unquestionably done some excellent work, albeit sporadically. However, the scholarly community worldwide was slow to recognize that it suffered from some fundamental flaws which even today have yet to achieve resolution. In consequence, therefore, the hope that TIR would furnish an adequate series of maps for the classical world persisted for too long, and discouraged efforts by others, when in reality all such hope was unjustified. In particular, clear editorial policies for the maps were never established, so that the categories of data to be marked on them, and the precise conventions to be adopted, were never defined, let alone adequately regulated by a coordinator. At the same time, the project's structure has always required that only a committee appointed by the modern nation whose territory occupies the major part of the requisite IMW sheet possesses the authority to issue it in the TIR series. If, therefore – as all too often occurs – the nation concerned shows no interest in sponsoring the sheet, even when others with territory there are willing to proceed, a lock is placed on progress in that region. Predictably enough, ever since the 1920s modern nations – for all kinds of reasons – have varied in the degree of their willingness to sponsor TIR sheets. As a result, even today, the coverage achieved is patchy (no more than approximately one-third complete), lacking in uniformity, and unlikely ever to attain the project's final goal without radical change.

APA's recommendation in 1980, with its firm rejection of any further reliance on the hope that TIR might soon furnish adequate maps of the classical world, was a bold and vital step forward. Even so, for some years thereafter, progress on the fresh initiatives that APA set in motion was disappointing. A bibliographic survey *Map Resources for the Greek and Roman Worlds*, with fifteen regional sections, was commissioned, but never achieved completion and publication. Meantime, for a range of reasons – conceptual, organizational, financial, personal – a project to plan and produce a major atlas was wound up in 1987, with nothing attained.

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*“... APA’s committee . . . and other interested colleagues still had no agreed vision of precisely what mapping should be attempted, how it should be undertaken and within what timeframe, what it was likely to cost, where the funding would be found . . . and how the results should best be disseminated.”*

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It was against this somber background that I was approached by APA’s Vice-President for Research in December 1987 and was asked to launch a complete fresh start on the planning and production of an atlas. From APA’s perspective, the approach made sound sense. I had gained some unique relevant experience from the production of a modest textbook *Atlas of Classical History*, involving twenty-five collaborators (all in the British Isles) and published in 1985. [9] It was only in the same year that I emigrated to North America, so that I had no prior engagement with, or even knowledge of, APA’s failed ventures into cartography to date. From my perspective, APA’s invitation was daunting, yet both intriguing and timely. On the one hand, it so happened that within the previous three years I had finished both the textbook atlas and another short book, as well as a third very long one, and I had not yet settled upon a further major project. I was keenly aware of the lack of a major classical atlas, and the urgent need for one. On the other hand, what APA envisaged was clearly something far larger, more ambitious and more costly than the textbook atlas; many of its maps consisted just of outlines, and all had been limited by a minuscule budget.

Personal considerations aside, at this point the prospects of providing APA with the successful outcome it sought could hardly have seemed bleaker. Some manifestly idealistic and impractical ideas were aired at our initial meetings. But the fact was that, even by now after several years, APA’s committee members and other interested colleagues still had no agreed vision of precisely what mapping should be attempted, how it should be undertaken and within what timeframe, what it was likely to cost, where the funding would be found (although APA did pledge support in the search), and how the results should best be disseminated. If nothing else, then, I was being offered an extraordinarily open opportunity to create and develop a major work of lasting value. To be sure, there were immense risks of every kind in prospect, and naturally APA’s approval would be essential for whatever plan was formulated; but for a reasonably practical proposal such approval might now be easier to secure while the memory of recent failures was still vivid. So all in all it seemed that I had little to lose by agreeing to work for APA – another failure would be no surprise either; indeed, many expected just that – and hence I succumbed to the temptation. In retrospect I could echo Cole Harris’ reflections on agreeing to edit Volume 1 of the HAC:

*“The lesson, presumably, is not to underestimate the work in a major atlas, and yet, had I not been optimistic, I would never have agreed to edit this volume, while SSHRCC, had it known what lay ahead, probably would never have funded us. A measure of naïveté may be necessary to launch historical atlases.” [10]*

#### *Framework*

The initial year and a half (early 1988-mid 1989) I spent trying to determine the most satisfactory solution to the network of fundamental unresolved questions outlined in the previous paragraph – the entire network, let it be stressed, because the questions were inextricably linked, and adoption of the most desirable solutions to some might simply not take adequate account of others. In short, what I needed to address, to use Dean’s term, was ‘atlas structure’, “those elements which give an atlas direction, purpose, and appearance. In other words, [‘atlas structure’] is the framework whereby atlas maps are selected, designed, drawn, and arranged.” [11]

During this initial phase the full force of what was lacking struck me. Altogether, the part of the globe over which Greeks and Romans had settled, fought and traded was vast, stretching from the British Isles to North Africa and eastwards to Sri Lanka. Detailed maps of large segments of this total area as they were during classical antiquity (however its timeframe was to be defined, another key issue) had never even been attempted, east of the Mediterranean especially. Elsewhere the coverage, such as it was, remained most unsatisfactory. For most of the Iberian peninsula and Gaul, as likewise for Italy and Greece – the heartlands of classical civilization – the only detailed maps predated World War I, and many adopted very small scales. It was this realization of how shockingly poor a grasp our discipline had of the geography of its world – an aspect never in doubt, naturally, for the planners of the HAC – which determined me to make physical and cultural landscape the main focus of my effort for APA. I was aware that an ongoing project of tangential significance – the *Tübinger Atlas des Vorderen Orients* (TAVO) – had chosen differently. [12] The maps in its most relevant sections (B IV, V and VI) are primarily thematic, and valuable as such. But by definition anywhere west of the Aegean falls outside TAVO's scope, and more generally my view was that the establishment of a clear overall sense of geography ought to precede a major effort at thematic mapping. Rather, the latter can, and should, build on the former.

I formed the view, therefore, that the appropriate goal for what would become the *Barrington Atlas* [13] was coverage of the physical and cultural landscape across the *entire* vast span of territory encompassed by Greek and Roman civilization. Even at this preliminary stage it was obvious that much other mapping could usefully be attempted, but it was also self-evident that such efforts might prove over-ambitious. The main goal alone, I estimated, would take perhaps a decade to achieve, and would in all likelihood suffice to exhaust the energy and enthusiasm of all those involved (myself included), not to mention sources of funding. Further initiatives were better kept separate and subsequent to achievement of the main goal, especially in view of the urgent need for such basic maps.

The longterm mapping projects best known to me – Kiepert's *Formae*, *TIR* and its equivalent *Tabula Imperii Byzantini* for the Byzantine world, [14] as well as TAVO – all issued their maps in loose sheet form, either individually or in fascicles, as they proceeded. Inevitably, this practice leads to some inconsistency in presentation, deters private buyers, and requires libraries to limit access to items that are so fragile (the more so when issued folded) and easily removed. My wish for the *Barrington Atlas*, by contrast, was for it to be a sturdy single volume, large in size although not unwieldy, and available at a price within the range of private buyers, high though the cost would have to be. The presentation must be attractive, in a contemporary style, and aimed at a circle of users and purchasers extending well beyond a narrow, introverted specialist group. To charge, say, upwards of U.S. \$1,000, therefore (the level of pricing set by TIB and TAVO, for example), would so restrict circulation of the project's results as to undermine its very purpose.

A single volume would unmistakably highlight the sheer span and diversity of the Greek and Roman world. Moreover it could incorporate the comprehensive gazetteer that none of the other projects mentioned was at that date in a position to furnish. This said, the wish for a single volume created additional risk because so long as even a single map for it remained unfinished, the work could not proceed to press; meantime the completed components would simply have to be suspended in limbo, to the intense frustration of those colleagues who had contributed them.

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*Partners*

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At this initial stage it was far from clear to me how an atlas of this scope and nature was actually to be created. What quickly did become evident, however, was that I should not even attempt to proceed further without engaging two key partners, a publisher and a cartographer. Both APA and any potential contributor of major funding had to be satisfied from the outset that publication of the project's results was assured. In addition, there is no means of laying out the maps for an atlas until the basic format of the volume is securely established, and this of course must be an initial step that cannot be postponed till later (as it typically is with a work that is primarily text). I approached four leading North American university presses, and was in turn approached by a fifth. Since all showed interest, the choice was a difficult one. In the end it fell upon Princeton in view of the quality and visibility of its list, especially in the classical field, and of my own favorable previous experience of working with the outstanding Classics editor, Joanna Hitchcock. Princeton was willing to permit the atlas format to be folio – in other words, the largest format that is both reasonably economical for production and convenient for the individual user to handle. Princeton also affirmed that the binding for the volume could be handsewn so as to permit a doublespread map to run across seamlessly without a central gutter becoming visible or any map data at each page's edge disappearing into it. [15] Consequently, a framed map occupying an entire single page could measure 17 ins. tall by 11.75 wide, and a doublespread could extend for 24.5. 'Bleeds' of up to approximately half an inch beyond the map frame could also be accommodated. [16]

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The search for a suitable cartographic partner posed a far tougher challenge. It clearly had to be one capable of handling a very substantial volume of work without long delays; this ruled out small companies, for example, as well as cartographic units within universities. At the same time, it was vital that the cartographic partner have experience of, and sympathy for, the creation of a major historical atlas, along with the ability to take a prominent role in designing absolutely every feature of a new one from scratch. A partner that would require, for example, the use of its existing 'house style' for presentation of the maps was ruled out. I cannot better Dean's summary of the need: "In atlases, besides the usual decisions having to do with texts of various kinds there are innumerable decisions regarding the maps and any other illustrative materials. Every bit of line work, every space, every symbol, every colour or shade, every piece of type, every typeface, every legend on a map, requires thousands of precise decisions." [17]

Among the very few recommendations that the Association of American Geographers was able to make for potential partners capable of meeting such taxing requirements, only one stood out – the Cartographic Services unit in Lancaster, Pa., of the prominent Chicago printers R.R. Donnelley and Sons. Here the lead was taken by Barbara Petchenik, who had been cartographic editor for the great *Atlas of Early American History: the Revolutionary Era 1760-1790*, [18] and had continued to publish widely on many aspects of cartography. To my immense relief, she soon demonstrated that Donnelley Cartographic Services were ideally, perhaps uniquely, qualified to serve as the cartographic partner; time was to prove her right. Had I but known it then, I had unwittingly fulfilled Cole Harris' recommendation stemming from his experience with the HAC: "I suspect this is a rule-of-thumb for most atlases: find, then rely on, one outstanding cartographic designer." [19] What I had found, to be sure, was a team rather than the HAC's individual (Geoff Matthews). Thankfully, despite

the company's successive changes of ownership and office removals between 1988 and 2000, [20] the team personnel were to remain very stable throughout. After Barbara Petchenik's premature death in 1992, Keith Winters took over the management of the account until completion of the project. There was a succession of no more than three cartographic managers – Jeannine Schonta to 1993, Janet Kelly to 1998, and thereafter David Stong. [21]

From the outset I wanted the role of Donnelley's team to be far more than a merely subordinate one. Donnelley, after all, could contribute vital cartographic knowledge, experience and perspective that I as a historian and academic lacked. My impression of TIR, TIB and TAVO maps was that their cartographers either lacked talent or (more probably) that the scholars in charge had not offered them adequate opportunity to contribute their expertise. By contrast, I was eager to invite recommendations from Donnelley. [22] There were many fundamental issues to discuss.

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### *Scale and Landscape*

Scale was perhaps the most basic of them. In the expectation that many users of the atlas would not be expert map-readers, there was good reason to keep the number of scales employed to a minimum, ideally perhaps to no more than one. Without doubt, a conspicuous merit of the TIR and TIB series was their adoption of a uniform scale – a marked advance on the nineteenth century classical atlases, which had never done likewise. The disappointment, however, was that both choices were so modest – 1:1,000,000 in the case of TIR, and 1:800,000 in that of TIB. By the end of the 1980s, scales as small as these simply could not do justice to our accumulated knowledge of many of the more populated and well explored regions of the Greek and Roman world. For these in particular, some more generous scale was essential. At the same time, however, the larger this scale was, the more space it would require, and the correspondingly less justifiable it might prove for thinly populated or little explored regions.

A minimum of two scales seemed unavoidable, therefore. What each should be depended in turn upon how the rendering of physical landscape was to be generated. It would be necessary to start from today's landscape, but whether to rest content there, or to attempt to restore it to its ancient aspect where sufficient data for the purpose survives, was a further fundamental concern. Earlier approaches had differed. When TIR was initiated at the end of the 1920s, the question of restoring the modern physical landscape back to its ancient aspect was seemingly not even raised. Nor was modern landscape created afresh for TIR maps. Instead, Crawford devised a brilliantly simple and economical scheme whereby the layout of TIR would replicate that of the (then new and ongoing) International Map of the World (IMW, 1:1,000,000). The elements created in the compilation of each IMW sheet would simply be reused for TIR, "except that for the black detail plate is substituted a black archaeological plate, and the red road plate is omitted altogether." [23] By the 1960s, when TIB was initiated, there was keener awareness of the need to allow for landscape change over the centuries, but at the same time this project was particularly concerned to enable the users of its maps to relate Byzantine features to their modern setting. Hence the first stage in the preparation of each TIB sheet is the creation of a new map of the relevant area today at 1:800,000, incorporating modern place-names and even such features as highways, railroads and airports. Purchasers of TIB receive two versions of this map: one, exclusively modern as described, printed in clear inks; the other reproduced as a subdued background in

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pale inks, over which are printed Byzantine names, features and road linework.

My view was that the *Barrington Atlas* should endeavor to show the ancient landscape so far as possible, not the modern, and this attempt was undertaken. The fact is that a high proportion of identifiable man-made landscape changes postdate World War II, and are not so difficult to adjust for. Even the most extensive area affected thus – now covered by Lake Nasser in southern Egypt (see Map 81) – could be redrawn from earlier maps. Where nature has changed the landscape, and over a much longer span, the attempt to restore its ancient aspect must inevitably often prove more delicate and problematic. In extreme cases we can only acknowledge that, while we know the ancient landscape of an area to have differed markedly from today's, sufficient data with which to restore it no longer exist; in these instances, more of today's landscape must perforce be left in place than would otherwise be justified. The Nile Delta, for example, offers an acute illustration of this problem. [24] It is true that where extensive restoration of a familiar landscape has been possible, certain users of the atlas are liable to be disoriented by the result. Lovers of Venice have complained to me about its 'disappearance' from Map 40, and Spaniards living north of Cadiz have taken me to task for rendering where they live today as open water on Map 26. Such upsets are to be regretted, but they can hardly justify abandonment of the attempt to set ancient cultural data so far as possible within the ancient physical landscape. To place these data against the modern landscape instead – as do TIB and the latest editions of the Ordnance Survey *Roman Britain* map, [25] for example – was in my view not an approach to imitate. Time and again, after all, ancient writers' geographical references are meaningful only in relation to the ancient landscape, and if we seriously wish to engage with any past civilization we should strive to do so within their landscape, not ours, however unfamiliar it may appear.

#### *Base materials*

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No less undesirable and unnecessary a model, it seemed, was TIB's costly and time-consuming practice of commissioning the creation of entire new landscape bases. Rather, it would be better to follow TIR's example and identify appropriate modern map series from which the required physical landscape elements could be adapted. This search, however, turned out to be prolonged and frustrating. National map series in all their variety were far from serviceable. Instead, whatever series were to be adopted had to relate satisfactorily to one another, to offer uniform presentation across modern national boundaries, and to be the product of makers willing to supply elements for reuse in the *Barrington Atlas*. For many reasons the IMW series originally adopted by TIR, and its corresponding “1404” series at 1:500,000, were not suitable. Neither series was still in production at the end of the 1980s, and elements in good condition could no longer be obtained. Other practical obstacles were, first, the inconsistency produced by conversion of the contour-interval figures on some sheets, but not all, from feet to metres. Second, the series sheet-size, while far from immense, was still too unwieldy a format for the atlas volume I had in mind. In addition, the series sheet-lines had an unfortunate knack of dividing areas that ought at all costs to appear entire on any historical map: south-east England, for example, was split between four sheets, and the islands of Sardinia, Euboea and Crete were all bisected. Altogether, there was no means here to create a satisfactory group of geographically and culturally meaningful map bases without

resorting to the expensive and awkward expedient of making almost every base a 'mosaic' of two or more IMW sheets.

Gradually it became clear that the required transnational uniformity could in fact only be furnished by Soviet or U.S. world map series. For all the high quality of much of the Soviet mapping, from a practical point of view the end of 1980s was no time to start relying upon this source of base materials. U.S. series, by contrast, had much to recommend them. In particular, the (then) Defense Mapping Agency's Operational Navigation Chart (1:1,000,000) and corresponding Tactical Pilotage Chart (1:500,000) series both offered all but complete coverage of the entire span to be covered by the atlas [26]. Although in the case of both series some of the sheets required are produced by the British Directorate-General of Military Survey, these adhere to U.S. specifications, so that uniformity is maintained. Thus, among other vital concerns, style of presentation is consistent, all contour intervals are in feet, [27] and the same orientation (North) and projection (Lambert Conformal Conic) are adopted.

Moreover, sheets of both these DMA world series – and two related ones at the smaller scales of 1:2,000,000 (Jet Navigation Chart) and 1:5,000,000 (Global Navigation and Planning Chart) – circulate widely (and cheaply) and are not protected by any copyright. If they were to form the basis for a restoration of the modern physical landscape back to its ancient aspect, users of the atlas wishing to make a direct comparison between ancient and modern for any region should find it relatively easy to acquire the relevant DMA sheet for the purpose. [Fig. 1] Most important of all, even the individual elements comprising any DMA sheet at 1:500,000 scale or smaller were in the public domain and available for purchase and reuse. This remarkable openness did not extend to any scale larger than 1:500,000, however. In particular, for some countries the actual printed sheets of the 1:250,000 series (Joint Operations Graphics; also oriented North, with Lambert Conformal Conic projection) remained classified, and hopes of obtaining any elements at this scale would be quite unrealistic.

So it emerged that the one practical way forward was to rely principally upon the ONC and TPC series for the provision of map bases. At the point when I took the decision to do this, there remained a single identifiable major drawback, although another gradually revealed itself. The former was that the ONC series incorporates only the most rudimentary elevation tinting. For consistent presentation within the atlas, it was highly desirable that all the maps with this base have such tinting added to match the TPC series style of presentation. However, to make that enhancement by means of the film-based technology then in use (peeling, creating 'open windows', etc.) would without doubt prove exceptionally laborious and costly; yet it was at least feasible, and had to be budgeted for. There was the prospect that the Digital Chart of the World (the first digitized version of the ONC series) might be released before this enhancement actually needed to be made, and in all likelihood its use could then simplify the task. In the event, it did prove possible to tap the DCW for the purpose, but that was far from predictable at the end of the 1980s.

The unanticipated drawback was the sluggish, uneven pace at which the DMA turned out to deliver the elements ordered. To be sure, the amount of material was large (forty-one sets of elements), [28] and in a military agency priority was rightly given to fulfillment of military needs. Even so, the delays became sufficiently extreme to make me fear that the progress of the project would be jeopardized. That it was not is due above all to the consummate diplomacy of Luis Freile at Donnelley, who ultimately was able to secure the full complement of elements ordered.

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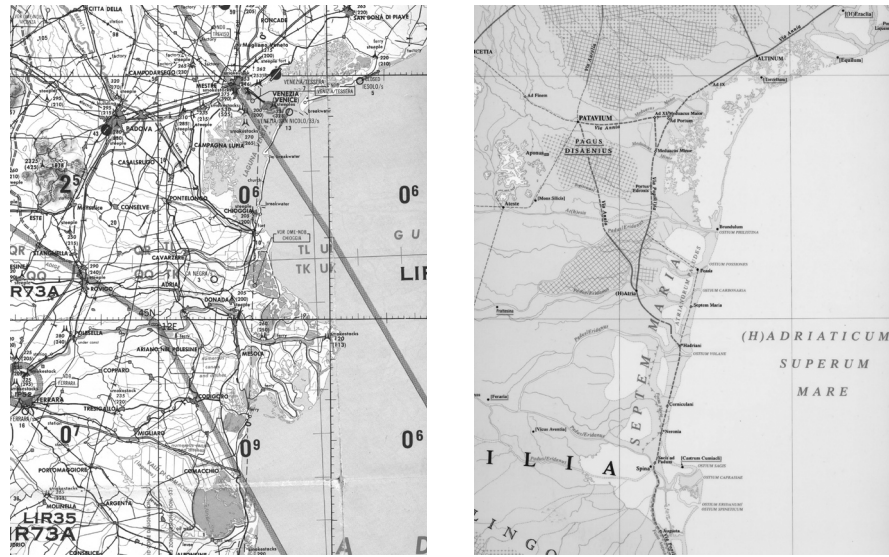


Fig. 1 Part of Map 40 (right) showing the Po delta in antiquity and the corresponding part of TPC F-2B (left) on which the map is based. As Map 40 clearly illustrates, the Barrington Atlas uses two lineweights to distinguish major roads from minor (the recommendation of a road specialist that as many as seven different weights be distinguished was hardly practical!). Solid linework of any kind (be it for a road, wall, aqueduct, etc) signifies that the course of the feature is known for certain in this location; where linework is dashed, by contrast, it can only be traced approximately. The checkerboard patterns denote 'centuriated' areas – land surveyed, divided and assigned by the Roman authorities. (see page 72 for larger color version)

Release of the final set caused extraordinary difficulty because it fell just after the date (October 1, 1996) on which the DMA became the National Imagery and Mapping Agency. NIMA from its inception was not authorized to fulfill any civilian requests for purchase of elements. So altogether, in retrospect, there is reason to feel hugely relieved at the fortuitous timing of the request for these vital materials that underpin the atlas. Frankly, I doubt if it would have been practical for the project – in the form I had conceived it – to proceed without them or (perhaps an even more frustrating plight in practice) with only some, but not others.

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#### *Coverage, layout, timespan [Figs. 2-4]*

For laying out the atlas, the sheer immensity of the ONC and TPC sheets (normally 37 ins. tall by 50 wide) seemed a further advantage insofar as it might help to limit the frequency with which mosaicing was required. I deliberately sought to keep this to a minimum, and in the end relatively few maps at 1:1,000,000 or 1:500,000 had to be mosaiced; of those that are, only a handful call for the more delicate north-south joins. [29]

Even so, establishment of the atlas layout on the basis of ONC and TPC sheets meant reconciling a perplexing array of ideals, principles and limitations. The map sizes were of course immutably fixed. I strove for ‘horizontal’ doublespreads where possible, but was also ready to resort to ‘horizontal’ single pages, and even to ‘vertical’ single and double turn-pages (with North to the left) where they seemed the most effective layout. To save space and contain costs, I determined to omit open water beyond what was needed of it to complete a mainland map; this could not be an atlas where coverage of the sea would match that of the land. Equally in this regard, I embraced Donnelley’s principles that the maps must be of uniform sizes and that each must extend to fill the size of frame permitted by the volume’s format. Otherwise there was to be no



Figure 2.



Figure 3.





of Map 36 in Libya, but was unable to devise any means of doing so economically, even by resorting to a smaller scale. [30]

Even with the limits just described, the extremities of the coverage were very far flung. To show them at 1:1,000,000 scale would occupy a formidable amount of space, and once again – in the present state of our knowledge – the effort (and expense) would seldom be justified. Consequently, I decided that 1:5,000,000 would have to suffice for these extensive ‘remote’ areas, and I also maintained coverage at this scale to create overview maps of almost everywhere shown at a larger scale. Once Map 2 had been added in, [31] there were twelve pages in all at this scale. [32] [Fig. 6]

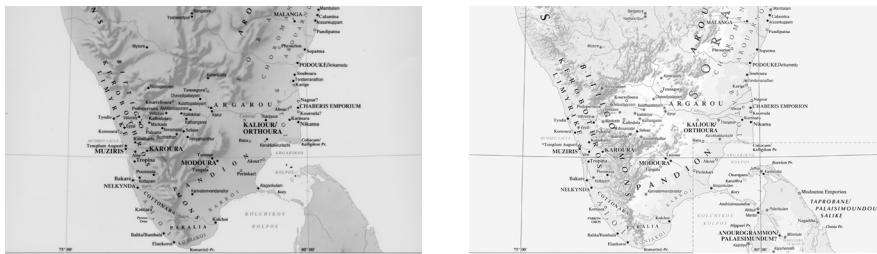


Fig. 6 Part of Map 5 India, first in an early draft (left) incorporating only the physical elevation offered by the GNC 12 base sheet, and then as published in 2000 (right) incorporating custom-designed digital elevation modeling by Donnelley (with use of GTOPO30, as described in Barrington Atlas, xxviii) which was adopted for all twelve maps at the 1:5,000,000 scale. (see page 75 for larger color version)

Naturally enough, all areas settled or controlled by Greeks or Romans should be shown at no less than 1:1,000,000. Acute difficulty arose in determining which parts of this expanse merited showing four times larger at 1:500,000. I would maintain that the parts chosen are broadly speaking the right ones – southern France, Italy, North Africa to the west and south of Carthage, Greece and the Aegean, the Straits of Kertch, much of Asia Minor and the Mediterranean’s eastern seaboard, and the Nile valley. This said, the constraints imposed by the layout and by the need to mesh two map base series make some unevenness unavoidable. Parts of central Asia Minor, for example, or of the Egyptian desert, could justifiably be reduced to 1:1,000,000. By the same token, much of southern Spain ought ideally to have been shown at the larger scale, but it simply proved impossible to incorporate the necessary shift of scale at all tidily into the layout here. The Aegean Sea, by contrast, presented the opposite problem. It could and should be shown at 1:500,000, but the page-size made it impossible to do this neatly; hence the resort to substantial insets for the islands in the center and south-east (all on Map 60). Moreover an overview was vital, and one could only be devised at 1:1,000,000, with considerable ingenuity at that; hence the exceptional number of bleeds off this ‘turned’ doublespread (Map 57).

I was keenly aware that three areas in particular – the environs of Athens, Rome and Constantinople – merited showing at considerably larger than 1:500,000. Ideally, DMA’s 1:250,000 scale Joint Operations Graphics series seemed the obvious recourse for a base in these instances, and with varying degrees of difficulty it was eventually possible to secure the relevant sheets (one in the case of Rome, two for Constantinople, and as many as four for Athens). The only way to create elements from these, however, was for Janet Kelly at Donnelley to trace each re-

*“... all areas settled or controlled by Greeks or Romans should be shown at no less than 1:1,000,000. Acute difficulty arose in determining which parts . . . merited showing four times larger at 1:500,000.”*

*“... the environs of Athens, Rome and Constantinople – merited showing at considerably larger than 1:500,000.”*



quired landscape feature separately in turn from the printed material. In the course of this painstaking labor she also accomplished the necessary complex mosaicing in the cases of Constantinople and Athens, and then enlarged the scale of all three maps by 166.7% to bring it to 1:150,000. By this ingenious means doublespread bases were created for the environs of Athens and Rome, and a single page for those of Constantinople.

Altogether, therefore, this layout for the atlas came to use as many as four different scales, although each may be related to the others with comparative ease, and two (1:5,000,000 and 1:150,000) are only used minimally. In fact all but nine of the ninety-nine maps are at either 1:1,000,000 (forty-seven of them) or 1:500,000 (forty-three of them); every map's scale is stated clearly alongside its title (printed twice for doublespreads), and the scale is naturally reflected by the scalebar placed at the bottom of each map or alongside it.

*“... to arrange the ninety-nine [maps] in order presented an intriguing challenge...”*

How then to arrange the ninety-nine in order presented an intriguing challenge when in principle there are so many possibilities. It seemed logical to proceed, broadly speaking, west-east and north-south. However, to develop a satisfying sequence of so large a mix of sixty-six doublespreads and twenty-four single pages without any breaks proved downright impossible, and perhaps it would be undesirable in any case. The most attractive expedient was to place all six overview maps (1:5,000,000 scale) first, and then to create six loose regional groupings each prefaced by a diagram sketch of the region on a righthand page; the corresponding lefthand page can either remain blank, or be used for a final (single page) map in the preceding grouping, if required (as with 48 and 99). Undeniably, the regional groupings are somewhat arbitrary, but their creation does facilitate a rational ordering of the maps and serves to make the atlas less overwhelming to users.

I hardly need to repeat that there was much other mapping of the Greek and Roman world which in principle could have been undertaken for the atlas. I am as regretful as anyone at having excluded it. The only maps I was willing to incorporate in addition to the ninety-nine already mentioned were three outlines at 1:10,000,000 (two doublespreads and one single page) which sketch the boundaries of Roman provinces at three successive stages of the Roman empire's growth and decline. These apart, my view was that the ninety-nine maps, spread over 175 folio pages, comprised a cohesive set which supplied an essential basis – otherwise missing to date – for further mapping initiatives of all kinds. Moreover it was starkly clear from the outset that the successful completion and publication of this set alone was a hugely ambitious goal, fraught with the risk of failure. Dozens of expert scholars would need to be recruited for compilation of the maps, and thereafter encouraged to deliver the work they had committed to in timely fashion. The amount of editing, checking, adjusting, proofreading and associated tasks would be colossal. Map production costs were well-nigh impossible to gauge, although it was obvious that they might easily run to a couple of million dollars or more. Meantime the prospects for securing the necessary funding support were hazy.

*“In these circumstances, to commit to further mapping would have been irresponsible, not to say suicidal.”*

In these circumstances, to commit to further mapping would have been irresponsible, not to say suicidal. I should dearly have liked to commission a series of city-plans at very large scales, since these are in principle feasible and without doubt badly needed, but the scope and nature of such a different type of mapping initiative would have been too much to accommodate. [33] Equally, the limitless potential range and variety of possible thematic maps – another distinctly different type of

mapping – cast serious doubt on whether an acceptable and appropriate selection could be made. [34]

I had resolved that the timespan encompassed by the atlas should be from the end of the Bronze Age (therefore no earlier than 1000 B.C. approximately) to the emergence of Islam in mid-seventh century A.D. The exclusion of the Bronze Age was a bitter disappointment to some, but data relating to it would not integrate well onto maps that had to cater for a further millennium and a half in addition. My own deeper disappointment was that it was not practical to offer even, say, two successive maps of each region so as to furnish a sharper sense of the physical and cultural change that occurred over time, very strikingly in some instances. Even to double the map pages at the two standard scales, however, would have brought their total alone to 312, and the extra burdens imposed at every stage in the volume's production (not to mention its marketing at an affordable price) would have been crushing. At least there was one modest indicator of change that could practicably be introduced to the maps. This was a range of five distinctive colors for five successive periods – Archaic, Classical, Hellenistic, Roman, Late Antique – within the full timespan of the atlas. Accordingly, names and features which occur in only one of the five are marked out in the relevant color. The possibility of extending this indicator to accommodate two or more periods was considered but rejected. The potential variants were too many, the color palette would soon be over-taxed [35], and many users were likely to be left bewildered. For such enquiries, it would be better that they consult instead the Directory which each expert map compiler was instructed to prepare for every name and feature marked on the map base. Among the data in each concise Directory entry [36] is a record of which among the five periods the name or feature is attested for.

#### *Map compilation*

By mid-1989 the fundamentals were in place: my vision for the scope and nature of the atlas was in broad measure determined, along with its base materials and a layout. The next vital step had to be the compilation, design and production of a specimen map. Funding applications would hardly be competitive without such tangible testimony that the broader vision could be implemented effectively. At the same time the exercise would resolve a great array of design issues; it would also clarify in detail what the regional experts who compiled the maps needed to supply to Donnelley's team, and in what format. For this purpose, Clive Foss (then at the University of Massachusetts, Boston) courageously volunteered to undertake the compilation of the 1:500,000 scale doublespread that appears (revised) in the published atlas as Map 52 *Byzantium*. Jeannine Schonta at Donnelley designed it with sensitivity and insight. It was completed along with a key, then printed by Meriden Stinehour, Lunenburg, Vermont, and delivered just in time to accompany the first major funding application made by the project, to the National Endowment for the Humanities, on September 1, 1990. [Fig. 7]

The funding awarded in mid-1991 as the result of that application made it possible for APA to issue contracts to the expert map compilers [37], for base materials to be ordered, and for a project office to be set up in Chapel Hill, NC. [38] Without question, the inspiring impression created by the specimen map played a decisive role in launching work on the atlas proper. In addition, as anticipated, the making of this map provided sharp lessons for refining the relationship between compiler, editor and cartographic team. The two former both had to recognize that the team

*“... the timespan encompassed by the atlas should be from the end of the Bronze Age . . . to the emergence of Islam in mid-seventh century A.D.”*

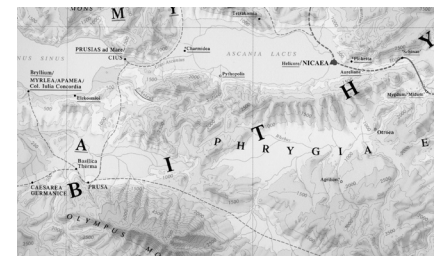


Fig. 7 Part of the specimen map at 1:500,000 as printed in 1990 (a revised version of which appears in the published atlas as 52 *Byzantium*). The colors developed to differentiate single-period features stand out distinctively. Note that physical elevations are enhanced by incorporation of the TPC series shaded relief element. However, its incorporation in the next map at this scale to go into production (54 *Epirus-Acarnania*) proved far less satisfactory, because in this more mountainous region it overwhelmed the elevation tints and single-period colors. Consequently, after much fruitless experimentation, the decision was taken to drop the use of the shaded relief element throughout. (see page 76 for larger color version)

*“ . . . I soon gained respect for cartographers’ unwavering attention to accurate detail of every kind, and grasped the need to convey this to my unsuspecting fellow scholar-compilers.”*

*“ . . . spreading the work so widely acted to limit the damage liable to be inflicted by compilers who sooner or later defaulted on their commitment, or proved unable to furnish materials of acceptable standard.”*

would not presume to contribute in any way to the map’s content; rather, it would just reproduce precisely and exclusively whatever was supplied to it through the editor. I applaud this as a sound and practical form of working relationship, but adjustment to it inevitably took practice. So, if the linework drawn for a road by the compiler was meant to continue until it touched a settlement symbol, but actually stopped a little short on the herculene (frosted mylar overlay) supplied to Donnelley, then on the proof it would duly stop short. Consequently, as editor, I soon gained respect for cartographers’ unwavering attention to accurate detail of every kind, and grasped the need to convey this to my unsuspecting fellow scholar-compilers.

It must be appreciated that few of these eighty and more scholars had ever compiled a definitive map before, so that it was imperative to furnish them with full, precise instructions for every aspect of how they were expected to proceed – in particular, which type of data was to be marked on each of the eight pin-registered herculenes (on the correct, frosted side!), and with which color pencil, when superimposed on the four or more physical landscape elements (film positives) comprising a map’s base. [39] Equally important was the compiler’s organization of a potential sheaf of type lists, which had to accommodate, for example, five possible sizes for settlement names, as well as single-period colors and other variants. Discrepancies between a compiler’s overlays and type lists (and Directory entries too) always had to be of concern to the map editor in the project office.

It was no surprise that the need to accustom so many experts to the novel requirements of mapmaking turned out to be laborious and sometimes inefficient, but the best knowledge of the classical world’s many different regions could only be tapped in this way. In addition, spreading the work so widely acted to limit the damage liable to be inflicted by compilers who sooner or later defaulted on their commitment, or proved unable to furnish materials of acceptable standard. As it turned out, instances of both types of embarrassment did occur, but thankfully in small numbers and early enough to remedy. Over the years I organized several group meetings of compilers on both sides of the Atlantic to demonstrate techniques and discuss problems; these occasions were invaluable for identifying difficulties and overcoming them.

More generally, there is no question that completion of the atlas was speeded by the unprecedented ease of communication that the 1990s offered – not only telephone and express courier services, but also fax, email and ‘floppy disks.’ [40] Even so, it remained a constant cause of concern that original herculenes marked up by compilers would be lost through theft, fire or other damage. To xerox them was impractical. Despite the expense, the only recourse was for Donnelley to reproduce them photographically as plastic positives. As a vital precaution, this was always done without delay; thereafter no set of original herculenes and all the copies made of it were ever kept in the same building overnight. So when a set of original herculenes later undergoing independent evaluation was left inadvertently in a Paris telephone box and never recovered, it proved possible to rely instead on the plastic copies that had been made. Throughout the project, as it turned out, loss of materials, or damage to them, were miraculously slight.

In practice, compilers’ submissions varied in the degree to which they fulfilled every requirement in the instructions. This was hardly remarkable, however, given that the instructions grew to fill twenty pages single-spaced, and that it is typical for hundreds of names in different categories and sizes to be marked on a single map, quite apart from linework that

often included complex deletions and additions called for by landscape changes. Most slips and inconsistencies in type lists were readily enough caught by the map editor and her assistants in the course of the extensive checking to which all material was subjected on arrival. Imprecisely or incompletely drawn linework posed tougher challenges, however, and many herculeses were redrawn before being forwarded to Donnelley.

Several compilers chafed at not being permitted to mark categories of data to which they attached importance for their areas, but which I had determined (reluctantly in some instances) that the atlas should exclude throughout. Even so, extreme frustration with compilers' departure from the instructions was rare, because most had the prudence to consult the project office before proceeding too far. Just one compiler, fortunately, was cavalier enough first to set aside the map base supplied and then to mark a great quantity of data on a different base instead (albeit at the same scale); only at a very advanced stage did this scholar contact the project office with a complaint that the two bases would not match. It is true that another compiler had been intending to mark all his data on bases of his own at 1:250,000 before transferring it to the base supplied at 1:500,000; but mercifully he articulated this intention before proceeding with it. A third compiler insisted that every site marked on maps for his area at 1:50,000 must be shown on the one he was preparing for the atlas at 1:500,000. Repeated warnings that he would need to be more selective for the latter scale did not deter him until his draft compilation for the atlas had all but disappeared under a blizzard of point symbols; he then finally acknowledged the need to begin all over again with a different approach. [41]

The overlap between maps where land coverage continues did more to hamper map production than anticipated. At the planning stage, it seemed essential to assist users of the atlas by incorporating it, and I remain convinced of its value. Even so, a stream of difficulties arose in implementing it. Ideally, production of any map requiring overlap at the same or a greater scale on any side should not begin until the compilations for all those adjacent maps are ready for production too. In practice, of course, it was impossible to wait so long in every case; to pay project office staff to do nothing for a period would be counterproductive, and if Donnelley's experienced team were to be sent no work, then they would be dispersed and assigned elsewhere. In some instances, predictably, an overlap area was slim and the amount of work it demanded minimal; the same compiler might even be responsible for one or more of the adjacent maps. After due consultation, therefore, it could seem safe enough to authorize production without having yet received all the adjacent compilations.

Much had to depend on how closely compilers adhered to the dates by which they had initially agreed to submit their work. Broadly speaking, the plan was to produce the larger-scale (1:500,000) maps in a first phase (1993-95), followed by a second one (1995-97) for the maps at 1:1,000,000. In practice, as was only to be expected, frequent adjustment was called for as time went on because compilers delivered late, and in a few instances very late. [42] Such delays could be compounded in the case of maps where the compilation had to be divided between two or more scholars – typically along modern national boundaries, because survey, exploration and publication of their results are organized thus. So Map 89, for example, called for scholars with expertise on Turkey, Syria, Iraq and Iran all to co-ordinate and deliver their work, even before the matter of this map's overlap with several others could be addressed. In a few instances the compilers of adjacent overlapping maps were actually unable to agree on what should be marked in the area they shared, so for the sake of main-

*“... extreme frustration with compilers' departure from the instructions was rare . . .”*

*“The overlap between maps where land coverage continues did more to hamper map production than anticipated.”*



taining consistency it then fell to me to make the final determination. Such disagreements aside, it was often a severe trial for both the project office and Donnelley to ensure that consistency was maintained in an overlap, especially if more than two maps were involved (as at the conjunction of Maps 24, 25, 26 and 27, for instance), and if there were linework continuations.

The case of Maps 44 and 45 was the most exacting one in almost all respects, not because the compilers disagreed (on the contrary, they collaborated well), but simply because the overlap area here is so extensive and 'busy'. Had I been more wary of the potential pitfall, I might have striven harder to reduce this overlap when creating the atlas layout. The likely obstacle then, however, would have been the perennial difficulty of accommodating the Italian peninsula deftly to maps oriented north. In the project's second phase of map production, digitization did prove to be of special value for ensuring speedily and efficiently that overlap coverage matched; but it could help only at the smaller scales, [43] and not therefore between 44 and 45, let alone between 43 and 44.

#### *Timing*

More than one observer has reflected that the project to create the *Barrington Atlas* was unfortunate in its timing. [44] Had its launch been delayed by only a few years, the suggestion goes, the atlas could have been fully digital and therefore immediately more versatile. The sentiment is well-intentioned, but I am not fully persuaded by it. It is true that the atlas is an extraordinary, not to say unique, hybrid: the three maps at 1:150,000, and all but three of those at 1:500,000, were produced by the traditional film-based method, and the remainder were produced digitally [45]. This second, larger group – approaching 60 per cent of the atlas maps – is impressive testimony to Donnelley's skill in exploiting successive advances in technology from the early 1990s onwards, when the Digital Chart of the World was first released, and when I resolved that all production of the smaller-scale maps for the atlas should be digital from the outset. That novel production method, however, [46] did not alter the established means by which the expert compilers would assemble their data and mark it on herculean superimposed on film-positive bases. Any notion that they might have made this mark-up electronically direct onto a monitor, I might add, is sheer futuristic fantasy. Even had it been practical to supply materials by this means, at that time few of these scholars worldwide had the capacity or the equipment to manipulate them in this medium.

In addition, from the project's short-term perspective, the hard fact was that digital production increased costs substantially rather than lowering them. The first edition of the Digital Chart of the World turned out to fall far short of its printed counterpart in quality of coverage. In part, this stemmed from conscious decisions, such as to omit all contours below 1,000 ft., for example; accordingly, Donnelley added in the 500 and 250 ft. contours. [47] But there were also countless instances where the scanning of the linework for physical landscape had been done with poor attention to detail (by accident or design, the rendering of Libya was especially defective, for instance), and the extra cost for Donnelley to bring it up to the standard of the printed ONC sheets was considerable.

Over time, it is true, digital production justified the initial high outlay, and it will continue to do so. At each proof stage (most maps were permitted two, and no more), correction and adjustment of film-based materials were unavoidably expensive by comparison, in particular the second time

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round when multiple elements might have to be re-shot in order to accommodate minimal changes. In a few instances therefore, on cost grounds, I forbore to make small changes in second proof that were not vital, although they would have been desirable [48].

In retrospect, it is the failure of APA's first atlas project to achieve anything that I would single out as the most fortuitous twist of fate. Had it proceeded from its inception in the early 1980s at approximately the same pace as its successor, the results would have been published in the early 1990s with the same outward appearance, but as an exclusively film-based production comprising materials that offered no potential for further exploitation. Whether the successor project should have waited before proceeding, I am far from sure. Perfect timing for any project is hard to achieve. In this case the need for the atlas envisaged was patent, and already long unfulfilled. No-one could predict how swiftly and how usefully digital technology would advance; in the late 1980s, it should be remembered, even fax and email were still emerging novelties to most scholars. Fortunately, all work for the *Map-by-Map Directory* could be computerized from the start, and so was able to proceed much faster and more efficiently (in the final stages especially) than would ever have been possible by use of the old conventional means.

A wait at the end of the 1980s – for how long in the first instance? – might only have led to further postponements as the technology of mapmaking turned out to experience dramatic, rapid change throughout the 1990s. My hunch is that, the longer the wait, the tougher it would have been to decide what to attempt. The new technology opened up an exciting, but also bewildering, array of possibilities, and that prospect could easily have encouraged prematurely ambitious plans. [49] At the risk of sounding over-cautious, I would claim that the plans for the atlas turned out to gain far more from the 1990s revolution in mapping technology than they lost. The need to rely exclusively on established conventional methods when the plans were made at the end of the 1980s discouraged any attempt to do more than lay the comprehensive foundation which was so badly lacking. This was labor enough in view of the immensity of the classical world and the complete lack of maps of many of its regions as they were in antiquity; here, the arduous pioneer work of gathering, assessing and synthesizing the mass of relevant data still had to be undertaken from scratch. The good fortune was that, as the 1990s advanced and digital technology developed, it could be harnessed to achieving the project's goals. As a result, the atlas is truly a transitional product. It achieved publication less than a year later than originally envisaged (in 2000, rather than 1999, minimal delay for a project of this size and complexity), [50] and it now forms the springboard for initiatives never even dreamed of at the outset. [51]

#### *Future prospects*

Hard though it is to believe today, everyone at the initial stage, in the late 1980s, regarded the atlas as an 'end', the definitive provision of a vital missing tool. Nobody foresaw then that, even before achieving publication, the atlas would appear rather to be only a beginning which opens the way to further mapping of many kinds. The University of North Carolina, Chapel Hill, merits gratitude for recognizing this potential by sponsoring the launch of an Ancient World Mapping Center to exploit it. [52] Bringing all the *Barrington Atlas* maps into a fully georeferenced format is one of the Center's early priorities, now well on its way to realization. Moreover, in place of the single map to cover all periods within the timespan of the

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*“... it still seems to me a minor miracle that the exceptional collaborative effort to create the atlas succeeded.”*

atlas, preparation of up to five successive ‘period’ versions now becomes a practical proposition in each case, with use of the ‘period of occupation’ data already assembled for each map’s Directory. Maps can be updated, too, as well as adapted and reissued in alternative formats; the range of possibilities is extraordinary. [53]

It is the technological revolution that transformed cartography during the 1990s which has given the achievement of the *Barrington Atlas* such unanticipated lasting value. Holdsworth’s wry comment that “perhaps the ultimate power statement in historical geography is revisionism that allows no subsequent revision due to prohibitive cost” [54] no longer holds good. The *Barrington Atlas* as published in 2000 will remain as a fixed foundation, but hereafter every component of it and its accompanying Directory stands ready to accommodate change as required. This is truly a more rewarding outcome than could ever have been sought for all the effort that went into the making of the atlas, especially when (in my estimation) the foundation laid was the right one regardless of technology. [55] Remembering how grim the outlook appeared at the start, not to mention the hazards of every kind encountered along the way, it still seems to me a minor miracle that the exceptional collaborative effort to create the atlas succeeded. All the same, it was a close run thing. I would be the last to dispute Dean’s caution in the Foreword to the HAC volume 1: “No good atlas exists that did not cost more than was expected and take longer to produce than was projected.”

#### Notes

1. R.J.A. Talbert (ed.), with *Map-by-Map Directory* (this latter both on CD-ROM and in two-volume printed format), Princeton and Oxford, 2000.
2. W.G. Dean (director), three vols., 1 (1987), 2 (1993), 3 (1990), Toronto.
3. J. Winearls (ed.), Toronto, 1995.
4. For overview and discussion, see R.J.A. Talbert, “Mapping the classical world: major atlases and map series 1872-1990,” *Journal of Roman Archaeology* 5 (1992) 5-38.
5. R.S. Bagnall (ed.), *Research Tools for the Classics: the Report of the American Philological Association’s Ad Hoc Committee on Basic Research Tools* (Chico, 1980), 27.
6. Publication was by Dietrich Reimer, Berlin, 1894-1914. There has been one reprint – to which I contributed an Introduction – by Edizioni Quasar (Rome, 1996). See further L. Zögner, *Antike Welten, Neue Regionen: Heinrich Kiepert 1818-1899* (Berlin, 1999).
7. On the production of this atlas, see further R.J.A. Talbert, “Carl Müller (1813-1894), S. Jacobs, and the making of classical maps in Paris for John Murray,” *Imago Mundi* 46 (1994) 128-50. Subsequently, by happy accident, I rediscovered the engraved copper plates of these very maps in the vault of the John Bartholomew Co., Edinburgh; they now form part of the Bartholomew Archive in the Map Library of the National Library of Scotland.

8. Since 1957 its sponsor has been the Union Académique Internationale ([www.uai-iaa.org](http://www.uai-iaa.org)). For reports, see the annual *Compte Rendu* of that body (Projet VIa), in particular (among recent years) 1999 pp. 52-56.
9. Initially by Croom Helm. The current publisher is Routledge.
10. Winearls [above, n. 3], 164 (italics are mine). Annual reports on the progress of APA's Classical Atlas Project were published in the Association's *Newsletter*.
11. Winearls, 137.
12. This atlas, published by Reichert, Wiesbaden, was begun in 1972 and completed in 1994: [www.reichert-verlag.de/](http://www.reichert-verlag.de/) offers full information.
13. This title for the work (which I use hereon) was eventually settled upon in recognition of the support furnished by the largest individual contributor to its funding, Robert B. Strassler; his family home is at Great Barrington, Mass. A full list recognizing all contributors appears at the front of the volume. The necessity of ensuring that sufficient funds were always available to sustain map production on schedule without a break was a vital – and persistently nerve-wracking – dimension of the project not treated in this article. During the peak period of activity in the late 1990s, Donnelley's quarterly billings were in the region of \$250,000. The project's total costs were to exceed U.S. \$4.5 million, a massive sum by the standards of the humanities, but in fact low for all that was achieved.
14. Begun in 1966 under the sponsorship of the Österreichische Akademie der Wissenschaften and still actively in progress ([www.oeaw.ac.at/tib/](http://www.oeaw.ac.at/tib/)); note also the reports (most recently by J. Koder as Director) to successive meetings of the International Congress of Byzantine Studies.
15. In 2000, when the atlas went to press, its printer Eurografica S.P.A., Vicenza, Italy, amply fulfilled expectations in this very demanding respect.
16. Map 57, an overview of the Aegean, exploits this option to an exceptional extent in order to include places of importance. Many maps in the range from 64 down to 80 'bleed' extensively off their lower margins in order to permit less tight continuation of coverage from one map to the next.
17. Winearls, 152-53.
18. L.J. Cappon (ed.), Princeton, 1976.
19. Winearls, 166; note Holdsworth's further comment on 188.
20. Geosystems, 1994-98; MapQuest.com, Inc., thereafter. In order to avoid confusion, I refer to the team as "Donnelley" throughout the present discussion.
21. For the members of Donnelley's cartographic team, see *Barrington Atlas*, xv. Donnelley's summary record of map production and all



exchanges with myself and the project office from summer 1989 to spring 2000 comprises twenty-eight thick binders now held by the Ancient World Mapping Center at the University of North Carolina, Chapel Hill (see further below).

22. Compare Dean's novel demand for the *Economic Atlas of Ontario* (Toronto, 1969): "Yet another most critical event with this atlas was justly placing the cartographer's name in the same type size on the title page alongside that of the editor. This was done over the vehement objections of the publisher accustomed to thinking of a cartographer in the same category as the illustrator of a book" (Winearls, 145). While I trust that the published *Barrington Atlas* duly offers its cartographers the prominence and praise they richly deserve, it remains the case perforce that much of their design work and their skilled adjustment and improvement of the map bases will never be identified as such by most users of the atlas, and hence unfortunately never appreciated for their full worth.
23. *The International 1:1,000,000 Map Report for 1938* (Southampton), 6; see further *Journal of Roman Archaeology* 5 (1992) 19, cited above (n. 4).
24. See Map 74 and its accompanying text in the *Map-by-Map Directory*. In fact, all the great river deltas gave rise to comparable difficulty.
25. Most recent in 2001 (1:625,000 scale).
26. In some remote regions – parts of Libya, for example, on ONC H3 and H4 – physical landscape data was missing, and therefore had to be imported from other maps.
27. To be sure, in the event of a choice, it might have been preferable to adopt metric measurements for the atlas; but there was no such choice. By the same token, to convert all figures and redraw all contour linework to metric intervals would have been grossly wasteful. A scalebar in both miles and kilometres accompanies each map, and there are bars for the elevation tints likewise on the foldout Map Key page. Contour intervals are the only figures of measurement to appear on the maps; all spot-heights marked on the base series are removed.
28. A list of all map bases used appears in *Barrington Atlas*, xxix. As it turned out, no use was made of the JNC (1:2,000,000) series.
29. Later into the project, the availability of DCW's large seamless 'tiles' permitted some advantageous adjustments which earlier it had been judged impractical to implement. Notably, the bottom margin of Map 86 (its upper part all open water) could now be dropped to extend well below ONC F-3's bottom sheet-line at latitude 40 00, greatly improving the continuation to Maps 62 and especially 63, both at 1:500,000.
30. Hence the arrows pointing to Gat, Zella and certain other oases situated beyond the scope of the atlas.
31. Fortunately the base it required was the GNC sheet already ordered for Map 1.

32. Map 1 uniquely comprises a doublespread with a foldout continuation equivalent to a third page so that the entire Mediterranean can appear on a single map. A few very isolated islands (Ustica, Aethusa, Lopadusa, for example) are only shown here because at larger scales much open water is omitted. I now realize that one such island group with an ancient name – Strophades, south of Zacynthus at lat. 37 15N, long. 21 00E – was inadvertently overlooked altogether.
33. Such maps might have been hoped for in R. Stillwell et al. (eds.), *The Princeton Encyclopedia of Classical Sites* (Princeton, 1976), but it offers none. Even the third edition of the *Oxford Classical Dictionary* (edd. S. Hornblower and A. Spawforth, Oxford, 1996) makes no apology for its complete lack of maps (see p. ix), and in fact seldom refers to any.
34. Range and variety are well illustrated by, for example, the *Atlas historique des cadastres d'Europe* series edited by M. Clavel-Lévêque et al. (Luxembourg, vol. 1, 1995; vol. 2, 2002), and L. Haselberger et al., *Mapping Augustan Rome* (Journal of Roman Archaeology Supplementary Series, no. 50, Portsmouth, RI, 2002), the latter a most welcome city-plan.
35. It could otherwise remain limited to five inks (and did) – the standard four (cyan, magenta, yellow, black) and a custom brown. Each further ink used increases costs, and complicates printing (note the slight misregistration of Late Antique orange in Map 67, which only surfaced on press, and could not be corrected). *Tabula Imperii Byzantini* maps – printed at government expense – incorporate a complex color-coding scheme for periodization.
36. Headings for each entry are: grid square; name as marked on the map; period(s) of occupation; modern name/location; reference(s) to publication(s) where fuller information may be found.
37. Over seventy worldwide came to be engaged, grouped under ten further colleagues who served as regional supervisors ('vicars'); draft compilations were sent to almost 100 more experts for independent evaluation which proved invaluable. For names, see *Barrington Atlas*, xi and xiii-xiv respectively.
38. Susan Jenny began as project manager early in 1992 and continued in the post until summer 1999, when there was no longer the need for it. Two successive map editors each served for three years, Drs. Mary Downs (1993-96) and Joann McDaniel (1996-99). Altogether, for administration and editing the project benefited greatly from the kind of continuity in personnel that also served the HAC so well (Winearls, 157, 182).
39. For further details, see *Barrington Atlas*, xxvii.
40. HAC, with its far earlier start, was able to benefit much less in these ways, as Dean points out (Winearls, 157).
41. HAC, too, had to face the problem of contributors who were tempted to overload their maps (Winearls, 194 n. 3).

42. Two factors saved the overall production schedule from slipping behind, however: unexpectedly *early* delivery by some compilers, and (ironically) the sheer immensity of the project. Often the plan to move ahead next in one area had to be postponed, therefore, because a compilation or two were still missing; meantime, on the other hand, it had become possible to bring forward the work for another area.
43. In particular between Maps 1 and 3, for example; also 5 and 6.
44. Note, for example, S.E. Alcock, H.W. Dey and G. Parker, "Sitting down with the *Barrington Atlas*," *Journal of Roman Archaeology* 14 (2001) 454-61 at 461.
45. The three digital 1:500,000 maps (17, 47, 68) had all suffered severe delays of various kinds at the compilation stage, and were the last at this scale to go into production.
46. Its five phases are summarized in *Barrington Atlas*, xxvii-xxviii. Both to reduce the risk of error and to contain costs, all the scanning overlays for phase 3 were created by the map editor in the project office rather than by Donnelley. This placed an extra burden on her, as well as adding to a "veritable snowstorm of paper" (and hercules) in the cramped confines of the office, comparable to that generated by the HAC (to cite Dean's phrase in *Winearls*, 157).
47. No 250 ft. contour was added to all or part of certain maps where the landscape hardly called for it. The omission is noted in the margin in each such instance; see, for example, Maps 9 and 86.
48. Hence, for example, on Map 62 D3 the underline for *Türkmen Baba* is not wholly orange as it should be.
49. Note Holdsworth's cautions on the transition to computerized cartography (*Winearls*, 193). For HAC, this only began successfully in 1990, after three earlier attempts at computerization had all failed "because of excessive costs or inadequate technology or both" (Dean in *Winearls*, 149, 152). By then only volume two of the three in the set remained to be completed, and funds were perilously low. It was computerization that made completion possible, with fifty of this volume's fifty-eight plates produced thus, all of them indistinguishable in appearance (as in the case of the *Barrington Atlas*) from those produced conventionally.
50. The original estimate that the first volume of the HAC could be delivered in three years proved "simply wrong" (Cole Harris in *Winearls*, 164).
51. A brief note on funding is in order before leaving the issue of timing. To raise the necessary support for the atlas was challenge enough during the 1990s; thereafter (as is now all too clear) the economic downturn is likely to have made it impossible, and the entire effort might well have foundered at an advanced stage.
52. I advocated such a center in "Maps for the classical world: where do we go from here?," *American Journal of Philology* 118 (1997) 323-27.

53. The Center's activities and prospects are discussed in a chapter "Mapping the ancient world" contributed jointly by Tom Elliott, the current director, and myself to A.K. Knowles (ed.), *Past Time: Past Place; GIS for History* (Redlands, Ca, 2002), 145-62. For up-to-date information, visit [www.unc.edu/awmc](http://www.unc.edu/awmc).
54. Winearls, 195 n. 14.
55. For comparable choice of goal by a project which began recently enough to use NIMA's VMAP0 (the 'successor' to DCW) as its base, note S. Parpola and M. Porter (eds.), *The Helsinki Atlas of the Near East in the Neo-Assyrian Period* (Casco Bay Assyriological Institute, Chebeague Is., Me, 2001).