

1 · The Map and the Development of the History of Cartography

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THE HISTORICAL IMPORTANCE OF THE MAP

The principal concern of the history of cartography is the study of the map in human terms. As mediators between an inner mental world and an outer physical world, maps are fundamental tools helping the human mind make sense of its universe at various scales. Moreover, they are undoubtedly one of the oldest forms of human communication. There has probably always been a mapping impulse in human consciousness, and the mapping experience—involving the cognitive mapping of space—undoubtedly existed long before the physical artifacts we now call maps. For many centuries maps have been employed as literary metaphors and as tools in analogical thinking.¹ There is thus also a wider history of how concepts and facts about space have been communicated, and the history of the map itself—the physical artifact—is but one small part of this general history of communication about space.² Mapping—like painting—precedes both written language and systems involving number, and though maps did not become everyday objects in many areas of the world until the European Renaissance, there have been relatively few mapless societies in the world at large. The map is thus both extremely ancient and extremely widespread; maps have impinged upon the life, thought, and imagination of most civilizations that are known through either archaeological or written records.

Any appreciation of the historical importance of maps depends upon a clear conception of their nature, of the factors that have shaped their making and transmission, and of their role within human societies. In these respects the starting assumption is that maps constitute a specialized graphic language, an instrument of communication that has influenced behavioral characteristics and the social life of humanity. Maps have often served as memory banks for spatial data and as mnemonics in societies without printing. Scholars over the centuries have been convinced of the eloquence and expressive power of maps, which can speak across the barriers of ordinary language. A group of American historians has asserted that maps “constitute a common language used by men of different races and tongues to express the relationship of their society . . . to a geographic envi-

ronment.”³ In the *History of Cartography* we have gone further and accepted language as a metaphor for the

I owe a considerable debt to those who have helped me formulate the ideas as well as the substance in this inevitably eclectic essay. Alan R. H. Baker (University of Cambridge) provided, through his theoretical writings, the initial stimulus to search for a deeper understanding of the place of maps in history, while the late R. A. Skelton, by his outstanding example of fertile scholarship, long ago convinced me that the history of cartography constitutes a discrete and important field of study. Among those who contributed material to an earlier draft of this Introduction, I am especially grateful to John Andrews (Trinity College, University of Dublin), Michael J. Blakemore (University of Durham), Christopher Board (London School of Economics and Political Science), Tony Campbell (British Library), Catherine Delano Smith (University of Nottingham), O. A. W. Dilke (University of Leeds), P. D. A. Harvey (University of Durham), Francis Herbert (Royal Geographical Society), Roger J. P. Kain (University of Exeter), Cornelis Koeman (University of Utrecht), Monique Pelletier (Bibliothèque Nationale), David B. Quinn (University of Liverpool), Günter Schilder (University of Utrecht), Gerald R. Tibbetts (Senate House Library, University of London), Sarah Tyacke (British Library), Vladimiro Valerio (University of Naples), and Denis Wood (North Carolina State University), and Lothar Zögner (Staatsbibliothek Preußischer Kulturbesitz).

1. The extent to which the map has become an almost universal metaphor is indicated by the second definition of a map in *Webster's Third New International Dictionary of the English Language* (1976): “something (as a significant outward appearance, a pointed or concise verbal description) that indicates or delineates or reveals by representing or showing with a clarity suggestive of that of a map.” For a discussion of the importance of the map analogy in scientific research, see Stephen Toulmin, *The Philosophy of Science: An Introduction* (London: Hutchinson University Library, 1953), esp. chap. 4, “Theories and Maps,” 105–39. For a recent example of the sustained use of the map analogy in teaching the history and philosophy of science, see units 1–3 in *Mapping Inquiry* (Milton Keynes: Open University Press, 1981). The present *History* cannot be systematically concerned with the development of these metaphorical uses, although it should be borne in mind that in various societies they may provide some index of how much familiarity and sophistication in handling maps writers assumed among their audience or readers.

2. This wider history would include, for example, the study of spatial representation in architecture, dance, drama, geometry, gesture, landscape and town plans, music, and painting as well as in oral speech and written language. Such a list serves also as a guide to topics that are not systematically considered within the *History* even where they provide examples of communication that was spatial in intention.

3. Frank Freidel, ed., *Harvard Guide to American History*, rev. ed., 2 vols. (Cambridge: Belknap Press of Harvard University Press, 1954), 1:44–47, where the importance of maps in the history of geographic exploration, diplomacy, economic development, social planning, and

way maps have been used in past societies as well as a means of tracing their spread through time and space. We must accept, although our general position is founded in semiology, that precise scientific analogies to the structure of language may be impossible to sustain;⁴ but as a general metaphor, helping to fashion an approach to the history of cartography, the concept of a graphic language—and the map as a graphic text—is valid. The significance of maps—and much of their meaning in the past—derives from the fact that people make them to tell other people about the places or space they have experienced. This implies that throughout history maps have been more than just the sum of technical processes or the craftsmanship in their production and more than just a static image of their content frozen in time. Indeed, any history of maps is compounded of a complex series of interactions, involving their use as well as their making. The historical study of maps may therefore require a knowledge of the real world or of whatever is being mapped; a knowledge of its explorers or observers; a knowledge of the mapmaker in the narrower sense as the originator of the artifact; a knowledge of the map itself as a physical object; and a knowledge of the users (or—more likely—the community of map users). The *History of Cartography* is concerned, as far as possible, with the historical process by which the graphic language of maps has been created and used. At once a technical, a cultural, and a social history of mapping, it rejects the view of a historian of discovery who wrote that “cartographical studies do not come within the sphere of social history.”⁵ On the contrary, it favors an approach that is potentially capable of exploring the behavioral and ideological implications of its subject matter.

A major problem in assessing the importance of maps for the historical study of society is the paradox constituted by the map itself. On the one hand, the map appears at first sight as a relatively simple iconic device. Indeed, much of its universal appeal is that the simpler types of map can be read and interpreted with only a little training. Throughout history—though ways of looking at maps have to be learned even within oral societies—formal literacy has not been a precondition for them to be made or read. An anthropologist has remarked that “the making and reading of two dimensional maps is almost universal among mankind whereas the reading and writing of linear scripts is a special accomplishment associated with a high level of social and technical sophistication.”⁶ Thus maps have been associated with cultures that differ widely in social or technological development, while modern psychological research has shown that children can derive meaning from maps (and indeed draw them) from an early age.⁷ There is an immediacy about the message in a map that makes

it more readily perceived than knowledge encoded in other ways. One of the map’s properties is that it can be taken in quickly by the eye, contributing to the potency of cartographic images. It has been said that maps have an “extraordinary authority,” even when they are in error, that may be lacking in other forms of images.⁸

warfare is especially stressed. See also Carl O. Sauer, “The Education of a Geographer,” *Annals of the Association of American Geographers* 46 (1956): 287–99, esp. 289, where he wrote that “the map speaks across the barriers of language; it is sometimes claimed as the language of geography.”

4. Arthur H. Robinson and Barbara Bartz Petchenik, *The Nature of Maps: Essays toward Understanding Maps and Mapping* (Chicago: University of Chicago Press, 1976), discuss the analogy at length. It is also rejected as an exact analogy by J. S. Keates, *Understanding Maps* (New York: John Wiley, 1982), 86, although he continues to employ it as a metaphor for the way maps “can be studied as ordered structures.” Another recent discussion is C. Grant Head, “The Map as Natural Language: A Paradigm for Understanding,” in *New Insights in Cartographic Communication*, ed. Christopher Board, Monograph 31, *Cartographica* 21, no. 1 (1984): 1–32, and Hansgeorg Schlichtmann’s “Discussion” of the Head article, *ibid.*, 33–36. Our context in relation to semiology is that maps form a system of signification. This is defined by Roland Barthes, *Elements of Semiology*, trans. Annette Lavers and Colin Smith (New York: Hill and Wang, [1968]), 9: “Semiology . . . aims to take in any system of signs, whatever their substance and limits; images, gestures, musical sounds, objects, and the complex association of all these, which form the content of ritual, convention or public entertainment: these constitute, if not *languages*, at least systems of signification.”

5. C. R. Boxer, *The Portuguese Seaborne Empire, 1415–1825* (London: Hutchinson, 1969), 396. It is not suggested that this view is typical; see also note 139 below.

6. Edmund Leach, *Culture and Communication: The Logic by Which Symbols Are Connected: An Introduction to the Use of Structuralist Analysis in Social Anthropology* (Cambridge: Cambridge University Press, 1976), 51.

7. Jean Piaget and Bärbel Inhelder, *The Child’s Conception of Space*, trans. F. J. Langdon and J. L. Lunzer (London: Routledge and Kegan Paul, 1956), esp. chap. 14. Although Piaget and his followers have dominated the study of human intelligence for nearly six decades, stimulating more recently a number of critical assessments as well as *exposées raisonnées*, the spatial aspect has received very little attention in this voluminous literature. Piaget himself produced only one other directly relevant book: Jean Piaget, Bärbel Inhelder, and Alina Szeminska, *The Child’s Conception of Geometry* (New York: Basic Books, 1960). Among recent reassessments of the Piagetian theory in general see Linda S. Siegel and Charles J. Brainerd, *Alternatives to Piaget: Critical Essays on the Theory* (New York: Academic Press, 1978), and Herbert Ginsburg and Sylvia Opper, *Piaget’s Theory of Intellectual Development*, 2d ed. (Englewood Cliffs, N.J.: Prentice-Hall, 1979). Piaget’s ideas have also been adapted in an attempt to provide a genetic epistemology for the study of images as cultural forms in general; see, for example, Sidney J. Blatt, *Continuity and Change in Art: The Development of Modes of Representation* (Hillsdale, N.J.: Lawrence Erlbaum Associates, 1984). This concept—for example, as manifest in the use of topological versus Euclidean geometry in maps—has not been applied to the history of cartographic representation and does not appear to coincide with the cultural sequences that can be observed empirically in this volume.

8. Arthur H. Robinson, “The Uniqueness of the Map,” *American Cartographer* 5 (1978): 5–7. Kenneth E. Boulding, *The Image* (Ann

On the other hand, however simple maps may appear at first sight, on analysis they are almost certainly less than straightforward. Mapmaking is not a simple inborn skill, even among “primitive” peoples, as believed by an earlier generation of scholars. Moreover, maps are two-dimensional combinations of “shapes, sizes, edges, orientation, position, and relations of different masses”⁹ that require painstaking interpretation in relation to their original purpose, their modes of production, and the context of their use. Maps created for one purpose may be used for others, and they will articulate subconscious as well as conscious values. Even after exhaustive scrutiny maps may retain many ambiguities, and it would be a mistake to think they constitute an easily readable language. Maps are never completely translatable. Historians cannot be alone in suggesting that they find maps an intractable form of evidence and “slippery witnesses” of the past.¹⁰ In some respects—even after the development of a more sophisticated vocabulary of cartographic signs—maps are no less imprecise than written language. Although a key or legend may be provided, a line, a dot, or a color, for instance, may have had several meanings, both manifest and latent, and it is unwise to assume that identical cartographic signs have similar meanings, or even a common origin, when found in different cultures. Thus even today, despite notable advances in the theory of cartography,¹¹ maps remain “a complex language . . . whose properties we know very little about.”¹² The proper understanding of maps, like that of any other ancient or modern language or like the reading of art or music, is a major challenge, even more so since contemporary cartographers are still trying to decide the “grammar” of current maps so that we can better understand how they are used. As representations of belief and ideology—rooted in particular cultures and institutions—as well as “factual” images of scientific knowledge, maps are increasingly being recognized as touching the subject matter of a wide range of scholarly disciplines. The value of the map as a humanly created document is one of the major themes in the *History of Cartography*.

Making a map, it is often said, involves both art and science. Similarly, if the study of how maps have communicated in the past is starting to reflect the hermeneutic concerns of scholars in many fields, then there are narrower scientific aspects of the history of cartography that are part of the traditional history of science and technology. These latter are the better known. The historical importance of maps has often been indexed to the progress of mapmaking as a scientific and practical skill, and this view is still deeply entrenched in the writings on cartographic history. Gerald R. Crone’s words, written in 1953, that “the history of cartography is largely that of the increase in the accuracy with which

. . . elements of distance and direction are determined and . . . the comprehensiveness of the map content”¹³ still have a measure of acceptance. Other writers have pointed out that the history of the map relates how many have striven to establish cartography as a precise science;¹⁴ that it is concerned with measuring the “rate of cartographic progress”;¹⁵ and that it involves the study of “scientific conquest of the unknown.”¹⁶ The contribution of these approaches is that they have secured for the history of cartography an established place in the traditional histories of science and technology.¹⁷ We also accept that a fundamental theme in the *History of Cartography* is the scientific development of mapping, with its related instrumentation and increasing mathematical sophistication.

Taken alone, however, this aspect fails to provide a balanced view of the development of maps in history. It assumes a linear historical progression and, moreover (somewhat anachronistically), assumes that accuracy of measurement and comprehensiveness were as important throughout the past as they have been in the modern period. Thus it is at least arguable that an overemphasis on the scientific frontiers and the revolutions of mapping, on landmarks and innovations, or on the saga of

Arbor: University of Michigan Press, 1956), 65–68, is among the philosophers who have commented on the authority of the map.

9. Wilbur Zelinsky, “The First and Last Frontier of Communication: The Map as Mystery,” *Bulletin of the Geography and Map Division, Special Libraries Association* 94 (1973): 2–8, quotation on 7–8.

10. J. A. Williamson, *The Voyages of John and Sebastian Cabot*, Historical Association Pamphlet no. 106 (London: G. Bell, 1937), 7; J. H. Parry, “Old Maps Are Slippery Witnesses,” *Harvard Magazine* (Alumni ed.), April 1976, 32–41.

11. See below, pp. 33–34.

12. David Harvey, *Explanation in Geography* (London: Edward Arnold, 1969; New York: St. Martin’s Press, 1970), 370; see also Robinson and Petchenik, *Nature of Maps*, chap. 3 (note 4).

13. Gerald R. Crone, *Maps and Their Makers: An Introduction to the History of Cartography*, 1st ed. (London: Hutchinson University Library, 1953), xi. The work has been published in five editions: 1953, 1962, 1966, 1968, and 1978.

14. C. Bricker and R. V. Tooley, *Landmarks of Mapmaking: An Illustrated Survey of Maps and Mapmakers*, preface by Gerald R. Crone (Brussels: Elsevier-Sequoia, 1968), 5.

15. R. A. Skelton, *Maps: A Historical Survey of Their Study and Collecting* (Chicago: University of Chicago Press, 1972), 106.

16. Lloyd A. Brown, *The Story of Maps* (Boston: Little, Brown, 1949; reprinted New York: Dover, 1979), 4.

17. The systematic attention paid by George Sarton, *Introduction to the History of Science*, 3 vols. (Baltimore: Williams and Wilkins, 1927–48), to the annals of geographical knowledge, including maps, sets the standard in this respect. Short sections on cartography are generally included even in concise histories of science; see, for example, Charles Singer, *A Short History of Scientific Ideas to 1900* (Oxford: Clarendon Press, 1959; reprinted 1966). Earlier volumes of Charles Singer et al., eds., *A History of Technology*, 7 vols. (Oxford: Clarendon Press, 1954–78), contain important essays on cartography and navigation, but cartography is dropped in volumes 6–7, *The Twentieth Century, c. 1900 to c. 1950*, ed. Trevor I. Williams.

how the unmappable was finally mapped¹⁸ has distorted the history of cartography: the historical importance of maps must also be related to the social implications of their varied format and subject matter. As Robinson and Petchenik put it, the map is at once “so basic and has such a multiplicity of uses” that “the variety of its occurrences is vast,” elaborating further that:

There are specific maps and general maps, maps for the historian, for the meteorologist, for the sociologist, and so on without limit. Anything that can be spatially conceived can be mapped—and probably has been. Maps range in size from those on billboards or projection screens to postage stamps, and they may be monochrome or multicolored, simple or complex. They need not be flat—a globe is a map; they need not be of earth—there are maps of Mars and the moon; or for that matter, they need not be of any place real—there have been numerous maps made of imaginary “places” such as Utopia and even of the “Territory of Love.”¹⁹

The historical record, it will be seen, yields a still longer list. In particular, accuracy is not regarded as the sole criterion for including maps as objects for serious study within the *History*. Historiography confirms that, for example, in many cultures crude, distorted, plagiarized, ephemeral, oversimplified, and small-scale maps have been neglected. Such scientific chauvinism dictates that they are often dismissed as not maps at all or labeled as mere oddities or cartographic curiosities. Many early maps were imagined evocations of space rather than realistic records of geography. The pages of the *History* have been deliberately opened up to this wide range of maps, including those created for nonscientific or nonpractical purposes that, although not part of the history of cartographic science in the narrowest sense, are nevertheless part of the history of human communication by means of maps.

What is true of types of maps, whether classified by purpose or by form, is also true of ways they are known to have been used since the cartographic record began. This aspect also has a history of an ever-widening diversity. Crone remarked that “a map can be considered from several aspects, as a scientific report, a historical document, a research tool, and an object of art”;²⁰ but since he wrote it has become much clearer that these scientific, historical, and artistic dimensions by no means exhaust the importance of maps in human terms. Far from being purely practical documents—surrogates of space²¹ or the mind’s miniatures of real distribution²²—maps have played an important role in stimulating the human imagination to reach for the very meaning of life on earth. An appreciation of the way maps have helped shape human beings’ ideas of their relationship to the natural world, and of the way they have acted as doc-

uments in the wider history of ideas, is based on an observation of the frequency—starting in prehistoric times and including nonliterate societies—with which maps have been used as teleological instruments, epitomizing the sacred and mythical space of cosmologies as well as the more tangible landscapes of the real world.²³ There is today a growing awareness of the importance of these other cartographic roles.²⁴ Recognition of the ideological, religious, and symbolic aspects of maps, particularly when linked with a more traditional appreciation of maps for political and practical purposes, greatly enhances the claim that cartography can be regarded as a graphic language in its own right. Maps, we find, are such a basic and universal form of human communication that the *History* has not had to seek its justification in some esoteric backwater in the development of civilization but finds its purposes in some of the most central aspects of human activities.

If these are bold claims for maps, they are based on a conviction of their considerable, yet only partly understood, relevance to the study of the development of human societies. Maps may indeed be a “sensitive indicator of the changing thought of man, and . . . an excellent mirror of culture and civilisation,”²⁵ but they are also more than a mere reflection: maps in their own right enter the historical process, to which they are linked by means of reciprocally structured relationships. The development of the map, whether it occurred in one

18. A recent extreme example of this emphasis on the “scientific heroes” of map history is John Noble Wilford, *The Mapmakers* (New York: Alfred A. Knopf; London: Junction Books, 1981); see the review by Denis Wood, *Cartographica* 19, nos. 3–4 (1982): 127–31.

19. Robinson and Petchenik, *Nature of Maps*, 15 (note 4).

20. Crone, *Maps and Their Makers*, 1st ed., ix (note 13).

21. Robinson and Petchenik, *Nature of Maps*, 86 (note 4).

22. The phrase is that of Robert Harbison, *Eccentric Spaces* (New York: Alfred A. Knopf, 1977), chap. 7, “The Mind’s Miniatures: Maps,” 124–39.

23. For an introduction to examples of such sacred and mythical conceptualizations but surprisingly without explicit reference to the literature of the history of cartography see Yi-Fu Tuan, *Topophilia: A Study of Environmental Perception, Attitudes, and Values* (Englewood Cliffs, N.J.: Prentice-Hall, 1974); also idem, *Space and Place: The Perspective of Experience* (Minneapolis: University of Minnesota Press, 1977). A valuable survey is found in Mircea Eliade, *A History of Religious Ideas*, trans. Willard R. Trask (Chicago: University of Chicago Press, 1978), vol. 1, *From the Stone Age to the Eleusinian Mysteries*, chap. 1.

24. For example, Hermann Kern’s exploration of the labyrinth in literature and art contains much that is relevant, not least in its interdisciplinary approach, to the history of world maps in various cultures: *Labirinti: Forme e interpretazione, 5000 anni di presenza di un archetipo manuale e file conduttore* (Milan: Feltrinelli, 1981); German edition, *Labyrinth: Erscheinungsformen und Deutungen, 5000 Jahre Gegenwart eines Urbilds* (Munich: Prestel-Verlag, 1982).

25. Norman J. W. Thrower, *Maps and Man: An Examination of Cartography in Relation to Culture and Civilization* (Englewood Cliffs, N.J.: Prentice-Hall, 1972), 1.

place or at a number of independent hearths, was clearly a conceptual advance—an important increment to the technology of the intellect²⁶—that in some respects may be compared to the emergence of literacy or numeracy. An archaeologist has recently observed that when men moved from cognitive mapping to a “mapping process” that “involves the production of a material ‘map’ . . . we face a documented advance in intelligent behaviour,”²⁷ an argument that is stated more comprehensively by Robinson:

The use of a reduced, substitute space for that of reality, even when both can be seen, is an impressive act in itself; but the really awesome event was the similar representation of distant, out of sight, features. The combination of the reduction of reality and the construction of an analogical space is an attainment in abstract thinking of a very high order indeed, for it enables one to discover structures that would remain unknown if not mapped.²⁸

It follows that the spread of the idea of the map from its origins, the growth of formal map knowledge, the adoption of distinctive geometrical structures for maps, the acquisition of maps as tools for practical and intellectual purposes, the gradual and sometimes sudden technical improvement of maps through new techniques, and later the ability to reproduce maps exactly by mechanical means have all been of major significance in the societies where they occurred. The processes of transmission underlying these changes—from their earliest beginnings to the age of mass and now computer cartography—also become a central concern of the history of cartography.

Thus several main threads have been identified that are woven through the history of cartography. They all rest on the axiom that the map is a historical phenomenon of great significance in human terms, with a rich harvest to be gleaned from its systematic study. Maps—like books—can be regarded as agents of change in history.²⁹ The history of cartography represents more than a technical and practical history of the artifact. It may also be viewed as an aspect of the history of human thought, so that while the study of the techniques that influence the medium of that thought is important, it also considers the social significance of cartographic innovation and the way maps have impinged on the many other facets of human history they touch.

RENAISSANCE TO ENLIGHTENMENT: THE EARLY ANTECEDENTS OF THE HISTORY OF CARTOGRAPHY

Ways of thinking about the history of early maps have often proved tenacious. The ideas and preoccupations of each period may survive as important ingredients in the thought and practices of the succeeding period. Most

of this chapter is devoted to a historiographical essay on the history of cartography. In the Western world³⁰ this development, albeit with national variations in chronology and precise direction, may be divided into three periods. The first deals with developments to about 1800; the second, with the nineteenth century and the early part of the twentieth (up to ca. 1930); and the third with the past fifty years, which have seen the emergence of a scholarly identity for the subject. Although these three periods can be identified in historiographical terms, older ways of approaching the study of early maps survived as orthodoxies into the recent past.

The scope of this review needs to be carefully defined. It is devoted not to the large literature relating to contemporary maps in each period—which will be dealt with in chronological context in the individual volumes—but to the historical writings of successive generations about the maps of earlier generations, a relatively small body of literature. Yet to those who dismiss the achievements of the pioneers in the history of cartography, the volume of such writings may come as a surprise. Moreover, they are sufficiently diverse in character to extend to at least some of the topics regarded today as lying at the heart of the history of cartography.³¹ Disappointment awaits those who expect to en-

26. Jack Goody, ed., *Literacy in Traditional Societies* (Cambridge: Cambridge University Press, 1968), 1–11, assessing the social importance of the acquisition of writing.

27. Colin Renfrew, *Towards an Archaeology of Mind*, Inaugural Lecture, University of Cambridge, 30 November 1982 (Cambridge: Cambridge University Press, 1982), 18–19.

28. Arthur H. Robinson, *Early Thematic Mapping in the History of Cartography* (Chicago: University of Chicago Press, 1982), 1. Others have commented on the intellectual achievement of the map. For example, Michael Polanyi, *The Study of Man*, Lindsay Memorial Lectures (London: Routledge and Kegan Paul, 1959), 24, comments on “the great speculative advantage achieved by storing up knowledge in a handy, condensed form. Maps, graphs, books, formulae, etc., offer wonderful opportunities for reorganizing our knowledge from ever new points of view.”

29. In this respect the history of the map is directly comparable to the history of the book as envisaged by Lucien Febvre: Lucien Febvre and Henri-Jean Martin, *L'apparition du livre* (Paris: Editions Albin, 1958); English edition, *The Coming of the Book: The Impact of Printing, 1450–1800*, new ed., ed. Geoffrey Nowell-Smith and David Wootton, trans. David Gerard (London: NLB, 1976). See also Kenneth E. Carpenter, ed., *Books and Society in History: Papers of the Association of College and Research Libraries Rare Books and Manuscripts Pre-conference, 24–28 June 1980, Boston, Massachusetts* (New York: R. R. Bowker, 1983), and especially Elizabeth L. Eisenstein, *The Printing Press as an Agent of Change: Communications and Cultural Transformations in Early Modern Europe*, 2 vols. (Cambridge: Cambridge University Press, 1979).

30. Excluded here is any systematic discussion of writings on the history of Asian cartography produced within those cultures; these will be dealt with in the appropriate context of volume 2 of the present *History*.

31. The potential of this literature has been illustrated by a series of volumes known as *Acta Cartographica* in which selected articles

counter in such studies the same assumptions, priorities, and techniques that can be brought to bear on a history of maps today: but at the same time, such studies cannot be dismissed as merely old-fashioned or antiquarian.

There are three main reasons why the *History*, as a synthetic work, has taken notice of this classic literature and why these older writings need to be reviewed here. In the first place, many older studies preserve the only record (or reproduction) of maps, or their related sources, that no longer survive. The high mortality of maps, albeit not always “more severe than that of any other class of historical document,”³² is an endemic condition that historians of cartography—like archaeologists—just have to live with. But recent wars and disasters have added their share of destruction.³³ Similarly, the breaking up and dispersal of once organic atlases³⁴ or the disappearance of cartographic items into inaccessible private collections accentuate the problem of document survival. For such reasons it is as hard to speculate about the number of maps that may originally have been produced in some early societies as it is to base generalizations on the surviving population of maps where the record is known to be so incomplete.

In the second place, so slow and uneven has been the pace of research in the history of cartography that some so called classic works have endured unchallenged as fundamental references. Research for this volume of the *History* has already proved this especially pertinent, and our remaining debt to such pioneer authorities as Nordenskiöld on portolan charts³⁵ or Konrad Miller on *mappaemundi*³⁶ will be clear from the appropriate chapters. Thus the sometimes fashionable view that such writings are no longer serviceable must be rejected as false concerning the substantive content of a general history of cartography, although it may be true in the sense that these have indeed ceased to be methodological exemplars.

Finally, past writings on the history of cartography are, after all, the primary sources for any account of that history’s intellectual development. As new directions are being sought in the history of cartography, it is appropriate that there be some retrospection and that the past be scanned for the methodological lessons it may hold. It is pertinent not only to ask, for example, When did the study of the history of cartography begin? but also to recognize that the answers lie in the literature of the past. Similarly, the question, Can we sustain the notion of an emerging subject that we call the history of cartography? calls for a historiographical review. Of course much will depend on what is understood by “the history of cartography,” and it begs the question whether such a concept was always separately formulated. This chapter will show how an understanding of what constitutes the history of cartography has altered

over the period during which early maps have been studied. The first to frame systematically such an agenda was R. A. Skelton, in his 1966 series of lectures,³⁷ and some of the same questions will be reexamined here, since they offer a relevant dimension to the intellectual heritage nurturing the present work.

ANTIQUARIES, COLLECTORS, AND MAPMAKERS AS CHRONICLERS OF THE SUBJECT

While it is difficult to put a precise date to the earliest writings in the history of cartography, it is probably safe to assume that it would have been broadly coeval with the origins of historical writing, particularly in cultures where geographical and historical studies were closely interrelated and served political purposes and where there is known to have been some tradition of preserving and collecting the maps of earlier periods.³⁸ Such conditions were met, for example, in China during the Han

from nineteenth- and early twentieth-century periodicals have been reproduced since 1967 and which now includes over 450 items from over 100 journals; recent volumes have extended the coverage further into the twentieth century. *Acta Cartographica*, vols. 1–27 (Amsterdam: Theatrum Orbis Terrarum, 1967–81).

32. Skelton, *Maps*, 26 (note 15). While Skelton’s contention may be true of some categories of working maps—such as sea charts or wall maps constantly in use—it is doubtful that it is true of all maps, some of which, on the contrary, have a particular capacity for survival, being kept when other records are thrown away. There may, however, also be a bias for fine, “collectible” specimens to be preserved, making the surviving sample less representative of everyday cartography.

33. See, for example, the reports of cartographic destruction referred to in [Anon.], “With Fire and Sword,” *Imago Mundi* 4 (1947): 30–31; A. Codazzi, “With Fire and Sword,” *Imago Mundi* 5 (1948): 37–38; [Anon.], “With Fire and Sword,” *Imago Mundi* 6 (1949): 38; Norbert Fischer, “With Fire and Sword, III,” *Imago Mundi* 10 (1953): 56; Marian Łodziński, “With Fire and Sword, VI,” *Imago Mundi* 14 (1959): 117; Fr. Grenacher, “With Fire and Sword, VII,” *Imago Mundi* 15 (1960): 120. On evidence for the destruction of portolan charts and on Italian losses of maps during World War II, see below, chapter 19, “Portolan Charts from the Late Thirteenth Century to 1500.”

34. Carl Christoph Bernoulli, “Ein Karteninkunabelnband der öffentlichen Bibliothek der Universität Basel,” *Verhandlungen der Naturforschenden Gesellschaft in Basel* 18 (1906): 58–82, reprinted in *Acta Cartographica* 27 (1981): 358–82, describes the contents of an important sixteenth-century composite Italian atlas. Since the atlas has now been broken up, the article is the only remaining historical record of its original composition; for another example, see Wilhelm Bonacker, “Über die Wertsteigerung von Einzelblättern aus zerfledderten alten Atlaswerken,” *Kartographische Nachrichten* 13 (1963): 178–79.

35. A. E. Nordenskiöld, *Periplus: An Essay on the Early History of Charts and Sailing-Directions*, trans. Francis A. Bather (Stockholm: P. A. Norstedt, 1897).

36. Konrad Miller, *Mappaemundi: Die ältesten Weltkarten*, 6 vols. (Stuttgart: J. Roth, 1895–98).

37. Skelton, *Maps* (note 15).

38. Some of these conditions in early cultures are described by Herbert Butterfield, *The Origins of History* (New York: Basic Books, 1981). In China, from about 1000 B.C. onward, there were archivists

and Chin dynasties, when contemporary geographical manuals sometimes reviewed earlier maps and indicated their shortcomings.³⁹ In much the same way, the practice of successive commentators, including Herodotus, Aristotle, Cleomedes, and Ptolemy, of criticizing earlier maps might be said to reflect an intuitive appreciation for a history of maps as a foundation of the modern geographical science of the Greek and Roman periods.⁴⁰ Likewise for medieval Europe, an awareness of the intellectual interest of noncontemporary maps can similarly be traced through some surviving texts containing *mappaemundi*. Skelton has suggested that the European Middle Ages saw “an incipient interest in the evolution of geographical ideas as expressed in maps,” supporting this contention with the observation that world maps attributed to different types and periods, both Roman and post-Roman, were juxtaposed in some texts so that “we may discern a rudimentary historical sense applied to comparative cartography.”⁴¹ It is probable, however, that these maps were reproduced to illustrate changing cosmological ideas rather than to demonstrate the development of cartographic form or technique. For those seeking the beginnings of the study of the history of cartography, there is little weight to such straws in the wind.

During the European Renaissance, however, especially from the sixteenth century onward, it is possible to trace an increasingly systematic attention to the maps of preceding centuries. The extent to which this represented a genuine historical feeling for maps as independent documents should not be exaggerated, especially in view of the general surge of interest in the fifteenth and sixteenth centuries in classical geographical authors and of the fact that maps from the classical sources were valued as useful contemporary tools as well as vaunted as monuments of antiquity. One of these monuments of antiquity, Ptolemy’s *Geography*—the touchstone of the Renaissance in European cartography—reveals to the modern historian of cartography the stages by which the antiquarian study of early maps hived off from the practical and technical development of contemporary mapping. In the fifteenth century, the Ptolemaic maps were initially valued as authoritative maps of the world and its regions, and it was only gradually, though accelerated by the application of printing to cartography, that they were replaced by the *tabulae modernae*,⁴² leaving the classical maps as primarily historical objects. The Strasbourg Ptolemy of 1513 was the first to separate modern from ancient maps in a discrete section, reflecting the growth of a general critical sense among mapmakers and readers. This practice was confirmed in 1578 when Mercator reissued the Ptolemaic maps alone, without any modern supplements, as a facsimile of a classical atlas, thereby underlining their purely historical interest.⁴³

Other historical maps were also reproduced, continuing a medieval tradition of manuscript copying in the Renaissance,⁴⁴ but it was the printed facsimiles of such maps that did most to stimulate their study and widen an appreciation of the cartography of earlier centuries. Notable examples, engraved from medieval manuscript sources, were the Peutinger map (reproduced in both the sixteenth and the eighteenth centuries),⁴⁵ Marino Sanudo’s medieval tract *Liber secretorum fidelium crucis* (in which the map of Palestine, though secondary to the text, was essential for its interpretation) in the early seventeenth century,⁴⁶ and in the eighteenth century, Richard Gough’s maps of medieval Britain.⁴⁷ By the eighteenth century too, in much of Europe, Renaissance

expressly responsible for “maps and records” (p. 142). In Mediterranean lands, however, scholarship, in the sense of research based on written texts, was relatively late in its development and awaited the growth of archives or libraries such as that established in Alexandria by, probably, the mid-third century B.C.: James T. Shotwell, *The History of History* (New York: Columbia University Press, 1939), 55.

39. Joseph Needham, *Science and Civilisation in China* (Cambridge: Cambridge University Press, 1954–), vol. 3, *Mathematics and the Sciences of the Heavens and the Earth*, 538–39, who cites the *Chin Shu* of Pei Hsiu (A.D. 224–71) in this respect. See also volume 2 of this *History* for a more detailed historiographical review.

40. In this sense one might also include Hipparchus’s criticism of Eratosthenes, as recounted by Strabo, and Pliny’s remarks on the province of Boetia, southern Spain, in Agrippa; see below, pp. 166–67 and 207–8.

41. Skelton, *Maps*, 64–65 (note 15).

42. The early date (1427) at which Claudius Clavus’s map of the north was added to the manuscripts of Ptolemy does, however, suggest an early belief that the classical world picture might not be completely applicable to the fifteenth-century world. A full list of “modern” maps and commentary appears in a chapter on the rediscovery of Ptolemy’s *Geography* and its reception in western Europe in volume 3 of the present *History*.

43. Skelton, *Maps*, 66 (note 15).

44. James Nelson Carder, *Art Historical Problems of a Roman Land Surveying Manuscript: The Codex Arcerianus A, Wolfenbüttel* (New York: Garland, 1978), 6. See also the account of the *Notitia Dignitatum* below, pp. 244–45.

45. Annalina Levi and Mario Levi, *Itineraria picta: Contributo allo studio della Tabula Peutingeriana* (Rome: Erma di Bretschneider, 1967), 17–25, for details of editions and earlier studies. In Renaissance Europe the first printed facsimile of an ancient map was probably the engraving of the Peutinger map commissioned by Abraham Ortelius, first published in 1598 and afterward included in several editions of his *Parergon*. See also Ekkehard Weber, ed., *Tabula Peutingeriana: Codex Vindobonensis 324* (Graz: Akademische Druck- und Verlagsanstalt, 1976).

46. Skelton, *Maps*, 69 (note 15); Marino Sanudo, *Liber secretorum fidelium crucis*, vol. 2 of *Gesta Dei per Francos*, ed. Jacques Bongars (Hanover: Heirs of J. Aubrius, 1611); Bongars also published facsimiles of three *mappaemundi*.

47. Richard Gough, *British Topography; or, An Historical Account of What Has Been Done for Illustrating the Topographical Antiquities of Great Britain and Ireland*, 2 vols. (London: T. Payne and J. Nichols, 1780); a list of maps is included in Ronald P. Doig, “A Bibliographical Study of Gough’s *British Topography*,” *Edinburgh Bibliographical Society Transactions* 4 (1963): 103–36, esp. 105–29.

as well as ancient and medieval maps were being recognized as part of the cartographic past. While the line between what was of contemporary and what was of historical interest was less closely drawn than it is today, a consciously antiquarian market for Renaissance maps was catered to both by keeping in print editions from the sixteenth-century copperplates and by issuing reen-graved versions of fifteenth-century items such as Andrea Bianco's world maps (Venice, 1783) or Martin Behaim's globe (Nuremberg, 1730 and 1778).⁴⁸ Such examples further confirm that the ability of the print trade to produce facsimiles of early maps, together with the contemporary maps that formed its main stock-in-trade, was already laying the foundations for an intellectual climate that favored the recovery and preservation of the cartographic past as well as its more systematic study.

A second influence on this tendency after the sixteenth century was the widespread growth of map collections. This was an integral part of the general European enthusiasm for collecting in this period, but it must be regarded as a central influence in the historical development of the study of early maps. Although there is evidence of systematic map collecting, often for bureaucratic purposes, in the ancient civilizations of both China and Europe,⁴⁹ the growth of map collecting is an especially marked feature in the rise of cartographic consciousness in sixteenth-century Europe. Records show that maps were included in medieval libraries, but they were usually integral to the texts they illustrated,⁵⁰ and no separate inventories of maps are known to us from the Middle Ages.⁵¹ Only after the sixteenth century can we begin to trace the emergence of maps and atlases as distinct categories within libraries as a whole or as items displayed as a group for decorative purposes. Thereafter, the formation of such map collections was rapid. It has been documented in many countries of Europe, not only in royal map collections (often the founding elements in today's national map libraries),⁵² but also in wall displays such as those in the Vatican or the Palazzo Vecchio in Florence, in the houses of the nobility,⁵³ or in maps and atlases associated with the libraries and working papers of statesmen, leading churchmen, city dignitaries, merchants, and historians, many of whom were particularly interested in collecting plans of cities and towns. By the eighteenth century maps were increasingly being kept in independently designed sections with their own specialist curators, and this too helped create the conditions under which historical studies could develop.⁵⁴

The truly antiquarian dimension in this map collecting, despite an interest in the recovery and preservation of ancient texts and monuments, is more difficult to isolate or to measure. Manuscript copies of Ptolemy's *Geography* were collected throughout Renaissance Eu-

rope;⁵⁵ but most map libraries owed their birth and development to the working copies of *contemporary* maps assembled as the political and military tools of statecraft, as raw materials in cartographers' workshops, as records of national exploration and discovery, as the working documents of trade and colonization, as specimens of graphic art, or in the case of astronomical maps, for the practice of astrology. Furthermore, one should not underestimate the practical value accorded to older maps in the sixteenth, seventeenth, and eighteenth centuries, when they were extensively drawn upon not only by cartographers but also by lawyers, politicians, and others as sources of information that, though old, were

48. Skelton, *Maps*, 71 (note 15), gives full references.

49. On China see volume 2 forthcoming; on Europe, pp. 210 and 244.

50. Leo Bagrow, "Old Inventories of Maps," *Imago Mundi* 5 (1948): 18–20. With *mappaemundi* the wider textual context of most surviving copies is especially apparent: Marcel Destombes, ed., *Mappemondes A.D. 1200–1500: Catalogue préparé par la Commission des Cartes Anciennes de l'Union Géographique Internationale* (Amsterdam: N. Israel, 1964).

51. Cornelis Koeman, *Collections of Maps and Atlases in the Netherlands: Their History and Present State* (Leiden: E. J. Brill, 1961), 12.

52. Helen Wallis, "The Royal Map Collections of England," *Publicações do Centro de Estudos de Cartografia Antiga, Série Separatas*, 141 (Coimbra, 1981); Mireille Pastoureau, "Collections et collectionneurs de cartes en France, sous l'ancien-régime" (paper prepared for the Tenth International Conference on the History of Cartography, Dublin 1983).

53. On the Vatican maps in this category see Roberto Almagià, *Monumenta cartographica Vaticana*, 4 vols. (Rome: Biblioteca Apostolica Vaticana, 1944–52), vol. 3, *Le pitture murali della Galleria delle Carte Geografiche*. On the mural collection in Florence, see George Kish, "The Japan on the 'Mural Atlas' of the Palazzo Vecchio, Florence," *Imago Mundi* 8 (1951): 52–54; Giuseppe Caraci, "La prima raccolta moderna di grandi carte murali rappresentanti i 'quattro continenti'," *Atti del XVII Congresso Geografico Italiano, Trieste 1961*, 2 vols. (1962), 2:49–60; Koeman, *Collections*, 19 (note 51), notes that in about 1560 fifty maps decorated the rooms and gallery of Batestein castle in the Netherlands. See also Juergen Schulz, "Maps as Metaphors: Mural Map Cycles of the Italian Renaissance," in *Art and Cartography: Six Historical Essays*, ed. David Woodward (Chicago: University of Chicago Press, 1987).

54. There seems to have been a map room or charts room in the British Museum from its opening in 1759: Helen Wallis, "The Map Collections of the British Museum Library," in *My Head Is a Map: Essays and Memoirs in Honour of R. V. Tooley*, ed. Helen Wallis and Sarah Tyacke (London: Francis Edwards and Carta Press, 1973), 3–20. In France, the Dépôt des Cartes et Plans de la Marine was created in 1720, but its unofficial origin can be dated from Colbert, minister of Louis XIV; it existed in 1682, and its keeper was Charles Pene, editor of *Le Neptune François* (first published Paris: Imprimerie Royal, 1693). In 1720 Duc de Luynes was nominated "directeur du dépôt"; in 1721 Philippe Buache was draftsman in the dépôt. For other examples see Skelton, *Maps*, 26–52 (note 15). Dates of foundation of other map libraries are given in John A. Wolter, Ronald E. Grim, and David K. Carrington, eds., *World Directory of Map Collections*, International Federation of Library Associations Publication Series no. 31 (Munich: K. G. Saur, 1985).

55. See volume 3 of the present *History*.

not necessarily out of date.⁵⁶ It would thus be wrong to regard the early collections as evidence, solely or even primarily, for the contemporary study of the history of cartography. There is no neat compartmentalization of motive in the acquisition of maps. On the contrary, the collecting mentality of the age is epitomized by the “cabinets of curiosities,” or *Wunderkammer*, with which maps were occasionally associated, albeit valued as artifacts rather than as documents representing the growth of cartography.⁵⁷ The antiquarian element in most map collections of the period before 1800 tends to be incidental in origin, and it has to be most carefully sifted out from its broader context. For example, in England, Burghley’s map collection was acquired almost wholly through political circumstances,⁵⁸ and the interests of Robert Cotton can be identified as partly political and partly historical.⁵⁹ So were those of Pepys,⁶⁰ linked to his naval responsibilities, and the driving force behind Ortelius’s accumulation of maps—to judge by his correspondence—was as much his interest in maps as historical documents as their usefulness in the compilation of new maps.⁶¹ Isaac Vossius, too, used maps to underpin not one but several of the aspects of his polymathic humanism,⁶² and in Louvain the learned librarian Viglius ab Aytta Zuichemus had several motives in bringing together a wide variety of maps relating to the half-century before 1575.⁶³

Analyzing the motives for forming such collections also lets us generalize about the intellectual and practical uses of early maps before 1800. The breadth of these applications is truly universal. Cosmography, geography, and chorography, as defined by Ptolemy and others, were regarded as inseparable.⁶⁴ Indeed, cosmography depended upon astronomical observation and mapping just as much as geography was based on terrestrial exploration and survey. In both cases, earlier maps were eagerly consulted as authorities and critically examined to see if they were in accord with current belief or observed reality. By the seventeenth century, however, maps—as in the textbooks of that age—were becoming more narrowly associated with geography and terrestrial survey and charting, and indeed they were formally regarded as one of the three methods of geographical representation,⁶⁵ although cosmological diagrams and celestial maps, atlases, and globes continued to be part of the general mapping impulse just as much as in the Renaissance.

Against such a background there were several reasons earlier maps were examined. First, it was the practicing map- and chartmakers who seem to have taken the lead in exploring the maps of the past. They did so either in their search for raw materials⁶⁶ (in a period when the useful life of an individual map was much longer than it is today) or in an attempt to compare the state of

geographical knowledge and science in their own age with that of the past. This latter approach, which is still a focus of much research in the history of cartography,

56. The role of early maps was thus then as now; see J. B. Harley and David Woodward, “Why Cartography Needs Its History,” forthcoming.

57. See, for example, Georges Duplessis, “Roger de Gaignières et ses collections iconographiques,” *Gazette des Beaux-Arts*, 2d ser., 3 (1870): 468–88. On the collections in general of this period, though he does not mention maps, see Arthur MacGregor, “Collectors and Collections of Rarities in the Sixteenth and Seventeenth Centuries,” in *Tradescant’s Rarities: Essays on the Foundation of the Ashmolean Museum 1683, with a Catalogue of the Surviving Early Collections*, ed. Arthur MacGregor (Oxford: Clarendon Press, 1983), 70–97.

58. R. A. Skelton and John Summerson, *A Description of Maps and Architectural Drawings in the Collection Made by William Cecil, First Baron Burghley, Now at Hatfield House* (Oxford: Roxburghe Club, 1971). In France, the Duke of Sully, Henry IV’s war minister, was likewise an avid collector of maps of strategic areas and cities; David Buisseret, “Les ingénieurs du roi au temps de Henri IV,” *Bulletin du Comité des Travaux Historiques et Scientifiques: Section de Géographie* 77 (1964): 13–84, esp. 80, describing him as “obsessed by maps.”

59. Kevin Sharpe, *Sir Robert Cotton, 1586–1631: History and Politics in Early Modern England* (Oxford: Oxford University Press, 1979); Skelton, *Maps*, 43 (note 15).

60. Pepys’s collection was a “modern” reference collection of maps and charts accumulated as a result of his public office. The historical collection of older maps and atlases dates only from the end of the sixteenth century. He did, however, try to collect all the naval textbooks and atlases he could find in order to compile a historical bibliography, and an antiquarian dimension in his collecting has recently been demonstrated by Sarah Tyacke, *The Map of Rome 1625, Paul Maupin: A Companion to the Facsimile* (London: Nottingham Court Press with Magdalene College, Cambridge, 1982). A short note on Pepys as collector appears in Robert Latham and William Matthews, eds., *The Diary of Samuel Pepys*, 11 vols. (Berkeley: University of California Press, 1970–83), 10:34–36.

61. Skelton, *Maps*, 45 (note 15); John Henry Hessels, ed., *Abrahami Ortelii (geographi antverpiensis) et virorum eruditorum ad eundem . . . Epistulae . . . (1524–1628)*, *Ecclesiae Londino-Batavae archivum*, vol. 1 (London: Nederlandsche Hervormde Gemeente, 1887).

62. Dirk de Vries, “Atlases and Maps from the Library of Isaac Vossius (1618–1689),” *International Yearbook of Cartography* 21 (1981): 177–93.

63. E. H. Waterbolk, “Viglius of Aytta, Sixteenth Century Map Collector,” *Imago Mundi* 29 (1977): 45–48; Antoine De Smet, “Viglius ab Aytta Zuichemus, savant, bibliothécaire et collectionneur de cartes du XVI^e siècle,” in *The Map Librarian in the Modern World: Essays in Honour of Walter W. Ristow*, ed. Helen Wallis and Lothar Zögner (Munich: K. G. Saur, 1979), 237–50.

64. Numa Broc, *La géographie de la Renaissance (1420–1620)* (Paris: Bibliothèque Nationale, 1980), 61–76. For Ptolemy’s definitions of geography and chorography see below, p. 183.

65. The other two were by “tables and divisions” and by “treatises”: Nicolas Sanson, *Introduction à la géographie* (Paris, 1682), 6.

66. In this respect the chart collections of the European maritime nations, involving both official bodies and the trading companies, were especially extensive; for just two examples see Avelino Teixeira da Mota, “Some Notes on the Organization of Hydrographical Services in Portugal before the Beginning of the Nineteenth Century,” *Imago Mundi* 28 (1976): 51–60, and Günter Schilder, “Organization and Evolution of the Dutch East India Company’s Hydrographic Office in the Seventeenth Century,” *Imago Mundi* 28 (1976): 61–78.

should be set in the context of the Enlightenment and the belief it had engendered in accuracy of measurement as the sine qua non of cartographic progress. While the trend toward cartographic realism should be neither oversimplified nor exaggerated,⁶⁷ by the eighteenth century there was an increasing emphasis in mapping on original survey, on more precise instruments, especially at sea, and on more detailed cartographic representation as an end in itself.⁶⁸ Moreover, practicing mapmakers were increasingly distancing themselves from—or were openly critical of—their predecessors' maps.⁶⁹

Second, maps were closely associated with the histories of discovery, and these, often with a strong nationalistic or imperialistic flavor, had become a historical genre of their own from the days of Ramusio, Thevet, Hakluyt, and de Bry onward.⁷⁰ In the age of European reconnaissance, in the sixteenth and seventeenth centuries, earlier maps were already being used as historical documents. By the eighteenth century they were widely employed not only as historical records—to establish national precedents in discovery, for instance, or rival territorial claims—but also, at a more academic level, to begin to sift out the false topographies and imaginary islands that so abounded in the geographical record.⁷¹

Third, early maps were increasingly coming into circulation, owing largely to an emergent antiquarian interest and a preoccupation with cartographic evidence for biblical and classical geography. These influences were important in the development of the study of the history of maps. Among the humanist scholars who collected maps were, for example, Konrad Peutinger, who had developed an interest in Roman geography,⁷² and Isaac Vossius, who also cultivated the study of classical geography as well as philosophy. Individual mapmakers engaged in reconstructions of antiquity, a research interest that would today be defined as historical cartography.⁷³ D'Anville, for example, who had collected some nine to ten thousand sheet maps (of which over five hundred were in manuscript), successfully employed some of these materials in the systematic study of the ancient world.⁷⁴

67. Certainly there is no neat progression toward scientific cartography, and all that can be said in the mapping of large areas, for example, is that the less realistic maps, with many instances of regression, were gradually ousted by more realistic maps. There continued to be much fusion of older and newer map sources, often leavened with academic notions or myths, but these were frequently as important as "true geography" in influencing human action. See, for example, P. J. Marshall and Glyndwr Williams, *The Great Map of Mankind: British Perceptions of the World in the Age of Enlightenment* (London: J. M. Dent, 1982), esp. 9; Percy G. Adams, *Travelers and Travel Liars, 1660–1800* (Berkeley and Los Angeles: University of California Press, 1962); and for a different interpretation, also with implications for maps, John L. Allen, "Lands of Myth, Waters of Wonder: The Place of the Imagination in the History of Geographical Exploration," in *Geographies of the Mind: Essays in Historical Geo-*

sophy in Honor of John Kirtland Wright, ed. David Lowenthal and Martyn J. Bowden (New York: Oxford University Press, 1976), 41–61.

68. Singer, *Short History*, 316–21 (note 17), dealing with the "Measurement of the Earth and Cartography"; Margarita Bowen, *Empiricism and Geographical Thought from Francis Bacon to Alexander von Humboldt* (Cambridge: Cambridge University Press, 1981), on the development of scientific empiricism in the eighteenth century.

69. *The Construction of Maps and Globes* (London: T. Horne, 1717), attributed to John Green, on whose critical work as a map editor see Gerald R. Crone, "John Green: Notes on a Neglected Eighteenth Century Geographer and Cartographer," *Imago Mundi* 6 (1949): 85–91. A similarly critical approach to earlier mapping was adopted by French cartographers, who, besides providing lists of previous mapmakers, sometimes inveighed against their inaccuracies; see Abbé Lenglet Dufresnoy, *Catalogue des meilleures cartes géographiques générales et particulières* (reprinted Amsterdam: Meridian, 1965), a reimpression of *Méthode pour étudier la géographie*, 3d ed., vol. 1, pt. 2 (Paris: Rollin Fils, Debure l'Aîné, 1741–42), where he makes value judgments about seventeenth-century printed maps such as those of Blaeu, Jaillot, Sanson, and de Wit; see also Didier Robert de Vaugondy, *Essai sur l'histoire de la géographie* (Paris: Antoine Boudet, 1755), 243. In France particular criticism was leveled at the working methods of the eighteenth-century "armchair cartographers," such as Guillaume Delisle and Jean Baptiste Bourguignon d'Anville, who combined old and new sources in their maps, while in Germany Eberhard David Hauber and his disciple Friedrich Anton Büsching were also advocating a more critical approach to map compilation. See Ruthardt Oehme, *Eberhard David Hauber (1695–1765): Ein schwäbisches Gelehrtenleben* (Stuttgart: W. Kohlhammer, 1976). Hauber also wrote specifically about the history of maps in his *Versuch einer umständlichen Historie der Land-Charten* (Ulm: D. Bartholomäi, 1724).

70. Febvre and Martin, *Coming of the Book*, 280–82 (note 29); Gerald R. Crone and R. A. Skelton, "English Collections of Voyages and Travels, 1625–1846," in *Richard Hakluyt and His Successors*, 2d ser., 93 (London: Hakluyt Society, 1946); on Thevet's maps see Mireille Pastoureau, *Les atlas français, XVI^e–XVII^e siècles: Répertoire bibliographique et étude* (Paris: Bibliothèque Nationale, 1984), 481–95.

71. Skelton, *Maps*, 71 (note 15); Philippe Buache, "Dissertation sur l'île Antillia," in *Mémoires sur l'Amérique et sur l'Afrique donnés au mois d'avril 1752* (n.p., 1752).

72. See above, note 45, for the authorities on Peutinger's researches into classical geography. As well as pursuing the antiquarian interests represented by his unearthing the Peutinger map, Peutinger also acquired in Italy the unfinished copperplate for the Nicholas of Cusa map of Central Europe and took it to Germany, where he arranged for Hans Burgkmair to print from it for him.

73. See Preface, note 16, for a definition of the term "historical cartography" and its misuse.

74. Jean-Baptiste Bourguignon d'Anville, *Considérations générales sur l'étude et les connaissances que demande la composition des ouvrages de géographie* (Paris: Galeries du Louvre, 1777), 5–12. A description of d'Anville's collection is given by Charles Du Bus, "Les collections d'Anville à la Bibliothèque Nationale," *Bulletin du Comité des Travaux Historiques et Scientifiques: Section de Géographie* 41 (1926): 93–145 (see also note 150 below). Among d'Anville's works that most reflect his interest in reconstructing the past with maps are *Dissertation sur l'étendue de l'ancienne Jérusalem et de son temple, et sur les mesures hebraïques de longueur* (Paris: Prault Fils, 1747); *Traité des mesures itinéraires anciennes et modernes* (Paris: Imprimerie Royale, 1769); and *Géographie ancienne abrégée* (Paris: A. Delalain, 1782); see also Juliette Taton, "Jean-Baptiste Bourguignon d'Anville," in *Dictionary of Scientific Biography*, 16 vols., ed. Charles Coulston

It will have been noted that the primary objectives in many of these approaches to old maps were those of the historian or historical geographer. This had not, however, led to a complete neglect of other aspects. The foundation of some of the other standard approaches to the study of early maps, which were yet to gather momentum, can also be traced in the eighteenth century. It is fair to say that there was a general lack of interest in the history of cartography as a continuous process; but against this can be offset the first attempts at a “systematic, if naïve, summary of cartographic history.”⁷⁵ Especially marked was the development of a biobibliographic approach to early maps. This reflects a sense of responsibility toward the relics of the past as well as the methods of the encyclopedist. The biobibliographical approach had already taken root in the Renaissance, so that by the 1603 edition of Ortelius’s *Theatrum orbis terrarum* the number of cartographers listed as constructing his maps had risen to 183, some having started work in the fifteenth century.⁷⁶ At the end of the seventeenth century, Jean Mabillon was listing mapmakers among geographers, together with their works, as part of his recommendations for the contents of a well-ordered ecclesiastical library.⁷⁷ During the eighteenth century such lists of earlier cartographic works became both more numerous and more extensive. In Venice, Vincenzo Coronelli compiled a “Cronologia de’ geografi antichi, e moderni,” naming ninety-six geographers and mapmakers from Homer to Ponce.⁷⁸ In France, Didier Robert de Vaugondy, in a comparative essay on the history of geography, listed the earlier maps of a number of European countries.⁷⁹ In Germany, J. G. Gregorii, who had noted that early maps had “now grown very rare and difficult to come by” and that they were “becoming as desirable as old coins,” also provided a chronological list of geographers and mapmakers down to his own time (beginning with Moses, whom he regarded as the first geographer).⁸⁰ In England, Richard Gough, whose explicit aim was “to trace the progress of Map-making among us,”⁸¹ similarly listed both national and regional mapmakers in his pioneer work *British Topography*.⁸²

Not all the eighteenth-century writing about early maps was cast in this biobibliographical mold, and we also encounter specialist studies of individual works. These include, above all, Ptolemy’s *Geography*,⁸³ the *mappaemundi*,⁸⁴ and the portolan charts.⁸⁵ Especially significant for the future scope of the history of cartography was the tentative beginning of an extension of theaters of interest away from the classical world and the European nations during the Renaissance to encompass maps from the Asian cultures⁸⁶ and, in the travel literature of the period, to include reports of the mapping skills of nonliterate peoples as they were first encountered by Europeans.⁸⁷ These signs of a historical con-

sciousness relating to the maps of earlier periods and non-European civilizations should not be overemphasized. The eighteenth-century view of the cartographic past not only was strongly Eurocentric—regarding other cultures as inferior—but also was colored by the contemporary appetite for greater precision in mapping. Even during the Renaissance, geographers such as Hakluyt had become aware of the “olde imperfectly com-

Gillispie (New York: Charles Scribner’s Sons, 1970–80), 1:175–76.

75. Skelton, *Maps*, 70–71 (note 15).

76. Leo Bagrow, *A. Ortelii catalogus cartographorum* (Gotha: Justus Perthes, 1928), reprinted in *Acta Cartographica* 27 (1981): 65–357.

77. Jean Mabillon, *Traité des études monastiques* (Paris: Charles Robustel, 1691), 463–66.

78. Vincenzo Coronelli, *Cronologia universale* (Venice, 1707), 522–24; this was designed as an introduction to his projected *Biblioteca universale* of 45 volumes, of which only vols. 1–7 seem to have been published (Venice: Antonio Tivani, 1701–5).

79. Robert de Vaugondy, *Essai*, chap. 5 (note 69), considers German, English, Dutch, Flemish, Spanish, Italian, Swedish, Russian, and French maps.

80. Johann Gottfried Gregorii, *Curieuse Gedancken von den vornehmsten und accuratesten alt- und neuen Land-Charten* (Frankfort and Leipzig: H. P. Ritscheln, 1713), 120, author’s translation.

81. Quoted by Gwyn Walters, “Richard Gough’s Map Collecting for the British Topography 1780,” *Map Collector* 2 (1978): 26–29, quotation on 27, from Gough’s correspondence with the Reverend Michael Tyson, a Cambridge antiquary.

82. Gough, *British Topography* (note 47); a preliminary essay by Gough, also listing maps, was published as *Anecdotes of British Topography* . . . (London: W. Richardson and S. Clark, 1768).

83. Georg Martin Ridel, *Commentatio critico-literaria de Claudi Ptolemaei Geographia, eiusque codicibus tam manuscriptis quam typis expressis* (Nuremberg: Typis et sumptibus haeredum Felseckerianorum, 1737); Jean Nicholas Buache, *Mémoire sur la Géographie de Ptolémée et particulièrement sur la description de l’intérieur de l’Afrique* (Paris: Imprimerie Royale, 1789), esp. 119, where he complains that Ptolemy’s works, although known for sixteen hundred years, were badly understood.

84. Gough, *British Topography*, 1:60–86 (note 47), dealing with medieval maps relating to Britain.

85. Girolamo Francesco Zanetti, *Dell’origine di alcune arti principali appresso i Veneziani*, 2 vols. (Venice: Stefano Orlandini, 1758), 46–48.

86. This interest arose earlier with Chinese cartography than with maps from the Muslim world. Although parts of al-Idrisi’s text were printed in Arabic and also translated during the Renaissance, the cartographic component in Arab geography was long neglected by Europeans; for the general background to this see Marshall and Williams *Great Map of Mankind*, chap. 1 (note 67). Joachim Lelewel, *Géographie du Moyen Age*, 4 vols. and epilogue (Brussels: Pilliet, 1852–57; reprinted, Amsterdam: Meridian, 1966), was the first European scholar to look at Arab cartography in detail; but he was more interested in reconstructing maps from Arab tables of latitude and longitude than in the Arabs’ own cartographic efforts. See also volume 2 of the present *History* on traditional Asian societies.

87. For example, Jonathan Carver, *Travels through the Interior Parts of North-America in the Years 1766, 1767, and 1768* (London, 1778), 252–53; Awnsham Churchill and John Churchill, *A Collection of Voyages and Travels*, 6 vols. (London: J. Walthoe, 1732), 6:165, cite Colonel Henry Norwood who in 1649–50 watched a map being drawn in sand in Virginia.

posed” maps (which he contrasted with “the new lately reformed Mappes, Globes, Spheares”).⁸⁸ By the eighteenth century Richard Gough could write even more dismissively of the medieval maps he had studied as belonging to “the barbarous Monkish system of Geography,” while Samuel Johnson collected “the maps drawn in the rude and barbarous times . . . to know the errors of the ancient geographers.”⁸⁹ By now, too, commentators were starting to look forward to perfection in a science of mapping,⁹⁰ even though this only reinforced a view of the maps of the past as lower on the ladder of progress. Given such attitudes, by 1800 it was still true (as Skelton has written of the seventeenth century) that maps were seldom contemplated and analyzed as artifacts, that little notice was taken of the methods by which they were constructed and drawn, and that the “study of cartographic expression and form as a mode of communication had not yet begun.”⁹¹ Indeed, in terms of these particular concepts, now taken for granted, the history of cartography had yet to be born as a subject we would recognize today.

THE HISTORY OF CARTOGRAPHY AS HANDMAIDEN: TRADITIONAL THEMES FROM THE NINETEENTH CENTURY

The nineteenth century was marked by a sharp intensification of interest in the study of early maps as an area of inquiry distinct from contemporary cartography. As for the history of science in general, it can be regarded as a major formative period. A number of yardsticks can be used to measure this development, including the volume of periodical and monographic literature, the tendency to issue facsimiles of early maps, and the number of scholars active in the field. This interest was to continue with an unbroken intellectual lineage into the present century. Its principal driving force, especially after 1850, was the rise and institutionalization of geography,⁹² together with the growth of specialist map libraries at a national level and—in Europe and North America especially—the development of a distinctive antiquarian map trade. It will also be suggested that these influences combined to give the study of early maps—and the very tentatively emerging field of the history of cartography—certain biases in aim and method of inquiry that differentiate it sharply from those of the present *History of Cartography*. In particular, the history of cartography was not studied then as an independent subject but remained primarily a handmaiden to the history of geography defined as the history of geographical discovery and exploration. However, when viewed in the proper context, these aims and methods are seen to be an essential part of the scholarly legacy of the subject, and a review clarifies the nature of the territory covered here.

EARLY VIEWS ON THE DEVELOPMENT OF THE SUBJECT

By the mid-nineteenth century there were a few scholars who would have considered themselves historians of cartography, and their attitudes to the development of their subject in their own time are revealing. For instance, Manuel Francisco de Barros e Sousa, Viscount of Santarém, the Portuguese scholar-author of the influential facsimile *Atlas* of early maps first published in 1841—also credited with coining, in 1839, the word “cartography” for the study of early maps⁹³—was being un-

88. Richard Hakluyt, *The Principall Navigations Voiages and Discoveries of the English Nation*, a photolithographic facsimile (originally imprinted in London, 1589) with an introduction by David Beers Quinn and R. A. Skelton and with a new index by Alison Quinn (Cambridge: For the Hakluyt Society and the Peabody Museum of Salem at the University Press, 1965), 2.

89. Walters, “Richard Gough,” 27 (note 81); Samuel Johnson, *Rambler* 82, Sat., 29 Dec. 1750. See below, chapter 2 for evidence of the persistence of those attitudes. For the similarly expressed view of a French writer of the same period, the Abbé Lebeuf, see chapter 18 below, “Medieval *Mappaemundi*,” n. 17.

90. Juan Andrés, *Dell'origine, progressi e stato attuale d'ogni letteratura di Giovanni Andrés*, new ed., 8 vols. (Pisa: Presso Niccolò Capurro, 1829–30), vol. 3, pt. 1, 161. On Andrés see *Dizionario biografico degli italiani* (Rome: Istituto della Enciclopedia Italiana, 1960–), 3:155–57.

91. Skelton, *Maps*, 70 (note 15).

92. Horacio Capel, “Institutionalization of Geography and Strategies of Change,” in *Geography, Ideology and Social Concern*, ed. D. R. Stoddart (Oxford: Basil Blackwell; Totowa, N.J.: Barnes and Noble, 1981), 37–69.

93. The word was soon applied to cartography in general in the senses we use it today and was to appear in many European languages by the second half of the nineteenth century. The fullest account of Santarém's career and contribution to the history of cartography is Armando Cortesão, *History of Portuguese Cartography*, 2 vols. (Coimbra: Junta de Investigações do Ultramar-Lisboa, 1969–71), 1:7–26; editions of Santarém's *Atlas composé de cartes des XIV^e, XV^e, XVI^e, et XVII^e siècles* are described in 1:15–22. The circumstances of Santarém's coining “cartography” in a letter to the Luso-Brazilian historian Francisco Adolfo de Varnhagen in 1839—but with Santarém's *Essai sur l'histoire de la cosmographie et de la cartographie pendant le Moyen-Age et sur les progrès de la géographie après les grandes découvertes du XV^e siècle*, 3 vols. (Paris: Maulde et Renou, 1849–52) being the first major work to bring the word into its title—are also discussed by Cortesão, *History of Portuguese Cartography*, 1:4–5 (above). It is tempting to find earlier examples. See the Matteo Pagano view of Venice of ca. 1565, described by Juergen Schulz, “The Printed Plans and Panoramic Views of Venice (1486–1797),” *Saggi e Memorie di Storia dell'Arte* 7 (1970): 52, where the word “Cortografia” appears on the map. This is no doubt a misprint for *corografia* (chorography), although it was mistranscribed as “Cartografia” in Giandomenico Romanelli and Susanna Biadene, *Venezia piante e vedute: Catalogo del fondo cartografico a stampa* (Venice: Museo Correr, 1982), 5. Another example concerns a gilded brass surveying instrument of 1557 now in the Museum of History of Science in Florence. This was reported to include the word “Cartographia” in its engraved inscription as described by Cornelis Koeman in “Hoe oud is het woord kartoografie?” *Geografisch Tijdschrift* 8 (1974): 230–31. It is now clear, however, that the word does not exist on the instrument: Helen Wallis, “Cartographic Innovation: An Historical Perspective,” in *Canadian Institute of Surveying Centennial Convention Proceedings*, 2 vols. (Ottawa: Canadian Institute of Surveying, 1982), 2:50–63.

usually precise when he commented that his subject was “quite new—the study of ancient maps is hardly a little over sixty years old.”⁹⁴ Some of the evidence he presented does not, as reviewed here, bear him out; but what is of interest is that he was placing the beginning of the subject at the end of the eighteenth century. He observed that it was only after Zurla and Andrés that some scholars began to be interested in the study of medieval maps in a more general manner.⁹⁵ In relation to his own special interest in medieval cartography, he listed those authors who had managed to contribute to the historical aspects of geography without mentioning the Middle Ages at all (or who had skipped over the period in two or three pages). Certainly, by the time Santarém was writing there had been an upsurge of interest in the study of early maps as historical documents, and it had been accompanied by an understandable and increasing tendency for some individuals among those most closely involved to consider themselves the true founders of the new subject. Signs of this attitude may be detected in the public debate between Santarém and Jomard. Edme-François Jomard was by then established as head of the map room that had been created in the Bibliothèque Royale in Paris in 1828. The debate focused on the two men’s competing claims to have been the first to conceive the idea of publishing an atlas of medieval maps in facsimile,⁹⁶ but it was echoed by scholars working in North America who also saw themselves as the first of a new breed of map historians. So Charles P. Daly asserted in 1879 that there was little “specifically devoted to such an inquiry” as the history of cartography.⁹⁷ So too J. G. Kohl, the German scholar, claimed in his Smithsonian lecture two years later that “the history of geographical maps has scarcely ever been thought of” and that as a “branch of geographical research” it had remained “a perfect blank” until his own day.⁹⁸ While it is understandable that in their more enthusiastic moments such scholars were perhaps apt to exaggerate the significance of their own efforts, it is also clear that they had started to develop a sense of destiny and purpose for the study of early maps. This awakening is nowhere better expressed than in the words of Jomard when he wrote that among his tasks was “that of provoking a more complete search [for] all the as yet unknown geographical monuments . . . to make them rise from the dust and come out from the oblivion in which they are buried.”⁹⁹

Twentieth-century historians of cartography have so far done little, except perhaps at a national level,¹⁰⁰ to assess this crucial period in the development of their subject. Only two, Armando Cortesão and R. A. Skelton, even attempted a general historiographic treatment. Both laid much stress on the seminal contributions of a number of leading scholars and on the landmarks in publication thus created. Both singled out atlases of

facsimiles of early maps that they saw as holding a preeminent place in the literature of the subject from the mid-nineteenth century onward. The main emphasis of Cortesão’s approach was biobibliographic. For him, writing in the 1960s, the systematic study of the history of cartography had started about a century earlier, and its subsequent development was best explained by the contributions of a procession of leading scholars. Thus he listed over ninety individuals in his chapter “Cartography and Its Historians,” although he admitted that even so he had “not mentioned all who have, directly or indirectly, contributed to the advancement of this important and enthralling branch of the history of science.”¹⁰¹ Valuable as they are, though, Cortesão’s bio-

94. Manuel Francisco de Barros e Sousa, Viscount of Santarém, “Notice sur plusieurs monuments géographiques inédits du Moyen Age et du XVI^e siècle qui se trouvent dans quelques bibliothèques de l’Italie, accompagné de notes critiques,” *Bulletin de la Société de Géographie*, 3d ser., 7 (1847): 289–317, quotation on 289, author’s translation. The article is reprinted in *Acta Cartographica* 14 (1972): 318–46.

95. Viscount of Santarém, *Essai*, 1:XLIV (note 93), designed to serve as an introduction to his *Atlas*. On Placido Maria Zurla, see Cortesão, *History of Portuguese Cartography*, 1:36 (note 93); on Andrés see note 90 above.

96. Jomard’s atlas, *Les monuments de la géographie; ou, Recueil d’anciennes cartes européennes et orientales* (Paris: Duprat), appeared serially from 1842 to 1862, the first issue being a facsimile of the Hereford map in six colored plates. Although Cortesão, *History of Portuguese Cartography*, 1:29–32 (note 93), tends to take a patriotic Portuguese line, regarding Santarém as “the creator of the systematic history of cartography” (1:23), he does give the fullest account of the affair. The issue is probably worth reexamination as a chapter in the intellectual development of the history of cartography. Taking the evidence presented by Cortesão, together with that from various writings by Santarém and Jomard, it seems unlikely that by the 1830s the idea of a facsimile atlas of early maps was the private property of any one scholar. Besides Jomard and Santarém, other scholars such as Marie Armand Pascal d’Avezac-Macaya and Joachim Lelewel were engaged in similar projects. For a reference to d’Avezac’s scheme, undertaken with Thomas Wright, an Englishman, but dropped in favor of Jomard, see Edme-François Jomard, *Sur la publication des Monuments de la géographie* (Paris, 1847), 6; on Lelewel see Marian Henryk Serejski, *Joachim Lelewel, 1786–1861: Sa vie et son oeuvre* (Warsaw: Zakład Narodowy imienia Ossolińskich, 1961); also Zbigniew Rzepa, “Joachim Lelewel, 1786–1861,” *Geographers: Biobibliographical Studies* 4 (1980): 103–12.

97. Charles P. Daly, “On the Early History of Cartography; or, What We Know of Maps and Map-Making, before the Time of Mercator,” Annual Address, *Bulletin of the American Geographical Society* 11 (1879): 1–40, quotation on 1.

98. Johann Georg Kohl, “Substance of a Lecture Delivered at the Smithsonian Institution on a Collection of the Charts and Maps of America,” *Annual Report of the Board of Regents of the Smithsonian Institution* . . . 1856, (1857), 93–146, quotation on 95.

99. Edme-François Jomard (posthumously published by M. E. Cortambert), *Introduction à l’atlas des Monuments de la géographie* (Paris: Arthus Bertrand, 1879), 6, author’s translation.

100. See below, p. 37.

101. Cortesão, *History of Portuguese Cartography*, 1:1–70, quotation on 69 (note 93).

ographies should be regarded as merely the raw material for future study of the intellectual development of the history of cartography. They stop short of the potential insights of modern prosopography in failing to go on to reveal the wider processes at work behind the contributions of individuals, which remain as unconnected episodes in the history of the study of early maps.¹⁰²

In his discussion of the historical study of early maps in the nineteenth century, R. A. Skelton drew heavily on the material quarried by Cortesão. Like Cortesão, Skelton laid stress on the scholarly achievements of the individual pioneers of the subject—notably Jomard, Santarém, Lelewel, Kohl, Nordenskiöld—and in particular on the contribution made through their facsimile atlases. In Skelton's view these atlases had continued, down to his own day, to enable scholars to formulate "the central problems in the comparative study and use of early maps as historical documents."¹⁰³ On the other hand, Skelton recognized that the study of early maps did not develop in an institutional vacuum, and he drew attention to the way the emergence of geography as an independent discipline, and in particular its "newly formed societies . . . hungry for work,"¹⁰⁴ provided the essential framework for a rapid expansion of interest in the history of cartography during the nineteenth century. Notwithstanding the major influence exerted by geography on the practice of the history of cartography, not least in reinforcing the tendency to equate it with a study of geographical maps, its significance has been overlooked elsewhere. A more explicit argument for its role is therefore offered below.

THE RISE OF GEOGRAPHY

The anatomy of the growth of geography in the nineteenth century—as a subject in the universities and with a growing professional community—has been traced in several recent studies,¹⁰⁵ but for the history of cartography perhaps the most important single facet of that growth was the foundation of national geographical societies. Beginning with the Société de Géographie de Paris (1821), followed by the Gesellschaft für Erdkunde zu Berlin (1828) and the Royal Geographical Society of London (1830), new societies were established not only in Europe but also in the New World. By 1885, it has been estimated, the world had ninety-four geographical societies with over forty-eight thousand members.¹⁰⁶ Most of these societies published journals, and through their extensive collections of topographic maps and atlases, as well as by serving as outlets for publication, they provided opportunities for research into early cartography. Of course, neither these societies nor their journals regarded the history of cartography as a major preoccupation, nor indeed did the journals hold a mo-

nopoly on such writings.¹⁰⁷ Yet even though they failed in general to initiate directly studies in the history of cartography, it is noticeable that in many countries it was the members of these societies who, for whatever reasons, were the most active in studying early maps and that a large proportion of the relevant literature from the nineteenth century is to be found in periodicals sponsored by the national and regional geographical societies.¹⁰⁸ Moreover, just as geography was studied within national and regional frameworks, so too was the history of cartography. Maps were key documents in both a practical and an ideological sense in shaping European nationalism and imperialism, and it is of interest that Santarém's facsimile *Atlas* had its origin in the use of old maps in a sovereignty dispute between Portugal and France over Casamance in Senegal. Even today, related aspects of the politics of knowledge are manifest in writings on the history of cartography, as, for example, in the case of the hotly disputed primacy between the nations of southern Europe in the development of the portolan chart.¹⁰⁹

Later in the nineteenth century the history of cartography was also to be caught up by international co-operation, designed to promote the study of academic geography, growing out of these national institutions and

102. Lewis Pyenson, " 'Who the Guys Were': Prosopography in the History of Science," *History of Science* 15 (1977): 155–88, has some pointers for directions in the history of cartography.

103. Skelton, *Maps*, 82 (note 15).

104. Skelton, *Maps*, 74 (note 15).

105. Capel, "Institutionalization" (note 92); also Robert E. Dickinson, *The Makers of Modern Geography* (New York: Frederick A. Praeger, 1969), 267–68.

106. H. Wichmann, "Geographische Gesellschaften, Zeitschriften, Kongresse und Ausstellungen," *Geographisches Jahrbuch* 10 (1884): 651–74, esp. 654.

107. In the Netherlands, for example, after 1850 many contributions to the history of cartography were published in the periodicals of the learned literary societies (personal communication from Cornelis Koeman).

108. On the early role of the Société de Géographie in this respect, see Alfred Fierro, *La Société de Géographie, 1821–1946* (Geneva: Librairie Droz, 1983), 4–18.

109. On Santarém see Skelton, *Maps*, 77 (note 15); on portolan charts see chapter 19 of this volume, "Portolan Charts from the Late Thirteenth Century to 1500"; Cortesão, *History of Portuguese Cartography*, 1:59 (note 93), for example, says that Italian historians of the discoveries and of cartography write "with a more or less bitter and spiteful bias against the Portuguese," and, similarly, Samuel E. Morison, *Portuguese Voyages to America in the Fifteenth Century* (Cambridge: Harvard University Press, 1940), represented a violently anti-Portuguese attitude. Something of the flavor of this debate is given by Heinrich Winter, "Catalan Portolan Maps and Their Place in the Total View of Cartographic Development," *Imago Mundi* 11 (1954): 1–12. Indeed, disagreement is particularly rife among such historians in the discussion of early maps, and it has often been expressed in bitter personal as well as nationalistic forms. As serious study has become more professionalized, however, argument, though still lively, is conducted less acrimoniously.

the territorial and commercial ambitions they supported. It was perhaps coincidence that the first International Geographical Congress, in Belgium in 1871, called for specialists interested in *la science de la terre* and in *les sciences cosmographiques*, had decided to honor the mapmakers Mercator and Ortelius by erecting statues in the towns of their birth. But early maps were exhibited at the Antwerp meeting, and the *questions de géographie historique* scheduled to be discussed by the Comité d'Honneur included a number relating to the history of cartography.¹¹⁰ At subsequent congresses during the nineteenth century, however, very few papers were given on the history of cartography,¹¹¹ and abundant interest in the subject within the organization, noted by Skelton, was primarily a feature of the first half of the twentieth century.¹¹² Even then, in the period from the congress of 1904 to that of 1972, historical subjects represented only some 14 percent of all the recorded cartographic papers and of course a relatively insignificant proportion of all geographical papers presented at the congresses.¹¹³

THE GROWTH OF MAP LIBRARIES

Another major source of institutional support for the history of cartography in the nineteenth and early twentieth centuries was to develop within the newly established map libraries, especially those of the national libraries. Before about 1790, there had been a slow growth of map collecting by individuals, as already noted, but after this date the expansion and institutionalization of this activity parallel the rise of geography itself.¹¹⁴ Again it has to be stressed that these libraries were not set up primarily to meet the needs of the history of cartography. On the contrary, their objectives varied widely, ranging from a need to house national map collections, as in the case of the Bibliothèque Nationale, the British Museum, and the Library of Congress, through the often complementary activities of the various geographical societies in collecting maps, to the establishment of map rooms in public and university libraries or in specialist government departments, not least those concerned with military and naval matters or with administration of overseas empires. While allowing for the wider functions of these map libraries, it can also be accepted that they played a crucial role in the development of the history of cartography by acting as repositories for antiquarian charts and maps and by arranging for their cataloging and exhibition. Moreover, they were especially important in helping to cultivate a new attitude toward the preservation and comparative study of early maps. The writings of Jomard, as he sought to justify the role of the *collection géographique spéciale* established within the Bibliothèque Royale in 1828, strongly reflect this philosophic underpinning.¹¹⁵

In 1839, for example, he noted that “the comparative study and attentive examination of geographical maps” had “served more than once to resolve political, diplomatic, or historical questions, such as illuminating legal disputes.” He insisted that it was not “enough to possess the newest maps”; a map library, he continued, should not “banish . . . the first products of the printing press,” for it was “only by comparing the successive product of a science that history can be written, and it is sometimes in the oldest that the solution to a difficulty is found.”¹¹⁶ True to this principle, Jomard tells us that it was

especially toward the search for the oldest medieval maps, those venerable monuments of primitive geography, that I directed my efforts. In 1828 nobody dreamed of gathering those precious remains and of reuniting them in a national collection. Since, all has been very much changed; these objects are avidly hunted for everywhere; they are gathered up for the

110. *Compte-rendu du Congrès des Sciences Géographiques, Cosmographiques et Commerciales*, 2 vols. (Antwerp: L. Gerrits and Guil. Van Merlen, 1872), ii–xv.

111. The tally is one (Paris, 1875), one (Venice, 1881), three (Paris, 1889), five (London, 1895), and three (Berlin, 1899): for details see George Kish, ed., *Bibliography of International Geographical Congresses, 1871–1976* (Boston: G. K. Hall, 1979).

112. Skelton, *Maps*, 98 (note 15). This interest can again be monitored from the papers relating to early maps presented at successive congresses: five (Rome, 1913), three (Cairo, 1925), eight (Cambridge, 1928), fourteen (Paris, 1931), seven (Warsaw, 1934), twenty-one (Amsterdam, 1938). Thereafter few papers were offered until the London congress of 1964, when there were twenty-three. For details see Kish, *Geographical Congresses*, passim (note 111).

113. John A. Wolter, “The Emerging Discipline of Cartography” (Ph.D. diss., University of Minnesota, 1975), 199–200.

114. See John A. Wolter, “Geographical Libraries and Map Collections,” in *Encyclopedia of Library and Information Science*, ed. Allen Kent, Harold Lancour, and Jay E. Daily (New York: Marcel Dekker, 1968–), 9 (1973): 236–66; see also Wolter, “Emerging Discipline,” 78–94 (note 113).

115. Edme-François Jomard, *Considérations sur l'objet et les avantages d'une collection spéciale consacrée aux cartes géographiques et aux diverses branches de la géographie* (Paris: E. Duverger, 1831), where he stressed that geographical maps have advantages peculiar to themselves (p. 8) and need to be treated separately from books. Within his map library he also proposed to have a special section for maps from the Middle Ages, or European maps up to ca. 1600 (p. 57). For modern studies of Jomard and the establishment of the Département des Cartes et Plans see Charles Du Bus, “Edme-François Jomard et les origines du Cabinet des Cartes (1777–1862),” *Union Géographique Internationale, Comptes rendus du Congrès International de Géographie, Paris 1931 3* (1934): 638–42; Edmond Pognon, “Les collections du Département des Cartes et Plans de la Bibliothèque Nationale de Paris,” in *Map Librarian*, 195–204 (note 63); and Monique Pelletier, “Jomard et le Département des Cartes et Plans,” *Bulletin de la Bibliothèque Nationale* 4 (1979): 18–27.

116. Edme-François Jomard, *De l'utilité qu'on peut tirer de l'étude comparative des cartes géographiques* (Paris: Burgogne et Martinet, 1841), 4, author's translation (reprinted from *Bulletin de la Société de Géographie*, 2d ser., 15 [1841]: 184–94).

enrichment of public depositories from which they cannot again come out, and they are becoming an extreme rarity.¹¹⁷

It was with aims such as this, the pursuit of “the linking of the history of science and its graphic products,”¹¹⁸ while simultaneously helping to ensure that maps were “raised to the dignity of historical documents,”¹¹⁹ that the larger map libraries became crucial institutions for the study of the history of cartography. And it is also clear from the history of other libraries, besides the Département des Cartes et Plans, that some of these collections became more than just repositories for antiquarian maps and plans. Rather, as with the Department of Maps and Charts established in the British Museum in 1867¹²⁰ or the Hall of Maps and Charts (later called the Geography and Map Division) founded in the Library of Congress in 1897,¹²¹ they started to function as national and even international clearing-houses for new findings in the history of cartography. Their curators were encouraged to engage in scholarship, and in this way and a number of other ways they have continued to play a central part in the development of the subject.

PRIVATE COLLECTORS AND THE ANTIQUARIAN MAP TRADE

In addition to the institutional infrastructure for the study of early maps provided through the growth of geography and through the emergence of map libraries, private collectors and the antiquarian trade together contributed a distinctive patina to research and writing in the history of cartography. Their influence was narrowing, akin to the role of connoisseurship in traditional art history. It has tended to favor the study of collectible printed maps and perhaps to encourage an excessive delectation of decorative maps as objets d’art. In practice *this usually meant* European printed maps of the period from the late fifteenth century to the end of the eighteenth, although in the nineteenth century in particular collectors and scholars joined in concentrating their interests upon the flowering of European cartography during the Renaissance.

The specific legacy of wealthy private collectors to the study of the history of cartography was especially felt in western Europe and North America. It has already been highlighted by Skelton, who discerned three main areas of influence.¹²² First, the main fruit of some collecting has been the concentration, to the benefit of later generations of scholars, of the major resources of early maps in the so-called treasure house libraries. For example, for North America attention has recently been drawn to those nineteenth-century collectors, such as John Carter Brown, James Lenox, and Edward E. Ayer,

who specialized in collecting early maps of particular regions or topics even though they did not themselves engage in research.¹²³ Second—and more directly linked to the intellectual development of the subject—is the group Skelton defined as the scholar-collectors, including J. T. Bodel Nijenhuis and Abraham van Stolk, both from the Netherlands, General von Hauslab in Austria, and the explorer Nordenskiöld in Sweden,¹²⁴ whose map collections were the raw materials of their writings on the history of cartography. Third, there were the scholar-dealers, for whom the archetype could have been Fredrik Muller, the Netherlands collector, publisher, and bibliographer of early maps and atlases. Cornelis Koeman has described Muller as “the innovator and propagandist par excellence of the scientific management of antiquarian bookselling in general and the first promoter of cartography as an historical source in particular,”¹²⁵ and it was Muller who laid the foundations for the history of Dutch cartography that was later written by others. Yet though a leader, Muller was by no means

117. Edme-François Jomard, *De la collection géographique créée à la Bibliothèque Royale* (Paris: E. Duverger, 1848), 79, author’s translation.

118. Jomard, *Collection géographique*, 13 (note 117).

119. Kohl, “Lecture,” 95 (note 98).

120. Wallis, “Map Collections,” 17 (note 54).

121. John A. Wolter et al., “A Brief History of the Library of Congress Geography and Map Division, 1897–1978,” in *Map Librarian*, 47–105 (note 63).

122. Skelton, *Maps*, 52–61 (note 15).

123. Douglas Marshall, “The Formation of a Nineteenth-Century Map Collection: A. E. Nordenskiöld of Helsinki,” *Map Collector* 21 (1982): 14–19. See also the continuing series in *Map Collector* on “America’s Treasure House Libraries,” including Norman J. W. Thrower, “The Treasures of UCLA’s Clark Library,” *Map Collector* 14 (1981): 18–23; Carey S. Bliss, “The Map Treasures of the Huntington Library,” *Map Collector* 15 (1981): 32–36; Thomas R. Adams, “The Map Treasures of the John Carter Brown Library,” *Map Collector* 16 (1981): 2–8; John Parker, “The Map Treasures of the James Ford Bell Library, Minnesota,” *Map Collector* 20 (1982): 8–14; Philip Hoehn, “The Cartographic Treasures of the Bancroft Library,” *Map Collector* 23 (1983): 28–32; Robert Sidney Martin, “Treasures of the Cartographic Library at the University of Texas at Arlington,” *Map Collector* 25 (1983): 14–19; Barbara McCorkle, “Cartographic Treasures of the Yale University Library,” *Map Collector* 27 (1984): 8–13; Robert W. Karrow, “The Cartographic Collections of the Newberry Library,” *Map Collector* 32 (1985): 10–15.

124. Skelton, *Maps*, 54–55 (note 15); for insight into Nordenskiöld’s scholarly collecting see Ann-Mari Mickwitz, “Dear Mr. Nordenskiöld, Your Offer Is Accepted!” in *Map Librarian*, 221–35 (note 63). To Skelton’s list might be added the map collections of some of the nineteenth-century academic geographers. In Germany, for example, that of Carl Ritter (some twelve thousand maps) was notable and a factor in the foundation of a national map library: see Lothar Zögner, “Die Carl-Ritter-Ausstellung in Berlin—eine Bestandsaufnahme,” in *Carl Ritter—Geltung und Deutung*, ed. Karl Lenz (Berlin: Dietrich Reimer Verlag, 1979), 213–23. Other map collections from geographers were those of Alexander von Humboldt, Carl Wilhelm von Oesfeld, Carl Friedrich von Klöden, and Heinrich Kiepert.

125. Koeman, *Collections*, 93 (note 51).

an isolated figure. As the correspondence over the foundation of Nordenskiöld's collection has revealed, by the late-nineteenth century a complex network of European dealers in early maps was coming into being, including, among others, Muller in Amsterdam, Lissa in Berlin, Kellings in Stockholm, Quaritch and Stevens in London, Perrella in Naples, and Olschki in Venice and Verona.¹²⁶ While the caution *caveat emptor* may sometimes have to be applied to their work, it is also true that such men helped to raise the standard of bibliographical description of maps, as in the succession of notable catalogs by Muller and his successor Anton Mensing (after 1902 assisted by F. C. Wieder), and through their own scholarly works, as in the case of the study by Henry N. Stevens of the printed editions of Ptolemy's *Geography*.¹²⁷

TRADITIONAL PATTERNS OF CARTOGRAPHIC HISTORY

The three influences on the history of cartography just outlined—the institutionalization of geography, the growth of specialist map libraries, and the interplay of scholarly collecting with an expanding antiquarian market for early maps—together determined the nature of most writings on the history of cartography to the middle of the present century. On the face of it, many of the substantive themes and distinctive topics that still head the history of cartography agenda today—and which will feature prominently in these volumes—were present in the literature of the century and a half after 1800. Such themes include, as R. A. Skelton has suggested, medieval cartography and its Roman origins, mathematical cartography and the history of map projections, the expansion of original topographical surveys, changing navigation techniques and their effects on the design of sea charts, the development of cartographic representation, the growth of the map trade, and the application of printing techniques to cartography.¹²⁸ Without qualification, however, such a list is misleading and exaggerates the maturity of the subject in the nineteenth century. Some of the topics—the history of map printing, to take a single example—were hardly studied systematically.¹²⁹ Moreover, in perhaps the majority of cases, the maps themselves—considered as independent artifacts and images—were still subservient to the pragmatic aims of the institutional or collecting context, so that it is difficult to acknowledge a history of cartography that possessed a sense of scholarly identity at this stage.

The relationship between the history of cartography and the development of geography from the early nineteenth century onward illustrates how interest in early maps was subordinated to problems external to the map itself. In part this was related to the fact that, in the first half of the nineteenth century, geography itself tended

to be regarded not as a subject in its own right, but as an adjunct to history.¹³⁰ Geography provided the necessary background for understanding historical events, especially those of classical history. It is not surprising that early maps should have been viewed primarily as historical documents, to be used in reconstructing the geographies of the past, whether of the ancient world, the biblical lands, or the age of the great discoveries when the foundations were laid for the overseas empires of the nineteenth century.

Accepting such an interpretation of the primary motivation for the study of early maps in the nineteenth and early twentieth century means that much of the writing loosely described as belonging to the history of cartography can also be allocated to other branches of knowledge. In particular, some of the so-called landmarks in the subject could equally well be seen as belonging to the historiography of geographical discoveries or to cognate parts of other historical specialisms. Note that Alexander von Humboldt's interest in the first maps of the New World was very largely connected with his study of the discovery and exploration of the Americas,¹³¹ and Santarém was preoccupied with the "immense utility" of ancient maps for the history of geography and the history of discoveries¹³² and (with a touch of chauvinism) the establishment of "the priority of the Portuguese discoveries in western Africa, and the services this nation rendered to geographical sciences."¹³³ The example of Santarém also serves to make the point that the atlases of map facsimiles¹³⁴ which, it

126. Mickwitz, "Nordenskiöld" (note 124).

127. Henry N. Stevens, *Ptolemy's Geography: A Brief Account of All the Printed Editions down to 1730*, 2d ed. (London: Henry Stevens, Son and Stiles, 1908, reprinted, Amsterdam: Theatrum Orbis Terrarum, [1973]); see also Stevens's *Recollections of James Lenox and the Formation of His Library*, ed., rev., and elucidated by Victor Hugo Paltsits (New York: New York Public Library, 1951).

128. The list is paraphrased from that of Skelton, *Maps*, 90 (note 15).

129. David Woodward, ed., *Five Centuries of Map Printing* (Chicago: University of Chicago Press, 1975), vii, states that "for many aspects of the study of historical map printing methods, the field is untouched."

130. Capel, "Institutionalization," 39–47 (note 92), summarized the evidence for a number of European countries in this period.

131. Alexander von Humboldt, *Examen critique de l'histoire de la géographie du nouveau continent et des progrès de l'astronomie nautique au XV^e et XVI^e siècles*, 5 vols. (Paris: Gide, 1836–39).

132. Viscount of Santarém, *Essai*, 1:LVI (note 93).

133. Viscount of Santarém, "Notice," 290 (note 94), author's translation.

134. A distinction has to be drawn between the prephotographic "facsimile" atlases, which were fresh engravings of hand-drawn copies imitating the originals (and which may contain erroneous graphic and textual transcriptions), and photographic facsimiles that date from the second half of the nineteenth century onward. For an early criticism of the reliability of the pioneer "facsimiles" of Jomard and Santarém, see Gabriel A. Marcel, *Reproductions de cartes et de globes relatifs à*

is usually assumed, represent the commanding heights of the history of cartography in the nineteenth century and beyond were in fact often designed as much to make early maps accessible for underpinning the history of geographical discovery as to promote the study of these maps as independent historical objects. Such interests are made absolutely plain by Jomard, whose explicit motives in compiling *L'atlas des monuments de la géographie* were “to illuminate successive eras with the progress of science and the principal discoveries.”¹³⁵ Similarly, the atlas accompanying Lelewel's *Géographie du Moyen Age* assigns early maps to their place within the history of geography, a relationship that is reinforced by the wider context of his other historical works.¹³⁶ Toward the end of the nineteenth century, the same objective in the study of early maps is reflected in Nordenskiöld's preface to his *Facsimile-Atlas to the Early History of Cartography*, where he observes that “the era of the great geographical discoveries can hardly be fully intelligible without a comparative study of the maps which were then accessible.”¹³⁷ Here too, as in his later *Periplus*, concentrating on “the early history of charts and sailing-directions,”¹³⁸ Nordenskiöld was esteeming that cartographic history was being written to provide the technical analyses necessary for the student of discovery and exploration.

Although twentieth-century historians of discovery, with notable exceptions, have failed to exploit early maps to the same degree as these pioneers,¹³⁹ links between the historical study of cartography and of discovery have remained firmly intact. As late as the 1960s, Cortesão was writing of the difficulty of disentangling the vast bibliographies relating to the histories of discovery, navigation, nautical science, and cartography.¹⁴⁰ It is true that by this date the range of technical studies in the history of cartography was increasing, in an attempt to match some of the new applications of early maps as sources in other historical specialisms. It is also true that an increasing number of articles and monographs no longer made such direct reference to the historical applications of the maps being studied. Yet lurking in the epistemology of many historians of cartography there was always still the feeling that their primary duty was to make accessible—and to interpret—the cartographic documents required by scholars in other fields.

First properly formulated by Jomard and Santarém, this approach found enduring expression in the continuing interest in the publication of facsimile atlases in the twentieth century. This was one of the objectives embraced by the International Geographical Union. Commissions for the reproduction of early maps were appointed in 1908 and in 1913; but though this project was continued by the Cambridge Congress of 1928, the members seem to have done more talking than publish-

ing, and by 1938, as Leo Bagrow noted in a report on that year's congress, the various proposals for the recording and study of old maps “had not yet materialised.”¹⁴¹ At a national level in many countries, and reaping the technical benefits of modern methods of map reproduction such as collotype and offset lithography using fine screens,¹⁴² scholars were more successful in bringing to fruition schemes for the reproduction of early maps relating to their own countries. There was a very real continuity between the pioneer atlases of Jomard, Santarém, and Nordenskiöld and the succeeding generation of *Monumenta cartographica* (to give them their generic title) that were organized on national and regional lines or in relation to particular collections,¹⁴³ perhaps culminating with the *Monumenta cartographica Africae et Aegypti* edited by F. C. Wieder for Prince Youssouf Kamal of Egypt.¹⁴⁴ Like their predecessors,

la découverte de l'Amérique du XVI^e au XVIII^e siècle avec texte explicatif (Paris: Ernest Leroux, 1893–94), preface, 8, where he makes a plea for “true” facsimiles.

135. Jomard, *Introduction*, 6 (note 99), author's translation.

136. Rzepa, “Lelewel,” 106–7 (note 96), for a “Selective and Thematic Bibliography” of works by Joachim Lelewel; see also Michael J. Mikoś, “Joachim Lelewel: Polish Scholar and Map Collector,” *Map Collector* 26 (1984): 20–24.

137. A. E. Nordenskiöld, *Facsimile-Atlas to the Early History of Cartography*, trans. Johan Adolf Ekelöf and Clements R. Markham (Stockholm, 1889), preface.

138. Nordenskiöld, *Periplus*, quotation from title page (note 35).

139. Many historians of discovery have treated maps as incidental contributors to what is primarily narrative history, and their indexes may be searched in vain for maps and charts. An exception is John H. Parry, who was a vigorous pragmatic user of early maps as an integral part of his subject, although his caution in generalizing from cartographic evidence has already been referred to (see Parry, note 10 above).

140. Cortesão, *History of Portuguese Cartography*, 1:70 (note 93).

141. [Leo Bagrow], “Sixteenth International Geographical Congress, 1938,” *Imago Mundi* 3 (1939): 100–102, quotation on 101. The ambitious scheme for the publication of a *Monumenta cartographica Europea*, set in motion through a subcommission in 1931, was eventually overtaken by World War II. In 1949, at the Lisbon meeting, the Commission pour la Reproduction et la Publication des Cartes Anciennes gave way to the Commission pour la Bibliographie des Cartes Anciennes on the grounds that the former (reproduction) could not be done satisfactorily without the latter (a bibliography), in order to establish priorities in reproduction. See Roberto Almagià, *Rapport au XVII^e Congrès international: Contributions pour un catalogue des cartes manuscrites, 1200–1500*, ed. Marcel Destombes, International Geographical Union, Commission on the Bibliography of Ancient Maps ([Paris], 1952), 5.

142. Walter W. Ristow, “Recent Facsimile Maps and Atlases,” *Quarterly Journal of the Library of Congress* 24 (1967): 213–29.

143. They are discussed as a group by Skelton, *Maps*, 93–95 (note 15), and also in Cornelis Koeman, “An Increase in Facsimile Reprints,” *Imago Mundi* 18 (1964): 87–88, and relate to countries or regions including Bohemia, Denmark, Iceland and the Faroes, Italy, the Netherlands, Portugal, Sudetenland, and the Ukraine.

144. Youssouf Kamal, *Monumenta cartographica Africae et Aegypti*, 5 vols. in 16 pts. (Cairo: 1926–51). See below, p. 40, where the full contents are itemized.

the “systematic plan and elaborate commentaries” of the later facsimile atlases gave them “the character of monographs or histories.”¹⁴⁵ Yet despite the value of the scholarly commentaries that accompanied them (epitomizing the geographical contribution to the study of early maps), these atlases have today declined in relative importance within the subject as a whole. With the development of new ideas about the history of cartography, taking it beyond the study of maps primarily as historical documents, their influence and significance will continue to decline so that they may even come to be regarded as dinosaurs whose time-absorbing nature (and the finance needed to present them in all their glory) is a thing of the past. The extinction of the commission of the International Geographical Union concerned with early maps at the 1964 congress was a partial reflection, among the wider geographical community, of this changing intellectual landscape.¹⁴⁶ In the event, the abandonment of the history of cartography by the International Geographical Union has done nothing to check the flood of facsimile publications of early maps. Indeed, they have become so numerous that they now have their own bibliography,¹⁴⁷ have attracted a growing secondary literature, and continue unabated to attract some of the more ambitious publishing ventures within the history of cartography as a whole.

The specialist map libraries have also made their mark on the literature of the history of cartography. If the geographical societies from the nineteenth century onward did much to consolidate an approach to early maps as records of discovery, simultaneously initiating the facsimile tradition, then it can equally well be said that the principal legacy to the history of cartography of the great research libraries—apart from the opportunities they offered for research—has been the bibliographical one. The output of bibliographical works relating to early maps is truly substantial.¹⁴⁸ They reflect the diversity both of maps and of the types of libraries where they are conserved. It has been suggested that these bibliographies may be divided into two categories: the lists institutions produce describing their own holdings, and cartobibliographies—lists that offer a more exhaustive analysis and description of the variant forms of each map as a means of illuminating its printing history or the interrelationships of manuscript copies.¹⁴⁹

As already noted, the history of the cataloging of early maps, so vital an adjunct to historians of cartography, can be traced back to primitive listings of maps undertaken in the seventeenth and eighteenth centuries. However, detailed cataloging was to be given particular impetus by the emergence of the independent map libraries during the nineteenth century. For example, in France in the 1820s, a manuscript *Catalogue géographique raisonné* had been compiled of d’Anville’s massive collection, which was by then in the Département des Affaires

Etrangères,¹⁵⁰ and Jomard is said to have proposed the publication of a *catalogue raisonné* of the geographical collections of the Bibliothèque Royale before 1839.¹⁵¹ Such ambitious projects did not, however, rapidly come to fruition. Of the national map collections on the eve of World War I, only the British Museum had issued a complete catalog of its holdings,¹⁵² although the Library of Congress had already published a list of the maps of America in its possession and had completed the first volumes of a list of its geographical atlases.¹⁵³ Elsewhere, the most solid progress by this date was the completion of major lists of manuscript maps in the archives of repositories in the Netherlands (the Rijksarchief) and Spain (the Archivo General de Indias) and of the medieval and Renaissance materials in German and Italian collections,¹⁵⁴ together with the map collections of some

145. Skelton, *Maps*, 95 (note 15).

146. In fact, the voting was fifteen for the continuation of the commission, nineteen against, and three abstentions: *International Geographical Union Newsletter* 16 (1965): 6.

147. Walter W. Ristow, *Facsimiles of Rare Historical Maps: A List of Reproductions for Sale by Various Publishers and Distributors* (Washington, D.C.: Library of Congress, 1960 and subsequent editions). This is selective, and Skelton, *Maps*, 107 (note 15), included among future tasks the preparation of a full index of published facsimiles.

148. John A. Wolter, “Research Tools and the Literature of Cartography,” *AB Bookman’s Yearbook*, pt. 1 (1976): 21–30, esp. 21, noted that out of 1,169 entries classified in *Bibliotheca cartographica* as “bibliographies, collections, documentations” from 1957 to 1972, over 75 percent were bibliographies.

149. Robert W. Karrow, “Cartobibliography,” *AB Bookman’s Yearbook*, pt. 1 (1976): 43–52, esp. 43.

150. D’Anville’s collection was sold to Louis XVI in 1780. In 1782, the year of d’Anville’s death and of the transfer of the collection to Versailles, the inventory started by d’Anville was finished by his assistant, Jean Denis Barbié du Bocage. Barbié du Bocage had to make a new classification after the collection was received by the Ministry of Foreign Affairs; after an interruption, the work was continued by his son, Jean Guillaume, who signed, in January 1827, the introduction to the *Catalogue géographique raisonné* reflecting the new classification (four manuscript parts in five volumes), 1826–27. This catalog has remained unpublished.

151. Jean Bernard Marie Alexander Dezos de La Roquette, *Notice sur la vie et les travaux de M. Jomard* (Paris: L. Martinet, 1863), 15–16.

152. British Museum, *Catalogue of the Manuscript Maps, Charts, and Plans, and of the Topographical Drawings in the British Museum*, 3 vols. (London: Trustees of the British Museum, 1844–61), and idem, *Catalogue of the Printed Maps, Plans and Charts in the British Museum*, 2 vols. (London: W. Clowes by order of the Trustees of the British Museum, 1885).

153. Philip Lee Phillips, *A List of Maps of America in the Library of Congress* (Washington, D.C.: Government Printing Office, 1901); reprinted, Burt Franklin Bibliography and Reference Series no. 129 (New York: Burt Franklin, [1967]), and Library of Congress, *A List of Geographical Atlases in the Library of Congress, with Bibliographical Notes*, 8 vols. (Washington, D.C.: Government Printing Office, 1909–74), vols. 1–4 (1909–20), ed. Philip Lee Phillips, supp. vols. 5–8 (1958–74), ed. Clara Egli LeGear.

154. They are listed by Skelton, *Maps*, 86–89 (note 15).

of the military survey organizations.¹⁵⁵ Given the “gigantic and endless labour,” as Skelton calls it, required for recording early map resources, these pioneer catalogs remain landmarks. Even today, over a century since the first major institutional catalogs appeared, there are still numerous collections of early maps lacking adequate published catalogs.¹⁵⁶

The listing of maps—like the listing of books in bibliographical scholarship—has held a particular fascination for students of early maps since the nineteenth century. No doubt, as a handmaiden of connoisseurship, such an interest was partly rooted in the collecting and listing mentality of that age, an enthusiasm that persisted well into the present century.¹⁵⁷ But it was also a response to the inconvenient lack of published catalogs of many collections that has just been noted. In any case, the interest in producing and publishing catalogs was rapidly diversified so that, quite apart from the catalogs of institutional holdings, there is today an equally large number of early map bibliographies organized according to type and form, by period, by geographical area (world, continent, country, province), by function (cadastral maps, road maps, sea charts, celestial maps), by format (atlases, globes, wall maps), or by various combinations of these criteria.¹⁵⁸

Another way the bibliographical approach came to exert such an influence on the developing character of the subject was through the frequent introduction of lists of maps, often accompanied by mapmakers’ biographies, as the central element of a monograph or of the essays introducing facsimile atlases. Thus biobibliography came to be regarded as the heartbeat of the history of cartography. Many of the classic studies in the history of cartography have a major bibliographical dimension: Nordenskiöld included a list of later world maps in his *Facsimile Atlas*, and nautical charts and sailing directions were listed in his *Periplus*. The central organizing principle of Konrad Miller’s *Mappaemundi* was a description of all the medieval world maps known to him,¹⁵⁹ and Henry Harrisse, nineteenth-century bibliographer-historian of the discovery of North America, had proposed a “Cartographia Americana” to accompany his *Bibliotheca Americana vetustissima*.¹⁶⁰ Since these men wrote, at the turn of the nineteenth and the twentieth centuries, the growth of bibliographical research has expanded to such an extent that it has become widely characteristic of the literature of the history of cartography, and many new projects today contain a bibliographical element.¹⁶¹

The term “cartobibliography” was coined by the English map historian Herbert George Fordham at the beginning of the present century. Fordham was particularly concerned with developing principles of analysis and classification that could be applied specifically to maps

as opposed to nonmap materials.¹⁶² Subsequent research in a number of countries has refined his methods, particularly by adapting concepts first developed within literary bibliography, so that cartobibliography, or what Karrow has defined as “physical cartobibliography,”¹⁶³ has now developed from being concerned merely with

155. In Germany, for example, the nineteenth-century published catalogs of this type include: *Katalog über die im Königlichen Bayerischen Haupt Conservatorium der Armee befindlichen Landkarten und Pläne* (Munich, 1832); *Katalog der Bibliothek und Karten-Sammlung des Königlichen Sächsischen Generalstabes* (Dresden, 1878); and *Katalog der Kartensammlung des Königlichen Preußischen Generalstabes* (Berlin, 1893). The last-named collection was integrated into the map collections of the Preußische Staatsbibliothek in 1919; see Lothar Zögner, “Die Kartenabteilung der Staatsbibliothek, Bestände und Aufgaben,” *Jahrbuch Preußischer Kulturbesitz* 14 (1977): 121–32.

156. For a recent plea see Monique Pelletier, “L’accès aux collections cartographiques en France,” in *Le patrimoine des bibliothèques: Rapport à Monsieur le directeur du livre et de la lecture par une commission de douze membres*, ed. Louis Desgraves and Jean-Luc Gautier, 2 vols. (Paris: Ministère de la Culture, 1982), 2:253–59.

157. It is also closely paralleled in the literature of the history of science. See, especially, the approach of George Sarton, *Introduction to the History of Science* (note 17) in vol. 1, *From Homer to Omar Khayyam*, 39, where he writes, “Bibliography is another essential basis of historical or scientific investigations of any kind. My account is brief, often of Linnaean brevity, but I have attempted to complete each item with a list of the main sources and of many other publications. Thus the reader will have abundant means of controlling every word of my statements and of continuing the study of any topic to any extent.” This could also have been a testament of many historians of cartography, and it has justifiably been regarded as a cornerstone of the subject.

158. There is no general published “bibliography of cartobibliographies.” For an institutional list of this nature, however, see Anemieke van Slobbe, *Kartobibliografieën in het Geografisch Instituut Utrecht*, *Utrechtse Geografische Studies* 10 (Utrecht: Geografisch Instituut Rijksuniversiteit Utrecht, 1978). An introduction to the main bibliographical finding aids is provided by Wolter, “Research Tools” (note 148).

159. See below, chapter 18, for a discussion of the development of his ideas into a proper classification.

160. This was to consist of a list and description of all the maps, whether published or in manuscript, relating to the New World and drawn before 1550: Richard W. Stephenson, “The Henry Harrisse Collection of Publications, Papers, and Maps Pertaining to the Early Exploration of America” (paper prepared for the Tenth International Conference on the History of Cartography, Dublin 1983), 10.

161. The continuing need for—and fundamental importance of—primary bibliographical listing for the history of cartography is illustrated by the inclusion of such lists in some of the subsequent chapters in this volume, such as, inter alia, those on the prehistoric period, portolan charts, and local maps and plans of medieval Europe: see pp. 93–97, 449–61, 498–500.

162. Herbert George Fordham, *Studies in Carto-bibliography, British and French, and in the Bibliography of Itineraries and Road-Books* (Oxford: Clarendon Press, 1914; reprinted, London: Dawson, 1969); the essay in the volume “Descriptive Catalogues of Maps: Their Arrangement, and the Details They Should Contain,” 92–127, shows the extent to which Fordham was thinking out new principles for cartobibliography.

163. Karrow, “Cartobibliography,” 47–50 (note 149).

the simple enumeration of maps to more complex forms of descriptive analysis that can answer questions about the production of maps, about their provenance, and, in particular, about their chronological relationship to each other in genetic sequences created by printing or manuscript copying. Increasingly, such techniques are being used to answer wider questions in the history of cartography, including the historicity of maps as documents, the nature of the map trade in different periods and places, the statistical growth of cartographic output, and the transmission and dissemination of early maps and their images.¹⁶⁴ Some cartobibliographers also attempted to define an elaborate terminology in connection with their subject,¹⁶⁵ but this has now been challenged by recent developments in the description of nontextual material in books in general rather than maps in particular.¹⁶⁶ Despite the poverty of historical interpretations of cartographic change built around bibliographic listings, which have been justifiably criticized,¹⁶⁷ a substantial volume of bibliographical research remains as the most characteristic and valuable legacy of the influence of map librarians on the development of the study of early maps.

As a group, large map libraries have also contributed significantly to the development of the history of cartography by mounting specialist cartographic exhibitions accompanied by published catalogs. Indeed, this has always been regarded as a major function of the curator of rare early maps. Yet it has been neglected by historians of cartography in helping to explain the rise of the study of the history of cartography.¹⁶⁸ For countries rich in older map resources, however, such as Italy or Spain, such exhibitions have often marked the pioneer phase in a historical awareness of early maps.¹⁶⁹ Exhibitions designed to bring early maps to the attention of a wider public or to expose them to scholars as an appetizer for subsequent detailed study have regularly been mounted in the larger map libraries since the nineteenth century. They have been reported in many national geographical journals, and were a regular feature of the meetings of some societies, and, from 1935 onward, of the "Chronicle" section of *Imago Mundi*.¹⁷⁰ The diversity of subject matter presented in the exhibitions themselves and in the accompanying catalogs is considerable, but it is possible to pick out recurrent themes.¹⁷¹ There have been major exhibitions to mark the occasions of conferences and congresses; exhibitions designed to highlight the cartography of particular cultures, periods, or places; and commemorative exhibitions to mark the anniversaries of the great names in cartography—the national heroes of the world of maps—or of their landmark publications. As in the history of art and in the museum world in general, an exhibition can serve wider intellectual purposes than merely creating a factual rec-

ord of what was displayed. In some cases the published catalogs (the best of which assume the character of illustrated monographs) provide an original synthesis of a specific subject in the history of cartography.¹⁷² Exhibitions can also be innovative, pioneering new conceptual approaches to maps, as with the exhibition *Cartes et figures de la terre*, held in Paris in 1980.¹⁷³ In

164. For these wider uses of bibliography in map history see Michael J. Blakemore and J. B. Harley, *Concepts in the History of Cartography: A Review and Perspective*, Monograph 26, *Cartographica* 17, no. 4 (1980): 37–42; see also, for a discussion with many implications for the history of cartography, G. Thomas Tanselle, "From Bibliography to *Histoire Totale*: The History of Books as a Field of Study," *Times Literary Supplement*, 5 June 1981, 647–49 (text of the second Hanes Lecture in the History of the Book, University of North Carolina, 15 April 1981).

165. Especially Coolie Verner, "The Identification and Designation of Variants in the Study of Early Printed Maps," *Imago Mundi* 19 (1965): 100–105, and idem, "Carto-bibliographical Description: The Analysis of Variants in Maps Printed from Copper Plates," *American Cartographer* 1 (1974): 77–87.

166. G. Thomas Tanselle, "The Description of Non-letterpress Material in Books," *Studies in Bibliography* 35 (1982): 1–42.

167. For example, P. D. A. Harvey, *The History of Topographical Maps: Symbols, Pictures and Surveys* (London: Thames and Hudson, 1980), 7.

168. Skelton, *Maps* (note 15), does not refer to exhibitions in his historical survey of the study and collecting of maps.

169. This still holds true; see, for example, for Spain, Biblioteca Nacional, *La historia en los mapas manuscritos de la Biblioteca Nacional*, exhibition catalog (Madrid: Ministerio de Cultura, Dirección General del Libro y Biblioteca, 1984); *Puertos y fortificaciones en América y Filipinas* (Comisión de Estudios Históricos de Obras Públicas y Urbanismo, 1985).

170. *Petermanns Geographische Mitteilungen* is a reliable source for the recording of map exhibitions after 1855. From 1892, exhibitions on early cartography were associated in Italy with the Congressi Geografici Nazionali; see Elio Migliorini, *Indice degli Atti dei Congressi Geografici Italiani dal primo al decimo (1892–1927)* (Rome: Presso la Reale Società Geografica Italiana, 1934); and Luigi Cardì, *Indice degli Atti dei Congressi Geografici Italiani dall'undicesimo al ventesimo (1930–1967)* (Naples: Comitato dei Geografi Italiani, 1972). In *Imago Mundi* the listings begin with "Chronik," *Imago Mundi* 1 (1935): 68–73.

171. The list in British Museum, *Catalogue of Printed Maps, Charts and Plans*, 15 vols. (London: Trustees of the British Museum, 1967), 15: col. 787, and in the supp. for 1965–74 (1978), cols. 1347 et seq., has provided the sample for this discussion. Exhibition catalogs are also currently recorded in the annual volumes of *Bibliographia cartographica* (section IV C). Such specialist catalogs, of course, underestimate the extent to which early maps have been exhibited; they often appear in exhibitions of art, science, and culture of a more general nature.

172. Marijke de Vrij, *The World on Paper: A Descriptive Catalogue of Cartographical Material Published in Amsterdam during the Seventeenth Century* (Amsterdam: Theatrum Orbis Terrarum, 1967); Arend Wilhelm Lang, *Das Kartenbild der Renaissance*, Ausstellungskataloge der Herzog August Bibliothek, no. 20 (Wolfenbüttel: Herzog August Bibliothek, 1977); Sarah Tyacke and John Huddy, *Christopher Saxton and Tudor Map-making* (London: British Library, 1980).

173. *Cartes et figures de la terre*, exhibition catalog (Paris: Centre Georges Pompidou, 1980); see also the comparable *Arte e scienza per*

other cases, they can highlight little-known aspects of maps,¹⁷⁴ introduce new map genres, or reveal to scholars the research potential of a specialist map library.¹⁷⁵ Such exhibitions have educational functions in the broadest sense, and they have contributed significantly to an awareness of the historical importance of early maps.

Finally, the private collectors and the antiquarian map trade, identified as one of the three major forces in the early development of the history of cartography, can also be assessed in terms of their historiographic impact. The major effect has been to reinforce tendencies consequent to the rise, already noted, of institutional geography and of the independent map libraries. On the one hand, there are the publishers who cater to the collector and to the antiquarian market by imitating the scholarly emphasis on facsimile publication, either through high-quality reproductions that have an antique appeal or through the medium of international coffee-table books combining lavish illustration of early maps with relatively brief texts.¹⁷⁶ On the other hand, collectors and the trade are served by catalogs with a bibliographical quality, which strengthens the existing domination of such works within the literature. Some of the catalogs of the leading antiquarian map sellers have for so long had the character of carto-bibliographies, contributing new editions and impressions to the printing history of atlases and maps,¹⁷⁷ that they are recognized as part of the research literature of the history of cartography.

A secondary effect of the links with map collecting and the antiquarian trade is the appearance of a popular face to the history of cartography. There is nothing unusual in this; other subjects, including the history of the fine arts in general, as well as archaeology, landscape history, and family history, have likewise breached the confines of their narrow academic circles. In the history of cartography, however, the tendency has been pronounced. Amateur¹⁷⁸ and professional interests are closely intertwined, and the subject has always been open to all comers, so that this impact is becoming clearly visible in recent decades.

First, there has been a spate of books, in several languages, aimed at popularizing antique maps and at stimulating the marketplace by encouraging beginners to discover and identify them, or offering advice about the investment potential of cartographic items or about the care and preservation of a collection. Such works, as already noted, have the effect of focusing attention upon the decorative and more highly collectible maps from before 1800. Yet since the supply of these early maps is clearly finite, there are now signs of a growing awareness of later periods and of the potential fascination (for example) of maps produced by nineteenth- and twentieth-century official mapmaking agencies.¹⁷⁹

Second, there has been the founding of both regional

and national societies for collectors of early maps. A society of cartophiles was established in New England in the 1920s and reestablished in the 1950s,¹⁸⁰ and in Europe Leo Bagrow founded the Circle of Lovers of Russian Antiquities in Berlin in 1927, clearly much concerned with maps.¹⁸¹ But permanent developments were to occur only after World War II. In 1952, for example, The International Coronelli Society for the Study of Globes and Instruments was founded (and has continued to publish the scholarly journal *Der Globusfreund*),¹⁸²

il disegno del mondo, exhibition catalog, city of Turin (Milan: Electa Editrice, 1983).

174. See, for example, Gillian Hill, *Cartographical Curiosities* (London: British Museum Publications, 1978); *Het aards paradijs: Dierenvoorstellingen in de Nederlanden van de 16de en 17de eeuw*, exhibition catalog (Antwerp: Zoo Antwerpen, 1982); Omar Calabrese, Renato Giovannoli, and Isabella Pezzini, eds., *Hic sunt leones: Geografia fantastica e viaggi straordinari*, catalog of exhibition, Rome (Milan: Electa Editrice, 1983). Recent catalogs concerning the relation between art and cartography include: "Art and Cartography: Two Exhibitions, October 1980–January 1981," *Mapline* special no. 5 (October 1980); Jasper Johns et al., *Four Artists and the Map: Image/Process/Data/Place* (Lawrence: Spencer Museum of Art, University of Kansas, 1981), and a concurrent exhibition in Lawrence, "A Delightful View: Pictures as Maps," 6 April–31 August 1981; "cartography" was the title of a two-part exhibition at the John Michael Kohler Arts Center, Sheboygan, Wisconsin, from 16 November 1980 to 11 January 1981; part 1, "An Historical Selection of Maps, Globes, and Atlases from the American Geographical Society Collection," and part 2, "Cartographic Images in Contemporary American Art."

175. See, for example, *A la découverte de la terre, dix siècles de cartographie*, trésors du Département des Cartes et Plans de la Bibliothèque Nationale, Paris, May–July 1979, 122, which was a presentation of their main resources; or *The Italians and the Creation of America: An Exhibition at the John Carter Brown Library*, prepared by Samuel J. Hough (Providence: John Carter Brown Library, 1980).

176. A model for this genre could be *Landmarks of Mapmaking*, with maps chosen and displayed by R. V. Tooley, text written by Charles Bricker, and preface by Gerald R. Crone (note 14); recent examples include George Kish, *La carte: Image des civilisations* (Paris: Seuil, 1980); Tony Campbell, *Early Maps* (New York: Abbeville Press, 1981); and its sequel by Robert Putman, *Early Sea Charts* (New York: Abbeville Press, 1983); see also George Sergeant Snyder, *Maps of the Heavens* (New York: Abbeville Press, 1984).

177. Examples would include some of the catalogs issued by Weinreb and Douwma, Francis Edwards, Nico Israel, H. P. Kraus, Frederick Muller, Kenneth Nebenzahl, Leo Olschki, Rosenthal of Munich, and Henry Stevens, Son and Stiles.

178. "Amateur" is not used here in a derogatory sense but serves to indicate the large number of contributions from scholars and others whose main fields lie outside the history of cartography.

179. For example, the Charles Close Society for the study of Ordnance Survey maps is largely devoted to their history. It publishes a newsletter, *Sheetlines*, no. 1– (October 1981–).

180. Erwin Raisz, "The Cartophile Society of New England," *Imago Mundi* 8 (1951): 44–45.

181. See obituary of Leo Bagrow, [R. A. Skelton], "Leo Bagrow: Historian of Cartography and Founder of *Imago Mundi*, 1881–1957," *Imago Mundi* 14 (1959): 4–12, esp. 8.

182. Wilhelm Bonacker, "The First International Symposium of the Coronelli Weltbund der Globusfreunde," *Imago Mundi* 18 (1964): 83–84.

and a Finnish Map Society, *Chartarum Amici*, was created in 1965.¹⁸³ The real spurt in the founding of such societies came in the 1970s. Both the Chicago Map Society (started with the aim of supporting and encouraging the study and preservation of maps and related materials) and the British Columbia Map Society were founded in 1976, and they were soon joined by half a dozen other societies in North America. In England the International Map Collectors' Society was formed in 1980,¹⁸⁴ and in the Netherlands *Caert-Thresoor*, though not published by a society, reflected the informal growth of similar interests.¹⁸⁵

A third result of the popularization of the history of cartography has been the launching of monograph and periodical publications with the needs of map collectors specifically in mind. First there was *The Map Collectors' Circle*, started in 1963 by R. V. Tooley, which continued publication until 1975.¹⁸⁶ Then in 1977 *The Map Collector* began publication. Today, as still the only magazine of its kind, it aims to encourage a community of interest between dealers, collectors, and scholars and all who share an interest in early maps. It might be regarded as only the latest event in the long development of the symbiotic contacts between these groups that have characterized research and writing in the history of cartography.

THE GROWTH OF A SCHOLARLY IDENTITY

Since the 1930s the history of cartography has been slowly emerging as a subject with its own scholarly identity.¹⁸⁷ The basis of this claim needs support, however, and, as we shall see below, there are signs that the history of cartography is indeed developing a conscious epistemology and sense of purpose in research that increasingly distance it from its nineteenth- and early twentieth-century phase. An understanding of this change can be derived from three main developments within the subject. First, there is the publication of the general histories of cartography, attempts at a synthesis of its subject matter, of which the present work is the latest reflection. Second, there is the influence of *Imago Mundi*, the journal founded by Leo Bagrow in 1935, which has been the only international journal devoted exclusively to the history of cartography. Third, and probably by far the most significant influence, there is the emergence of cartography as an independent academic and practical discipline providing new theoretical frameworks as well as a reinforced *raison d'être* for the study of cartographic history.

Even accepting that awareness of their subject is increasing among historians of cartography, the relevant criteria for the changes are difficult to isolate. Moreover, the process can neither be dated precisely nor measured

in other than the most qualitative terms. It would be hard to discover, for example, from even the recent literature, any sustained conceptual shift¹⁸⁸ in the ways of thinking of cartographic historians. All that can be discerned is much continuity and some slow change. The former is represented by the survival of approaches toward the study of early maps established in the nineteenth century, while the evidence for change can be traced back to the 1930s. But there is no neat line separating two phases of intellectual development, and there are no grounds yet for believing in succeeding eras of an old and a new history of cartography.

Historiographic analysis of the history of cartography is also complicated by the fragmentation of its literature. The framework of three main influences outlined above is valid in general terms, but it fails to take account of the scattering of writings about early maps in the literature of other subjects. No less than any other historical artifact or document, early maps are not the exclusive property of one subject. From an inspection of the first annual bibliography in *Imago Mundi*, relating to the year 1933, Skelton concluded that of the items listed there:

Some were published (as we might expect) in journals of geography, history, local history, geodesy and survey, hydrography and navigation, the history of science. But articles on early maps appeared in many other less obvious quarters—periodicals devoted to physical science, biology, agriculture, magnetism, economics, political science, art history, oriental studies, the classics, archaeology, printing history, bibliography and library science, archives.¹⁸⁹

This enumeration can easily be extended to reveal the wider field of the history of cartography. Bibliographies published subsequently in *Imago Mundi* also list material relating to cartographic history in books or peri-

183. *Map Collector* 10 (1980): 32.

184. Like a number of other societies, it publishes a newsletter, *IMCOS, Journal of the International Map Collectors' Society*, vol. 1–(1980–); for an account of one of the North American societies see Noël L. Diaz, “The California Map Society: First Years,” *Bulletin of the Society of University Cartographers* 18, no. 2 (1984): 103–5.

185. *Caert-Thresoor*, no. 1–(1982–).

186. *Map Collectors' Circle*, nos. 1–110 (1963–75).

187. Cornelis Koeman, “Sovremenniy issledovaniya v oblasti istoricheskoy kartografii i ikh znacheniye dlya istorii kul'tury i razvitiya kartograficheskikh nauk” (Modern investigations in the field of the history of cartography: Their contribution to cultural history and to the development of the science of cartography), in *Puti razvitiya kartografii* (Paths to the evolution of cartography), a collection of papers on the occasion of Professor K. A. Salishchev's seventieth birthday (Moscow: Izdatel'stvo Moskovskogo Universiteta, 1975), 107–21.

188. The ideas of Thomas S. Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1962), have, however, been applied to the recent growth of cartography as a subject by Wolter, “Emerging Discipline” (note 113).

189. Skelton, *Maps*, 101–2 (note 15).

odicals devoted to the history of astronomy and mathematics, to geology and medicine, to the histories of architecture, cosmology, religion, and numismatics, to literature and philology, to anthropology and sociology, to historical geography, and to urban history and town planning. Moreover, especially for the recent history of cartography, relevant contributions are increasingly to be found in remote sensing and computer journals and in the recently founded cartographic journals noted below.¹⁹⁰ That there are so many diverse contexts for the history of cartography can, of course, be taken as additional evidence for the universality of maps and for the increasing interest in early maps of a diversified circle of readers. But the scattered literature—and the centrifugal tendencies it has encouraged—also highlights the problem of communication which has so far inhibited the development of a coherent subject. Thus, without ignoring the value of the contribution of many subjects to the history of cartography, there is a justification for trying to understand those long-term influences that have operated to draw together the scattered disciplinary threads. Such influences are therefore discussed below as being of particular significance in the growth of the scholarly identity that is also a central concern of this *History of Cartography*.

ATTEMPTS AT SYNTHESIS

Histories of cartography—setting out to provide a synthesis of the whole field as perceived by their authors—have not exerted a dominant role in the development of the subject. If they are regarded as barometers of integration and self-awareness within the history of cartography, then one measure of the immaturity of the subject is that the composite histories seem to have lagged a long way behind developments in specialized research in the past fifty years. Even today, at neither an academic nor a more popular level is there an up-to-date or balanced treatment of the full spread of the subject matter of the history of maps. In some respects this is a negative chapter in the study of the history of cartography, yet at the same time the histories reviewed here have helped to mold an image of the history of cartography still widely accepted in the 1980s.

It is doubtful that the need for a specific history of maps—apart from the study of their content as records of geographical discovery and exploration—would have been perceived in the nineteenth century in the way this need is viewed today. It is not until the present century that the growth of the idea of independent histories of cartography can be detected, and even then its translation into practice was to make little progress until about 1940. In view of his later dominance in the history of cartography, it is worth noting that as early as 1918 Leo

Bagrow had published in Russia a preliminary essay titled “The History of the Geographical Map: Review and Survey of Literature.”¹⁹¹ This work, however, was intended mainly as a bibliography (it listed no fewer than 1,881 items on the history of cartography), and it was heavily biased in its text and illustrations toward Russian examples. As Bagrow stated in his foreword, his work was undertaken in isolation, and he lacked the library resources available to scholars elsewhere. Indeed, at this date the country where one might expect that a history of cartography would have been conceived was Germany. Berlin, it might be said, had assumed the mantle that Paris had worn in the mid-nineteenth century as the center of “the real ferment in cartographic history.”¹⁹² By the early twentieth century there had been important developments in cartography in both Austria and Germany.¹⁹³ Moreover, it was from Germany that the most outstanding cartographic thinker of the generation—Max Eckert—was to come. Not only did Eckert begin to offer a philosophical basis for the study of cartography,¹⁹⁴ but in his two-volume treatise on cartography, *Die Kartenwissenschaft* (1921–25), he provided both a substantial and a seminal work which was to exert a considerable influence on modern cartography. Maintaining an approach characterized by a strong historical emphasis, Eckert systematically analyzed the character and evolution of different types of maps and established genetic principles for their formal study, so his *Die Kartenwissenschaft* may also be regarded as a contribution to the history of cartography along systematic lines. It did, however, quite deliberately stop short of any attempt at historical synthesis. Eckert’s views on this matter are of particular interest in relation to the question why, despite the considerable interest in the subject, no general history of cartography was produced in the Germany of the 1920s. While Eckert acknowledged, as already noted, that a major deficiency in geo-

190. See below, pp. 32–33.

191. Leo Bagrow, *Istoriya geograficheskoy karty: Ocherk i ukazatel' literatury* (The history of the geographical map: Review and survey of literature), *Vestnik arkheologii i istorii, izdavayemyy Arkheologicheskim Istitutom* (Archaeological and historical review published by the Archaeological Institute) (Petrograd, 1918).

192. Skelton, *Maps*, 76 (note 15).

193. See below p. 32 nn. 262, 263.

194. See, for example, Max Eckert, “Die Kartographie als Wissenschaft,” *Zeitschrift der Gesellschaft für Erdkunde zu Berlin* (1907): 539–55; idem, “Die wissenschaftliche Kartographie im Universitäts-Unterricht,” in *Verhandlungen des Sechszehnten Deutschen Geographentages zu Nürnberg*, ed. Georg Kollm (Berlin: D. Reimer, 1907), 213–27; idem, “On the Nature of Maps and Map Logic,” trans. W. Joerg, *Bulletin of the American Geographical Society* 40 (1908): 344–51; see also Wolfgang Scharfe, “Max Eckert’s ‘Kartenwissenschaft’—The Turning-Point in German Cartography” (paper prepared for the Eleventh International Conference on the History of Cartography, Ottawa, 1985).

graphy was felt to be the lack of a history of cartography, he believed that it was unlikely to be written in the near future because too many preliminary studies were lacking.¹⁹⁵ Eckert's view prevailed for the next two decades. Konstantin Cebrian, a lecturer in a military school in Danzig, projected a multivolume history of cartography, but only the first volume was actually produced.¹⁹⁶ Several shorter works also appeared in the interwar years; but notwithstanding the aspirations as general histories conveyed in their titles, these either were heavily biased toward particular areas of the world¹⁹⁷ or contained a mélange of topics that did not properly reflect the broad sweep of cartographic development through time.¹⁹⁸

Toward the middle of the century, however, there appeared three short general histories of cartography, and it is these that, in various editions, have held much of the field until the present day and which deserve notice as broadly diagnostic of existing attempts at synthesis.¹⁹⁹ The first text to be completed, in 1943, was Leo Bagrow's *Die Geschichte der Kartographie*, but the material for the reproduction of the illustrations was destroyed by wartime bombing and it was not finally published until 1951 in Berlin.²⁰⁰ The revised and enlarged English-language edition did not appear until 1964.²⁰¹ Meanwhile, and over a decade before this English edition, Lloyd Brown's *The Story of Maps* was published in 1949.²⁰² This was followed by the third of this group of general histories, Gerald R. Crone's *Maps and Their Makers* (first edition 1953).²⁰³ Whatever their shortcomings as reviewed today, these three books made a substantial contribution to the development of an appreciation of early cartography. They should first be judged in the light of history of cartography studies at the time of their conception and of their own terms of reference as introductory summaries for popular and student use. But even allowing for such considerations, all three point to the poverty of synthetic writing on the history of cartography. As contemporary reviewers sometimes made plain, they all left much to be desired, not so much on the grounds of technical scholarship as in internal balance and in total coverage.

When Bagrow's *Die Geschichte der Kartographie* first appeared, it was understandably praised as a remarkable performance in synthesis.²⁰⁴ A closer look, however, reveals that its terms of reference were doubly restrictive. In the first place, as Bagrow himself explained, it excluded some matters such as scientific methods of map-making, the way material is collected, and the compilation of maps,²⁰⁵ yet these are aspects now regarded as vital in cartographic history. In the second place, his narrative ended in the eighteenth century, at the point he saw as "where maps ceased to be works of art, the

products of individual minds, and where craftsmanship was finally superseded by specialised science and the

195. Max Eckert, *Die Kartenwissenschaft: Forschungen und Grundlagen zu einer Kartographie als Wissenschaft*, 2 vols. (Berlin and Leipzig: Walter de Gruyter, 1921–25), 1:26–27. He stated: "What impedes the construction of the great edifice of a history of cartography is to be found partly in personal qualifications and partly in the subject matter. A historian of the map and its theory must be equally well versed in the history of geography . . . and philology. With this he must combine considerable mathematical knowledge. It is in the fullest mastery of these branches of science that the formula is to be found that will lead to the desired result" (author's translation).

196. Konstantin Cebrian, *Geschichte der Kartographie: Ein Beitrag zur Entwicklung des Kartenbildes und Kartenwesens* (Gotha: Perthes, 1922), vol. 1, *Altertum: Von den ersten Versuchen der Länderabbildungen bis auf Marinus und Ptolemaios (zur Alexandrinischen Schule)*. This project is described by Wilhelm Bonacker, "Eine unvollendet gebliebene Geschichte der Kartographie von Konstantin Cebrian," *Die Erde* 3 (1951–52): 44–57. Cebrian died in World War I; unpublished materials are preserved in the Map Department of the Staatsbibliothek Preußischer Kulturbesitz.

197. For example, Herbert George Fordham, *Maps, Their History, Characteristics and Uses: A Handbook for Teachers*, 2d ed. (Cambridge: Cambridge University Press, 1927), and Arthur L. Humphreys, *Old Decorative Maps and Charts* (London: Halton and Smith; New York: Minton, Balch, 1926), rev. by R. A. Skelton as *Decorative Printed Maps of the 15th to 18th Centuries* (London: Staples Press, 1952).

198. W. W. Jervis, *The World in Maps: A Study in Map Evolution* (London: George Philip, 1936); see Bagrow's scathing review of this work in *Imago Mundi* 2 (1937): 98.

199. There have been similar short or popular histories in competition that will not be specifically reviewed here: Hans Harms, *Künstler des Kartenbildes: Biographien und Porträts* (Oldenburg: E. Völker, 1962); A. Libault, *Histoire de la cartographie* (Paris: Chaix, 1959); Thrower, *Maps and Man* (note 25); and more recently, Georges Grosjean and Rudolf Kinauer, *Kartenkunst und Kartentechnik vom Altertum bis zum Barock* (Bern and Stuttgart: Hallwag, 1970); Kish, *Carte* (note 176); A. G. Hodgkiss, *Understanding Maps: A Systematic History of Their Use and Development* (Folkestone: Dawson, 1981); Wilford, *Mapmakers* (note 18); and Ivan Kupčik, *Alte Landkarten: Von der Antike bis zum Ende des 19. Jahrhunderts* (Hanau am Main: Dausien, 1980), or the French edition: *Cartes géographiques anciennes: Evolution de la représentation cartographique du monde de l'antiquité à la fin du XIX^e siècle*, trans. Suzanne Bartošek (Paris: Edition Gründ, 1981).

200. Leo Bagrow, *Die Geschichte der Kartographie* (Berlin: Safari-Verlag, 1951).

201. Leo Bagrow, *The History of Cartography*, rev. and enl. R. A. Skelton, trans. D. L. Paisey (Cambridge: Harvard University Press; London: C. A. Watts, 1964), preface, 5. This version was also translated into German; see *Meister der Kartographie* (Berlin: Safari-Verlag, 1963).

202. Brown, *Story of Maps* (note 16).

203. Crone, *Maps and Their Makers* (note 13).

204. It was reviewed by C. B. Odell, *Annals of the Association of American Geographers* 43 (1953): 69–70; W. Horn, *Petermanns Geographische Mitteilungen* 97 (1953): 222; and A. W. Lang, *Erkunde* 7 (1953): 311–12. The 1964 English edition was reviewed by George Kish, *Geographical Review* 56 (1966): 312–13, and J. B. Harley, *Geographical Journal* 131 (1965): 147.

205. Bagrow, *History of Cartography*, 22 (note 201). See the criticism by David Woodward, "The Study of the History of Cartography:

machine.”²⁰⁶ There is no doubt that this view of Bagrow’s, which sees the subject as having its center of gravity before the nineteenth century, has been influential. It is easy to understand why so many scholars have been attracted by the flowering of cartography in the European Renaissance, but the narrowness of their focus has skewed the total effort in relation to the cartographic record in its entirety. This tendency is manifest in much subsequent writing on the history of cartography, not only in the coffee-table publications that, as already noted, have served collectors as specimen books for the decorative printed maps of the European period from the sixteenth century to the eighteenth, but also in the content (as will be seen) of *Imago Mundi*, edited by Bagrow for many years and the main journal for the history of cartography.²⁰⁷ In retrospect, this “paleocartographic bias,” as it has been aptly described,²⁰⁸ is an unnecessary and unjustifiable truncation of cartographic history, but it continues to be reflected in the subject at both a research and a popular level.

Nor have the books by Crone and Brown escaped criticism; but of the two, that by Crone is better organized and arguably remains the best summary of the history of cartography published so far.²⁰⁹ By its second edition (1962), a chapter had even been added dealing with contemporary cartography. But though its terms of reference—treating maps as scientific reports, historical documents, research tools, and objects of art and regarding them as “products of a number of processes and influences”—are unexceptionable,²¹⁰ as one of a series of student texts its length was inevitably restricted. It was intended to describe “the main stages of cartographical development to which many countries have contributed in turn,”²¹¹ but the maps of nonliterate peoples are dealt with in a short paragraph, those of Egypt and Mesopotamia are allotted a second paragraph, and there is no treatment at all of West Asian or East Asian cartography.

Lloyd Brown’s book was also written in response to the need for a general survey of the history of cartography. “There is no other such chronicle in print,” he could state in 1949, “though in the past seventy-five years or so it has been many times reasserted that the world is becoming increasingly aware of and interested in maps.”²¹² The reasons for delay seemed to him clear enough: the limited biographical material on earlier mapmakers; the high mortality of maps, leading to the destruction of the relevant evidence; and the unwillingness of specialist scholars “to confine the story” to other than “a straight and more or less narrow path.”²¹³ Such problems are still with us, but Brown’s solutions to them disappointed his scholarly reviewers. *The Story of Maps* is in effect “a personal, independent narrative” rather than a history of cartography, and it introduces, as one

early reviewer put it, “such a variety of subjects, handled with so little attention to order or precision, that the real theme can only be conjectured.”²¹⁴ These words ring true today, yet for want of alternatives Brown’s book perforce remains on our reading lists, with a reprint edition even welcomed by a new generation of reviewers. These are the reviewers, too, who have heralded as succeeding, where other books have failed, new general works such as John Noble Wilford’s *The Mapmakers*, an eminently readable book but one that lacks the scholarly apparatus for a work of reference and fails to fill the vacuum left by Bagrow, Crone, and Brown.²¹⁵ These retrospective comments are not made in a critical spirit. But as revealed in the light of the changing needs of the subject, the earlier works’ deficiencies as general histories—whether imposed by a conceptual climate different from our own, by length, or by the authors’ interpretation of their terms of reference—both justify and make opportune this *History of Cartography*.

LEO BAGROW, *IMAGO MUNDI*, AND THEIR INFLUENCE

A second identifiable contribution to the growing identity of the history of cartography since the mid-1930s has been made by the periodical *Imago Mundi*, founded by Leo Bagrow. Initially designed as a yearbook for the subject, it is now described as the “Journal of the International Society for the History of Cartography.” Leo Bagrow (1881–1957) was born Lev Semenovich Bagrov, an émigré from Saint Petersburg first to Berlin and then to Sweden.²¹⁶ Through his personality and his scholarly conception of his subject, he came to dominate the his-

A Suggested Framework,” *American Cartographer* 1 (1974): 101–15, esp. 102.

206. Bagrow, *History of Cartography*, 22 (note 201).

207. See below, pp. 27–28.

208. Robinson, *Thematic Mapping*, ix (note 28).

209. Reviews included George Kish, *Geographical Review* 45 (1955): 448–49, and E. M. J. Campbell, *Geographical Journal* 120 (1954): 107–8.

210. Crone, *Maps and Their Makers*, 2d ed., ix (note 13).

211. Crone, *Maps and Their Makers*, 2d ed., ix (note 13).

212. Brown, *Story of Maps*, 3 (note 16).

213. Brown, *Story of Maps*, 4 (note 16).

214. Edward Lynam, *Geographical Review* 40 (1950): 496–99, quotation on 496; it was praised by other reviewers such as “F. G.” (Frank George), *Geographical Journal* 116 (1950): 109.

215. Alan M. MacEachren, *American Cartographer* 9 (1982): 188–90; Peter Gould, *Annals of the Association of American Geographers* 72 (1982): 433–34; and J. A. Steers, *Geographical Journal* 149 (1983): 102–3; but see also the more reflective review by Denis Wood, *Cartographica* 19, nos. 3–4 (1982): 127–31, setting the work in the context of similar general histories.

216. “Leo Bagrow” (note 181), which included a bibliography; see also Wilhelm Bonacker, “Lev Semenovich Bagrov (1888–1957): Ein Leben für die Geschichte alter Karten,” *Petermanns Geographische Mitteilungen* 101 (1957): 308–9.

tory of cartography over three decades, from the 1930s to the 1950s. In the 1930s he had already conceived several massive projects for the synthesis of materials for the history of cartography. These included a catalog of printed maps of the sixteenth century (surviving only as a typewritten list); a series of monographs with facsimiles of early maps; an encyclopedia of early maps (which never emerged from the planning stage during Bagrow's lifetime); a history of cartography (eventually published, as already noted, in 1951); and finally, a periodical devoted to the history of cartography, to be published annually. The first two of these projects perpetuated nineteenth-century traditions, but the last three point to Bagrow's recognition of what would now be called an "identity crisis" within the history of cartography.²¹⁷ Against this background he founded his periodical, in an explicit attempt to create a more unified subject.

First published in 1935, *Imago Mundi* was the first journal to be devoted entirely to the history of cartography, and it is still the only scholarly international one. By giving historians of cartography their own forum it has contributed to their sense of self-awareness, and it has become a barometer for the development of the subject in general. It represents Bagrow's most important contribution to the consolidation of the field. Although other scholars shared in its inception and early development, it was Bagrow who remained at the editorial helm until his death. It was later noted that he had "devoted to it his formidable energy, his authority as a scholar and the greater part of his time" and that, almost dictatorially, "with only occasional reference to corresponding editors, he made all decisions on acceptance or rejection of contributions and on the contents and lay-out of each issue; he conducted all correspondence, and compiled such regular items as the Chronicle and Bibliography."²¹⁸ Bagrow's anxiety for integration within the history of cartography is reflected in the "Editorial" to volume 2, where he noted that, although the literature of early cartography was increasing very rapidly and though this increase was a reflection of widespread activity in the study and collection of early maps, there was still little coordination. He continued:

Students in different countries have very inadequate means of knowing what is being done and published in other countries; many rare and important maps in state archives and private collections are little known and have never been described; and librarians, students, collectors and booksellers, despite the assistance which geographical societies willingly give, often have difficulty in dealing with the various problems, bibliographical, historical and scientific, presented by maps in their possession.²¹⁹

This prospectus confirms that *Imago Mundi* was not

conceived as a narrowly based academic journal. It was to be an open forum—designed to create "an international center of information"—in which the diverse streams of interest in the study of early maps that had long been touching without interacting could be brought together. Bagrow planned his format to achieve these ends.²²⁰ Each issue was to consist of a number of major articles accompanied by shorter articles and notices, reviews, and an annual bibliography of items published in the history of cartography. It was also to include what Bagrow called a "Chronicle," a summary of relevant events such as conferences, exhibitions, and major publications, and a means of following the migration or destruction of important maps. Bagrow's *Imago Mundi* has now been published almost every year for nearly fifty years except for a break between 1939 and 1947,²²¹ and it has become part of the history of the subject. It is thus possible to assess the extent to which it has contributed to change in the history of cartography.

Account, however, must first of all be taken of Bagrow's own terms of reference and of his background as a gentleman dealer. Bagrow explicitly defined the scope of *Imago Mundi* as a "review of early cartography." While no precise date was set down, it is clear that he envisaged a period, as in his own *History of Cartography*, that stopped short of the end of the eighteenth century. As Franz Grenacher, who knew him well, remarked, "Bagrow's interest tended towards material which was difficult of access, rare, primitive, or out-of-the-way; he would have preferred . . . to add some pages on Armenian, Abyssinian and Burmese maps, of which he had evidence, rather than deal with the dry, over-commercial or scientifically constructed maps of the 17th and 18th centuries."²²² He was consistent in his prejudice against modern materials, and his personal tastes have tended to reinforce the wider bias in research

217. "Leo Bagrow," 8–9 (note 181). It is another example of the durability of Bagrow's ideas that, some fifty years after his proposal, the scheme for an encyclopedia of early maps has at last been taken up in Vienna in a modified form as the *Lexikon zur Geschichte der Kartographie*, ed. I. Kretschmer, J. Dörflinger, and F. Wawrik, 2 vols. (Vienna, 1986).

218. "Foreword of the Management Committee," *Imago Mundi* 16 (1962): XI, referring to the first thirteen volumes of the journal, those edited by Bagrow.

219. "Editorial," *Imago Mundi* 2 (1937): prelim.

220. Bagrow's format has remained with relatively little modification to the present day.

221. R. A. Skelton, "Historical Notes on *Imago Mundi*," *Imago Mundi* 21 (1967): 109–10, gives details of the publication arrangements and changes of publisher for the series as a whole. It is thus a major reference work for the subject: volumes 1–36 (1935–84) have generated some 4,749 printed pages, comprising 315 major articles, some 260 shorter articles and notices, a Chronicle in 32 of the volumes, 367 reviews, 55 obituaries, and bibliographies relating to the history of cartography which enumerate some 7,000 items.

222. F. Grenacher, review of Bagrow's *Meister der Kartographie* in *Imago Mundi* 18 (1964): 100–101, quotation on 101.

and writing against more recent cartographic history. It is not surprising, therefore, to find that only 4.7 percent of the articles in volumes 1–30 (1935–78) of *Imago Mundi* deal with the period after 1800.²²³

A closer look at the content of the articles published in *Imago Mundi* enables us to explore how far the history of cartography has become genuinely international in outlook and practice by our own day. A clear picture of Eurocentricity remains. Though Bagrow himself was said to be intensely interested in the maps of non-European peoples, the thirty-six issues published up to 1985 are largely filled with European authors writing about European subjects and much less frequently feature non-European authors writing about their indigenous maps. For example, of the papers published in the journal between 1935 and 1978, nearly four-fifths relate to European cartographers and their products.

No more international in scope or authorship was the Chronicle section, to which Bagrow invited foreign scholars to contribute. This attracted a response from at most thirty countries over a forty-year period (1935–75), and every nation with five or more entries was in Europe or North America.²²⁴ Of these thirty countries, eleven make only a single appearance, pointing to their isolation within the subject if not to the low priority the contributors gave to such contacts. Thus it is clear, at least as reflected by the journal *Imago Mundi*, that the history of cartography was, as Skelton remarked, organized predominantly according to national political boundaries²²⁵ and that the main effect of Bagrow's journal was to reinforce existing links, namely those between historians of cartography in Europe and the English-speaking world. No obvious or significant increase of activity in other areas of the world occurred, a situation that still remains, to judge from both the numbers and the distribution of subscribers to the journal.²²⁶

This Eurocentric tendency is confirmed by two other aspects of the history of cartography that can be monitored from *Imago Mundi*, the origins of the books and articles contained in its annual bibliographies and the languages in which they were published. The bibliographies have appeared in the journal since its inception.²²⁷ They relate to the total literature of the subject either as gathered by their compilers or as supplied by contributors. For the period 1935 to 1983, they contain approximately seven thousand entries.²²⁸ In terms of a trend, there is no sign of any exponential increase or of a take-off even in the past two decades. Nor is the geographical distribution different from that already noted for papers published in *Imago Mundi* itself. Although the total of seventy-three countries contributing items in the bibliographies is more than double that recorded in the *Imago Mundi* Chronicles, Europe and North America are again the outstanding contributors to the

literature of the history of cartography. Ten countries account for not less than 70 percent of the recorded entries in the period, while only two countries from outside these regions (Japan and Argentina) feature in the first twenty.²²⁹

When it comes to language of publication, the nar-

223. Blakemore and Harley, *Concepts*, 16 (note 164).

224. Countries most frequently submitting entries for the *Imago Mundi* Chronicle are ranked as follows in the period 1935–75: twenty (United States), seventeen (Great Britain), fifteen (Germany), twelve (France), twelve (Netherlands), nine (Italy), nine (Russia), nine (Switzerland), eight (Austria), eight (Belgium), seven (Czechoslovakia), seven (Sweden), six (Poland), and five (Denmark). No Chronicle was included in volumes 7 and 22.

225. Skelton, *Maps*, 95–96 (note 15), where he discusses the implications of this tendency.

226. The 1980 membership statistics, though their geography is partly obscured by sales through booksellers, show that out of over seven hundred subscribers, under fifty relate to countries outside Europe and North America, with the majority of these being recorded in Australia and New Zealand, and Japan. I owe this information to the secretary and treasurer of *Imago Mundi*.

227. No bibliographies appeared in volumes 7 and 15.

228. I am grateful to Francis Herbert of the Royal Geographical Society and Michael Turner of the University of Exeter for assistance with this analysis in notes 229 and 231. These statistics should be used with care. In any one year they will reflect the information provided by foreign contributors; the assiduity and accuracy of the compiler and the criteria used for their selection; and the space available for bibliographies as a matter of editorial policy. Moreover, no indication is given in the original bibliographies of which journals and sources were searched, and the problem of identifying places of publication—especially items in earlier journals—has also been considerable.

229. Totals of entries for the top twenty countries contributing items to the *Imago Mundi* bibliographies, 1935–83, with percentage shares in the total recorded literature, are as follows:

Country	Total Items in <i>Imago Mundi</i> Bibliographies	% Share
England	1,055	15.2
United States	937	13.5
Germany	879	12.7
Netherlands	638	9.2
Italy	422	6.1
USSR	363	5.2
Austria	270	3.9
France	240	3.4
Sweden	231	3.3
Poland	196	2.8
Portugal	157	2.3
Belgium	151	2.2
Switzerland	150	2.2
Japan	148	2.1
Canada	126	1.8
Hungary	126	1.8
Czechoslovakia	100	1.4
Spain	93	1.3
Scotland	89	1.3
Argentina	63	0.9
Other	514	7.4
N = 6,948		

rowness of the geographical base of the history of cartography is again confirmed.²³⁰ Obviously there is a tendency, in the history of cartography as in other subjects, for scholars to publish in one of the main scientific languages, but even so it is clear that English (accounting for 3,048 items or nearly 43.5 percent in the bibliographies) has strengthened its position as the main language of publication in the history of cartography, especially since World War II.²³¹ This no doubt reflects the strong interest shown in the subject, as already noted, by scholars from the English-speaking world, especially the British Isles, the United States, and a number of Commonwealth countries.²³² The second most important language is German (19.4 percent). The use of German has maintained the same position as in the 1930s, mirroring the importance of Germany in the rise of cartography as an academic and practical subject²³³ as well as the continuing interest in the history of cartography in that country and in Austria and Switzerland. In brief, the use of four languages—English, German, French, and Italian—for over three-quarters of the publications enumerated in the bibliographies merely confirms the established and traditional interest of European countries in the history of cartography, a trend already discernible in the nineteenth century. As to its apparent neglect in other parts of the world, this must in part reflect a real lack of interest and opportunity, for whatever reasons, in the study of a subject that is so well entrenched in the western European nations. At the same time, the linguistic spread of writings in the history of cartography can easily be underestimated if based on the *Imago Mundi* bibliographies alone. They are never exhaustive. The smallness of the tally of recorded publications in any one of the “minority” languages—seven in Chinese, one in Greek, and little from the South American countries, for example—very likely reflects that the compilers of the bibliographies (and their contributors) acquired items by chance rather than by systematic searches among relatively inaccessible national and regional publications from distant or less familiar parts of the world.

Whatever the limitations of the data derived from *Imago Mundi* and its contents, a general conclusion may be reached about the role of the journal in the development of the history of cartography. Despite the dedication of Bagrow and his editorial successors, their policies for *Imago Mundi* have done relatively little to widen the history of cartography. Some problems—including that of proper international communication—remain almost as Bagrow diagnosed them fifty years ago. The development of systematic interdisciplinary contacts has not been seriously attempted. Largely untouched by recent academic debates in the humanities and social sciences, the journal has maintained a conservative posi-

tion. It has continued to project a connoisseur’s image for the subject: it has stressed the cartography of the period before 1800, and it has generally emphasized the cartographic history of the developed nations of the Western world. Moreover, in being not only the sole specialist journal in the field but also, as it happened, published mainly in English, it has probably done most to consolidate the study of the history of cartography in Europe and North America—precisely the regions where the subject was already well entrenched by 1935—and to stimulate it particularly in the English-speaking nations within those two continents.²³⁴ It is on such narrow intellectual foundations—constricted by *Imago Mundi*²³⁵—that the scholarly identity of the history of cartography has traditionally been built.

230. There is the particular problem with this analysis that some items have been transliterated in the bibliography using a different orthography from that of their original languages.

231. The top fifteen languages recorded in *Imago Mundi* bibliographies, 1935–83, with percentage shares in the total recorded literature, are as follows:

Language	Total Items in <i>Imago Mundi</i> Bibliographies	% Share
English	3,048	43.5
German	1,359	19.4
French	504	7.2
Italian	416	5.9
Russian	333	4.7
Dutch	276	3.9
Spanish	198	2.8
Polish	159	2.3
Portuguese	140	2.0
Japanese	123	1.8
Hungarian	120	1.7
Swedish	90	1.3
Czech	89	1.3
Danish	38	0.5
Norwegian	27	0.4
Other	90	1.3
N = 7,010		

232. It is, however, normal that the country/language of publication of the particular bibliography has most citations; this has been widely observed in the literature of scientific disciplines.

233. See p. 24 and the subsection on “The Rise of Cartography,” esp. pp. 32–33.

234. Conversely, comparison with other bibliographies confirms that *Imago Mundi* is least representative of research in the history of cartography in countries such as Germany, France, and Italy: only volume 1 was published in German; in subsequent volumes a few articles have been published in French.

235. This tendency has been further reinforced in the past twenty years by the series of biennial international conferences on the history of cartography partly organized under the aegis of *Imago Mundi*: the conferences have been held in London (1964, in association with the Twentieth Congress of the International Geographical Union), London (1967), Brussels (1969), Edinburgh (1971), Warsaw-Jadwisin (1973), Greenwich (1975), Washington, D.C. (1977), Berlin (1979), Pisa, Florence, and Rome (1981), Dublin (1983), and Ottawa (1985). Many of

THE RISE OF CARTOGRAPHY

The third principal influence on the history of cartography as a scholarly field, and on its definition and scope, has been the growth of cartography as an increasingly independent academic subject and practical activity. The distinction must be made between cartography as the ancient art and science of making maps in a practical sense (and its products) and cartography as an organized method by which maps are studied, investigated, and analyzed.²³⁶ One can argue that, among all factors, it is the latter influence that lies at the root of the changes taking place in the history of cartography today. Cartography influences the history of cartography in two ways. In the first place, the organizations set up to promote cartography have also increased the opportunities for meetings and publication in the history of cartography. In the second place, academic cartography acts as an intellectual haven, offering a new philosophical basis, alternative theoretical frameworks, and a range of appropriate techniques for the study of early maps.²³⁷ Furthermore, the growing autonomy of cartography is having repercussions on the history of cartography in such a way that the latter has now the opportunity of becoming, among its other scholarly roles, the “discipline” history for an expanding subject and its practitioners.²³⁸

For an increasing number of historians of cartography, this relatively new relationship with cartography is clearly stimulating. It must be set against the background of a relative decline of interest among geographers in the study of early maps. Since the 1960s, the history of cartography has been losing its niche within academic geography. This is partly a reflection of geographers' attitudes toward cartography as a whole. While it is true that many of today's academic cartographers were trained as geographers, to others cartography has tended to be regarded primarily as a technical service, very useful but clearly lower in the intellectual hierarchy. Signs of impatience with the closeness of the relationship between cartography and geography have been noticeable since the 1930s. Richard Hartshorne, for example, while applauding the association, evidently preferred to see cartography as a discrete specialist subject: “Because it is more essential to geography than in any other science, and has been developed to the highest extent in geography . . . it is both natural and reasonable that it should be most closely associated with our science, but it is no more a branch of geography, logically speaking, than is statistics a branch of economics.”²³⁹ The position of the history of cartography was also weakened in the more recent period of major conceptual change and innovation within geography.²⁴⁰ This left the history of cartography stranded with its concern for old maps and its

old-fashioned (early twentieth century) image. If not consciously then subliminally, it has been relegated to an antiquarian periphery of geography. Despite pleas for the importance of “graphicacy” in geographical education,²⁴¹ early maps—like maps in general—do not seem to have been considered humanistic documents in their own right in the paradigm changes in human and historical geography of recent years. Instead, at the very time when geography was discovering cognitive space, it tended to forget conventional maps. A general decline of the perceived importance of maps in geography is widely reported;²⁴² recent assessments of the development of human geography, mirroring the emphasis of conceptual changes, have not seriously reviewed carto-

the papers, especially from earlier conferences, were published in *Imago Mundi*, which has also carried reports of proceedings in all cases. For a wider discussion of *Imago Mundi* and its role in developing the history of cartography see also J. B. Harley, “*Imago Mundi*: The First Fifty Years and the Next Ten” (paper prepared for the Eleventh International Conference on the History of Cartography, Ottawa, 1985).

236. The distinction is based on Daniel E. Gershenson and Daniel A. Greenberg, “How Old Is Science?” *Columbia University Forum* (1964), 24–27, esp. 27.

237. It is significant that some German cartographers, without being very explicit, regard the history of cartography as an integral part of theoretical cartography: see, for example, Rudi Ogrissek, “Ein Strukturmodell der theoretischen Kartographie für Lehre und Forschung,” *Wissenschaftliche Zeitschrift der Technischen Universität Dresden* 29, no. 5 (1980): 1121–26; Ingrid Kretschmer, “The Pressing Problems of Theoretical Cartography,” *International Yearbook of Cartography* 13 (1978): 33–40. This follows Eckert's view of the content of scientific cartography expressed in *Die Kartenwissenschaft*.

238. Paul T. Durbin, ed., *A Guide to the Culture of Science, Technology, and Medicine* (New York: Free Press, 1980), 33, discusses the development of histories of scientific disciplines within the literature of the history of science.

239. Richard Hartshorne, *The Nature of Geography: A Critical Survey of Current Thought in the Light of the Past* (Lancaster, Pa.: Association of American Geographers, 1939), 398–99; his *Perspective on the Nature of Geography* (Chicago: Rand McNally for the Association of American Geographers, 1959) contains no further discussion of cartography.

240. The rift with maps was accelerated by a shift to statistical rather than cartographic techniques in geographical analysis: what became a widely held view was set out by William Bunge, *Theoretical Geography*, Lund Studies in Geography, ser. C, General and Mathematical Geography no. 1 (Lund: C. W. K. Gleerup, 1962; 2d ed., 1966), 71, when he concluded that notwithstanding “much pre-commitment to maps” among geographers and “in spite of certain advantages of maps over mathematics, mathematics is the broader and more flexible medium for geography.”

241. Most recently by David Boardman, *Graphicacy and Geography Teaching* (London: Croom Helm, 1983), who summarizes the history of the term.

242. Phillip Muehrcke, “Maps in Geography,” in *Maps in Modern Geography: Geographical Perspectives on the New Cartography*, ed. Leonard Guelke, Monograph 27, *Cartographica* 18, no. 2 (1981): 1–41. Some statistical data on the falling percentage of cartographic articles in selected geographical journals up to 1968 were given by Wolter, “Emerging Discipline,” 206 (note 113).

graphy, let alone the history of cartography.²⁴³ Neither have their counterparts in historical geography²⁴⁴ taken much notice of the existence of the history of cartography. Even in the literature on cognitive maps, conceptions of space, and environmental images—containing ambitious attempts to reconstruct the geographies of the mind—there has been a failure to relate the manifestations of these internal cognitive processes to the “real” maps that must in an increasing number of cases in modern societies have helped to fashion them.²⁴⁵ There are very tentative signs that this undervaluation of “real” maps, old and new, which was particularly characteristic of Anglo-American geography, may be coming to an end. At least one American geographer, referring specifically to the history of cartography, has recently written of this “most fundamental part of our discipline.”²⁴⁶

The decline of interest among some geographers in the study of early maps has been partly counterbalanced by the rise of interest among those who increasingly regard themselves as cartographers. So, whereas during the last century a major formative influence in the history of cartography was the rise of geography, currently it is that of academic cartography. Certainly, for most cartographers, early maps have always been regarded as maps in their own right, and this tends to reinforce the affinity between cartography and the history of cartography. It is not easy to foresee the future relationship of academic cartography to geography and therefore of the history of cartography to geography and other subjects concerned with the management of the environment, but it is certain that the more recent links with academic cartography, which have already led to a rethinking of the nature of early maps (discussed below), will remain influential.

Particular examples of how the growth of an independent cartography provides support for the history of cartography are given by John A. Wolter in his study of the emergence of cartography as a discipline.²⁴⁷ First, using bibliometric methods, he traces the history of subject bibliographies of cartography back to the nineteenth century.²⁴⁸ During that century, and for most of the first half of the present century, the cartographic entries were usually an integral part of geographical bibliographies. Even in the most comprehensive of such bibliographies—notably the cartographic sections of the *Geographisches Jahrbuch*,²⁴⁹ the *Bibliographie géographique internationale*,²⁵⁰ and the *Research Catalogue of the American Geographical Society*²⁵¹—there is a marked tendency to underrecord the literature of cartography and, consequently, the writings on the history of cartography.²⁵² Since the middle of the present century, however, the literary output of cartography as a whole has been independently listed, as in Hans-Peter

Kosack and Karl-Heinz Meine, *Die Kartographie*,²⁵³ and later in the *Bibliotheca cartographica*,²⁵⁴ the *Biblio-*

243. For example, Paul Claval, *Essai sur l'évolution de la géographie humaine*, new ed. (Paris: Belles Lettres, 1976); R. J. Johnston, *Geography and Geographers: Anglo-American Human Geography since 1945*, 2d ed. (London: Edward Arnold, 1983); Preston E. James and Geoffrey J. Martin, *All Possible Worlds: A History of Geographical Ideas*, 2d ed. (New York: John Wiley, 1981). An exception is *Progress in Human Geography*, vol. 1—(1977–), which has maintained a series of “Progress Reports” on cartography.

244. For example, Alan R. H. Baker, ed., *Progress in Historical Geography* (Newton Abbot: David and Charles, 1972), where the references to maps in the various essays concern only their role as landscape evidence or as a means of presenting data.

245. Robert Lloyd, “A Look at Images,” *Annals of the Association of American Geographers* 72 (1982): 532–48, for a review of literature, critical of geographical studies of mental maps and images.

246. Peter Gould, *Annals* 72 (1982): 433 (note 215).

247. Wolter, “Emerging Discipline” (note 113). The following three paragraphs are largely based on this thesis. Wolter also considers other measures of growth, including textbooks and manuals written for students of cartography, and (in the context of the United States) provision for the education and training of cartographers. An examination of these last two types of evidence, however, suggests that while the history of cartography has been accepted as a valid research activity within cartography, it plays only a minor part in the training of cartographers.

248. Defined here as bibliographies that list the literature of cartography rather than cartobibliographies, which refer to lists of maps. It is, however, difficult to isolate the two, especially in the nineteenth century; bibliographies often contain references to the publication of items such as maps, atlases, and globes as well as to the literature pertaining to cartography.

249. *Geographisches Jahrbuch* (Gotha: Perthes, 1866–). Cartography is found in particular volumes: a brief subject analysis of the *Jahrbuch* appears in J. K. Wright and E. T. Platt, *Aids to Geographical Research: Bibliographies, Periodicals, Atlases, Gazetteers and Other Reference Books*, 2d ed., American Geographical Society Research Series no. 22 (New York: Columbia University Press for American Geographical Society, 1947), 52–57.

250. *Bibliographie géographique internationale* (Paris: Centre National de la Recherche Scientifique, 1891–), annual.

251. *Research Catalogue of the American Geographical Society*, 15 vols. and map supplement (Boston: G. K. Hall, 1962); it has been updated by *Current Geographical Publications: Additions to the Research Catalogue of the American Geographical Society* (New York: American Geographical Society, 1938–78; Milwaukee: American Geographical Society Collection, 1978–).

252. Wolter, “Emerging Discipline,” 138–39 (note 113); see also 204–6 for an analysis of the cartographic content of selected geographical journals.

253. Hans-Peter Kosack and Karl-Heinz Meine, *Die Kartographie, 1943–1954: Eine bibliographische Übersicht*, Kartographische Schriftenreihe, vol. 4 (Lahr/Schwarzwald: Astra Verlag, 1955).

254. *Bibliotheca cartographica: Bibliographie des kartographischen Schrifttums; Bibliography of Cartographic Literature; Bibliographie de la littérature cartographique* (Bonn-Bad Godesberg: Institut für Landeskunde and Deutsche Gesellschaft für Kartographie, 1957–72); its title was changed to *Bibliographia cartographica: Internationale Dokumentation des kartographischen Schrifttums; International Documentation of Cartographical Literature* with the 1975 issue (re-numbered 1–). For a bibliographical note and statistics on its contents, see Lothar Zögner, “25 Jahre ‘Bibliographia cartographica,’ ” *Zeitschrift für Bibliothekswesen und Bibliographie* 29 (1982): 153–56.

graphy of Cartography,²⁵⁵ and the *Referativnyi zhurnal: Geografiia*.²⁵⁶ The appearance of these bibliographies—and the rate of growth of the literature they portray—can be taken as a measure of the increasing independence of the field of cartography. The point is that all such bibliographies recognized and thus helped to demarcate—and to stimulate—the history of cartography as a distinct subject area within cartography. For example, in *Die Kartographie* monographs dealing with historical topics are listed separately, and of the approximately 5,000 entries in this work, a total of 354 (7 percent) relate to the history of cartography. Similarly, an analysis of the citation structure of *Bibliotheca cartographica* and *Bibliographia cartographica* from 1957 to 1981—containing in all some 43,314 entries—reveals that the history of cartography (accorded its own place in the classification) was the third most important subject category in that period, with a total of 6,298 entries (14.5 percent).²⁵⁷ These rather dry facts illustrate the new forces working for the history of cartography. Moreover, the attention paid to the history of cartography in these international bibliographies has had its counterpart at the national level. New journals of cartography have listed or reviewed the history of cartography literature, and abstracting journals dealing with cartography have now also recognized the history of cartography as a discrete subject area.²⁵⁸

A second example can be given of how the rise of cartography has benefited the history of cartography. It concerns the foundation of new cartographic societies and their associated specialist journals, which have provided a wide range of new outlets for the history of cartography. In comparison with the foundation of new geographical societies in the second half of the nineteenth century,²⁵⁹ the establishment of societies devoted exclusively to cartography gained momentum much more slowly.²⁶⁰ Kartografiska Sällskapet was the first modern cartographic society, founded in Stockholm in 1908, but its periodical *Globen* did not begin publication until 1922.²⁶¹ Before World War II there were also several attempts to establish cartographic societies and journals in Austria²⁶² and Germany.²⁶³ These attempts reflected the interest in a science of mapping in those two countries, but not until after 1950 did the more general takeoff occur. The Deutsche Gesellschaft für Kartographie was founded in 1950 and began publishing the *Kartographische Nachrichten* in 1951.²⁶⁴ This soon gained a reputation as a leading scholarly journal for cartography. In 1958 the *Bulletin* of the Comité Français de Cartographie and the Dutch journal *Kartografie* were first issued. By 1972 there were twenty-six cartographic societies and forty-three cartographic journals; by 1980 the number of journals had risen to sixty-seven.²⁶⁵

The importance of such cartographic organizations

and their periodicals for the history of cartography has not always been recognized. It is clear, however, that most new societies of cartography included the advancement of research into the history of cartography among their objectives.²⁶⁶ Their journals reflect this interest,

255. In 1897, Philip Lee Phillips began collecting entries for the *Bibliography*. What had been collected was inserted as a preface to *A List of Maps of America in the Library of Congress* in 1901. Additions continued to be made, although the effort lagged for some years and was then renewed. Over several years, all of the entries (from the early nineteenth century to 1971) were compiled on twenty-nine reels of sixteen-millimeter microfilm and were finally published: United States Library of Congress, Geography and Map Division, *The Bibliography of Cartography*, 5 vols. (Boston: G. K. Hall, 1973), with subsequent supplements.

256. *Referativnyi zhurnal: Geografiia* (Moscow: Institut Nauchnoi Informatsii, Akademiia Nauk SSSR, 1956–), monthly.

257. Zögner, “25 Jahre ‘Bibliographia cartographica,’” 155 (note 254). This total of over six thousand entries for a shorter time period confirms a shortfall in the *Imago Mundi* bibliographies analyzed above (note 229).

258. *Geo Abstracts*, sec. G, “Remote Sensing, Photogrammetry and Cartography,” has had since 1979 a separate heading for the historical aspects of cartography.

259. In some cases, of course, the journals of these societies were of seminal importance in promoting the systematic study of cartography in the nineteenth century. In the German-speaking world, especially, *Petermanns Geographische Mitteilungen*—the earliest European geographical journal—and the *Ergänzungshefte* were of overwhelming importance in this respect: for further evidence see Wolter, “Emerging Discipline,” 156–59 (note 113).

260. These societies were listed and discussed by Wilhelm Bonacker, “Kartographische Gesellschaften: Vorläufer und Wegbereiter der internationalen kartographischen Vereinigung,” *Geographisches Taschenbuch* (1960–61), supp., 58–77; T. A. Stanchul, “Natsional’nye kartograficheskiye obshchestva mira” (National cartographic societies of the world), *Doklady Otdeleniy i Komissiy* 10 (1969): 89–99 (Geograficheskogo obshchestva SSSR, Leningrad).

261. It remains the oldest periodical devoted to cartography that is still being published.

262. In Austria, the *Kartographische und Schulgeographische Zeitschrift* was published from 1912 to 1922; *Die Landkarte: Fachbücherei für Jederman in Länderaufnahme und Kartenwesen* was more short-lived (1925–27), as was the *Kartographische Mitteilungen* (1930–32). For further details see Wolter, “Emerging Discipline,” 165–68 (note 113).

263. Early attempts at publishing a regular cartographic journal in Germany were also unsuccessful: the *Deutsche Kartographische Gesellschaft* existed from 1937 to 1949, but not until 1941 did it publish a *Jahrbuch der Kartographie*, which ceased publication in the following year: Wolter, “Emerging Discipline,” 168–70 (note 113).

264. *Kartographische Nachrichten* 25, no. 3 (1975), was a special issue: “1950–1975: 25 Jahre Deutsche Gesellschaft für Kartographie.”

265. Wolter, “Emerging Discipline,” 171 with a list of serials on 303–5 (note 113). In 1980, John D. Stephens listed sixty-seven cartographic serials in six categories (including some categories not included by Wolter in his listing, i.e., bibliographic serials); see John D. Stephens, “Current Cartographic Serials: An Annotated International List,” *American Cartographer* 7 (1980): 123–38.

266. *American Cartographer*, for example, established in 1974, despite its strong technical emphasis, included “the history of mapmaking” among its terms of reference: Robert D. Reckert, “A Message from the President of ACSM,” *American Cartographer* 1 (1974): 4.

and a few societies have even established special interest groups to promote the history of cartography.²⁶⁷ Indeed, for at least one of the new journals—the *Canadian Cartographer* (now *Cartographica*)—the history of cartography seems to have been the primary interest in the years 1964 to 1972, with 30 percent of its articles devoted to this subject. Elsewhere, less space was given to articles on the history of cartography: in the (British) *Cartographic Journal* only 16 percent (1964–72); in *Surveying and Mapping* 11 percent (of cartographic articles 1944–72); in *Kartographische Nachrichten* 11 percent (1952–82); in the (Australian) *Cartographer* 3 percent (1954–69); and in the *International Yearbook of Cartography* a mere 2 percent (1961–72).²⁶⁸

The existence of the history of cartography was also acknowledged at an international level. In 1972 the International Cartographic Association formally extended its activities to the history of mapmaking when it established the “Working Group on the History of Cartography,” its terms of reference being the investigation of cartographic techniques and map production before 1900. In 1976 it was given commission status and a brief to prepare a “historical glossary of cartographic innovations and their diffusion.”²⁶⁹ In this way—but in many countries in cartography rather than in geography—the void left by the phasing out of a commission for ancient maps from the International Geographical Union has been filled.

There is more to the relationship between the new cartography and the history of cartography than the infrastructural matters of bibliographies, societies, journals, and international organizations. Of even greater potential importance to the history of cartography has been the intellectual infusion from a rethinking of concepts and from techniques in cartography. The development of the idea of cartography as being quintessentially concerned with communication—while not the only major concept to have attracted attention in recent years—is nevertheless the one that most nearly offers a set of general principles for the humanistic study of early maps. That these ideas have only slowly filtered into the history of cartography partly reflects the generally belated appearance²⁷⁰ of a search for theoretical frameworks in cartography itself. As Robinson and Petchenik observe,

During most of the long history of cartography, cartographers have been chiefly concerned with technical problems: acquiring and perfecting geographic data, devising ways of symbolizing it, and inventing methods of mechanically preparing and duplicating the physical map. Remarkably little concern was ever expressed about how a map actually accomplished what it was supposed to do—communicate. . . . there were thousands of maps made with little or no

thought given to the images evoked in the minds of those who looked at them.²⁷¹

If this was still true in cartography in the 1970s, then it was doubly true of the history of cartography at the same time. In vain are the journals searched for papers concerned explicitly with the nature of maps, as opposed to accounts of mapmakers or descriptions and evaluations²⁷² of the content of maps. Even when an interest in theory finally began to enliven the history of cartography—mainly in the 1960s—it was first directed at the problems of assessing map content as documentary record rather than at illuminating their study as artifacts or images on their own terms.²⁷³ One can go so far as to suggest that the eventual awareness of early maps as maps in the history of cartography derives mainly from cartography. It is probably too early to predict whether modern cartographic thinking will produce a lasting change of direction, but three signs of a shift in interest are beginning to permeate the history of

267. For example, the Deutsche Gesellschaft für Kartographie set up such an interest group in 1954, the Canadian Cartographic Association in 1976. There is also a working group on the history of cartography of the Nederlandsche Vereniging voor Kartografie (NVK) and a Commission on the History of Cartography in the National Committee of Cartographers of the USSR. In France there is no special group on the history of cartography, but a commission on cartographic documentation was created in 1980 by the Comité Français de Cartographie.

268. Wolter, “Emerging Discipline,” 187–98 (note 113), using the *Bibliotheca cartographica* classification system; I am grateful to Francis Herbert for the statistics relating to *Kartographische Nachrichten*.

269. International Cartographic Association, *Cartographical Innovations: An International Handbook of Mapping Terms to 1900*, ed. Helen Wallis and Arthur H. Robinson (Tring, Hertfordshire: Map Collector Publications, forthcoming); International Cartographic Association, *Map-making to 1900: An Historical Glossary of Cartographic Innovations and Their Diffusion*, ed. Helen Wallis (London: Royal Society, 1976). See also Helen Wallis, “Working Group on the History of Cartography,” *International Geographical Union Bulletin* 25, no. 2 (1974): 62–64; Henry W. Castner, “Formation of the I.C.A. Working Group on the History of Cartography,” *Proceedings of the Eighth Annual Conference of the Association of Canadian Map Libraries* (1974): 73–76.

270. There were a few exceptions: see above, on Max Eckert, pp. 24–25.

271. Robinson and Petchenik, *Nature of Maps*, vii–viii (note 4).

272. The critical appraisal of earlier maps, already visible in the seventeenth- and eighteenth-century literature, did, however, gather strength in the nineteenth century: a notable example is Gregorius Mees, *Historische atlas van Noord-Nederland van de XVI eeuw tot op heden* (Rotterdam: Verbruggen en Van Duym, 1865), where the introduction consists of a critical examination of atlases published in Europe since the seventeenth century; Mees, incidentally, was also the first Dutchman to use the word “cartographie” in print (personal communication to author from Cornelis Koeman).

273. R. A. Skelton, *Looking at an Early Map* (Lawrence: University of Kansas Libraries, 1965); see also the Conference on the History of Cartography, London, September 1967, which took as its theme “Early Maps as Historical Evidence.” A selection of papers, some of them methodological, were published in *Imago Mundi* 22 (1968).

cartography: the greater concern with the meaning of the words “map” and “cartography” already commented upon;²⁷⁴ a greater emphasis on maps as artifacts and on the technical processes by which they are produced; and finally, an initiation of communication approaches to the study of early maps. These last two points are taken up here.

By the 1960s greater emphasis was being placed in cartography on the rapidly changing technical processes by which maps are produced, while in the history of cartography a similar interest in maps as artifacts was growing. In cartography, however, this emphasis on technical processes was soon challenged. A body of literature based on empirical research in psychophysics sought to explain the responses of the map reader to various map elements as an aid to effective map design, and this contributed to a number of seminal papers published in the 1960s.²⁷⁵ These papers anticipated the developing theories of mapping as a cognitive science that involves communication from mapmaker to map user. By the 1970s these new theories were firmly rooted in the subject,²⁷⁶ thus stressing the nature of cartography as a process rather than maps as a product. This also led to the modified definitions of “map” and “cartography” already noted. By 1974 cartography was seen as becoming “a science . . . allied in part with the science of graphic communication”;²⁷⁷ by 1976 it could be positively asserted that cartography was the science of communicating information between individuals by the use of maps;²⁷⁸ and by 1981 it was described as “a formal system for the communication of spatial information.”²⁷⁹ Theoretical cartographers were dismantling their early information flow models, crudely derived from engineering, and seeking to refine their concepts through semiology.²⁸⁰ They looked for parallels between language and cartography²⁸¹ and explored the cognitive dimension in cartographic communication.²⁸²

For the past two decades this revitalized cartography has increasingly been a major source of new ideas for the study of early maps. From the 1960s onward, the two major preoccupations of the cartographers—the technical aspects of mapmaking and the study of how maps communicated their information—were both reflected in writings on the history of cartography. We can detect a number of theoretical statements designed to reconcile the more traditional study of maps as historical documents with the intensified interest in their characteristics as physical products resulting from human workmanship. Historians of cartography were now exhorted to train their emphasis more on the artifactual nature of the map and less on its content. Skelton recognized the dichotomy in research in 1966 when he clarified the distinction between form and content in the study of early maps. The form of the map artifact, he

said, represented “the mind, eye, and hand of the contemporary mapmaker” and the content of the map “the geographical data presented in it.”²⁸³ But Skelton’s approach to early maps was by both apprenticeship and inclination that of a historian of their content, and a study of form and content were for him aspects of research that would “mutually control and support each other.”²⁸⁴ Others saw it differently. By the 1970s, some felt urgently that the study of design and technique should be given greater emphasis in the history of maps. Thus F. A. Shibonov, a specialist in early Russian maps,

274. See above, Preface, pp. xv–xviii.

275. Barbara Bartz Petchenik, “A Map Maker’s Perspective on Map Design Research, 1950–1980,” in *Graphic Communication and Design in Contemporary Cartography*, ed. D. R. Fraser Taylor, Progress in Contemporary Cartography, vol. 2 (New York: John Wiley, 1983), 37–68. By 1960 Arthur H. Robinson was envisaging the primary process of cartography as “the conceptual planning and designing of the map as a medium for communication or research”: Arthur H. Robinson, *Elements of Cartography*, 2d ed. (New York: John Wiley, 1960), v. Another important paper was Christopher Board, “Maps as Models,” in *Models in Geography*, ed. Richard J. Chorley and Peter Haggett (London: Methuen, 1967), 671–725; and Jacques Bertin’s *Sémiologie graphique: Les diagrammes, les réseaux, les cartes* (Paris: Gauthier-Villars, 1967), attempted to codify a body of theory for cartography derived from semiotics. Bertin’s book was published in English as *Semiology of Graphics: Diagrams, Networks, Maps*, ed. Howard Wainer, trans. William J. Berg (Madison: University of Wisconsin Press, 1983).

276. See the collection of essays in Leonard Guelke, ed., *The Nature of Cartographic Communication*, Monograph 19, *Cartographica* (1977); but a good guide through the literature of the period is Christopher Board, “Cartographic Communication,” in *Maps in Modern Geography*, 42–78 (note 242). See also Lech Ratajski, “The Main Characteristics of Cartographic Communication as a Part of Theoretical Cartography,” *International Yearbook of Cartography* 18 (1978): 21–32.

277. Joel L. Morrison, “Changing Philosophical-Technical Aspects of Thematic Cartography,” *American Cartographer* 1 (1974): 5–14, quotation on 12.

278. Joel L. Morrison, “The Science of Cartography and Its Essential Processes,” *International Yearbook of Cartography* 16 (1976): 84–97.

279. M. J. Blakemore, “Cartography,” in *The Dictionary of Human Geography*, ed. R. J. Johnston (Oxford: Blackwell Reference, 1981), 29–33, quotation on 29.

280. Bertin, *Sémiologie graphique* (note 275), was probably the first to attempt to work out a “grammar” of graphic symbols applied to cartography; Ulrich Freitag, “Semiotik und Kartographie: Über die Anwendung kybernetischer Disziplinen in der theoretischen Kartographie,” *Kartographische Nachrichten* 21 (1971): 171–82; Hansgeorg Schlichtmann, “Codes in Map Communication,” *Canadian Cartographer* 16 (1979): 81–97; idem, “Characteristic Traits of the Semiotic System ‘Map Symbolism,’” *Cartographic Journal* 22 (1985): 23–30.

281. Christopher Board, “Maps and Mapping,” *Progress in Human Geography* 1 (1977): 288–95; Head, “Natural Language” (note 4).

282. Barbara Bartz Petchenik, “Cognition in Cartography,” in *Nature of Cartographic Communication*, 117–28 (note 276); Ratajski, “Characteristics of Cartographic Communication,” 24–26 (note 276).

283. Skelton, *Maps*, 63 (note 15).

284. Skelton, *Maps*, 63 (note 15).

suggested cogently that what was “of importance for the history of cartography is not what has been represented on a map but how it has been portrayed cartographically.”²⁸⁵ This line of argument had already been taken even further by David Woodward when he set out to show that the study of early maps as a product of cartographic skill and practice had, with certain notable exceptions, remained a major gap within the history of cartography.²⁸⁶ Woodward approached the problem by classifying stages in the production process according to the resultant cartographic form, summarizing these in terms of a simple matrix and concluding: “The study of the form of maps is that part of the field which we might call the technical history of cartography and is usually attempted by those historians of cartography with a background in cartography. In short, it is the cartographer’s view of his craft.”²⁸⁷ These words amount to a statement regarding the cartographer’s place in the history of cartography, and they were accepted as such by historically minded cartographers. They were thus also a sign of the coming of age of a larger technical component in the history of cartography. A general analogy could be that this trend belatedly matches the rise of the history of technology as distinct from the history of science in the period since World War II. As another practicing cartographer expressed it, “chronological map knowledge,” involving “the history of cartographical technics and technology,” ought to be set to increase its relative share of the subject.²⁸⁸

So far, only the harbingers rather than the substance of a change in the balance of the history of cartography can be detected.²⁸⁹ At the very least, however, the emergence of cartography as an independent discipline had the effect of recruiting for the history of cartography a new group of scholars, with technical training and a different intellectual outlook, who were attracted to research in their own specialist fields. An example has been the increased attention paid to the history of thematic mapping, progressively related to the growing importance of this subject in cartography as a whole.²⁹⁰ Yet these trends must be kept in proportion: the history of cartography has clearly not identified entirely with cartography. For many practicing cartographers, historical studies have inevitably remained a sideline to their contemporary researches, and this tendency has weakened the impact of their contribution on the history of cartography. Systematic studies of form are only just beginning to complement a continuing and proper concern for the content of early maps as historical documents.

An interest in early maps as a means of communication in the past shows a similar process of gradual colonization. Although such models became well established in cartography from the late 1960s onward, they were only slowly taken up in the history of cartography.

The idea that maps represent a form of graphic language is not new. Almost as soon as mapmakers had become aware of the special nature of their craft and had recorded its practice in written treatises, they seem also to have grasped the nature of the communicative properties of maps. For example, Leonard Digges, in his *Pantometria* of 1571, referred to the advantages not only of exactness but also of “dispatch” in the reading of maps, although it was left to John Green, writing in the eighteenth century, to restate the well-established belief that “a Draught shews at once what many Words can’t express.”²⁹¹ But if such a view was often echoed—and had wide acceptance among historians of cartography trained as geographers—it was a truth implicitly understood and conveyed in their writings rather than one that had been fully developed in their research. Statements such as one to the effect that the signs on early maps represented a “cartographical alphabet,”²⁹² another that studies of early maps should be concerned with the language or vocabulary of mapmakers,²⁹³ or that historians of cartography might focus on the “expressive terms by which [a map] makes its communication,”²⁹⁴ can easily be found in the literature.

285. F. A. Shibano, “The Essence and Content of the History of Cartography and the Results of Fifty Years of Work by Soviet Cartographers,” in *Essays on the History of Russian Cartography, 16th to 19th Centuries*, ed. and trans. James R. Gibson, introduction by Henry W. Castner, Monograph 13, *Cartographica* (1975), 141–45, quotation on 142.

286. Woodward, “Suggested Framework” (note 205); see also David Woodward, “The Form of Maps: An Introductory Framework,” *AB Bookman’s Yearbook*, pt. 1 (1976), 11–20. Woodward’s exceptions to this tendency “to slight or ignore the processes by which maps were made” (“Suggested Framework,” 109 and n. 17) were Brown, *Story of Maps* (note 16), and François de Dainville, *Le langage des géographes* (Paris: A. et J. Picard, 1964).

287. Woodward, “Suggested Framework,” 107 (note 205).

288. Lech Ratajski, “The Research Structure of Theoretical Cartography,” *International Yearbook of Cartography* 13 (1973): 217–28.

289. See Blakemore and Harley, *Concepts*, 48–50 (note 164), for examples of the imbalances in the historical study of such cartographic processes.

290. This connection is synthesized in—and epitomized by—Robinson, *Thematic Mapping* (note 28).

291. Leonard Digges, *A Geometrical Practise, Named Pantometria* (London: Henrie Bynneman, 1571), preface; [John Green], *The Construction of Maps and Globes* (note 69), quoted in J. B. Harley, “The Evaluation of Early Maps: Towards a Methodology,” *Imago Mundi* 22 (1968): 62–74, quotation on 62.

292. E. M. J. Campbell, “The Beginnings of the Characteristic Sheet to English Maps,” pt. 2 of “Landmarks in British Cartography,” *Geographical Journal* 128 (1962): 411–15, quotation on 414.

293. De Dainville, *Langage des géographes*, x (note 286); it should be pointed out, however, that de Dainville was not interested in maps for their own sake in this work—or in the history of cartography—but used maps as documents in the service of history.

294. Skelton, *Maps*, 101 (note 15); Skelton’s later writings in particular are full of suggestive pointers that reveal his understanding of the potential of the analogy between maps and language.

The theoretical basis, however, was never formally set out, nor was there an interchange with developments in other subjects, such as art history, literature, or social anthropology, where these concepts had been more thoroughly exploited.

Not until the early 1970s can we detect the first deliberate historical adaptations of ideas derived from the cartographer's concern with theories of communication. In 1972, for example, Freitag suggested dividing the history of cartography into eras and epochs corresponding to Marshall McLuhan's eras of communication, starting with the "chirographic or manuscript era" and going on to the eras of "typographic or printed maps" and of "telegraphic (or screened) maps."²⁹⁵ By the mid-1970s the theme of maps as a means of communication was increasingly being identified in the history of cartography. Woodward had reviewed communication models as part of his "framework" for the subject;²⁹⁶ Wallis had stressed the place of communication in the study of the history of thematic cartography;²⁹⁷ at the level of documented research strategies, Andrews was writing about "medium and message" in connection with early Ordnance Survey maps of Dublin City²⁹⁸ and Lewis had modeled the "message images" transmitted through selected maps of the Great Plains in the eighteenth century;²⁹⁹ and in 1975 Harley had proposed a systematic documentation using historical evidence for the "user segment" of the communication model of Robinson and Petchenik.³⁰⁰ By the end of the decade a similar approach to the history of maps was being developed independently by scholars in other disciplines. Some research by art historians on early maps, for example, not only has adopted an iconographic strategy, strongly influenced by the concept of art as language, but has also attempted to make more explicit its assumptions about art (broadly defined to include some types of prints and maps) as a graphic language.³⁰¹ Such developments are forcing historians of cartography to consider the contemporary meaning of maps and their social significance as well as their qualities as artifacts or historical documents.³⁰² In another example, a historian of science wrote about the emergence of "a visual language," in the sense of maps and diagrams, for geology, while historians of the book can now envisage their subject in general in terms of "the communications circuit."³⁰³ For a formalization of an interest in the properties of maps as communicators of knowledge about space, the history of cartography is perhaps primarily indebted to the rise of academic cartography in the past two decades.

RECENT DEVELOPMENTS IN THE HISTORY OF CARTOGRAPHY

The literature reviewed above may be taken to suggest that a changed scholarly identity for the history of car-

tography had already taken shape by the end of the 1970s. It has to be stressed, however, that the history of cartography cannot be defined as an academic subject by criteria such as the number of university departments or established chairs devoted to its pursuit. In Portugal, where the Junta de Investigações do Ultramar made provision in the period 1958–60 for the study of early cartography in Lisbon and Coimbra, a formal status has emerged, albeit on a small scale.³⁰⁴ And in the Netherlands, in 1968, a chair of cartography was established in the University of Utrecht, which also formally incor-

295. Ulrich Freitag, "Die Zeitalter und Epochen der Kartengeschichte," *Kartographische Nachrichten* 22 (1972): 184–91. He drew on the ideas in Marshall McLuhan, *Understanding Media: The Extensions of Man*, 2d ed. (New York: New American Library, 1964), esp. 145–46.

296. Woodward, "Suggested Framework," 103–5 (note 205).

297. Helen Wallis, "Maps as a Medium of Scientific Communication," in *Studia z dziejów geografii i kartografii: Etudes d'histoire de la géographie et de la cartographie*, ed. Józef Babicz, Monografie z Dziejów Nauki i Techniki, vol. 87 (Warsaw: Zakład Narodowy Imienia Ossolińskich Wydawnictwo Polskiej Akademii Nauk, 1973), 251–62.

298. J. H. Andrews, "Medium and Message in Early Six-Inch Irish Ordnance Maps: The Case of Dublin City," *Irish Geography* 6 (1969–73): 579–93.

299. G. Malcolm Lewis, "The Recognition and Delimitation of the Northern Interior Grasslands during the Eighteenth Century," in *Images of the Plains: The Role of Human Nature in Settlement*, ed. Brian W. Blouet and Merlin P. Lawson (Lincoln: University of Nebraska Press, 1975), 23–44; idem, "Changing National Perspectives and the Mapping of the Great Lakes between 1775 and 1795," *Cartographica* 17, no. 3 (1980): 1–31.

300. J. B. Harley, "The Map User in Eighteenth-Century North America: Some Preliminary Observations," in *The Settlement of Canada: Origins and Transfer*, ed. Brian S. Osborne, Proceedings of the 1975 British-Canadian Symposium on Historical Geography (Kingston, Ont.: Queen's University, 1976), 47–69.

301. Michael Twyman, "A Schema for the Study of Graphic Language," in *Processing of Visible Language*, ed. Paul A. Kollers, Merald E. Wrolstad, and Herman Bouma (New York: Plenum Press, 1979), 1:117–50.

302. Juergen Schulz, "Jacopo de' Barbari's View of Venice: Map Making, City Views, and Moralized Geography before the Year 1500," *Art Bulletin* 60 (1978): 425–74; J. B. Harley, "Meaning and Ambiguity in Tudor Cartography," in *English Map-Making, 1500–1650*, ed. Sarah Tyacke (London: British Library, 1983), 22–45, for an example of an iconographic-linguistic approach aimed at uncovering the contemporary meaning of a group of early maps; also J. B. Harley, "The Iconology of Early Maps," in *Imago et mensura mundi: Atti del IX Congresso Internazionale di Storia della Cartografia*, 2 vols., ed. Carla Clivio Marzoli (Rome: Enciclopedia Italiana, 1985), 1:29–38.

303. Martin J. S. Rudwick, "The Emergence of a Visual Language for Geological Science, 1760–1840," *History of Science* 14 (1976): 149–95; Robert Darnton, "What Is the History of Books?" in *Books and Society in History*, 3–26 (note 29); a graphic model of the "communications circuit" appears on p. 6.

304. See "Portugal" in the Chronicle section of *Imago Mundi* 17 (1963): 105–6, and *Imago Mundi* 24 (1970): 147–48.

porated the history of cartography.³⁰⁵ But such institutional support for the history of cartography is still relatively fragile, and its growth has to be measured in terms of the activity of individuals rather than permanent endowments. Outside the universities, the only important development has been the establishment (in 1970) of the Hermon Dunlap Smith Center for the History of Cartography at the Newberry Library, Chicago. Created as a research institute, it was designed as much to promote the subject as to exploit that library's rich holdings of early maps. It remains, so far, the only permanent center of its kind.³⁰⁶

Some compensation for the lack of formal institutional support is available in the growing self-awareness discernible among those who regard themselves as, first and foremost, historians of cartography. This self-awareness is providing its own support. It could be said that lines of communication now exist for the emergence of an "invisible college" of historians of cartography.³⁰⁷ These contacts already operate both through national groups and through international links and meetings. What can also be seen is the way the groups, increasingly conscious of the identity of the history of cartography, are beginning to advance the intellectual development of their subject and to exploit its past achievements and its potential to this end. Steps in the process of subject building already noted include the development of special interest groups in the national cartographic societies, the continuing series of international conferences, and the establishment of an International Cartographic Association Commission for the History of Cartography. An additional supporting influence is the regular publication of an international directory of research.³⁰⁸ Although only forty-four countries are represented in the 1985 edition (compared with seventy-three countries recorded in the *Imago Mundi* bibliographies), even this geographical spread points to an increased flow of ideas across the national boundaries within which the history of cartography has been traditionally constrained.

Taken singly, many of these developments may seem no more than a taste of a different future for the subject; but in recent years they have been supported by a number of writings of an explicitly methodological nature, concerned either with stocktaking at a national level or with criticism of the aims and purposes of the history of cartography of a more general nature. Most convincing is the extent to which this critique is not exclusive to one or two countries but can be traced in most countries where there is an established tradition of research in the history of cartography. As already noted, there is nothing particularly new in the practice of bibliographical stocktaking, but over the past two decades, for example, there have appeared Baldacci's review of studies by Italian scholars;³⁰⁹ Buczek's bibliographical essay on

the history of cartography in Poland and that of Koeman on the Netherlands;³¹⁰ Ruggles's account of the history of cartography in Canada;³¹¹ and Scharfe's description of the state of the art in Germany.³¹² In addition, there are the detailed Chronicle entries relating to the United States published in *Imago Mundi*.³¹³

Most significant, from the point of view of intellectual change, however, is the parallel tendency toward introspection and self-criticism among historians of cartography. Looking no further than Britain, for example, one finds that as early as 1962 Crone had pointed to an antiquarian and bibliographical bias in the history of cartography,³¹⁴ though it was left to Skelton to mount a more systematic critique in 1966. It was Skelton's clearly enunciated view that the subject, as he surveyed it, was loosely defined and lacked philosophical and

305. In 1981 the chair was split into a chair of cartography and a personal professorship in the history of cartography.

306. David Woodward, *The Hermon Dunlap Smith Center for the History of Cartography: The First Decade* (Chicago: Newberry Library, 1980). Other unsuccessful proposals were made in the early 1960s: see G. Jacoby, "Über die Gründung einer internationalen Zentralstelle für die Geschichte der Kartographie," *Kartographische Nachrichten* 12 (1962): 27–28; Wilhelm Bonacker, "Stellungnahme zu dem Plan einer internationalen Zentralstelle für Geschichte der Kartographie," *Kartographische Nachrichten* 12 (1962): 147–50. Jacoby's main objective was to create an international archive of photographic negatives of all old or rare maps, together with appropriate information and reference material.

307. Diana Crane, *Invisible Colleges: Diffusion of Knowledge in Scientific Communities* (Chicago: University of Chicago Press, 1972).

308. Elizabeth Clutton, ed. and comp., *International Directory of Current Research in the History of Cartography and in Carto-bibliography*, no. 5 (Norwich: Geo Books, 1985).

309. Osvaldo Baldacci, "Storia della cartografia," in *Un sessantennio di ricerca geografica italiana*, Memorie della Società Geografica Italiana, vol. 26 (Rome: Società Geografica Italiana, 1964), 507–52.

310. Karol Buczek, *History of Polish Cartography from the 15th to the 18th Century*, 2d ed., trans. Andrzej Potocki (Amsterdam: Meridian, 1982), 7–15; Cornelis Koeman, *Geschiedenis van de kartografie van Nederland: Zes eeuwen land- en zeekaarten en stadsplattegronden* (Alphen aan den Rijn: Canaletto, 1983); chap. 2 is concerned with "Biografieën van Nederlandse schrijvers over kartografie," 6–13.

311. Richard I. Ruggles, "Research on the History of Cartography and Historical Cartography of Canada, Retrospect and Prospect," *Canadian Surveyor* 31 (1977): 25–33.

312. Wolfgang Scharfe, "Geschichte der Kartographie—heute?" in *Festschrift für Georg Jensch aus Anlaß seines 65. Geburtstages*, ed. F. Bader et al., Abhandlungen des 1. Geographischen Instituts der Freien Universität Berlin, 20 (Berlin: Reimer, 1974), 383–98.

313. For example, Walter W. Ristow in the Chronicle section, *Imago Mundi* 17 (1963): 106–14; idem, *Imago Mundi* 20 (1966): 90–94; and other issues up to *Imago Mundi* 29 (1977), when a new arrangement for the Chronicle, cutting across national divisions—and designed to foster internationalism—was introduced.

314. G. R. Crone, "Early Cartographic Activity in Britain," pt. 1 of "Landmarks in British Cartography," 406–10 (note 292); referring to Crone's observation, similar tendencies were noted in the United States by Walter W. Ristow in the Chronicle section of *Imago Mundi* 17 (note 313).

methodological direction. In particular, he said, it needed “a firm general base, secure lines of communication, and an accepted methodology.”³¹⁵ Recently, however, some of these ideas have been developed. In England, Blakemore and Harley reviewed them critically in the context of recent Anglo-American writings on the history of cartography.³¹⁶ In the United States, Woodward had already concluded in 1974 that the collective picture in the history of cartography was “that of a body of literature lacking consistency in terminology, approach, and general purpose,”³¹⁷ to which Denis Wood added his support, inveighing more stridently against what he sees as the dominant “collecting mentality” of many historians of cartography.³¹⁸

The new critical spirit is by no means confined to Great Britain and North America. Those European countries in which there are strong traditions of research in the history of cartography are also adding to the methodological debate. In the Netherlands Koeman, promoting the idea of the wider relevance of the history of cartography, has examined “modern investigations” in the field in terms of their contribution to cultural history and to the development of cartography.³¹⁹ In Italy, where discussion centers on the dynamism of the subject, Elio Manzi rejected the notion of decline in the history of cartography as practiced in that country, demonstrating its vigor by enumerating 136 items in a recent review paper;³²⁰ but Gaetano Ferro’s answer was that these were mainly local in scope, were fragmented, and were undertaken without an awareness of unifying concepts.³²¹ Vladimiro Valerio has also injected a systematic note of criticism into the study of the history of cartography by Italian scholars.³²² In Poland, historians of cartography have likewise examined the situation and needs of their subject,³²³ and in Switzerland Eduard Imhof, writing in 1964, was one of the earliest scholars to complain of the extensive gaps in historical cartographic research, referring in particular to the emphasis he saw being given to biobibliographical studies at the expense of technical analyses of the map artifact.³²⁴ In Germany too, Ruthardt Oehme had already remarked in 1971 that ‘early cartography is now looked on mainly as a hobby and it receives little consideration for study or research in German universities.’³²⁵ Since he wrote, an awareness of the history of cartography in Germany has been raised by the activities in the Deutsche Gesellschaft für Kartographie of a working group devoted to its study, and its potential and the need for change have been recognized in a recent review by Scharfe.³²⁶ In France there has been relatively little interest in theoretical matters by the few practicing historians of cartography, but Philippe Pinchemel, a geographer, has sought to clarify the relation between the history of geography and the history of cartography, noting that historians of cartography have only rarely been aware of epistemological

issues.³²⁷ Finally, in Russia, where the history of cartography has attracted substantial scholarly attention,³²⁸ there has also been published a systematic review, “The Use of Old Maps in Geographical and Historical Investigations.”³²⁹ This, as its title suggests, is primarily concerned with early maps as sources for physical and human geography, but it serves to reemphasize the wider role of a history of maps in historical research in general.

315. Skelton, *Maps*, 92 (note 15).

316. Blakemore and Harley, *Concepts* (note 164).

317. Woodward, “Suggested Framework,” 102 (note 205).

318. Denis Wood, review of *The History of Topographical Maps: Symbols, Pictures and Surveys* by P. D. A. Harvey in *Cartographica* 17, no. 3 (1980): 130–33.

319. Cornelis Koeman, “Moderne onderzoekingen op het gebied van de historische kartografie,” *Bulletin van de Vakgroep Kartografie* 2 (1975): 3–24.

320. Elio Manzi, “La storia della cartografia,” in *La ricerca geografica in Italia, 1960–1980* (Milan: Ask Edizioni, 1980), 327–36.

321. Gaetano Ferro, “Geografia storica, storia delle esplorazioni e della cartografia” (Introduzione), in *Ricerca geografica*, 317–18 (note 320). Italian scholars have recently launched a bulletin, *Cartostorie: Notiziario di Storia della Cartografia e Cartografia Storica* (Genoa), no. 1– (1984–).

322. Vladimiro Valerio, “A Mathematical Contribution to the Study of Old Maps,” in *Imago et mensura mundi: Atti del IX Congresso Internazionale di Storia della Cartografia*, 2 vols., ed. Carla Clivio Marzoli (Rome: Enciclopedia Italiana, 1985), 2:497–504; idem, “Sulla struttura geometrica di alcune carte di Giovanni Antonio Rizzi Zannoni (1736–1814),” published as offprint only; idem, “La cartografia napoletana tra il secolo XVIII e il XIX: Questioni di storia e di metodo,” *Napoli Nobilissima* 20 (1980): 171–79; idem, “Per una diversa storia della cartografia,” *Rassegna ANIAI* 3, no. 4 (1980): 16–19 (periodical of the Associazione Nazionale Ingegneri e Architetti d’Italia).

323. Zbigniew Rzepa, “Stan i potrzeby badań nad historia Kartografii w Polsce (I Ogólnopolska Konferencja Historyków Kartografii),” *Kwartalnik Historii Nauki i Techniki* 21 (1976): 377–81.

324. Eduard Imhof, “Beiträge zur Geschichte der topographischen Kartographie,” *International Yearbook of Cartography* 4 (1964): 129–53, quotation on 130.

325. Ruthardt Oehme, “German Federal Republic,” in *Chronicle, Imago Mundi* 25 (1971): 93–95, quotation on 93.

326. Wolfgang Scharfe, “Die Geschichte der Kartographie im Wandel,” *International Yearbook of Cartography* 21 (1981): 168–76.

327. Philippe Pinchemel, “Géographie et cartographie, réflexions historiques et épistémologiques,” *Bulletin de l’Association de Géographes Français* 463 (1979): 239–47. This interest arose from a report presented to the Centre National de la Recherche Scientifique in 1978; in France the history of cartography is often subsumed under the history of geography, an association that is reflected in recent writings; see, for example, Broc, *Géographie de la Renaissance* (note 64).

328. Shibanov, “Essence and Content,” 143 (note 285), reports that in an unpublished bibliography he had compiled there were some 550 studies representing the work of Soviet scholars in the history of cartography in the period 1917–62.

329. L. A. Goldenberg, ed., *Ispol’zovaniye starykh kart v geograficheskikh i istoricheskikh issledovaniyakh* (The use of old maps in geographical and historical investigations) (Moscow: Moskovskiy Filial Geograficheskogo Obschestva SSSR [Moscow Branch, Geographical Society of the USSR], 1980). For a complete listing of the contents see *Imago Mundi* 35 (1983): 131–32.

Such studies may form only a small percentage of the total new literature of the history of cartography, but they do reflect a heightened consciousness of its place in the humanities. They reflect, too, an awareness of an academic subject that has to be understood in terms of its own problems and potential. By 1980 the history of cartography was at a crossroads. The divergence was not only between its historical associations with geography and map librarianship and its newer, enhanced role within an increasingly independent cartography. It was also between its traditional work in the interpretation of the content of early maps as documents and its more recently clarified aims to study maps as artifacts in their own right and as a graphic language that has functioned as a force for change in history.

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CHAPTER 1 THE MAP AND THE DEVELOPMENT OF THE HISTORY OF CARTOGRAPHY

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