

*McKay
Hill
Buckler*

THIRD
EDITION

A HISTORY OF WORLD SOCIETIES

VOLUME A
FROM
ANTIQUITY
THROUGH THE
MIDDLE AGES



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A HISTORY OF WORLD SOCIETIES



About the Authors

John P. McKay Born in St. Louis, Missouri, John P. McKay received his B.A. from Wesleyan University (1961), his M.A. from the Fletcher School of Law and Diplomacy (1962), and his Ph.D. from the University of California, Berkeley (1968). He began teaching history at the University of Illinois in 1966 and became a professor there in 1976. John won the Herbert Baxter Adams Prize for his book *Pioneers for Profit: Foreign Entrepreneurship and Russian Industrialization, 1885–1913* (1970). He has also written *Tramways and Trolleys: The Rise of Urban Mass Transport in Europe* (1976) and has translated Jules Michelet's *The People* (1973). His research has been supported by fellowships from the Ford Foundation, the Guggenheim Foundation, the National Endowment for the Humanities, and IREX. His articles and reviews have appeared in numerous journals, including *The American Historical Review*, *Business History Review*, *The Journal of Economic History*, and *Slavic Review*. He edits *Industrial Development and the Social Fabric: An International Series of Historical Monographs*.

Bennett D. Hill A native of Philadelphia, Bennett D. Hill earned an A.B. at Princeton (1956) and advanced degrees from Harvard (A.M., 1958) and Princeton (Ph.D., 1963). He taught history at the University of Illinois at Urbana, where he was department chairman from 1978 to 1981. He has published *English Cistercian Monasteries and Their Patrons in the Twelfth Century* (1968) and *Church and State in the Middle Ages* (1970); and articles in *Analecta Cisterciensia*, *The New Catholic Encyclopedia*, *The American Benedictine Review*, and *The Dictionary of the Middle Ages*. His reviews have appeared in *The American Historical Review*, *Speculum*, *The Historian*, *The Catholic Historical Review*, and *Library Journal*. He has been a fellow of the American Council of Learned Societies and has served on committees for the National Endowment for the Humanities. Now a Benedictine monk of St. Anselm's Abbey, Washington, D.C., he is also a Visiting Professor at Georgetown University.

John Buckler Born in Louisville, Kentucky, John Buckler received his B.A. from the University of Louisville in 1967. Harvard University awarded him the Ph.D. in 1973. From 1984 to 1986 he was the Alexander von Humboldt Fellow at Institut für Alte Geschichte, University of Munich. He is currently a professor at the University of Illinois. In 1980 Harvard University Press published his *The Theban Hegemony, 371–362 B.C.* He has also published *Philip II and the Sacred War* (Leiden 1989), and co-edited *BOIOTIKA: Vorträge vom 5. International Böötien-Kolloquium* (Munich 1989). His articles have appeared in journals both here and abroad, like the *American Journal of Ancient History*, *Classical Philology*, *Rheinisches Museum für Philologie*, *Classical Quarterly*, *Wiener Studien*, and *Symbolae Osloenses*.

Preface

A HISTORY OF WORLD SOCIETIES grew out of the authors' desire to infuse new life into the study of world civilizations. We knew full well that historians were using imaginative questions and innovative research to open up vast new areas of historical interest and knowledge. We also recognized that these advances had dramatically affected the subject of economic, intellectual, and, especially, social history, while new research and fresh interpretations were also revitalizing the study of the traditional mainstream of political, diplomatic, and religious development. Despite history's vitality as a discipline, however, it seemed to us that both the broad public and the intelligentsia were generally losing interest in the past. The mathematical economist of our acquaintance who smugly quipped "What's new in history?"—confident that the answer was nothing and that historians were as dead as the events they examine—was not alone.

It was our conviction, based on considerable experience introducing large numbers of students to the broad sweep of civilization, that a book reflecting current trends could excite readers and inspire a renewed interest in history and the human experience. Our strategy was twofold. First, we made social history the core element of our work. Not only did we incorporate recent research by social historians, but also we sought to re-create the life of ordinary people in appealing human terms. A strong social element seemed to us especially appropriate in a world history, for identification with ordinary people of the past allows today's reader to reach an empathetic understanding of different cultures and civilizations. At the same time we were determined to give great economic, political, intellectual, and cultural developments the attention they unquestionably deserve. We wanted to give individual readers and instructors a balanced, integrated perspective, so that they could pursue on their own or in the classroom those themes and questions that they found particularly exciting and significant.

Second, we made a determined effort to strike an effective global balance. We were acutely aware of the great drama of our times—the passing of

the European era and the simultaneous rise of Asian and African peoples in world affairs. Increasingly, the whole world interacts, and to understand that interaction and what it means for today's citizens we must study the whole world's history. Thus we adopted a comprehensive yet realistic global perspective. We studied all geographical areas and the world's main civilizations, conscious of their separate identities and unique contributions. Yet we also stressed the links between civilizations, for these links eventually transformed multicentered world history into a complex interactive process of different continents, peoples, and civilizations in recent times. Finally, it was our place neither to praise nor to vilify our own civilization's major role in the growth of global integration, accepting it rather as part of our world heritage and seeking to understand it and the consequences for all concerned. Four years ago, in an effort to realize fully the potential of our fresh yet balanced perspective, we made many changes, large and small, in the second edition.

Changes in the New Edition

In preparing the third edition we have worked hard to keep our book up-to-date and to make it still more effective. First, we have carefully examined the entire book and each of its sections for organization, clarity, and balance. Above all, the treatment of non-European societies has been expanded and enriched, while the history of European developments has been tightened and condensed. In the new edition, therefore, the history of Africa from 400 to 1500 receives a full chapter-length treatment in Chapter 15, permitting a more extensive analysis of early African kingdoms, and an expanded discussion of Mesoamerican civilizations is included in Chapter 16, the Americas before European intrusion. Similarly, in order to do justice to the complex developments occurring in Africa and western Asia in the early modern period, Africa is discussed in Chapter 22 of the new

edition and the Middle East and India are the subject of Chapter 23.

As for Europe, Chapter 14 now brings together the history of the high and later Middle Ages in a single chapter. The emergence of royal absolutism and constitutionalism in western and eastern Europe in the early modern period is similarly combined in a reorganized and more sharply focused Chapter 19. For greater clarity, recent social developments in the West have been integrated into the larger, fully up-dated discussion of recovery and crisis in Europe after 1945 in Chapter 36. This chapter covers the transforming events in eastern Europe of recent years, including the revolutions of 1989.

Other major changes include a new section on the study of history and the meaning of civilization in Chapter 1. Islam and Islamic societies receive expanded and reworked coverage throughout the book. Chapter 34 contains a revised discussion of twentieth-century intellectual trends that emphasizes the connection between these movements and subsequent political developments, and Chapter 35 provides a unified account of the Second World War. With these changes and with numerous modifications highlighting cross-cultural linkages, we feel we have improved the geographical and cultural balance of our text and written a more integrated and effective world history.

Second, every chapter has been carefully revised to incorporate recent scholarship. Many of our revisions relate to the ongoing explosion in social history, and once again important findings on such subjects as class relations, population, and the family have been integrated into the text. We have made a special effort to keep up with the rapidly growing and increasingly sophisticated scholarship being done in women's history, adding or revising sections on women in early Jewish society and in the Crusades, as well as in the Renaissance, the Reformation, and the Industrial Revolution. The roots of modern feminism have been explored. The revised discussion of the origins and early development of Islam reflects recent scholarship, as does the extended reconsideration of the Ottomans and their cultural and intellectual achievements. Japanese feudalism is also reconsidered in the light of current scholarly thinking.

A major effort has also been made to improve the treatment of economic development and accompanying social changes in the light of new re-

search and fresh concepts. We are proud of the resulting changes, which include a consideration of early Islamic capitalism and agricultural innovation in Chapter 10, a new discussion of early modern crises in Chapter 19, a reexamination of the social and demographic effects of the slave trade in Africa in Chapter 22, and a fundamental rethinking of European industrialization in Chapter 26 and its global significance in Chapter 30. Other subjects not mentioned above that incorporate new scholarship in this edition include early human evolution, Germanic tribes, the Inquisition, industrial progress in early modern China, French industrialization and utopian socialism, and the development of modern Arab nationalism. New topics designed to keep the work fresh and appealing include *I-Ching* thinking in ancient China, Greek federalism, Sufism in the Islamic world, the early European reaction to knowledge of China and Japan, the settlement and the emergence of Australia, reform and revolution in the Soviet Union and eastern Europe in the 1980s, and the recent breakthrough in the struggle for racial equality in South Africa.

Third, the addition of more problems of historical interpretation in the second edition was well received, and we have continued in that direction in this edition. We believe that the problematic element helps the reader develop the critical-thinking skills that are among the most precious benefits of studying history. New examples of this more open-ended, more interpretive approach include the significance of Chinese economic development in the eighteenth century (Chapter 24), the social costs of English enclosure and the impact of industrialization on women and the standard of living (Chapter 26), and the impact of slavery on the black family in the United States (Chapter 31).

Finally, the illustrative component of our work has been completely revised. There are many new illustrations, including nearly two hundred color reproductions that let both great art and important events come alive. As in earlier editions, all illustrations have been carefully selected to complement the text, and all carry captions that enhance their value. Artwork remains an integral part of our book, for the past can speak in pictures as well as in words.

The use of full color throughout this edition also serves to clarify the maps and graphs and to enrich the textual material. Again for improved

clarity, maps from the second edition have been completely redesigned to provide easily read and distinguished labels and prominent boundaries and topographical relief. We have also added new maps that illustrate social as well as political developments, including maps on Europe at 1715, the Safavid Empire, the ethnic and political boundaries of the Soviet republics, the reform movements of 1989 in eastern Europe, the world drug trade, and the Persian Gulf War.

In addition to the many maps that support text discussion, we offer a new, full-color map essay at the beginning of each volume. Our purpose is twofold. First, by reproducing and describing such cartographic landmarks as the Babylonian world map, the Islamic al-Idrisi map, the medieval Ebstorff map, the twelfth-century map of China, maps of the Americas and Africa based on Ptolemy and Mercator, the Japanese world map of 1645, and contemporary global projections and satellite images, we hope to demonstrate for students the evolution of cartography and to guide them toward an understanding of the varied functions and uses of maps. Second, the map essay is intended to show depictions of the world from different cultural perspectives and to reveal the changing concepts of our world and its interrelated parts from antiquity to the present. In a real sense, the map essay may serve as an introduction to the course as well as to cartography.

Distinctive Features

Distinctive features from earlier editions remain in the third. To help guide the reader toward historical understanding we have posed specific historical questions at the beginning of each chapter. These questions are then answered in the course of the chapter, each of which concludes with a concise summary of the chapter's findings. The timelines have proved useful, and the double-page comparative timelines, which allow students to compare simultaneous developments within different world areas, have been revised and updated.

We have also tried to suggest how historians actually work and think. We have quoted extensively from a wide variety of primary sources and have demonstrated in our use of these quotations how historians sift and weigh evidence. We want the reader to think critically and to realize that history is neither a list of cut-and-dried facts nor a sense-

less jumble of conflicting opinions. It is our further hope that the primary quotations, so carefully fitted into their historical context, will give the reader a sense that even in the earliest and most remote periods of human experience, history has been shaped by individual men and women, some of them great aristocrats, others ordinary folk.

Each chapter concludes with carefully selected suggestions for further reading. These suggestions are briefly described to help readers know where to turn to continue thinking and learning about the world. The chapter bibliographies have been revised and expanded to keep them current with the vast and complex new work being done in many fields.

World civilization courses differ widely in chronological structure from one campus to another. To accommodate the various divisions of historical time into intervals that fit a two-quarter, three-quarter, or two-semester period, *A History of World Societies* is published in three versions, each set embracing the complete work:

One-volume hardcover edition, *A HISTORY OF WORLD SOCIETIES*; a two-volume paperback, *A HISTORY OF WORLD SOCIETIES Volume I: To 1715* (Chapters 1–19), *Volume II: Since 1500* (Chapters 18–39); and a three-volume paperback, *A HISTORY OF WORLD SOCIETIES Volume A: From Antiquity Through the Middle Ages* (Chapters 1–16), *Volume B: From 1100 Through the French Revolution* (Chapters 14–25), *Volume C: From the French Revolution to the Present* (Chapters 25–39).

Note that overlapping chapters in the two- and three-volume sets permit still wider flexibility in matching the appropriate volume with the opening and closing dates of a course term.

Ancillaries

Learning and teaching ancillaries, including a *Study Guide*, *MicroStudy Plus* (a computerized version of the *Study Guide*), *Instructor's Resource Manual*, *Test Items*, *MicroTest* (a computerized version of the *Test Items*), and *Map Transparencies*, also contribute to the usefulness of the text. The excellent *Study Guide* has been thoroughly revised by Professor James Schmiechen of Central Michigan University. Professor Schmiechen has been a tower of strength ever since he critiqued our initial prospectus, and he has continued to give us many valuable suggestions and his warmly appreciated

support. His *Study Guide* contains chapter summaries, chapter outlines, review questions, extensive multiple-choice exercises, self-check lists of important concepts and events, and a variety of study aids and suggestions. New to the third edition are study-review exercises on the interpretation of visual sources and major political ideas as well as suggested issues for discussion and essay and chronology reviews. Another major addition is the section, Understanding the Past Through Primary Sources. Seven primary source documents widely used by historians are included, each preceded by a description of the author and source and followed by questions for analysis. The *Study Guide* also retains the very successful sections on studying effectively. These sections take the student by ostensive example through reading and studying activities like underlining, summarizing, identifying main points, classifying information according to sequence, and making historical comparisons. To enable both students and instructors to use the *Study Guide* with the greatest possible flexibility, the guide is available in two volumes, with considerable overlapping of chapters. Instructors and students who use only Volumes A and B of the text have all the pertinent study materials in a single volume, *Study Guide, Volume 1* (Chapters 1–25); likewise, those who use only Volumes B and C of the text also have all the necessary materials in one volume, *Study Guide, Volume 2* (Chapters 14–39).

The multiple-choice sections of the *Study Guide* are also available as *MicroStudy Plus*, a computerized, tutorial version that tells students not only which response is correct but also why each of the other choices is wrong and provides the page numbers of the text where each question is discussed. *MicroStudy Plus* is available for both IBM and Macintosh computers.

The *Instructor's Resource Manual*, prepared by Professor John Marshall Carter of Oglethorpe University, contains learning objectives, chapter synopses, suggestions for lectures and discussion, paper and class activity topics, and lists of audiovisual resources. Professor Carter also offers suggestions for the instructor who is teaching world history for the first time. The accompanying *Test Items*, by Professor Charles Crouch of St. John's University in Collegeville, Minnesota, offer identification, multiple-choice, and essay questions for a total of approximately two thousand test items. These test items are available to adopters in both IBM and Macintosh versions, both of which include editing capabilities. In addition, a set of full-color *Map Transparencies* of all the maps in the text is available on adoption.

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M Expanding Horizons: apmaking in the World

Today cartography, the art of making maps, is as widespread as typography, the process of printing. Maps are so much a part of daily life that people take them for granted. But people are not born with maps in their heads, as they are with fingers on their hands. The very concept of a map is a human invention of vast intellectual and practical importance. Like writing itself, cartography depends on people's use of visual and symbolic means to portray reality. Earth is not a flat table. Instead it is marked by features such as mountains, valleys, rivers, and oceans and by the distances that separate them all. Knowledge of these physical features and the accurate mapping of them allow people to understand their relationship to the planet on which they live.

Cartographers contribute something singular to the understanding of peoples. Human beings, no matter where they live, have a natural curiosity about their world and find joy in discovering new parts of it or in learning more about regions not well known. The Roman statesman and orator Cicero once asked, "Ubinam gentium sumus?" ("Where in the world are we?") Although he used this question as a figure of speech, many people have been quite serious about finding an accurate answer to it. Such curiosity and desire have led people to examine not only the earth but its relation to the cosmos of which it is a part. Early cartographers learned to use the stars as fixed points for the measurement of place and distance. Even today American nuclear submarines depend on



MAP 1 Babylonian world map, ca 600 B.C. (Source: Courtesy of the Trustees of the British Museum)

celestial navigation, transmitted by satellite, to determine their course and position. Once people looked to the stars, they began to wonder about the shape, nature, and content of the universe itself. Mapping of the earth was no longer enough; people began to chart the cosmos. The Hubble space satellite, launched in May 1990, is a sign that the quest continues today.

For ordinary purposes cartography fills a host of practical needs. Maps were first used to describe people's immediate environment—to illustrate the shape of villages and the boundaries of fields. As knowledge of the earth grew, maps became indispensable for travel, both on land and at sea. It was necessary for people to know where their destination lay, how to reach it, and what to expect along the way. Mariners used the geographical knowledge provided by maps to sail from one port to another.

Other uses of early maps were economic. As people came into contact with one another, they saw new opportunities for barter and trade. It was no longer enough to know how to travel to different locations. Merchants needed to understand the geography of their markets and to know what foreign lands produced and what trading partners wanted in return for their goods. In short, economic contact itself increased knowledge of the face of the land, and that knowledge could be preserved on maps by symbols to indicate the natural resources and products of various lands.

Another important function of early maps was military. Rulers and generals needed information about distances and the terrain through which their armies would move and fight. This need spurred interest in *topography*, the detailed description and representation of the natural and artificial features of a landscape, and led to greater accuracy of maps and better definition of the physical environment.

The demands of empire were not only military but also administrative. An area cannot be governed effectively unless the ruler knows where each part of it is located and what its importance is. Rulers need precise maps to enforce their authority, dispatch commands, collect taxes, and maintain order. Thus the value to historians of some maps lies in their illustration of people's knowledge of the world in relation to the needs of government and the exercise of authority over broad distances.

Those are only a few of the uses of cartography. But what of the maps themselves? How do cartographers visually and accurately depict large sections of land or the entire face of the globe? The ways are numerous and some more exact than others.

The earliest maps are pictures of towns showing spatial relationships within a very limited area. A more accurate way of making a map was derived from land surveys. Beginning about 1500 B.C., surveyors trained in geometry and trigonometry began to study the land in question and to divide its physical features into a series of measured angles and elevations. Cartographers then placed this information on a grid so that they could represent visually, according to a consistent and logical system, relations among areas. Although the method sounds simple, it presented a daunting problem, one that still exists. Mapmakers must represent on a two-dimensional surface the face of a three-dimensional globe. To complicate matters even further, the earth is not a perfect sphere. How cartographers have grappled with these problems can be seen from the maps reproduced here.

Since maps are basically visual, it is best to trace their evolution in their own context. People of all cultures have mapped their lands, and in many cases their approaches have been strikingly similar. The earliest known representation of the world is a Babylonian world map that dates to about 600 B.C. (Map 1). It is not a map of the entire globe, for the Babylonians were ignorant of the existence of many people beyond their immediate frontiers. Instead, Babylon, with its neighbors around it, lies at the center of the world. Surrounding the land is the ocean, depicted as a circle. The triangles beyond the ocean indicate that the Babylonians knew something of the peoples beyond the ocean. Here for the first time is evidence of a people who attempted to put themselves geographically into the context of their larger world.

The greatest geographer of the Greco-Roman period was Claudius Ptolemaeus, better known as Ptolemy, who lived in Alexandria in the second century A.D. He advanced far beyond the schematic Babylonian world map to produce a scientific atlas based on data. He knew from previous scholars that the world was spherical, so he devised a way of using conic lines of *longitude*, angular distances east and west, and *latitude*, angular distances north and south, to plot the positions and distances of the earth's features. Despite its distortions, Ptole-

my's *Geographia* became the standard Western work on geography until Europeans sailed out to explore the broader world around them (ca 1450–1650). The best illustration of Ptolemy's brilliant vision actually dates much later than its first representation. It dates to a manuscript produced in the German city of Ulm in 1482 (Map 2). Ptolemy put cartography on a scientific basis.

Some of the fruits of Ptolemy's labor can be seen in the series of maps known as the Peutinger Table, which probably dates to ca A.D. 500. The Table is a good example of how cartography served the Roman Empire. The section shown here is typical of the entire series: it indicates roads, rivers, mountains, cities, and towns in Greece (Map 3). In that respect it is an ancient road map, for its

purpose was not to define the known world, as Ptolemy had done, but to inform the emperor and his bureaucracy how they could most easily administer and communicate with the provinces. Although alien to modern notions of the shape of Europe, the Peutinger Table is a remarkably accurate atlas of routes and distances and thus displays vividly and beautifully one of the most practical functions of cartography. The table received its name from Konrad Peutinger of Augsburg, an owner of the maps in the sixteenth century.

Islamic cartographers also drew heavily on Ptolemy's research, but they relied on exploration as well. The most famous of them was al-Idrisi, who lived in the twelfth century. His atlas depicted the entire known world and was accompanied by a

MAP 2 Map from Ptolemy's *Geographica* (Source: Michael Holford)





MAP 3 Section of the Peutinger Table illustrating Greece, ca A.D. 500 (Source: Österreichische Nationalbibliothek)



MAP 4 Portion of the map of al-Idrisi, thirteenth century (Source: Reproduced by permission of Norman J. W. Thrower, Department of Geography, UCLA)



MAP 5 Ebstorf Map, thirteenth century (Source: *Niedersächsische Landesbibliothek Hannover*)

written commentary about the places illustrated. The portion shown here represents the eastern Mediterranean and the Middle East (Map 4). As in the Peutinger Table, physical features such as rivers and mountains are stylized, but al-Idrisi made a serious effort to delineate the general features of the landmass. His map looks different from modern maps because he used south as his basic point of orientation, not north as do modern cartographers. As a result, the atlas appears upside down to our eyes, with south being at the top of the map.

Europeans in the Middle Ages, like their predecessors, drew maps of the world, but religion became an ingredient of cartography. Ptolemy's concepts of geography remained in force, but maps also served another and different purpose for society. The Ebstorf Map, drawn during the thirteenth century, shows the world surrounded by

the ocean, a conception dating to antiquity (Map 5). Yet the map has several novel features. In its background is the crucified Jesus. His head, portrayed at the top, signifies the east. His outstretched arms point north and south. His feet, at the bottom, signify the west. Jerusalem occupies the center of the map to represent the place of Jesus's death as the center of the Christian world. The Ebstorf Map, unlike the practical maps of the Peutinger Table, was intended to convey a religious message, a declaration of faith.

Like the Romans, the Chinese early found it necessary to draw maps to administer efficiently the vast tracts of land under their control. The Chinese so successfully mastered the problem of reducing a huge amount of territory into a visually manageable scale that in the twelfth century they produced the Yü Chi Thu Map (Map of the Tracks

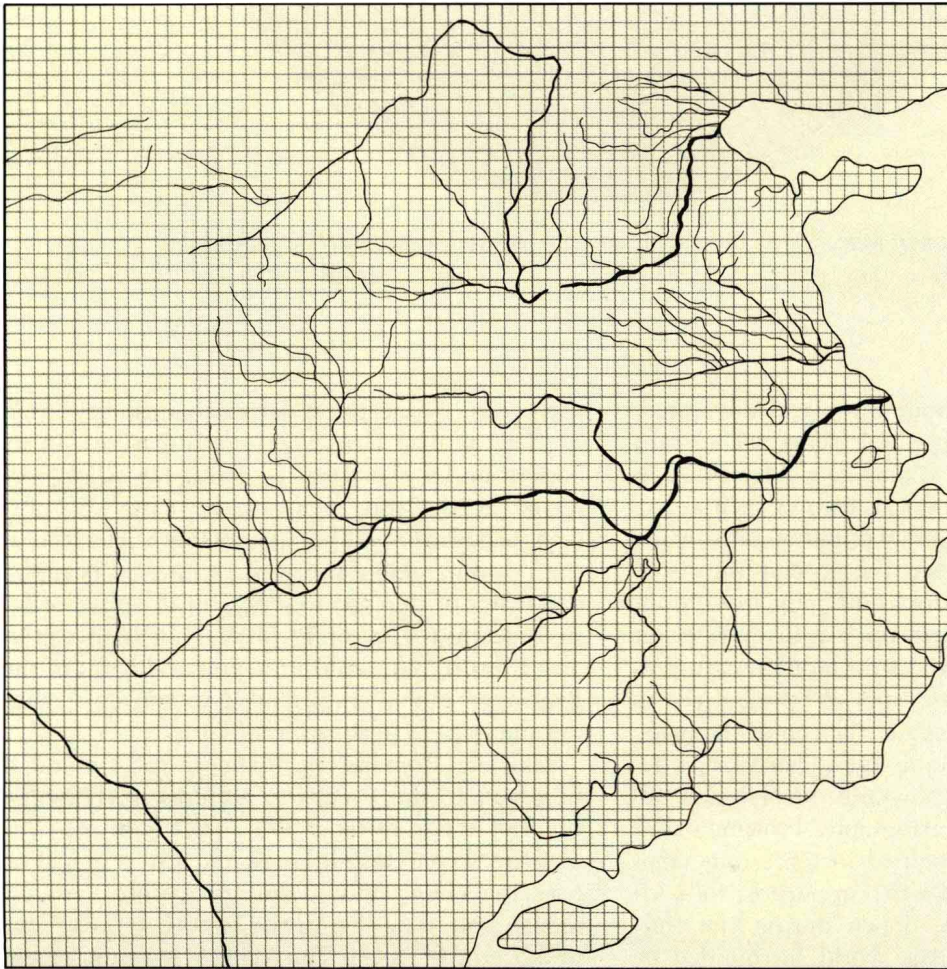
of Yü the Great) (Map 6). Although the name of the geographer is unknown, his achievement is monumental. He used a system of uniform square grids to locate features of the land in exact and measured relationship to one another. The outline of the coast and the courses of the rivers are remarkably accurate. As in the case of early European maps of Africa (see Map 10), knowledge of the interior was somewhat scanty. Nonetheless, the geographer devised a reliable system in which new discoveries could be easily fitted into what was already known.

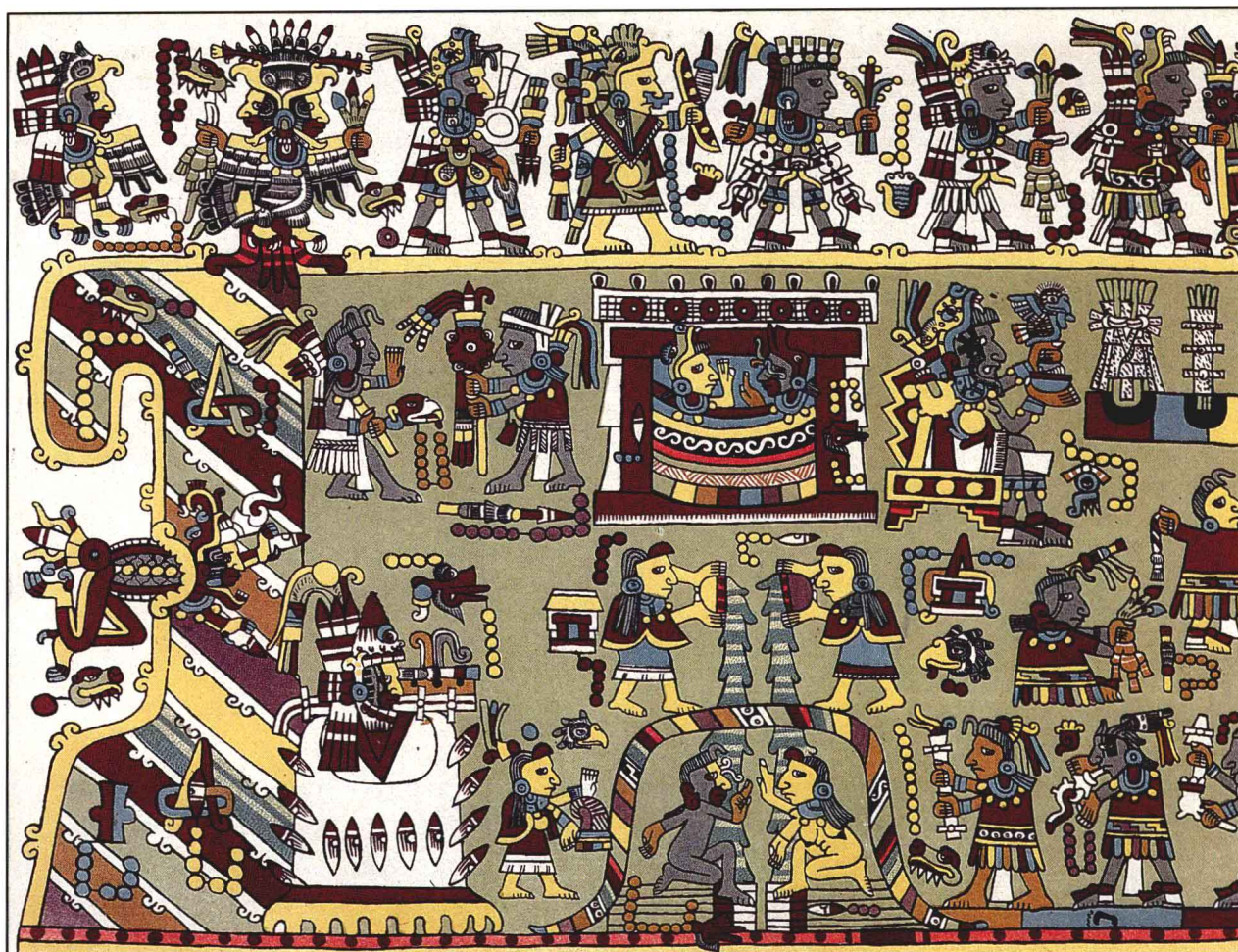
In the Americas, maps were sometimes put to a novel use. The pre-Columbian picture map (Map 7) at first sight does not look like a map at all. Dating from sometime before the sixteenth century, it

portrays the history of the Mixtec people of Mexico, who can be traced from about 800. Geographical features are incidental to the historical narrative. Nevertheless, the map amply demonstrates the originality of the pre-Columbian Americans in the art of mapmaking.

Meanwhile, the people of the European Middle Ages continued to draw maps along the lines set out by Ptolemy, yet they made improvements on the work of the master. Indeed, they explored the concept of triangulation to survey the land and to navigate the seas. Cartographers chose several major points to serve as hubs of a series of lines extended to other major points. The face of the globe was thereby cut up into a pattern of triangles, rectangles, and occasionally squares. Al-

Map 6 After the Yü Chi Thu Map, twelfth century (*Source: Pei Lin Museum, Sian, China*)





MAP 7 The Dominions of Quetzalcoatl 9 Wind, Lord of the Toltecs. From the *Codex Zouche-Nuttall* (Source: Courtesy of the Trustees of the British Museum (Museum of Man-kind))

though this system proved complicated and unwieldy, triangulation did improve the utility of maps for explorers. An excellent example of a triangulated map comes from the Catalan Atlas of 1375 (Map 8). The atlas is more functional than other early maps because the cartographer indicated orientation, so that users could locate their position according to the points of a compass.

Only when the Europeans began to explore the broader world around them did they make significant advances over Ptolemy's view of the world. Sailors and navigators who voyaged to find new lands or to learn more about familiar places had to be able to calculate where they were. They knew

that the world was curved, and they used the stars as fixed points to guide them. It is thus ironic that one of the most important advances in geographic knowledge came by mistake. In 1492 Christopher Columbus, looking for a sea passage to India, discovered the New World by sailing westward from Europe. Although Columbus himself did not immediately recognize the full significance of his achievement, his discovery revolutionized geographical thinking: there was more to the world than Ptolemy had known; and the basic features of the earth had to be explored, relationships rethought, and a new way of looking at the globe found.