

Taylor, D.R.F. (editor) (1991). *Geographic Information Systems: The Microcomputer and Modern Cartography* (Modern Cartography, Volume One). Pergamon Press, 251pp. ISBN 0-08-040277-1 (Softcover \$39) ISBN 0-08-040278-X (Hardcover \$100)

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The preface of *Geographic Information Systems: The Microcomputer and Modern Cartography* succinctly explains the book's intent: to consider the impact of the microcomputer and Geographical Information Systems on cartography. In a surfcial way the emphasis of this volume is GIS. The title proclaims it in brash letters; the Library of Congress subject classification is under 'Geographic Information Systems' (no mention is made of cartography); and 'GIS' is referred to countless times in the twelve chapters in the book. Yet this is not a book about GIS. Or is it? This quandary is touched on in the introductory essay by D. R. Fraser Taylor, the editor of the book. Is GIS part of cartography, or is cartography part of GIS, or are they somehow separate? The quandary is left unresolved, and the book, while providing some excellent reviews of the current status of various areas of cartography, is a reflection of a discipline that is itself a bit confused about exactly what it is and where it is going.

Taylor, in the volume's engaging introductory essay, makes the case for re-examining and redefining the nature of the discipline of cartography. In the process he manages to touch on many of the current questions which have been raised regarding the impact of the microcomputer and GIS, as well as some broader foundational debates. Taylor's opinion about GIS and cartography is clear: GIS is a technique, cartography is a discipline. Taylor laments the

reenchantment with formalism and positivism — a result of the current technological focus in the field — and sees such an approach as 'sterile and limiting.' This technological focus does not, Taylor argues, hold much promise as a future for cartography. Instead, Taylor suggests, we need to concoct anew a 'cartographic theory.' Citing the work of Brian Harley, who has urged sensitivity to the social context within which maps and cartography and cartographers are inextricably nestled, and Theodore Roszak, who has forcefully argued against the "cult of information" and for a focus on "relevance, coherence, and insight," Taylor urges a new focus on three concepts: cognition, communication, and visualization. We do not know enough, Taylor argues, about the cognition of maps. The glut of data which is piling up all around us is useless unless we can find ways to expand understanding with it. Understanding does not just "emerge" from heaps of data. A renewed focus on how to communicate the information we have is also important. New products, new displays, and new forms of geographic information presentation must be established and we must seek to understand how people communicate with and work with such media. Visualization, which involves high technology linked to issues of communication and cognition, is, argues Taylor, a fertile meeting ground for all aspects of cartography. In the end, Taylor concludes, cartography will be judged by the value society attaches to the products it produces. These products must be intriguing, imaginative, useful, and interesting — these, Taylor argues, are human and not technological problems.

Chapter two, by Y.C. Lee, **Cartographic data capture and storage** provides a review of the current status of total stations,

global positioning systems, photogrammetry, remote sensing, digitizing, and the various digital data storage media. While providing a valuable review of the aforementioned topics, the chapter is marred by its strict focus on physical geographical data; cartography and GIS are not only tools for physical geographers.

Chapter three, by David Coll, **Developments in equipment and techniques: Microcomputer graphics environments** reviews general microcomputer graphics principles and the current status of graphics hardware and software. While comprehensive for what it does cover, the chapter is limited by its focus on DOS-based graphic environments. The chapter could have been improved by the thinning out of some of the DOS details and the addition of information on alternative graphics environments. The following chapter by Bengt Rystedt, **The cartographic workstation** adds to Coll's discussion by briefly expanding upon the notion of the microcomputer workstation in cartography.

Chapter five, by Donna Peuquet, **Methods for structuring digital cartographic data in a personal computer environment** is an adaptation of an article published in *Cartographica* (21:4, pp. 66-113). Basic concepts and definitions, cartographic data models, the nature of cartographic data, and basic cartographic data models are discussed.

Chapter six, by C. Peter Keller and Nigel Waters, **Mapping software for microcomputers** provides a relatively comprehensive review of software of interest to cartographers. Software is grouped into nine categories: paint, CAD, thematic mapping, GIS, image analysis, locational analysis/electronic atlases, projection packages, application software, and digital charting. Each category of software is described



and examples noted; an eleven page table summarizes several hundred software packages, available reviews, cost, and company. Notable exceptions from the categorization scheme include graphic design software and multimedia software.

Chapter seven, by Barbara Buttenfield and David Mark, **Expert systems in cartographic design**, provides a status report on what we know about expert systems in the production of locational and navigational maps. Other types of maps are excluded, since the rules structuring these maps have "seldom been addressed in the literature" and are, well, not easy to figure out: "where formalized descriptions of rules are not common, alternative approaches may substitute for, or perhaps augment the expert systems approach." With that out of the way, a useful review of expert systems terms and definitions is provided along with a detailed description of progress on and potential for expert systems in cartography. The application areas include **generalization**: simplification (reduction, selection, reposition), classification (aggregation, partition, overlay), enhancement (interpolation, smoothing, generalization), **symbolization** (encoding strategy, conceptual constraints, situational constraints), and **production** (plotting, layout, displacement, label placement, and visual contrast). The chapter provides a proposal of where work needs to be done and where there is potential for progress in cartographic expert systems as well as an extensive bibliography of sources.

Chapter eight, by Timothy Evangelatos, **Digital geographic interchange standards**, takes a detailed look at why digital standards have not been successful to date and provides a review of current national and international standards activities. Evangelatos

provides an interesting discussion of the myriad of technical, political, and human problems surrounding the creation (or lack of creation) of digital data standards. While many problems are evident, Evangelatos is optimistic that agreement on standards will come in the not so distant future. He assumes that a true "spatial science" is emerging and solidifying and that this will provide "good standards."

Chapter nine, by Terry Slocum and Stephen Egbert, **Cartographic data display**, provides a review of developments in cartographic display hardware and software, and reviews new techniques in static, interactive, and animated mapping. The chapter notes several important developments including the continuing development of software packages which allow non-programmers to construct complex cartographic representations and the increasing emphasis on developing new cartographic display and analysis methods (as opposed to just attempting to replicate traditional cartographic techniques). Developments in static maps (univariate and bivariate choropleth maps, continuous data maps, 3D maps), interactive mapping (interactive choropleth maps, interactive multimedia systems, electronic atlases), and animated mapping (3D maps, spatio-temporal representations, vehicular navigation systems, and visualization) are reviewed. The chapter concludes with comments on the implications of new data display techniques on cartographic research and education. In sum, the chapter provides a good starting point for those interested in the new media (and adaptations of more traditional media) in cartographic display and their possible implications.

Chapter ten, by Jean-L. Raveneau, and others, **Micro-Atlases and the diffusion of geographic information: An**

**experiment with Hypercard**, details two projects the authors undertook using the HyperCard software environment. The authors argue (as Taylor and Slocum and Egbert in their respective chapters also argued) that there must be more effort put into devising new methods of communicating geographic information. The notion of hypertext, the 'non-sequential disposition of information' is seen as a way to enhance multiple associations between different pieces of information. A fine line between unstructured and structured information must be maintained, giving the user maximum freedom of navigation while not allowing them to get mired down and lost. The integration of maps, graphs, pictures and text as well as links to digital data bases and video disks is discussed. While the details and subtleties of HyperCard programming and project construction are not detailed, the chapter provides a solid introduction to the possibilities of HyperCard and related hypertext software for cartography.

Chapter eleven, by Hinrich Claussen, **Vehicle navigation systems**, details progress to date on vehicle navigation, route planning, and associated software and hardware.

The final chapter, by Jean-Philippe Grelot, **Cartographers and microcomputers**, concludes the book with a discussion of the impact of technology on cartography, on the shift to the "image-less map," the recomposition of cartographic knowledge, and the market context of cartography. Grelot sees the microcomputer, satellite data, and data processing techniques as democratizing cartography, of making it available to "a large number of individuals." A shift to the image-less map — the virtual map — is evident as is the associated shift in interest away from the image and toward the cartographic object in the



database. Increasingly we focus on knowing how to use software as opposed to knowing how to work through map projection equations or classification algorithms — they are encoded in the computer. More “thematic” specialists, cartographers with some application area who use cartographic software, are evident; the “technique is not an end in itself.”

In sum, I found myself feeling a bit confused by *Geographic Information Systems: The Microcomputer and Modern Cartography*. On one hand, the book provides a series of informative chapters which provide reasonably complete reviews of important developments in cartography. Cartographic practitioners and students interested in cartography will be interested in the reviews and their bibliographies. On the other hand, I was intrigued by the seeming contradictions in the book as a whole. The outward GIS camouflage of a book about cartography (I assume it won't sell if it just says cartography) is curious. More interesting is the fact that the editor defined a three part focus for the future of cartography in the introductory chapter: cognition, communication, and visualization. Communication was part of the focus of chapters nine, ten, and eleven; cognition was generally ignored, and visualization mentioned only briefly. Taylor also detailed the problems with neopositivism and neo-formalism, problems which have also been attacked in the larger arena of the philosophy of science. Yet much of the book is about as positivistic and formalistic as you can get: in chapter two we hear of “improvements in the visibility, resolution, and accuracy of space sensors and transmitters”, in chapter five we hear about “the more perfectly the model represents reality”; in chapter seven we hear that the development of a “full expert

system” which can replace the human cartographer “may be a problem which can be effectively addressed only by a multi-investigator team over a period of several to many years”; in chapter eight we hear that an all-inclusive set of spatial data standards is just around the corner; and in the final chapter we are told of the fact that geographical research can be done at home and “it is no longer necessary to go into the field” — this asserts that modern technologies have essentially made the map into the landscape. Borges and Baudrillard would blush. I am intrigued by these contradictions, and how they reflect upon cartography as a discipline. Do we accept Taylor's and Harley's critical approaches to formalism, positivism, and scientism or do we accept these to be the most practical and popular means of many cartographer's endeavors? Can both exist at the same time within cartography? Can either ‘side’ learn something from the other? Can there even be a dialogue? Does anyone even care? Interesting questions raised by an interesting book.

### cartographic events

#### COLUMBIAN ENCOUNTER

The University of Wisconsin-Milwaukee is to be the home of a major exhibition of rare maps for the 1992 Columbus Quincentennial. Including research, exhibitions, and public programs, this regional project will be directed by Professor J. Brian Harley of the Department of Geography and the Office for Map History in the American Geographical Society Collection of the Golda Meir Library.

The Exhibition will highlight many rare maps of the age of Columbus. The themes which will

structure the exhibition and guide the presentation of the maps include 1) the geographic realities and misconceptions in the maps of the Encounter period, 2) the science and technology of map-making in the fourteenth, fifteenth, and sixteenth centuries, 3) the Encounter as a religious crusade, 4) the wealth of the New World as a force behind the Encounter, 5) the geopolitics of maps in the Encounter, and 6) the way maps reflect the Old World's and the New World's growing awareness of each other.

Seeking to answer not only the question “What does the map show?” the Exhibition also asks, “What did the maps mean to the men and women of the Encounter period?” and “What do they mean to modern Americans?” Through its extensive interpretation the Exhibition will present maps as documents of human interaction. For further information, please contact: Mark Warhus, Program Manager, The Office for Map History, American Geographical Society Collection, University of Wisconsin-Milwaukee, P.O. Box 399, Milwaukee, Wisconsin 53201. (414) 229-4101.

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#### ORDNANCE SURVEY BICENTENARY

The Ordnance Survey will celebrate its bicentenary in 1991, in hopes of raising public awareness of the Survey and its activities. The key event will be an evening function in the Tower of London on June 21. The Tower, where the Ordnance Survey was located for its first 50 years, will also provide the site of a major exhibition of Ordnance Survey past, present and future, between May and September 1991. The Royal Mail is to issue a set of commemorative stamps in honor of the Survey.

Moving forward into the 21st century the Survey will be aiming to: maintain the National Data