

information), and we will make it available for downloading or for use in a public laboratory. Eight PCs, connected to the server, CD-ROM drives, and color, and black and white printers will be available in the Maps Room. We plan to offer mapping software and limited GIS capability. The in-house facility will be open the same hours as the library. To help staff the new lab, the Geography Department will offer a new course spring semester that will require students to staff the lab in addition to their time in the classroom. Topics to be covered include hardware troubleshooting, software skills, reference techniques and data organization as well as dealing with clients.

A few telephone calls, or a visit, to your local library will determine what kinds of services the library can provide. Although librarians are moving rapidly into new technologies, they still value traditional map library services also. Fortunately, paper maps will be with us for a long time. As the new editor of this column, I hope to highlight some of the interesting paper and digital collections various libraries hold, and address some of the current developments in map libraries. Your suggestions are welcome. □

EDITOR'S NOTE:

I would like to welcome Melissa Lamont of the Pattee Library at Penn State University to the Editorial Board of *Cartographic Perspectives*. Melissa has agreed to take on the responsibility of the Map Library Bulletin Board column. It has been a number of years since this column has been a regularly featured item in *CP* and I am pleased that Melissa is committed to see that this important column appears in every issue.

Sona Karentz Andrews
Editor, *CP*

reviews

BOOK REVIEW

Map Projections: A Reference Manual

Lev M. Bugayevskiy and John P. Snyder, Taylor and Francis Ltd., 1995, xx and 328 pp., references, appendices, index. \$ 105.00. Cased. (ISBN 07484 0303 5); Paper. (ISBN 07484 0304 3).

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Here is a reference manual about map projections that combines the best knowledge about the subject by leading experts in Russia and the United States. The book is an extensively revised translation of a Russian text with the translated title *Cartographic Projections - A Reference Manual* written by Lev M. Bugayevskiy and Lyubov' A. Vakhrameyeva (since deceased), published in Moscow in 1992. The preface informs us that John P. Snyder was brought abroad during the translation to "add pertinent Western material for balance and to correct some of the impression inadvertently given in the Russian text Westerns projections."

The book is divided into an introduction, eleven key chapters, an extensive list of references and eight appendices. The introduction sets the tone. It is here that we learn that this book is about mathematical cartography, defined as the theory and mathematical analysis of map projections and their characteristics. We also learn about the history of map projections starting with early Greek works but quickly moving to a who's who in Russian and American map projection research. The

introduction concludes with a brief summary of advances in measurement of the shape of the earth.

The first key chapter covers the general theory of map projections. Spanning 48 pages and broken into eight main sections, this chapter lays the mathematical foundation for the rest of the book. We are introduced to mathematical notations and relationships between curvilinear, three-dimensional rectangular, plane rectangular, plane coordinate, and triaxial ellipsoid coordinate systems. Map projections are classified using five criteria. Conditions and mathematical properties of the key characteristics of conformality, equivalence, equidistance, and azimuthal distortion are examined.

Chapters Two through Four introduce the mathematical formulation, characteristics and, wherever applicable, a brief history of a large number of different map projections. Chapter Two focuses on map projections with straight parallels. In 39 pages we learn about the families of cylindrical and pseudocylindrical projections. Chapter Three covers map projections with parallels in the shape of concentric circles. Here, 45 pages introduce us to conic, azimuthal, perspective azimuthal, pseudoconic, pseudoazimuthal, and retroazimuthal projections. Chapter Four concentrates on map projections with parallels in the shape of non-concentric circles, namely polyconic projections.

Chapter Five moves on to discuss map projections for topographic maps, named-quad-range maps, and projections used in geodesy. We learn about eleven of the most common projections for topographic mapping, including three projections not covered in the previous chapters. Topographic mapping in Russia and the United States is given special attention.

Chapter Six deals with map projection research, argued to be related to "further development of theory and practice, improving the mathematical basis of a map, obtaining new sets and variations which possess definite advantages over known projections, and satisfying new cartographic requirements facing science and the economy." Viewed very much from a mathematical perspective, we are informed that map projection research is about solving differential equations with partial derivatives of the first order involving elliptic, hyperbolic, parabolic, and combined functions. Twenty pages lead us through examples of this type of investigation, however, research into social aspects of map projections and the search for map projections suitable for mapping non-spherical worlds is ignored.

Chapter Seven focuses on best and ideal map projections, examining what projections satisfy given conditions of representation. 'Best' projections are divided into those "minimizing and optimizing distortion of a minimax and variational (least squares) type," or those "satisfying in an optimum way an entire group of requirements for projections in accordance with the particular purpose of the map being designed (e.g. graticule simplicity, distortion values, etc.)." We learn that minimum distortion has been essentially completely solved for conformal projections, but is not yet adequately solved for other types of projections, with no concrete solutions. In 35 pages we are guided through a number of conditions of representation and associated projections, including an interesting section on anamorphous projections, offering a theoretical basis for cartograms. A section on map projections for maps on globes explains projection strategies for pasting map gores onto balls for globe construction.

Chapters Nine and Ten carry on with the theme of what map projection to use where and when. Chapter Nine explores the choice and identification of suitable map projections. Entirely devoid of mathematics, this chapter takes 12 pages to go through suggestions for most suitable projections from mapping of the world and continents through to mapping of, for example, geology, fauna and flora, history, economics, transportation, and communication. We also learn how map projections can be identified from the shape of the graticule. Chapter Ten is devoted to the problems and directions of automation in obtaining and applying map projections. The chapter commences by listing eight problems with automation of map projections, thereafter dealing with each in some detail. Concerns noted include the problem of computerized selection of the best map projections and automated identification of a given projection.

This book is a 'must have' on the book shelves of anybody with a serious interest in map projections. It does not make for easy reading. It is crammed with mathematics and it will frighten most students. However, closer scrutiny will reveal that this book is full of information about the history and mathematics of map projections found in few other texts. It offers an insight into Russian work on map projections hitherto largely hidden from those not fluent in the Russian language. Yes, I was disappointed that this text did not cover some of the social aspects of map projections and that it failed to address map projections for truly non-spherical worlds. However, John Snyder and Lev Bugayevskiy must be congratulated on rising to the challenge of co-authoring a book where neither speaks the language of the other, coming up with what is no doubt a major contribution to the literature on map projections. □

BOOK REVIEW

The AGI Source Book for Geographic Information Systems 1995

David Green and David Rix, editors. London: The Association for Geographic Information, 1995. 392 pages, diagrams, index. \$125.00 Paper. (ISBN 0-471-95580-9)

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The *AGI Source Book*, formerly the *AGI Yearbook*, is a recent publication in the annual series by the Association for Geographic Information (an organization whose mission is to "spread the benefits of geographic information and GIS to the wider community and to help all users and vendors of GIS"). One of the means by which the AGI accomplishes this task is through the production of this business oriented *Source Book*. The *Source Book* contains two main sections: an articles section (106 pages) which addresses many broad GIS technological considerations, and a trade directories section (208 pages). There is also a 62 page "Miscellaneous Reference Material" section which includes listing of European GIS organizations, GIS standards, a comprehensive GIS dictionary, and other related resource materials. With the exception of several pages of color advertisements, the *Source Book* is a black and white publication.

The first section of the *Source Book* contains a collection of articles by leading GIS business and academic authors from North America and Europe. The aim of this section is to "present a view of GIS futures together with an appraisal of some of the most important GIS technology issues" (p. 17). The fourteen articles in this section address many of these issues of the larger GIS commu-