Contents lists available at ScienceDirect

International Journal of Applied Earth Observation and Geoinformation

journal homepage: www.elsevier.com/locate/jag

Book review

A.L. Allan, Principles of Geospatial Surveying, Whittles Publishing, CRC Press, Dunbeath, UK (2007)., 456 pp., price: £65, ISBN: 978-1904445-21-0

Principles of Geospatial Surveying is the successor of a previous textbook, *Practical Surveying and Computations*, written by the same author and published in 1997. Today the author is Emeritus Reader at University College London and he does not disavow his teaching background. By a simple class room example, in which students have to draw and measure a line 300 mm in length with a 100 mm ruler, he discusses all the particularities a surveyor is confronted with in a nutshell. An enlightening example!

The book comprises a main part, 13 chapters distributed over 350 pages and an appendix part covering 100 pages. Nearly every page of the book is endowed with formulas. The mathematics a surveyor needs to calculate derived quantities from measurements are taught at length in secondary school and most people will understand the mathematical basics used by the surveyor. However, surveying is not a paper exercise. It is not just a matter of multiplying a given length with a given width to calculate a rectangular-shaped area. The length and the width are not givens in the surveying exercise; they have to be measured and the measurements are performed in a physical environment, either on-site where conditions can be harsh sometimes or in the office using for example a Digital Photogrammetric Workstation. The dominant preoccupation of a surveyor is to prevent occurrence of measurement errors and once they occur to cope with them. And they will occur, not because surveyors would be careless but because making measurement errors is an experimental reality.

The fast majority of mathematics in the book is directed towards preventing occurrence of errors and once they occur to get rid of them and to quantify them as a check on the quality of measurements and derived quantities. A separate chapter (nearly 40 pages) treats theory of errors and quality control (Chapter 5). Error propagation is discussed alongside least squares adjustment (LSA), which is the central apparatus to cope with errors and it is actually the core of the entire book. A lengthy chapter of nearly 40 pages (Chapter 6) is devoted to the basics of LSA, an appendix chapter treats general least squares, and in other chapters the application of LSA to specific surveying tasks, including levelling and coordinate transformations, is discussed. Chapters 5 and 6 form the spicy sandwich filling of the main part. On top of the filling there is first a short introductory chapter, next in short sections Chapter 2 treats a broad spectrum of technical issues ranging from datum selection to paper sizes, while Chapters 3 and 4 pinpoint on coordinate systems and coordinate transformations, respectively.

The bottom part of the sandwich consists of chapters treating satellite surveying, survey computations, heights and levels, maps and map data processing, construction and curves, and industrial and engineering surveying. Where the sandwich touches the plate, instrumentation is discussed, in particular optical–mechanical–electronic devices including theodolites, electronic distance measurement (EDM) instruments, and levelling instruments. Most of the appendix chapters are intensifications of subjects treated in the main part.

The structure of the book centres around measuring methods and computing derived quantities from measurements including coordinates, surfaces and volumes. The pinpoints lie not on instrumentation and such a profiling through the surveying profession is really refreshing. Instruments do rapidly change but the principles at large remain the same. The main focus is on ground based surveying using total stations and levelling instruments, although one chapter (19 pages) concentrates on positioning using global navigation satellite systems (Chapter 7). Calibration, i.e. determination of features such as reliability, robustness, range and accuracy of an instrument, is briefly touched by describing sources and magnitudes of systematic errors in general. No calibration procedures for instruments, such as total stations and levelling instruments, are discussed in-depth.

Photogrammetry is present but treated very rudimentary covering no more than a dozen pages. Without getting deficient this appendix chapter could have been omitted. Although the title reads 'Principles of Geospatial Surveying' the book is obviously directed towards the land surveyor operating in the fields of construction, plant industry and cadastral surveying. Most of the chapters can be read as stand-alone entities and as such the book is suited for a range of surveying courses from entry level to advanced level.

Mathias J.P.M. Lemmens*
Delft University of Technology, Delft, The Netherlands

*Tel.: +31 15 278 1042
E-mail address: m.j.p.m.lemmens@tudelft.nl

11 May 2009

0303-2434/$ – see front matter
doi:10.1016/j.jag.2009.05.002