

*A Course on the Solution of Spherical Triangles for the Mathematical Laboratory.* By HERBERT BELL, M.A., B.Sc., Assistant in Natural Philosophy in the University of Edinburgh. London, G. Bell and Sons, Limited, 1915. viii + 66 pp.

THIS little book is No. 5 of the Edinburgh Mathematical Tracts of which Nos. 1, 2, and 4 are also manuals for the mathematical laboratory. It presents an account of various methods, numerical and graphical, of solution of spherical triangles.

The author keeps his object clearly in mind, goes directly at it, maintains a good proportion of parts in definition, exposition, and illustration, and the result is a practical syllabus of the subject in brief space. The value of this manual is considerably enhanced for the inexperienced computer by the foresight of the author in going into details to exhibit and illustrate methods and devices which arise from experience which the beginner has not had, and are not immediately evident. On the other hand the reader is not confused with long expositions where they are not needed, and when he has once been over the contents and has acquired some experience in computing he will find the book what it was intended to be, a useful and practical manual.

The first chapter deals with the use of logarithmic tables, including addition and subtraction logarithms, and questions of precision. Seven place tables are used in the examples. The second chapter is an exposition of the general spherical triangle, the cases which arise on the basis of D'Ocagne's classification, and the fundamental formulas, including those for solution by means of auxiliary angles. The third and fourth chapters are devoted to the numerical solution of the right-angled and the general spherical triangle, respectively.

Chapter V treats certain special applications to navigation and astronomy, including great circle sailing, finding the longitude at sea, reducing an angle to the horizon, and conversion of star coordinates. In Chapter VI graphical methods of solution are set forth at some length. Here are given Monge's method, the Emerson-Langley construction, nomograms, including the analemma, Chauvenet's solver, and straight-line nomograms.

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