T. M. MacRobert: Spherical Harmonics, an elementary treatise on harmonic functions with applications. Third revised edition. Pergamon press, London, 1967, xviii + 345 pp., price £5.

The first edition of this book was published in 1927. At that time the theory of complex functions did not feature in mathematical courses for engineers and physicists and hence "Spherical Harmonics" was written "with the object of providing a text-book on the elements of the theory of the spherical harmonics, with applications to mathematical physics, so far as this could be done without employing the methods of contour integration. Subsequently it was thought advantageous to include discussions on similar lines of Fourier series and Bessel functions, with corresponding applications".

Without using the theory of analytic functions the author develops the theory of well-known special functions such as the hypergeometric functions, the Legendre functions, the Bessel functions and others, and gives many applications to problems in electrostatics, heat conduction and wave motion.

The book is divided into 18 chapthers as follows:
1. Fourier Series. 2. Conduction of Heat. 3. Transverse Vibrations of Stretched Strings. 4. Spherical Harmonics: The Hypergeometric Function. 5. The Legendre Polynomials. 6. The Legendre Functions. 7. The Associated Legendre Functions of Integral Order. 8. Applications of Legendre Coefficients to Potential Theory. 9. Potentials of Spherical Shells, Spheres and Spheroids. 10. Applications to Electrostatics. 11. Ellipsoids of Revolution. 12. Eccentric Spheres. 13. Clerk Maxwell's Theory of Spherical Harmonics. 14. Bessel Functions. 15. Asymptotic Expansions and Fourier-Bessel Expansions. 16. Applications of Bessel Functions. 17. The Hypergeometric Function. 18. Associated Legendre Functions of General Order.

Although nowadays most physicists and engineers have some knowledge of the theory of complex functions, it still seems very advantageous that a book is available in which those special functions that are used most frequently in mathematical physics, are treated by means of real analysis.

H. W. Hoogstraten