5. H. Heyer, *Probability measures on locally compact groups* (Springer-Verlag, 1977).

6. H. Heyer, Convolution semigroups of probability measures on Gelfand pairs, *Exposition. Math.* 1 (1983), 3–45.

7. I. G. Macdonald, *Symmetric functions and Hall polynomials* (2nd edn) (Clarendon Press, 1995).

8. N. Ya. Vilenkin, *Special functions and the theory of group representations* (Transl. Math. Monographs 22, Amer. Math, Soc., 1968).

9. G. N. Watson, *A treatise on Bessel functions* (2nd edn), (Cambridge Univ. Press, 1944).

Ramsay, A. and Richtmyer, R. D., *Introduction to hyperbolic geometry* (Universitext, Springer-Verlag, Berlin-Heidelberg-New York-London-Paris-Tokyo-Hong Kong 1995), xii+287 pp., softcover, 3 540 94339 0, £30.

This is indeed a very nice book on hyperbolic geometry. It clarifies the axiomatic and logical development of the subject, describes its traditional geometrical features and rounds off with a differential geometric setting.

After a useful introduction Chapter 1 deals with the axiomatic method (based on Hilbert's ideas), summarises the relevant properties of the real numbers and discusses categoricalness. The choice of parallel axiom, distinguishing Euclidean and hyperbolic geometry, is introduced. In Chapter 2 'neutral geometry' and the usual 'neutral theorems' are studied. A quite thorough discussion of the hyperbolic plane H^2 is given in Chapter 3, including asymptotic features, isometries, tilings and horocycles. Three-dimensional hyperbolic space H^3 is the subject of Chapter 4 and again an instructive section on isometries is included. In Chapter 5 the differential geometry of surfaces is introduced and the discussion includes metrics, parallel transport and geodesics, vectors and tensors and the relation between isometries and preservation of the metric (line element). Here H^2, as such a surface, is described and continued further in Chapter 6. In Chapter 7 the classical models of H^2 are clearly described and its isometries interpreted within them. The categoricalness of the axioms is established. Isometries are revisited in Chapter 8 and the link with fractional linear transformations and $SL(2, \mathbb{R})$ is shown for H^2 and compared to the isometry group of the Euclidean plane. The differential geometry of H^3 is studied in Chapter 9 where the idea of a manifold is introduced. Lorentz metrics are introduced in Chapter 10 and the corresponding Lorentz and Poincaré groups are discussed. Special relativity is briefly mentioned and the 'symmetries' of Maxwell's equations used to introduce Lorentz transformations. The realisation of H^2 in 3-dimensional Minkowski space is shown, as is the relation between the isometries of H^2 and the associated Lorentz transformations. A similar discussion of H^3 is presented. Chapter 11, the final chapter, is devoted to straightedge and compass constructibility in H^2.

This book represents a most commendable attempt to introduce hyperbolic geometry in a little under 300 pages. It clarifies the subject axiomatically, describes it differentially and exhibits it within Minkowski space. There is much discussion of isometries and comparisons with Euclidean space are usually at hand. The book is well laid out with no shortage of diagrams and with each chapter prefaced with its own useful introduction. The mathematical prerequisites are developed *ab initio*. Also well written, it makes pleasurable reading.

G. S. HALL

Seydel, R. *Practical bifurcation and stability analysis: from equilibrium to chaos* (2nd edition) (Interdisciplinary Applied Mathematics, Vol. 5, Springer-Verlag, Berlin–Heidelberg–New York–London–Paris–Tokyo–Hong Kong 1994), xv+407 pp., 3 540 94316 1, £34.50.

According to the Preface this book is a new version of a previous text, *From Equilibrium to*