

cavities of several shapes: the parallelepiped, right circular cylinder, torus of rectangular and circular cross sections, and sphere.

In Chapter IV, account is taken of losses in guides. First the effect of a nonperfect conductor is discussed with reference to the skin-effect. This leads to the study of attenuation losses which are discussed for some special cases in an approximate and an exact fashion. Chapter V deals with a discussion of propagation in horns. Several geometries are considered, the right circular cone, biconical horn, the sectoral horn and the parabolic mirror. For these geometries, the solution of Maxwell's equations are given in detail. The closing chapter deals with Huyghens' principle and the diffraction of electromagnetic waves at the opening of a guide or a horn. Kottler's representation for the electromagnetic field is given and the chapter closes with some specific applications. A good fraction of the references pertain to post-war contributions of the French school.

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*Elements of the topology of plane sets of points.* 2d ed. By M. H. A. Newman. Cambridge University Press, 1951. 8+209 pp.

This is a new edition of Newman's very useful and readable book on the topology of the plane published in 1939 (see the review in *Bull. Amer. Math. Soc.* vol. 45). The text has been revised extensively and there are a number of changes in the choice and arrangement of topics. For example, the sections on the boundary elements of domains and on the connectivities of certain closed sets have been replaced by a section on the orientation and intersection of plane curves. The first part of the book, dealing with the general topology of metric spaces, has been augmented by a section on complete spaces and by discussions of the properties of various vector spaces of infinite dimension. In the chapter on separation theorems the author has added a short proof of the implicit function theorem as an application of Brouwer's theorem on the invariance of regionality (established for arbitrary dimension despite the fact that the book deals primarily with the plane). The proof of the so-called stronger form of Cauchy's integral theorem has been agreeably shortened. On the other hand the proof of the Jordan separation theorem—essentially that of Alexander—seems a trifle longer. Here no doubt is a reflection of the author's purpose of presenting the proof of this famous theorem with such care as to make it accessible to mathematicians generally, not merely to those who will read the book as an admirable introduction to a systematic training in topology.

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