Finally, we know little more than before of the nature of the final products of radio-active transformations. In the case of radium, we have, indeed, strong indirect evidence that lead is the product, but direct evidence is still wanting. The recent investigations of Prof. Rutherford's school on "lateral disintegration," *i.e.* the formation of collateral branches of descent, make it not improbable that more than one final product of thorium exists. It may be hoped that now that powerful mesothorium preparations are produced commercially, a direct chemical investigation of these final products may eventually prove feasible. Each such final product identified may be expected to form a link connecting up common elements with the scheme of radio-active evolution. The early hopes of bringing these elements into the scheme have been disappointed. The β radiation of potassium and rubidium remain isolated and perplexing facts. It may be that the studies now so eagerly pursued on the *rôle* of β rays in the more rapid changes associated with the radium series will afford a clue.

The principal focus of interest at the present time is indeed in connection with the β and γ rays. The discovery of v. Baeyer, Hahn, and Meitner that the β rays from certain radio-active bodies can, by improved technique, be resolved into a line spectrum by the magnet has given the lead which was needed, and now we begin to see order and definiteness where all appeared before to be hopelessly involved.

In this subject, as in all others which have arrived at any maturity, the labour of keeping abreast of the literature becomes increasingly heavy, and the value of a complete and authoritative treatise up to date proportionately great. Even more gratitude will be felt to the author by workers in this field for the present work than for its predecessors. R. J. STRUTT.

MAP PROJECTIONS.

Map Projections. By Arthur R. Hinks. Pp. xii + 126. (Cambridge: University Press, 1912.) Price 5*s.* net.

NOTWITHSTANDING the large amount of surveying which has been done in this country and throughout the Empire, there are few works in English which treat of the various ways in which portions of the earth's surface may be most conveniently and correctly represented on the plane surface of a map. The subject has been treated partially by several eminent mathematicians, and valuable summaries occur in some encyclopædias, but we do not in this country possess any works such as those by Germain, Tissot, Hammer, and others. There are also many works of a less advanced type which are available to Continental geographers, but this class, too, is very insufficiently represented here. We therefore welcome the appearance of the present volume, in which the subject is treated clearly and in a manner which makes but small demand upon the mathematical training of the geographer, while at the same time the important points in any projection, suitability for special purposes, and facility of construction are given especial prominence.

After indicating the inevitable limitations of all projections, in representing length, area, and shape of any portion of the earth's surface, the author reviews the principal systems, and here the question of nomenclature has to be faced. There is as yet no general agreement in this matter, and the same projections are differently named by different writers, and in different counties. In the present work it is laid down that the first name of a title should describe the method of construction, a second name should indicate its principal quality, while the author's or introducer's name may be added in the case of projections which are specially associated with any individual. But even this arrangement cannot as yet be conveniently used in all cases, and several well-known projections are referred to by their usual names.

This difficulty of a suitable classification certainly increases the difficulties of the beginner, so that a tabular statement of the principal projections in this part of the book would be a useful addition. Conical, cylindrical and zenithal, as well as certain conventional projections, are well described and clearly explained, their special advantages and points of weakness being indicated. A chapter on the projections in actual use is an instructive addition, especially as at the present time there is much more activity in selecting the most suitable projections, both for wall-maps and for atlas maps, than was formerly the case.

The chapter on the simple mathematics of projections treats of the theory of each particular case, and discusses the errors which may arise in its use under different conditions. Several actual examples are worked out, so as to show the procedure in a particular case. The present volume will be of great use to all geographers, and should pave the way for a more serious study of cartography on scientific lines than yet generally obtains. Great care and labour are expended on the measurement of various regions in order to produce trustworthy surveys, and the utilisation of the results should be based on sound cartographical principles, and in such work this book will be a valuable assistance.

H. G. L.