material will be best indicated to mathematicians by saying that the Lebesgue integral is nowhere mentioned —a limitation which to the reviewer seems a wise one. As an instance of this material may be mentioned Harald Bohr's simple theorem that $y = \log \Gamma(x)$ is the only "convex" solution of the functional equation $y(x+1) - y(x) = \log x$ such that $y(1) = 0$. This shows the interesting fact that the gamma function, $\Gamma(x)$, is uniquely characterized in the real domain by its well-known functional equation and the condition that $\log \Gamma(x)$ is a convex function.

It is certain that all American mathematicians will feel grateful to the author, Professor Courant, and also to the translator, Professor McShane, for their cooperation in making this excellent text-book immediately available to our mathematical public.

GEORGE D. BIRKHOFF

RADIOACTIVITY

Radioactivité. By MADAME PIERRE CURIE. Paris: Hermann et Cie, Editeurs, 6, rue de la Sorbonne. 563 pp., price, 150 Fr., 1935.

FINISHED in 1934 at the death of Madame Marie Curie and seen through the press by Irene Curie-Joliot and Frederic Joliot, this book deals mainly with the classical phenomena of radioactivity. The first part (p. 1–125), serving as a brief introduction into modern physics, has as a sub-title: "Ions, Electrons and X-rays." It contains in some detail the more old-fashioned methods of ionization measurements; modern equipment (counters, Wilson cloud chamber, etc.) are referred to in the second part, but only briefly. The treatment of the many phases of modern physics touched upon is rather sketchy, but references are given in this first part to more extensive texts for the student who wishes to study the different subjects in detail.

The second part of the book is devoted to radioactivity proper. The discovery of the radio elements and the chemical methods of extraction and purification are discussed in some detail. The theory of radioactive transformations is developed and illustrated with examples; the analysis of the decay curves is carried out for the most important cases. The chapters that follow (203–335) are devoted to the discussion of the radioactive radiations and their properties. In these chapters the results of the modern investigations (both experimental and theoretical) are given, but without derivations or any detailed discussion.

Artificial disintegration, the discovery of the neutron, the positron and of artificial radioactivity are briefly discussed (p. 367–389). A few pages (389–401) are given to the discussion of the structure of the atom and the modern theory of radioactive disintegration. The remaining chapters deal with the effects produced by the radiations, the classification of radio elements and their chemistry and a brief discussion of radioactive families. An appendix contains numerical tables useful for the student of radioactivity.

Throughout the book facts and not problems are discussed. A serious handicap for the student and the non-specialist who wants to study the subject is the complete absence of literature or quotations. The book which covers the work done over a period of more than 30 years will be of small value for the beginner, for whom, according to the plan, it is intended because of this serious lack of references. Since derivations are only given for the most elementary formulae, it is necessary to consult the originals to understand the full meaning of the results. This, however, has to be done by using other references, since no quotations are given where, or even when the work was published. An appendix giving the necessary references would enhance the value of the book considerably. A number of excellent photographic plates accompany the discussion of the different subjects.

K. LARK-HOROVITZ

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SPECIAL ARTICLES

DETECTION OF CRYSTALLINE SILICA IN LUNG TISSUE BY X-RAY DIFFRACTION ANALYSIS

IN the analysis of lung tissue for silica, present chemical methods permit only the estimation of total silica. It is not possible to differentiate between free and combined silica or between crystalline and amorphous silica. When such a differentiation is attempted by the application of petrographic methods to a study of lung ash, the results are frequently unsatisfactory because, first, the silica may react with the alkaline constituents of the ash at the high temperature (500° C.) necessary for the elimination of carbon and, secondly, the particles may be so small that they can not be rigorously identified. It is thus highly desirable to develop a procedure for the study of the inorganic constituents of lung tissue which does not involve the destruction of the organic matter and which may be applied to particles of extremely small size. Our preliminary experiments, which we are now reporting, indicate that such a procedure may be based upon an application of a suitably refined x-ray diffraction technique.

In the present investigation the lung tissue was hardened in a dilute solution of formaldehyde, dried in vacuo at 70° C., ground to pass a 40-mesh sieve,