The second chapter contains an explanation of formulas for disability premiums and reserves under various conditions.

In chapter III there is given an account of the theory and derivation of rates of sickness, of the statistics pertaining thereto, the principal sickness tables, and the methods of calculating net and gross sickness premiums and the mathematical reserves.

Chapters IV and V have to do with applications of the combination of insurance against sickness, disability and death, and also a variety of other forms of insurance relating to marriage, birth, civil responsibility, and so on.

Book II, which deals with collective insurance, gives the technical basis of social insurance and special treatment of insurance against travel accident. An appendix contains an account of the operation of the Caisse Nationale for insurance against death, accident, and to provide for old age. It contains also a brief history and treatment of tontines and societies operating on a tontine basis, and an account with formulas of certain financial operations on a collective basis.

The second volume closes with seven pages of bibliographic references of much value to students of the subjects mentioned therein.

In the opinion of the reviewer these two books cover an unusual variety of insurances, especially the second volume, and the clear and complete development of theory must meet with general approval among mathematicians interested in these subjects. The practical applications are taken chiefly from foreign sources and have little bearing on the methods used in this country.

J. W. GLOVER

Leçons sur les Invariants Intégraux. By E. Cartan. Paris, Hermann, 1922. x + 210 pp.

The theory of integral invariants was first set forth by H. Poincaré in the third volume of *Les Méthodes Nouvelles de la Mécanique Céleste.* Cartan develops this theory systematically in his Leçons, using a different point of view. Instead of connecting an integral invariant with a system of differential equations as did Poincaré, Cartan considers the integrand of this integral as a differential form and studies its properties of invariance under a group of transformations.

The mathematician will be especially interested to read this book because of the elegant treatment of the subject. Enough of the classical theories of differential forms and continuous groups, for instance, is given to make the book readable. Considerable space is devoted to the development of methods of deriving integral invariants, such as Jacobi's last multiplier and infinitesimal transformations.

These Leçons are to be recommended to students of applied mathematics because of the admirable treatment of physical problems from the modern point of view. The theory of turbulence, the n-body problem, and certain problems in optics are considered from the point of view of tensors and their relation to the integral invariant theory.

E. P. LANE
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