the solution of a certain partial differential equation of the second order which is reduced by quadratures to a linear partial differential equation of the first order.

The more complicated types of problems in the calculus of variations are examined in a similar manner. But in no type except the simplest are the differential equations which present themselves as necessary conditions of general character, *i. e.*, the system of extremals is no longer an arbitrary system of curves or surfaces (in space of any number of dimensions). Thus an integral of type

$$\int F(x, y, y', y'')\, dx$$

leads to a four parameter system of extremals; but only a restricted class of four parameter systems of curves can be obtained in this way. The characterization of this class depends upon the consistency of a certain set of partial differential equations.

The results obtained are of interest in connection with Hilbert's recent investigations, as serving to characterize the types of differential equations which can be studied by means of corresponding problems in the calculus of variations. All ordinary equations of the second order, but only a restricted class of linear partial differential equations of the second order, can be so treated.

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MODERN METHODS OF TREATING DYNAMICAL PROBLEMS AND IN PARTICULAR THE PROBLEM OF THREE BODIES.

PRÉCIS OF FOUR LECTURES DELIVERED BEFORE THE ITHACA COLLOQUIUM, AUGUST 21–24, 1901.

BY PROFESSOR E. W. BROWN.

IN this course an attempt was made to give some idea of the methods which have been used during the last twenty-five years to obtain information about certain classes of dynamical problems and in particular about those problems which are ordinarily considered by physicists to be insoluble in all their generality. One of the most important of these problems and one specially considered in the lectures is the *Problem of Three Bodies*, which at