

FOREWORD

The present issue, as a previous one (Vol. 15, No. 4), concerns existence theorems in calculus of variations and optimal control. This topic covers a vast area which is interrelated with the most diverse parts of mathematics.

The classical work of Hilbert, Tonelli, McShane, Graves, Nagumo, and the many who worked in this direction is usually referred to as the "direct method of calculus of variations based on lower semicontinuity." The method has been recently extended to include optimal control theory, where the concept of lower semicontinuity is often replaced by lower closure, and the convexity of the figurative by the convexity of suitable relevant sets.

On the other hand, so much recent work lies in parallel directions—the developments of Mikhlin, Krylov, and Kantorovich, for instance, and the wave-front approach, or Carathéodory's propagation of disturbances with its extensions to present-day widened structures, both deterministic and stochastic. Convexity has permeated the field, and this concept is at the basis of the theory of variational inequalities, and of so many other approaches in existence analysis.

The papers appearing in this issue offer an introduction to the subject.

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