

PREFACE

Hugo De Vries, Professor of Botany in the University of Amsterdam, says in his work, "Species and Varieties—Their Origin by Mutation," "The probabilities are now greatly in favour of our finding out the causes of evolution by a close scrutiny of what really occurs in nature. A persistent study of the physiological factors of this evolution is the chief condition of success. To this study, field observations may contribute, as well as direct experiments, microscopical investigations, as well as extended pedigree-cultures.

"The co-operation of many workers is required to cover the field. Somewhere, no doubt, the desired principle lies hidden, but until it is discovered all methods must be tried. A very slight indication may change forever the whole aspect of the problem."

It was through "field observations" that the writer's interest in scientific research was first awakened.

Having undertaken the preparation of material for the furtherance of Nature Study in the schools of Canada, such as "Birds of Canada, in Relation to Agriculture" (published 1908), "The Wild Animals of Canada," "The Wild Flowers of Canada," and "The Fishes of our Canadian Waters," at the request of the Minister of Education of the Provincial Government, in the form of Pictorial Charts, a very careful study of the classification of the different forms of life was necessary.

The evidence of fixed numbers and their multiples in determining the division and subdivision of the different forms of life, forced the conclusion that only by regarding science indivisible in all its details can its great truths be rendered discoverable.

The wonderful achievements of specialization had been kept too separate. The new knowledge of matter afforded by electro-chemical analysis, and by experiments with substances of the radium group, proved that the same kind of rays were being emitted by all forms of matter.

The electrical constitution of matter appeared to hold the key to the solution of the laws that governed the grouping of material forms, in fixed numbers and multiples of those numbers.

The present conception of Evolution places the origin of life as "spontaneous" and in sterilized waters (condensing on a molten mass), a condition which is to-day declared impossible.

The electrical constitution of matter forces the recognition that *motion is life*, and the control of motion determines the length of time the material form shall *live*.