NATURE'S MIRACLES, VOL. III: ELECTRICITY AND MAGNETISM

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Electricity and Magnetism

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INTRODUCTION.

For the benefit of the readers of Vol. III, who have not read the general Introduction found in Vol. I, a word as to the scope and object of this volume will not be amiss.

It will be plain to any one on seeing the size of the little book that it cannot be an exhaustive treatise on a subject so large as that of Electricity. This volume, like the others, is intended for popular reading, and technical terms are avoided as far as possible, or when used clearly explained. The subject is treated historically, theoretically, and practically.

As the author has lived through the period during which the science of Electricity has had most of its growth, he naturally and necessarily deals somewhat in reminiscence. All he hopes to do is to plant a few seed-thoughts in the minds of his readers that will awaken an interest in the study of natural science; and especially in its most fascinating branch—Electricity.

If Vol. I is at hand, please read the Introduction. It will bring you into closer sympathy with the author and his mode of treatment.

Again, if the reader is especially interested in the theory of Electricity it will help him very much if he first reads Vols. I and II, as a preparation for a better understanding of Vol. III. All the natural sciences are so closely related that it is difficult to get a clear insight into any one of them without at least a general idea of all the others.

NATURE'S MIRACLES.

ELECTRICITY AND MAGNETISM.

CHAPTER I.

THE AUTHOR'S DESIGN.

The writer has spent much of his time for thirty-five years in the study of electricity and in inventing appliances for purposes of transmitting intelligence electrically between distant points, and is perhaps more familiar with the phenomena of electricity than with those of any other branch of physics; yet he finds it still the most difficult of all the natural sciences to explain. To give any satisfactory theory as to its place with and relation to other forms of energy is a perplexing problem.

It is said that Lord Kelvin lately made the statement that no advance had been made in explaining the real nature of electricity for fifty years. While this statement—if he really made it—is rather broad, it must be acknowl-

edged that all the theories so far advanced are little better than guesses. But there is value in guessing, for one man's guess may lead to another that is better, and, as it is rarely the case that each one does not give us a little different view of the matter, it may be that out of the multiplicity of guesses there may some time be a suggestion given to some investigator that will solve the problem, or at least carry the theme farther back and establish its true relationship to the other forms of energy. I cannot but think that there is yet a simple statement to be made of Energy in its relation to Matter that will establish a closer relationship between the different branches of physical science. And this, most likely, will be brought about by a better understanding of the nature of the interstellar substance called Ether, and its relation to all forms and conditions of sensible matter and energy.

In the talks that will follow it will be the endeavor of the writer to give such a simple and popular exposition of the phenomena and applications of electricity, in a general way only, that the popular reader may get, at least, an elementary understanding of the subject so far as it is known. As we have said, the descriptions will have to be elementary, for nothing else can be done without such elaborate technical drawings and specifications