

**THE FORMS OF WATER
IN CLOUDS & RIVERS,
ICE & GLACIERS**

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The forms of water in clouds & rivers, ice & glaciers by John Tyndall

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JOHN TYNDALL

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IN CLOUDS & RIVERS,
ICE & GLACIERS**

TIDE

INTERNATIONAL SCIENTIFIC SERIES

VOL. I.



James
Sanford

THE FORMS OF WATER

IN

CLOUDS & RIVERS, ICE & GLACIERS

BY

JOHN TYNDALL, LL.D., F.R.S.

PROFESSOR OF NATURAL PHILOSOPHY IN THE ROYAL INSTITUTION

*WITH THIRTY-FIVE ILLUSTRATIONS DRAWN AND ENGRAVED
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AMERICAN PREFACE

TO THE

INTERNATIONAL SCIENTIFIC SERIES.

THE rapid development of science in the present age, and the increasing public interest in its results, make it desirable that the most efficient measures should be adopted to elevate the character of its popular literature. The tendency of careless and unscrupulous book-makers to cater to public ignorance and love of the marvellous, and to foist their crude productions upon those who are too little instructed to judge of their real quality, has hitherto been so strong as to cast discredit upon the idea of "popular science." It is highly important to counteract this evil tendency by furnishing the public with popular scientific books of a superior character. The publication of the present volume is the first step in carrying out a systematic enterprise of this kind. It initiates a series of such works on a wide range of scientific subjects, to be prepared by the leading thinkers of different countries, and known as the "INTERNATIONAL SCIENTIFIC SERIES."

It is designed to consist of compendious scientific treatises, representing the latest advances of thought upon subjects of general interest, theoretical and practical, to all classes of readers. The familiar phenomena of surrounding Nature, in their physical and chemical aspects, the knowledge of which has recently undergone marked extension or revision, will be considered in their latest interpretations. Biology, or the general science of life, which has lately come into prominence, will be explained in its leading and most important principles. The subject of mind, which, under the inductive method and on the basis of its physical accompaniments and conditions, is giving rise to a new psychology, will be treated with the fulness to which it is entitled. The laws of man's social development, or the natural history of society, which are now being studied by the scientific method, will also receive a due share of attention. While the books of this series are to deal with a wide diversity of topics, it will be a leading object of the enterprise to present the bearings of inquiry upon the higher questions of the time, and to throw the latest light of science upon the phenomena of human nature and the economy of human life.

As the first requisite of such a series of works is trustworthiness, their preparation has been confided only to men of eminent ability, and who are recognized authorities in their several departments. As they are to address the non-scientific public, it is a further requisite that they should be written in familiar and intelligible language. It is not to be expected that the authors will all attain to the same standard in this respect, but they are pledged to the utmost sim-

plicity of exposition that is possible consistently with clear and accurate representation.

As science is now the supreme interest of civilization, and concerns alike the people of every country, and as, moreover, it affords a common ground upon which men of all races, tongues, faiths, and nationalities, may work together in harmony, it seemed fitting that an undertaking of this kind should be of comprehensive scope and stand upon an international basis. With the growing sentiment of sympathy and brotherhood among the most widely-separated students of Nature, and the extensive facilities of business intercourse that now exist, there appeared no reason why an international combination of authors and publishers should not be effected that would be equally favorable to their own private interests and advantageous to the public. To gain this end and guarantee to authors better remuneration for their work, is a distinctive purpose of the present enterprise. But there was this difficulty in the way of any such arrangement, that, while the rights of foreign authors are guarded by all other civilized governments, they are not protected by the government of the United States. To escape this difficulty, and secure American coöperation, the first thing needed was to obtain the consent of an American publishing-house to grant voluntarily to foreign authors the justice which our government denies them. It was agreed by Messrs. Appleton that they would pay the foreign contributors to this series the full rates of copyright that are usually allowed to American authors. When this was done, engagements were made with distinguished scientists of England, France,