that true hero that can be accessible to the ordinary reader.

The greatest fault of the book is that the length of the text bears no sort of proportion to the importance of the men or their possible interest to the reader. Lamarck's life is one of the most picturesque of all scientific lives: it is more heroic in quality than that of any other given in the series. Lamarck gave as much or more to natural science than any other naturalist whose name appears here; yet to this man's eventful history but fifteen pages are given, while Sir Roderick Impey Murchison, from whom the world had little profit, who will find his place among naturalists of the second or third order, has twice the space allotted to him. Singularly enough, the one man who should have the first place among the modern men is not named at all. Darwin, who could have claimed a place in all the three divisions of the book as botanist, zoölogist, and geologist, is passed by. It may be that the book was prepared before the death of this great naturalist, and thus that the date does not represent the time of its printing. This is the only possible explanation of this startling omission.

The book is well printed. It has a sufficient table of contents, but no index.

GORDON'S ELECTRICITY AND MAGNETISM.

A physical treatise on electricity and magnetism. By J. E. H. GORDON. Second edition, revised, rearranged, and enlarged, in 2 vols. London, *Sampson Low*, 1883. 343 p., 27 pl., 151 illustr.; 332 p., 46 pl., 161 illustr. 8°.

THE demand for a new edition of a work of this magnitude, within about three years of its first publication, is a sufficient indication of its real usefulness, especially when we consider the fact that the first edition was also republished in this country.

The general scope of this treatise is to detail every thing of importance which is known experimentally respecting electricity and magnetism, referring to, and following as closely as may be, the original memoirs.

The mathematical theory of the subject is omitted so far as possible; nevertheless, the connection between the experimental facts and the results of modern theory are constantly pointed out by very numerous citations and references, especially to Maxwell. Indeed, these may, perhaps, be best regarded as companion volumes to those of Maxwell, from which the reader may learn how far theory and facts are now known to be in accordance.

We feel, however, that the author's reading has been too much confined to what has been published in England, and that he has not gleaned the field with equal diligence elsewhere. For example: we find no notice of the remarkable discovery by E. H. Hall of a new action of the magnet on electrical currents.[1]

The principal enlargements of this new edition are contained in the three chapters, 33, 35, and 36.

Chapter 33 contains an account of the beautiful experiments of Mr. Tribe in determining the variations of potential along the surface of a metallic conductor immersed in a fluid-cell by means of the electrolytic deposit upon the conductor.

Chapter 35 gives an account of the hydrodynamical experiments of Professor Bjerkens, on the apparent attractions and repulsions between bodies which are pulsating or vibrating in a fluid, which attractions are due to the mutual action of the currents set in motion by the pulsations. The importance of these experiments lies in the fact that they afford a possible clew to the nature of the mechanism which transmits electric and magnetic forces through space. In the course of these experiments, Bjerkens succeeded in imitating mechanically most of the ordinary magnetic phenomena, and showed that his field of force was similar to the magnetic field.

Chapter 36 details the subsequent researches of Mr. Stroh, respecting the same phenomena. Mr. Stroh used air instead of water as the medium in which the currents were set in motion. In this medium it was possible to explore the field of force much more completely than in water, and so to arrive at a much more exact knowledge of the facts and their explanation.

The author reserves what he has to say upon the subject of electric lighting for another work, which he has nearly completed, and which is to be specially devoted to that subject.

BASSLER'S WEATHER.

The weather: a practical guide to its changes, showing signal-service system, and how to foretell local weather. By S. S. BASSLER. Cincinnati, *Robert Clarke & Co.*, 1883. 54 p., illustr. 8°.

IN spite of our ten years' familiarity with the weather predictions of the signal-service as published in the newspapers, the general reader has as yet a very slight acquaintance with the principles and methods of weather study. The official circular on the 'Practical use of mete-

[1] *Amer. journ. math.*, ii. No. 3.

orological reports and weather-maps,' published in 1871, to aid in popularizing the work of the signal-service, is not sufficiently detailed, and has never had a great circulation. Another edition of it, with additional illustration and mention of the many facts discovered by studies of the ten years of signal-service observations, is now much needed; for we have no book in this country occupying the place held in England by the excellent little volume on 'Weather-charts and storm-warnings,' prepared by Mr. Scott of the British meteorological office. An attempt in this direction has, however, recently been made by Mr. S. S. Bassler of the Cincinnati *Commercial gazette*, who aims to make "a practical guide to weather-changes, and a help to a better understanding of the weather reports and predictions daily issued," with especial adaptation to the Ohio valley. The ordinary sequence of atmospheric conditions accompanying barometric maxima and minima is briefly described and roughly illustrated; but we regret to find in the field of popular instruction, where conciseness, clearness, and accuracy are of prime importance, so many departures from these essentials. Error and inaccuracy of statement, as well as the omission of many important facts, for which ample space might be found by avoiding needless repetitions, indicate lack of acquaintance with the subject; and although the preface says that "it is not proposed to consider any of the conflicting scientific theories, many of them still mere assumptions that have been accepted as explaining the phenomena daily presented in our atmosphere," we find on p. 36 the following obscure and inaccurate statement concerning the origin of storms: —

"The warm, light, vaporized air may move high over the land, frequently over strata of dry cool air, in great volume, from the central meteorological zone, gradually sinking down and forming the germs of barometric fields of low pressure, which spread and develop into extensive storm areas. It is in such fields that the heat of the sun is concentrated and storm centres originated. The earth absorbing electricity from the air, electric disturbances of more or less violence, according to the intensity of the condition, are experienced. The absorption or withdrawal of electricity from the vaporized air produces sudden condensation, excessive precipitation, and change of temperature."

It is said farther on, that the tornado "has its origin in the enormous electric tension caused by the friction of opposing atmospheric currents of different temperature; and electricity is undoubtedly the active agent producing the appalling effects of tornadoes." Some physical demonstration of this very popular and very erroneous assumption would not be out of place after so unqualified an assertion. The pamphlet is better than nothing, but it is by no means a satisfactory piece of work.

ART-CATALOGUE OF THE NEW-ENGLAND MANUFACTURERS' INSTITUTE.

Catalogue of the art department of the New-England manufacturers' and mechanics' institute. Boston, *Cupples, Upham, & Co.*, 1883. 4°.

THIS catalogue certainly has a very alluring exterior, and leaves little to be desired in its general presentation of reproductions of certain sketches and pictures which were exhibited at the fair of 1883 in Boston. It is not our function to criticise the pictures, but the methods of reproducing the pictures and sketches by the various mechanical processes exhibited in the catalogue fall within the province of *Science*.

Still, a critic of the various methods of reproduction of pictures cannot limit himself entirely to a mere consideration of the thoroughness of the technical processes involved in such reproductions; for he would appeal only to the ardent follower of the albertype process, or to an etching process. He must decide as impartially as possible, which of the various methods exhibited, for instance, in this catalogue, gives an idea of the pictures which appeals to the artistic sense in the fullest way. From this point of view there is no doubt that the wood-engravings and the etchings in this catalogue are superior to the specimens of the albertypes, and to those of the photographic processes in general. No photolithographic process represents the values of the lights and shades of a picture except in the most solid and implacable manner. Witness the 'View on the Nile,' which represents a darbeah in the foreground, with some figures on the river-bank near it, a stretch of river and of low-lying hills. The reproduction has an air of *vraisemblance*, but nothing more. It is not artistic. The little picture entitled 'Give me a swing,' representing a pretty little girl leaning against a tree near a hammock, and coquettishly entreating some passer-by, is a better specimen of what an albertype can do. The remaining specimens of albertypes lose whatever clearness of definition a real photograph might possess, and render the blackness of shadow of many photographs in a still more pronounced way; so that the albertypes presented in this volume have the appearance of poor photographs. There are certain subjects, however, for the reproduction of which the albertype is suitable.