latter, of course, claim the greatest attention, on account of their number, size and variety. Here are the most accessible tide-water glaciers, and many tourists have already seen the birth of icebergs at the end of Muir glacier. Here also is the great Malaspina glacier, a mass of ice formed by the coalescence of the ends of many glaciers descending from the St. Elias Alps. It lies on a flat expanse between the mountains and the ocean and covers an area of some 1,500 square miles. Professor Russell has crossed this glacier along several lines and practically all we know of it is due to his explorations. It is the only Piedmont glacier that has been visited.

The absence of glaciers in the central and northern parts of Alaska is explained as due to insufficient precipitation; but in these regions we find the strange subsoil ice whose thickness has not been determined, but which in places certainly extends several hundred feet below the surface of the soil.

The glaciers in the northeastern part of the continent occur both in Grinnell Land and Greenland. Some of the former have been visited and described, but have not received much attention, whereas the latter have attracted quite a number of observers. The recent studies of Professor Chamberlin first made us familiar with certain remarkable characteristics of these glaciers which are not found in regions further south.

In the chapter on Climatic Changes, Professor Russell shows that the glaciers of North America, with a few exceptions, are growing smaller; and he mentions the efforts being made by the International Committee on Glaciers to collect information on the variations of glaciers everywhere.

In telling of 'How and Why Glaciers move,' the observations of Kock and Klocke are narrated. These observers thought they had detected certain irregularities in the motion of the Moteratsch glacier, parts of the ice moving at times up the valley. Professor Russell is cautious in accepting such an anomaly, and indeed the observers themselves have since recognized that these irregularities were within the limit of the errors of observation.

The hypotheses which have been advanced to account for the apparent plastic flow of ice, notwithstanding its great brittleness, are well given and well criticised, especially from the point of view of the geographer; though James Thomson's theory is too shortly dismissed, and Croll's hypothesis receives more attention than it deserves, for it is radically wrong. The growth of the glacier grains, as a cause of motion, has been advanced from time to time, but has not been sustained; Forel developed this hypothesis into a theory, but found later that it was not supported by his observations.

Professor Russell believes that the motion of glaciers is due principally to the plastic flow of ice under its own weight, but that many other causes play a minor part; some of these a physicist would throw out entirely.

The book closes with a very interesting chapter on 'The Life History of a Glacier.' This is an extension of Professor Davis' topographical cycle to the history of a glacier, and is an entirely new addition to glacial literature.

A slip is made on page 181 in saying that the heat absorbed when ice melts equals the heat necessary to raise the water thus formed from its freezing to its boiling point, and §11, p. 187 is misleading; exception might also be taken to the statement (p. 192) that in a vertical section through the névé-fields the maximum flow [velocity] would probably be near the bottom.

This book may be heartily commended to the general reader, and will be of great help to the student of glaciers. It is illustrated by a number of well-selected pictures and maps, and important references are given in foot-notes.

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Neudrucke von Schriften und Karten über Meteorologie und Erdmagnetismus, herausgegeben von PROF. DR. G. HELLMANN.

No. 7. *Esperienza dell'Argento Vivo.* EVANGELISTA TORRICELLI. *Istrumenti per conoscer l'Alterazioni dell' Aria.* ACCADEMIA DEL CIMENTO. 4to. Pp. 22, 16.

No. 8. *Meteorologische Karten.* E. HALLEY, A. VON HUMBOLDT, E. LOOMIS, U. J. LE VERRIER, E. RENOU. 1688, 1817, 1846, 1863, 1864. 4to. Pp. 13. Charts 6.

No. 9. *A Discourse Mathematicall on the Variation of the Magneticall Needle.* Henry Gellibrand. London, 1635. 4to. Pp. 7, 24. Fascimiledrucke, mit Einleitungen. Berlin. A. Asher & Co., 1897.

Three new numbers in Dr. Hellmann's notable series of *Neudrucke* are before us, each number being of great interest and value. Dr. Hellmann certainly deserves, and we do not doubt will receive, the thanks of all men of science for the pains he is taking in preparing this set of publications. No. 7 contains reprints of the letters which passed between Torricelli and Ricci concerning the measurement of atmospheric pressure, and of the description of the thermometer and hygrometer, prepared and published by the Accademia del Cimento. The letters of Torricelli are of very great scientific interest, for they concern the famous experiment, which was carried out by Viviani in Florence in 1643, at the suggestion of Torricelli. The latter left no written statements regarding the barometer, but he sent word of his discovery to his friend Ricci, in Rome, and his two letters, most fortunately preserved, are reprinted in the present volume. They bear dates June 11 and 28, 1644, and show clearly that Torricelli knew that the mercury in the tube changed its height according to the conditions of the surrounding atmosphere, rising or falling as the air became heavier or lighter, and that he made the experiment in order that he might have an instrument for observing atmospheric changes. The report of the Accademia del Cimento concerns the early history of temperature and humidity observations. This reprint, which is a facsimile, gives two chapters of a celebrated work by Lorenzo Magalotti, Secretary of the Academy, entitled '*Saggi di naturali esperienze fatte nell'Accademia del Cimento*' (1667), in which the most important results of the experiments made by the Academy were set forth. These chapters deal with thermometers and hygrometers, and facsimiles of the original drawings of some of these instruments are given.

No. 8 of the *Neudrucke* gives reproductions of six meteorological charts, the original publication of which was in each case epoch-making. The first is the wind chart of Halley (1686), the oldest of all meteorological charts; the second, Humboldt's isothermal chart, 1817, the first one on which isotherms were given; the third is a reproduction of one of the 13 synoptic weather maps published by Loomis in 1846, the fourth and fifth charts are facsimiles of those issued by Le Verrier in September, 1863. These were the first daily weather maps with isobars, based on data sent by telegraph. The sixth chart is a reproduction of one by Renou in 1864, which was the first to give the mean isobars for any country. This gives the mean isobars of France.

No. 9 is a facsimile reprint of a very rare paper by Gellibrand (1635), which contains the first account of the discovery of the secular variation of magnetic declination.

All these reprints, like those which have preceded, contain copious notes by Dr. Hellmann, in addition to the introduction. The series is one which should be in every scientific library.

R. DeC. Ward.

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Biologia Centrali-Americana. Archæology. The Archaic Maya Inscriptions. By J. T. Goodman. London, R. H. Porter. 1897. 4to. Illustrated. Price, $13.50.

One of the early Spanish missionaries warns his readers against studying the native Mexican calendar system, since it is an invention of the devil and liable to disturb the faith and cloud the reason of those who seek to understand it.

It is a pity that this warning has not been heeded in the present generation by a certain class of writers, as we should then have been spared a rather extensive series of works characterized by a plentiful lack of sound knowledge and an abundance of wild speculation; among them the bulky quarto (which the author fancifully calls 'a little book'!), the title of which is given above.

It is the result, he tells us, of twelve years' labor; but when it was tendered to the California Academy of Sciences that learned body 'could not see its way' to printing the book (prudent Academy!). Mr. Maudslay, however, whose explorations have been so valuable, but who does not pretend to interpret the inscrip-