

marine, then alternating brackish and fresh, and finally wholly fresh. This, of course, implies the occurrence of great physical changes upon the North American continent during the Cretaceous and Eocene periods, which, however, did not interrupt sedimentation in a large part of its interior.

Dr. White has also done stratigraphic geology an important service in his concluding remarks upon the value of fresh-water fossils in geological determinations.

"The differentiation of the mollusca into generic, family, and ordinal groups, and the diversification of specific forms among these groups, are immensely greater in marine waters than in any other. In brackish waters it is much less than in the open marine, and in lacustrine waters the minimum of differentiation is found. The large collections of fossil mollusca which have been made in different parts of the world indicate that this slight tendency to differentiation among fresh-water mollusca has always obtained in past geological time; also, that types once established have persisted through a long series of geological periods. Therefore it has become known that fossils of fresh-water origin are of little value, compared with those of marine origin, as indices of the true geological age of the strata containing them. In consequence of this, the real value of fresh-water fossils as aids in the study of stratigraphical geology has been underestimated. While it is admitted that these fresh-water forms are of little value in determining the geological age of strata, they are really of as great importance in the study of local, and even of continental, geology as are any other fossils. Indeed, it would be quite impracticable to ascertain whether the waters in which formations have been deposited were marine, brackish, or fresh, except by the character of the contained fossils.

"Fresh-water formations of considerable extent can only be produced upon continental areas, and they consequently record phases of continental history of which marine formations give no indication. In western North America the fresh-water deposits rival in extent and thickness the great marine formations; and it would have been impossible to arrive at the knowledge of them which we have now attained except by a study of their fossils. Each of these great lacustrine formations has its own distinguishing fauna, the uniform character of which over great areas is quite remarkable. So large has been the area of some of the fresh-water seas in which these deposits were formed, and so uniform the conditions under which they existed, that the geographical distribution of species in them has been nearly or quite as great as the average of that of marine mollusca. For example, some of the species of the Laramie group have been found at points more than a thousand miles apart; and in the fresh-water Eocene groups the molluscan fauna is practically identical at points as much as 200 miles apart."

The Margin of Profits. BY EDWARD ATKINSON. New York, Putnam. 12°.

MR. ATKINSON'S writings on practical economy are among the best that we have. They are always interesting and suggestive, and frequently contain information and advice of much value to those for whom they are intended. They are not original in a scientific sense, and do not profess to be, Mr. Atkinson being a man of business rather than of science; yet all his arguments rest on a scientific basis, and on carefully collected statistics. He is, moreover, in hearty sympathy with the toiling poor in their efforts to improve their condition in life—indeed, most of his writings are inspired by this motive; yet he freely criticises them when he thinks their efforts are in the wrong direction.

The book now before us contains an address delivered before the Central Labor Lyceum of Boston, together with a reply made on the same occasion by Mr. E. M. Chamberlin, and Mr. Atkinson's rejoinder to the same. The special object of the work is to show, first, that the margin of profits, that is, the share of the capitalist in the products of industry, is much smaller than workingmen generally suppose; and second, that the progress of industry and the increase of capital, while benefitting the capitalist, of course, benefits the laborer far more. To prove and illustrate the first of these propositions, he cites the example of the cotton manufacture, in which the amount of capital used is larger in proportion to the product than in any other industry; so that here, if anywhere, we might

expect the profits to be unusually large. Yet, according to Mr. Atkinson, who is thoroughly informed in the matter, the profits are but a very small portion of the cost of the goods. He says: "When you buy 40 yards of cotton cloth at \$2.50, you pay the owner of the mill 15 cents profit, but you also pay about 15 cents more to other people for profit; that is, 30 cents profit in all; and you pay \$2.20 directly for labor" (p. 28). This statement he proves by an analysis of the process of production, illustrating the same by a chart.

He then goes on to show how greatly the working classes have gained by the improvements that have taken place in production and the consequent increase of capital. He gives it as his opinion, and economists generally hold the same view, that "there has never been a period in the history of the world in which there have been so many important new inventions or so many applications of previous inventions, all tending to human welfare, as in the last twenty-five years" (p. 109). And these improvements, though at first chiefly beneficial to the few, are now, he thinks, tending rapidly and largely to the benefit of the many. He cites some statistics showing that during the past twenty-five years the cost of living has been greatly reduced, while the wages of workmen have largely increased.

Mr. Chamberlin's reply to Mr. Atkinson is very feeble indeed, not one of his opponent's arguments being met, nor any new ones of value advanced. That Mr. Atkinson's views are in the main sound there can be no doubt; yet the scientific relations of capital and labor are not yet thoroughly understood, and until they are we cannot tell precisely how improvements in production and increase of capital affect the different portions of society. Mr. Atkinson is doing important service, however, in calling attention to the service rendered to society by capitalists, inventors, and other brain-workers, and which laboring men are liable to overlook or underestimate. He gives also valuable hints on the subject of personal and domestic expenditure, showing that the poorer classes might save much more than they now do without diminishing their present enjoyment in the least. The whole book, in fact, though containing little that is new of a scientific character, cannot fail to be of use to workingmen, as well as to all others who are studying the labor question from a practical point of view.

Die Klimate der Erde. Von Dr. A. WOEIKOF. 2 vols. Jena, Costenoble. 8°.

DR. WOEIKOF, professor of physical geography in the University of St. Petersburg, is well known to American meteorologists as the author of the general explanatory essay in Professor Coffin's 'Winds of the Globe,' published after the death of the latter by the Smithsonian Institution. He has also been a frequent contributor to the Austrian and German meteorological journals and to other scientific periodicals outside of Russia, and his essays on the climate of the glacial period have attracted much attention from geologists. He has travelled and observed widely abroad, as well as read exhaustively at home. Students of physical geography are therefore to be congratulated that he has condensed the results of his labors in a general work on the climates of the earth, and also that an authorized German translation of the Russian original has appeared; for it is a positive loss to science when an experience as wide and well trained as Dr. Woeikof's is not recorded as far as may be in transmissible form.

The first volume of the work includes a series of chapters on matters of general importance, several of which have been republished elsewhere, so agreeable are they in style and treatment. The chief headings are, 'Pressure and Winds, including a Consideration of Temperature Changes in Vertical Currents;' 'Atmospheric Moisture and Precipitation;' 'Influence of Snow and Ice on Climate;' 'Temperature of Bodies of Water and their Climatic Influences;' 'Daily Variations of Temperature, Moisture, and Wind;' 'Variation of Temperature with Altitude, with Particular Regard to the Effect of Topographic Form on Temperature Changes;' 'Effect of Climate on Vegetation and of Vegetation on Climate;' 'General Statement of the Distribution of Temperature and Pressure over the Earth.' There is nothing of text-book style in these chapters: they are rather essays than lessons, fit for reading by the well-informed meteorologist rather than for study in