row field exhaustively. He believes that in some cases this method is of more practical value than its contrary. Sociology he defines as "a discussion of the conditions and laws of combination and growth in society." In the following sentence he adds that this definition includes change which is retrogressive as well as that which is progressive. It is plain that any good definition of sociology must include retrogressive change, inasmuch as a considerable school of thinkers assert that the world and society are becoming worse all the time. Perhaps the substitution of the word 'development' or 'evolution' for 'growth' in the above definition would have obviated the necessity for this explanation, because it is well understood nowadays that evolution includes progress from good to bad as well as from bad to good.

The author's various chapters on custom, government, economics, religion, ethics, and so on, are of much interest, although very sketchy in character. His style is good, and enlivened with numerous illustrations of the argument. One of the first questions to be asked about a book of this sort is, What position does the author take in respect to the pressing questions of socialism and the limit of governmental functions? We can best answer this in President Bascom's own words. "The office of the state," he says (p. 45), "is not simply to recognize a primitive equality of rights, and to grant these rights the protection we term justice. Such a course will soon issue in extreme equalities. It has the far more difficult duty of encouraging and aiding unimpeded activity in every class, and at the same time renewing its conditions in each class. Each citizen is, under general principles, to be put back as speedily as possible on his feet when he has lost them. The race is to be renewed, morning, noon, and night, on equal terms. The state must then be benevolent as well as just. While it takes from no man what he has, it must not allow any man such an exercise of his powers as will ultimately swallow up the powers of other men. . . . The state must put positive limits on powers, when, by natural force and the conferred energy of society, they are ready to break the bounds of prosperous and beneficent competition."

There is much in President Bascom's chapters on ethics and religion that is suggestive, especially his comprehensive use of the word 'morality,' and his illustrations of the degenerating process as to particular parts of a religion which usually accompany *its* development. The publishers would have greatly increased the value of the book had they provided it with an index. Unindexed books are a relic of barbarism.

JUKES-BROWNE'S HISTORICAL GEOLOGY.

THIS volume completes the 'Student's handbook of geology;' the first part, on physical geology, having appeared in 1884. The author states his intention as being "to give as full an account of the rocks of Great Britain and Ireland as space would permit, supplementing this with only so much of continental geology as is necessary to fill up the gaps in the British records and to complete the outline of geological history." After a brief but excellent introduction on the laws and applications of paleontology, the book proceeds to a review of the formations, giving a chapter to each system. An account of every separate area in the British islands is given under each formation, with numerous sections and illustrations of characteristic fossils, and each chapter closes with a statement of what is known or inferred of the physical geography of the period. Some departures from the divisions of geological time usually employed in America and on the continent of Europe will be noticed. Thus the Cambrian is regarded as a distinct 'system,' as is the lower Silurian, for which Lapworth's term 'Ordovician' is taken. It is interesting to notice that Mr. Walcott's studies lately published lead him to a similar result for this country. More novel is the division of the tertiary rocks into two systems, for which Mr. Jukes-Browne proposes the terms 'Hantonian' (including the eocene and oligocene) and 'Icenian' (including the miocene, pliocene, and pleistocene). The quaternary is thus given an entirely subordinate position.

The science of geology includes such a great number of distinct subjects that no one man can master them all, and for this reason the text-book of the science that shall be equally satisfactory in all departments has yet to be written. Probably it can only be written by the co-operation of many specialists. The first part of Mr. Jukes-Browne's handbook, that on physical geology, is excellent, and will be found most useful to American students; but the volume before us cannot be of nearly such general value, as, from its plan, it is adapted only to Great Britain. But even there we think the comparatively minute study of British formations, to the exclusion of the rest of the world, is a mistake. It is true, that, in whatever district the English student may be, he will find a clew to its geological structure in this book; but this advantage is more than counterbalanced by the loss of a general view of the earth's developmental history. Such a method must give the beginner very disproportionate views, and result in the loss of all 'perspective.' American

The student's handbook of historical geology. By A. J. JUKES-BROWNE. New York, Scribner & Welford. 8°.

geology, which throws so much new light upon the subject, is almost completely ignored.

Mr. Jukes-Browne is not a biologist, and his remarks on the structure and affinities of extinct organisms are not always happy. The anatomist will hardly agree with such statements as the following (p. 437): "Of the mammals, Coryphodon and Lophiodon resembled the recent tapir; Palaeotherium and Paloplotherium were animals from which both the rhinoceros and the horse seem to have descended; Hyracotherium was a small animal combining characters now found in the peccary and the hyrax or Syrian coney." On the same page the snout of an alligator is inverted and called the lower jaw. Our author seems not to have heard of the great paleontological discoveries of the last twenty years on this side of the Atlantic, as he mentions only the mastodon, of which a wretched figure is given, and the mammoth.

It would, however, be very unfair to leave the impression that this is a carelessly written book. It is nothing of the sort, but, on the contrary, has been compiled with painstaking accuracy, and in many respects has been admirably done. While it cannot be recommended as a text-book in this country, it will prove of great service to investigators as a book of reference and comparison, containing much valuable information in a small space.

BERGHAUS'S ATLAS OF PHYSICAL GEOGRAPHY.

THE geographical institute of Justus Perthes in Gotha is publishing a new edition of Berghaus's 'Atlas of physical geography' ('Physikalischer Atlas'). Though the editor retains the name of the old edition of 1838–48 and of 1852, this is a totally new work, not one of the old maps being used in the new edition. The most eminent authorities in the different branches of physical geography contribute to this work, each department being intrusted to a specialist. Berghaus himself is the author of the hydrographical part, and to him is due the excellent execution of the work, which comes up to the standard we are used to apply to works published by Justus Perthes. J. Hann edits the meteorology; G. Neumayer, the part on terrestrial magnetism; von Zittel, geology; O. Drude, geography of plants; G. Hartlaub and W. Marshall, the distribution of animals; and G. Gerland, the ethnological part. The names of these scientists warrant that the material will be reliable, and in every respect be kept up to date. The maps are copperplate prints, and bear the date of publication. This way of reproduction will enable the publisher to have any desirable corrections made, so that we may be sure to see the maps always corresponding to the latest state of our knowledge. The economical use of space on the single sheets is really admirable. Map 16, for instance, contains the drainage-areas of the oceans, which are represented in Lambert's equivalent projection. These maps show the limits of ice-drifts, currents, deltas, and the navigable extent of rivers. On the same sheet we find eleven detail-maps showing the different kinds of bifurcations, and two diagrams showing the extent of land in different latitudes.

The general principle of the atlas is, first, to give maps of the earth and of continents, showing the distribution of physical phenomena; and then detail-maps, which are particularly illustrative of it. On the map showing the annual rainfall (No. 37) we may observe the influence of elevation and wind on detail-maps of Jamaica, Mauritius, and New Zealand. On the map of the German Ocean (No. 23) we find the various types of coasts, — the rias of the north coast of Spain, the downs of France and Germany, and the fjords of Norway. Diagrams show the temperatures of the ocean. This atlas is an indispensable work for the student of physical geography. Its systematically selected contents and excellent execution make it a worthy companion of Stieler's 'Hand-atlas' and Spruner-Mencke's 'Historical atlas.' As the editor does not give any preference to the physical geography of Europe, it is as valuable for the American student as for the European.

A CENTURY OF ELECTRICITY.

THOSE whose curiosity is excited by the presence on every street-corner of an electric light, and in every doctor's office of a telephone, in every railway-station of a clicking telegraph instrument, and yet have been unable to find time or opportunities for understanding how these things have been brought into existence, will find in Professor Mendenhall's little book, 'A century of electricity,' a trusty guide which will lead them by easy steps from the beginnings of a science of electricity towards the end of the eighteenth century, through the discoveries of Galvani, Volta, Oersted, Faraday, and others, to the present time. Professor Mendenhall's success as a writer is too well known to need especial praise in this place. The author has endeavored to sketch the growth of the science of electricity and its principal applications. The book is not a history of the science, nor is it a scientific treatise, and the use of technical language has been avoided as far as

A century of electricity. By T. C. MENDENHALL. Boston, Houghton, 1887. 16°.