the heads of some chipmunks of California, showing distinct species produced through isolation and very well drawn by Mr. W. S. Atkinson, forms the frontispiece, though we have been unable to find any reference to it in the text.

Dr. Jordan's own studies on the relation between latitude and the number of vertebræ contains many interesting facts, but these are not correlated with a number of similar cases of change in structure characterizing local varieties and races, which would throw more light on this attractive subject, though all these cases appear primarily to be due to local or comparatively restricted changes of the environment, and secondarily to isolation.

The chapter on 'the evolution of fossil cephalopoda,' by Dr. Smith, gives the results, some very striking, of long-continued studies on the evolution of these animals, and will be of much value to the specialist in paleontology. It is illustrated by five excellent plates.

The reviewer hardly feels qualified to pass judgment on the sociological chapters, but has enjoyed reading them and thinks that they merit attention, and will undoubtedly secure it from a wide circle of readers. They are all concerned with some of the burning questions of the day. The fancy sketch of 'the heredity of Richard Roe' is very well done. Based on the essays of Galton and others, with studies of his own, our author shows that the same conditions which have resulted in the formation of the English race will apply to such a colonial type as ours, and that in a few centuries "these same conditions will unite to form a 'Brother Jonathan' as definite in qualities and as 'set in his ways' as his ancestor, the traditional 'John Bull.'"

The chapters on 'the evolution of the mind,' 'degeneration,' 'hereditary inefficiency,' 'the woman of evolution and pessimism,' 'the stability of truth' and 'the struggle for realities' contain strong, wholesome thoughts presented in a clear, simple, homely style, which seem to us sound, progressive and most timely. When our race, and our people especially, wake up to and realize the strength and nature of the forces for evil, the tendencies to degeneration, and begin to battle with and overcome these—when that moment arrives, our nation need not fear the negro problem, the pauper phantoms of the submerged thousands of our cities or the scandalous influence of our boss politicians. Then with the ever-growing strength resulting from long striving and experience in ruling the savage and barbarian elements actually among us, we can reach out and absorb, and perhaps turn to some good use, rather than exterminate, the millions of the barbarous and uncivilized of the Philippines, which have suddenly drifted in upon us as the wreckage of war.

A. S. PACKARD.

Earth Sculpture or the Origin of Land-forms. By JAMES GEIKIE. New York, G. P. Putnam's Sons. 1898. Illustrated.

The editors of The Science Series are fortunate in their selection of the author of this volume. Dr. James Geikie, Murchison professor of geology in the University of Edinburg and author of 'The Great Ice Age,' is one of the ablest and best known geologists in Europe. His wide acquaintance with geological phenomena, his experience as a teacher and his conservatism make him an eminently fit and safe person to follow into a field that has been explored of late years by so many enthusiasts.

We feel thankful, too, that the subject has been treated by a man who concerns himself with the processes and results of earth sculpture, and but little with the names that have of late years been so copiously showered upon them. Dr. Geikie tells us in the preface that he has 'made scant use of those neologisms in which, unfortunately, the recent literature of the subject too much abounds.' A glossary is given at the end of the work for such technical terms as are indispensable.

The volume does not pretend to be a text-book on physiography. Its scope is best indicated by the contents, which are briefly as follows:

Agents of denudation.

Land forms { in horizontal strata, in gently inclined strata, in highly inclined strata, in faulted regions, due to igneous action.

Rock character and land forms.

Land forms modified by { glacial action, æolian action, underground water.

Basins.
Coast lines.
Classification of land forms.

These subjects are necessarily treated briefly owing to the limitations imposed by the size of the book, but they are all treated ably, and as the reader leaves each topic behind he feels that the author has not pumped his reservoir of knowledge dry.

If one wishes to find fault with a topographic map he need only go into greater detail or use a larger scale than was used by the maker of the map; if one would find fault with a book of this kind he needs only go a little further into the details of the processes and results under discussion. On this principle one may venture the following criticisms:

On page 46 the author says that the three main factors determining land forms are: (1) original slope; (2) geological structure; (3) character of the rocks. If he had cared to go into greater detail and finer subdivision of these factors he might have added to this list: (4) climatic conditions; (5) interruptions during development; (6) duration of exposure; (7) nature of denuding agency; (8) slope during development. Such subdivisions, however, are mere matters of convenience in discussion; the subjects themselves have not been overlooked.

It would have been well for American readers if the author had noted that the 'swallow-holes,' *dolinas*, 'kettle-valleys,' etc., spoken of on page 271 are known in this country as 'sink-holes.'

On pages 267–8 the author expresses the opinion that earthquakes may sometimes be caused by the falling-in of the roofs of caverns. To a person living in an earthquake region this seems to be an inadequate, or rather a highly exceptional, cause of earthquakes. Limestone regions are not generally looked upon as earthquake regions.

On page 284 æolian basins are mentioned 'as occurring in Arkansas.' These basins are not in Arkansas, but in the valley of the Arkansas River. In common with many other writers, he gets the name of *Rio de Janeiro* wrong (330, 332). To call it 'Rio Janeiro' is equivalent to calling a man Kinley when his name is McKinley. The editor may be warranted from analogy in spelling *pulverise* so (pp. 30, 32), but neither Webster nor the Century gives such a spelling.

The illustrations are, on the whole, not up to the standard of the text. Most of them are smudged as if reproduced on the scale on which they were hastily drawn.

But these are all very small matters, and have little to do with the general merit of the book. It ought to be remembered, too, that Dr. Geikie is no mere maker of books. He is a busy scientific worker, who can find time only with great difficulty for writing a work of this character, and whatever one finds to criticise in this book is not to be attributed to any unfitness or unfamiliarity on his part with the subject he is dealing with.

Several references in the work to the relations of geology and earth-sculpture afford an occasion for referring to a doctrine being promulgated in this country of late years by enthusiasts on the subject of physiography, physical geography, earth-sculpture or whatever one may choose to name it, in the grammar and high schools, and even in the primary grades themselves.

Dr. Geikie says, on page 45: "So dominant, indeed, has been the influence of geological structure in determining the results worked out by erosion that without a knowledge of the structure of a country we can form no reliable opinion as to the origin of its surface features." At the end of the book he returns to this subject. On page 364 he concludes "that these (surface features) cannot be accounted for without some knowledge of geological structure." On page 367 he says: "It is almost impossible, indeed, to consider the formation of surface features without at the same time inquiring into their geological history. And not infrequently we find that the configuration of a land is the outcome of a highly involved series of changes. To understand the distribution of its hills and valleys, its plains and plateaux, and the whole adjustment of its hydrographic system, we may have to work our way back to a most remote geological period."

The book is made up of facts, almost every one of which is a silent witness to the correctness of this conclusion. Physiography is a study for mature minds, and it cannot successfully be

taught as a science to those who have no knowledge of geology. However much entertainment a boy or girl may get from dabbling in these subjects, for the common run of students they are university studies or studies for minds capable of doing university work.

JOHN C. BRANNER.

STANFORD UNIVERSITY, CALIFORNIA,
December 1, 1898.

The Story of Photography. By ALFRED T. STORY. The Library of Useful Stories. New York, D. Appleton & Co. 1898.

In this little book of one hundred and sixty-five pages, which can be carried in the pocket, the author has gathered together an epitome of the gradual development of photography from the early attempts of Schultze in 1727 to the present day. The experiments of Wedgwood and Davy, Niépce, Daguerre, Fox, Talbot and St. Victor are given at length. An account of the usual printing processes, of photo-block printing and reproduction processes for illustrating, are included; also the recent application of the X-ray and the kinetoscope. There is just enough of physics and optics to enable the lay reader to form a good idea of the principles on which photography is based. 'The Story of Photography' reads easily and pleasantly, and it is doubtful if elsewhere in so small a compass can be found as comprehensive a description of an art that has so wide and varied applications. It will undoubtedly form a desirable addition to many private libraries.

E. L.

SCIENTIFIC JOURNALS.

American Chemical Journal, December. 'Camphoric acid:' By W. A. Noyes. In this paper, which is a continuation of former reports, the methods of preparation and the derivatives of xylic acid and xylidene are described. 'On some relations among the hydrates of the metallic nitrates:' By J. H. Kastle. Attention is called to the amount of water of crystallization of the different nitrates and the explanation that can be given for the complex and basic compounds. 'Liquid ammonia as a solvent:' By E. C. Franklin and C. A. Kraus. The solubility of about 400 substances has been determined. 'Determination of the molecular rise in the boiling point of liquid ammonia:' By E. C. Franklin and C. A. Kraus. 'On the non-existence of four methenylphenylparatolyl amidines:' By H. L. Wheeler and T. B. Johnson. 'An active principle in millet hay:' By E. F. Ladd. 'Comparison of methods for estimating caffein:' By E. F. Ladd. 'Creatin and its separation:' By E. F. Ladd and P. B. Bottenfield. 'A double citrate of zirconium and ammonium:' By S. H. Harris.

J. ELLIOTT GILPIN.

THE *Revue des Sciences Médicales*, an excellent quarterly journal, established twenty-six years ago and edited by M. Hayem, has been compelled to suspend publication. *L'Éducation Mathématique* is a new journal edited from Paris by Professors J. Griess and H. Vuibert.

SOCIETIES AND ACADEMIES.

THE PHILOSOPHICAL SOCIETY OF WASHINGTON.

THE 491st meeting of the Society was held at the Cosmos Club, December 10th, at 8 p. m. Mr. W. H. Dall spoke on the proposed University of the United States, to establish which efforts are being made in pursuance of the ideas of Washington expressed in his will; and its possible relations to the scientific bureaus of the government.

He thought that the projectors of the enterprise should avoid any official connection with the government and that the institution should not attempt to duplicate the undergraduate work of existing colleges with which the city is already abundantly supplied. He then outlined a scheme for post-graduate work in connection with the scientific bureaus which he believed practicable and which would occupy a promising field at present unutilized, and which would also involve a minimum of expense, little legislation and no costly buildings. The paper as a whole will appear in the *American Naturalist*.

The second paper, on 'Two Remarkable Semidiurnal Periods,' was by Professor F. H. Bigelow, of the United States Weather Bureau. An account was given of the three components of the diurnal barometric wave, their distribution and variations in different latitudes, and of