3, Niederschoena, Saxony, Hungary. Some of these districts are exceedingly vague; 'Quadersandstone,' for example. Niederschoena is in Saxony; and Quedlinburg is in the Harz district, at the same horizon as Blankenburg, which is not Cenomanian at all, but Senonian. From all these sources he enumerates 442 species, — a number which is still too small. The Dakota group alone furnishes 195 species.

The second division of the work relates to the Laramie group, but does not review its flora. Some dozen additions to it, made by Mr. Lakes at Golden, Col., are described, six of which are new species. Mr. Lesquereux here discusses again the geological position of this group, and, while still insisting upon its eocene character, admits that its flora resembles that of the travertines of Sézanne in the Paris basin, but which are known to lie considerably lower than the coarse limestone and lignites that prevail in that district. In his table of distribution he only enumerates 207 species; but the reason for this paucity is his failure to recognize as Laramie the plants described from the Fort-Union group, — the upper Missouri and lower Yellowstone region, and the Bad lands of Dakota.

The third division of the work consists of an exhaustive survey of the flora of the Green-River group; and, as this had not previously been done, it forms altogether the most valuable part of the treatise. Since the appearance of the 'Tertiary flora,' a large amount of material from this formation had accumulated in the author's hands, out of which he obtained no less than ninety new species. The most fertile source of this material was the small locality in South Park, Col., known as Florissant, from which, in a light volcanic ash, also containing insect-remains, an immense number of beautifully preserved specimens of fossil plants have been derived. The other principal localities grouped under the general designation of 'Green-River group,' are those of Green-River Station and Alkali-Stage Station, Wyoming; Elko Station, Nev.; and a place reported as in 'Randolph county.' As to this last, as there appears to be no Randolph county in any western territory, it is probable that Randolph courthouse, Rich county, Utah, is meant, which is the same as is otherwise known as Bell's Fish-Cliff, where fine specimens of palm-leaves and other fossil plants are found. The locality called Barrel's Springs is also here referred to the Green-River group, although it appears in the preceding table as belonging to the Laramie group. This is confusing, to say the least.

We have not space to show how the floras of these several localities are correlated by the author; but the occurrence of identical and wholly characteristic species in several of them seems to establish their geological synchrony with considerable certainty. This formation is now commonly regarded as eocene; but Mr. Lesquereux, led, as in the case of the Laramie, by the affinities of the flora with that of Europe, insists upon placing it somewhat higher, and calls it 'oligocene.'

The remainder of the work is devoted to what is called the 'miocene flora.' So far as the localities on the Pacific slope (Chalk Bluffs and Corral Hollow, Cal.; John Day valley, Ore.; and Alaska) are concerned, this reference is doubtless correct; but the large collections from the 'Bad lands of Dakota' belong almost without question to the Fort-Union group, and should have been referred to the Laramie, with which the invertebrate fauna forces us to correlate that group. It is true that this flora has a marked miocene aspect when compared with those of European strata, and that several species seem to have persisted from that period to the present (e.g., Corylus Americana, Onoclea sensibilis); but the entire Laramie flora is also strongly miocene, and at least one species (Ginkgo biloba, L.) of the living flora has come down to us seemingly unchanged from the typical Laramie of Point of Rocks, Wyoming.

Geological considerations aside, this volume is one of the most important that have lately appeared upon the paleontology of western America, and, should it prove his last work, would fittingly crown the long and faithful labors of its justly celebrated author.

ANTHONY AND BRACKETT'S PHYSICS.

FOR many years the English have borrowed or stolen their text-books of elementary physics from the French, and Americans have borrowed or stolen from the English. About a year ago, Daniell produced a distinctly English, or rather distinctly Scotch, book of this order. Now Professors Anthony and Brackett have undertaken to remove America's reproach. Their book is to consist of two parts, of which part i., 'Mechanics and heat,' has already appeared. It is a small volume, and in other respects shows a disregard of old traditions. It has numerous diagrams, but hardly a *picture*.

Elementary text-book of physics. Part i. Mechanics and heat. By Prof. W. A. ANTHONY and Prof. C. F. BRACKETT. New York, *Wiley*, 1884. 9 + 246 p. 12°.

It gives almost at the start a short treatment, much shorter than Daniell's, of simple harmonic motions; and it devotes several pages to the idea and theorems of potential. The subject of air-pumps, and with it much that is wont to make the student miserable, is dismissed after a treatment of four pages. In the chapters devoted to heat we miss the familiar names of Dulong and Petit, and the other pre-Regnault investigators of the phenomena of expansion. The steam-engine occupies one page, without an illustration. Carnot's cycle, with related matters, fills ten pages.

The book is written with great care. Its language is clear and judicious. There are, of course, slight inaccuracies. For instance: the first sentence of article 26 reads as if a point could be located by means of its distance from any one plane. Again: on p. 209 we find it stated as having been demonstrated experimentally by Joule, that, "when a gas expands without performing external work, it is not cooled;" the later experiment of Joule and Thomson, which led to a different conclusion, not being mentioned.

From beginning to end, this volume of Anthony and Brackett grapples with difficult principles boldly and in good faith, as if the authors expected their whole book to be read and mastered. Trigonometry is freely used, and occasionally something that borders on the calculus. The long experience of the authors as teachers encourages the hope that they have not over-estimated the capacity of college classes; but, excellent as is the matter and the manner of the book, one fears that the ordinary student will find portions of it formidable.

Perhaps it should not be otherwise. Certainly the extraordinary student, who craves strong meat, will find it here, and of the best. So small a book cannot teach all there is to learn: it is not intended to do so. It does not show the whole of physics, but it shows physics as a whole.

NOTES AND NEWS.

During the opposition of Neptune just passed, Professor Pickering continued the observation of the planet's magnitude with the meridian photometer of the Harvard-college observatory in the same method as previously employed. Nine series of observations extend from Dec. 16, 1884, to Jan. 21, 1885, the final result from which, when corrected for atmospheric absorption, instrumental error, and reduction to mean opposition, becomes 7.63. The residual difference for only one series is as great as two-tenths of a magnitude. The corresponding results for two previous seasons are 7.71 and 7.77. Contrary to the experience of Mr. Maxwell Hall of Jamaica, who found evidence for a rotation-period of Neptune in small variations of the planet's light according to his own observations, Professor Pickering regards it as improbable that there is any variation in the light of Neptune of a strictly periodic character, and further calls attention to the influence, much neglected by observers, upon the observed brightness of objects when seen east and west of the meridian on the same night. This has to be taken account of in the observations of maxima and minima of many variable stars, and may to some extent account for the variations of Neptune's light detected by Mr. Hall.

— Prof. Charles E. Bessey writes to the *American naturalist* that fifteen years ago there were no dandelions in the Ames flora (in central Iowa): now they are very abundant, and have been for half a dozen years. Then there were no mulleins: now there are a few. Then the low and evil-smelling Dysodia chrysanthemoides grew by the roadside in great abundance: now it is scarcely to be found, and is replaced by the introduced 'dog-fennel' (Anthemis cotula). Then the small fleabane (Erigeron divaricatum) abounded on dry soils: now it is rapidly disappearing. Then no squirrel-tail grass (Hordeum jubatum) grew in the flora: now it is very abundant, and has been for ten years. Then there was no burr-grass in the flora: now it is frequently found, and appears to be rapidly increasing. Both of these grasses have apparently come in from the west and north-west. Fifteen years ago the low amaranth (Amarantus blitoides) was rather rarely found: now it is abundant, and has migrated fully a hundred and fifty miles north-eastward. This plant has certainly come into the Ames flora from the south-west within the last twenty years. Old settlers say that there have been notable migrations of plants within the past twenty or thirty years. The buffalo grasses of various kinds were formerly abundant in the eastern part of the state: now they have retreated a hundred to a hundred and fifty miles, and have been followed up by the blue-stems (Andropogon and Chrysopogon). The blue-stems now grow in great luxuriance all over great tracts of the plains of eastern Nebraska, where twenty years ago the ground was practically bare, being but thinly covered by buffalo grasses. In Dakota it is the same: the blue-stems are marching across the plains, and turning what were once but little better than deserts into grassy prairies.

— A principle that may generally be wisely adhered to by reviewers is that notices of books appearing in numbers should not be based on the first number issued; but this can be safely departed from in announcing the preparation of a new (fourth) edition of Meyer's 'Konversations lexikon,' of which the first part appears with imprint of 1885. Sixty-four pages carry it to 'Absteigung.' Abyssinia is allowed six and a half pages, which include liberal reference to sources of information, an essential in all good encyclopaedias. Among the illustrations there are