ject, and must precede all else, while stratigraphical geology depends upon all the other divisions, and must follow them. Palæontological geology is in some sense co-ordinate with dynamical and structural geology taken together, but finds place after them because its use cannot be explained before their principles are known. Whether dynamical geology should precede or follow structural, is a question admitting of discussion. They are to a large extent correlatives, and either is more intelligible if preceded by the other. To give precedence to structural geology is to describe phenomena in advance of their explanation. If dynamical geology precedes, a variety of natural agents are described which have no apparent connection with the general subject. The majority of writers have selected the former alternative; but a few have preferred the latter, and among them our author. All things considered, he appears to have chosen the lesser evil.

The single new departure of the volume consists in the elevation of physiographical geology to the rank of a major division. The same title it is true has been placed by Dana at the head of a primary division of the subject, but it was used by him in a different sense. With Dana it is a synonym for physical geography; with Geikie it is that "branch of geological inquiry which deals with the evolution of the existing contours of the dry land." So far as the subject has had place in earlier treatises it has been regarded as a subdivision of dynamical geology, and the classification which placed it there was certainly logical. In dynamical geology, as formulated by Geikie, the changes which have their origin beneath the surface of the earth (volcanic action, upheaval, and metamorphism), and the changes which belong exclusively to the surface (denudation and deposition) are separately treated. In physiographical geology the conjoint action of these factors of change is considered with reference to its topographical results. Starting from geological agencies as data we may proceed in one direction to the development of geological history, or in another direction to the explanation of terrestrial scenery and topography, and if the development of the earth's history is the peculiar theme of geology, it follows that the explanation of topography, or physiographical geology, is of the nature of an incidental result—a sort of corollary to dynamical geology. The systematic rank assigned to it by Geikie is an explicit recognition of what has long been implicitly admitted: that geology is concerned quite as really with the explanation of the existing features of the earth as with its past history. The separation initiated by our author is an indication of the growing importance of the subject, and it is safe to predict that in the future it will not merely retain its new position, but will even demand a larger share of space.

The following scheme exhibits the general plan of the volume:—

Book 1.—Cosmical aspects of geology.

Book 2.—Geognosy: an investigation of the materials of the earth's substance.

Book 3.—Dynamical geology.

Book 4.—Geotectonic geology; or the architecture of the earth's crust. (*Geotectonic* is a new term proposed as a substitute for *structural*).

Book 5.—Palæontological geology.

Book 6.—Stratigraphical geology.

Book 7.—Physiographical geology.

Comparing this classification with that of other authors, and viewing it with reference to the present condition of the science, we may say without hesitation that it has no superior, and that it is well adapted to existing needs.

G. K. GILBERT,
U.S. Geological Survey

(*To be continued.*)

OUR BOOK SHELF

Uniplanar Kinematics of Solids and Fluids; with Applications to the Distribution and Flow of Electricity. By George M. Minchin, M.A. Pp. viii. + 266. (Oxford: Clarendon Press, 1882.)

IN subject-matter this book is almost unique among our mathematical manuals. The only fellow to it is Clifford's "Kinematic." It consists of six chapters, the first dealing with Displacement and Velocity, the second with Acceleration, the third with Epicycloidal Motion, the fourth with the Mass-Kinematics of Solids, the fifth with the Analysis of Small Strains, and the sixth almost as long as the others put together, with the Kinematics of Fluids. The subdivisions of the last chapter are headed —General Properties: Multiply Connected Spaces; Motions due to Sources and Vortices, Electrical Flow; Conjugate Functions. There is also a short appendix, with notes on such subjects as Vectors and their Derivatives, Current-Power, and Routh's Use of Conjugate Functions.

It is impossible, without occupying considerable space, to give an adequate idea of the freshness and originality which mark Prof. Minchin's work. These are notable in the exceedingly valuable sixth chapter, but even on such well-worn subjects as velocity and acceleration, he treats us to many pleasant little surprises. Nor is this accomplished at the expense of the student; the clearness, fulness, and good arrangement specially requisite in a college text-book are all of them conspicuous; and valuable collections of exercises, worked and unworked, and given at intervals. The book is altogether one for which success may be cordially wished, not merely as a reward to the author, but in order that the science of which he treats may go on as steadily and rapidly advancing as it has of recent years been doing.

Die Käfer Westfalens. Zusammengestelt von F. Westhoff. Abtheilung ii. (Supplement zu den Verhandlungen des naturhistorischen Vereins der preussischen Rheinlande und Westfalens, Jahrgang 38, pp. 141-323.) (Bonn, 1882.)

WE have already noticed the first part of this work in NATURE. The second and concluding portion is now before us. It forms one of the most useful local Beetle catalogues that we have seen, nicely printed (the names being in bold black type), with copious local and other information. The district comprises about 450 square (German) miles, and is varied in its physical conditions. In all, 3221 species are enumerated, in 59 families. The *Staphylinidæ* comprise 667 species, *Curculionidæ* 471, *Carabidæ* 321, *Chrysomelidæ* 265, and *Dytiscidæ* 115. All the other families have each less than 100 representatives, and 10 of them less than 5. The nomenclature followed is that of the newest "Stein-Weise" German list, which, as is well known, has introduced a great multitude of changes and innovations; but other generally received names are indicated in brackets, thus avoiding confusion. Westhoff describes no new species in Part ii., but indicates and names a good many new (chiefly colour) varieties. Probably the rage for naming colour-varieties, so wide-spread at the present day, should be deprecated. For instance, in this catalogue we find a list of 27 named