Tourists in the Rocky Mountains have waited long for such a book as this, and we hazard the guess that it will be eagerly accepted by them as the manual which will enable them to recognize and name the flowers they find on the high plains and in the mountain canyons. For such people the colored plates of approximately two hundred species, and the black and white plates, of not far from three hundred more, will prove most helpful. But aside from tourists and other summer residents of the Rocky Mountains there is a still larger class of people who will welcome this attractive book. For, contrary to the opinion of many who have never crossed the Great Plains, there are schools and colleges and universities with their students and teachers interested in the plant life about them. And to these we may add an increasing number of people who are interested in plants because they love them. In fact, these great highlands of the United States are coming to contain very many people to whom such a book as this will appeal very strongly. We can not imagine a better book for the high school libraries of the west, or for that matter for the libraries of the western colleges and universities. The beautiful plates, which were made by the junior author, must appeal to every pupil with any esthetic sense, as they must also to many cultured people outside of the schools.

The chief features of the book are its general key to families, in which the treatment is distinctly non-technical, accompanied by a chart of relationship that should make the determination of the family relatively easy. Following these are the Dicotyledonous orders, and families, followed later by the Monocotyledonous orders and families, with keys, again, to the genera, and later to the species. Here a useful feature is emphasized in giving rather fully the etymology of the generic names, a matter that will be appreciated especially by those who are not privileged to be in the classes of scholarly teachers. Each genus is briefly characterized, and following this the species are indicated by a key in which as many descriptive features as possible are emphasized. In passing it should be pointed out that the plates always include related plants, so that family relationship is thus emphasized. The black and white plates, again, emphasize the more difficult species, notably those of the grasses and sedges. This fact will add much to the usefulness of the book.

An introduction of nine pages gives some idea of "the general lines of the evolution of flowering plants from the ancestral ferns," and suggests "the relationships of the various groups." The discussion leads up to the "chart of relationship" mentioned above.

In the preface the authors have something to say about "species" that will show the scientific reader that they have been thinking of the problem of species limits. Of course this preface was not written for high school pupils, nor indeed for the tourist of limited scientific training, but for botanists this short preface will be found to contain some suggestive thoughts.

We are told by the authors that the range of the book includes "Colorado, Wyoming, most of Montana, northern New Mexico, eastern Utah, and western North, and South Dakota, Nebraska and Kansas," and no doubt it may be profitably used in a considerable area oustide of these limits.

The authors are to be congratulated upon the successful completion of this notable work.

Charles E. Bessey
The University of Nebraska

The Life of the Mollusca. By B. B. Woodward. London: Methuen & Co. 1913. 12mo. Pp. xii + 158. Pl. XXXII., 1 map.

This volume is one of a popular series intended to summarize existing published knowledge on the subject of which it treats, and not to present fresh information or new researches. It is distinctly not ecological, and, perhaps in deference to British prudishness, omits the existing data on the reproduction of the pulmonates, a body of facts which have more bearing on the life of these mollusks and have been more thoroughly observed than any other phases of molluscan life.

The plan includes a (somewhat obsolete) system of classification, a chapter on geological history, one on distribution (such as can be obtained from existing manuals), on reproduction (omitting reproductive acts), on food, evolution, instinct, intelligence and uses, with an index.

Taken for what it is, a compilation from the literature for popular use, it should not be too harshly criticized, and in fact presents a useful compendium of widely scattered data, not elsewhere brought together.

It is well illustrated, chiefly by reproduction of the plates of the well-known "Manual of the Mollusca," by S. P. Woodward, first published in 1850, and in its time easily the best of the smaller manuals of the mollusca.

Taking into consideration the purpose of the book, the chief criticism which in justice to the reader we feel should not be suppressed, touches on the too ready acceptance by the author of some statements by others which stand in desperate need of confirmation.

For instance the assertion that the murices utilize the spur or projecting spine of the aperture of the shell to pry open bivalves which they intend to devour, is almost precisely on a level with the statement that a man can sit in his own lap, and would be possible only in space of the fourth dimension. In the most charitable view the author of this assertion united to a lively imagination very imperfect observation. Such notions touch the imagination of the ignorant, but have no proper place in scientific literature.

Also the assertion that the shell-bearing Pteropoda are derived (p. 56) from the *Bulla*-like Tectibranchs (originating with an anatomist of limited experience with mollusks) is hardly compatible with the ascertained facts that shell-bearing Pteropods occur in the Cambrian; while the Bulloid Tectibranchs first appear near the close of the Carboniferous (p. 47).

Here and there such questionable statements mar the generally high average of accuracy of this little compendium, but, on the whole, it will fulfil a useful purpose.

WM. H. DALL

PRINCIPIA ATMOSPHERICA

1. *Upper Air Calculus and the British Soundings during the International Week* (May 5–10), 1913. By W. N. SHAW. *Journal of the Scottish Meteor. Soc.*, Vol. XVI., No. XXX., p. 167.
2. *Principia Atmospherica.* A Study of the Circulation of the Atmosphere. *Proc. Roy. Soc. Edinburgh.* Read December 1, 1913.
3. *Principia Atmospherica.* An address before the Mathematical Society, January 7, 1914. Privately printed.
4. *The Interpretation of the Results of Soundings with Pilot Balloons. Quar. Jour. Roy. Meteor. Soc.*, April, 1914.

In these four recently issued pamphlets, Dr. W. N. Shaw, the progressive director of the British Meteorological Office throws wide open a new door in aerology through which we seem to catch sight of that great desideratum, the forecast based on definite laws, or perhaps it would be the part of wisdom to say, definite foreknowledge of the structure and energy distribution in "highs" and "lows" in connection with the flow of air at different levels.

It is only a short time since W. H. Dines, studying numerous upper air observations, came to the conclusion that the differences of pressure at the earth's surface were of the same order of magnitude as those at a height of nine kilometers and therefore the distribution must be regarded as controlled by conditions at the base of the stratosphere. In studying this remarkable result, Shaw examined the physical conditions necessary for the building up of pressure between points at the same level in two verticals and found that the difference in the influence of the stratosphere and troposphere is attributable to the characteristic difference of temperature. He establishes a formula for the increase of pressure difference per meter of height and a second equation which gives the gradient wind velocity at any level. This latter is used to explain the variation of wind velocity with height and in particular the falling-off in velocity in