Yet on the other hand there seems no really good reason (other than common practise, which is recognizedly potent) for discarding the "i." I have somewhat hurriedly scanned the works of Skeat, on etymology, in search of some authority, besides that of the elements' discoverers, for the prevailing spelling. I have been unsuccessful. Some time ago I was told by an eminent philologist that the formation of modern Latin words does not always follow fixed rules. Also, an eminent Boston chemist informed me that outside of the dictionaries he knew of no authority for the present spelling of the elements under discussion. It is evident that in the beginning the authoritative spelling of the name of any element is due to its discoverer in almost all cases. For when we read of the discovery of an element and learn that its discoverer gave it a name in conformity with the names of existing elements (provided it is an "ium" element) we observe that there is a tendency toward the species of uniformity which is the subject of this note.

If we take all the "ium" and "um" elements and consider them from the standpoint of—what I may call—syllabic uniformity, we see that there are twenty-six elements of three syllables; seventeen of four; three of five, and one of six. Platinum falls into the first class, and molybdenum into the second, which two classes compose the great majority. If we add "i" to the endings of these elements, then platinum still remains in the majority class and molybdenum passes into the minority. Can it be possible that the naming of the elements with a design for syllabic uniformity had a place in the minds of the various discoverers? It would seem fair to assume that such was not the case. Therefore a possible argument in favor of the present spelling of the two above mentioned elements is eliminated.

On the other hand, the argument in favor of what may be called terminal uniformity has more to recommend it than syllabic uniformity. Aside from the very desirable property of terminal uniformity itself, the sound of the pronounced word ending in "ium" is more pleasing to the ear, and its appearance is more pleasing to the eye, than is the word with the "um" ending, which gives the sensation of dullness, and is dumpy. While by simply adding "i" the pronunciation of the word "platinium" for instance, becomes at once musical. Any one uttering the word first with one ending and then with the other will appreciate the last remark.

In conclusion, one may say that although the "um" elements have back of them the power of common usage (as did aluminum some years ago—now we almost invariably write aluminium) yet there seems to exist an unnecessary lack of harmony in the spelling of some elements. However, this discord is not at all extensive, for according to the highest authorities the only elements at present irregular are platinum and molybdenum. It is only a few years ago that it was very common to write "aluminum," now it is rarely used by scientific writers. This change has been brought about by their adoption of the more approved spelling. Why may not the contemporary scientific writers go a step farther, and whenever they find it necessary to use the names of these elements, write them glucinium, lanthanium (lantanium), molybdenium, platinium and tantalium? Should the many influential scientific men find the suggestion here offered pleasing to them and furthermore worthy of adoption, then, in a short time, there would be introduced into the spelling of the names of elements a greater uniformity than at present exists. G. B. O.

PROVIDENCE,
July 5

SCIENTIFIC BOOKS

Mendel's Principles of Heredity. By W. BATESON. 396 pp., 6 colored plates, 3 portraits of Mendel and 35 figures in the text. Cambridge (England) University Press; also New York, G. P. Putnam's Sons. 1909.

This is not a new edition of the book published under the same title in 1902 by the same author and publisher, but for some time now out of print. That little book served a useful purpose in directing the attention of

biologists to the newly rediscovered discoveries of Mendel, but at the present time a book with a wider scope is needed and it has been supplied by the author.

The present work omits the controversial features of its predecessor, which happily are no longer required, but adds in Part II. some interesting biographical material and three portraits to the translation of Mendel's original papers which the earlier book contained, and gives a comprehensive account of the development of Mendelian principles of heredity down to the present year. It may be regarded as an authoritative statement of Mendelism at the present time. No small part of the book is taken up with an account of the author's own investigations, which have probably added more to our present knowledge of heredity than has come from any other source since Mendel's time.

Chapter I. contains a brief account of pre-Mendelian writings on heredity, of the rediscovery of Mendel's law, and of the essential feature of that law, "segregation."

Chapter II. contains a list of observed cases of Mendelian inheritance, with the name of the observer in each case and bibliographic references to his work, and a statement of its most important features. The fact is emphasized that in animals and in plants, and both among domesticated and among wild forms, the laws of heredity are the same. The nature of "dominance" and the occurrence of distinctive heterozygous characters are topics also considered here. Regarding dominance, the conclusion is reached that "a dominant character is the condition due to the *presence* of a definite factor, while the corresponding recessive owes its condition to the *absence* of the same factor."

A critical comparison is instituted between the Mendelian system and Galton's system of analyzing the facts of inheritance, and the inadequacy of Galton's system is shown. Praise is bestowed upon Galton for his early attempts to break a path through the unexplored fields of heredity, but his followers are censured for persistently closing their eyes to the fact that Mendel has opened a path.

In a third chapter explanation is made of the usual Mendelian "ratios," 3:1, 9:3:3:1, etc., and an account is given of how novelties may arise, by recombination of the separate factors of compound characters. Examples from breeding-experiments with fowls, primroses and sweet-peas serve as illustrations.

The next five chapters, about a fourth part of the book, deal with color-inheritance in plants and animals. This is no undue amount of attention, since the phenomena here dealt with are the most carefully studied and the most instructive of all Mendelian cases.

In this part of the book are discussed and illustrated the modified Mendelian ratio 9:3:4, the "presence and absence hypothesis," epistatic and hypostatic factors, reversion on crossing, and a variety of related topics of greater or less complexity.

A chapter on "genetic coupling and spurious allelomorphism" precedes and leads naturally to a discussion of "heredity and sex." The theory is here advocated that sex has its ontogenetic origin in gametic differentiation, that in each species of animal or plant one sex is heterozygous, the other homozygous as regards the differential sex-factor. In the cases studied by experimental breeding methods the author concludes that "the female is a sex-heterozygote with femaleness dominant," whereas the male is a homozygous recessive. The possibility is, however, admitted that in insects, such as have been studied by Wilson, Morgan and others, the male may be the heterozygous sex, as the cytological evidence suggests.

Double flowers and their peculiar inheritance are considered in a special chapter, following which comes what to many will be the most interesting chapter in the book, "Evidence as to Mendelian inheritance in man." Eye-color and hair-color are shown to be inherited in typical Mendelian fashion, though the evidence is admittedly incomplete. Skin color, in the case of the mulatto at least, seems to be inherited without segregation. Various hereditary diseases and malformations are shown to be inherited as Mendelian dominant characters. Brachydactyly, cataract, color-blindness and a variety of other hereditary

peculiarities are here included. On the other hand albinism and alkaptonuria are recessive in heredity.

The next two chapters deal with exceptions, real or apparent, to Mendel's law, a most profitable field for students of heredity to cultivate; and the last two chapters of Part I. deal with the new light shed on biological conceptions by Mendelian discoveries and the practical application of Mendelian principles. The sociological application made, which will be of general interest, is stated concisely thus:

> To the naturalist it is evident that while elimination of the hopelessly unfit is a reasonable and prudent policy for society to adopt, any attempt to distinguish certain strains as superior, and to give special encouragement to them would probably fail to accomplish the object proposed, and must certainly be unsafe.

This is a conclusion both democratic and sensible, it would seem.

Part II. contains a biographical notice of Mendel, and a translation of Mendel's two published papers on hybridization, together with a very complete bibliography, an index of subjects and one of authors.

The book as a whole will be quite indispensable to the student of heredity; the general reader will find in it much of absorbing interest, although parts will be found too technical for him to follow readily, unless he too will become, as he will be tempted to become, a student of heredity.

W. E. CASTLE

Hints for Crystal Drawing. By MARGARET REEKS, with preface by Dr. JOHN W. EVANS, Imperial College of Science and Technology, London. Longmans, Green and Co. 1908.

The accurate construction of crystal figures usually offers considerable difficulty to the beginner and it was with a view of eliminating some of these difficulties as well as adding a few short-cut methods that this book of 148 pages with its 44 plates of drawings was published.

Of the various types of projections used by the mineralogist the one known as the clinographic projection is now usually employed and it is this projection which is chiefly considered. This is discussed in chapter I.

Chapters II. to IX., or fifty pages of the book, are devoted to directions for the drawing of crystals of the cubic system. The first three classes of this system are treated quite thoroughly and the plates illustrating a few of the common combinations aid the student in following the directions given. The tetragonal system is discussed in ten pages, the hexagonal in twenty, the orthorhombic in fourteen, and the monoclinic and triclinic in fourteen and nine, respectively, while the last eighteen pages are devoted to a consideration of twinned crystals.

In the construction of the axial crosses as well as in the drawing of the more complicated forms, the orthographic plan is first drawn and by dropping vertical projectors the corresponding points on the clinographic projection are located. This is a decided help to the beginner in pointing out the relationship existing between the two types of projections as well as for locating various points in the drawing itself.

But the text is not entirely free from criticism. The treatment throughout is from the standpoint of an experienced draftsman rather than from that of a skilled crystallographer. A few examples will make this point clear.

In the drawing of the tetragonal trisoctahedron $\{211\}$ (Fig. 1, p. 29) the intersection line P, 3 between the faces designated by II. and III. does not check with one found by the intersection of the two planes indicated. In Fig. 1, p. 35, the location of the point X can hardly be considered as accurate. The drawing of the tetragonal bisphenoid (Fig. 4, p. 65) is incorrect, for its edges should be parallel to lines joining the ends of the crystallographic axes. In the figure on page 79 the crystallographic axes are poorly drawn.

In all of the above-mentioned instances the general direction of the lines is correct, but carelessness in construction is clearly evident. This is to be regretted, for in a treatise on crystal drawing the figures should by all means be accurate. How can a student be