The main factors represented by grades intelligently given may be described by the six terms: time, effort, mental ability, memory, language sense and preparation. The relative importance of these factors varies widely with the nature of the subject, but all are involved in every intellectual pursuit. The order chosen is that of directness of control by the student.

Time.—This includes both that in attendance on classes and that given to the subject outside of class hours. Irregularity of attendance on classes and deficiency of outside preparation would have their obvious results in this factor, irrespective of the reasons for such irregularity or deficiency.

Effort.—This factor includes the practise of concentration in and out of class, largely a result of past habits; thoroughness of thought, which passes nothing until really grasped; and system, which insures sustained and continuous work as opposed to cramming at intervals.

Mental Ability.—This is evidenced by the ease and accuracy with which new ideas are grasped. It is of course largely a natural endowment, developed, however, or allowed to deteriorate, slowly by its exercise or its disuse. This factor is most important in subjects of a strongly reasoning character.

Memory.—By this term is meant the retaining of ideas rather than the memorizing of words or symbols; it is mainly a natural endowment but somewhat subject to cultivation by mental activity.

Language Sense.—By this is meant the ability to understand and to use language with precision. It is probably to some degree a natural gift, but is also largely a result of early training and associations and an appreciation of its importance. The student who can not express his own ideas clearly usually receives only vague impressions from his oral or printed instruction. The language sense can be cultivated by sustained effort directed to that end.

Preparation.—This includes general education along intellectual lines, to which appeal can be made for analogies and illustrations. It also means a proper command of the earlier part of the same subject and of other subjects directly used as foundational material and as tools; grades wisely given in these antecedent subjects indicate clearly the adequacy of this direct preparation. It is in this factor that the student who has habitually aimed at passing rather than grasping his curriculum encounters the natural consequences in his increasing difficulties.

In conclusion it may be noted that time and effort are under immediate control; mental ability, memory and language sense are subject to slow cultivation; and preparation is beyond present control. Of course less than all the allotted time, or less than the student's best effort, or less than an average rating in factors, would necessitate correspondingly higher values for the other factors that an average grade might be earned.

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Scientific Books

Elementary Studies in Botany. By John M. Coulter, A.M., Ph.D., Head of the Department of Botany, University of Chicago. New York and Chicago: D. Appleton and Company. 12mo. Pp. ix + 461.

It is a pleasure to note the gradual approach to a standard course of study in botany for the high schools of the country, and there can be no question that such an approach to standardization is occurring if one will look over the text-books prepared during the last few years. Especially is this tendency marked where the authors combine a considerable experience in the teaching of botany with a comprehensive knowledge of the science. The book before us is an excellent illustration of this fact, which the author recognizes in the opening paragraph of his preface, and which is so good that we quote it complete. "It is seven years since 'A Text-book of Botany' was published, and during this period there has been not only great progress in the knowledge of plants, but also much discussion concerning the effective use of plants in high school education. It is natural that a discussion of this kind should lead to considerable

diversity of opinion, and it is evident that no one is in a position as yet to decide the points at issue. Amid all the flux of opinion, however, there is evident a desire to relate plants more closely to the interest and to the need of high school students. This desire expresses itself in an extreme form when courses in 'agriculture' are asked to be substituted for courses in 'botany.' This has brought a distinct temptation to publishers and to authors to 'meet the demand' without much consideration as to its significance. It can not mean that all that has proved good in the older method is to be abandoned, and an unorganized mass of new material substituted for it. It can not mean that high school pupils are to become apprentices rather than students. It must mean that the structure and work of plants are to be so studied that this knowledge will enable the student to work with plants intelligently. In other words, it is intended to be the practical application of knowledge, rather than practical work without knowledge."

It would be well for teachers of botany of all classes to carefully read these sentences, which gain in strength and significance to the end of the paragraph. As the writer of this review has insisted over and over again, botany wherever taught must be botany, and not some application of botany, or some study of plants not involving the orderly sequence of structural and physiological inquiry. Agriculture, horticulture, plant breeding, forestry, etc., are most excellent subjects of study for young people (and older people, for that matter), but they are not botany; rather, they require botany as a prerequisite, and must be based upon it.

Coming to Dr. Coulter's text-book we find twenty-seven chapters arranged in two "parts." Chapters I. to XIV., inclusive, deal with what may be called "pure" botany, and in these the pupil is taken step by step from the simpler to the more complex plants and their principal functions. This part of the book is intended to afford a good half-year's work for the high school pupils, and without doubt this is one of the best formulations of this work which has yet appeared. In looking through the chapters one finds nothing which can well be omitted, nor anything which imperatively demands admission. In the second part, which is entitled "Plants in Cultivation" one finds also not a little of pure botany. Thus the chapter "What Plants Need" is plant physiology, pure and simple, as is also the chapter on "What the Soil Supplies." There is a little concession to the "practical" in the chapters on "Seeds," "Other Methods of Propagation" and "Plant Breeding," and considerably more in those on "Cereals and Forage Plants," "Vegetables," "Fruits," etc., and yet in even the most "practical" of these one sees that the presentation is by one who is primarily a botanist. All through this second part the living plant *as a plant* is emphasized, rather than the plant as a crop to be sold for such and such a sum. And here is perhaps the line of difference between the scientific conception of plant study and the conception held by those who think of plants as things to be grown for our use or pleasure. Dr. Coulter's book is a demonstration of the possibility of presenting much of applied botany in a scientific manner.

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The Evil Eye, Thanatology and Other Essays. By ROSWELL PARK. R. G. Badger, Boston. 1913.

This volume consists of a series of entertaining essays, which, as the author states, "partake of the character of studies in that border-land of anthropology, biology, philology and history which surrounds the immediate domain of medical and general science." The subjects include The Evil Eye, Thanatology (the study of the nature and causes of death), Serpent Myths and Serpent Worship, Iatro-Theurgic Symbolism, Giordano Bruno, The Career of the Army Surgeon, The Evolution of the Surgeon from the Barber, History of Anesthesia and the Introduction of Anesthetics in Surgery, etc. The treatment in nearly every case is primarily historical, and the main purpose appears to be to show how many