which has been raised is to recognize frankly that the privilege of doing a year of professional work as a part of the A.B. course, which juniors and seniors now enjoy, is a favor extended to candidates who study at a university six or seven years, and that there is no reason for shortening the course of candidates whose studies cease on the receipt of the A.B. degree.

Another question, which has not indeed been formally discussed, but which has occasionally been mooted, is the advisability of requiring the A.B. degree (or its equivalent) for admission to the professional and technical courses. It seems safe to say that Cornell University is not likely soon to adopt that policy. If a youth desires to be a lawyer, engineer, physician or architect, there is no good reason why he should be compelled to study other subjects for four years as a condition of entering upon his professional course. And there is less reason to-day, when the A.B. course has everywhere been made largely, and in some institutions wholly, elective, than might have been imagined a generation ago when the prescribed classical course was deemed the one and indispensable means of liberal culture and mental training, which also fitted and qualified the candidate to undertake professional study. At Cornell University, at any rate, the established policy is to admit students to any course who are able to pass the examinations qualifying them to pursue that course. And such preliminary tests, it is generally conceded by the members of the professions concerned, do not exceed the requirements for graduation at the best high schools. The age of high school graduates is also suitable. And, finally, Cornell University could not, without surrendering the democratic spirit in which it was conceived and by which it has always been inspired, establish conditions of admission to its courses of study which would close its doors to the masses of the people and leave them open only to those who had time and money enough to study for a period of six or seven years after graduating at high schools. Nevertheless, the members of the professional faculties are fully aware of the advantages of superior education and culture to its possessor, and, other things being equal, they know it conduces to professional success. Accordingly, students whose age, means and circumstances justify such a plan are advised to study both for the A.B. and the professional degree.

SCIENTIFIC BOOKS.

Development and Evolution. By Professor JAMES MARK BALDWIN. New York, The Macmillan Co. Pp. 395. $2.60.

Although biologists all agree as to the general truth of the theory of descent, disagreement is still rife as to the *method* of descent of the species. Those who have been interested in these problems in recent years have been divided into two camps, agreeing as to the general facts but differing in their views as to the forces by which the evolution of animals has been brought about. One school has held a modified view of the Lamarckian theory, assuming that the directive force in evolution has been the environment which produces direct modifications in the individual, to be subsequently inherited. The second school has adopted an ultra-Darwinian position, denying that the modifications produced by the environment can be inherited, and insisting that acquired characters can play no part in evolution. According to this school, evolution has been due to the natural selection of congenital variations. Both of these schools have labored under serious disadvantages. The neo-Lamarckian school is quite unable to obtain any clear evidence that acquired characters are transmitted by heredity, and thus their fundamental datum is without demonstration. On the other hand, the neo-Darwinian school has labored under disadvantages of a different nature. No one questions the cogency of congenital variations or the importance of natural

selection as influencing evolution, but the difficulties connected with this special theory of a more general character have been so serious as to have convinced many modern naturalists that natural selection of congenital characters is insufficient to account for the facts of nature.

A few years ago there was suggested to biologists a new conception of the method of evolution, a method which was believed by its advocates to remove many or most of the difficulties of the two schools hitherto recognized, and to give an explanation of the process of evolution more intelligible and not open to the lines of criticism which were raised against the two other views. This new suggestion was independently conceived by three different naturalists, Professor Baldwin, of Princeton, Professor Osborn, of Columbia, and Lloyd Morgan, of England. The names that have been applied to the new theory are several. The one most commonly used has been *Organic selection,* a term which really expresses very little. Professor Baldwin himself has preferred *Othoplasy,* which term he now adopts in the volume which has recently appeared.

This new conception of evolution in a way offers a compromise between the views of the natural selectionist and the Lamarckian school, inasmuch as it does not involve the necessity of assuming the inheritance of acquired characters, but at the same time it assumes that acquired characters, or the environment in general, is the chief directive force in controlling the line of evolution. It, therefore, puts into the possession of evolutionists the uniform directive force of an environment, thus avoiding many of the difficulties of the natural selection theory, but does not involve the conception of the belief in the inheritance of acquired characters for which it seems to be impossible to obtain any proof or any good evidence.

The theory of organic selection or othoplasy can not be explained in a few words and no concise definition can be given of it. This theory points out the fact that acquired characters, though they may not be inherited, do produce profound modification in individuals. The development of acquired characters, therefore, adapts the individual to the new conditions of life and to any change in environment. Such adaptations enable the individual to meet changes in environment and to become adapted to new conditions of life. They, therefore, prevent the extermination of the individuals which might occur with modifications in environment. Even though such modifications be not transmitted by heredity, the second generation in the same environment would independently develop similar acquired characters and would itself become adapted to the environment. Thus the development of acquired characters would protect generation after generation from extermination, even though they were not transmitted by the force of heredity. Such a protection of the individual would shield from extermination members of the race that develop the acquired characters, and thus keep alive that portion of the race in which certain acquired characters develop. This shielding process would continue until, according to the suggestion of this theory, congenital variations might arise, amid the numerous indefinite variations of this character, which were in a line with the acquired characters. The acquired characters under these circumstances would have nothing to do with *producing* the congenital variations, but would simply preserve the life of the individuals until the proper congenital variations appear. The chief significance of this theory, then, is that it greatly prolongs the time over which the race might wait for the appearance of proper congenital variations.

The volume just published by Professor Baldwin contains a somewhat miscellaneous collection of chapters upon different phases of evolution. Certain phases of psychological evolution are found at the beginning, and at the close of the volume certain other suggestions of a more psychological character. The larger part of the work, and the part which to biologists in general will be the most suggestive, concerns the development of this theory of organic selection or othoplasy, as Baldwin prefers to call it. The subject has been developed with extreme care and the gen-

eral theory has been applied in numerous directions. The reading of this volume will give a very much more comprehensive conception of the significance of this new theory and the applications of various lines of evolution, than can be obtained from the reading of isolated papers on the subject which have hitherto appeared. Indeed, Professor Baldwin's discussion of this theory and its application in various lines is a real contribution to the general subject of evolution. No one who is interested in the modern doctrine of evolution and the method of the development of animals and plants can afford to miss reading this new work of Professor Baldwin's, for it throws a light upon many phases of the descent theory which are left in the dark by both the Darwinian and the Lamarckian schools. Although Professor Baldwin is not the sole originator of this conception, and has given due credit to the two who independently conceived it with him, he certainly has developed it more carefully than any other, and this new work of Baldwin's must be regarded as one of the positive contributions to the discussions of the evolution doctrine.

The other parts of the work, though interesting and suggestive, are, at least to the general biologist, less significant and instructive than this careful elaboration of the theory of othoplasy, but may be especially recommended to those interested in the psychological phases of evolution.

H. W. CONN.

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SCIENTIFIC JOURNALS AND ARTICLES.

The Museums Journal of Great Britain contains a brief account of 'The Manchester Whitworth Institute,' a paper on 'The Descriptive Arrangement of Museum Collections,' by Frank C. Baker, dealing with that of the Chicago Academy of Sciences, and 'Notes upon the Haslemere Educational Museum,' by E. W. Swanton. This last is extremely interesting, describing a successful attempt to make a museum instructive at the minimum cost; the building covers 6,400 square feet and cost but £1,305. There are reprints of H. I. Smith's 'Methods of Collecting Anthropological Material' and of H. F. Osborn's paper on 'The Collecting and Preparing of Fossil Vertebrates.' Also there are the customary interesting notes.

The American Museum Journal has an account of 'Entomological Work in the Black Mountains of North Carolina' by Wm. Beutenmüller and an illustrated article on 'Collecting Flamingoes and their Nests in the Bahama Islands' by Frank M. Chapman, which gives a very clear idea of the breeding grounds of a flamingo colony. The lecture announcements are made. *The Guide Leaflet Supplement* is devoted to 'The Sequoia, a Historical Review of Biological Science' by George H. Sherwood. It is primarily a brief account of the specimen of Sequoia acquired by the museum and secondarily a review of the progress of science during the life of the tree, which was 1341 years.

The Plant World for September commemorates its fifth anniversary, by issuing a number comprising many more pages and plates than usual. It contains 'Extracts from the Note Book of a Naturalist on the Island of Guam,' by W. E. Safford; 'A Deciduous Tropical Tree,' by O. F. Cook; 'Our Vanishing Wild Flowers,' by L. H. Pammel; 'The Etymology of Columbine,' by E. J. Hill; and the second paper on 'The Origin of Plant Names,' by Grace S. Niles. There are the customary notes, reviews and briefer articles.

SOCIETIES AND ACADEMIES.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

THE fifty-second annual meeting of the American Association for the Advancement of Science, and the first of the 'Convocation Week' meetings, will be held in Washington, D. C., December 27, 1902, to January 3, 1903.

A meeting of the executive committee of the council (consisting of the general secretary, secretary of the council, the permanent secretary, and the secretaries of all the sections), will be held in the council room of the Cosmos Club at noon on Saturday, December 27.