

lish researches. Surely in the story of the metabolism of the carbohydrates room might have been found for the classic work of Brown and Morris, and Brown and Escombe on the physiology of the foliage leaf and of the germinating barley grain; in other places for the work of the Cambridge school on the enzymes, the phenomena of gaseous interchange, and the conditions of respiration; and for the researches of Chittenden, Vines, and others on the phenomena of proteolysis. The discovery of erepsin is not mentioned, though its importance in the metabolic phenomena of proteins is beyond dispute. The author is apparently satisfied with the researches of the German scientific world, which, from the point of view of the advancement of knowledge, can only be regretted.

J. R. G.

#### AGRICULTURAL ESSAYS.

*Lectures Agricoles.* By Prof. C. Seltensperger. Pp. 576. (Paris: J.-B. Baillière et Fils, 1911.) Price 5 francs.

"**L**y a trois manières d'enseigner: on peut instruire en amusant, instruire en ennuyant, et même ennuyer sans instruire." The book before us opens with this incontestable statement, and when we reach the end we feel that the editor has kept well clear both of the second and third methods, and has succeeded in maintaining interest throughout.

The plan of the book is, we believe, entirely new in agriculture. It is not a text-book in the ordinary sense of the word. There is a scheme running through it, but the chapters are not written by one author, or even written expressly for the book, but are taken from the writings of the best known French agriculturists. Thus there is a lack of continuity and an absence of detail, but by way of compensation the reader gets a fine breadth of view, and he is introduced to the best agricultural experts in his country.

M. Schloesing writes on the soil, and succeeds in a very few pages in giving a picture that will carry the student a long way in his studies. M. Nivoit writes on railways and agriculture; he points out that France is not specially rich in minerals, but she has a good soil and an incomparable geographical position; thus a great variety of crops is possible, and good transport facilities become indispensable. Instances are given of what has already been accomplished: the Compagnie Paris-Lyon-Méditerranée carries fruit from Avignon to Paris in 24 hours, to London in 40 hours, to Hamburg and Berlin in 80 hours. The advantage to the grower is enormous, but the local consumer may suffer; where formerly he could often buy fruit at very low prices, he may now have to pay actually more than in some of the markets further off. This, however, is a detail that is easily remedied.

The applications of electricity in agriculture are dealt with by M. Petit. It is regarded only as a source of power, the direct effects of the discharge on plant-growth not being considered. As a driving power it has many advantages, and it is attracting attention in France; for us here, unfortunately, it is as yet inaccessible in country districts.

A number of chapters deal with the general economic

and social problems of agriculture. Where there are so many small holdings and so few hedges as in France, the question of boundary lines between one man's property and his neighbours' becomes a fruitful source of dispute and of vexatious litigation. M. Muret deals with this problem, and gives some very useful advice to the disputants.

There are a number of admirable illustrations throughout the volume, which, however, are not always connected with the text, and are sometimes not even explained. In several chapters, especially those dealing with insect and fungoid pests, the absence of detail is felt more than it is elsewhere. References are, however, always given to inexpensive text-books where the further information can be obtained. Considering the very wide range covered—practically the whole of the agriculture of France—and the very modest price of the book, it must be put down as one of the most generally useful of the admirable series to which it belongs.

#### MICROSCOPY FOR ZOOLOGISTS AND ANATOMISTS.

*Grundzüge der mikroskopischen Technik für Zoologen und Anatomen.* By A. B. Lee and P. Mayer. Vierte Auflage. Pp. vii+515. (Berlin: R. Friedlander and Son, 1910.)

**I**N this the fourth edition of an established publication the authors have not found it necessary to make any material alteration in the contents of the previous edition. They have added, however, much new substance derived mainly from various microscopical journals; medical periodicals, numerous though they be, having, to the authors' regret, been almost entirely unproductive. As will be gathered from the title the scope of the work is limited to anatomical and zoological microscopy. Such limitation is strictly observed. Even in the general paragraphs all temptation to wander off into by-paths is sternly resisted. Although the authors give freely of their own experience, they refer largely to the labours of others. The book is, in fact, crowded with condensed information, which has been industriously and exhaustively compiled during the last four years from suitable sources in many languages. References to these sources are always given. Nine chapters (131 pages) are devoted to the preliminary operations of killing, fixing, hardening, and imbedding. Seven chapters (94 pages) deal with staining; five (45 pages) with cements, varnishes, injections, and bleaching. Nine (140 pages) of the remaining ten chapters treat minutely the specific examination of the embryo and of various tissues and organs: one chapter (39 pages) is restricted to invertebrates. There is a copious index of no less than sixty-two pages, so that consultation of the contents is easily made.

A glance at any chapter, or group of chapters, readily reveals the thoroughness of compilation and the judgment of the authors. Thus, the essential process of imbedding is introduced by a general chapter (No. 6) on the subject. This chapter (*inter alia*) summarises the merits and demerits of the chief varieties of microtomes. It also summarises the ad-

vantages and disadvantages of paraffin and celloidin as imbedding materials. Around these much controversy has raged. The authors conclude that, while very thin sections can without doubt be best obtained in celloidin, the greater difficulty of manipulation and the greater requisite dexterity will probably lead an inquirer who wishes to work out a structure quickly and easily to adopt paraffin. As paraffin and celloidin are the chief imbedding agents, each of these is fully treated in a separate chapter, each chapter being of about twenty pages.

The chapters on stains are particularly full, and every colouring medium appears to be included. The recipes for their composition are given with quantitative accuracy, and, in the general preface, Dr. Mayer raises a protest against the vagueness with which such concoctions are frequently quoted. In several cases the important matter of stain durability is suitably discussed. The synonyms of tar dyes are always given.

It may be that to many investigators the most useful chapters will be those which deal specifically with organs and tissues, while other students will perhaps find the chapters on invertebrates the most attractive. Fulness of treatment is as much in evidence in these specialised regions of applied microscopy as in the more general parts of the book. The chapter on embryology (33 pages), for example, covers the animal kingdom; nerves are treated in three chapters (54 pages); and, under the heading of Echinoderms, each of the main subgroups is separately described.

The work as a whole gives the impression of unvarying thoroughness and completeness. It should be a valuable and indispensable auxiliary in the library of every biological laboratory. An appendix, compiled while the book was in the press, brings the contents thoroughly up to date.

A. N. D.

#### DARWINISM AND PHILOSOPHY.

*Dogmatism and Evolution: Studies in Modern Philosophy.* By Prof. T. de Laguna and Dr. Grace A. de Laguna. Pp. v+259. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd., 1910.) Price 7s. 6d. net.

THE authors explain that the term "dogmatism" is here used to denote the body of logical assumptions which were generally made by thinkers of all schools (e.g. Berkeley and Hume, as well as Descartes and Leibniz) before the rise of theories of social and organic evolution. The first part of the work is devoted to the analysis and illustration of the dogmatic principles. The second part, entitled "Revolution and Reaction," deals with the opposition offered to the old dogmatism by the critical philosophy and absolute idealism. The third part, which is developed to greater length, deals with the pragmatist revolt.

From our naturalist's point of view we turn with most interest to what the authors have to say in regard to the Darwinian theory of evolution, and we are not disappointed. It is shown that while the idea of evolution first became effective in the realm of social science, it was conceived in an essentially

abstract fashion, without any adequate consideration of the factors which operated. "It was not until the work of Darwin in biology that there existed anything like a scientific theory of evolution, based on wide and intensive empirical study." But "the importance of Darwin's work did not lie simply in the fact that it provided an acceptable theory of the evolution of organic species." His success gave investigators in other fields confidence in their clue, and opened the way for a universal theory of evolution. Moreover, "the bridging of the gap between man and the lower orders meant a transformation of those sciences dealing with essentially human activities."

While psychology and ethics have developed in post-Darwinian days under the application of evolutionary methods, logic has until recently remained untouched. "Until the rise of pragmatism no thoroughgoing attempt was made to explain the fundamental notions of logic itself in the light of the selection hypothesis." "Pragmatism is the first whole-hearted attempt at an appreciation of the significance of Darwinism for logical theory." What the authors seek to show is that the attempt has only half succeeded;

"that conceptions and methods inherited from the dogmatic empiricism of the eighteenth century go far to vitiate the evolutionary empiricism of to-day; and that the critical revision of these inherited notions from an evolutionary standpoint will make of pragmatism a far less iconoclastic movement."

The student of organic evolution will be interested in the clear contrast which the authors make between the Darwinian and the Hegelian concepts of evolution. The course of organic evolution is not conceived by biologists as a dialectic; it is not to be explained in terms of mere logical relationship; external circumstances, instead of being unessential, are determining factors. The later stage cannot be described as the necessary realisation of the earlier. "Had external circumstances been ever so little different, the succeeding stages of the process might have been profoundly different." Organic evolution cannot be properly described as the progressive unfolding of a reality potentially existent throughout. Applying the point of this contrast to rational thought, the authors maintain that on the Darwinian view, thought is regarded not as the end and determinant of organic development, but as a product and (more importantly) as a moment or factor in that development—"a factor whose existence and nature are throughout conditioned by the part it has to perform in organic life."

J. A. T.

#### GEOLOGY AND THE DOCTRINE OF DESCENT.

*Abstammungstheorie mit Rücksicht auf Erdgeschichte.* By Prof. H. Pohlig. Pp. 191. (Stuttgart: Gesellschaft "Neue Weltanschauung" and F. Lehmann, 1909.) Price 2 marks.

SCIENCE in England has been peculiarly fortunate in its popular exponents, especially on the biological side; the only regret is that they are so few. In Germany there is no lack in number, but it would be insincere to express unqualified admiration of the prevailing style. Most of us probably would prefer