markable success was obtained in the experiments. Particulars are also given as to how these varieties compare with the *standard* sorts in cultivation and notes on their adaptability to the different climates of Canada.

'The Scientific Work of Professor Charles F. Hartt,' by Professor G. U. Hay, M.A., Ph.B. A tribute to one of Canada's most illustrious sons who laboured successfully in the field of Geological Science, first in Canada, then in Cambridge and later in Brazil, where he fell a victim to yellow fever, in 1878, at Rio Janeiro, where he held the post of Director of the Geological Commission.

'Recent additions to the Injurious Insects of Canada,' by Dr. James Fletcher, F.L. S., etc. This paper treats of the several injurious species which have attracted public attention by their ravages upon crops of all kinds for the last twenty years. It will form a most practical as well as scientific treatise on a subject of vital importance to Canada.

'Catalogue of Canadian Proctotrypidæ,' by W. Hague Harrington, Esq. Two hundred species are enumerated, most of which come from Ottawa and its vicinity. Descriptions of new species are given and notes on the habits of several species added.

'On the Origin of the Silvery Appearance in the Integument of Fishes,' by Professor E. E. Prince, B.A., F.L.S., and 'Some Chitinous Elements in the Larval Skeleton of Fishes which appear to be Primitive,' by Professor E. E. Prince, also form two interesting contributions to the science of biology.

'The Geology of the more important Cities in Eastern Canada' is the title of a paper by Dr. H. M. Ami. Geological tables have been drawn up for St. John (New Brunswick), Quebec City, Montreal, Ottawa, Kingston, Toronto, Hamilton and London.

Professor T. Wesley Mills, of McGill University, entertained Section IV. with an intensely fascinating subject, 'An Investigation of the Physiology of the Brain of the Bird,' together with 'An Examination of some points in the Psychology of that Animal.' Two pigeons whose brains had been almost entirely removed and wounds healed have been subjected to close examination and their behavior noted. Upwards of four months have elapsed since the operation was performed, and Dr. Mills awaits further developments before submitting the healed parts to a microscopical examination.

On the evening of the 23d of May—an evening with our Canadian poets and writers was held with immense success. Dr. W. H. Drummond, of Montreal; Wilfred W. Campbell, of Ottawa; W. A. Frazer, of Toronto; W. J. Phillip-Woolley, of British Columbia; Attorney-General Longley, of Halifax, Nova Scotia; Duncan C. Scott, of Ottawa; Dr. Louis Frèchette, Laureate of the *Académie de France*, of Montreal, and Revs. Frederick G. Scott, of Drummondville, Quebec, and Archbishop O'Brien, of Halifax, took part.

At the public meeting Professor Rutherford, assisted by Professor John Cox, of the Physics Laboratories, McGill University, described and illustrated 'Wireless Telegraphy' to a large audience with marked success.

H. M. Ami.

Ottawa, June, 1899.

SCIENTIFIC BOOKS.

The Anatomy of the Central Nervous System of Man and of Vertebrates in General. By Professor Ludwig Edinger, M. D. Translated from the Fifth German Edition by Winfield S. Hall, Ph.D., M. D., assisted by P. L. Holland, M.D., and E. P. Carlton, B.S. The F. A. Davis Co. Pp. 446. Figs. 258.

Few books could be more welcome in an acceptable English dress than the last edition of Edinger's 'Vorlesungen ueber den Bau der Ner-

vösen Centralorgane,' the greatly enlarged fifth edition of which has been for some time in our hands and has quite superseded the translation by Dr. Riggs, though the latter has already served a useful purpose in introducing our author to the American public. The transformation which this book, intended simply to give a summary of the best-established facts of neurology for busy people, has undergone in so short a time is a good index of the progress the science has been making.

Professor Edinger quotes with approbation the suggestion of Burdach that, in addition to the gathering of building material, every period brings with it the obligation to attempt anew the rearing of a structure presenting the knowledge in definite form. This synthesis of our present knowledge Edinger endeavors to give. In some parts of the edifice, it is true, the efforts result chiefly in making more evident great gaps to be filled. This is for the active investigator a most important service in itself, especially when brought into relation with the received facts in such a way as to afford a perspective of the path which research may profitably follow.

No one now-a-days could fail to appreciate that the light needed for the decipherment of the intricate structure of the human brain must come from the study of the simpler brains of lower vertebrates, and no one has had better opportunities than Professor Edinger to supply just this light. Not only have his own studies peculiarly fitted him for this work, which his experience as practical physician and teacher has tended to keep in touch with human interest, but the duty of preparing a yearly summary for Schmidt's *Jährbucher* has enforced the necessity of a minute knowledge of the work done in these lines by others the world over. More than any other leading European neurologist he has familiarized himself with the work of his contemporaries in all lands.

The book as it now stands contains, in addition to the material of the original twelve lectures on the structure of the mammalian brain which now constitutes Part III., an introduction devoted to fundamental conceptions and physiology of brain and peripheral nerves, and Part II., a review of the embryology and comparative anatomy of the vertebrate brain. It may be admitted that this method of treatment is at the expense of unity and entails some repetition, yet the practical advantage to the student who may be chiefly interested in human anatomy is manifest.

The results of the author's studies of the forebrain and mid-brain of reptiles are here used to great advantage. It has been a matter of surprise to the present reviewer that the desirability of starting with the reptilian brain has not been more clearly recognized by teachers of the comparative anatomy of the brain, for in this group we have a degree of simplicity without the puzzling interference of the specialized structures found in the brain of fishes or the embryonic lack of differentiation seen in amphibia. The present book makes this course possible and presents the strongest possible reasons for pursuing it.

As might have been expected, the olfactory apparatus is clearly and fully treated, as are the cephalic parts of the brain in general.

The discussion of the cerebellum, on the other hand, is somewhat less satisfactory than the other sections, and serves very vividly to enforce the need of thorough comparative work on this organ in spite of the wealth of isolated facts recently accumulated. "Of the connections and definite course of the fibers of the cerebellum there is, as yet, little known." "Where the inferior cerebellar peduncle enters the cerebellum is the least understood portion of the whole nervous system." "Least known as to their real origin are several frontal tracts." "The relation of the nuclei to the fiber system of the white substance is almost wholly unknown." In fact, it has to be admitted that we have but the vaguest idea of the relations of the afferent, efferent and special sensory fibers that have been traced into or to the cerebellum. The present writer may remark that his suggestion, made several years ago on the basis of a study of types from nearly all groups of vertebrates, that connections are established, by way of certain 'switch cells' in the pes pedunculi, between descending motor tracts from the cerebrum and fibers to the cerebellum, has remained unchallenged, and offers a reasonable basis for interpreting some of the facts of phys-

iology. It is not correct to say with our author that the cerebellum is ontogenetically developed from a simple cell plate. There is abundant evidence that the cerebellum is essentially a paired organ, and this, too, is in harmony with its function. The curious method of supplying its surface where the bulk is increased, as in mammals, by lateral diverticles deserves passing mention.

The English translation is neatly printed, though there are a few mistakes which greater care would have avoided. Figure 3, for example, is wrong side up, and thus the description is belied.

The translation is far from faultless, though for the most part intelligible. We are prepared to find that a translator should be so influenced by the idiom of the original as to produce a somewhat halting English style, and it often happens that the translator's own style leaves something to be desired, but there is no excuse for translating Gehörgrube as oral pit, as Dr. Hall has done. Fasersystem appears as 'tract' in a connection where it is important to distinguish between these terms. 'Dicht anlegen' is translated 'lie close beside.'

On page 16 the author is made to say 'all vertebrates,' where the original says 'all lower vertebrates,' and proceeds to make an important distinction between lower and higher vertebrates.

We do not wish to enter upon the field of vexed neuronomy, but regret that the translator was not satisfied with 'neurite' or 'axis cylinder,' as used by the author, and substitutes the less satisfactory 'neuraxon,' which Dr. Edinger did not use at all. 'Fundament' for 'Anlage' is to us an unpleasant word, to say nothing of its ambiguous sound. 'Proton' is sufficiently well known. It seems strange that in an English work we should need to puzzle over the terms of direction 'up and down,' 'back and forward,' etc. Minor inaccuracies like 'mantel' for 'mantle' in one place are probably slips in proof-reading.

On the whole, then, while we congratulate ourselves on this addition to the resources of the teacher of neurology, we hope that a later edition may remove these causes for irritation to the instructed reader. C. L. Herrick.

The Characters of Crystals, an Introduction to Physical Crystallography. By Alfred J. Moses, E.M., Ph.D., Professor of Mineralogy, Columbia University, New York City. New York, D. Van Nostrand Company. 1899. Pp. 211.

This little volume contains the principles of modern crystallography and descriptions of the instruments and methods used in the determination of the various physical characters of crystals. The advanced student in mineralogy and crystallography will find it of much assistance, because it presents in a concise form, omitting unnecessary detail, the subjects treated of in the larger foreign text-books on physical crystallography.

The contents are divided into three parts, the first dealing with the geometrical characters of crystals. In the classification of the thirty-two types of crystals the author has followed Professor Groth, and has wisely retained the same descriptive names for the classes and forms. The common methods of measuring crystals are well described, but a more complete description of the use of the two-circle goniometer would have been better, since this instrument will undoubtedly be used in the future by the advanced worker more than the ordinary goniometer; also in the chapter on crystal projection no mention is made of the gnomonic projection, the value of which Professor Goldschmidt has so well demonstrated. This projection possesses so many advantages over Miller's that it, in connection with the use of the two-circle goniometer, should be understood by every mineralogist.

An excellent course in optical crystallography is given in the second part of the book. The causes of the various optical phenomena and the latest methods for the determination of the optical characters of crystals are explained briefly, yet clearly enough for the student to readily understand this difficult subject.

The third part treats of the general physical characters, such as the effects of heat, magnetism, electricity, etc., on crystals. The author appends a synopsis of an advanced course of crystallography as given at Columbia University. The book is well illustrated by crystal-drawings and by cuts of instruments, and fre-