who accordingly have fully and sympathetically entered into the doctrine of nerve components as developed within the past decade. While he has not himself studied the peripheral nervous system of *Acipenser*, his analysis of the medulla oblongata has been made in the light of the facts of peripheral connections already known, and hence his results are of far-reaching importance to the major problems of the morphology of this confusing region. Into the details of these results we cannot now go, merely calling attention to the fact that in this connection he has made some observations of great importance to the phylogeny and organogeny of the vertebrate nervous system.

For instance, he confirms statements of previous writers that the communis, or visceral sensory, system of cranial nerves is related anatomically with centers both in the oblongata and in the spinal cord which are quite distinct from those of the tactile nerves (general cutaneous centers and dorsal horns). On the other hand, the acustico-lateral system of cranial nerves, innervating the ear and lateral line organs, is structurally very intimately related to the general cutaneous centers and dorsal horns. Johnston, in agreement with other very recent writers, finds the cerebellum directly related with the tuberculum acusticum, all the types of cells characteristic of the cerebellum being represented in the acusticum by transitional forms. From this it follows that the cerebellum and acustico-lateral nerve centers are phylogenetically derived from the dorsal horns of the spinal cord. It is important that this interesting conclusion be controlled by studies upon still more primitive vertebrates and by embryological studies upon the lower fishes, and that the succeeding steps in this evolutionary process be worked out in the types next above the ganoids. The first of these desiderata has already been met in large measure by an exhaustive study of the brain of the lamprey by similar methods, which Dr. Johnston has now in press in an American journal and by which the main theoretical conclusions of this paper are confirmed in a striking manner.

Another critical region upon which interesting conclusions are expressed is the pallium. "There are found in *Acipenser* two sets of cells which seem to constitute the earliest representative of the cortex proper. One of these serves to connect the epistriata of the two sides by fibers through the anterior commissure. The other is found in the dorsal membranous roof of the fore-brain and probably corresponds to the dorsal or dorso-median cortex of reptiles. The transformation of a membranous pallium into a massive nervous pallium, which has recently been declared impossible, is seen in actual progress in its early stages in *Acipenser*."

In conclusion, we may add that, whether Dr. Johnston's theoretical conclusions stand or fall (and we think that for the most part they will stand), the cause of sound morphology is best promoted by just such exhaustive and painstaking researches as this one, by which a secure basis of positive fact is first laid down.

C. JUDSON HERRICK.

The Smithsonian Institution, Documents Relative to its Origin and History, 1835–1899. Compiled and edited by WILLIAM JONES RHEES. In two volumes. Vol. I., 1835–1887. Twenty-fourth Congress to Forty-ninth Congress. Washington, Government Printing Office. 1901. Pp. liii + 1044.

The Smithsonian Institution is taking praiseworthy pains to make permanent records of its origin, history and activities, so that the future historian of science in America shall be able to draw from authorized sources. Three volumes have previously appeared pertaining to the origin and history of Smithson's foundation, one bearing a title similar to that under review, one dealing with the 'Journals of the Board of Regents, Reports of Committees, Statistics,' and the third, the large, handsome work, 'History of the First Half Century,' edited by Dr. George Brown Goode and published in 1897. The volume in hand is compiled and edited by one who has been in the service of the Institution under all three secretaries, as chief clerk and now as keeper of archives, and whose familiarity with the life of the Smithsonian, together with painstaking research, has produced a valuable work.

The book is complementary to that issued in 1879, and contains in detail the history of the

relations of the Institution to Congress, as found in the volumes of the *Congressional Globe* and *Congressional Record*, the Journals of the Senate and House, and the Statutes at Large. Part I. contains the documents pertaining to the foundation, the will of James Smithson, the correspondence ensuing and statements of other bequests to the Institution; Part II. embraces legislation relative to the establishment of the Institution, 1835–1847; Part III. embraces the legislation in Congress from 1847 to 1887; and according to the table of contents of a second volume (printed in Vol. I.), that will contain details of legislation from 1887 to 1899.

These volumes will prove indispensable to those seeking full and accurate information of the Smithsonian Institution.

H. C. B.

A College Text-book of Chemistry. By Ira Remsen. New York, Henry Holt and Co. 1901. Pp. xx + 689.

This book is intended to fill a place between the 'Inorganic Chemistry' and the elementary text-books by the same author. After an introductory chapter, in which some fundamental principles, including the laws of definite and multiple proportions, symbols, and equations, are discussed, six chapters are given to oxygen, hydrogen, water and the atomic theory. The remaining elements are considered in the following order of the families of the periodic system: Chlorine, nitrogen, carbon, lithium, glucinum, aluminium, copper, zinc, gallium, germanium, chromium, manganese, iron, platinum. Two short chapters on carbon compounds close the book. At appropriate points, topics pertaining to theoretical chemistry are taken up, such as the perodic law, mass action, dissociation, osmotic pressure, Faraday's law and atomic heats.

While President Remsen believes that 'the time has not yet come for the abandonment of the study of elements and their compounds in what some are pleased to call the old-fashioned way,' those subjects which pertain to what is commonly known as physical chemistry receive a fair degree of attention. Not only are the fundamental theories of solutions discussed in detail in two or three places, but several applications of the theory are considered in connection with individual compounds. The great importance of such a reiteration of fundamental principles is, of course, clearly recognized by all successful teachers.

The laboratory study which the author intends should accompany the use of the text is indicated by a series of experiments at the close of the successive chapters. A few quantitative experiments are included. The subjects for experimental illustration are mostly well selected, but the addition of some work, demonstrating the fundamental properties of solutions is needed.

The book, as a whole, is written in that clear and fluent English which is so characteristic of the author and which has done so much to make him one of the greatest of the teachers of chemistry.

W. A. Noyes.

SCIENTIFIC JOURNALS AND ARTICLES.

The American Naturalist for November opens with an article on 'The Parasitic Origin of Macroërgates among Ants,' by W. M. Wheeler, in which the writer describes the occurrence of certain monstrous workers of the genus *Pheidole* caused by the presence of a parasite of the genus *Mermis*. These macroërgates are compared with phenomena observed among other species, the author concluding that the character of the adult ants is not due to the efforts of the attendant workers alone, but also to a certain amount of initiative in the larvæ. H. L. Osborn describes 'Some Points in the Anatomy of a Collection of Axolotls from Colorado, and a Specimen from North Dakota,' these points being wholly external and connected with the change of *Siredon* into *Amblystoma*. 'A Parasitic or Commensal Oligochæte in New England' is described in some detail by M. A. Willcox, and Albert C. Eycleshymer gives some interesting 'Observations on the Breeding Habits of *Ameiurus nebulosus*.' M. Louise Nichols considers 'The Spermatogenesis of *Oniscus Asellus* Lim., with especial reference to the History of the Chromatin,' and George H. T. Nuttall treats of 'The Formation of Specific Anti-Bodies in the Blood, following upon Treatment with the Sera of Different Animals,' giving the results of a series of investigations which