many of the papers are illustrated with lithographic plates. All have appropriate head figures, and there are occasional text figures. Part I., Vol. VIII., has a handsome colored plate in which representative insects of different orders are figured, and Part II., Vol. IX., has, as a frontispiece, a heliotype print of Popof Island. The style of printing, binding and illustration is a testimony to the experience and interest of the editor, Dr. C. Hart Merriam, and of the publishers, Doubleday, Page & Co.

C. L. MARLATT.
U. S. DEPARTMENT OF AGRICULTURE.

Lehrbuch der vergleichenden Anatomie. By B. HALLER. Zweite Lieferung. Jena, Gustav Fischer. 1904.

A little more than a year ago a review of the first part of Haller's 'Lehrbuch der vergleichenden Anatomie' was published in this journal (SCIENCE, September 13, 1903) and we have now before us the second part, dealing with the chordata, a volume of some 579 large octavo pages and containing 465 figures.

As is but natural, the standpoint of the author is that of the Heidelberg school and his treatment of the subject is essentially the same as that presented by Gegenbaur in his 'Vergleichenden Anatomie der Wirbelthiere,' so much so, indeed, that the present volume may be regarded as very largely an abridgment of the more extensive work. As such it will undoubtedly prove useful, especially as the author's style is generally clear, the reading pleasant and the figures numerous, excellently reproduced and pertinent.

To speak of the volume as an efficient abridgment of Gegenbaur's 'Vergleichenden Anatomie' is no inconsiderable praise, but it also implies that a perusal of the book gives one the impression that little has been added to our knowledge of the comparative anatomy of the vertebrates since Gegenbaur's volumes appeared. It is unfortunate, also, that the author has chosen to express dogmatically certain hypotheses which, to say the least, are still *sub judice*. Thus, for example, the dogmatic reference (p. 465) of all cases of polymastia in the human species of atavism is certainly ill-advised, as is also the apparently unconditional acceptance of the explanation of the double articulations of the ribs as a relic of a primary double-ribbed condition, a theory which lacks at present any embryological confirmation. So too the emphasized homology (p. 512) of the præchordal portion of the head with the præoral lobe of annelids is decidedly open to adverse criticism and places the author, it may be noted, on a very different standpoint from that adopted by Gegenbaur, for whom the præchordal portion of the cranium was a secondary structure developed from the primitive chordal cranium in adaptation to the development of the brain and sense-organs.

An efficient treatment of the vertebrate nervous system is to be expected from Professor Haller, and in some respects, notably in that some attention is paid to the tracts of the central system, the section shows an improvement over what is usually furnished by text-books of the grade of the present one. A little too much is attempted, unfortunately, within the limits set for the section, the result being an occasional obscurity, but a far more serious defect is the failure to discuss the cranial nerves on the basis of their components. Nothing that has been added to our knowledge of the nervous system within recent years equals in morphological significance the recognition of the cranial nerve components, and any discussion of the cranial nerves on the basis of the old two-root hypothesis must be futile so far as a proper understanding of their general morphology is concerned. And yet not a word is to be found in the volume under review concerning nerve components, but merely one of the variants of the oft-repeated two-root theory, which for many years has but served to retard progress towards the solution of the problem of vertebrate cephalogenesis.

More excusable is the insufficient treatment afforded the sympathetic system, for in it the author is but following the examples of his predecessors, no adequate account of that physiologically important system being as yet incorporated in any text-book of vertebrate anatomy. But scant consideration is given

to the thyreoid and thymus glands, and the difficult morphology of the cœlom and peritoneum is dismissed with little more than a page and a half of actual reading matter.

In the review of the first part of the 'Lehrbuch' attention was called to the exceptionally numerous and gross typographical errors it contained. Two pages of errata contained in the first part form an introduction to the second part, and aroused hopes that due care had been taken that the latter should be tolerably free from errors of this sort. The hopes, however, were vain. Although the errors are less numerous and striking than in the earlier part yet they are sufficiently abundant to cause surprise. They are, as before, most frequent in connection with the proper names, but one must needs rub one's eyes and look again when one reads of the lamina scribosa of the ethmoid or of the hetopapancreas. J. P. McM.

SOCIETIES AND ACADEMIES.

THE SAN FRANCISCO SECTION OF THE AMERICAN MATHEMATICAL SOCIETY.

THE sixth regular meeting of the San Francisco Section of the American Mathematical Society was held at the Universty of California on October 1, 1904. Fifteen members of the society were present. A number of other teachers of mathematics living in or near San Francisco attended both of the sessions. The following officers were elected for the ensuing year:

Chairman—Professor Haskell.

Secretary—Professor Miller.

Program Committee—Professors Haskell, Lehmer and Miller.

Major P. A. MacMahon member of the council of the London Mathematical Society, presided during the morning session, and Professor Irving Stringham during the afternoon session. The following papers were read:

PROFESSOR E. J. WILCZYNSKI: 'General projective theory of space curves.'

PROFESSOR L. M. HOSKINS: 'Stresses in an elastic sphere due to a superficial layer of heavy matter of uniform thickness bounded by a circle.'

DR. T. M. PUTNAM: 'Concerning the factors of $(p^2-1)^2$ that are of the form $px+1$, and allied problems.'

MAJOR P. A. MACMAHON: 'Groups of linear differential operators.'

PROFESSOR H. F. BLICHFELDT: 'On primitive continuous groups.'

PROFESSOR D. N. LEHMER: 'Figures invariant in space of three dimensions under the most general projective transformation.'

PROFESSOR G. A. MILLER: 'Determination of all the groups of order 2^m which contain an odd number of cyclic subgroups of composite order.'

The program provided also for a 'Conference on recent investigations in the foundations of geometry.' This conference was opened by Professor Stringham, who was followed by Dr. J. H. McDonald. A number of the high school teachers took part in the discussion, which had reference mainly to the influence of the recent investigations on the teaching of elementary mathematics. The next meeting will be held at Stanford University, on February 25, 1905.

G. A. MILLER,
Secretary of the Section.

NEW YORK ACADEMY OF SCIENCES.
SECTION OF GEOLOGY AND MINERALOGY.

THE section met at the American Museum of Natural History on October 17, 1904, at 8:15 P.M., with Professor James F. Kemp in the chair.

The special business of the evening was the nomination by the section of officers to serve for the calendar year 1905. The following nominations were made: For chairman and vice-president of the academy, E. O. Hovey, of the American Museum of Natural History; for secretary, A. W. Grabau, of Columbia University.

The program of the evening consisted of a lecture by E. O. Hovey, on 'St. Vincent, British West Indies: The Eruptions of 1902 and their Immediate Results.'

The author gave a summary account of the results obtained on two expeditions undertaken by him for the American Museum of Natural History in 1902 and 1903, for the study of the volcanic eruptions of the Soufrière which began in May, 1902. Particular attention was devoted to the heavy coating of