

SCIENCE

EDITORIAL COMMITTEE: S. NEWCOMB, Mathematics; R. S. WOODWARD, Mechanics; E. C. PICKERING, Astronomy; T. C. MENDENHALL, Physics; R. H. THURSTON, Engineering; IRA REMSEN, Chemistry; J. LE CONTE, Geology; W. M. DAVIS, Physiography; O. C. MARSH, Paleontology; W. K. BROOKS, C. HART MERRIAM, Zoology; S. H. SCUDDER, Entomology; C. E. BESSEY, N. L. BRITTON, Botany; HENRY F. OSBORN, General Biology; C. S. MINOT, Embryology, Histology; H. P. BOWDITCH, Physiology; J. S. BILLINGS, Hygiene; J. MCKEEN CATTELL, Psychology; DANIEL G. BRINTON, J. W. POWELL, Anthropology.

FRIDAY, FEBRUARY 10, 1899.

CONTENTS:

<i>The Smithsonian Institution</i>	193
<i>Agricultural Experiment Stations</i> : DR. A. C. TRUE	199
<i>Physiological Osmosis</i> : PROFESSOR GEORGE MAC- LOSKIE	206
<i>Professional Schools vs. Business</i> : PROFESSOR R. H. THURSTON	207
<i>Mechanical Illustration of Kirchoff's Principle</i> : PROFESSOR WILLIAM HALLOCK	210
<i>Plastiline, a New Modeling Compound</i> : DR. C. R. EASTMAN	211
<i>Scientific Books</i> :—	
<i>Beddard on the Structure and Classification of Birds</i> : F. A. LUCAS. <i>Russell on The Rivers of North America</i> : PROFESSOR R. E. DODGE. <i>Broomell's Anatomy and Histology of the Mouth and Teeth</i> : PROFESSOR CHARLES S. MINOT. <i>Books Received</i>	212
<i>Scientific Journals and Articles</i>	217
<i>Societies and Academies</i> :—	
<i>The Texas Academy of Sciences</i> : PROFESSOR FREDERIC W. SIMONDS. <i>Philosophical Society of Washington</i> : E. D. PRESTON. <i>The Anthro- pological Society of Washington</i> . DR. J. H. MC- CORMICK. <i>The New York Academy of Sciences, Section of Psychology and Anthropology</i> : DR. C. B. BLISS. <i>Section of Astronomy and Physics</i> : DR. REGINALD GORDON. <i>Academy of Science of St. Louis</i> : PROFESSOR WILLIAM TRELEASE	217
<i>Discussion and Correspondence</i> :—	
<i>Zoological Nomenclature</i> : DR. W. H. DALL. <i>The Red Beds of Kansas</i> : PROFESSOR S. W. WILLISTON. <i>Men of Science and Anti-vivisection</i> : HENRY C. MERCER	221
<i>Astronomical Notes</i> :—	
<i>Reports of Observatories; The Planet DQ</i> : PRO- FESSOR WINSLOW UPTON	224
<i>Notes on Physics</i> : <i>Some Recent Investigations upon the Becquerel Rays</i> : A. ST. C. D.	225
<i>Botanical Notes</i> :—	
<i>Sargent's Silva of North America; Commendable Free-Seed Distribution; The Study of Iowa Sedges; North American Seaweeds; Arthur and Holway's Rusts</i> : PROFESSOR CHARLES E. BESSEY	226
<i>Current Notes on Anthropology</i> :—	
<i>Courses at the École d'Anthropologie; The Mean- ing of Race; The Extinction of the Polynesian</i> : PROFESSOR D. G. BRINTON	227

<i>Meeting of the Trustees of the Marine Biological Laboratory</i>	228
<i>Scientific Notes and News</i>	228
<i>University and Educational News</i>	232

MSS. intended for publication and books, etc., intended for review should be sent to the responsible editor, Professor J. McKeen Cattell, Garrison-on-Hudson N. Y.

THE SMITHSONIAN INSTITUTION.*

FINANCES.

THE permanent funds of the Institution are as follows:

Bequest of Smithson, 1846.	\$515,169.00
Residuary legacy of Smithson, 1867. .	26,210.63
Deposits from savings of income, 1867	108,620.37
Bequest of James Hamil- ton, 1875.	\$1,000.00
Accumulated interest on Hamilton fund, 1895. ...	1,000.00
	2,000.00
Bequest of Simeon Habel, 1880.	500.00
Deposits from proceeds of sale of bonds, 1881.	51,500.00
Gift of Thomas G. Hodgkins, 1891. .	200,000.00
Portion of residuary legacy, T. G. Hodgkins, 1894.	8,000.00
Total permanent fund.	912,000.00

The appropriations made by Congress for the fiscal year 1899 were as follows:

International Exchanges, Smithsonian Institution, 1899.	\$21,000
American Ethnology, Smithsonian In- stitution, 1899.	50,000
Astrophysical Observatory, Smithsonian Institution, 1899.	10,000
National Museum, Smithsonian Institu- tion, 1899:	
Furniture and fixtures.	35,000
Heating and lighting.	14,000

* From the report of S. P. Langley, Secretary of the Smithsonian Institution, for the year ending June 30, 1898.

a concise method of expression until his ideas were so clear that a short handle appealed to him, not as a possible, but as a necessary convenience. The chapter as a whole is a very serviceable text-book on modern physiography and is of exceptional value to all who have previously been embarrassed by the inaccessibility of the literature on this subject.

The footnote references are many and well selected, and, although not complete, give a good introduction to the general literature. The illustrations are, on the whole, excellent, and the form of reproduction has been unusually successful. The book could well have been enriched with more illustrations of normal river topography, and would then have been much more valuable, both to student and teacher. The typography is clear and pleasing, and the book very attractive in its general form. A good index completes the volume.

We read the book through almost at one sitting, and laid it down with but two regrets: first, that there was not more; and second, that this, the best of the series of four monographs by Professor Russell, was not uniform in general appearance with its predecessors. It is certainly a misfortune that three publishers should have issued these four books. Had they been uniform in appearance, they would have been of greater interest to the general reader, especially to those who get pleasure from the shelf as well as the hand appearance of a row of related books.

We know of but few books that are so nearly what one would desire as this book. Adverse criticism can only be directed to details, and lamentation over details is out of place when a book is so generally pleasing as this.

RICHARD E. DODGE.

TEACHERS COLLEGE, COLUMBIA UNIVERSITY.

Anatomy and Histology of the Mouth and Teeth.

By J. NORMAN BROOMELL, D. D. S. Philadelphia, P. Blakiston's Sons & Co. 1898.

With 234 Illustrations. 8vo. Pp. viii + 428.

The book contains the best account of the teeth of man, which has yet appeared in the English language. It includes the treatment of oral anatomy and of dental histology and development. It is illustrated chiefly by original

photographs engraved in half-tone. The most important and most meritorious part of the book is comprised in Chapters VIII.-XI. (pages 131-280), which offer detailed and valuable descriptions of the teeth, marred only by a fantastic subdivision of the incisors, canines and first bicuspids of the upper jaw into four types, bilious, nervous, sanguineous and lymphatic, an astonishing revival this of mediæval pseudo-science in the midst of a work otherwise serious and intelligent. The author's descriptions are clear and admirable, and by their thoroughness meet a real need. In fact, it has long seemed singular that there should be no adequate detailed account of human teeth, but the need seems to be now well supplied.

The chapters on the teeth, above referred to, are preceded by the seven which deal with the anatomy of the oral region, and are followed by six chapters on the development of the teeth, the histology of oral structures and the histology of the teeth. Dr. Broomell's attempt to apply photography for histological illustrations is not encouraging, all of the figures of microscopic structure being very far inferior to cuts from drawings. The account of the development of the teeth is fairly good, but not equal to the standard of the anatomical part. Some minor errors appear in the embryological portions, for example, 'tooth band' is used instead of 'dental shelf;' the tooth germ in Fig. 180 is so distorted that it gives no idea of the true relations; in Fig. 181 the hole between the tooth and the shrunken enamel organ is labeled enamel. But it is not worth while to dwell upon these defects in a work of solid merit.

The publisher's share has been well executed, the general appearance of the volume being dignified and attractive, the printing excellent.

CHARLES S. MINOT.

BOOKS RECEIVED.

The Foundations of Zoology. WILLIAM KEITH BROOKS. Columbia University Biological Series. Vol. V. New York, The Macmillan Company. 1899. \$2.50.

The Native Tribes of Central Australia. BALDWIN SPENCER and F. J. GILLEN. London and New York, The Macmillan Company. 1899. Pp. x + 671. \$6.50.

Die Spiele der Menschen. KARL GROOS. Jena, Gustav Fischer. 1899. Pp. iv + 538. Mark 10.

Zoological Results based on Material from New Britain, New Guinea, Loyalty Islands and Elsewhere, collected during the Years 1895-1897. ARTHUR WILLEY. Cambridge University Press. 1899. Pt. 2. Pp. 121-206. 12s. 6d.

Lectures on the Evolution of Plants. DOUGLAS HOUGHTON CAMPBELL. New York and London, The Macmillan Company. 1899. Pp. viii + 319. \$1.25.

Mental Arithmetic. J. A. MCLELLAN and A. F. AMES. New York and London, The Macmillan Company. 1899. Pp. x + 138.

New York State Museum. Forty-ninth Annual Report of the Regents, 1895. Vol. 2, Report of State Geologist, Albany. University of the State of New York. 1898. Pp. 738.

Physical Chemistry for Beginners. DR. CH. VAN DERVENTER. With an Introduction by PROFESSOR J. H. VAN'T HOFF. Translated by BERTRAM B. BOTHROW. New York, John Wiley & Sons; London, Chapman & Co. 1899. Pp. x + 154. \$1.50.

SCIENTIFIC JOURNALS AND ARTICLES.

THE *Auk* for January is an unusually large number, and consequently is a little late in making its appearance. It commences with Mr. Chapman's discussion of the 'Relationships of *Ammodramus maritimus* and its Allies,' which is followed by Mr. O. B. Warren's 'Chapter in the Life History of the Canada Jay.' Mr. Oberholser has a paper on 'The Blue Honey-Creepers of Tropical America,' for which the new generic name *Cyanerpes* is proposed, and Dr. Gill considers the generic names *Pediocætes* and *Poocætes*, concluding that they must give way to *Pedioecetes* and *Poocetetes*. Many new species and subspecies are described, a New *Hylocichla* by Mr. Oberholser, a number of new forms from Mexico by Mr. Nelson, and several new species and subspecies of *N. A. Fringillidæ* by Mr. Ridgway. Under the caption 'Truth versus Error,' Mr. Elliot and Dr. Allen continue the discussion of the propriety of correcting mis-spelled scientific names. Mr. Witmer Stone presents a long report, very encouraging in parts, on 'The Protection of North American Birds,' and, finally, is the Ninth Supplement to the A. O. U. Check List. This contains a long list of

changes, the most startling of which, perhaps, is at the outset, where the generic name for the Loons is decided to be *Gavia* and the family name *Gaviidæ*.

THE contents of *The American Journal of Science* for February are as follows:

'Contribution to the Study of Contact Metamorphism,' by J. M. Clements.

'Origin of Mammals,' by H. F. Osborn.

'Chemical Composition of Tourmaline,' by S. L. Penfield and H. W. Foote.

'Littoral Mollusks from Cape Fairweather, Patagonia,' by H. A. Pilsbry.

'Thermodynamic Relations for Steam,' by G. P. Starkweather.

'Descriptions of imperfectly known and new Actinians, with critical notes on other species, III,' by A. E. Verrill.

'Volumetric Method for the Estimation of Boric Acid,' by L. C. Jones.

SOCIETIES AND ACADEMIES.

THE TEXAS ACADEMY OF SCIENCES.

THE midwinter meeting of the Texas Academy of Science was held in Austin during the last week of December. The program was as follows:

Tuesday, December 27th.—(1) 'Do the Reactions of the Lower Animals due to Injury indicate Pain Sensations?' Professor W. W. Norman, University of Texas. Numerous experiments upon living animals were described in detail and the conclusion reached that so far as the invertebrates and the lower vertebrates are concerned the reactions due to injury do not necessarily indicate pain. (2) 'Three Recent Gifts to the University of Texas,' Dr. W. J. Battle. The gifts described in this paper consisted of, 1st, a storage amphora from the cellar of the Courts of Justinian in Constantinople; 2d, a stone bearing an inscription recording the gift of a crown to one Lysagoras by the people of Ilium, and 3d, a twelfth century manuscript of the Gospels from the Island of Prinkipos, Sea of Marmora. These interesting objects were presented to the University by the Hon. Alexander Terrell, late Minister of the United States to Turkey.

Wednesday, December 28th.—(1) 'Some New Measurements of Electric Waves,' Regent R. S. Hyer, Southwestern University. This valu-