are retained in the Council for one year after retirement.

The following papers were read at the meeting:

(1) PROFESSOR M. I. PUPIN: 'Electrical oscillations on a loaded conductor.'

(2) PROFESSOR MAXIME BÔCHER: 'An elementary proof that Bessel's functions of the zeroth order have an infinite number of real roots.'

(3) PROFESSOR J. M. PEIRCE: 'Determinants of quaternions.'

(4) PROFESSOR HENRY TABER: 'The chief theorem of the theory of finite continuous groups.'

(5) PROFESSOR ALEXANDER MACFARLANE: 'On the imaginary of geometry.'

(6) PROFESSOR EDGAR ODELL LOVETT: 'On a certain class of differential invariants.'

(7) PROFESSOR JAMES PIERPONT: 'On arithmetizing mathematics.'

(8) DR. VIRGIL SNYDER: 'Lines of curvature on annular surfaces having two spherical directrices.'

(9) PROFESSOR W. F. OSGOOD: 'On a continuous function of a real variable whose derivative cannot be integrated.'

(10) PROFESSOR ERNEST W. BROWN: 'On the progress of the calculations in the new lunar theory.

(11) PROFESSOR M. I. PUPIN: 'Lagrange's equations and the principle of equality of action.'

(12) PROFESSOR E. B. VAN VLECK: 'On the determination of a series of Sturm's functions by the computation of a single determinant.'

(13) DR. G. A. MILLER: 'On the primitive groups of degree 17.'

(14) DR. L. E. DICKSON: 'Concerning the abelian and hypoabelian groups.'

(15) DR. F. H. SAFFORD: 'Surfaces of revolution in the theory of Lamé's products.'

(16) DR. D. F. CAMPBELL: 'On linear differential equations of the third and fourth orders in whose solutions exist certain homogeneous relations.'

(17) MR. E. R. HEDRICK: 'On three-dimensional determinants.'

(18) DR. G. H. LING: 'An examination of groups whose orders lie between 1093 and 2000.'

(19) PROFESSOR A. G. WEBSTER: 'Traces illustrating the motion of the top.'

The next meeting of the Society will be held on Saturday, April 29th. The Chicago Section meets at the University of Chicago on Saturday, April 1st.

F. N. COLE,
Secretary.

THE NOMENCLATURE OF THE HYOID IN BIRDS.

THE hyoid apparatus of birds is so simple a structure, one so long known and so well studied, that it would naturally be supposed anatomists might agree upon the names of its component parts. Those who have occasion to refer to anatomical text-books, however, are well aware that there is a surprising, not to say bewildering, variation in the nomenclature used by different authors, as a glance at the accompanying figure and table of names will make apparent.

It is quite evident that all of these names cannot be correct, and a little reflection will show some of the changes that are certainly needed, and others that probably should be made. Taking the last first, let us consider that part, B, termed urohyal by Mivart and Gadow. The urohyal of fishes is a membrane bone developed beneath the anterior portion of the branchial arches; hence, it is quite evident that the name cannot be consistently applied to a cartilage bone at the posterior end of the branchial apparatus, and that Parker's term, second basibranchial, should stand. Equally simple is the case of the paired bones, D, called basibranchials by Gadow and hypobranchials by Beddard. Basibranchials are unpaired bones developed in the median line, and the term is inapplicable to paired bones lying on either side of an unpaired basal bone. As for hypobranchials, these are among the first seg-

ments of a branchial arch to disappear, not being developed even in tailed amphibians, and it will be safe to call the lower portion of the posterior arch of the hyoid a ceratobranchial, and the adjoining segment an epibranchial. The anterior pair of bones, in the body of the tongue, C, are naturally ceratohyals.

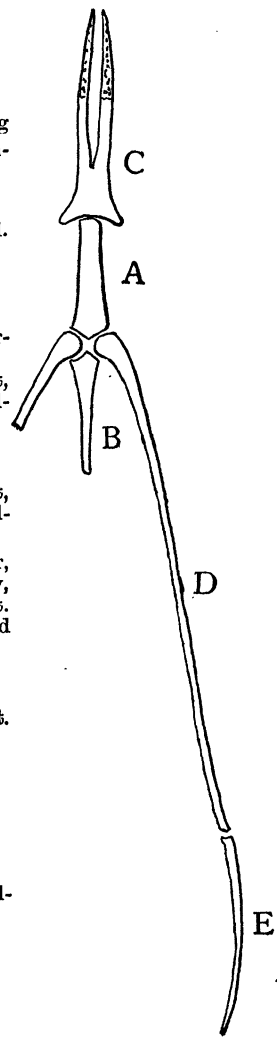

Fig. 1.

Hyoid of Grebe showing component bones, much enlarged.

A First basibranchial.
B Second basibranchial.
C Ceratohyals.
D Ceratobranchials.
E Epibranchials.

A { Basibranchial: Parker. / Basihyal: Mivart, Gadow, Beddard-figure.
B { Basibranchial 2: Parker. / Urohyal: Mivart, Gadow, Beddard.
C { Ceratohyal: Parker, Mivart, Gadow, Beddard in part. / Basihyal: Beddard in part.
D { Ceratobranchial: Parker. / Thyrohyal: Mivart. / Basibranchial: Gadow. / Hypobranchial: Beddard.
E { Epibranchial: Parker. / Ceratobranchial: Gadow, Beddard.

The next question, that of the proper name for the anterior basal bone of the hyoid, A, calls for some reflection, since it involves not only the nomenclature of the hyoid in birds, but in mammals as well. This bone is called basibranchial by Parker and basihyal by Gadow, this latter name being ordinarily used for the basal bone of the mammalian hyoid.

A true basihyal, or as it is better called from its relations, glossohyal, is found in fishes at the upper, anterior portion of the hyoid apparatus. It is also present in turtles, where it has the same relation to the tongue as in fishes, and where it ossifies some little time after the first basibranchial, with which it soon becomes confluent. It seems a little doubtful if a true basihyal occurs among birds, although the median piece of cartilage contained in the fleshy portion of the tongue and articulating with the fused ceratohyals in such birds as ducks may represent this bone. The question is one which the embryologist can readily answer. As pointed out by Parker, the true basihyal does not occur in mammals, the term being given to a bone that is morphologically the first basibranchial. It would seem that exact morphological nomenclature should reject the term basihyal for the first basal median bone in the hyoid of birds and mammals, including, of course, man, as there is no reason why human anatomy should stand as a stumbling block in the way of the student of comparative anatomy, although it has often done so.

F. A. Lucas.

SCIENTIFIC BOOKS.

A Treatise on Universal Algebra. By A. N. Whitehead, M.A., Fellow and Lecturer of Trinity College, Cambridge. Cambridge, University Press; New York, The Macmillan Co. Vol. I. Pp. xxvii+586. Price, $7.50.

By 'Universal Algebra' is meant the various systems of symbolic reasoning allied to ordinary algebra, the chief examples being Hamilton's Quaternions, Grassmann's Calculus of Extension and Boole's Symbolic Logic. The present volume contains an exposition of the general principles of universal algebra, followed by a