"Evolution in Biology" is an entertaining history of the contest between the theories of Epigenesis and Metamorphosis, passing on to a brief account of the facts relating to the "Evolution of the Individual" as brought to light by modern embryology, and of the "Evolution of the Sum of Living Beings," as previously taught by the older theorists, and as now taught by a conjunction of the sciences.

On the two addresses that remain it is needless to comment, as one of them—viz. that which was delivered before the International Medical Congress in August last—must be well within the recollection of our readers, and the other "On the Coming of Age of the 'Origin of Species,'" has already been printed in these columns (1880). We may, however, fitly conclude our necessarily inadequate review of so much admirable writing by again printing the beautiful peroration of this address.

"I venture to repeat what I have said before, that, so far as the animal world is concerned, evolution is no longer a speculation, but a statement of historical fact. It takes its place alongside of those accepted truths which must be reckoned with by philosophers of all Schools. Thus when, on the first day of October next, the 'Origin of Species' comes of age, the promise of its youth will be amply fulfilled; and we shall be prepared to congratulate the venerated author of the book, not only that the greatness of his achievement and its enduring influence upon the progress of knowledge have won him a place beside our Harvey; but, still more, that, like Harvey, he has lived long enough to outlast detraction and opposition, and to see the stone that the builders rejected become the head-stone of the corner."

GEORGE J. ROMANES

OUR BOOK SHELF

Proceedings of the London Mathematical Society, vol. xii. (November 11, 1880–November 10, 1881).

THE papers in this volume, as usual, are mostly purely analytical in their character. Prof. Cayley's contributions are very short: the binomial equation $x^p - 1 = 0$; quinquisection; on the flexure and equilibrium of a skew surface; on the geodesic curvature of a curve on a surface, and on the Gaussian theory of surfaces. Sir J. Cockle continues his remarks on binomial biordinals. Mr. Glaisher's papers are also few and short, viz. on some definite integrals expressible in terms of the first complete definite integral, and of gamma-functions; note on certain symbolic operators and their application to the solution of certain partial differential equations. Messrs. Crofton and J. J. Walker have some points of contact, the former writing on operative symbols in the differential calculus, the latter continuing his theorems in the calculus of operations. Mr. Walker also contributes a quaternion proof of a problem discussed by Mr. S. Roberts, viz. certain tetrahedra specially related to four spheres meeting in a point. Mr. Roberts also gives a historical note on Dr. Graves's theorem on confocal conics." Mr. W. R. W. Roberts has a paper on the periods of the first class of hyper-elliptic integrals, and a note on the coordinates of a tangent line to the curve of intersection of two quadrics. Mr. T. Craig has a note on Abel's theorem. Papers bearing on geometry are contributed by Prof. Genese, on a system of co-ordinates; by Mr. H. Hart, on the general equation of the second degree in tetrahedral co-ordinates; by Mr. H. M. Jeffery, on bicircular quartics, with a triple and a double focus, and three single foci, all of them collinear; and on spherical quartics, with a quadruple cyclic arc and a triple focus; by Prof. Mannheim, sur les surfaces parallèles; by Mr. R. A. Roberts, on the tangents

drawn from a point to a nodal cubic; and note on a system of cartesian ovals, passing through four points on a circle. Signor Brioschi writes sur une propriété du paramètre de la transformée canonique des formes cubiques temaires; and Mr. Carpmael renews an old discussion in his some solutions of Kirkman's 15-school-girl problem. The subject of kinematics on a sphere is ably treated by Mr. E. B. Elliott. Mr. Routh contributes some applications of conjugate functions, and Mr. W. D. Niven writes on the electrical capacity of a conductor bounded by two spherical surfaces cutting at any angle. The presidential address is by Mr. C. W. Merrifield, and is entitled "Considerations respecting the Translation of Series of Observations into Continuous Formulæ." We have sketched out a bill of fare appealing to many diverse tastes, and we can assure our readers that the dishes are all of admirable quality.

Jornal de Sciencias Mathematicas e Astronomicas. Publicado pelo Dr. Francisco Gomes Teixeira. (Coimbra, 1881.)

WE have received the first two volumes of this work and the five opening numbers of the third volume. It is a matter of considerable interest to see what a place scientific writings and mathematical works are taking in the Peninsula. The journal before us is apparently not at all ambitious in its aims, but seeks to bring before the students such articles as might perhaps find a place in our own *Messenger of Mathematics*. A fault we have to find with the single numbers is that they have no index of contents, and further, they are unstitched. We wish Prof. Gomes Teixeira every success in his venture.

Philosophische Studien herausgegeben. Von Wilhelm Wundt. Bd. 1 Heft 1. (Leipzig: W. Engelmann, 1881.)

IN the *Philosophische Studien* we have the first instalment of a new periodical conducted by Wilhelm Wundt, which bids fair to attract a wide circle of readers not deterred by close, hard reasoning. It contains four articles:—(1) *On psychological methods*, by the editor; in three sections treating of the psychophysical methods, methods of analysis of the sense-perception, and of psychological measurement of time; (2) *On the length of time in the apperception of simple and compound ideas (colours and numbers)*, by Dr. Max Friedrich; an essay which no doubt owes a great deal also to the editor, and containing the results of some remarkable experiments on the above phenomena; (3) *Investigations on the sense of time*, by Julius Kollert, in continuation of Vierordt's experiments on the same subject; (4) *On mathematical induction*, by the editor, under the heads of "analytical and synthetic methods in mathematics," "the question of the origin of mathematical principles," "experimental beginnings of mathematics," "permanent forms of mathematical induction," "mathematical abstraction," and "exact analogy." The spirit and methods of the editor permeate the whole of this first number, and guarantee the value of the periodical.

Biologische Probleme, zugleich als Versuch einer rationellen Ethik. Von W. H. Rolph. (Leipzig: W. Engelmann, 1881).

ORIGINALLY intended as a criticism on the customary methods of ethics, especially Herbert Spencer's "Data of Ethics," the present work has assumed a wider scope, and embraces the treatment of a number of biological problems, which the author has endeavoured to connect with a view to solution on a common basis. Its aim may be best exhibited in the following enumeration of the subjects discussed:—viz. the doctrine of evolution, subjective systems (Mallock, Spencer, Miss Bevington); H. Spencer's Hedonism; theory of nourishment (hunger the first motive to action, p. 53); theory of development