A. S. GALE: 'On three types of surfaces of the third order regarded as double surfaces of translation.'

L. P. EISENHART: 'Surface of Bonnet and their transformations.'

EDWARD KASNER: 'On partial geodesic representation.'

F. N. COLE: 'On the factoring of large numbers.'

E. GOURSAT: 'A simple proof of a theorem in calculus of variations (extract from a letter to W. F. Osgood).'

BURKE SMITH: 'On the deformation of surfaces whose parametric lines form a conjugate system.'

G. A. MILLER: 'On the number of sets of conjugate subgroups.'

ELIJAH SWIFT: 'On the condition that a point transformation of the plane be a projective transformation.'

IDA M. SCHOTTENFELS: 'On the simple groups of order 8!/2 (preliminary communication).'

IDA M. SCHOTTENFELS: 'The necessary condition that two linear homogeneous differential equations shall have common integrals.'

The American Physical Society was also in session at Columbia University on the same day. The members of the two societies lunched together at the university restaurant. In the evening the members of the Mathematical Society held an informal dinner.

THE annual meeting of the American Mathematical Society will be held at Columbia University, December 28–29. The Chicago section of the society will meet, in conjunction with Section A of the American Association for the Advancement of Science, at St. Louis, December 31–January 1. F. N. COLE,

Secretary.

DISCUSSION AND CORRESPONDENCE.

THE ST. LOUIS CONGRESS OF ARTS AND SCIENCE.

TO THE EDITOR OF SCIENCE: In the number of SCIENCE for August 28, I occupied considerable space in raising certain questions suggested by Dr. Münsterberg's article on the St. Louis Congress in the May number of the *Atlantic Monthly.* I objected

1. To Dr. Münsterberg's basing the working classification and grouping of the schedule or program of that Congress upon a scheme of philosophical methodology (of which he himself happened to be the author), and

2. To the representation made in the article that the Committee on the Congress had given his methodology an official sanction and endorsement by arranging a program upon its basis.

In what purports to be a reply in SCIENCE for October 30, Dr. Münsterberg elaborately ignores the objection I raised and as elaborately attributes and refutes a position which I neither took nor even suggested. The objection which he attributes to me is upon its face either a matter of minor importance or else is absurd. This is an objection to the actual working classification and grouping adopted for the conduct of the Congress. It does not require two pages of SCIENCE to point out that such an objection is trivial if taken to mean an objection to just this or that number and set of divisions, departments and sections; and absurd if taken to mean objection to any classification and grouping whatsoever. Nor does it require a careful reading of my SCIENCE article to discover that I never entertained such objections.

While I regret that Dr. Münsterberg has raised an irrelevant issue, instead of discussing the matter on its merits, I yet take one consolation from his article. His ignoring the real point of my objection suggests that as a matter of fact the philosophical methodology set forth in such a prominent way in the May *Atlantic* has ceased to have (if it ever had) any bearing upon the actual conduct of the Congress; and that what now exists is just a certain working classification, whose exact merits, as I have just indicated, are a matter of detail and not of principle. In that case, while some explanation would seem to be due the editor and readers of the *Atlantic Monthly,* the scientific men of the country may rest reasonably content.

JOHN DEWEY.

THE UNIVERSITY OF CHICAGO.

RECENT ZOOPALEONTOLOGY.

ADDITIONAL DISCOVERIES IN EGYPT.

Cetacea.—Dr. E. Stromer describes a skull and lower jaw of a new species of *Zeuglodon, Z. Osiris,* from the Middle Eocene of Egypt,

and discusses in detail in two papers* and in an elaborate memoir† the structure and relationships of these animals. He advocates their extremely early origin, holding that even the oldest Creodonta do not give us a sufficiently generalized ancestor, and that we must revert to the Jurassic triconodont animals generally considered as primitive marsupials. The memoir is the most important and exhaustive one which has appeared upon the skull of this aberrant form.

Proboscidea.—Dr. C. W. Andrews‡ continues his important papers on the evolution of the Proboscidea, tracing this line back to *Palæomastodon,* Upper Eocene, and *Mœritherium,* Middle Eocene, a small ungulate with quadritubercular molar teeth, which this author regards as in the direct line leading to the Proboscidea; it shows most interesting relationships to the Sirenia, which tend to connect the two groups.

In this connection may be mentioned a paper by Mr. W. K. Gregory on the 'Adaptive Significance of the Shortening of the Elephant's Skull,'§ in which the mechanical effect of trunk and tusks on the evolution of the skull is worked out in detail.

Other Mammals.—Other African fossils described by Dr. C. W. Andrews|| include the *Arsinoitherium,* a large ungulate with a pair of enormous horns on the front part of the skull, and a new hyracoid, *Saghatherium.* In this connection it is noted that 'the presence of five Hyraces in these beds indicates that these animals must at that time have been an important factor in the fauna, and that the comparatively small members of the group now existing are the degenerate descendants of a once important stock.' It is shown that the specialization of the molar teeth in the Hyracoidea was already well marked in the Upper Eocene beds. Of great interest also is the discovery of a large creodont referred to *Pterodon africanus,* of Oligocene age, and of an animal related to *Hyopotamus.* Altogether, the discoveries of Messrs. Beadnell, of the Egyptian Survey, and Andrews, of the British Museum, are the most important features of recent progress in mammalian paleontology.

Of an entirely different nature is the superb memoir entitled 'La Faune Momifiée de l'Ancienne Égypte,' by Messrs. Lortet and Gaillard, recently issued from Lyons. It covers the mummified mammals, birds and fishes of Egypt and includes an exhaustive systematic revision of these types, which have been known over a century but have never hitherto received adequate systematic description.

RECENT DISCOVERIES IN FRANCE.

Lophiodonts.—Professor Ch. Depéret, of Lyons,* has made the welcome discovery of the hitherto unknown skull of *Lophiodon* in the Middle Eocene, *Bartonien* age. He points out that it presents an astonishing resemblance to the skull of the primitive rhinoceroses, while it is remote from the skull of the tapirs. This resemblance agrees with the lophiodont form of the molar teeth, which is substantially intermediate between the tapir and the rhinoceros type.

Creodonts.—Equally welcome is the de-

*'Einiges über Bau und Stellung der Zeuglodonten, Sonder-Abdr. a. d. Mai-Protokoll,' *Zeitschr. d. Deutsch. geol. Gesellschaft,* Jahrg., 1903.

'Bericht über eine von den Privatdozenten Dr. Max Blanckenhorn und Dr. Ernst Stromer von Reichenbach ausgeführte Reise nach Aegypten. Einleitung und ein Schädel und Unterkiefer von Zeuglodon Osiris Dames,' Sep.-Abdr. a. d. *Sitzungsberichten d. mathem.-phys. Classe d. kgl. bayer. Akademie d. Wissenschaften,* Bd. XXXII., 1902, Heft III.

†'Zeuglodon-Reste aus dem Oberen Mitteleochän des Fajûm,' Sep.-Abdr. aus *Beiträge zur Palöontologie und Geologie Osterreich-Ungarns und des Orients,* Band xv., Heft ii. u. iii., Vienna and Leipzig, 1903.

‡'On the Evolution of the Proboscidea,' *Proc. Roy. Soc.,* Vol. 71, p. 443.

§ *Bull. Amer. Mus. Nat. Hist.,* Vol. XIX., July 8, 1903, Art. IX., pp. 387–394.

||'Notes on an Expedition to the Fayûm, Egypt, with Descriptions of Some New Mammals,' *Geol. Mag.,* Dec. iv., Vol. X., No. 470, August, 1903.

*'Sur les caractères crâniens et les affinités des *Lophiodon,*' Ch. Depéret, Extr. des *Comptes Rendus des Séances de l'Académie des Sciences,* t. CXXXIV., p. 1278, 2 June, 1902.

scription by M. Marcellin Boule* (who has now succeeded Professor Gaudry as professor of paleontology in the Natural History Museum of Paris) of a large example of the Lower Eocene creodont *Pachyæna* of the family Mesonychidæ. This is the second example of this family found in France, and it strengthens the proofs of the close relation which existed between northern Europe and North America in the Lower Eocene period. The animal is slightly larger than the *Dissacus saurognathus* of Wortman.

Lower Oligocene Fauna.—Under the title 'Les Vertébrés Oligocènes de Pyrimont-Challonges (Savoie)'† MM. Depéret and H. Douxami contribute an extensive memoir of ninety pages on the Lower Oligocene of Savoy. The rhinoceroses are represented by a new type, *R. asphaltense,* which the authors consider allied to the American *Diceratherium.* It is characterized by a very long skull; the nasals, although separate distally, bear a rudimentary pair of terminal horns; the forefoot retains a reduced fifth digit, whereas the American forms are strictly tridactyl. It is shown that the classic *R. minutus* of Cuvier is exclusively Oligocene. A new genus of tapir, *Parata-pirus,* is also described, in which the internal lobes of the superior molars are completely separated. The memoir concludes with a valuable review of localities where a contemporaneous fauna is found in various parts of France.

SOUTH AMERICAN MAMMALS.

Glyptodonts.—Professor Henry F. Osborn has recently described the complete carapace of a new genus of glyptodont, *Glyptotherium,* discovered in Texas by one of the Whitney expeditions under Mr. Gidley. It presents a curious combination of primitive and progressive characters.

Mr. Barnum Brown describes‡ a new genus and species of primitive glyptodont, *Eucinepeltus complicatus,* found on the Rio Gallegos by the American Museum of Natural History expedition of 1898. It is distinguished by the structure of the teeth and by the pitting of the plates on the cephalic shield, characters which are illustrated by a number of figures.

Armadillos.—The 'Reports of the Princeton University Expeditions to Patagonia, 1896–1899, in charge of J. B. Hatcher,' are now appearing rapidly under the editorship of Professor William B. Scott. Volume 5 opens with Part I., No. I., of Scott's Memoir entitled 'Mammalia of the Santa Cruz Beds,' and is devoted to the Dasypoda or armadillos of the Santa Cruz, which are fully described, and richly illustrated in sixteen plates. It is impossible to do justice to this very important memoir, which contains not only much needed systematic revision, but the enunciation of many important biological principles and full anatomical descriptions. The Edentata are regarded as a separate subclass divided into the armadillos, glyptodonts, ground sloths, tree sloths, anteaters, pangolins and aard varks. The Santa Cruz armadillos, as a whole, are very unlike the modern representatives of the suborder, rarely appearing ancestral to existing forms; it is certainly rather disappointing not to find any direct forerunners of the existing South American types. The author concludes that the lines of evolution which ended in recent genera must have taken place in some other region of the South American continent, doubtless the same region as that which gave rise to the true sloths and the anteaters, no trace of the latter two types having yet been found in the Santa Cruz beds. The usual systematic treatment is rendered difficult by the extraordinary variability of these animals. Most of them are of relatively small size. Although of great geological age, fully developed carapaces are found in both the armadillos and glyptodonts. The teeth are devoid of enamel, rootless and tubular, no traces of milk dentition having been observed. Altogether, they present a high degree of specialization, and in some instances, as in the reduction of the dentition in *Stegc-*

* 'Le *Pachyæna* de Vaugirard,' *Memoires de la Société Géol. de France,* No. 28, Tome X., fascicule 4.

† 'Mémoires de la Société Paléontologique Suisse,' Vol. XXIX., 1902.

‡ 'A New Species of Fossil Edentate from the Santa Cruz Formation of Patagonia.' *Bull. Amer. Mus. Nat. Hist.,* Vol. XIX., 1903, pp. 453–457.

therium, they are more specialized than any recent armadillos.

MARSUPIALS AND MONOTREMES.

Professor C. F. W. McClure* contributes an exhaustive paper on the venous system of *Didelphys,* based on the examination of very extensive material which shows wide individual variation, partly reversional. In general, the venous system runs back through the monotreme to the sauropsidan or reptilian type, and exhibits profound differences from the venous system of the Placentalia.

Dr. B. Arthur Bensley† contributes a valuable paper in which he demonstrates that the groove on the inner side of the jaw of the Jurassic mammalia erroneously described by Owen and Osborn as a 'mylohyoid groove' is actually a 'meckelian groove,' lodging the Meckelian cartilage. After very extensive comparison of this groove in various types of mammals, he finds it frequently present in the Marsupialia, Edentata and certain Insectivora and Cetacea. It is, however, absent in the Multituberculata; the groove is also wanting in the Echidna, owing perhaps to the degeneration or reduction of the jaw. The paper is fully illustrated.

HORSES AND MAN.

A most interesting recent contribution to the *Comptes Rendus des Séances de l'Académie des Sciences* is by Emile Rivière‡ on the prehistoric figures of horses in the cave de La Mouthe found with figures of the reindeer, antelope, bison, buffalo, mammoth. Although for the most part crude outlines, they all possess a certain artistic value.§ H. F. O.

* 'A Contribution to the Anatomy and Development of the Venous System of *Didelphys marsupialis* (L.),' Part I., Anatomy, *Amer. Jour. Anat.,* Vol. II., No. 3, July 1, 1903, pp. 371–404.

† 'On the Identification of Meckelian and Mylohyoid Grooves in the Jaws of Mesozoic and Recent Mammalia,' *University of Toronto Studies,* No. 3.

‡ 'Les figurations préhistoriques de la grotte de La Mouthe (Dordogne),' *Comptes Rendus des Séances de l'Académie des Sciences,* 28 July, 1902.

§ 'Les Parois gravées et peintes de la Grotte de La Mouthe (Dordogne),' Extr. de 'l'Homme préhistorique,' t. I., fasc. 3, 1903.

THE ENDOWMENT OF APPLIED SCIENCE AT HARVARD UNIVERSITY.

By the will of the late Gordon McKay, of Newport, R. I., inventor of the sewing machine that bears his name, Harvard University receives a very large bequest for applied science, estimated by the daily papers to be 'about $4,000,000 and eventually many millions more.' According to the terms of the will, Harvard University is to receive $1,000,000 when this amount has accumulated from the income, and is thereafter to receive 80 per cent. of the balance of the income after annuities have been paid, and is to receive the entire residue of the estate after the death of the last surviving annuitant.

The portion of the will defining the object of the bequest is as follows:

The net income of said endowment shall be used to promote applied science.

First, by maintaining professorships, workshops, laboratories and collections for any or all of those scientific subjects which have, or may hereafter have, applications useful to man; and

Second, by aiding meritorious and needy students in pursuing those subjects.

Inasmuch as a large part of my life has been devoted to the study and invention of machinery, I instruct the president and fellows to take special care that the great subject of mechanical engineering, in all its branches and in the most comprehensive sense, be thoroughly provided for from my endowment.

I direct that the president and fellows be free to provide from the endowment all grades of instruction in applied science, from the lowest to the highest, and that the instruction provided be kept accessible to pupils who have had no other opportunities of previous education than those which the free public schools afford.

I direct that the salaries attached to the professorships maintained from the endowment be kept liberal, generation after generation, according to the standards of each successive generation, to the end that these professorships may always be attractive to able men and that their effect may be to raise, in