directives being present. But in fissiparous forms, since there is no tendency to reproduce directives in the regenerative growth which succeeds the division, all of the polyps of a colony, with the exception of two, will lack directives and will show little regularity in the arrangement of the mesenterial pairs.

What might be regarded as a third mode of non-sexual reproduction has been observed in the perforate corals *Madrepora* and Porites and has been aptly termed by Duerden *fissiparous gemmation,* since the mesenteries of any one polyp are partly derived directly from the parent and are partly new formations, the process in this respect resembling ordinary fission, while it also resembles gemmation in that the original hexamerous arrangement of the mesenteries and the typical number of directives are retained as a result of growth processes which precede the fission.

The careful study of the madrepores, however, has not yielded such important taxonomic results as might have been expected; their soft parts do not present as much variety as do those of the actinians. But by extending his observations over so great a number of forms Duerden has been able to establish as fundamental certain facts in the morphology of the corals which throw some light upon their position among the Anthozoa. The fact that the corallum appears only after the development of the first cycle of mesenteries seems to warrant the conclusion that the corals are derived from non-coralligenous hexamerous forms. In other words, it indicates that the Hexactiniæ, Zoantheæ and Madreporaria are all traceable to a common hexamerous ancestor, and that after the differentiation of the Zoantheæ the Madrepores and Hexactinians continued together for a time and have for a fundamental distinction only the development or non-development of a corallum. The Madreporaria are merely Hexactiniæ which secrete a corallum. This is by no means a novel view of the relationship of these two groups, but it is one that is emphasized by Dr. Duerden's careful and interesting observations.

But the question whether the derivation of the Madreporaria from the Hexactiniæ is mono- or polyphyletic still lacks a decisive answer. The uniformity of structure shown by the madreporarian polyp seems to argue for a monophyletic origin, although it by no means excludes the other possibility. It is exceedingly interesting to note that of all the actinians, those which approach nearest to the corals in structure are, as Duerden himself has elsewhere pointed out, such forms as *Actinotryx* and *Ricordea,* forms, that is to say, belonging to the stichodactyline group of actinians, having more than one tentacle arising from certain of the endocœlic spaces. And yet such an arrangement of the tentacles is not known to occur among the corals. It would seem either that the corals are derived from actinine forms with regularly cyclical tentacles, and that the similarities which the actinians mentioned above present to them are due to similar conditions of life, the actinians molding themselves over foreign bodies very much as a coral ployp is molded over its corallum, or that we may yet discover stichodactyline corals. So far as our present information goes we are justified in assuming only an actinine origin for the corals, but if, as suggested, the similarities of *Actinotryx* and *Ricordea* to the coral be due to similar life conditions, it would be easy to understand how the formation of a corallum would lead to very general uniformity of structure in forms of different ancestry, and would permit a supposition that the coralligenous forms might have arisen independently from several actinine groups.

A decision on these points must be left for future investigation, which, it is hoped, will be abundantly stimulated by Dr. Duerden's most painstaking and important work.

J. P. McM.

SOCIETIES AND ACADEMIES.

NEW YORK ACADEMY OF SCIENCE.

SECTION OF ANTHROPOLOGY AND PSYCHOLOGY.

THE regular meeting of the section was held on April 27 in conjunction with the New York branch of the American Psycho-

logical Association, Professor Thorndike presiding.

Professor E. L. Thorndike reported the results of extended measurements of mental traits in the two sexes. In general the females were less variable. In the case of children 9 to 12 the ratio of female to male variability was .92; in the case of children 13 and 14 it was 1.02; in the case of children 15 it was .97; in high school pupils .95; in college students .85. In the abilities measured the greatest difference found was the female superiority in the tests of impressibility, such as the rate and accuracy of perception, verbal memory and spelling. In these only about one third of the boys reach the median mark for girls.

Mr. Wm. Harper Davis read 'A Preliminary Report of Tests of Scientific Men,' dealing with some twenty physical and mental measurements made upon one hundred professional men of science, under the auspices of the Committee on Anthropology of the American Association for the Advancement of Science. No significant correlations were found between any of the tests and the several departments of scientific activity, although the cases were too few to warrant an expectation of decided results. (The superiority of psychologists in 'logical memory' was attributed to the accident that the passage used in the tests was psychological in content.) Vivid mental imagery was less common among the older than among the younger men. Two cases of color-blindness were detected.

Comparison with Columbia College students, upon whom the same measurements have been made, revealed no significant difference between the two groups, except such as would naturally arise from their disparity in age.

Critical comments were made on some of the tests and on the method of administering them. It is expected that these measurements will be continued under the direction of Professor J. McK. Cattell, who is engaged upon a comparative study of scientific men.

Mr. S. C. Parker presented a paper upon 'Correlation of School Abilities.' Several investigations in Teachers College have had for their subject 'The Correlation of School Marks.' The method and results of these researches are set forth in Vol. XI., No. 2, of the 'Columbia University Contributions to Philosophy, Psychology and Education.' This paper reports the results of some new calculations based on the marks of 245 boys in a New York City high school.

It must be borne in mind that we do not know exactly what school marks represent; they may represent real ability in the school subjects or merely the ability to get marks.

In performing the statistical work, it is important to transmute each teacher's marks separately. This point is mentioned because the neglect of it by one investigator lays his results open to question.

There is not any very great variation in the correlations between marks in academic subjects, such as the languages, sciences and mathematics. The Pearson coefficients run between 40 per cent. and 60 per cent. The correlations of drawing with academic subjects are low—lying as a rule between 0 and 25 per cent. From a psychological standpoint, the academic correlations are high. But it must be borne in mind that many constant errors enter in which would make the correlations much higher than the essential relationships would be. From an educational standpoint the correlations are low. They show the futility of the belief in general brightness for all things, and are one of the best arguments for the elective system.

Professor MacDougall read a paper on 'The Specialization of the Hand in Relation to Mental Development.'

James E. Lough,
Secretary.

ENTOMOLOGICAL SOCIETY OF WASHINGTON.

The 177th regular meeting was held on April 2, 1903, nineteen members and one visitor present.

Mr. Banks reported that eleven members attended the field excursions to Bladensburg, Md., on March 26. A most enjoyable day was spent and some good specimens secured.

Dr. Dyar read 'A Note on *Pyrausta ochosalis* Fitch MS.,' a pyralid moth, showing that Fitch's species is distinct from *Pyrausta generosa* G. & R. He exhibited, further, a living larva of *Hemileuca electra* Wright, from southern California, one of the rarest of our saturnian moths. Dr. Dyar presented, also, a description of a new genus and species of moths belonging to the family Tortricidæ.

Mr. Ashmead exhibited a ceropalid (pompilid) wasp taken in Texas in the nest of the harvesting ant, *Pogonomyrmex barbatus* Smith. It constitutes a new genus and species.

Mr. Warner showed a proctotrypoid hymenopterous parasite found attached by its jaws to a specimen of grasshopper in the National Museum collection. It is a species of the genus *Scelio,* the members of which are parasites of grasshoppers' eggs, and have a habit of attaching themselves to gravid female grasshoppers and waiting for them to oviposit.

Dr. Hopkins reported some observations he had made recently in North Carolina upon (1) certain dipterous galls found on pine at Asheville, and (2) the damage inflicted upon girdled cypresses, sweet gums and black gums by ambrosia beetles.

Mr. Heidemann exhibited a specimen of the aradid bug, *Neuroctenus pseudonemus* Bergroth, collected at Bladensburg, Md., under bark, and not previously recorded from the vicinity of the District of Columbia.

Mr. Banks showed a specimen of the syrphid fly, *Ceria willistonii* Kahl, reared from the puparium at East End, Virginia. It is new to that locality. The adult resembles a fly of the family Conopidæ, or some wasp. He exhibited, also, two rare ortalid flies which resemble ants in appearance, *Myrmecomyia myrmecoides* Loew and *Odontomera ferruginea* Macquart.

Dr. Howard described some recent experiments carried on in Brazil for the purpose of testing the correctness of the conclusions of the U. S. Army Commission in regard to yellow fever. These experiments have been generally accepted as conclusive, and have removed all incredulity as to the fact that mosquitoes play a part in the transmission of yellow fever.

The following papers were presented: 'A Revision of the Boreal-American Species of *Nonagria* Ochs,' a genus of noctuid moths, by John B. Smith; 'Some Remarks on Genera in the Mutillidæ' (sand wasps), by William H. Ashmead; 'A Review of the North American Species of the Lepidopterous Family Anthroceridæ' (Zygænidæ), by Harrison G. Dyar.

ROLLA P. CURRIE,
Recording Secretary.

DISCUSSION AND CORRESPONDENCE.

THE GRAND GULF FORMATION.

TO THE EDITOR OF SCIENCE: In response to the clear and courteous exposition of their present ideas of what constitutes the Grand Gulf formation, by Messrs. Smith and Aldrich (SCIENCE, July 3, pp. 20–26), I may say: (1) That I withdraw the opinion that it is not new; now that I understand it clearly, I regard it as an absolutely new view; (2) that so far as observed facts are concerned I am far from wishing to be understood as questioning the existence of a deposit of unfossiliferous clay which contains irrecognizable traces of vegetable matter, which has a wide distribution as claimed by these gentlemen, and lies above the Chesapeake Miocene and below the so-called Lafayette, from which it is not separated, where I have observed it, by any unconformity or characteristic peculiarity. I would recall the fact that I have personally no knowledge of the 'Grand Gulf' except what I have derived from such excellent authorities as Wailes, Hilgard, Smith, Langdon, Professor G. D. Harris, Miss Maury, etc., from their published writings and observations in the field. My office has been, after making field studies of the fossiliferous Tertiary, especially the Chattahoochee and Chipola sections, to endeavor to correlate with horizons of known age in the marine series, the fresh- or brackish-water formations almost destitute of fossils, laid down about the margin of the Mississippi embayment during a long period of Tertiary time, which have been named by the geologists above mentioned, and to which, so far, no satisfactory key has been found.