and Plants in Mid-winter to Snow Flakes, Birds in Mid-winter, Animals with and without Combs, The Moon, the Oil Beetle, Buds, Dutch-weed, Flower-Haunting Insects and twenty-seven other equally diversified subjects. It is interesting to learn that "Jenner, the discoverer of vaccination, was accomplished in music, and studied natural history with diligence and success." He it was who made most valuable contributions on the habits of the cuckoo, the hibernation of the Hedge-Hog, and other subjects.

A curious mistatement is made on p. 53, where the author speaks of the pearl-forming Avicula as the shell which the Chinese utilize in making artificial pearl images. Any local shell collector would have told him that it was Hyria, a fresh water mussel, and not the marine Avicula, which the Chinese use for this purpose.

The illustrations are well chosen and clearly drawn. For teachers of elementary science and as a reading book for the higher grammar and even High Schools it may well be commended. E. S. Morse.

Researches on Mimicry on the basis of a Natural Classification of the Papilionidæ. By Dr. Erich Haase; translated by C. M. Child, Ph. D. 1896. Pp. 154, plates 8, colored, 4to. Nägele, Stuttgart.

It should interest entomologists, and general zoologists also, to know that an English translation of a part of Dr. Erich Haase's elaborate study of mimicry among the Papilionidæ has been published. The results of Dr. Haase's researches were originally published in two parts in Leuckart and Chun's Bibliotheca Zoologica.

The portion issued in English translation is Part II. of the study, and makes a quarto volume of one hundred and fifty pages with eight colored plates. The translator, Dr. C. M. Child, now of the University of Chicago, undertook his work at the suggestion of Dr. Leuckart, of the University of Leipzig, and has made a conscientious and idiomatic translation of this important contribution to the knowledge of mimicry. Dr. Child, though not a professed special student of insects, is known to entomologists through his excellent study of Johnston's antennal organ of hearing.

So much of our knowledge of mimicry has come through the study of the mimetic phenomena exhibited among insects, and especially among the butterflies, that it was to be expected that the first serious attempt to combine a study of phylogeny with a study of mimicry should have butterflies for its subject. Systematists have certainly not yet taken much into account the influence of mimicry in making forms of wide phyletic divergence superficially alike, or in making closely related forms superficially dissimilar. Yet mimicry produces exactly these conditions; and where so many members of a group, as Dr. Haase shows is true of the butterflies, owe the chief features of their habitus to the influence of mimicry, systematists have got to take this matter into account. And this will be good for us, for it will hold up very plainly to us one of the most interesting and instructive phases of the biological study of organisms. It may broaden some of us; it can narrow no one of us.

As much for its suggestiveness as for its light on the origin and development of mimetic coloration among the butterflies, entomologists should become acquainted with Dr. Haase's work. Vernon L. Kellogg.

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California.

SCIENTIFIC JOURNALS.

AMERICAN JOURNAL OF SCIENCE.

The February number opens with an article by C. E. Beecher, giving an 'outline of a natural classification of the trilobites.' This is the opening portion of a memoir which will be completed in the numbers immediately following. The author's extended study of this group has enabled him to reach definite conclusions, not only in regard to the position that the trilobites properly occupy as a group of the Crustacea, but also to give a systematic and minute classification of the families and genera. The subject is too special to allow of being developed here, but attention may be called to the plate in which certain typical forms are taken to show the principles adopted as the basis of classification.

Carl Barus describes a form of interferential induction balance and details some experiments to show what may be accomplished with it. This apparatus involves the principles of Michelson's interferential refractor, the iron cores of two like helices at right angles to each other being fastened at one end and free to move in the direction of the axes at the other. The interference fringes are visible whenever the excursions of the free ends of the cores are either zero or vibrating in the same phase, amplitude and period to and from the point of convergence; for other phases the fringes vanish more or less fully. In the course of one series of experiments to test the speed of transmission of electric impulses from one helix to another, the author concludes that an arrangement could be made which would indicate the retardation along something over a single knot of wire of high capacity inserted between the helices. This retardation would be exhibited by the passage of one yellow interference fringe across the spider lines of the telescope.

John Trowbridge and Theodore M. Richards discuss the multiple spectra of gases, as a continuation of their work on the spectra of argon described in the January number. They have experimented upon the spectra of nitrogen, hydrogen and other substances, with the result of confirming their former conclusion that the electrical conditions of the circuit have an essential influence in determining the character of the spectra obtained.

Theo. Holm gives the third paper of his studies of the Cyperaceæ. This is devoted to a morphological and anatomical study of *Carex Fraseri* and is illustrated by a plate.

T. A. Jaggar, Jr., describes a simple mechanical device for inclining a preparation in the microscope in petrographical study. It allows, for example, of a rapid determination of the optical orientation in feldspar sections and similar cases.

A. E. Verrill has two papers; the first on the nocturnal protective coloration in mammals, birds, fishes and insects as developed by natural selection. In this he calls attention to the fact that the color of many animals is such as to give them protection at night at the time when it is most called for. This is illustrated by a number of interesting examples. The second paper discusses the nocturnal diurnal changes in the color of certain fishes and of the squid (*Loligo*), with notes on their sleeping habits. When at Wood's Holl, Massachusetts, in the laboratory of the United States Fish Commission, in 1885–1887, the author had an opportunity to make observations on the marine animals in the aquaria between midnight and two o'clock a. m. Some remarkable cases of change of color were then noted. It is remarked that most fishes sleep very lightly and are aroused by almost imperceptible vibrations of air or water. Some of the fishes take remarkable attitudes while asleep.

The same author gives additional notes in regard to an enormous octopus, as it was supposed to be, which was thrown up on the Florida coast some weeks since. The body as preserved is some 21 feet long and is estimated to weigh between six and seven tons. The name *Octopus giganteus* is proposed for it.

O. C. Marsh has an article on the Stylinodontia, a sub-order of Eocene Edentates, in which a description is given, with numerous figures, of *Stylinodon mirus*, the type specimen as described in May, 1874. In regard to the origin of the Edentates the author repeats his remarks of August, 1877. He concludes by saying that the work of the past two decades has served to confirm the opinion that this group of mammals originated in North America and migrated from there to other parts of the earth where their remains have been found or living representatives are in existence.

The number closes with the usual chemical, physical and geological abstracts and notices.

AMERICAN GEOLOGIST, JANUARY.

SKETCH of W. W. Martin, accompanied by a list of official and professional positions held by him and a bibliography, by C. H. Hitchcock.

'The study of natural Palimpsests,' by G. P. Grimsley, gives a brief historical account of the discoveries in archæan and metamorphic rocks, and the methods employed in their study.

F. W. Sardeson continues his discussions on the Galena and Maquoketa series begun in the December number. Under the Galena series he recognizes the Beloit and Galena formations,

both of which are further subdivided into beds characterized by certain leading fossils. The Maquoketa series is divided into the Transition, Maquoketa and Wykoff formations, which also comprise beds marked by the presence of certain genera.

Jules Marcou has the first installment of a paper on 'Rules and Misrules in Stratigraphic Classification.' The early history of geologic correlation is sketched, and the independent discoveries of Giraud-Soulavie, William Smith, Cuvier and Brongniart are reviewed. Direct application is then made to American geological correlation, with special reference to the Taconic and Champlain systems.

'The relation of the streams in the neighborborhood of Philadelphia to the Bryn Mawr gravel,' by F. Bascom. With the exception of the large rivers, the streams of this region are shown to be of superimposed origin, having begun on a surface covered with gravel deposits, underlying which were older crystalline and paleozoic rocks. This has made their valleys quite independent of the strike or hardness of the rocks through which they are now cutting. The age of the Bryn Mawr gravels has been uncertain, and they have been referred to the Mesozoic, the Tertiary and the Quaternary by various observers. The author shows that they cannot belong to the Quaternary and inclines to the belief that they are a member of the Potomac formation, though the data obtained from the study of the drainage system may not be sufficiently exact to precisely determine their geologic relations.

SOCIETIES AND ACADEMIES.

ZOOLOGICAL CLUB, UNIVERSITY OF CHICAGO, MEETING OF JANUARY 6, 1897.

ABSTRACTS OF PAPERS PRESENTED.

I. MICROSOMES AND THEIR RELATION TO THE CENTROSOME.

THE problem of the centrosome presents itself under five heads:

1. The centrosome in caryokinesis of tissue cells.

2. The centrosome in the maturation of the ovum.

3. The centrosome in fecundation, or, more strictly, *the problem of the origin of the centrosomes which take part in the first caryokinetic division of the fertilized egg-cell.*

4. The centrosome in cells in which locomotor function is more or less well developed, as in leucocytes, pigment-cells, and some unicellular organisms.

5. The centrosome in some cells which undergo periodic growth, as in the sperm-mother-cell, the ovarian ovum, and some tissue cells. The centrosome in some ganglion cells probably belongs to this group of phenomena.

It was pointed out that these are coordinate features of one and the same problem. The different forms of the centrosome and their mode of origin, their variations under pathological conditions, their behavior during fertilization of the ovum in different forms, were examined in reference to two fundamentally opposed theories now current among cytologists.

In this connection a historical review of our knowledge of the microsomes (cytomicrosomes), as found in the observations of Hanstein, Schmitz, Schwartz, Strasburger, van Beneden, Boveri, Heidenhain, together with the author's observations on the ovarian ovum of an ascidian, was presented, and the bearing of the microsome question on the problem of the centrosome, pointing to the existence of homology between microsome and centrosome, was indicated.

The main conclusion of the paper was as follows: The living substance of the cell-body is to be regarded as composed of an element capable of dimorphic existence, with perfect freedom of transition from one to the other, under some definite condition. It can exist in the form of cytomicrosomes, or it can assume the appearance of clear, hyaline filaments, network, or vesicular structure, as the case may be. At one stage, the cell-body of a given cell, say an ovarian ovum of some organism, may be composed almost wholly of microsomes; at the next these microsomes may be transformed into hyaline cytoplasmic substance, with corresponding increase in the bulk of the cell.

In the phenomena of caryokinesis, fecundation, motion, periodic growth of the cell referred to at the beginning of the paper, both of