found in stable form in close-fertilized species (and which exist potentially in cross-fertilized species) is a matter of great interest, both theoretically and practically. The adherents of the mutation theory will see in them a confirmation of their views. The rest of us are compelled to admit that, thus far, their origin is obscure.

In the light of the facts cited, the question whether a given crop is cross- or close-fertilized becomes a matter of prime importance, as different methods of procedure are required in the two cases. Dr. Hopkins states that clover plants selected in a manner analogous to that described for timothy did not reproduce true to seed, but that the plants grown from the seed of a single plant represented all the forms observable in the original field of clover. This is what Mendel's law leads us to expect, if clover is cross-fertilized, a matter which has recently been called in question. It is easily seen that we have here a list of important problems for plant physiologists, in determining definitely what crops do and what do not cross-fertilize. There is likewise a broad and promising field of work in securing in a stable form superior strains of all ordinary crops to which these methods have not already been applied. The amount of improvement possible represents the difference between the mixture of all strains and the best components of the mixture.

W. J. SPILLMAN.
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RECENT ZOOPALEONTOLOGY.

FIELD EXPEDITIONS DURING THE PAST SEASON.

THE Kansas chalk was visited by three parties during the summer. The first, under Professor S. W. Williston, representing the University of Chicago, was extremely successful, especially in procuring remains of mosasaurs, pterosaurs and toothed birds; the collection will be arranged principally as a study collection in the university. The second party represented the Carnegie Institution of Pittsburg, and is reported to have been very successful also. The third party was that of Mr. Charles H. Sternberg in the same field. He writes that he collected over sixty specimens of Cretaceous fossils, including especially well-preserved specimens of the turtles. *Protostega gigas* is represented by three skulls and a complete skeleton. The skeleton lay on its dorsal surface with the fore limbs stretched out at right angles to the median line of the carapace, measuring six feet between the ungual phalanges; the hind limbs were parallel with the neural arch, and stretched out behind. Mr. Sternberg also secured a number of mosasaur skulls, with portions of the skeleton of *Platecarpus* (one individual included sixty-six continuous vertebræ behind the skull); also skulls of each of the three genera of mosasaurs, the skeleton of *Portheus,* and skulls and skeletons of a number of other genera of fishes. It appears that erosion of the chalk is quite rapid, and there are practically fresh exposures in many parts of this famous region.

Professor Loomis, of Amherst College, who has been for some years with the American Museum of Natural History expeditions, during the past season conducted a party from Amherst into South Dakota. A collection including the remains of some 500 animals was made, chiefly in the White River beds, the best specimens being the skeleton of a titanothere and of an oreodon.

Princeton University sent an expedition under Dr. Marcus Farr into the Laramie and Judith River Beds of Montana. It is reported as having been very successful.

The American Museum of Natural History sent four parties into the field. The first, the third Whitney Expedition for fossil horses, worked in western Nebraska and South Dakota, and added considerably to the collection of fossil horses already in the museum. The choicest specimen found by this party was the skeleton of *Camelus occidentalis.* The second party worked in the Bridger Beds of western Wyoming under Mr. Walter Granger, and was successful in securing a representative collection of the small fauna of that region. The third party, under Mr. Peter Kaison, continued the excavation of the Bone Cabin Quarry in the Como region, the chief discoveries being a fore limb of *Morosaurus,* a skull of *Diplodocus,* portions of another skeleton of *Stegosaurus* and a very large

collection of the limb bones of *Camarasaurus* from the Reed Quarry. The fourth expedition went into South Dakota and northern Wyoming, under Mr. Barnum Brown, and resulted particularly in the discovery of abundant mosasaur and plesiosaur material.

The explorations of the Carnegie Museum have been described by Mr. Hatcher in a recent number of SCIENCE.

Mention should also be made of the continuation of the explorations in the Triassic under Professor Merriam, of the University of California, as well as of the cave fauna in Shasta County, a description of which has already appeared in SCIENCE. H. F. O.

BOTANICAL NOTES.

THE MISSOURI BOTANICAL GARDEN.

THE appearance of the Fourteenth Annual Report of the Missouri Botanical Garden covering the year ending December 31, 1902, enables us to note the rapid growth of this institution. The report shows that the income from all sources for the year was $127,142.50 and that considerably more than one half of this amount was expended on the garden, including library, herbarium, salaries, etc. The total number of species of plants now in cultivation in the garden is 11,551, which is more than double the number grown in 1895. The herbarium now includes 427,797 specimens. During the year there were added no less than 62,844 sheets of specimens. The botanical library was increased by more than 2,000 books and pamphlets, bringing the total number up to about 42,000. Other interesting statistics are given, showing that the garden has been an active agent in the promotion of botanical knowledge.

The bulk of the volume is taken up with a paper by Alfred Rehder under the title of 'Synopsis of the Genus *Lonicera*,' covering 206 pages, and including twenty full-page plates. The lapse of seventy years since the last general revision of the genus in the fourth volume of DeCandolle's 'Prodromus' makes such a paper as this especially necessary. This is shown by the fact that of the 154 species recognized in this monograph, but 42 occur in the 'Prodromus.' The conservative treatment accorded to the genus is indicated by the small number of new species (eleven, only) which the author has described. Such moderation, after the 'lying fallow' of this particular botanical field for so long a time, should put to shame our 'species makers.' In this the Missouri Botanical Garden has rendered a distinct service to botanical science.

AN ELEMENTARY JOURNAL OF MYCOLOGY.

ABOUT a year ago Professor Kellerman, of Columbus, Ohio, began publishing a leaflet for the benefit of those who wish to learn something about the fungi. He called it the *Ohio Mycological Bulletin* and filled it with excellent photoengravings of the larger fungi. With each picture was given a simple description adapted to the understanding of 'children in years and children in knowledge.' It has been so successful that practically all of the earlier numbers have been exhausted. The first volume, which includes twelve numbers aggregating forty-eight pages, closes with a good index. With the last number a title page for the volume is supplied. The new volume is to start with the new year, and it is announced that 'the frequency of issue during the year will depend on the financial receipts.' The hope is expressed that two numbers a month may be issued during the spring and fall. For teachers in the public schools who wish to learn to know the commoner large fungi nothing better than this is published anywhere.

SOME RECENT PAPERS ON SYSTEMATIC BOTANY.

WILLIAM R. MAXON in the 'Contributions from the United States National Herbarium' (Vol. VIII., part 3) publishes 'A Study of Certain Mexican and Guatemalan Species of *Polypodium*,' in which he notices eight species, five of which are new to science. Two good plates illustrate the paper.

In the September number of the *Bulletin of the Torrey Botanical Club* Dr. G. N. Best revises the mosses of the genus *Leskea*, so far as the North American species are concerned. Ten species are recognized, two of which are new. He finds two new varieties also. The paper is accompanied with two plates showing structural details.