cell in the female than in the male. The primary factor in the differentiation of the germ cells may, therefore, be a matter of metabolism, perhaps one of growth.

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October 3, 1905.

THE GEOGRAPHICAL DISTRIBUTION OF THE BELL-TOADS.

At the meeting of the Association of American Geographers in Philadelphia, December 29, 1904, I read a paper on the 'Geographical Distribution of the Discoglossoid Toads in the Light of Ancient Land Connections,'[1] in which I made the following statement:

> All indications point towards the country southeast[2] of the Himalayas as the original center of the radiation of the discoglossoid toads, as well as of their near relations the pelodytoid toads. The former are not now found in this region; but that fact weighs but little in view of *Ascaphus* having remained unknown on this continent till 1899, and thus far known only from a single specimen.

This statement assumes almost the character of a prophesy in view of the fact that Dr. G. A. Boulenger, a month later, announced the discovery of a bell-toad (*Bombina*) in the province of Yunnan, near Tong Chuan Fu, at an altitude of about 6,000 feet. This new species, *Bombina maxima* (Boulenger), thus indicates the central form from which both the European and the Korean bell-toads have sprung. Confirmatory of this, it may be mentioned that the new species in most essentials agrees with *Bombina orientalis* and *B. salsa*, the latter being the more southern and, in my opinion, the more primitive of the two European species.

The discovery of this species lends further weight to the theory propounded by me for the migration of this genus[3] in the following terms:

Of the various theories which might be advanced in order to explain this distribution it seems most reasonable at present to select the one which presupposes a comparatively late immigration of this genus from southeastern Asia into Europe after a late Miocene land connection had been established—a theory which would account for the failure of these toads to reach Spain on the one side and Japan on the other.

The supposed original central form in southeastern Asia has now been found, and the theory to a great extent verified almost at the very moment of its publication.

Leonhard Stejneger.

U. S. National Museum,
Washington, D. C.,
August 31, 1905.

HYDRATION CAVES.

The conclusions set forth in my paper 'On the Origin of the Caves of the Island of Put-in-Bay, Lake Erie,'[1] were based mainly upon observations, made last year, in Perry's Cave. The conditions, however, which exist on the island, led me to believe that the hydration of anhydrite has played an important rôle in the formation of all the caves. At that time I was able to visit three of the four caves open to the public, namely, Perry's, Kindt's and the Crystal Caves. Concerning the other cave, Daussa's, the following statement was, however, made in the paper referred to above: "But inasmuch as this cave is in very close proximity to Perry's Cave, the above explanation, no doubt, also applies to it."

During another visit to the island several weeks ago, Daussa's Cave was visited and it was noted that the fitting of the roof and floor is to be observed fully as well in this cave as in Perry's, leaving, therefore, no doubt whatever as to the origin of the same.

From the general topographic features of the island and the mainland in that vicinity —especially that which is known as Catawba Island—one is led to believe that careful searching should reveal more of these interesting caves, which differ so much in their origin and structure from the ordinary solution cave, that I would suggest they be termed

[1] Résumé published in *Amer. Geogr. Soc. Bull.*, XXXVII., February, 1905, pp. 91–93.

[2] In the résumé quoted 'southwest' through a lapsus or misprint.

[3] *L. c.*, p. 93.

[1] *American Geologist*, XXXV., 167–171, March, 1905.

hydration caves, because of the fact that, as previously shown, the process of hydration has been such an important factor in their formation.

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A PRELIMINARY NOTE ON CLOVER DISEASES IN TENNESSEE.

FOR a few years past there has been considerable complaint among Tennessee farmers of the failure of the red clover crop. A careful investigation of the question was begun by the botanical department of the Tennessee Experiment Station early in the present season, and a short account of the present stage of these investigations may be of some interest.

While the whole state has been more or less explored with reference to diseases affecting clover, the immediate region about Knoxville has been more carefully studied, and may be assumed as typical of the situation throughout Tennessee, and perhaps adjoining states.

The crop begins to die in the summer following late winter sowing. The trouble has been popularly attributed to some supposed condition of the soil, and so termed 'clover sickness' of the land. It was soon learned, however, that the malady is independent of soil conditions, and there was at the outset a strong presumption in favor of some fungous or bacterial disease. Our later investigations have fully justified this opinion.

Early in the season a few leaves were found to be attacked by the clover rust, *Uromyces trifolii* (Hedw.) Lev. This disease occurs so sparingly that it may be left out of consideration. Careful search frequently reveals the presence of *Pseudopeziza trifolii* (Bernh.) Fuck. While this fungus caused considerable damage in some instances, it may also be left out of account.

A rather destructive disease, apparently caused by *Macrosporium sarcinæforme* Cav.,[1] is very frequent and widely disseminated. It often appears on stray alsike plants (*Trifolium hybridum* L.) associated with the red clover, which is not true of any other parasites discussed in this paper. The *Macrosporium* disease appears capable of destroying the clover plant unassisted by any other parasite, though this statement is based only on inspection in the field.

The most destructive disease thus far found is what appears to be an undescribed species of *Colletotrichum.* In its general appearance this disease very closely simulates the anthracnose of clover (*Stengelbrenner*), described by Mehner[2] and Kirchner[3] and by the latter attributed to the attacks of *Glœosporium caulivorum* n. sp.

The *Colletotrichum* species here referred to causes considerable injury to young clover plants in early summer, where it confines its attacks to the petioles of the leaves. Its greatest damage, however, is done to blooming and fruiting plants, where it attacks the stems most often just below the flower heads, but frequently at other points, causing the sudden blackening and death of a limited region, eventually destroying the entire plant.

A description and characterization of this species will shortly appear, and further experiments now under way will be described in a forthcoming bulletin of the Tennessee Experiment Station.

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[1] Cited in Tubeuf and Smith, 'Diseases of Plants,' 1896, p. 517; also Malkoff, *Zeits. f. Pflanzenkr.*, Bd. XII., pp. 283–285.

[2] *Zeits. f. Pflanzenkr.*, Bd. XI., p. 193, 1901.

[3] *Ibid.*, Bd. XII., p. 10.

A NEW ARMORED DINOSAUR FROM THE UPPER CRETACEOUS OF WYOMING.

THE writer has recently been fortunate in the discovery, near Lander, Wyoming, of the larger part of a skeleton of a remarkable dinosaur, evidently new. The animal is about half the size of *Stegosaurus,* to which it is allied, but is peculiar in having a heavy bony carapace, two inches or more in thickness. This carapace is covered with, and for the most part firmly united to, a mosaic of pentagonal dermal bony plates, much like those of *Glyptodon.* Each plate is about four inches