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.

Edmund B. Wilson.

Zoological Laboratory,
Columbia University,
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.