tions between the lesser natural groups are relevant to the subject under discussion.

It is difficult to see, in the case of *Sciurus*, or any other group, that we are any better off when we have divided all our species into numerous geographical (and other) species, and have called the old species genera, of course changing the names in the process, than we are when we retain the old species, calling their now recognized subdivisions subspecies, races and forms, and treat as subgenera rather than genera newly discerned natural groups of species within the old genus. Of course, an old genus, if shown to be unsound and to express a false concept of relationship, will be abandoned.

There is almost no limit to the niceties of taxonomic analysis that might be introduced by breeding of all animal species. Any classification short of one founded on such complete data is conventional. The practical question is, what convention shall we adopt? The one here advocated retains, in so far as they are valid, old genus and species names, using a subsidiary nomenclature of subgenera, subspecies, etc., for the more intimate distinctions.

There are several advantages in this course. It does not change general conceptions of genus and species to something of a different grade of taxonomic value. It keeps us in touch with the zoology of the past (*i. e.*, that of year before last). It saves immense labor in ascertaining what forms are meant by the unfamiliar names when one is reading outside his special field. It ensures more general understanding by one's readers. It does not limit completeness of taxonomic analysis, which is recorded in the subsidiary nomenclature. It confines to the field of the specialist, who uses the subsidiary nomenclature only when writing for his fellow specialist, most of the confusion which comes from the acceptance and later the rejection of unjustified terminology. It thus saves the general literature of zoology from the introduction of an immense deal of confusion.

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October 26, 1915

NOTES ON THE PERMO-CARBONIFEROUS GENUS CRICOTUS COPE

IN Publication No. 207 of the Carnegie Institution of Washington I described and figured an ilium from the Brier Creek Bone Bed of the Wichita Formation in Archer Co., Texas (page 161, pl. 22, figs. 2 and 3). This bone was assigned to the genus *Cricotus* because of the relative abundance of the specimens associated with large numbers of the vertebral and intervertebral centra of that genus. The peculiar form of the ilium, unique and previously unknown from the North American beds, makes it of peculiar value in correlating faunas of widely separated localities. In looking over Fritsch's "Fauna der Gaskohle" I find an almost identical form of this bone described and figured for two genera, *Diplovertebron*[1] and *Macromerion*.[2] Fritsch recognized these elements as ilia but in some figures confuses parts of the bones with the ischia and pubes. It is at once obvious from a comparison of his figures with those published by me that the bones from the two widely separated localities are nearly identical, even to the smallest details. Unfortunately the ischia and pubes of the Bohemian forms were only partly known to Fritsch and he publishes figures of fragments only.

The two Bohemian genera, from the upper Carboniferous, are embolomerous forms and many of the bones figured by Fritsch as associated with the ilia are strikingly like those assigned to *Cricotus* from the Brier Creek Bone Bed, notably the femur and the smaller bones of the limbs. The inter-centra of *Macromerion schwarzenbergii*[3] are indistinguishable from those of *Cricotus*. The teeth also show many resemblances in the two types, especially in the manner of fixation to the jaw and the slightly infolded dentine of the base.

There can remain no doubt that the family Cricotidæ was present in Bohemia and North America at nearly the same time and was represented by closely related genera. This adds

[1] Bd. 11, Taf. 52, Fig. 2 and Taf. 53, Fig. 14.

[2] Bd. 11, Taf. 6, Figs. 1, 2; Taf. 67, Figs. 1, 2; Taf. 69, Fig. 1.

[3] Taf. 66, Figs. 5*a*, *b*, *c*.

materially to the evidence that the deposits in the two regions were cotemporaneous, a fact hitherto suggested only by the common occurrence of the genus *Edaphosaurus* (*Naosaurus*).

It has been shown by me[4] that North America was probably isolated from the Old World in Permo-Carboniferous time, at least for such forms as the Amphibia, and the suggestion arises of the great antiquity of the embolomerous type permitting such a distribution, a suggestion borne out by Moodie's find of an embolomerous form, *Spondylerpeton spinatum,* in the Mazon Creek beds of Illinois.

Further work suggested by the facts here stated is in progress. E. C. Case

A SIMPLE METHOD OF INDICATING GEOGRAPHICAL DISTRIBUTION

In a recent number of Science a method of showing geographical distribution is suggested.[1] All who have to work with these problems will agree that political boundaries are unsatisfactory in such work, and also that the system of geographic coordinates (parallels and meridians) is often too exact for the information in hand, and, moreover, does not give a very clear idea of the location to most readers. Although there are obvious disadvantages in the use of rectangular areas such as those suggested, it is probable that their advantages are even greater.

A modification of the boundaries suggested seems desirable from the point of view of uniformity among the sciences. After thorough discussion at several international geographic congresses the government surveys have undertaken the preparation of an international map of the world on a scale of 1 to 1,000,000. The quadrangle adopted for this map seems nearly if not quite as well suited for showing distribution as that suggested recently. If this quadrangle can be adopted there will be a single system of areas for the topographic map of the world and for the purpose of stating distribution, and this has the great advantage of simplicity. There is the further advantage that the statement of the location in the new system will show directly what topographic sheets will give the actual physical environment of the species under discussion.

The quadrangle of the international map is 4 degrees of latitude by 6 degrees of longitude; these quadrangles are designated by a system of letters beginning at the equator and numbers beginning at longitude 180°. The surface of the earth is divided into zones bounded by parallels of latitude, each zone is 4 degrees wide and extends around the earth. Zone *A* extends from the equator to latitude 4°, zone *B* from latitude 4° to latitude 8°, and so on; there are separate sets of zones north and south of the equator, that north of the equator designated by the word "north" and that south of the equator by the word "south." There are also north polar and south polar sheets, each circular and 4 degrees in diameter. The quadrangles of each zone are numbered from longitude 180° eastward around the earth. Thus the two sheets of the international map already published for the United States are *Boston,* North K 19 (latitude 40° to 44° N., longitude 72° to 78° W.) and *San Francisco,* North J 10 (latitude 36° to 40° N., longitude 120° to 126° W.).

The only disadvantage of the international map quadrangle, when compared with the "merospheres" suggested by Adams, is their somewhat smaller size. This is slight when compared with the gain in uniformity secured by the use of the quadrangle already adopted for mapping the world. It is to be hoped that any system of dividing the surface of the earth into quadrangles will in the future be based on the international map.

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September 22, 1915

NEW JERSEY CETACEA

Apropos of Mr. Fowler's note in the August 13, 1915, issue of Science, I wish to add another New Jersey record for the dolphin, *Delphinus delphis;* early in May of this year I found a dead specimen on the beach at Sea

[4] Publication 207, Carnegie Institution.

[1] Adams, J., "A Simple Method of Indicating Geographical Distribution," Science, N. S., Vol. 42, pp. 366–68, September 17, 1915.