tion and our author says that each is characterized by a definite association of species. "It can readily be understood," he continues, "that the birds that have their habitat in the dense forest country would not long survive if transported to the inhospitable wastes of the Sudanese arid belt, and vice versa, where conditions would be entirely foreign to them; but it is not so apparent why the birds of the Upper Guinea or Ubangi Savannas should show such marked differences from those of the Lower Congo Savanna, or why the birds of the Upper Guinea forests should differ in marked degree from those of the Lower Guinea forest." Evidently there is still much to be learned about the history and distribution of the West African avifauna even after the present day facts are presented. The main text of the present volume covers the Struthioniformes, Colymbiformes, Procellariiformes, Pelicaniformes, Ciconiiformes, Anseriformes, Falconiformes, and Galliformes, including about 190 species and subspecies; there are eight colored plates from paintings by the late Major Henry Jones, two maps and 119 text figures from drawings by H. Grönvold, Roland Greene, F. W. Frohawk, and W. P. Tenison.

We shall look forward to Mr. Bannerman's succeeding volumes with great interest.—W. S.

Kleinschmidt's 'The Formenkreis Theory.'—We are under obligations to Rev. F. C. R. Jourdain for his painstaking translation of Kleinschmidt's volume[1] on the 'Formenkreis Theory,' but even with the care taken to present the author's arguments and expressions as nearly verbatim as can be done in a translation, we remain more or less dazed by a mass of verbage and somewhat in doubt as to just what the author is endeavoring to place before us.

There would seem to be two principal problems discussed (1) an attempted explanation of descent more or less at variance with the accepted theory of evolution, and (2) the use of the "Formenkreis Theory," there explained, in practical nomenclature.

In the discussion of the theory as an explanation of descent we are taken back to the writings of Kant in 1775 and we must confess our inability to see in what way Dr. Kleinschmidt's views differ from these or just what claims he has to originality in his presentation of the theory. Our author sums up his discussion of the errors in the "old theory of evolution" by stating that the Formenkreis Theory "upholds the indications found in nature as to independent sources of life," yet he admits that their may be a relation between the several independent creations ("between root and root") but it is "quite a different kind of relation than between their com-

[1] The Formenkreis Theory and the Progress of the Organic World. A Re-casting of the Theory of Descent and Race-Study to Prepare the Way for a Harmonious Conception of the Universal Reality. By O. Kleinschmidt, Dr., h. c. Translated by the Rev. F. C. R. Jourdain. With 16 plates from photographs and 53 text figures by the author. London, H. F. and G. Witherby, 326 High Holborn, W. C. [1930] pp. 1–192. Price 10s. 6d. net.

ponent parts" ("between two leaves from the same root"), and when he comes to proving his contention he states that "the whole matter is still hidden in Democritus' deep spring" and that we cannot "expect anyone to solve these darkest secrets of nature before science can achieve it." Wherein such statements are at variance with the generally accepted theory of evolution it is difficult to see.

In the consideration of the practical application of names on the Formenkreis Theory the idea of separate entities is still further emphasized and the "species," as our author understands it (i. e. his Formenkreis), consists of not only the various subspecies usually allotted to it but also many forms now recognized on all hands as species which are "degraded" into subspecies solely because they replace one another. In other words the Formenkreis as he explains it is composed of forms which "must exclude each other geographically and also replace one another," and all forms which fall under these conditions belong to the same Formenkreis and are to be regarded merely as subspecies regardless of intergradation or any other factor. Nevertheless when he comes to arrange forms (subspecies and nearly related species) in a Formenkreis we find our author including some that do not accord with his dictum and to explain their inclusion he formulates other dicta the accuracy of which he does not prove. He makes, for instance, one Formenkreis of the House, Italian, and Spanish Sparrows although representatives of two of these often occur together and his proffered explanation, without proof, is that when one race invades the territory of another "it is either attacked by the neighboring race or absorbed by interbreeding," but apparently recognizing the weakness of this explanation he adds in a foot note "exceptions in which the process is protracted may easily be recognized as such." But naturally we ask: How?

We are forced to admit that the criterion of intergradation for distinguishing species from subspecies is not always practicable and that in many cases we accept "replacement" and "exclusion" as indicators of subspecific rank where actual intergradation has not yet been demonstrated, but to degrade to subspecies a lot of perfectly good species which offer no suggestion of intergradation, simply because they replace one another seems to serve no good purpose, and the whole scheme, just as in the case of the intergradation criterion, resolves itself into a question of personal opinion. It is interesting to notice moreover that many of those who apply the Formenkreis idea do not go so far as to make trinomials for the "degraded" species but quote both trinomials and binomials as components of their Formenkreises.

That the Formenkreis so used may be convenient in some cases in the sense that we use "Group," or "Subgenus," we do not deny, and we also endorse the author's statement that while climatic effects on the individual, such as bleaching by the sun, are "aptly comparable to an evanescent coat of paint. Racial characters are not coats of paint, but an inheritable property." (cf. Prof. Sumner's experiments in rearing the subspecies of *Peromyscus*.) But we interpret this fact to mean that the difference between

species and subspecies (Formenkreis and Race) is merely one of degree and we have in nature forms differing by every conceivable amount of difference from very slightly differentiated geographic races to strikingly different species, their grouping into genera, species and subspecies (or into Genera, Formenkreises and Races) being largely one of personal opinion, aided often by breaks in the series caused by the extinction of connecting links, or possibly by the sudden emphasis exerted by environment, or otherwise, on some usually dormant or recessive character. Also that the subspecies may in course of time, quickly or slowly, become a species through isolation or other cause.

Dr. Kleinschmidt's method of presenting his theme is peculiar and much space is devoted to considering objections to the Formenkreis Theory for which objections,—so far as we can see, the author himself is responsible, standing, as it were, as council for both sides of the case! All through the book, too, he seems to consider himself as the originator of a revolutionary theory of creation a claim that hardly seems justified.

The careful distinction of races from sports and other forms of individual variation seems beside the point as such things are not recognized nomenclatorially under any system, and also the explanation that the Formenkreis (literally "form circle") is really not a circle but a union of forms distinct from other unions, the range of which may be anything but circular—we can hardly imagine anyone thinking that a circle, a square or any other geometrical figure was in any way concerned in the discussion!

The book is well gotten up with many interesting illustrations but we regret that the author has not devoted more time and effort to a clearer presentation of his theory and dispensed with much unnecessary praise of what the Formenkreis Theory has accomplished, and will accomplish, in recasting biological education and research—and even the public museum! —claims which we fear his readers will hardly endorse.—W. S.

Belcher's 'Birds of Nyasaland.'—This well gotten up book[1] consists of an annotated list of the birds of Nyasaland based primarily upon the observations of the author during seven years residence in the country. The nomenclature follows that of Sclater's 'Systema' and there is a brief description of each species with keys, sometimes to genera sometimes to species, translated from Reichenow's great work on African birds. The "annotations" are very full and discuss the abundance, distribution and peculiarities of each species. Our only criticism is the use of abbreviations of dates. For instance "21. xi. 26." is very little shorter than "Nov. 21, 1926" and the latter is far more satisfactory. Fortunately this usage is resorted to in only part of the text.

[1] The Birds of Nyasaland. Being a Classified List of the Species Recorded for the Nyasaland Protectorate up to the Year 1930, with brief descriptions and field notes, and a map. By Charles Frederic Belcher. London: Crosby Lockwood and Son. Stationers' Hall Court, Ludgate Hill, E. C. 4. 1930. pp. i–xii + 1–356. Price 15 shillings, net.