

not of a thoroughly convincing nature, all the more so, seeing that the work is primarily intended for the layman, who has not the means of sifting out such matter and putting the correct interpretation upon it. Thus in dealing with Malta fever, in a few short sentences he would lead the reader to infer that mosquitoes often serve as the "inoculating" agents, and unfortunately leaves one entirely in the dark as to the true cause of the spread of this disease.

Many of the photographic illustrations which accompany this work are very good; indeed, more especially so are those representative of the various developmental stages of the mosquitoes; we do not agree with the author's statement, however, that all his pictures show "the insects, not as we think they should be, but as they actually are," because both colour values and general morphological characters are in many instances entirely wanting, and the resulting print is nothing more than a silhouette. Moreover, the photographs of both museum and microscopical preparations show a marked absence of care and neatness in the display of the various organs, and such figures as these stand out in marked contrast to those of Manson, Kellog, Nuttall, and others. We would point out also that Figs. 76 and 77 represent a female and male mosquito respectively, and not the reverse order, as stated by the author. *Ochromyia anthropophaga* (p. 49) should read *Auchmeromyia luteola*. The latter, not the former, is the parent of the congo-floor maggot.

This work is furnished with an extensive and useful bibliography occupying forty-seven pages, to which annotations are appended.

SYSTEMATICS.

Die taxonomischen Grenzen der Art und ihrer Unterabteilungen. Versuche einer genauen Definition der untersten systematischen Kategorien. By Andreas Semenov-Tian-Shansky. Pp. 24. (Berlin: R. Friedlaender and Son, 1910.) Price 2s.

THIS is the German translation of a pamphlet which appeared first in Russian. It deals on a wide basis with the definition of the term species and the lower categories in classification. The author—whose title, "Tian-Shansky," reminds us of his exploration of the Tian-shan or Celestial Mountains in Central Asia—pleads for uniformity of terminology in the various branches of botany and zoology, and then proceeds to examine critically the opinions of various botanists and zoologists on the criteria of species and its several component varieties. The large experience gained by Semenov from his many years' study of insects, especially Coleoptera, and his acquaintance with at least an essential portion of the literature bearing on the subject, enable him to substantiate his criticisms by illustrations drawn from his own knowledge and to adduce corroborative evidence from the writings of other authors. The co-existent species are defined by the author as units which are morphologically and psycho-physiologically separated from each other. The units thus isolated do not fuse, although very occasional intercrossing

may occur. The individuals belonging to a species may all be practically alike, or they may form various kinds of varieties. Semenov defines four principal categories of modifications within a species:—

1. Subspecies or geographical race (*subspecies*) is the most important subdivision of a species, inasmuch as it represents a phylogenetic stage one degree below the complete separation from the parent stock.
2. Nation (*natio*) is a term proposed by Semenov for local varieties which are subdivisions of a subspecies, each *natio* occupying only a comparatively small definite portion of the whole area of the subspecies.
3. Morph (*morpha*) is adopted for the non-geographical varieties which are produced by the action of the seasons, the soil or the food.
4. Aberration (*aberratio*) is employed for purely individual deviations from the normal type.

It appears to us so very difficult and often impossible to draw in nature a distinction between subspecies and nation (=sub-subspecies) that in many cases the employment of one or the other term will entirely depend on the personal opinion of an author. The Greek term *morpha* does not appeal to us as a happy choice, and will hardly recommend itself to systematists generally, who are used to the Latin term *forma*, often employed with a convenient qualifying addition, such as *f. temp.*, for the seasonal form.

The pamphlet is a lucid interpretation of the distinguished author's view, and will be read with great profit by all who are interested in the philosophical aspect of systematics.

K. J.

COORDINATE GEOMETRY.

An Elementary Treatise on Coordinate Geometry of Three Dimensions. By R. J. T. Bell. Pp. xvi+355. (London: Macmillan and Co., Ltd., 1910.) Price 10s. net.

THE substance of this volume has formed the material of a course of lectures delivered for some years past to undergraduates in Glasgow. Its object is to provide the student, whose bent is towards applied mathematics, with as complete an exposition of the subject as he will require, and at the same time to act as an introduction to those who intend to proceed to a more exhaustive study of differential geometry and the theory of surfaces. Its scope is best indicated by a brief enumeration of the headings of the chapters:—coordinates, direction ratios, the plane and straight line, change of axes, the sphere, the cone, the conicoids, axes of sections, generating lines, confocals, the general equation of the second degree, systems of conicoids, conoids and general surfaces, curves in space, ruled surfaces, curvature, geodesics. It will be noted that there is no mention of homogeneous and tangential coordinates. The author has excluded these on the ground that the student has already acquired a knowledge of the general principles involved from his work in plane geometry. The same consideration has led him to exclude any section on duality or reciprocation. Some teachers will regret this omission, as the student is