form; following, except last, moniliform, enlarging and becoming quadrate. Posterior ocelli as far from one another as from the eye-margin, each connected to the eye-margin by a raised line. Pronotum with a series of large punctures along its posterior edge. Mesonotum shining, almost impunctate; parapsidal furrows complete, converging behind, of equal width throughout; lateral lobes of mesonotum scarcely depressed; a deep foveate impression in front of the tegula. Scutellum with two large hoof-shaped foveae at base, at apex with two small circular ones. Metathorax with a carina in the shape of an inverted V. Petiole twice as long as broad, with three strong longitudinal carinae above, and a weaker lateral one, marking off four shallow grooves; second segment with the base raised and medially notched from behind; its median furrow extending nearly to the middle. Pro- and mesopleurae smooth and shining, each margined by a raised line; metapleura pubescent, coarsely reticulate. Legs stout. Wings strongly pubescent, except at extreme base.

One female from Independencia, Parahyba, Brazil, Mann and Heath.

This species resembles _G. sulcaticeps_ Kieffer, differing by its larger size, longer petiole, shorter first and second flagellar joints and longer scape. In certain lights the front shows a trace of the median lanceolate area present in _sulcaticeps_.

NOTE ON THE MOUTHPARTS OF ORTHOPTERA.

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This paper is presented for the purpose of calling attention to an error which appears in some of our most widely used textbooks on general zoology and entomology, as well as in other works which deal with the anatomy of Orthoptera.

For several years I have noticed the error, and always find it necessary to warn students against the tendency to see and draw the mouthparts of the “grasshopper” as they appear in the textbook instead of drawing them correctly from the specimen. For the drawings commonly used in textbooks are not only anatomically incorrect, but are also unreasonable. For example, if one refers to Lang’s Comparative Anatomy, Part 1, p. 446; or to Parker and Haswell, Vol. 1., p. 621, one finds the mandibles of the Blattidae represented as two organs identical in form; each bearing three sharp-pointed teeth, which are arranged in exactly corre-
ponding positions. The cutting edges of both mandibles are beveled in exactly the same manner, on the same side, so that were the cutting edges brought together, the point of each tooth on one mandible would come into direct contact with the corresponding tooth on the opposite mandible. Upon a moment's reflection it is clear that such an arrangement would be utterly useless as an organ of mastication. By the use of an ordinary lens one can easily see that such is not the structure, but that the mandibles of the cockroach have their cutting edges quite different the one from the other. Both have toothed edges; but the corresponding teeth on the different mandibles are not exactly alike and never borne in the same position; and are so arranged that those of the left mandible overlap those of the right mandible. This is accomplished by both cutting edges being beveled, the one in the opposite manner from the other so that in coming together they form a crushing apparatus. This structure I have taken pains to show in the accompanying drawing (fig. 1), made from a specimen.

Insects more commonly used to illustrate the mouthparts of the class are the locusts. The mandibles of *Melanoplus femur-rubrum* as represented in Linville & Kelly's General Zoology, or Comstock's Manual of the Study of Insects; and those of *Schistocerca americana* represented in Sanderson's Insect Pests of the Farm, Garden and Orchard, all present the same kind of error as that pointed out in the preceding paragraph. All show the two mandibles exactly, or very nearly alike. Unfortunately this error is of such a nature as to obscure the highly specialized structure of these organs for their function of mastication, for the drawings referred to above more nearly represent the true nature of the mandibles of carnivorous insects than those of the vegetable-eating locusts. I have examined many specimens upon this point, representing no less than forty different species and I herewith present several drawings which I have made from specimens selected from various species to show the variations which occur in the mandibles of the locusts. The drawings are made from mandibles mounted in the same position as when closed in the living specimen; but separated enough to show the grinding surface of the right mandible.
Mandibles of Various Locusts.

Fig. 1, *Hippiscus tuberculatus*; fig. 2, Cockroach; fig. 3a, *Melanoplus femur-rubrum*; fig. 3b, *Schistocerca alutacea*; fig. 4a, *Schistocerca americana*, mandibles closed; fig. 4b, same, mandibles separated; fig. 4c, same, left mandible turned over to show grinding surface; fig. 5a, *Syrbula* sp.; fig. 5b, *Melanoplus differentialis*; fig. 5c, *Disesteira carolina*; fig. 5d, *Encoptolophus sordidus*; fig. 5e, *Melanoplus differentialis*
Some of the constant characteristics of the mandible of locusts may be stated as follows:

1. The left mandible is generally slightly, and sometimes considerably larger than the right one; and projects beyond it ventrally when closed.

2. The distal ends of the two mandibles are always beveled, the one in the opposite manner from the other so that when the mandibles are closed these beveled surfaces are contiguous throughout.

3. When the mandibles are closed the anterior aspect presents the cutting edges meeting, not on the median line, but always to the right of it. (Plate 1, fig. 4a).