Kullenberg as the *dorsal sack* and he considered it to be derived from the *common oviduct* (Figs. 5, 14, 17, *OdC*). This view is supported in the present study.

Membranous margins of the paratergites of the eighth segment are continuous with the anterior wall and roof of the genital chamber at the rami of the first valvulae (Fig. 11, *mb*). Also the anterior wall lies posterior to the seventh sternum. Therefore, these portions of the genital chamber may be considered to have been derived from the sternum of the eighth segment.

The posterior margin of the region designated as the roof of the genital chamber is marked by a ventral inflection. The surface of the genital chamber extending from this inflection ventrally to the base of the second valvulae is the posterior wall (Figs. 13C, 15, 16A). Laterally, the posterior wall extends between the rami of the second valvulae. The dorsal portion of the posterior wall is membranous. The ventral portion, in general, consists of a median sclerotized process and a pair of bilateral sclerotized plates. The plates are referred to in this study as the *inter-ramal sclerites*. The dorsal margin of the inter-ramal sclerites in *Miris dolabratus* and *Lygus lineolaris* is turned anteriorly and a membranous fold extends from them (Figs. 13C, 16A, *IrS*). In *Lopidea staphyleae* the dorsal portion of each inter-ramal sclerite gives rise to a pair of prominent biramous processes (Fig. 15). In *Plagiognathus albatus* the inter-ramal sclerites are simple, oblong plates and in *Lopidea staphyleae* they are not clearly differentiated from the remainder of the posterior wall (Fig. 15, *IrS*). Between the dorsal portions of the inter-ramal sclerites the posterior wall is differentiated into a sclerotized process which has an s-shaped form when viewed laterally. This is referred to here as the *sigmoid process*. Its development is elaborate in *Miris dolabratus* and *Lygus lineolaris* (Fig. 19A, *SmP*), whereas it is rather simple in *Plagiognathus albatus* and *Lopidea staphyleae* (Fig. 15, *SmP*).

The posterior wall is continuous with the second valvifers at the rami of the second valvulae (Fig. 11, *2Ra*). For this reason the posterior wall may be considered to have been derived from the sternum of the ninth segment.

The Seminal Depository

Of particular interest in mirids is the relatively large membranous bladder which opens into the anterior wall of the genital chamber (Figs. 5, 7, *SmDp*). This organ apparently serves to receive and store sperms and is, consequently, referred to as the *seminal depository* in this investigation. It is of integumental origin and evidently derived from the venter of the eighth segment. The lumen of the seminal depository is lined with a thin, very pliable cuticle. The internal surface, that is the surface facing the haemocoel, is lined with epidermis. On the dorso-lateral surfaces of the seminal depository the epidermis appears to be differentiated into two large patches of glandular epidermis consisting of cuboidal cells with nuclei which are almost opaque when stained with hematoxylin (Fig. 10A, *epd*). Large secretory vacuoles were not found in these cells so it is assumed that their secretion passes through pores in the cuticle as it is slowly formed.

In the virgin female this bladder is collapsed and contains almost no fluid (Fig. 18, *SmDp*). After insemination it is completely filled by the seminal fluid and by clumps of semi-solid material.

Though the seminal depository appears to function as an organ for the storage of sperms, there is not sufficient reason for considering it to be homologous to the spermatheca of other insects. The first indication that it is not a spermatheca is that it is not in the proper position relative to the gonopore. Johannsen and Butt (1941) have pointed out that embryological studies indicate that the median oviduct of higher insects arises in early development by in invagination of the posterior region of the seventh venter. This is followed by the formation of a groove extending posteriorly on the venter of the eighth segment. The groove is gradually transformed into a tubular extension of the common oviduct. The external opening of the common oviduct, or *gonopore*, thus comes to lie in the posterior region of the venter of the eighth segment. The spermatheca arises as a median

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EXPLANATION OF PLATE V

FIG. 13A. Dorsal aspect of the genital chamber of *Miris dolabratus* with the common oviduct and seminal depository removed. X 56.

FIG. 13B. Ventral aspect of the roof and anterior wall of the genital chamber of *Miris dolabratus* with the first valvulae removed at the first valvifers. X 56.

FIG. 13C. Dorsal aspect of the posterior wall of the genital chamber of *Miris dolabratus*. X 56.

FIG. 14. Dorsal view of the genital chamber of *Plagiognathus albatus*. X 100.

FIG. 15. Dorsal aspect of the posterior wall of the genital chamber of *Lopidea staphyleae*. X 46.

FIG. 16A. Dorsal aspect of the posterior wall of the genital chamber of *Lygus lineolaris*. X 61.

FIG. 16B. Ventral aspect of the anterior wall and roof of the genital chamber of *Lygus lineolaris* with the left valvula removed at the left first valvifer and the right valvula removed at its rami near the posterior margin of the roof. X 61.

AWVst, anterior wall of the vestibulum; *BOdC*, margin of attachment of the common oviduct; *brp*, biramous process; *DLbp*, dorsal labiate plate; *IrS*, inter-ramal sclerite; *mb*, membranous fold on the posterio-dorsal portion of the inter-ramal sclerite; *mt*, cuticular muscle tendon; *OdC*, the modified common oviduct; *OdL*, lateral oviduct; *Ovp*, ovipositor; *r2*, strengthening ridge of the second valvifer; *1 Ra*, ramus of the first valvula; *2 Ra*, ramus of the second valvula; *rg*, ridge; *RGl*, area in which the ringed gland occurs; *SmDp*, seminal depository; *SmP*, sigmoid process; *SR*, sclerotized ring; *VLbP*, ventral labiate plate; *2Vlf*, second valvifer.