NEW SPECIES OF CHIONASPIS AND NOTES ON PREVIOUSLY KNOWN SPECIES.

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In the CANADIAN ENTOMOLOGIST, Vol. XXVII., page 33 (1895), Professor T. D. A. Cockerell stated that Dr. James Fletcher had just sent him a species of *Chionaspis* from Charlottetown, Prince Edward Island -- very abundant on the bark of *Betula papyrifera* — and that in comparing it with Prof. Comstock's description of *C. Lintneri* he believed it to be that species. Following the description of the Prince Edward Island specimens, Prof. Cockerell drew attention to a few probable points of difference between it and Prof. Comstock's description, but as he could find no positive differences he did not separate the form on *Betula*, inferring that the discrepancy was due either to variation in his specimens or the incompleteness of Prof. Comstock's description. I have since received specimens of the form on *Betula papyrifera* from Prof. Comstock and Dr. J. A. Lintner, and the latter gentleman has also lent me Prof. Comstock's co-types of *C. Lintneri*. On comparing the two I was at once convinced that they were distinct, and upon giving Prof. Cockerell my reasons for thinking that the two insects could not be identical, he advised me to separate the form on *Betula*.

While the insect is distinct from *Lintneri*, Comst., I believe it to be only a variety of that species, and have described it as such below.

CHIONASPIS LINTNERI BETULÆ, n. var.

Scale of Female.—Widely pyriform, flat, covered with the very thin epidermis of the bark, giving a brownish tinge to the snow-white scale. Exuviæ bright orange-brown, contrasting strongly with the secreted portion. Texture of scale compact. Length of exuviæ about .8 mm.; total length of the scale about 2 mm.

Compared with typical *Lintneri*, the variety is .5 to 1 mm. shorter, proportionately broader, firmer in texture, with the exuviæ orange-brown instead of yellowish-brown.

Scale of Male.—Of the normal form and colour of the genus, with a distinct but feeble median keel and pale yellow exuviæ. Length about .8 mm.

Unfortunately I have no typical male scales of *Lintneri* with which to compare those of this variety.

Female.—Elongated, with the segmentation moderately distinct.

Pygidium with three pairs of lobes visible; median pair large and well developed, second pair smaller, third pair rudimentary. Median pair contiguous at the base, their inner edges diverging at about a right angle, each lobe being bluntly pointed. Lobes of the second pair each composed of two rounded lobules, of which the inner is the larger. Third pair only slightly produced. A distinct spine at the base of each median lobe, and a small plate and obscure marginal gland opening between the median and second lobes. A large spine above and a small one below the outer lobule of the second lobe. A plate and marginal gland opening between the second and third lobes. Following the third lobe, two spines, two plates, a marginal gland opening, and, after a space, a group of one to three plates, followed first by a marginal gland opening and then by a terminal group of five to nine plates. Dorsal rows of oval gland openings present.

Groups of circumgenital glands compact. Median, 13 to 18; anterior laterals, 25 to 42; posterior laterals, 19 to 28.

Male.—Unknown.

It is impossible to separate the two insects by their pygidia.

Chionaspis Lintneri, Comst., and this variety both belong to the group of *salicis* L., *ortholobis*, Comst.

CHIONASPIS CARYÆ, n. sp.

Scale of Female.—Inconspicuous on the bark of the host plant; elongated, rather irregular in form, of a dirty white colour with brown exuviæ. Anterior and smaller exuvia easily distinguished, the posterior and larger one completely hidden from view by the copious secretion that covers it. Length, 1.7 to 2. mm. Breadth, about .8 mm.

Scale of Male.—Very small and white, with a very indistinct median keel. The pale brown exuvia extending about one-third the total length. Length, .5 to .7 mm.

Female.—Elongated, narrowed toward the anterior end, being broadest toward the posterior end. Segmentation distinct, the posterior segments being produced laterally and bearing numerous gland openings. Rudimentary antennæ distinct, the distance between them about equal to the width of the mouth-parts. Pygidium brown, somewhat triangular, with the first and second pairs of lobes well developed, the third pair being more or less rudimentary. Median pair large, conspicuous, with their inner edges fused together for about half their length, forming one solid piece. Lobes of the second pair each divided into an inner,

oblique, lobule which is sometimes serrated, and an outer straight one, the inner one being larger. Third pair of lobes broad and only slightly produced, with the outer edge serrated. A distinct spine above at the base of each median lobe, and between the median and second lobes a short plate and an obscure marginal gland opening. A large spine above the outer lobule of the second lobe and a smaller one below, and between this lobule and the third lobe a plate and a marginal gland opening. A marginal gland opening at the base of the third lobe, and, outside this lobe, a large spine above and a small one below, followed first by a plate and then by a notch in which is a marginal gland opening. Following this is a spine, one or two plates, and, after a space, the terminal group of about seven plates. Dorsal rows of oval gland openings present.

Circumgenital glands arranged in five groups: Median, 12 to 19; anterior laterals, 21 to 29; posterior laterals, 15 to 22.

Male.—Unknown.

This species also belongs to the *salicis* group, but may be readily distinguished from all others of the genus by the peculiar fusion of the inner edges of the median lobes.

Habitat.—On *Carya* from Washington, D. C.

CHIONASPIS LOUNSBURYI, n. sp.

Scale of Female.—Elongated, sometimes narrow like *Mytilaspis* and sometimes broadened posteriorly like *Chionaspis;* straight, very firm in texture, silvery-white with the exuviæ yellowish or brownish. Secretion covering the second exuvia firm and persistent. Scale more or less covered with a brown bloom, which occurs naturally on the surface of the leaves of the host-plant. Length of exuviæ about 1 mm.; total length, 2.4 to 3 mm.

Scale of Male.—Very loosely constructed and fragile; median keel present, but very indistinct, invisible, in fact, except in the more perfect specimens. White, with the exuvia pale yellowish or colourless. Length, 1.2 to 1.5 mm.

Female.—Elongated, narrowed at the anterior end, but with the abdominal segments of about equal width; mouth-parts occupying fully one-half the width of the body at the anterior end. Pygidium with a median notch, the two sides being formed by the first pair of lobes, which are large and well developed in some individuals, or small and rudimentary in others. Second pair present, third pair obsolete. Median lobes

when well developed rounded on the posterior extremities, sometimes faintly serrate, with a pair of spines in the notch; when rudimentary, only slightly produced, with the pair of spines in the notch often inconspicuous or absent. Second lobe composed of two lobules, inner large and rounded, outer smaller and bluntly pointed. Two spines anterior to the outer edge of each median lobe. A well-developed plate and a marginal gland opening between the median and second lobes. Two spines at the base of the second lobe, and outside this lobe, a second plate, followed by a deep notch in which is a marginal gland opening. Then two spines and a third plate followed by a second notch in which is a marginal gland opening, and, after a short space, the fourth and last plate. Dorsal rows of oval gland openings present.

Five groups of circumgenital glands: median, 5 or 6; anterior laterals, 10 to 13; posterior laterals, 13 to 27.

Male.—Unknown.

This species may be distinguished from other known members of the genus by the characteristic appearance of the scales, particularly those of the female. It belongs to the group of *eugeniæ* (Green), *chinensis* (Ckll.), etc., or those having a terminal median notch in the pygidium.

Habitat.—On an unidentified plant from Ceres, Cape Colony, South Africa, sent by the Government entomologist, Mr. Charles P. Lounsbury, to Dr. L. O. Howard, at Washington, and also to the writer. The female scales are indiscriminately distributed over both surfaces of the leaves, while the male scales occur in groups chiefly on the under surface.

I take pleasure in naming this insect after its discoverer, Mr. Lounsbury, who is doing very valuable and praiseworthy work in economic entomology.

CHIONASPIS HOWARDI, n. sp.

Scale of Female.—Elongated, narrow, sides nearly parallel. White, with the exuviæ variable in colour, being yellow, brown or green; two parts of the same exuvia often of different colours. Second exuvia obscured by the waxy secretion that covers it. Length of exuviæ about .7 mm.; total length of the scale, 1.5 to 1.7 mm.

Scale of Male.—Elongated, sides parallel, with a distinct median keel; creamy white with the exuvia of about the same colour. Length about 1.2 mm.

Female.—Elongated, very slightly broadened posteriorly, with the segmentation not pronounced, the posterior segments having numerous

gland openings on the sides. Pygidium cleft at intervals and having the margin distinctly denticulate, more plainly so in some specimens than in others. Median and second pairs of lobes well developed, often with thickenings of the body wall extending anteriorly from them; third pair wholly wanting. Median pair separated by a distance about equal to the width of one of the lobes. Each lobe of the second pair composed of two distinct and separate lobules, the inner one being larger and often approximating the median lobes in size. Interval between the median lobe occupied by two more or less distinct teeth, anterior to which is a transverse oval gland opening. Two spines anterior to each median lobe, and immediately outside each median lobe, a large plate, anterior to which is a spine. An oval gland opening between this plate and the second lobe, and, outside this lobe, a second plate, a denticulate space with two marginal gland openings and a spine, then one or two plates, followed by another denticulate space with two marginal gland openings and a spine, and, lastly, the terminal group of two plates.

Five groups of circumgenital glands; median, 5 to 7; anterior laterals, 9 to 14; posterior laterals, 7 to 14.

Male.—Unknown.

Habitat.—On East Indian bamboo from the Department of Agriculture, Washington, D. C.

I take pleasure in naming this insect after Dr. L. O. Howard, United States Entomologist, the extent and value of whose work is well known by all workers in entomology.

CHIONASPIS LINTNERI, Comst.

Since this species was described in 1882, in Prof. Comstock's second Report of the Department of Entomolgy of the Cornell University Experiment Station, no mention has been made of its having been discovered in other localities, except in the instance mentioned in a previous paragraph of this paper. On January 12, 1898, Mr. A. F. Burgess, an assistant in the scientific department of the work of extermination of the Gypsy moth, found a *Chionaspis* abundant on *Alnus* in a swamp in Stoneham, Mass. I made an examination of these specimens and found them to be *C. Lintneri*, Comst. The specimens occur only at the bases of the young trees.

CHIONASPIS MINOR, Mask.

In the fall of 1897, Prof. A. L. Quaintance sent me a piece of a branch of a "China-tree" *(Melia azedarach)* badly infested with a white

Chionaspis, which, on examination, proved to be *Chionaspis minor*, Mask. From the appearance of the branch, it occurred to me that the species might be doing harm, and, on writing to Prof. Quaintance, I was informed that it was severely attacking the "China-trees" at Braidentown, Florida, having apparently killed many trees on the main street of the town. This is the first time this species has been reported from the United States, so far as I can learn, and as it has quite a large number of food plants, its introduction is an important matter.

Chionaspis minor was originally described from New Zealand, and is quite generally distributed in the West Indies. Mr. Alexander Craw has also sent me specimens which arrived at San Francisco, Cal., on an unidentified plant from Panama. The species is known to attack Palm, *Vitis vinifera*, *Rhipogonum scandens*, *Persoonia*, *Hibiscus*, *Capsicum*, *Erythrina*, and *Melia azedarach* (China-tree).

A NEW GRASSHOPPER FROM ONTARIO.

BY E. M. WALKER, TORONTO.

Melanoplus abortivus, new species.— Size rather small, especially the male. Female nearly as large as *M. femur-rubrum*, but proportionately much stouter.

Frontal costa nearly reaching the clypeus, subequal,though sometimes a little contracted toward the vertex, plane except a slight depression at the ocellus, or in the male generally slightly sulcate from just above the ocellus, rather thinly punctate. Vertex with the margins slightly elevated, gently expanding in front of the eyes for a distance about equal to or somewhat less than that between the eyes in the female, rather greater in the male. Interspace between the eyes rather broader than the first antennal joint in the male, nearly twice as broad in the female. Eyes rather prominent, especially in the male, of moderate size. Top of head moderately prominent, evenly convex. Antennæ about as long as the head and pronotum. Anterior margin of pronotum truncate or very slightly emarginate, posterior margin obtusely rounded. Sides of pronotum in the male sub-parallel, only slightly divergent posteriorly on the metazona; in the female distinctly divergent throughout their entire length, so that the width of the pronotum is about one-third greater at the posterior than at the anterior margin. Dorsum of pronotum broadly convex and more or less distinctly and finely punctate on the metazona. Median carina entirely obliterated or very indistinct on the prozona, distinct and