

ON SOME CARIBIDÆ, INCLUDING NEW SPECIES,  
FROM THE MOUNTAINS OF NORTH CARO-  
LINA AND TENNESSEE

BY P. J. DARLINGTON, JR.

In late August and early September, 1930, I collected with an expedition from the Museum of Comparative Zoölogy (of Cambridge, Massachusetts) on several of the mountain ranges of western North Carolina and eastern Tennessee. Probably because of the lateness and dryness of the season few phytophagous or other arboreal beetles were found. However, Carabidæ, in which I was chiefly interested, were abundant in suitable places, especially on the heavily forested slopes of the higher mountains, so that we (Prof. Nathan Banks, Dr. F. M. Carpenter, Mr. Gilbert Banks and myself) were able to secure about 1800 specimens of the family. Dr. W. S. Creighton and Mrs. Creighton collected about 400 additional Carabidæ at Little Switzerland, in the Black Mountains, North Carolina, also during the summer of 1930. This collection they have very kindly turned over to me. Study of these series of accurately labeled specimens has led to the recognition of several new species and subspecies, and it is chiefly to describe these novelties that the present paper is written. However, a few previously described local forms are discussed. It is hoped that the paper may help to stimulate coleopterists to collect and study the interesting fauna of the southern Appalachian uplands. Only when much more collecting has been done, and the specimens labeled accurately *and in detail*, can a comprehensive study of this fauna and of its distribution be undertaken.

I am indebted to the authorities of the Museum of Comparative Zoölogy not only for sending me with their expedi-

tion to the southern Appalachian region, but for permitting me to study the Coleoptera which were secured, and to refer to the invaluable type collections in the Museum. The authorities of the American Museum have very kindly allowed me to examine several types and other specimens in their care collected by Beutenmüller in the Black Mountains.

#### **Scaphinotus viduus irregularis** Beut.

Taken by us at about 6,000 feet on Mt. Mitchell, Black Mountains, N. C., and at 5,200 feet at Newfound Gap, Smoky Mountains, on the North Carolina-Tennessee state line. Three specimens in all, under stones and loose bark.

I have seen the type in the American Museum. This is a geographical subspecies of the more northern typical *viduus*, not an aberration as stated by Roeschke (1907, p. 145). *Irregularis* seems to be the only recognizable subspecies of *viduus*, for the series of *viduus* which I have examined from New England and other regions show conclusively that *leonardi* Harr. is not valid. All the characters given by Harris (1839, p. 193) to distinguish *leonardi* from *viduus* prove to be of a purely individual nature.

#### **Scaphinotus confusus** n. sp.

General form and structure of the subgenus *Irichroa* as defined by Roeschke (1907).

Color black, with variable æneous or purplish reflections above.

Head of the usual *Irichroa* type, but with the labrum less deeply emarginate and the eyes less prominent than usual.

Prothorax narrow, by actual measurement very slightly (about 10%) wider than long, but appearing as long as wide; about 1.6 times as wide as head. Sides bluntly angulate just before the middle, slightly convexly arcuate from lateral angles to anterior angles, slightly concavely arcuate and converging from lateral angles to basal angles, which are obtusely rounded. Base and apex slightly emarginate. Lateral margins very narrowly and evenly flexed from

base to apex; each margin with a seta at the lateral angulation and a second seta a little before (not in) the basal angle. Disc of pronotum irregularly punctate and transversely wrinkled especially near the base and sides, variably elsewhere. Disc with a deep basal and a shallower apical transverse impression, the two connected by a median longitudinal impressed line.

Elytra with humeri broadly rounded, nearly obliterated. Each elytron with about 16 punctured striae anteriorly, but with more, especially in the ♀, near and behind the middle. Striae frequently in part irregular, however, especially laterally and apically and along a well-marked zone between the 9th and 11th striae (as counted near the front of the elytron). Epipleuræ rather closely and coarsely, but not deeply, punctured.

Anterior tarsi of ♂ very narrowly dilated, sole of the basal joint with spongy pubescence only in apical one-fourth of its length.

Length: ♂, 22.5-24.5; ♀, 26-28 mm.

Type: ♂, Museum of Comparative Zoölogy, No. 16430, from Mt. Mitchell, Black Mountains, North Carolina, taken by myself, September 7, at about 6,000 feet altitude, under loose bark at the base of a dead conifer in damp forest. Allotype ♀ and 5 paratypes (♂ ♂ ♂ ♀ ♀) from "Black Mountains, N. C., Beutenmüller," dated from May to July. One ♂, which I have not made a type, was taken by myself between Newfound Gap and Clingman's Dome, 5,200-6,642 feet, in the Smoky Mountains, on the North Carolina-Tennessee state line, September 2. A pair of paratypes is in my own collection; all the other specimens mentioned are in the Museum of Comparative Zoölogy.

*Scaphinotus confusus* may be distinguished from the other species of subgenus *Irichroa* as follows:

1. Prothorax rather broadly margined, the margin expanded toward the base ..... *S. viduus*  
 Margin usually narrower, not expanded toward the base ..... 2

2. Anterior tarsi of ♂ scarcely dilated, sole of first joint with spongy pubescence confined to apical  $\frac{1}{4}$ . Elytral striae confused from about the 9th to the 11th striae, the zone of confusion separated from the marginal area of confused punctuation by several regular striae. Size larger, all specimens seen over 22 mm. long ..... 3

Anterior tarsi of ♂ more dilated, sole of first joint with spongy pubescence covering at least apical  $\frac{1}{2}$ , sometimes nearly whole sole. Elytra usually, but not always, without a zone of confused striae separated from the margin by regular striae. Size smaller, usually under 22 mm. .... 4

3. Prothorax both actually and proportionately wider, almost exactly twice as wide as head.....*S. guyoti*

Prothorax narrower, about 1.6 times as wide as head. Upon direct comparison the lateral margin of the prothorax is seen to be more abruptly and more narrowly reflexed, and the eyes to be less prominent than in *guyoti* .....*S. confusus*

4. ....All other species of *Irichroa*

Beutenmüller included *confusus* in his conception of *guyoti*, and it is possible that he had specimens of *confusus* before him when he described *angelli* (1918, p. 89). However, since the entire description of *angelli* consists of a statement that it is merely a black color form of *guyoti*, since no type seems to have been designated, and since Beutenmüller's material is so scattered that it is impossible to say that he did not have a black *guyoti* in his series, it seems best to take his statement at its face value and consider *angelli* as really a black form of *Scaphinotus guyoti* Lec. (It is to be noted that *S. guyoti* and *S. confusus* cannot be separated by color.) By thus interpreting Beutenmüller's inadequate description literally, I think that much future confusion may be avoided, especially abroad.

**Scaphinotus guyoti** Lec.*(angelli* Beut.)

Not taken by the Museum of Comparative Zoölogy expedition. Described from "The Black Mountains of North Carolina . . . resembling in its characters *C. andrewsi*, but as large as *C. viduus*" (from original description, Lecomte, 1866). The only specimens I have seen in addition to the type are a pair (♂ ♀) in the Blanchard Collection, Museum of Comparative Zoölogy, from Highlands, N. C. The relationship of this species to *confusus* Darl. (see key above) parallels very closely that of *S. andrewsi* to *S. germari*, as interpreted by Roeschke (1907).

It is to be noted that Roeschke did not know *guyoti*, but drew his description from those of several authors who failed to distinguish *confusus* from *guyoti*.

**Nomaretus (Maronetus) unistriatus** n. sp.

Of the general form and structure of the subgenus, sometimes called genus, Maronetus; *i. e.*, of the *imperfectus* group of Nomaretus.

Piceous black, strongly shining.

Head as usual in the subgenus, constricted just behind the eyes but expanded posteriorly to form a condyle.

Prothorax as long as wide, about 1.6 times as wide as head, widest about the middle; sides broadly arcuate in anterior  $\frac{3}{4}$ , converging but slightly sinuate before the obtuse basal angles; base and apex nearly squarely truncate. Disc of pronotum smooth and shining, with deep basal and shallower apical transverse impressions, the two connected by a median impressed longitudinal line; pronotum with also a short, deep sublongitudinal impression on each side near the basal angle. Raised lateral margin of pronotum very fine and even; each margin with two setigerous punctures, one about  $\frac{1}{3}$  from apex and one a little before base.

Elytra widest well before the middle, outer margin strongly arcuate anteriorly, slightly and nearly evenly arcuate posteriorly to the pointed but not produced apex. All striae completely obliterated except the sutural, which

is represented in anterior  $\frac{2}{3}$  of elytral length by a series of coarse, subconfluent punctures. Disc of elytra otherwise shining and impunctate, except that on the left elytron there are three and on the right two setigerous (the bristles can be detected in three of the five punctures, and are broken off in the other two) punctures in a position corresponding to the 4th interval in striate *Maronetus*. Subapital marginal setigerous punctures of elytra nearly obliterated, only one or two very small ones being visible on each elytron.

Epipleuræ and under surface of body shining, impunctate except for the usual orderly series of setigerous punctures.

Tarsi and palpi of ♂ unknown; those of ♀ normal for *Maronetus*.

Length: ♀, 7  $\frac{3}{4}$  mm.

Type: ♀, Museum of Comparative Zoölogy, No. 16431, from Highlands, N. C., June, 1888. In the Frederick Blanchard Collection, probably collected by Blanchard himself.

*Nomaretus unistriatus* is unique in the great reduction of the elytral striation, and probably also in the reduction of the marginal setigerous punctures near the apex of the elytra. Blanchard's specimen (my type) has been mentioned by Leng (1916, p. 42) as probably representing an undescribed species, but Leng did not describe it, because he was unable to determine the amount of variation normally occurring in species of *Maronetus*. Fortunately the series of over 50 specimens of *M. schwarzi* before me shows pretty conclusively that such variation is not extreme, so that I feel sure that *unistriatus* is a real species, not an individual variant of some striate form. In addition to the unique characters by which it may be recognized at a glance, *unistriatus* differs from *schwarzi* in having the dorsal surface not microreticulate, and from *imperfectus* (probably its closest relative) in having setigerous punctures on the elytra in a position corresponding to the 4th interval in the striate species.

#### ***Nomaretus (Maronetus) debilis debilis* Lec.**

Taken by us in the Smoky Mountains at Newfound Gap

near 5,200 feet, and between the Gap and Clingman's Dome, near 6,000 feet. Both localities are on the North Carolina-Tennessee state line. Three specimens in all. These have the elytral striae less impressed and less heavily punctured, especially apically and externally, than the unique type of *debilis* from Georgia, but it would not be wise to describe a Smoky Mountain race until a larger series of both it and the typical form can be examined.

**Nomaretus (Maronetus) debilis alpinus** Beut.

Taken by us in the Black Mountains on Mt. Mitchell, 5,000-6,711 feet, and on Grandfather Mountain, 3,000-4,000 feet. Five specimens in all. This distinct form is stouter than *debilis*, with nearly impunctate elytral striae. It seems to be a geographical (northern) rather than an alticoline subspecies of *debilis*, notwithstanding the opinions of Beutenmüller (1903, p. 512) and of Roeschke (1907, p. 160) to the contrary, for in the Smoky Mountains nearly typical *debilis* ranges nearly as high as *alpinus* does in the Black Mountains.

Both *Nomaretus debilis* and its subspecies *alpinus* seem invariably to be found under stones and logs on the ground, not under loose bark or among dead leaves like most of our other eastern Cychrini.

**Sphæroderus multicarinatus** n. sp.

Unusually elongate for the genus. Black, with bluish or purplish reflections on the head, prothorax, and outer margins of elytra.

Head as usual in the genus, except much more rugose than usual between the eyes, and usually with a strong, longitudinal puncture midway between the eyes.

Prothorax about 1.6 times as wide as head; appearing at least as long as wide, but by actual measurement about  $\frac{1}{8}$  wider than long. Base slightly wider than apex. Sides evenly, not strongly, arcuate in anterior  $\frac{3}{4}$ , distinctly sinuate before the right or slightly obtuse posterior angles. Base and apex slightly emarginate; lateral margins nar-

rowly and evenly elevated, with a single setigerous puncture at middle. Pronotum with moderate basal and apical transverse impressions, with a fine longitudinal median impression from base to apex, and with a deep longitudinal fovea on each side extending from base more than  $\frac{1}{3}$  to apex. Numerous punctures are grouped in and near the foveæ and across the base, otherwise the disc is smooth, impunctate, and shining.

Elytra widest behind the middle, sides more arcuate posteriorly than anteriorly. Each elytron with about 16 striae as counted across the middle of its length. Intervals 4, 8 and 12 cariniform, but often interrupted; intervals 2, 6 and 10 also often cariniform (especially in ♀) but usually lower and more interrupted; other intervals much lower and usually so much interrupted that they resemble series of small tubercles; apex and outer margin of elytron studded with small tubercles, the striae confused. Epipleuræ moderately closely and coarsely punctate.

Anterior ♂ tarsi broadly dilated, basal joint entirely pubescent below; ♂ palpi each with last joint expanded, as usual in the genus.

Length 14-17 mm.; width 5.8-7 mm.

All type specimens from the Smoky Mountains, as follows: holotype ♂, allotype ♀, and 23 paratypes (12 ♂ ♂, 11 ♀ ♀) from Newfound Gap, near 5,200 feet, on the North Carolina-Tennessee state line, August 30 to September 3, 1930. 7 paratypes (♂, 6 ♀ ♀) from between Newfound Gap and Clingman's Dome, 5,000-6,642 feet, on the same state line, September 2. 2 paratypes (♀ ♀) from State Road to Newfound Gap, Tennessee side, 3,500 feet, September 1. 3 paratypes (♂ ♂ ♀) from Deep Creek (Bryson City), North Carolina, 2,000 feet, August 23-26. Holotype, allotype and paratypes in the Museum of Comparative Zoölogy (No. 16432); paratypes in the writer's collection. All type specimens taken by the writer and the other members of the Museum of Comparative Zoölogy 1930 expedition, in forest, usually under loose bark, in rotten logs, or on the ground among dead leaves. I have seen other speci-

mens, which I have not made types, from Highlands, N. C. (Blanchard Collection, Museum of Comparative Zoölogy.)

This species may be distinguished from other *Sphæroderus* as follows:

Sides of prothorax near base broadly and distinctly, though not strongly, sinuate; elytra with numerous parallel carinæ .....*S. multicarinatus*

Sides of prothorax not sinuate, or, if sinuate, elytra without distinct parallel carinæ

All other species of *Sphæroderus*

The exceptionally narrow prothorax, and strong puncture on the head midway between the eyes in *multicarinatus* are also useful diagnostic characters.

*Multicarinatus* is a geographical representative of *Sphæroderus bicarinatus* Lec., which it replaces in the Smokies. As species go at present in the genus, *multicarinatus* is a specific form, differing from *bicarinatus* (of which I have seen the type and numerous other specimens from the Black Mountains, N. C.) in being more slender, with the sides of the prothorax sinuate, with a constant puncture between the eyes (rarely present in *bicarinatus*), and with better developed elytral carinæ. However, I have seen intergrades between the two species—notably a specimen from Lake Toxaway, N. C., 3,000 feet, August 28, taken by myself. Notwithstanding Leng's (1961, p. 41) opinion to the contrary, I think that *Sphæroderus lecontei*, *bicarinatus*, and *multicarinatus* are all geographical representatives of a single stock, and that when the genus is revised upon a sounder basis, the last two forms should be considered as (very distinct) subspecies of *lecontei*. Until a revision can be undertaken, however, the three forms had better be kept apart.

#### ***Nebria appalachia* n. sp.**

A member of subgenus *Nebria* s. str., group XI of Bänninger's (1925) "Die Nibriini."

Brownish to piceous black; legs, palpi, antennæ, and (usually) a pair of spots between the eyes flavous.

Head proportionately large, with unusually prominent eyes.

Prothorax cordate; about  $\frac{1}{5}$  wider than the head across the eyes; just over  $\frac{1}{2}$  wider than long; base slightly narrower than apex, nearly  $\frac{1}{3}$  narrower than widest part; sides evenly arcuate in anterior  $\frac{3}{4}$ , strongly sinuate before the *acute* basal angles. Base and apex slightly emarginate; basal angles each with a setigerous puncture; lateral margins narrow, without setigerous puncture; Disc of pronotum not punctate; transverse basal and apical impressions and median longitudinal line present, and also a pair of short, linear basal foveæ just within the basal angles.

Elytra widest behind the middle, each elytron independently rounded at apex; humeri distinctly narrowed; elytra each with 8 well impressed striae, the striae faintly or not punctate, the 3rd interval with 3 or 4 large setigerous punctures. Inner wings about as long as the elytra.

Prosternal process margined except at extreme apex. Abdominal sternites 3 to 5 each, with a pair of single setæ near middle. Anterior tarsi of  $\delta$  slightly dilated, the first 3 joints pubescent beneath.

Length 7.5-8.5 mm. Width 3.0-3.7 mm.

Holotype  $\delta$ , allotype  $\varphi$ , and 43 paratypes from the Smoky Mountains, below Newfound Gap, Tennessee side, near 5,000 feet, August 30. 8 paratypes from the Black Mountains, Mt. Mitchell, N. C., near 6,000 feet (just above Camp Alice), September 5. Holotype, allotype, and paratypes in the Museum of Comparative Zoölogy (No. 16433); paratypes in the writer's collection. All specimens taken by the writer under stones on gravelly bars and banks of small mountain brooks.

The absence of the lateral marginal bristle of the prothorax and the presence of red spots between the eyes distinguish *appalachia* from all our other species of *Nebria s. str.*, group XI (*cf.* Bänninger, *l. c.*) except from *pallipes*. From the latter *appalachia* may be known at once by its much smaller size, proportionately smaller prothorax and

larger head, and especially by the acute rather than obtuse basal angles of the prothorax. *Appalachia* is one of our smallest, perhaps really our smallest, *Nebria*, and is apparently a strictly alticoline species. Careful search at 3,500 feet along the banks of the very stream, on the upper reaches of which the type series (Smoky Mountains) was collected, did not yield a single specimen.

***Pterostichus (Gastrellarius) unicarum* n. sp.**

Small, slender, but slightly ventricose; dark brown or piceous, antennæ, palpi, tarsi, and apices of tibiæ rufous.

Head with two setigerous punctures over each eye; eyes moderately prominent; antennæ long and slender; mentum tooth entire, elongate, triangular, bluntly pointed at apex.

Prothorax by actual measurement very slightly wider than long;  $1\frac{1}{3}$  times as wide as head; somewhat constricted toward base; base slightly narrower than apex,  $\frac{2}{3}$  as wide as widest part; sides evenly arcuate in anterior  $\frac{3}{4}$ , rather strongly sinuate before the rectangular basal angles; lateral margin very fine and even; base margined, but sometimes indistinctly so at middle. Pronotum with basal and apical transverse impressions faint, connected by a deeper, longitudinal impressed line on middle of disc; later basal foveæ linear, extending from base  $\frac{1}{3}$  or less toward apex; surface of pronotum impunctate even about the foveæ.

Elytra more than  $\frac{1}{4}$  wider than the prothorax  $\frac{2}{5}$  to  $\frac{1}{2}$  longer than wide; striae entire, not or just detectibly punctate; 3rd interval with a single setigerous puncture at or just behind the middle. Inner wings atrophied.

Anterior tarsi of ♂ slightly dilated, first 3 joints pubescent below; apex of last ventral segment with 1 bristle on each side in ♂, 2 in ♀.

Length 6.2-7.5 mm. Width 2.5-3 mm.

All specimens from the Smoky Mountains, as follows: Holotype ♂, allotype ♀, and 33 paratypes from Newfound Gap, North Carolina-Tennessee state line, 5,000-5,200 feet. 4 paratypes from State Road to Newfound Gap, Ten-

nessee side, 3,500 feet. 13 paratypes from Deep Creek (Bryson City), N. C., 2,000 feet. All specimens taken by myself. Holotype, allotype, and paratypes in the Museum of Comparative Zoölogy (No. 16434); paratypes in the writer's collection. The Deep Creek specimens were washed from piles of drifted trash along the banks of the creek; they may have been carried down from higher altitudes. All the other specimens were taken among loose dead leaves (*not* in compact leaf mold) on the ground on forested slopes.

The name I have used is derived from that of the Unica Mountains, of which the Smoky Mountains are a part. I completely failed to find this species outside of the Smokies.

The various species of the subgenus *Gastrellarius* of *Pterostichus* may be tabulated as follows:

1. Base of pronotum with numerous scattered punctures; average size larger; only 1 setigerous puncture over each eye in *honestus* and probably in Casey's three species—
 

|                        |                         |
|------------------------|-------------------------|
| <i>honestus</i> Say    | <i>scolopaceus</i> Csy. |
| <i>atronitens</i> Csy. | <i>deficiens</i> Csy.   |
  
- Base of pronotum not punctate; average size smaller; 2 setigerous punctures over each eye..... 2
2. Base of pronotum distinctly (and by actual measurement) wider than apex; form stouter and more convex; head proportionately smaller; elytral striae as a rule more distinctly punctate; length 5.0 (*teste* Casey)-6.8 mm. .... *blanchardi* Horn
 

Base of pronotum distinctly (and by actual measurement) narrower than apex; form more slender, much as in *honestus*; other characters opposed to those above; length 6.2-7.55 mm. .... *unicarum* Darl.

I know Casey's three species only from description. I am indebted to Mr. L. L. Buchanan for pointing out to me the interesting reduction of the supraocular setæ in *Gastrellarius honestus*. The presence of an entire mentum tooth in this subgenus is also noteworthy.

Pterostichus, subgenus or section *Monoferonia* Csy.

Casey 1918, p. 363

Excellent series, including all previously described and several new forms in this subgenus, are before me, so that it seems desirable to publish a complete review of the species. The treatment of *Monoferonia* as a group of full generic rank seems to me to be unjustified. I prefer to treat it merely as a natural subgenus or section of *Pterostichus*, as is done in the Junk Catalogue (Csiki 1930, p. 674). Among the other *Pterostichini*, *Monoferonia* may be characterized as follows:

Body slender, convex, black or piceous, very highly shining; mentum tooth deeply emarginate at apex; two bristles over each eye; prothorax never much constricted at base, the basal angles obtuse, often rounded at apex; inner basal stria of pronotum deep and linear, outer shorter, often deeply obliterated; elytral striation complete except that the scutellar stria is nearly or quite obsolete; a single dorsal puncture on inner edge of third elytral interval behind the middle (two punctures on one or both sides in rare individuals); inner wings atrophied; met-episternum short; sides of body below with or without (variation largely individual) scattered, shallow punctures; anterior tarsi of ♂ dilated, joints not oblique; ♂ palpi slender; last ventral abdominal segment of ♂ modified.

The species are difficult, but I think may be distinguished by the following table:

- |  |                         |
|--|-------------------------|
| 1. Elytral striae shallow, distinctly punctuate near base, intervals perfectly flat near apex; last ventral of ♂ only slightly modified.....   | 1. <i>primus</i> n. sp. |
| Elytral striae more impressed, not distinctly punctulate, intervals distinctly convex even at apex (less so in typical <i>maneus</i> , in which, however, the ♂ last ventral is characteristically modified—see description below) ..... | 2                       |
| 2. Outer basal fovea of pronotum nearly or quite obsolete, basal angles rounded at apex; last ventral  |                         |

of ♂ with sculpture consisting of a large, apical, transverse impression, oval in form, and bounded anteriorly by a curved, transverse, subcariniform elevation .....2. *diligendus* Chd.

Outer basal fovea usually (not always) well impressed, about  $\frac{1}{2}$  as long as inner fovea; basal angles of prothorax sometimes rounded apically, sometimes more abrupt; sculpture of ♂ last ventral not as described above ..... 3

3. Last ventral of ♂ with a small but distinct, bubble-like, sometimes slightly transverse tubercle set in the middle of a weak, post-median depression; basal angles of prothorax rounded apically.

Striae of elytra lightly impressed apically (Ga.)  
3a. *mancus* Lec. (typical)

Striae deeply impressed at apex (N. C.)  
3b. *mancus plethorus* subsp. n.

Last ventral of ♂ weakly impressed behind the middle, with a weak, transverse elevation at extreme apex; basal angles of prothorax scarcely rounded apically.

Sides of prothorax distinctly, usually strongly, sinuate before the base; body stouter (Black Mountains region, etc.) .....4a. *carolinus* n. sp.

Sides of prothorax not or very slightly sinuate before the base; form more slender (Smoky Mountains).....4b. *carolinus fumorum* subsp. n.

"*Monoferonia*" *idahoanus* Csy. (1924, p. 78), of which I have apparent topotypes, is nothing but *Pterostichus sphodrinus* Lec. It lacks the dorsal puncture of the elytron characteristic of the subgenus *Monoferonia* (Casey himself notes this fact), and belongs in subgenus *Hypherpes*, or possibly *Leptoferonia*, by Casey's own table (1918, pp. 320-).

Since all our species are mutually similar in appearance and in most points of structure, the following brief descriptions are all that are necessary to characterize them. I shall take the commonest and best known species, *diligendus* Chd. (*osculans* Csy.), as a basis for comparison of the others. All of the species are found under stones and logs in damp forests.

### 1. *Pterostichus (Monoferonia) primus* n. sp.

Of usual form and appearance for the subgenus; sides of prothorax oblique and usually slightly sinuate before the basal angles; latter only minutely rounded at apex, and therefore more abrupt than in *diligendus*; outer basal stria of pronotum nearly or quite obliterated; elytral striae comparatively little impressed, distinctly punctulate in basal  $\frac{1}{2}$ , intervals slightly convex anteriorly, completely flat in posterior  $\frac{1}{3}$ ; last ventral of  $\delta$  slightly impressed behind the middle, with a very weak transverse ridge adjacent to the apical margin.

Length 10.0-11.3 mm. Width 3.6-4.0 mm.

Smoky Mountains at comparatively low elevations: holotype  $\delta$ , and 2 ( $\varphi \varphi$ ) paratypes from Deep Creek (Bryson City), N. C., near 2,000 feet; 2 ( $\delta \varphi$ ) paratypes from State Road to Newfound Gap, Tennessee side, 3,500 feet. All collected by myself. A pair of paratypes is in my own collection; the rest of the type series, in the Museum of Comparative Zoölogy (No. 16435).

### 2. *Pterostichus (Monoferonia) diligendus* Chd.

(1868, p. 334)

*osculans* Csy. (1884, p. 2)

*apalachius* Horn (1892, p. 41)

*appalachius* (as corrected by) Csy. (1913, p. 132)

Of usual form and appearance for the subgenus; sides of prothorax oblique, rarely just perceptibly sinuate, before the basal angles; latter more broadly rounded at apex than

in most *Monoferonia*; outer basal stria of pronotum either obliterated or very weak; elytral striae deep, only rarely with even the slightest trace of punctulation; elytral intervals definitely convex even at apex; the last ventral of ♂ with a large, subapical, transverse impression which is bounded anteriorly by a pronounced transverse ridge.

Length 10.7-14 mm. Width 4.0-5.0 mm.

Range at least from the lower slopes of the White Mountains of New Hampshire to Virginia (Pennington Gap) and possibly to North Carolina (1 ♀ from Linville, doubtfully determined), and west (*teste* Casey 1924, p. 78) to Priest Lake, Idaho. Common in some localities.

There seems to be no doubt that Chaudoir's *Feronia* (*Evarthrus*) *diligenda* is a species of *Monoferonia*, and I am reasonably sure that it is the present species, in spite of Chaudoir's later opinion (*cf.* Horn 1892, p. 41) that the name is a synonym of *mancus* Lec. *Mancus* and the present species, like all *Monoferonia*, resemble each other so closely, especially in the absence of males, that Chaudoir might easily have considered them identical, even upon a comparison of specimens, and we do not even know that he had an opportunity for direct comparison. Setting aside Chaudoir's later opinion as of no certain value, then, we have the following statements in the original description of *diligenda* which, in combination, I think can refer only to the present species: the basal angles of the prothorax are obtuse, with the apices rounded; the inner basal fovea of the pronotum is recurved along the base and the lateral margin, where it is obliterated (this description fits some of my specimens but not others); the elytral striae are smooth and deep through their entire length; and, most significant of all, the ♂ last ventral has a transverse oval impression near the posterior margin. The species under discussion is the only *Monoferonia* known to me to which this last statement really applies. Casey (1918, p. 363) points out that Chaudoir mentions a depression on the ♂ last ventral but not a more anterior transverse ridge, and evidently concludes that the ridge would have been mentioned if it had been present and that since it is not men-

tioned, *diligenda* must be distinct from *osculans*, which has such a ridge. This, of course, is merely another example of Casey's specious reasoning—its weakness becomes strikingly evident when it is pointed out that Casey, in his own original description of *osculans*, mentions only the depression, not the ridge, of the ♂ last ventral. It may be added that the present species is the commonest and most widely distributed *Monoferonia*, and that its range is the most easily accessible, facts which increase the probability that it is what Chaudoir had in hand.

### 3a. *Pterostichus (Monoferonia) mancus mancus* Lec.

(1852, p. 234)

Form as usual in the subgenus; sides of prothorax oblique, sometimes just detectibly sinuate, before the posterior angles; the latter rounded at apex as in *diligendus*; outer basal stria of pronotum sometimes well marked and  $\frac{1}{2}$  as long as inner stria, sometimes almost obsolete; elytral striae less impressed than in any other *Monoferonia* except *primus*, intervals barely convex near apex, though more so anteriorly; striae not punctulate; last ventral of ♂ with a small, abrupt, rounded or sub-transverse, bubble-like tubercle set in the center of a very weak postmedian depressed area; tubercle smaller but distinct in the single ♀.

Length 11.0-11.8 mm. Width 3.9-4.4 mm.

Known to me only from Leconte's original series of three specimens (♂ ♂ ♀) from Georgia. A fourth (♀) specimen from the same locality, associated by Leconte, is *Pt. (Monoferonia) carolinus* (see below). In order to avoid confusion, I have labeled and here designate Leconte's first specimen (a ♂) as the type of *Pterostichus mancus* Lec. Type number: Museum of Comparative Zoölogy 16439.

### 3b. *Pterostichus (Monoferonia) mancus plethorus*

subsp. nov.

Precisely similar to typical *mancus* except that the striae of the elytra are deeply impressed, with the intervals

much more convex even at apex; last ventral of ♂ as in typical *mancus*; last ventral of ♀ usually (but not invariably) showing the ♂ sculpture in reduced form, *i. e.* with a minute, abrupt, bubble-like tubercle about  $\frac{1}{3}$  or  $\frac{1}{4}$  from the apex of the segment, but usually *not reaching the apex*. Females of other *Monoferonia* often have a less abrupt, longitudinal, *apical* elevation on the last ventral.)

Length 10.0-13.0 mm. Width 3.6-4.6 mm.

Holotype ♂, allotype ♀, and 81 paratypes (47 ♂♂, 34 ♀♀) all from the Black Mountains, Mt. Mitchell, North Carolina, 5,000-6,711 feet, taken by the writer and the other members of the museum expedition. Holotype, allotype, and paratypes in the Museum of Comparative Zoölogy (No. 16436); paratypes in the writer's collection.

This species (*mancus* and subspecies *plethorus*) seems to be the only one in which the sculpture of the ♀ last ventral is of assistance in identification, but the character is not to be depended upon even here, for it varies somewhat.

#### 4a. *Pterostichus (Monoferonia) carolinus carolinus* n. sp.

Of usual appearance for *Monoferonia*; sides of prothorax rather strongly sinuate before the basal angles; the latter obtuse but almost right, rather abrupt, rounded only at extreme apex; outer basal stria of pronotum usually about  $\frac{1}{2}$  as long as inner, but sometimes partly obliterated; elytral striae deep, not punctulate, intervals strongly convex even at apex; ♂ last ventral weakly impressed behind the middle, with a weak transverse elevation contiguous to the apical margin.

Length 11.2-12.3 mm. Width 3.9-4.5 mm.

Holotype ♂, allotype ♀, and 29 paratypes, (18 ♂♂, 11 ♀♀), from the Black Mountains, Little Switzerland, N. C., about 3,400 feet, all taken by Dr. W. S. Creighton, August 9 to September 10. In addition to the types I have seen 1 ♀ from Linville, N. C., September 8 (Creighton); 3 ♂♂ (not quite typical) from Black Mountain City, N. C., 2,700 feet (taken by myself); and 1 ♀ from Georgia in the Leconte Collection. Paratypes are in the collection of the writer; all other specimens mentioned are in the Museum of Comparative Zoölogy (type No. 16437).

The sculpture of the ♂ last ventral of this species resembles that of *primus*, but the other characters of the two species are very different.

4b. ***Pterostichus (Monoferonia) carolinus fumorum***

subsp. nov.

Similar to typical *carolinus*, but a little smaller, with the sides of the prothorax only slightly or (usually) not at all sinuate before the basal angles; the latter therefore more obtuse than in typical *carolinus*, but still not nearly so rounded as in *diligendus*; ♂ last ventral as in *carolinus*.

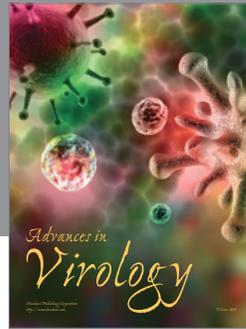
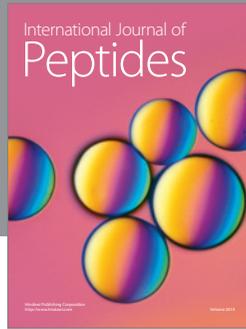
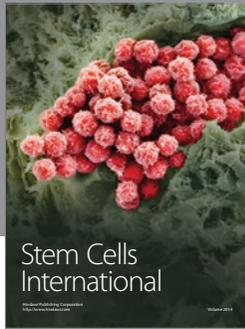
Length 10.1-12.0 mm. Width 3.7-4.5 mm.

Holotype ♂, allotype ♀, and 17 paratypes (6 ♂♂, 11 ♀♀) from the Smoky Mountains, between Newfound Gap and Clingman's Dome, along the North Carolina-Tennessee state line, 5,000-6,642 feet, September 2, all collected by the writer. Strangely enough, the species was not found near Newfound Gap itself. Several paratypes are in the writer's collection; the rest of the type series is in the Museum of Comparative Zoölogy (No. 16438).

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