An additional locality, one of the two original ones, is Ooumu, 4050 feet, Nukuhiva, Marquesas Islands (Mumford and Adamson), one worker.

KEY TO WORKERS OF SMITHISTRUMA*

1. Head length without mandibles (HL) less than 0.55 mm. 2
   Head length without mandibles (HL) more than 0.55 mm. 3
2. Clypeus broader than long, its free border broadly rounded; occiput in undamaged specimens with 8 prominent outstanding hairs (Palau Is.; possibly a tramp species) ..... *dubia* n. sp.
   Clypeus not broader than long, its free border rather narrowly rounded; prominent erect hairs on dorsum of head apparently limited to a single pair situated slightly anterior to cephalic midlength (Sumatra) ..... *karawajewi* (Brown)
3. Propodeal dorsum in profile straight or very nearly so, continuing to the posterior depressed portion of the mesonotum without sensible interruption; long humeral hairs flagellate. See note at end of key 4
   Propodeal dorsum in profile feebly convex; metanotal groove weakly but distinctly impressed below highest point reached by propodeum; humeral hairs stiff and narrowly spatulate at apices. See note at end of key 5
4. Petiolar node slightly broader than long (Burma) ..... *dohertyi* (Emery)
   Petiolar node slightly longer than broad (Borneo) ..... *lamellignatha* n. sp.
5. Fifth hair from the base of the anterior scape border curved toward scape apex; MI usually slightly more than 25 (Philippines) ..... *pedunculata* n. sp.
   Fifth hair from base of the anterior scape border curved toward scape base; MI probably rarely more than 25 (E. New Guinea, etc.) ..... *capitata* (Fred. Smith)

Note: The species *inezae, taipingensis* and *mumfordi* are not included in the key because inadequately known. The first two species would probably key out to *lamellignatha,* from which they are both supposed to differ, according to the original descriptions, in having smooth and shining postpetiolar discs. For further information on these species and on *pedunculata* vs. *capitata,* see discussions in the text above. *Mumfordi* is also discussed in the text above; any small *Smithistruma* taken in the Polynesian islands may belong to Wheeler's species, which is inadequately described. *Capitata* and *karawajewi* are keyed from probable worker characters as deduced from the females.

SMITHISTRUMA S. STR. OF THE ETHIOPIAN REGION

EMARGINATA GROUP

To date, there are only four species of *Smithistruma* known from Africa south of the Sahara, and two of these are recently described as new. While very diverse in form, all of these species show apparent relationship to the *rostrata* group, and they are separated more on a geographical than a morphological basis from *rostrata* and its allies. The Ethiopian forms examined have rather fully and acutely dentate mandibles, and where the basal structure is clear, there is little or no trace of diastemation. The anterior clypeal border is transverse to very deeply emarginate.

The species *emarginata* and *cavinasis* are strongly aberrant and easily recognized. *Transversa* is known to me only through the original description, which is rather ambiguous concerning certain important features. *Truncatidens* is a more "typical" *Smithistruma,* but has a very distinctive basal mandibular lamella.

The relative scarcity of *Smithistruma* species in Africa appears to be due chiefly to the presence in the same region of the decidedly more ubiquitous and dominant forms of the genus *Serrastruma.* There are roughly 20 times as many records known to me for African *Serrastruma* as for *Smithistruma,*

* This key applies to species of the Indo-Malayan, Papuan and Oceanian regions.

and I believe that this situation demonstrates less effective competition by the *Smithistruma* species in food-getting, the prey presumably being Collembola.

Smithistruma species may be distinguished from *Serrastruma* by the mandibles, which are shorter than the clypeus in the four known forms and which possess an armature of less than 15 teeth, all acute and not even in length, on the inner mandibular border.

SMITHISTRUMA (SMITHISTRUMA) EMARGINATA (Mayr)
Pl. 1, fig. 11

Strumigenys emarginata Mayr, 1901, Ann. Naturh. Hofmus., Wien 16:26-27, worker. *Strumigenys (Trichoscapa) emarginata* Santshi, 1913, Bull. Soc. Ent. France, p. 257, worker, in key. *Strumigenys emarginata* Arnold, 1917, Ann. S. Afr. Mus. 14:379, worker. *Strumigenys (Cephaloxys) emarginata* Emery, 1922, Gen. Ins. Fasc.: 174:324. *Smithistruma (Smithistruma) emarginata* Brown, Trans. Amer. Ent. Soc. 74:105.

Worker: TL 2.45-2.56, HL 0.63-0.68, WL 0.61-0.64, CI 59-62, MI 17-19, ICD 40-42. The long, very slender, depressed head was not emphasized by Mayr, except that he made a point of comparing the species with the almost equally narrow-headed *S. clypeata* of North America. The mandibles are rather prominent and broad, with dentition as in the figure. Labral lobes rather stout and incurved, the entire labrum a little longer than broad. Eyes rather large, elongate-oval and rather convex, 7-9 facets in the greatest diameter, slightly protruding at sides when the head is viewed en face. Dorsum of head very feebly impressed in the wide area between the vertex and the posterior clypeal border. Antennal scapes 0.33-0.35 mm. long, bent at about the basal third (ca. 30°), broadest just beyond the bend, where the anterior border is feebly subangulate. Funiculus 0.47-0.49 mm. long; apical segment slightly longer than I-IV taken together.

Pronotum narrow (average width 0.24 mm.); anterior pronotal margin nearly or completely obsolete; pronotal dorsum weakly substriate, appearing weakly submarginate laterally. Mesonotum subcircular seen from above, promesonotal sulcus weakly indicated. Mesonotum and remainder of alitrunk (except shining propodeal declivity) densely and finely punctulate. Propodeal teeth approximately as long as the distance between the centers of their bases, acute, the tips slightly upturned; infradental lamella thin and narrow, but slightly variable in development, narrowing gradually from the tooth downward.

Petiolar node about as long as its peduncle; fine carinulate margins ascending the anterior face to form dorsolateral margins setting off the posterodorsal face as a disc; the disc about 0.11 mm. wide and approximately as long, with rounded anterior border, posteriorly slightly diverging lateral borders, and transverse posterior border. Postpetiolar disc much larger, convex dorsally and smooth and shining, free portion about 0.16 mm. long and 0.26 mm. wide. Spongiform appendages of both segments abundantly developed ventrally, moderately well developed posterolaterally; posterodorsal isthmus of postpetiole discontinuous in the middle, corresponding to a sulcus extending onto the anterior surface of the basal gastric tergite which causes the anterodorsal gastric border to be sinuate and almost completely divides the otherwise very well developed anterodorsal gastric spongiform margin. Basal costulae distinct, bilaterally grouped, spreading fanwise from the spongiform mass on each side of the shallow sulcus, about 9 or 10 in each group and extending about half the length of the first tergite.

In the "typical" form, the erect bristle-like hairs are confined to the mesonotum and the tergites posterior to it, and to a small group of shorter ones on the posterior occiput. Dorsum of head with abundant short spoon-shaped hairs, mostly reclinate; similar but much sparser on the pronotum; clypeus with small, abundant, suborbicularly squamiform and appressed hairs, crowded, those on the free border rather uniform, only slightly shorter in the center, touching or overlapping one another; about 12-13 on each side of the midline. "Typical" form without extra-long specialized hairs on sides of occipital lobes or on humeri.

Color ferrugineous yellow, varying only very slightly in the series seen.

The anterior clypeal emargination varies slightly in degree in my specimens, appearing nearly straight in workers such as one from Richards Bay. This specimen and another from the same colony also differ from Mayr's description and from the majority of workers from Natal and Southern Rhodesia in having more abundant stiff, erect hairs,

replacing the spoon-shaped ones not only on the propodeal dorsum, but also on the occiput and on the promesonotum. Furthermore, the posterior half of the mesonotum and the propodeal dorsum form a single, very shallow concavity in these specimens. I should consider the Richards Bay specimens as a separate species were it not for the fact, even though my specimens are so few, that other series show apparent intergrades in all these characters. Variability is strongest in the Zululand specimens, and it may be that future specialists working in South Africa will be able to show northern and southern races meeting in the Zululand area not clearly indicated by the present series. The Richards Bay specimens possess weakly differentiated and somewhat elongate humeral hairs.

Female and male unkown. *Type locality:* Port Elizabeth (H. Brauns). Type in Mayr Coll.

Material examined: Bird Island, St. Lucia Lake, Zululand, 8 workers (J. C. Faure). Richards Bay, Zululand, 3 workers representing two colonies (J. C. Faure). Sawmills, Southern Rhodesia, 3 workers representing two colonies (G. Arnold, leg. et det.).

SMITHISTRUMA (SMITHISTRUMA) TRANSVERSA (Santschi)

Strumigenys transversa Santschi, 1913, Bull. Soc. Ent. France, pp. 257-258, worker, in key. *Strumigenys* (*Trichoscapa*) *transversa* Santschi, 1914, Medd. Göteborgs Mus. Zool. Afd. 3:31-32, fig. 6, worker. Arnold, 1917, Ann. S. Afr. Mus. 14:380, worker, (subgen. not cited). *Strumigenys* (*Cephaloxys*) *transversa* Emery, 1922, Gen. Ins. Fasc. 174:324. *Smithistruma* (*Smithistruma*) *transversa* Brown, 1948, Trans. Amer. Ent. Soc. 74:105.

Worker: Santschi differentiates this ant (which I have not seen) from *emarginata* on the basis of the straight anterior clypeal border and the "dark yellowish-brown" color. In view of the variability of the clypeal border noted above for *emarginata* and the inadequate description and figure Santschi gives, the characterization of this form and its differentiation from the sympatric *emarginata* must remain in doubt. From Santschi's figure, the head would show a cephalic index of about 70 and a mandibular index of about 23, but this conflicts slightly with his description, "Tete d'un quart plus long que large. . ." The mandibles are approximately ¾ the length of the clypeus as shown in the figure, and seem from all the evidence presented by Santschi to be both relatively and absolutely larger and longer than those of *emarginata*. The figure shows a basal diastema of sorts, but I regard this representation as open to question. Only the worker is known; "Long. 2.2 mm." Type apparently in Santschi Coll.

Type locality: Pietermaritzburg, Natal (I. Traegaordh).

SMITHISTRUMA (SMITHISTRUMA) TRUNCATIDENS Brown

Pl. I, fig. 12

Smithistruma (*Smithistruma*) *truncatidens* Brown, 1950. Trans. Amer. Ent. Soc. 76:43-45, Pl. 3, fig. 1, worker.

Holotype worker: TL 2.36, HL 0.62, WL 0.64, CI 73, MI 14. Related to *S. emarginata,* but differing considerably in its more robust body build and especially by its broader, more "normal" head. Superficially, it resembles somewhat the Neotropical members of the *schulzi* group in general habitus, especially *S. orchibia* new species. Head with broadly expanded lateral occipital lobes, the latter not continued in outline by the preocular laminae, which are approximately parallel and very feebly convex. Clypeus subpentagonal, with the anterior border broadly and very shallowly emarginate and the anterolateral angles distinct but rounded; lateral clypeal borders weakly convex and moderately convergent anteriorly; clypeal surface approximately plane, with a small, inconspicuous anteromedian tumulus. The anterior clypeal emargination is weaker than in most specimens of *emarginata,* but stronger than in *rostrata;* these three species forming a close series in this respect. Maximum width of the clypeus approximately half the greatest width across the occipital lobes, and the disc slightly broader than long. Dorsum of head between vertex and posterior clypeal border approximately plane, appearing very slightly depressed in profile view; the vertex forming an obtuse rounded angle. ICD about 46. Eyes a little smaller than in *emarginata,* more nearly round, just barely protruding at the sides when head is viewed en face; each with 6-7 facets in the greatest diameter, placed slightly behind the cephalic midlength.

Antennal scape 0.29 mm. long, bent at an angle of about 40° near the basal third;

rather broadly incrassate, not quite so broadly as in *studiosi*, but a bit more so than in *margaritae* among the Neotropical species, broadest just distal to the bend; anterior border straight basally to bend, where it forms a rounded obtuse angle, beyond which it is gently convex until the extreme apex of the scape, which is narrowed and curved slightly anteriorly. Funiculus 0.42 mm. long, the apical segment accounting for more than half the length; basal segment (I) slightly longer than IV; IV about as long as II + III, but much thicker; III appearing (at 60X) slightly broader than long; II about as broad as long.

Mandibles in place and closed resembling those of *S. rostrata*, but not relatively so long, the toothing rather coarse and occupying the entire visible inner borders. The figure will show the peculiar truncate, blade-like basal lamella so characteristic of this species and for which I have coined the name *truncatidens*.

Pronotum somewhat depressed dorsally; in profile extremely feebly convex and sloping anteriorly; mesonotum gently convex in front, anteriorly and laterally with very feeble margins or carinulae; promesonotal sulcus faintly indicated. Anterior pronotal margin seen from above entire, but not very sharp, passing through gentle humeral curves into the sides and forming with them a major segment of a slightly lengthened circle. Posterior half of mesonotum narrowed and depressed, nearly continuous posteriorly with the propodeal dorsum, the latter very slightly elevated above the level of the posterior mesonotum and feebly convex. Metanotal groove obsolescent, barely discernible as a line. Propodeal teeth acute, with rather broad bases; moderately divergent and about 2/3 as long as their interbasal distance; infradental lamellae low, even, translucent, almost cariniform, following the concavity of the steeply sloping propodeal declivity.

Petiolar node broader than long and shorter than its peduncle; anterior face sloping rather steeply, summit narrowly rounded seen from the side. Cariniform margins of face of node suppressed, not evident. Both posterior collar and ventral strip of spongiform tissue present, but moderately developed. Postpetiole transversely oval, about 1.4 times as broad as the petiolar node and about 1.3 times as broad as long; disc strongly convex, appearing superficially to be smooth and shining, but at higher magnifications seen to be obscurely and very feebly longitudinally striate its length. Postpetiolar spongiform appendages fairly well developed posterolaterally and ventrally, the posterodorsal isthmus very poorly developed and interrupted in the middle. Gaster with weakly depressed dorsum; anterodorsal spongiform margin well developed. First gastric tergite not sulcate anteromedially, but the middle costulae more or less effaced. In spite of this medial gap, the costulae remaining on each side are not "bilaterally grouped" in the sense that they radiate from two common centers; instead, they are parallel, about 20 in number, and extend longitudinally about 1/2 the length of the basal tergite. Remainder of gastric dorsum smooth or nearly smooth and shining, but with a few very feebly roughened areas that may represent foreign material or a secretion. Sculpture of body of the usual *Smithistruma* pattern, except that the pronotum has very obscure longitudinal substriation superimposed on the usual dense, fine punctulation; posterior sides of alitrunk partially smooth and shining.

Head dorsally with rather abundant but inconspicuous, subreclinate to subappressed, short spoon-shaped hairs, a few on the posterior and lateral borders of the occipital region a little longer, more nearly clavate, and obliquely suberect. Hairs on clypeal disc few, extremely small, scale-like, not usually visible at all except in good light at magnifications of 50-60X; hairs on free clypeal border much larger, spoon-shaped and curved toward the middle, about 12 on each side of the midline, forming a fringe much like that of *rostrata*, except that the hairs on the anterolateral corners, while largest, are not so greatly lengthened relative to the lengths of the neighboring hairs on the border; also, the bordering hairs are all much broader than in *rostrata*. The altitrunk has very few and inconspicuous small, narrow reclinate hairs on the dorsum, but these so small that special pains must be taken in order to view them even at higher magnifications. No prominent hairs on the humeri; possibly rubbed off, but not present in paratypes. A pair of conspicuous, erect, feebly clavate hairs on the mesonotum. Petiolar node with a pair of long, stiff, subclavate hairs, directed posteriorly; postpetiole with about 8 moderately long subclavate erect hairs; gaster with about 6 transverse rows of 3-4 feebly clavate, stiffly erect hairs each. Anterior scape border with distinctive hair pattern; the hairs long, linear-spatulate, all curved slightly toward the base except the most basal one (no. 1), which is curved weakly apicad; the hair on the anterior angle at the bend much the longest, distinctly longer than

the greatest width of the scape itself. Pilosity of legs very sparse and inconspicuous, consisting of small, narrow reclinate hairs.

Color dull yellowish-ferrugineous.

Holotype one of a series of 4 workers taken at Lupembe, Tanganyika (K. Bock); deposited in Consani Coll.

Paratypes: The three remaining workers from the type series, taken with the holotype, show only very slight variation. TL 2.35-2.43, HL 0.62, WL 0.63-0.65, CI 72-73, MI 14-15. In the largest specimen, the head is very faintly infuscated posteriorly. [Consani Coll., MCZ]

Signor Consani has also sent a specimen taken by S. Patrizi at Elmenteita, Kenya Colony. TL 2.81, HL 0.69, WL 0.74, CI 73, MI 14. Entire body larger than in the types of *truncatidens*. Substriation of pronotum and postpetiole a little stronger, but still obscure. Gastric costulae extending quite half he lengh of gastric tergite I, rest of this tergite appearing feebly and superficially but densely shagreened and subopaque. Small suberect spatulate hairs, one on each humerus. Color medium ferrugineous, slightly but distinctly darker than in *truncatidens* types.

Signor Consani believes that this specimen represents a new species, and he may be right. However, the differences are so slight that I do not feel inspired to credit this single specimen as representative of a species distinct from *truncatidens*. In expressing this opinion, I have kept in mind the variability in pilosity of the closely related species, *S. emarginata*, and also the fact that very little is known about variation in other African *Smithistruma*. The material available for *truncatidens* is so scanty, representing only one colony and this single doubtful stray, that I consider it wiser to wait for additional material. If the stray is doubtfully distinct, there is even less justification for calling it a subspecies under modern systematic principles, and no justification whatever for calling it a "variety."

SMITHISTRUMA (SMITHISTRUMA) CAVINASIS Brown

Smithistruma (*Smithistruma*) *cavinasis* Brown, 1950, Trans. Amer. Ent. Soc. 76:42-43, worker.

Holotype worker: TL 2.01, HL 0.55, WL 0.50, CI 63, MI 7 (low MI due both to small size of mandibles and to the partial recession in the deep anterior clypeal excision).

Head shape of *rostrata* group, most like that of *conspersa* Emery, but with very shallowly concave posterior occipital border and clypeus deeply and semicircularly excised anteriorly. Cephalic dorsum convex posteriorly, impressed posterior to clypeus. Clypeus weakly convex, only slightly broader than long, lateral borders convergent and very feebly convex. Eyes moderate in size, placed very slightly behind the cephalic midlength and rather far ventrad; not visible from dorsal view of head. Antennal scape sharply bent at about its basal quarter and thickest at the bend; anterior border at this point forming nearly a right angle; exposed scape length about 0.25 mm. Funiculus about 0.34 mm. long, apical segment 1½ times as long as the remaining funicular segments taken together; segment I much longer than IV; IV as broad or slightly broader than long and slightly longer than II + III, II about as broad as long; III shorter, transverse.

Mandibles very small, closed, their bases received into the clypeal excision (dorsal view) and their depressed blades converging. Dentition uninterrupted along the visible portions of the inner borders, consisting of fine, slender acute teeth, the principal series apparently numbering five, with two smaller ones just basal to the preapical denticulae; the latter and the apical tooth could not be seen distinctly in this specimen due to the complete closure of the mandibles. Since the specimen is a unique, no dissection could be made to determine the structure of the basal lamella. No diastema seen, but it is not known whether one might be present hidden under the clypeal shield.

Alitrunk feebly depressed; pronotum without humeral angles or tubercles and not distinctly marginate laterally. In profile, dorsum of alitrunk forming one continuous weakly convex outline; metanotal groove virtually obsolete. Propodeal teeth short, triangular, acute, subtended ventrally by very slight infradental lamellae gradually diminishing to weak carinulae at ventral extremities. Petiole with node rounded above and about equal to the slender peduncle in length; a fine lamelliform carinula on each side, extending up the anterior nodal slope to the summit. Postpetiole broad (width about 0.30 mm.) and very convex, approximately twice as broad as the petiolar node. Both nodes with voluminous ventral and lateral spongiform masses. Gaster more strongly convex ventrally

than dorsally, with a heavy anterodorsal transverse border of spongiform tissue. Basal gastric costulae delicate but distinct, well separated and parallel, with feeble reticulation intervening; extending about 1/3 the length of the basal tergite. Remainder of gaster and dorsum of postpetiole smooth and shining.

Alitrunk feebly and indistinctly reticulate-punctulate, appearing somewhat subopaque except for promesonotal dorsum, which is finely and rather irregularly longitudinally striate or rugulose. Head, scapes, legs and petiole densely punctulate and opaque.

Ground pilosity consisting of comparatively few (very few on alitrunk) conspicuous, whitish-yellow, thickened and suborbicularly broadened squamose hairs set close to the integumental surface, but not strictly appressed; more crowded, flatter, and slightly smaller on the clypeal surface; the excision bordered by six of these hairs, three on each side, and the dorsal surfaces of the scapes with a row near the anterior border. Longer spatulate hairs, about 6 on each lateral clypeal border and 8 on the anterior border of each scape, where all but the last three nearest the apex are directed sharply basad. Base of first gastric tergite with a single pair of short, erect, mesially inclined clavate hairs; posterior half of the same tergite with a few scattered short, appressed simple hairs. Apical region of gaster with a few short, fine erect clavate hairs. No specialized erect hairs on head or alitrunk of this specimen.

Color sordid yellowish-ferrugineous.

Holotype a unique collected during February 1948, Beni-Irumu, Ituri Forest, Belgian Congo (N. A. Weber, cat. no. 2129); to be returned to Dr. Weber for eventual deposition in AMNH.

This is a very distinct and bizarre species, differing from the known African species (and from all others known to me) in the extremely small mandibles, shallow posterior occipital excision and very deep anterior clypeal excision. The large, heavy, disc-like hairs are also developed to a degree unique among the species I have seen. The hairs fringing the free clypeal border are so arranged as to heighten the effects of clypeal excision and mandibular recession, and the apices of the hairs form a deep semicircle framing the mandibles on three sides. The longest hairs on the anterolateral lobe-like projections formed by the deep median excision extend forward almost as far as do the mandibles themselves. The clypeal excision is easily the strongest and deepest known for any species of *Smithistruma* known. *Cavinasis* appears to be a very extreme develoment of the *rostrata* line in the Ethiopian Region, and it is related to the other species of this line here treated as the *emarginata* group. Furthermore, *cavinasis* shows many similarities to the two African species of *Miccostruma*, small forms with the funicular segments reduced to three in number.

KEY TO THE WORKERS OF SMITHISTRUMA S. STR.*

1. Clypeus with a very deep anterior semicircular excision; mandibles very small, partly recessed in the excision (MI 7); clypeal hairs very broadly suborbicular and conspicuous; size small, TL under 2.10 mm. (Congo) ..... *cavinasis* Brown
   Clypeus transverse or shallowly and broadly emarginate anteriorly; mandibles larger, projecting (MI well over 10); clypeal hairs not broadly suborbicular; size larger, TL over 2.10 mm. 2
2. Head very long and narrow (CI under 65), depressed; mandibular dentition as in figure 11 (eastern South Africa) ..... *emarginata* (Mayr)
   Head broader (CI over 65) 3
3. Anterior clypeal border gently emarginate; prominent erect hairs on alitrunk at most two pairs; MI under 20; mandibular dentition as in fig. 12 (British East Africa) ..... *truncatidens* Brown
   Anterior clypeal border straight (teste Santschi); numerous prominent erect hairs on alitrunk; MI over 20; mandibular dentition in doubt, see discussion in text (eastern South Africa) ..... *transversa* (Santschi)

SMITHISTRUMA OF THE PALEARCTIC REGION

The Palearctic Region contains two distinct faunas. The Sino-Japanese fauna contains two known species belonging to the *rostrata* group; these have

* This key applies to species of the Ethiopian Region.