Onderstepoort Journal of Veterinary Science and Animal Industry, Volume 20, Number 2, April, 1945.

Printed in the Union of South Africa by the Government Printer, Pretoria.

Ticks in the South African Zoological Survey Collection. Part IV.—The Inornate Aponommas.

By GERTRUD THEILER, Section of Parasitology, Onderstepoort.

"APONOMMA TRANSVERSALE", LUCAS (1844), (THE PYTHON TICK).

Male. (Figs. 1–4).

2·2 × 2·8 to 3 mm., broader than long; has a characteristic quadrangular appearance when looked at casually, the hind part of the body being almost as wide as the front part plus the tucked-in legs; inornate.

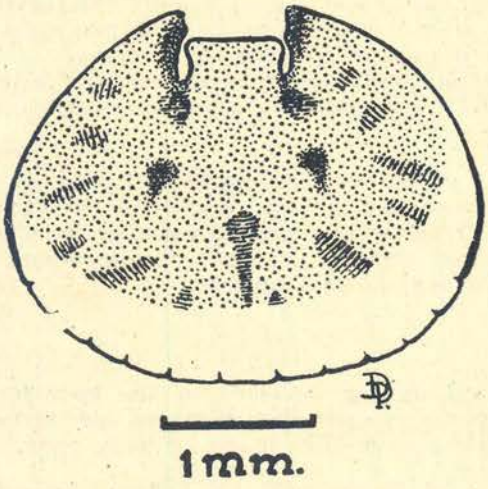


Fig. 1.

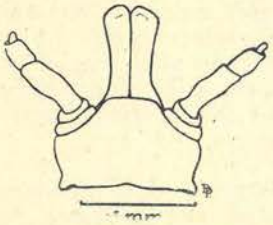


Fig. 2.

Fig. 3.

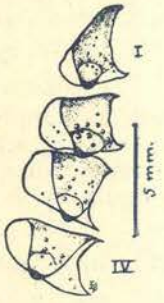


Fig. 4.

Fig. 1.—*A. transversale.* Male, dorsal view, showing incomplete chitinization of conscutum (Stippling =chitinized portion) and muscular depressions (shown by hatching).

Fig. 2.—*A. transversale.* Male. Rostrum dorsal view, showing cylindrical palps with article 4 terminal.

Fig. 3.—*A. transversale.* Hypostome×125 after Neumann, 1899. Fig. 42 C.

Fig. 4.—*A. transversale.* Male. Coxae showing the lightly chitinized base and the more highly chitinized (stippled) and punctate portion carrying the spur.

Conscutum.—Broadest in posterior half, with an abrupt square posterior border, narrow in front; emargination wide and deep; cervical grooves deep, sharp straight lines, parallel; immediately behind them a shallow depression; lateral grooves absent; festoons faint to obsolete; punctations absent or very fine and few in number, scattered. The conscutum shows weak or imperfect chitinization; the posterior one-fifth is similar to the ventral surface, the rest of the dorsum shows some chitinization and is of a light brown colour. The rather even, shiny surface of the anterior four-fifths is disturbed by depressions representing the posterior median, the posterior accessory, the posterior and the anterior paramedians and the three laterals; these depressions may show deeper pigmentation.

Rostrum.—Basis capituli somewhat quadrangular, wider than long, posterior lateral angles with slight cornua, fairly well chitinized. *Palps* rather primitive, cylindrical with but slight flattening mesially, and article 4 projecting terminally. Article 1, visible dorsally, is only slightly chitinized as is also the point of attachment; article 2 twice as long as article 3; article 4 small and usually clearly visible dorsally. *Hypostome* deeply emarginate at the tip and very clearly divided into two; broad and spatulate; edged on either side with two rows of large teeth, about 7–8 to each row; anteriorly a corona of small denticles, which extend backwards, along the mid-line, between the two rows of teeth.

Legs.—Short, very stout, well chitinized. *Coxae;* with a single spur, are peculiar, the basal portion is but lightly chitinized and pale in colour, the well developed spurs are situated at the end of a more heavily chitinized support, so that each coxa has the appearance of being made up of two parts. These supports may show some heavy punctation (Fig. 4). *Tarsus I.*—Tapering gradually with blunt ending, one short ventral spur; *tarsus IV* with well pronounced false articulation; distal portion with large hump, one or two ventral spurs.

Ventral surface.—Unpigmented, genital orifice opposite coxae II; genital, anal and ano-marginal grooves absent. The depressions on the dorsal surface, made by the muscle attachments, are represented by the corresponding depressions on the ventral surface. *Stigma.*—Large, almost circular with a short prolongation towards the dorsal surface.

Female. (Figs. 5–6).

2·8×3·7 mm., 2·5×3·4 mm., subcircular, broadest in the posterior half with a fairly straight posterior border; preserved unengorged specimens light in colour (Neumann gives the colour as reddish brown or dirty green).

Scutum.—Inornate, cordiform; emargination wide and deep; lateral angles rounded, latero-posterior margin sinuous, posterior border broadly emarginate; cervical grooves deep and extending as almost straight lines to the posterior border, dividing the scutum into a central smooth rectangular portion, and with the lateral areas triangular; these lateral areas may show slight corrugations (gerunzelt). Festoons, in partially engorged females, only just visible. Punctations very fine and widely scattered (Neumann states that there are no punctations).

Alloscutum.—The dorsal surface of the body shows the same arrangement of grooves as are present in the male.

Rostrum.—Basis capituli wide, almost three times as broad as long; lateral sides straight and almost parallel; cornua highly chitinized; posterior margin weakly chitinized and interrupted by the *areae porosae*, with a hardened spur-like, highly chitinized portion in the middle separating the porose areas on the margin. *Areae porosae* large, overlapping the posterior margin; with somewhat indefinite edges. *Palps* subcylindrical with article 4 terminal as in the male. *Hypostome* broad as in the male.

Legs.—As in the male.

Ventral surface.—Short hairs present; *genital orifice* opposite Coxae III (Neumann gives it as opposite the second intercoxal space), wide. Genital and anal grooves absent. Muscle-attachment depressions, corresponding to the dorsal depressions, well marked in partially engorged females. *Stigma* broadly oval, the narrower end pointing dorsally.

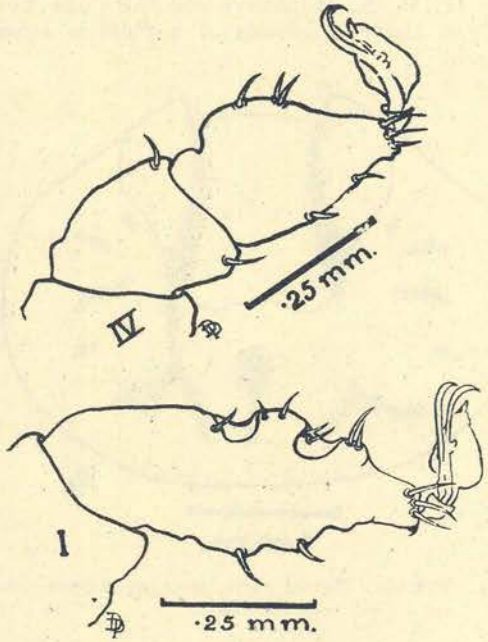


Fig. 5.—*A. transversale.* Female Tarsus I and Tarsus IV.

Nymph.

1·7 × 2·1 mm., 2·2 × 3·3 mm., when engorged; very much like the female in every respect. The *Scutum* showing the same division into three; but whereas there are no punctations in the adult the nymph shows a few large shallow punctations scattered over the scutum. The engorged swollen specimens do not show any of the muscular depressions so characteristic of the partially engorged adults. The *basis capituli* is two and a half times as broad as long and has a smooth even surface. *Palps* and *hypostome* as in the adults.

Legs.—Perhaps slightly more swollen than in the adults. *Coxae*: as in the rostrum, the chitinization is rather more even than in the adults.

Ventral surface.—Hairs appear to be absent. The abdominal skin shows fine transverse striations.

(My thanks are due to the Director of the Cape Town Museum who kindly put his material of the nymphs at my disposal.)

Larva.

Unknown.

Occurrence.

Host.—Found on the edge of the eye sockets of *Python sebae.*

Geographical distribution described by Lucas and by Neumann from South Africa. The Onderstepoort collection contains a batch from Kampala, Uganda, collected by G. H. E. Hopkins; and the Cape Town Museum has a batch of nymphae from the eye sockets of a *Python sebae* collected at the Cape Town Snake Park.

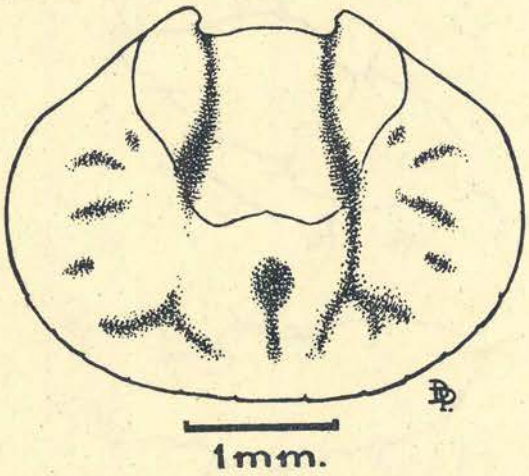


Fig. 6.—*A. transversale.* Female. Dorsal view, showing depressions equivalent to those in the male.

Classification.

General remarks.—Neumann (1899) in describing the species, suggested that, in view of its peculiar shape and in view of the absence of an anal groove, it might form a genus by itself. He, however, omitted to stress (*a*) the imperfect chitinization, more pronounced in the male than in either the female or the nymph; (*b*) the somewhat primitive palps. Lahille, whose publication unfortunately is not procurable at the moment, subsequently created the genus *Neumaniella* for this species. Despite the peculiarities of *A. transversale* I am inclined to agree with Bedford that the creation of a new genus is not justified. In *Aponomma latum* (the *laeve-capensis* of previous South African workers) the palps also tend to be primitive; they are, however, slightly hollowed out mesially, and article 4 is attached subterminally and may also protrude ventrally or anteriorly. The chitinization

of *A. latum* compared with that of other Aponommas is weak, though never as incomplete as in *A. transversale*. The lack of an anal groove alone, unassociated with any other constant morphological feature, does not warrant the creation of a new genus.

Lucas (1860) described a tick, collected from a *Python sebae* under the name of *Ixodes globulus*. Neumann (1899) quotes the meagre description *in toto* and decides that the description is that of an Aponomma. The description given, quite obviously is not that of either adult inornate African Aponommas, for neither has " fortiter ", though scattered punctations, nor does the cuticle of either show fine striations. The description, however, does fit the nymph of *A. transversale*, except that its punctations, though scattered, are not well pronounced. Nevertheless one can safely conclude that *Aponomma globulus* is the nymphal stage of *A. transversale*, a conclusion supported by the fact that the African python is the host common to both.

Synonymy.—The synonymy for *Aponomma transversale* would thus be:

Ixodes transversalis, Lucas, 1844.

Aponomma transversale, Lucas. Neumann, 1899.

Neumaniella transversale, Lucas. Lahille, 1905(?).

Ixodes globulus, Lucas, 1860.

Aponomma globulus, Lucas. Neumann, 1899.

Summary.

1. The description of *A. latum*, male and female, is brought up to date, and the nymph is described for the first time.

2. Attention is drawn to the weak and unequal chitinization, and to the somewhat primitive palps.

3. *Aponomma globulus* is sunk as a synonym of *A. latum* and is taken to be the nymphal stage.

" Aponomma Latum ".—Koch (1844) (The Snake Tick).

Male. (Figs. 7–11).

2·3×2·3 mm.; 2·4×2·7 mm.; 2×2·2 mm.; 2·3×2·2 mm.; 3·2×3·1 mm. Broadly oval, widest behind; usually as wide as long; varying in colour from a light to a darkish brown; chitinization never heavy; frequently in preserved specimens, the internal organs show through the cuticle; inornate; smooth.

Conscutum.—Emargination deep; cervical grooves absent or mere dimples; lateral grooves absent; festoons inconspicuous or picked out with light brown lines. A few large shallow punctations on the pointed shoulders, fine punctations may be present sparsely scattered over the conscutum, most readily seen along the margins. The dorsal porose areas are seen with difficulty at a level behind legs 4, small and well separated. Dorsum usually shows a fairly strong curvature and bends over onto the ventral side.

Rostrum.—Long and slender. *Basis capituli* broadly triangular with sides rounded; posterior edge straight or slightly concave; no cornua; surface smooth with a few scattered punctations. *Palps.*—Somewhat flat, hollowed

out but slightly mesially. Article 1 visible dorsally. Article 2 twice as long as article 3, constricted at base; article 4 subterminal, frequently visible from the dorsal surface. Hyperstome $2\frac{1}{2}/2\frac{1}{2}$; the outer row has the largest teeth and extends further down the hypostome than either of the other two rows, the innermost row has small teeth and extends only about half as far back as the large outer row. Tip has a corona of small denticles.

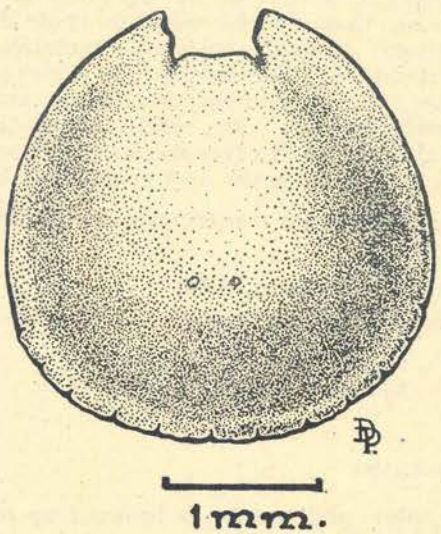


Fig. 7.

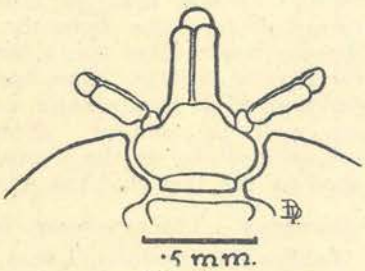


Fig. 8.

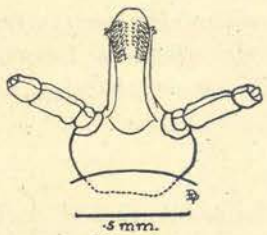


Fig. 9.

Fig. 7.— ***A. latum.*** Male, dorsal view; stippling to show the curvature of the body and the overlapping of the dorsum onto the venter.

Fig. 8.—***A. latum.*** Male, rostrum, dorsal view, to show palps slightly hollowed mesially.

Fig. 9.—*A. latum.* Male. Rostrum ventral view.

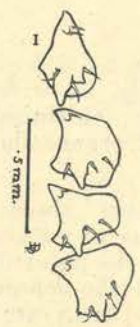


Fig. 10.

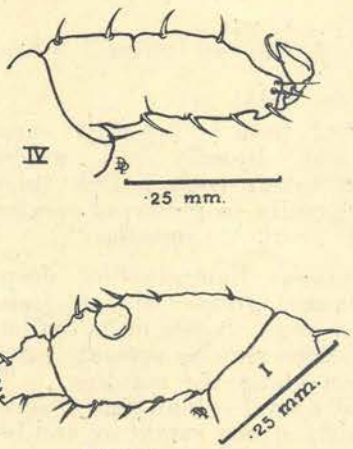


Fig. 11.

Fig. 10.—*A. latum.* Male. Coxae I-IV.

Fig. 11.—***A. latum.*** Male. Tarsus I and Tarsus IV.

Legs.—Not as stout as in *A. transversale*—*Coxae* short, close together; *Coxa I* external spur long and well developed, internal spur closely applied to external, small; *Coxae II–IV* with a central spur; all coxae with 3–4 well developed hairs. *Tarsus I* false articulation pronounced, small hump dorsally after the false articulation, ending abruptly in a short ventral spur. *Tarsi II–III* with false articulation pronounced. *Tarsus IV* false articulation indicated, ending abruptly, single terminal ventral spur. These ventral spurs are variable in size.

Ventral surface.—Genital orifice opposite Coxa II; genital grooves divergent to level of Coxa IV; anal groove well developed; anomarginal groove absent; festoons pronounced and more heavily chitinized than the rest of the venter. Cuticle frequently transparent, numerous short white hairs extending onto the darker festoons. *Stigma* elongate oval with short projection dorsally.

Female. (Figs. 12–13.)

Very broad oval 2·2 × 1·6 m.m.; 3·3 × 3·3 m.m., up to 7 m.m. × 5 m.m., narrower in front, light to darker brown depending on the chitinization; inornate.

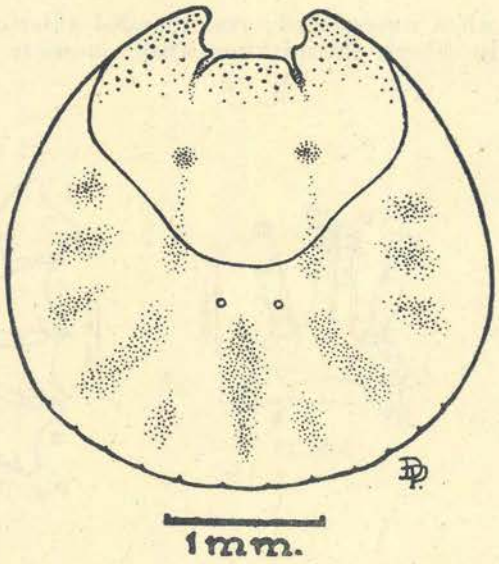


Fig. 12.

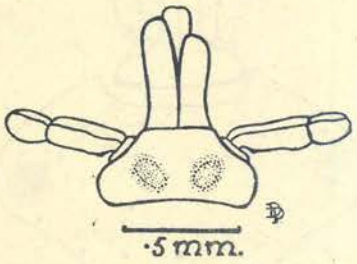


Fig. 13.

Fig. 12.—*A. latum.* Female. Dorsal view, showing depressions on the conscutum.

Fig. 13.—*A. latum.* Female. Rostrum, dorsal view.

Scutum.—Cordiform, angles broadly rounded, postero-lateral margin slightly concave, never heavily chitinized; cervical emargination deep; cervical grooves very short. Punctations fairly large and deep and close together on the shoulders, becoming smaller, shallower and more widely scattered from before backwards and may extend over the anterior third of the scutum; as in the male the scutum is smooth and shiny, and its anterior dorsal edge tends to bend over on to the venter.

Alloscutum.—Smooth, cuticle with shallow wide depressions representing the median, posterior accessory, the paramedian and the three lateral grooves; the anterior accessory commencing just behind the edge of the scutum runs forwards and may be seen as a continuous groove denting the surface of the scutumm, or may merely show as a small circular depression about half-way up the scutum. Dorsal porose areas easily seen not far behind the edge of the scutum, at about the same level as in the male. Festoons but faintly marked even in the unengorged specimens; marginal groove absent.

Rostrum.—As in the male. *Porose areas* on basis capituli large, wide, oval, diverging slightly. *Palps* shorter than in the male.

Legs.—As in the male.

Ventral surface.—Genital orifice opposite the second interspace; genital fold not conspicuous, anal grooves pronounced, with short ano-marginal groove. *Cuticle* usually somewhat transparent in preserved specimens, with a few short white hairs. *Stigma* more elongate and comma shaped than in the male. *Festoons* more pronounced than on the dorsal surface.

Nymph. (Figs. 14–17).

1 × 1 m.m.; 1·5 × 1·3 m.m.; when unengorged; oval rounded anteriorly as well as posteriorly; yellowish in colour, chitinization weak; inornate.

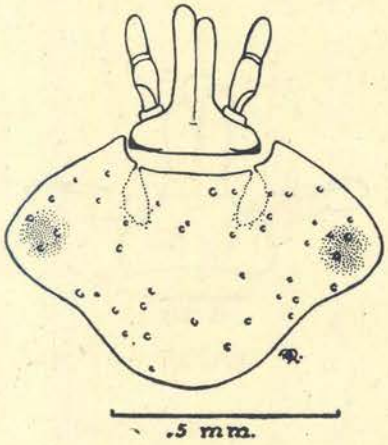


Fig. 14.

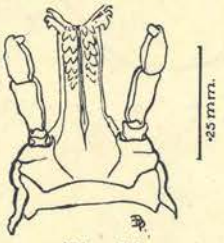


Fig. 15.

Fig. 16.

Fig. 14.—*A. latum.* Nymph. Dorsal view.

Fig. 15.—*A. latum.* Nymph. Rostrum, ventral view.

Fig. 16.—*A. latum.* Nymph. Coxae I-IV.

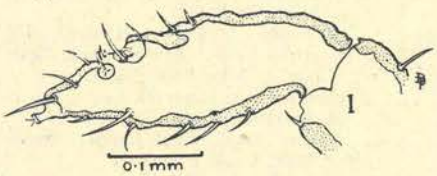
Scutum.—0·51 × 0·86 m.m.; broadly heart shaped; wide emargination; scapulae pointed; anterior margin convex, only curving slightly onto the venter; posterior margin sinuous, posterior angle widely rounded; cervical groove wide, pronounced comma-shaped; punctations large, shallow, unevenly scattered, with a tendency to cluster anteriorly (the drawing gives them as being distributed almost evenly). (Howard states that there are no cervical grooves and no punctations); a spot of red pigmentation in the eye region.

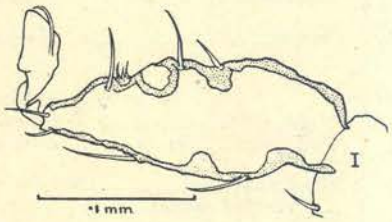
Alloscutum.—Shows the same muscular depressions as are seen in the female: *cuticle* thin and transparent.

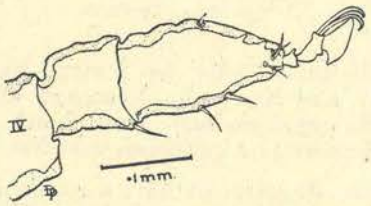
Rostrum.—Slender; *basis capituli* broadly triangular with posterolateral corners considerably thickened. *Palps* as in the female with article 4 subterminal usually pointing meso-ventrally, but may project anteriorly and be visible from the dorsal surface. *Hypostome* 2/2 with corona.

Legs.—Medium with segments slightly swollen. *Coxa I* external spur sharper and longer than the internal; *Coxae II–IV* one median spur. *Tarsus I* long; *tarsi II-IV* tapering fairly gradually from a slight median swelling; in some instances this swelling is large enough to produce the effect of a hump; *tarsus IV* usually less swollen than tarsi II–III.

Ventral surface.—genital fold divergent; anal groove and ano-marginal groove well developed; festoons well developed; no hairs present.







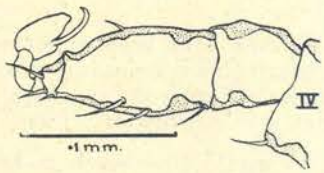


Fig. 17. Fig. 18.

Fig. 17.—*A. latum.* Nymph. Tarsus I and Tarsus IV.
Fig. 18.—*A. latum.* Larva. Tarsus I and Tarsus III.

Larva. (Fig. 18).

1 m.m. × 0·8 m.m.; not unlike the nymph; body broadly oval, widely rounded posteriorly, narrower anteriorly; light yellow, very transparent.

Conscutum.—Heart shaped; lateral and posterior angles broadly curved, postero-lateral border concave. Emargination shallow; cervical groove short and shallow; a spot of red pigmentation in the eye region.

Rostrum.—Basis capituli wider than long; postero-lateral margin heavily chitinized; markedly swollen to carry the base of the mandibles. *Palps.* Short, article 1 visible; articles 2 and 3 fairly plump, article 2 showing the same constriction at its base as is seen in the adults and in the nymph; article 3 about as long as 2. Article 4 subterminal, usually pointing meso-ventrally; mesial surface hollowed out slightly. *Hypostome* 2/2 of 4–5 large teeth in each row, small corona.

Legs.—Not as swollen as in the other stages; Coxae squarish with a sharp spur. *Tarsus I* had a small subterminal dorsal hump; *tarsus III* tapering rather more suddenly than I, with a very small subterminal hump.

Occurrence.

Host.—Snakes and one record from a blind lizard. The zoological survey has the following records listed:—

Python	*Python sebae*	Natal; Cape Town Museum.
Three-cornered snake	*Simocephalus* sp.	Northern Rhodesia.
Mole snake	*Pseudaspis cana*	Snake Park, Port Elizabeth.
Cape Cobra	*Naia flava*	Vryburg; Port Elizabeth; Umfolozi, Zululand; Rietfontein, Johannesburg.
Black necked Cobra	*Naia nigricollis*	Noordsberg; Natal Snake Park; Cape Town; South West Africa;
Tree Cobra	—	Kampala, Uganda.
Ringhals	*Sepedon haemachates*	Ntambanana, Zululand; Tzaneen, Louis Trichardt.
Mamba	*Dendraspis angusticeps*	Kampala, Uganda; Klaserie, Pilgrims Rest; Ntambanana, Zululand; Ndwedwe, Natal.
	Dendraspis mamba	Snake Park, Cape Town.
Night adder	*Causus rhombeatus*	Snake Park, Cape Town.
Puff adder	*Bitis arietans*	Kaffirs kraal, Rustenburg; Snake Park, Cape Town.
Black snake	—	Gottesbrook. Adelaide.
Unidentified snake	—	Kampala, Uganda; Lilingwe, Nyasaland.
Zebra snake	—	Kampala, Uganda.
Blind lizard	*Acontias meleagris*	Sorgwana, Zululand.

It has also been reported from the Belgian Congo by Nuttall and by Bequaert (*Bitis arietans*) from Tanganyika and Kenya by Neumann and by Bequaert (*Dasypeltis scaber; Rhamphiophis oxyrhynchus*); from South West Africa by Warburton; from Liberia by Bequaert (*Dendraspis viridis*).

It would thus seem to be distributed in all parts of Africa south of the Sahara, and to have no predilection for any one group of snakes. The two records, the one for the python and the one for the blind lizard, probably represent instances of accidental hosts.

Classification.

General discussion.—Koch 1844 described a female tick from Weinachsbaai, South Africa, as *Amblyomma latum*, which Neumann (1901) upon re-examination placed into his new genus *Aponomma*. (Koch's *Hyalomma latum* he showed to be an *Amblyomma* and to be a synonym of *A. sylvaticum*, de Geer, 1778). He, however, decided that Koch's South African species was the same as *A. politum*, Neumann 1899 found *Python molurus* from the East Indies. In all subsequent publications, e.g., Howard 1908 and Bedford, we hence find the description of *A. politum* given as being that of *A. latum*. In the same memoir Neumann 1901 describes a new sub-species var. *capensis* for his Patagonian *Aponomma laeve*, his description being based on four males and four females from Adelaide in the Eastern Province of the Cape Colony, collection Lounsbury. Dönitz 1910 redescribes the type specimen of *A. latum* and enlarges the description of the female according to material collected at Mkaluma in the Mpapua district, Tanganyika, which he identifies as similar in all respects to the type, and describes the male.

He points out that Neumann's *A. politum* in no way agrees with Koch's type specimen and that hence the Asiatic *A. politum* is not a synonym of *A. latum*. The South African form of *Aponomma laeve;* i.e., *A. laeve var. capensis*, he separates from the Patagonian form and shows it to be a synonym of Koch's *A. latum*, since Neumann's description agrees in every respect with Koch's type. Subsequent workers seem to have overlooked Dönitz's publication and the African snake tick continues to figure almost indiscriminately as either *A. laeve* or as *A. laeve var. capensis*. Schulze 1936 sorts out the laeve-group as follows: *A. laeve*, type species, Patagonia; *A. pseudolaeve*, Schulze 1925, Asiatic; *A. laevetum* n.sp., South America; *A. falsolaeve* novem nomen for *A. laeve-capensis* from South Africa. He decides that his *falsolaeve*, Neumann's *laeve-capensis*, is not a synonym of *A. latum* as Dönitz suggested, and lists (the supposed) differences between the two species.

Onderstepoort has a batch of ticks, *A. laeve-capensis* from the Lounsbury collection, off Black Snake, Cottesbrook, Adelaide, Cape, with the covering remark " determined by Neumann ". This one can thus safely presume to be the type material, although there is nothing to show that it has been designated as such: The males and the females answer in every respect to both Dönitz's detailed description for *A. latum* and Neumann's description for *A. laeve var capensis*. Each and every one of Schulze's differences is seen to fall away; viz: (*a*) Neumann's description " Festons bien apparents á la face ventrale, plus foncés qu'elle " is correct and agrees with Dönitz' statement " Bauchplatten gut entwickelt ". These remarks Schulze quite apparently misinterpreted; they refer to the thickened ventral festoons and not to the presence of separate plaques or peltae. (*b*) The dorsum very definitely curves over to the venter. (*c*) The postero-lateral border of the female shows an appreciable variation from " schwach eingebuchtet " to "deutlich eingebuchtet ". (d) The punctation in the shoulder region also varies considerably from very fine and sparse to fairly deep and more closely clustered. The extent to which these punctations show up depends, not only on their actual size and depth, but also on how well the tick has been cleaned. (*e*) The tarsi, except tarsus I, though swollen, cannot be said to be humped, and all end abruptly.

Hence one can but conclude that *A. laeve-capensis* Neumann (*A. falso*-laeve novem nomen Schulze, 1936), is a synonum of *A. latum* Koch.

The synonymy of *Aponomma latum* would thus be:—

Amblyomma latum, Koch, 1844.
Aponomma latum, Koch. Neumann, 1901.
nec *A. politum*, Neumann 1899, 1901.
nec *A. latum*, Koch. Howard, 1908.
A. latum, Koch. Dönitz, 1910.
A. laeve-capensis, Neumann, 1901.
A. falsolaeve, Schulze, 1936.

As regards *A. pseudolaeve*, Schulze (1935) this may yet prove to be a synonym of Neumann's Asiatic *A. politum*. Schulze's description, taken in conjunction with his photographs, agrees with Neumann's description except for the nature of Coxae II–IV.

SUMMARY.

1. The description of the various stages of *Aponomma latum* is brought up to date and its known hosts and geographical distribution listed.

2. Dönitz's contention, that *A. laeve capensis* Neumann 1901 is a synonym of *A. latum* is upheld by the study of Neumann's type material.

3. The revised synonymy is given.

4. Attention is drawn to the possible synonymy of *A. pseudolaeve* Schulze 1935 and of *A. politum*, Neumann 1899.

REFERENCES.

BEDFORD (1932). A synoptic Check-list and Host-list of the Ectoparasites found on South African Mammalia, Aves and Reptilia. *18th Report of the Direct. Vet. Serv. & Anl. Ind.*, 1932.

DÖNITZ (1910). Die Zecken Süd Afrikas. *Jen. Denkschriften XVI*, p. 449.

HOWARD (1908). A list of ticks of South Africa. *Annals Tvl. Museum.* Vol. I, pp. 150-155.

NEUMANN (1899). Revision de la Famille des Ixodides (*Mem.* 3). *Mem. Soc. Zool. France.* Vol. 12, pp. 188; 191.

NEUMANN (1901). Revision de la Famille des Ixodides (*Mem.* 4). *Mem.. Soc. Zool. France.* Vol 14, p. 291.

SCHULZE (1935). Kenntnis der Zeckengattung Aponomma. (*A. pseudolaeve*) *Zool. Anz.* Vol. 112.

SCHULZE (1936). Neue en Wenig bekannte Amblyommen & Aponommen aus Afrika, etc. (*A. falsolaeve.*) *Z. Parasitk.*, Vol. 8, p. 627.