A NOTE ON MONSTROSITIES OBSERVED IN IXODID TICKS.

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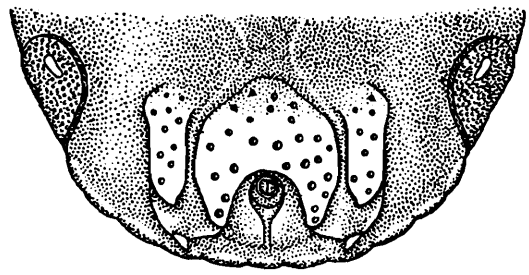
(Plate III.)

Neumann,[1] Senevet,[2] Warburton and Nuttall,[3] Nuttall,[4] and Robinson[5] have from time to time described and figured a number of abnormalities observed in ticks: some of those recorded by the last three workers were of Indian origin. While going through a big collection[6] of ticks belonging to the Indian Museum, I came across a number of abnormalities, of which fourteen, and an additional abnormal phenomenon, are described and figured here, as they appear to be sufficiently striking to be placed on record.

I am greatly indebted to Lt.-Col. R. B. Seymour Sewell for revising my manuscript. The text-figures illustrating this paper are all Camera lucida drawings and were finished from my pencil sketches by Babu Subodh Mondul, who with Babu S. C. Mondul has prepared the photographs accompanying this paper. I am thankful to these artists of the Zoological Survey of India for the care they have taken in making true and faithful delineations of the specimens.



TEXT-FIG. 1.—*Hyalomma* (*Hyalomma*) *aegyptium* ♂. Abnormal: posterior portion of the venter, × 23.

Specimen 1.

In text-fig. 1 I depict a monstrosity in a ♂ (1223/18) of *Hyalomma* (*Hyalomma*) *aegyptium* (Linnaeus). This specimen was captured on the 14th February, 1926, by Veterinary Assistant Surgeon S. N. Sinha on a cow at Nawadah in the Gaya district, Bihar, in company with other normal specimens. The adanal shields are larger than usual and are fused with each other, as in the male of *Margaropus winthemi* Karsch, in front of the anus, which is more posterior in position than in normal specimens. The adanal and accessory shields are less chitinised than

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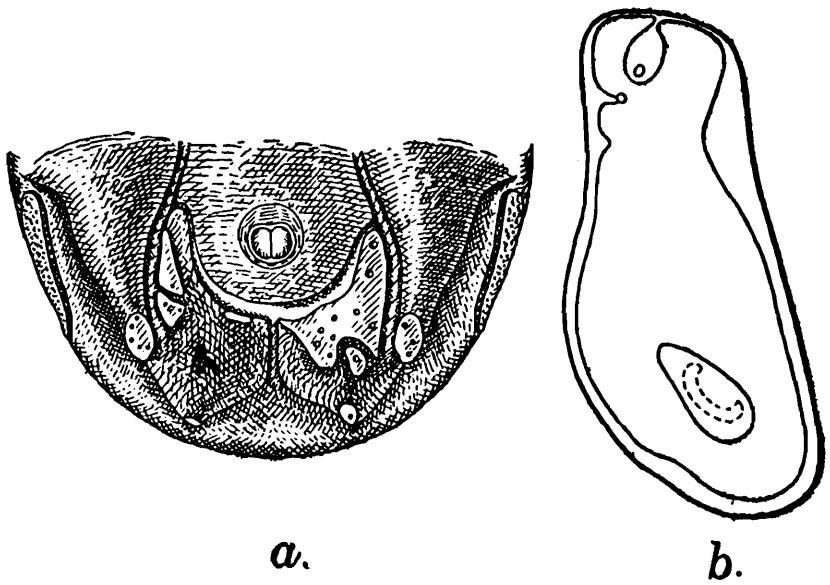
[1] Neumann, *Arch. Parasitol.* II, pp. 463-465 (1899).
[2] Senevet, *Bull. Soc. Hist. Nat. Afriq. Nord*, XIII, p. 95 (1922).
[3] Warburton and Nuttall, *Parasitology* II, pp. 70-76 (1909).
[4] Nuttall, *Parasitology* VII, pp. 250-257 (1914).
[5] Robinson, *Parasitology* XII, pp. 175-179 (1920).
[6] Results embodying this collection were published in *Rec. Ind. Mus.* XXX, pp. 217-344, pls. viii, ix (1928).

in the normal male, which is illustrated by Warburton and Nuttall in *Parasitology* II, p. 71, text-fig. 17 (1909).



Text-fig. 2.—*Hyalomma* (*Hyalomma*) *aegyptium* ♂. Abnormal: (*a*) posterior portion of the venter, × 30; (*b*) right spiracle, × 80.

Specimen 2.

Text-fig. 2 illustrates a deformity in a ♂ (1227/18) of *Hyalomma* (*Hyalomma*) *aegyptium* which was found on a bullock at Seoni in the Jubbulpore district, Central Provinces, on the 28th January, 1926, and was presented to the Indian Museum by the Veterinary Adviser to the C. P. Government. The right adanal shield is very much reduced in size and is represented by two rudiments. The left adanal shield is larger than the normal and is of irregular form. It is bilobed posteriorly and has a small additional plate behind it between the two lobes. The right subanal shield is underdeveloped. The right posterior portion of the body is slightly underdeveloped and the scutum in that region is raised as if forming a pseudo-scutum. The tail portion of the right spiracle is shorter and much broader than the normal. A normal spiracle of the ♂ is illustrated by me in *Bull. Agric. Res. Inst. Pusa* No. 152, pl. v, fig. 21 (1924).

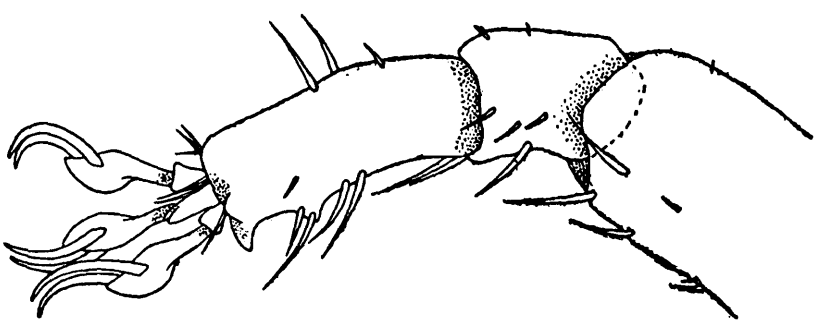
Specimen 3.

In a ♂ (1224/18) of *Hyalomma* (*Hyalomma*) *aegyptium* (pl. iii, fig. 1), which was taken off a bullock by Veterinary Assistant Surgeon H. H. Singh at Bhabua in the Shahabad district, Bihar, there are only two legs on the left side; the third and the fourth legs are totally absent and there are no indications as to whether they were originally present. Coxa II on the left side is shorter and broader than the normal. The arrangement of the legs on the right side is normal.

Specimen 4.

In a ♂ (1225/18) of *Hyalomma* (*Hyalomma*) *aegyptium* (pl. iii, fig. 2), which was collected at Katni in the Jubbulpore district, Central

Provinces, on the 17th January, 1926, and was presented to the Indian Museum by the Veterinary Adviser to the C. P. Government, there are three legs on the right side; the fourth leg is missing, and so also is the spiracle of that side. The anterior pointed portion of the right adanal shield is absent. The right accessory and subanal shields are slightly under-developed as compared with their fellows on the opposite side of the body. The posterior grooves on the scutum are irregular in outline and are broader and more shallow than in the normal. The right margin of the scutum opposite the spiracle is broken.



TEXT-FIG. 3.—*Hyalomma* (*Hyalomma*) *aegyptium* ♂. Abnormal: tarsus IV with three feet, × 60.

Specimen 5.

Text-fig. 3 illustrates a unique monstrosity in a ♂ (1237/18) of *Hyalomma* (*Hyalomma*) *aegyptium* which came from the same lot as specimen 4. The distal portion of the tarsus of the left fourth leg does not taper as in the normal condition but is of uniform breadth throughout. It possesses three complete feet of normal size in place of the usual one. There is an additional tarsal spur close to the middle foot. A normal tarsus of the fourth leg is illustrated by me in *Rec. Ind. Mus.* XXX, p. 304, text-fig. 35*a* (1928).

Specimen 6.

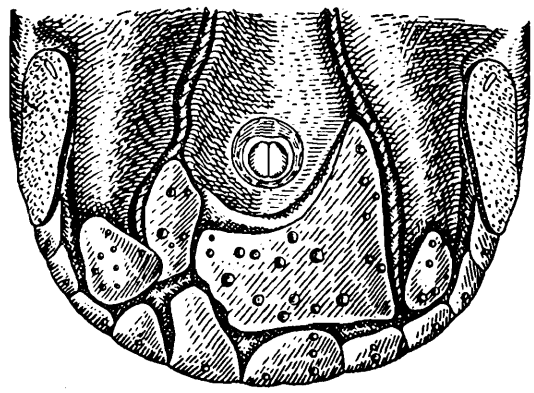
In a ♀ (1229/18) of *Hyalomma* (*Hyalomma*) *aegyptium* (pl. iii, fig. 3), coming from the same lot as specimens 4 and 5, there are only two legs on the right side; legs III and IV are missing, as also is the spiracle of that side. Coxa II of the right side is shorter than the normal. The legs on the left side are all normal.

Specimen 7.

In a ♀ (1226/18) of *Hyalomma* (*Hyalomma*) *aegyptium* (pl. iii, fig. 4), which was taken off a dog at Patur in the Akola district, Central Provinces, and is the gift of the Veterinary Adviser to the C. P. Government, there are three legs on the left side. The empty space between legs II and IV indicates that it is the third leg that is missing. The second leg of the same side, though preserving the normal number of segments, is underdeveloped and is considerably shorter. The right side shows the normal arrangement and proportions of the segments of the legs.

Specimen 8.

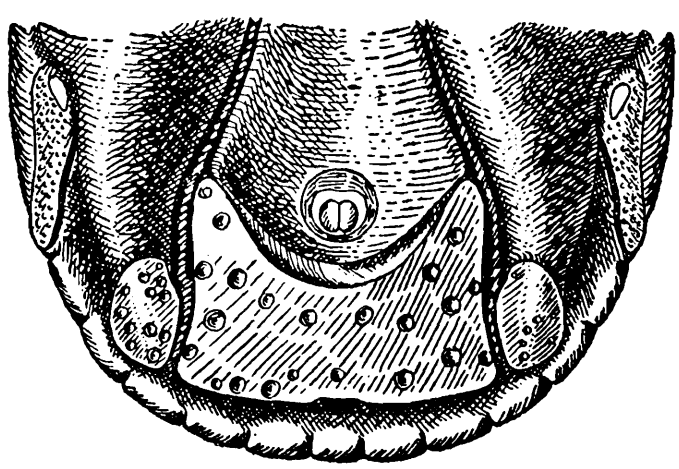
In a ♀ (1228/18) of *Hyalomma* (*Hyalomma*) *aegyptium* subsp. *isaaci* Sharif (pl. iii, fig. 5), which was captured on a mare by Veterinary Assistant Surgeon P. Topno at Chatra in the Hazaribagh district, Bihar, on the 7th March, 1926, there is a narrow elongated false scutum with numerous fine punctations, lying behind the scutum proper and fused with it anteriorly. The false scutum is shorter than the body and as a result of this the dorsum of the abdomen is thrown into laterally running folds.



TEXT-FIG. 4.—*Hyalomma* (*Hyalommina*) *hussaini* ♂. Abnormal : posterior portion of the venter, × 30.

Specimen 9.

Text-fig. 4 shows an abnormality in a ♂ (1230/18) of *Hyalomma* (*Hyalommina*) *hussaini* Sharif, which was collected from a bullock at Akola, Central Provinces, on the 29th January, 1926, and was presented to the Indian Museum by the Veterinary Adviser to the C. P. Government. The ventral shields are of unequal size ; the right adanal shield is smaller but the left is considerably larger than usual. The right accessory shield is larger than the normal one, which is shown on the left side. The first and second scutes on the right side, counting from the median one, are larger in size and the median scute is fused with the



TEXT-FIG. 5.—*Hyalomma* (*Hyalommina*) *kumari* ♂. Abnormal : posterior portion of the venter, × 40.

adjacent scute of the left side. The venter of a normal ♂ is illustrated by me in *Rec. Ind. Mus.* XXX, p. 315, text-fig. 39*a* (1928).

Specimen 10.

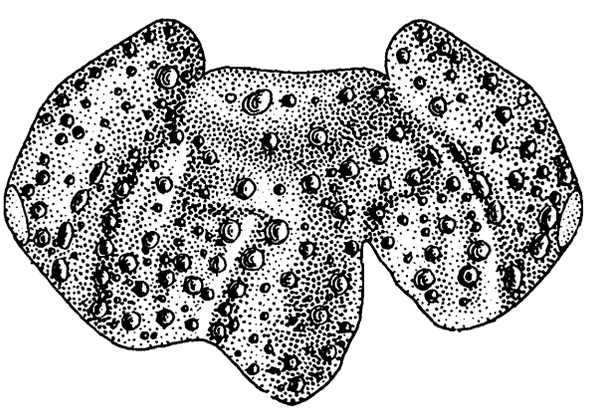
In text-fig. 5 I have depicted a deformity in a ♂ (1231/18) of *Hyalomma* (*Hyalommina*) *kumari* Sharif, which was collected off a dog at Sasaram in the Shahabad district, Bihar, by Veterinary Assistant Surgeon D. Prashad on the 9th February, 1926. The two adanal shields, which are otherwise of normal size and form, are fused with one another behind the anus. In the normal male the two shields are separated by the median post-anal groove.

Specimen 11.

A ♂ (1232/18) of *Rhipicephalus sanguineus* (Latreille) (pl. iii, fig. 6), which was found on a dog at Daltonganj in the Palamau district, Bihar, on the 15th August, 1925, by Veterinary Assistant Surgeon N. D. Singh, possesses only three legs on the right side. The first leg is missing and as a result the axis of the capitulum is inclined towards the right side.

Specimen 12.

In a ♀ (1233/18) of *Rhipicephalus sanguineus* (pl. iii, fig. 7), which was presented to the Indian Museum by Dr. H. H. Marshall labelled " R 33 " but with no other data, there are three legs on the right side ; leg IV is missing. On the left side the third leg is only represented by the coxa and a small bud attached to it. In the fourth leg of the left side the distal five segments are smaller than the normal and the foot is absent.



TEXT-FIG. 6.—*Rhipicephalus sanguineus* ♀. Abnormal: scutum, × 53.

Specimen 13.

Text-fig. 6 shows a deformity in the scutum of a ♀ (1234/18) of *Rhipicephalus sanguineus*, which was collected from a dog at Chaibasa in the Singhbhum district, Bihar, on the 21st September, 1926, by Veterinary Assistant Surgeon G. S. Dehuri. The posterior portion of the scutum is underdeveloped and as a result there are three lobe-like processes in the hinder margin. The normal female with its scutum is illustrated by Cunliffe in *Parasitology* VI, p. 377, text-fig. 4 (1914).

Specimen 14.

A ♀ (1235/18) of *Rhipicephalus haemaphysaloides* Supino (pl. iii, fig. 8) which, along with other specimens, was taken off infected calves

in the Vaccine Institute, Belgaum, Bombay Presidency, on the 22nd November, 1926, by Dr. J. L. Pinto, possesses three legs on the right side ; the fourth leg is missing. The axes of the capitulum and the scutum are slightly inclined towards the right side.

Specimens 15.

Fig. 9 of plate III illustrates an interesting phenomenon, hitherto unrecorded, in *Rhipicephalus sanguineus* (Latreille) (1236/18) which came from a lot collected from a goat at Sasaram in the Shahabad district, Bihar, by Veterinary Assistant Surgeon D. Prashad, on the 18th September, 1925. The male has with its proboscis pierced the dorsum of the abdomen of the female [1] just behind the scutum and is holding the body of the female with its legs. The only two possible explanations for this curious phenomenon are : either that the hungry male had pierced the body of the female for sucking blood, or that the male had failed to find the female genital aperture and had pierced the body with a view of copulating at that spot. The first explanation seems to be more reasonable and is supported by a personal observation of mine of an identical phenomenon in *Aponomma gervaisi* var. *lucasi* Warburton. In September, 1925, I brought a large number of specimens of *A. gervaisi* var. *lucasi* from the Zoological Gardens, Calcutta, and placed them for a day in a large tube on my laboratory table. The next day when I returned to the laboratory I found that a male had pierced the body of a replete female just near the anus. I killed the couple by pouring boiling water on them and preserved them in spirit. These two specimens were, however, later on unfortunately lost.

[1] These two specimens reached me well preserved in rectified spirit along with other specimens of this species. Apparently the two specimens were instantly killed in this condition by pouring boiling water on them in a tube ; a process which was recommended to the various collectors of ticks by me in a circular letter.