

ON DEFECTIVELY REGENERATED PALPS IN  
MALE SPIDERS.

As early as 1845 Blackwall proved that palps of male spiders (copulatory organs) when lost or cut regenerate fully and perfectly if a sufficient number of moults occurs between the loss of these members and the time the animal becomes adult. Afterwards some authors doubted or denied this fact - generally without knowing the experiments of Blackwall.

Bonnet made further investigations about this subject in many series of experiments with *Dolomedes* and attained the following results:

a) after three moults the regenerated palp was perfect in every respect and functioned normally;

b) after two moults the palp as a rule was perfectly formed but because it was too short the animals could not come to a normal copulation; in one case only the palp was functionally perfect too; sometimes, however, the most grotesque constructions arose, some parts of which remotely resembled parts of the normal palp;

c) mostly such monstrosities arose as well when the palp was wholly or partly lost after the last moult but one; sometimes, however, the tarsus did not show any further structure and consequently the palp resembled a female one, only the tarsal claw being always wanting (1930, p. 613-639).

With spiders in natural conditions, too, such deformities are sometimes found (cf. Falconer, 1910, 1917).

Once I found among several normal specimens of *Pachygnatha clercki* Sundeval a ♂ the palps of which were very defectively regenerated (Wahlwiller - South Limburg - 21-8-1952). The animal was adult: the chelicerae were perfectly formed (cf. Locket & Millidge, 1953, p. 108) though a little smaller than normally (the span of them was 1.75 mm - normally it is 2-3 mm), the length of the body too was a little shorter viz. 4 mm - normally it is 4.5-5 mm. Apparently the animal had moulted recently because the chitin was still very light-coloured.

The left palp (fig. 1 C) is almost absolutely female; the tarsus is remarkable: it looks as if the penultimate skin (with tarsal claw) has stuck as a transparent cover round the new limb, which is considerably smaller and lacks the tarsal claw!

The right palp (fig. 1 A) shows a strangely formed tarsus: two cylindrical excrescences on the same level, and more or less perpendicularly over them an oval knob; just like the whole palp these parts are white, the extremity of the biggest excrescence only being brown. When we compare this deformation with the tarsus of a normal male palp of this species (fig. 1 B and D) it looks as if the three principal parts are present in a rudimentary condition; if so the biggest excrescence corresponds with the cymbium (cb), the smaller with the paracymbium (pc) and the knob with the big round ball (b), which in the Tetragnathidae gives such a characteristic appearance to the normal palp. Perhaps the brown spot on the biggest excrescence is an indication of the black, strongly chitinated embolus (e), which skirts the tip of the cymbium.

A comparison of these palps with some figures of Bonnet makes it probable that this animal had lost the tips of both its palps by some accident which occurred between its penultimate and its last moult; the length of the 2 (3) basal parts, which is fairly normal, gives strong evidence that these parts have not regenerated and therefore that the animal had not lost its palps entirely.

On 17-10-1954 Br. Monulphus found a ♂ of *Steatoda bipunctata* (L.) at Wellerlooi (Limburg); the right palp of the animal is normal (fig. 1 E), but the tarsus of the left palp seems very much deformed (fig. 1 F). On closer inspection, however, especially if we compare both palps after treating them for a short time with nearly boiling acetic acid - under these conditions the haematodocha and the other connecting membranes expand and the different parts of the bulbus genitalis uncoil, which happens exactly when during copulation the palp is used - the following statement can be made:

In the deformed tarsus all parts are recognizable, they possess their normal mutual position, more or less their normal form but not their requisite size: the more apically they are situated the more they are undersized. The chitin is considerably weaker and the connecting membranes are very elastic so that their swelling causes an abnormal uncoiling of the details (cf. fig. 1 H with 1 G - the same details are indicated with the same letters); in normal position, too, these parts are already more uncoiled as can be seen by comparing fig. 1 F with 1 E.



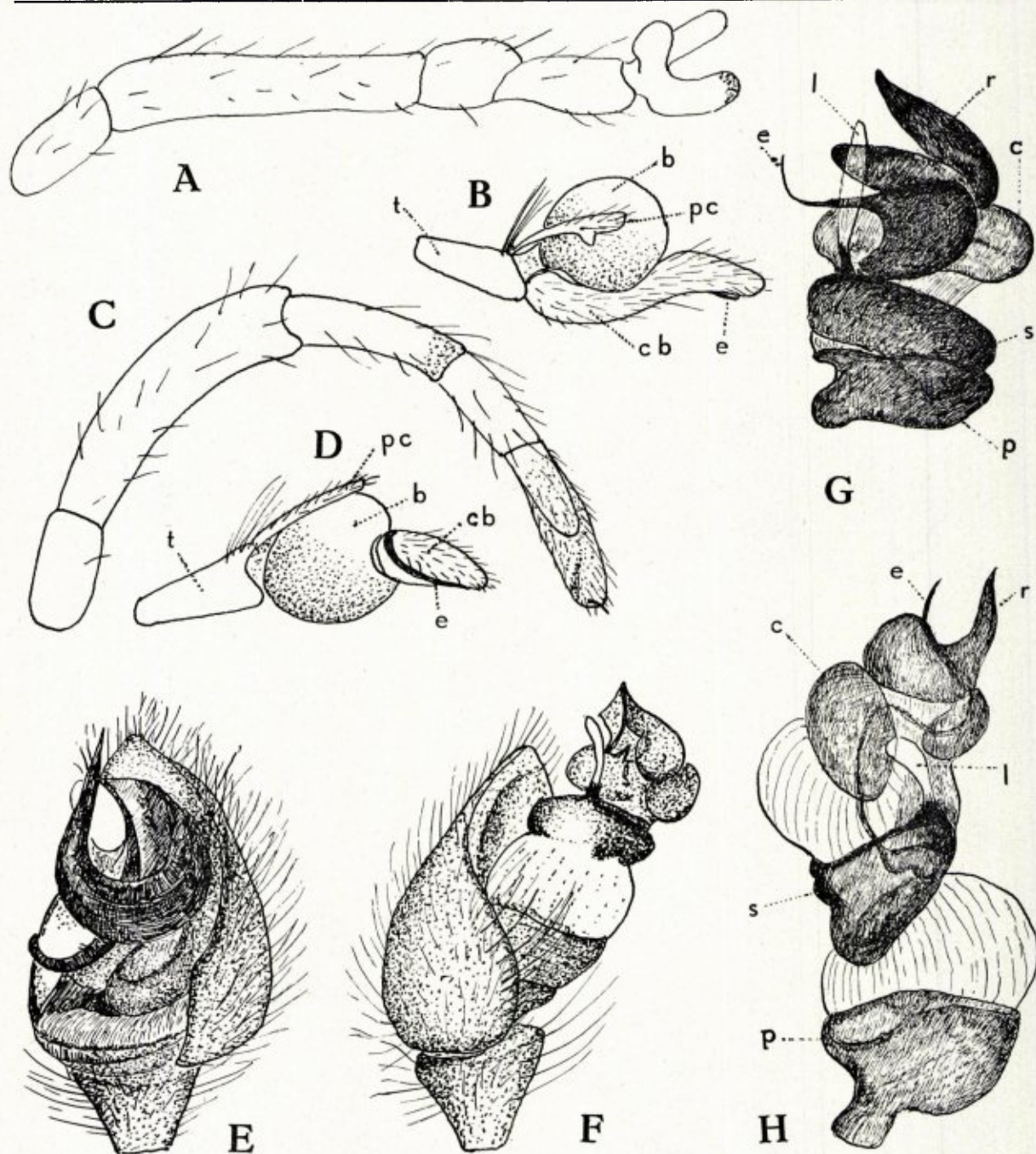
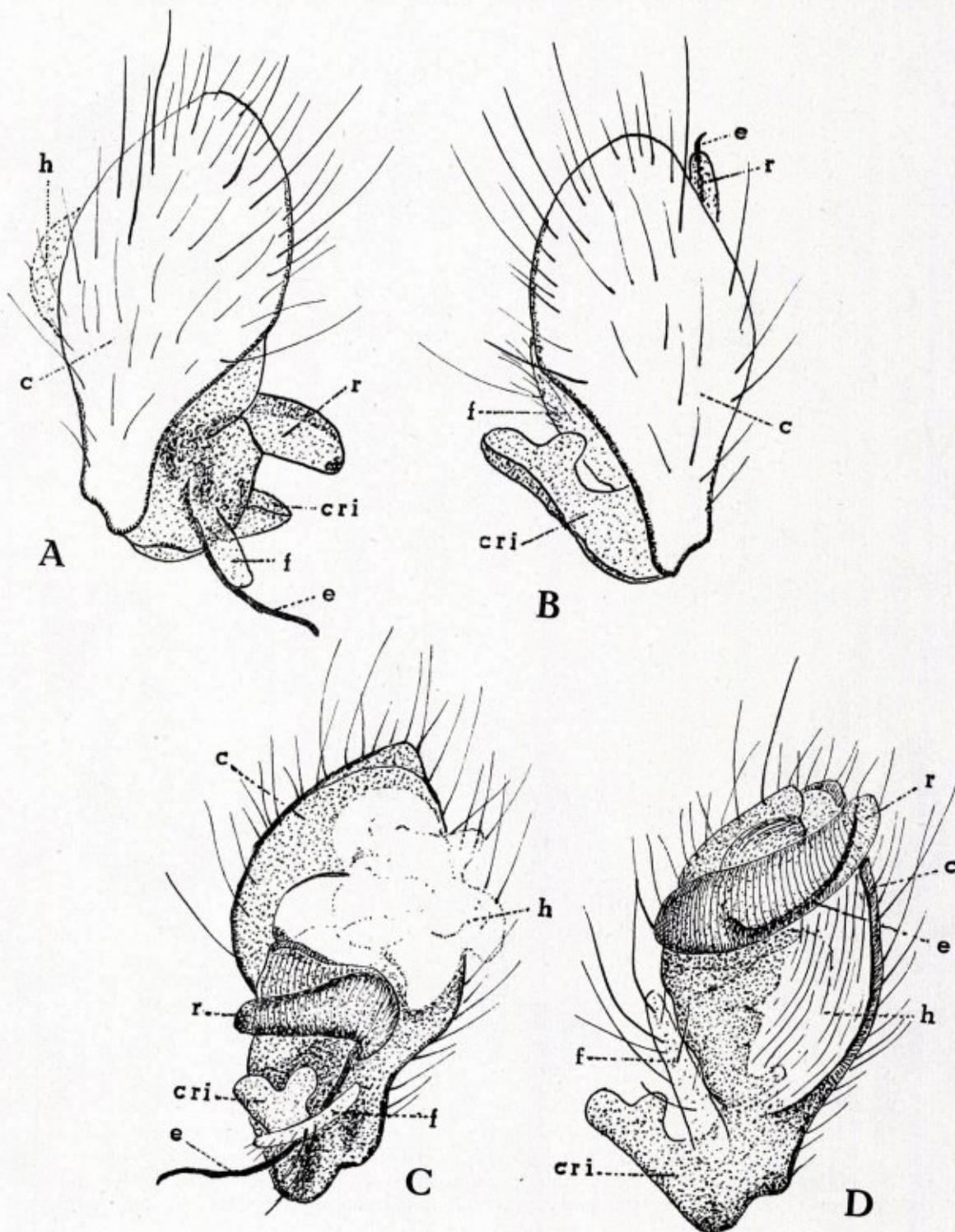


Fig. 1. A—D: *Pachygnatha clercki* Sundeval; A: abnormal right palp; B: normal left palp; C: abnormal left palp; D: normal right palp.  
 E—H: *Steatoda bipunctata* (L.); E: normal right palp; F: abnormal left palp; G: bulbus genitalis of normal left palp partly uncoiled; H: bulbus genitalis of abnormal left palp strongly uncoiled.





It is fairly certain that this animal had lost its left palp completely before the penultimate moult and that it could not use the regenerated palp.

Among a great number of males of *Meta mengei* Blackwall, which I collected mainly at Voorschoten (near the Hague) in the course of some years, I found a slightly different case. In this ♂ the right palp was perfectly normal (fig. 2 B) the left palp, however, was very strangely formed (fig. 2 A and C — the names of the details are borrowed from Osterloh (1922)—). Most parts of a normal tarsus are to be found with it, too, they possess their normal shape wholly or at least for the greater part, some of them are only a little too small, but everything is in an absolute disorder (cf. fig. 2 D too).

This palp was certainly lost completely before the penultimate moult and was also unfit for use.

Fr. CHRYSANTHUS O.F.M.Cap.

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#### CALLIPHORINAE (DIPT. BRACH.)

#### UIT VOGELNESTEN

door BR. THEOWALD

Onder de metaalgroene en metaalblauwe vliegen, die de Engelsen samenvatten onder de naam "blow-flies" en "bottle-flies" zijn er enkele, waarvan de larven zich ontwikkelen in vogelnesten. De meeste soorten hiervan ontwikkelen zich in de excrementen van de vogels of in andere afvalproducten; enkele zuigen bij de jonge vogels bloed af. Vorig jaar ontving ik uit Garmisch-Partenkirchen materiaal, dat gekweekt was uit larven, die gevonden waren in de neusopeningen van nestjongen van een mezensoort. Deze wijze van parasiteren was mij onbekend.

De literatuur over deze groep is zeer verward. Ten dele komt dit doordat men het niet eens was over de verschillende genera, waarin deze soorten moesten worden ondergebracht, ten dele ook, doordat er verschil van opvatting was over hetgeen de auteurs met hun beschrijvingen bedoeld hadden. Hennig (1939) heeft een studie van deze groep gemaakt en aan de hand van het type-materiaal o.a. van Zetterstedt en Fallén kunnen vaststellen welke namen de juiste zijn en welke als synoniemen moeten komen te vervallen.

De "blow-flies" die uit vogelnesten bekend zijn behoren tot de genera: *Calliphora*, *Lucilia*, *Phormia*, *Protophormia* en *Protocalliphora*. Juist in de laatste drie genera is de verwarring groot. Daarom wordt hier een overzicht gegeven over de namen voor deze genera en de ertoe behorende soorten, zoals men die in de thans gebruikte handboeken vindt aangegeven. Tevens zal iets naders worden medegedeeld over het voorkomen ervan in Nederland en tot slot zal een determinatietabel gegeven worden voor de "blow-flies", die men uit Nederland kent en bij het uitkweken van larven uit vogelnesten kan verwachten.

Fig. 2. A—D: *Meta mengei* Blackwall; A: abnormal left palp; B: normal right palp; C: abnormal left palp; D: normal left palp. (c: cymbium; cri: retinulum of the cymbium; e: embolus; f: appendix of the cymbium; h: haematodocha; r: modified retinaculum).