A New Record of the Arctic Caddisfly *Apatania* Kol. from Denmark.

With Notes on the Relict Fauna of Jutland

By
Anker Nielsen
Zoological Museum, Copenhagen.

In 1957 I observed an abundant occurrence of *Apatania* larvæ in Svinebæk, a small, stony, and swift-flowing, springfed brook, almost in the middle of Jutland (9° 23' 10" E, 55° 55' 50" N.). The water has a quite constant temperature of 8° C. Rearings of pupæ, collected March 28. 1961, were carried out in April and proved the species to be *A. cimbrica*.

This species was described by the author (1950a) from material collected in the spring Lille Blåkilde, about 108 km north of Svinebæk. The theory was then put forward that *A. cimbrica* is a mutant of *A. nielseni* Schmid (1954, p. 39). The mutation had changed the annual cycle of *A. nielseni* (Anker Nielsen 1942, pp. 587—88; cp. Schmid 1954, p. 39) into one more adequate under recent climatic conditions and as a pleiotropic effect the shape of the genital segments had been altered. Later the species was found by Schmid (1954, p. 38) in material collected by Brinck in Lappland, which of course to some degree invalidated my theory. After the discovery of *A. cimbrica* in Svinebæk it has to be abandoned, or rather, it must be modified.

In Svinebæk the annual cycle of *A. cimbrica* is quite different from that in Lille Blåkilde and very much like that of *A. nielseni* in Rold Kilde. On October 21. 1957 the vast majority of the population was in the state of "winter larvæ" (see Anker Nielsen 1950 a, p. 392). The population in Lille Blåkilde is thus a mutant of *A. cimbrica*. The mutation has changed the annual cycle, but has not had any, or at least not any striking, effect upon the morphology of the species.

Similar mutants seem to be present also in Svinebæk, but play an almost negligible role in the population. On October 21. I found seven free living larvæ, six in the 5. instar and one in the 4. instar. At the same time I could easily have collected scores of "winter larvæ". On March 28. I saw one — and only

one — free-living larva. The size of the specimens reared from Svinebæk is: body length 6.15—8.7 mm (average 7.75), length of anterior wing 7.8—9.7 mm (average 9.0), i. e. a little larger than the specimens from Lille Blåkilde. This may indicate that life-conditions are more favourable in Svinebæk than in Lille Blåkilde and therefore mutations of the type mentioned have a greater selective value in the last mentioned locality.

Rold Kilde with *A. nielseni* and Lille Blåkilde with *A. cimbrica* are both tributaries to the small river Lindenborg Å, their mutual distance being about 10 km. No doubt in the Late Glacial Period both species lived in the river itself. The question then is why the recent *Apatania* populations in the two springs are different. Previous conditions perhaps give the clue.

At Rold Kilde the Lindenborg Å valley is narrow and has a steep gradient. At Lille Blåkilde it is broad with a flat bottom. The plain was formerly occupied by the lake Gravlev Sø, the last remnants of which were overgrown in the beginning of the present century. In the Early Boreal Period the lake reached a depth of at least 32 m. Unpublished investigations carried out by Sigurd Hansen, D. Sc., have shown in that the Late Glacial Period the lake basin was filled with dead ice covered by a layer of course morainic deposits, in which the Lindenborg Å of those times flowed. The physiographic conditions in the two parts of the river (at Rold Kilde and Lille Blåkilde, resp.) thus must have been rather different, and this may account for a difference in the *Apatania* population. Svinebæk flows to the lake Rørbæk Sø. Most likely the basin of this lake, too, was filled with dead ice during the Late Glacial Period. — The possibility still exists that *A. intermedia* (Anker Nielsen 1950 a, pp. 396—97), also found in Lille Blåkilde, is a mutant of *A. nielseni*.

In the large springs of Himmerland *Apatania* is accompanied by some other Trichoptera which also are to be considered Late Glacial relicts (Anker Nielsen 1942, pp. 624—25, 1950 b). The same species are present in Svinebæk. In Himmerland there are, moreover, a number of species which must be considered relicts from the warm Atlantic Period (Anker Nielsen 1942, p. 625, 1950 b). These have been preserved in the springs on account of the high winter temperature of the water. In Svinebæk the latter element is entirely lacking. This probably is due to human interference, not with the brook itself, but with its surroundings.

Centuries ago the area round Svinebæk was deforested and subsequently became part of the great Jutlandic heathlands (Jonassen 1950). With the disappearance of the forest, the cold western winds from the nearby North Sea obtained free access, thus making the conditions too severe for the thermophile imagines of the Atlantic relicts.

References.

Jonassen, H., 1950: Recent pollen sedimentation and Jutland heath diagrams. Dansk Botan. Ark. **13**, no. 7.

Nielsen, Anker, 1942: Ueber die Entwicklung und Biologie der Trichopteren. Arch. Hydrobiol., Suppl. **17**.

— , 1950 a: Notes on the genus *Apatidea* MacL. Ent. Medd. **25**, pp. 384—404.

— , 1950 b: On the zoogeography of springs. Hydrobiologia **2**, pp. 313—21.

Schmid, Fernand, 1954: Contributions à l'étude de la sous-famille des Apataniinæ. Tijdschr. voor Entomol. **97**.

Anmeldelse.

Torben W. Langer: **Biller, Guldsmede og Græshopper. Indsamling og præparation.** Råd og vink for unge samlere. 80 sider, ill. J. Fr. Clausens Forlag, København 1961. Pris kr. 7.75.

En udmærket lille bog med klare og letforstaaelige anvisninger, skrevet af en entomolog, der røber stor praktisk erfaring som samler og præparator.

Udeladelsen af anvisninger paa yderligere et par moderne metoder til tørpræparering af insektlarver (Sprit-Æter-metoden, Xylol-Parafin-metoden og Dioxane-Æther-metoden) og mangelen paa angivelse af yderligere et par moderne opbevaringsvæsker („Barbers væske" og „Fæsters væske") retfærdiggøres ved henvisning til undertitlen: Råd og vink for unge samlere.

Man nærer ingen betænkning ved at anbefale bogen varmt til de unge samlere, og selv den mere fremskredne samler kan utvivlsomt finde et og andet godt „tips", som kan blive ham til nytte.

Carl Strømberg.
