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DANSK PEARYLAND EKSPEDITION 1947–50
LEADER: EIGIL KNUTH

# THE SPIDERS (ARANEIDA) OF PEARY LAND, NORTH GREENLAND

BY

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WITH 5 FIGURES IN THE TEXT

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Fig. 1. Map of Peary Land., drawn by E. Knuth (Kjeld Holmen 1957).

# INTRODUCTION

The Danish Peary Land Expedition 1947—50 under the leadership of EIGIL KNUTH was the first expedition to bring home spiders from this region, which may rightly be called the remotest and most inaccessible part of the kingdom of Denmark.

Previously only two species of Araneida were known from the whole of North Greenland: *Lycosa glacialis* THORELL, found at Foulke Fjord by the Polaris Expedition 1871, and *Tarentula exasperans* CAMBRIDGE, found on Saunders Ø by the Crocker-Land Expedition 1917. Both localities are situated in the Thule district.

The Peary Land material comprised a total of 103 spiders, all determinable as to species, and with the addition of this material the Zoological Museum, Copenhagen, now possesses a valuable and rather unique collection of arctic spiders. It is true that it includes only one species, *Tarentula exasperans* CAMBRIDGE, which the Museum did not possess before; but this species is still a great rarity, which has only been found in four arctic localities (see p. 8), three of them in Greenland. Another rare species from Peary Land is *Collinsia thulensis* (JACKSON), previously only known from Northeast Greenland and Spitsbergen.

However, what makes the collection especially unique, is that only one collection from a slightly more northerly locality is at hand, viz. from the north coast of Grant Land, where a party of G. S. NARES's North Pole Expedition made collections in 82°33′N. lat. Only two species of spiders were brought home from this place: *Erigone psychrophila* THORELL and (*Erigone provocans* CAMBRIDGE) = *Collinsia spitsbergensis* (THORELL), both of which have also been found in Peary Land.

All the specimens collected in Peary Land belong to eight arctic species, all found rather near the station of the expedition on the south side of Jørgen Brønlund Fjord (82°10′N. lat.). The southernmost localities are Astrup Fjord and Kap Ejnar Mikkelsen (ca. 81°57′N. lat.) and the northernmost one was situated 5 km. up the Børglum Elv valley (ca. 82°15′N. lat.). Actual travelling was impossible during the summer owing to the presence of ice in the fjords. However, Jørgen Brønlund Fjord proper was free of ice and navigable for boats. Sledging was possible in the winter, but then it was impossible to collect terrestrial arthropods.

The zoologist of the expedition, PALLE JOHNSEN, M. Sc. collected the greater part of the material; but also BØRGE FRISTRUP, M. Sc., TORBEN ANDERSEN, M. Sc., and KJELD HOLMEN, M. Sc. contributed to the collections. In particular I am indebted to the botanist of the expedition, KJELD HOLMEN, for supplying me with valuable information of the localities and the natural conditions of the country. For this valuable help I wish to express my most cordial thanks. To WILLIS J. GERTSCH, PH. D., curator at the American Museum of Natural History, New York, I likewise express cordial thanks for lending me a *Tarentula exasperans* ♀ ad. of the collections of the Museum. This enabled me to publish a drawing of the epigynum of the female, which has not been known before.

The following abbreviations are employed in the text: jun. = individuals with only one moult left before reaching sexual maturity; juv. = younger individuals with several moults left; pull. = young just after leaving the egg cocoon. Finally, the name of the author is often abbreviated to Brgd.

Translated by EMILIE GLEERUP.

## SYNOPSIS OF THE SPECIES

### *1. Family Dictynidae.*

#### 1. Dictyna borealis CAMBRIDGE.

*Dictyna borealis* CAMBRIDGE 1877 p. 273, pl. VIII fig. 1; *Dictyna hamifera* BRÆNDEGÅRD 1940 p. 7, figs. 1, 3, 5; *Dictyna borealis* BRÆNDEGÅRD 1946 p. 25; CHAMBERLIN & GERTSCH 1958 p. 136, pl. 42, figs. 1—4.

*Occurrence in Peary Land:* Kap Ejnar Mikkelsen, June 6, 1949: 1 juv.; west side of Astrup Fjord, June 9, 1949: 2 ♂♂ juv., 1 ♀ juv.; southern Heilprin Land, 50 m. from the edge of the glacier, June 26, 1949: 1 juv.; Heilprin Land, near Jørgen Brønlund Fjord, June 21, 1949: 1 ♀ ad., 1 ♀ jun., 4 juv.; August 16, 1948: 1 ♂ jun.; in vegetation in a snow-patch above the station at Jørgen Brønlund Fjord, June 25, 1949: 1 ♀ ad., 1 ♂ jun.; south side of Jørgen Brønlund Fjord, August 3, 1947: 1 ♀ ad.; August 10, 1947: 1 ♀ ad.

*Distribution:* North Greenland (Peary Land); East Greenland (from Danmarks Havn 76°50′ N. lat. to Kangerdlugssuaq 68°05′ N. lat.); West Greenland (from 74°44′ N. lat. to 59°55′ N. lat.); Canada (Northwest Territories); Colorado in U.S.A.

It is a nearctic species, which after being found in 1956 in alpine localities (2400 to 3600 m. above sea-level) in Colorado by H. and L. LEVI, must now be regarded as an arid arctic-alpine-boreal species. The alpine-boreal individuals are a little bigger (0.5 mm.) and darker than the arctic ones (CHAMBERLIN and GERTSCH 1958).

*Ecology:* In Peary Land *D. borealis* has especially been found in dry localities such as south-facing slopes exposed to the sun and arctic steppes with a vegetation of Dryas, Casiope, Carex, and Vaccinium. Also found under stones 300 m. above sea-level and once in moss only 50 m. from the edge of the glacier. The ♀ which was found on June 25, 1949, in the vegetation of a snow-patch, in the tube in which it was placed spun a white lenticular cocoon with 14 eggs. It is probably the first egg cocoon belonging to this species that has ever been observed. The finding, on June 21, 1949, of 1 ♀ ad., 1 ♀ jun., and 4 juv. might indicate that the species has a triennial life cycle. It agrees, at any rate, with earlier findings (BRGD. 1946 p. 26).

## *2. Family Lycosidae.*

### 2. Lycosa glacialis THORELL.

*Lycosa glacialis* THORELL 1872 p. 159 (♀); CAMBRIDGE 1877 p. 281 (♂); *Pardosa glacialis* BRÆNDEGÅRD 1946 p. 13, figs. 3, 4, 5.

*Occurrence in Peary Land:* West side of Astrup Fjord, June 9, 1949: 1 ♀ jun., 13 juv., 1 pull; Blomsterstranden on the north side of Independence Fjord, Heilprin Land 5 km. southwest of Kap Knud Rasmussen, June 5, 1949: 1 ♂ ad.

*Distribution:* North Greenland (Peary Land, Foulke Fjord 78°20′ N. lat.); East Greenland (from Danmarks Havn 76°50′ N. lat. to Kangerdlugssuaq 68°05′ N. lat.); West Greenland (from 74°44′ N. lat. to 64°10′ N. lat.); Ellesmere Land (Discovery Bay 81°45′ N. lat., Hages Sound 79° N; lat., Havne Fjord 76°40′ N. lat.); Baffin Land; Southampton Island; Manitoba in Canada.

*Lycosa glacialis* seems to be a typical arid arctic species, which is only known from nearctic areas. Its more southerly occurrence in West Greenland than in East Greenland, is due to the special geographic conditions prevailing there (see p. 21).

### 3. Tarentula exasperans CAMBRIDGE.

*Tarentula exasperans* CAMBRIDGE 1877 p. 283, pl. VIII fig. 7 (♂); *Lycosa exasperans* EMERTON 1921 p. 167; *Tarentula exasperans* GERTSCH 1934 p. 14.

*Occurrence in Peary Land:* Itukussuk Dal, July 25, 1949: 1 ♂ jun.; northern Heilprin Land 460 m. a.s.l., July 8, 1949: 1 ♂ ad.; east end of Midsommersø, Erlandsen Land, July 23, 1949: 1 ♂ ad., 2 juv.

*Distribution:* North Greenland (Peary Land, Saunders Ø 76°40′ N. lat.); West Greenland (the island Ûmánaq in the interior of Godthåb Fjord 64°40′ N. lat.); Ellesmere Land (Discovery Bay 81°45′ N. lat.).

According to the occurrences known, *Tarentula exasperans* must be characterised as an arid arctic species which is only known from nearctic areas.

*Ecology:* In Peary Land the species has only been found on a mountain slope and in Dryas vegetation.

*Remarks:* Evidently only some few specimens of this species are found in the zoological museums. The type (♂ ad.) was found at Discovery Bay by the British polar expedition led by G. S. NARES (1875—76). EMERTON (1921) recorded the species from Saunders Ø west of Thule, North Greenland, where it was found in 1917 by the so-called Crocker-Land Expedition. However, EMERTON mentions this find without stating

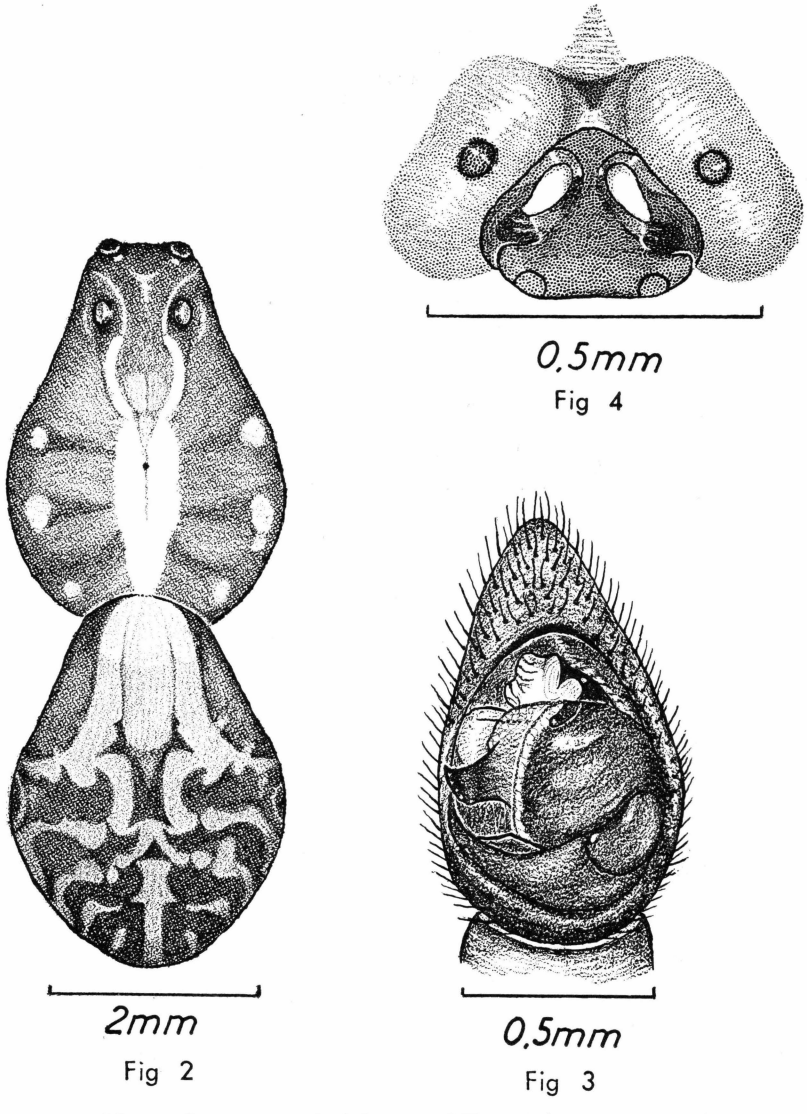


Fig. 2. Carapace and abdomen of Tarentula exasperans ♂.
Fig. 3. Tarentula exasperans ♂. Right palp, ventral view.
Fig. 4. Tarentula exasperans ♀. Epigynum.

the number or sorts of the individuals of which it consists. Some years later GERTSCH (1934) recorded a ♂ ad. and a ♀ ad. found in 1914 on the island Ûmánaq in Godthåb Fjord, and finally the Danish Peary Land Expedition found the aforementioned five individuals (2 ♂♂ ad., 1 ♂ jun., 2 juv.) of this rare species.

As, to my knowledge, the female has never been described before, Dr. GERTSCH showed me the great favour to forward to me on loan the

female specimen found in the American Museum of Natural History thus enabling me to describe it and draw its epigynum.

♀: The adult female is bigger and more robust than the male. Its measurements compared with those of the male will be seen from the subjoined table I.

Table I.

| | Carapace | | Abdomen | | Total Length |
|---|---|---|---|---|---|
| | Length | Breadth | Length | Breadth | |
| ♂..... | 2 mm | 1.5 mm | 2 mm | 1.5 mm | 4 mm |
| ♀..... | 2 mm | 1.75 mm | 2.75 mm | 2.15 mm | 4.75 mm |

The female is of a lighter appearance than the male. This is due both to the colour of the skin and to the hairy equipment. Where the skin of the male is blackish-brown, the female is dark brown, and while the male is rather sparsely equipped with white and light-grey hairs, the female is abundantly covered with such hairs, also outside the light-coloured median band and other light patches of the skin. Thus, there is a broad lateral brim of light hairs on either side of the carapace of the female, and its abdomen is predominantly covered with light-coloured hairs. The legs are provided with broad ring-shaped belts of light hairs. CAMBRIDGE (1877) says as follows about the limbs of the male: "Numerous short grey hairs give the prevailing tinge of colour to them all". This description does not apply to the two males (ad.) from Peary Land, their legs bearing almost exclusively dark hairs. It fits, however, the young animals. The dorsal patterns of the carapace and the abdomen are as in the male (fig. 2). The characteristic epigynum of the female will appear from fig. 4.

BONNET (1955 p. 647) refers this species to the genus *Arctosa*. This error can be traced from REIMOSER (1919 p. 144) back to STRAND (1906 p. 466), who states that *Tarentula exasperans* is synonymous with *Arctosa alpigena* (DOLESCHALL). Unfortunately it is not the only erroneous synonymy found in this paper ("Die arktischen Araneae"), which, peculiarly enough, still enjoys the honour of being regarded as authoritative. GERTSCH (1934 p. 14) says about this systematic question: "It is a typical *Tarentula*", and in this he is quite right.

BONNET (1955 p. 232) rejects the generic name of *Tarentula* (praeoc. FABRICIUS 1793), using instead of it the almost unknown name of *Alopecosa* SIMON 1885. Fabricius, it is true, in the case of three harvestmen replaced the generic name of *Phalangium* with *Tarentula*; but in the alphabetic list of "Gültigen Gattungs- und Artnamen" in the paper by ROEWER (1923) one looks in vain for the name of *Tarentula*. Since, thus, this name is no longer associated with any genus within the order of the

*Ophiliones*, there is hardly any reason not to use it as the name of a genus of spiders, as has, in fact, been commonly done since it was introduced by SUNDEVAL in 1832.

### *3. Family Agelenidae.*

#### 4. Tegenaria domestica (CLERCK).

*Araneus domesticus* CLERCK 1757 p. 76; *Aranea domestica* LINNÉ 1758 p. 620; *Tegenaria domestica* LOCKET & MILLIDGE 1953 p. 15, fig. 12; *Tegenaria domestica* BRÆNDEGÅRD 1958 p. 26, figs. 15, 16.

*Occurrence in Peary Land:* In the expedition house at Jørgen Brønlund Fjord, August 25, 1948: 1 juv.

*Distribution:* Cosmopolitan.

*Ecology:* It can be regarded as beyond doubt that this typically synanthropous species (house spider) is not indigenous in Peary Land, but has been introduced. As all the provisions and building materials of the expedition were transported to Jørgen Brønlund Fjord by aircraft, we are here confronted with a positive example of aerial introduction of spiders by aeroplane.

### *4. Family Linyphiidae.*

#### 5. Collinsia spitsbergensis (THORELL).

*Erigone Spetsbergensis* THORELL 1871 p. 692; *Microerigone spitsbergensis* BRÆNDEGÅRD 1937 p. 8, figs. 3, 4 (♂); 1958 p. 59, fig. 55 (♀).

*Occurrence in Peary Land:* Northern Heilprin Land, on a mountain slope 460 m. above sea-level, July 8, 1949: 1 ♀ ad.

*Distribution:* North Greenland (Peary Land); East Greenland (Kangerdlugssuaq 68°05′ N. lat., Angmagssalik 65°35′ N. lat.); West Greenland (Disko); Grant Land (82°33′ N. lat.); Thetis Island off the north coast of Alaska; Iceland (ca. 1000 m. a.s.l.); Sweden (Regio alpina superior 1500—1740 m. a.s.l.); Spitsbergen; Novaya Zemlya (21 localities from the northern and the southern island); New Siberian Islands; Siberia (69°15′—77°34′ N. lat.).

After the finding of *Collinsia spitsbergensis* in alpine localities in both Torne Lapmark, Sweden (HOLM 1950 p. 109), and in Iceland (BRGD. 1958 p. 59), it will be most correct to characterise it zoogeographically as a circumpolar, arctic-alpine-boreal species, which in the north-boreal area has only been found in the superalpine zone.

*Ecology:* It was with some doubt that the author (1946 p. 77) referred this species to "The Euryoequous Fauna Element", for in East Greenland only two specimens (♂ and ♀) from two different localities have been

found. ÅKE HOLM writes as follows (1958 p. 47): "It is otherwise an eurytopic species which was collected both in very dry localities as Cetraria on a talus slope and in such a humid biotope as a Sphagnum-bog", thus confirming that *Collinsia spitsbergensis* is an euryoequous species. But HOLM also writes: "It is typical of the „fjældmark", where it is the most abundant species in Dryas, Saxifraga oppositifolia, and Salix polaris cushions as well as under stones."

*Remarks: Erigone provocans* O. P.-CAMBRIDGE and *Erigone oxycephala* L. KOCH are synonymous with *Collinsia spitsbergensis*, whose generic name has repeatedly been changed: *Typhochraestus*, *Microerigone* (JACKSON 1934[1] pp. 335—36; HOLM 1937 p. 6; BRGD. 1958 pp. 59—60). The last-mentioned paper contains a fairly comprehensive list of synonyms.

### 6. Collinsia thulensis (JACKSON).

*Coryphaeolanus thulensis* JACKSON 1934[2] p. 615, pl. XVIII figs. 3—7; *Coryphaeolana thulensis* BRÆNDEGÅRD 1940 p. 16, figs. 12, 13.

*Occurrence in Peary Land:* Northern Heilprin Land, at the shore of Klaresø, August 8, 1949: 2 ♀♀ ad., 1 ♂ jun., 2 ♀♀ jun., 1 juv.; Erlandsen Land between Frysefjeld and Nedre Midsommersø, July 25, 1949: 1 ♀ ad.

*Distribution:* North Greenland (Peary Land); East Greenland (70°50′—76°50′ N. lat.); Spitsbergen. While this species is known from East and North Greenland, viz. 20 specimens from six different localities, only three specimens are known from Spitsbergen. Judging by the occurrences known, it is an arid arctic amphi-Atlantic species.

*Ecology:* In East and North Greenland it has repeatedly been found under stones. The first specimen (♂) from Spitsbergen was found under such circumstances that one is inclined to believe that it was transported to the locality by a fulmar (JACKSON 1934[2] pp. 618—19).

*Remarks:* ÅKE HOLM (1958 pp. 43—49) showed it to be probable that *Coryphaeolanus holmgreni*, *Coryphaeolanus thulensis*, and *Microerigone spitsbergensis* belong to the same genus; but as the generic name of *Collinsia* O. P.-CAMBRIDGE (1913) has precedence to *Coryphaeolanus* STRAND (1914), the name of *Collinsia* should be used.

### 7. Erigone psychrophila THORELL.

*Erigone psychrophila* THORELL 1871 p. 689; CROSBY & BISHOP 1928 p. 38, figs. 66, 67, 68, 70; BRÆNDEGÅRD 1940 p. 17, figs. 14, 22.

*Occurrence in Peary Land:* Northern Heilprin Land, in a meadow 200 m. a.s.l., June 23, 1949: 3 ♂♂ ad., 5 ♀♀ ad., 2 ♂♂ jun., 2 juv.; on a

mountain side in northern Heilprin Land 460 m. a.s.l., July 3, 1949: 1 ♂ ad., 2 ♀♀ ad.; at the south side of Jørgen Brønlund Fjord, August 16, 1948: 1 ♀ ad.; Oksesletten at the south side of Jørgen Brønlund Fjord, June 7, 1949: 1 ♀ ad.; Heilprin Land, at Jørgen Brønlund Fjord, 400 m. a.s.l., June 14, 1949: 1 ♂ ad.; on the shore of Lersø near the station, July 4, 1949: 1 ♀ ad.; Nedre Midsommersø, eastern end, July 22, 1949: 1 ♀ ad.; river bed at the station, June 30, 1949: 1 ♂ ad., 1 ♀ ad.; river bed of Børglum Elv, August 6, 1949: 1 ♂ ad.; in the alimentary canal of Crocethia alba, killed at Klaresø June 2, 1949: 1 ♂ ad., 1 ♀ ad.; Heilprin Land, June 21, 1949: remains of 4 ♂♂ ad., 4 ♀♀ ad., and an indeterminable jun. found in the alimentary canal of a ringed plover.

*Distribution:* North Greenland (Peary Land, Polaris Bugt 81°30′ N. lat.); East Greenland (65°35′—76°50′ N. lat.); West Greenland (Wandel Land 74°35′ N. lat.); Grant Land (82°33′ N. lat.); Ellesmere Land (78°46′ and 76°49′ N. lat.); the arctic sea coast of Alaska; New Siberian Islands; Cape Tscheljuskin (77°33′ N. lat.); the Waigatsch Island; Novaya Zemlya; Franz Joseph Land; Spitsbergen. From the north-boreal area it is known from alpine and superalpine localities in Iceland; the Faroes; Sweden (Lapland 980—1250 m. a.s.l.); Siberia (62°15′ N. lat.); Kamchatka. It is a circumpolar, arctic-alpine-boreal species.

*Ecology:* This species has repeatedly been found under stones or otherwise concealed, most often under humid conditions as for instance near banks of lakes, thaw-water pools, in snow-patches among Saxifraga and Ranunculus, in river beds and river valleys. In addition it has been found thrice in alpine localities, and likewise on mountain sides under arid conditions. This is in good accordance with the reports from East Greenland (Brgd. 1946 p. 47). It is also in accord with the records by Åke Holm (1950 p. 109) from Lapland. About the biotopes of the species on Spitsbergen he writes (1958 p. 53): "*E. psychrophila* belongs both to dry and humid localities, and has been found under stones or among moss in „fjældmark" and in tussocks of Poa and Salix polaris in a bog." All this agrees with the fact that *Erigone psychrophila* belongs to the "Euryoequous Fauna Element" in Greenland (Brgd. 1946 p. 77) and in other regions within the arctic and subarctic zones.

Åke Holm (1958 p. 53) publishes a characteristic picture of the egg cocoon of this species, and says: "The presence of the species in a locality can often be established from the egg cocoons which are easily distinguished from those of other species of *Erigone*".

It would seem that this species is particularly pursued by small wading birds (cf. above, Occurrence in Peary Land).

### 8. Hilaira vexatrix (CAMBRIDGE).

*Erigone vexatrix* CAMBRIDGE 1877 p. 280, pl. VIII fig. 6; *Hilaira vexatrix* HOLM 1937 p. 8, fig. 3a, d, g (♂); *Hilaira curvitarsis* BRÆNDEGÅRD 1940 p. 12, figs. 7, 8, 9 (♂ & ♀); *Hilaira vexatrix* HOLM 1956 p. 464, fig. 5g, h, i, k, l, m (♀).

*Occurrence in Peary Land:* Heilprin Land inside Diabasholmene, June 6, 1949: 1 ♀ jun.; south side of Jørgen Brønlund Fjord, on the mountain 300 m. a.s.l., August 3, 1947: 2 ♂♂ ad., 4 ♀♀ ad.; Heilprin Land, near Jørgen Brønlund Fjord 400 m. a.s.l., June 14, 1949: 1 ♀ ad.; North Heilprin Land at the shore of Klaresø, August 3, 1949: 1 ♀ ad.; August 8, 1949: 2 ♂♂ ad., 3 ♀♀ ad.; near the station at Jørgen Brønlund Fjord, August 6, 1947: 1 ♀ ad.; south side of "Buen" in Erlandsen Land, September 1, 1948: 1 ♀ ad.

*Distribution:* North Greenland (Peary Land, Saunders Ø 76°40′ N. lat.); East Greenland (76°50′—70°25′ N. lat.); West Greenland (72°50′—68°45′ N. lat.); Ellesmere Land (Discovery Bay 81°45′ N. lat., Hages Sound 78°46′ N. lat., Havnefjord 76°49′ N. lat.); North-East Baffin Land (Eglinton Fjord); Alaska (Collinson Point 70° N. lat.); Banff-Rocky Mountains National Park in Alberta, Canada.

After being found in the National Park of Alberta (SCHENKEL 1950 p. 59), *Hilaira vexatrix* must be regarded as an arid, arctic-alpine-boreal species. It is only known from nearctic areas. This and the two very closely related species, *Hilaira glacialis* (THORELL) and *H. nivalis* HOLM, together constitute a circumpolar group.

*Ecology:* The species has been found under stones, in moss, and a few times on banks of lakes or water pools. In addition, it has been found on slopes exposed to the south and in alpine localities. In East Greenland it has been found under similar conditions (BRGD. 1946 p. 38). According to its distribution in Greenland (cf. "Distribution", above) it should belong to the arid arctic faunal element in Greenland (BRGD. 1946 p. 74).

*Remarks:* Formerly arachnologists have been inclined to assume that *Erigone vexatrix* CAMBRIDGE, *Erigone glacialis* THORELL, *Notioscopus? curvitarsis* SOERENSEN, and *Hilaira whymperi* JACKSON belonged to one and the same species; however, ÅKE HOLM (1937 pp. 6—9 and 1956 pp. 464—66) has demonstrated that they belong to three very closely related species, viz. *Hilaira glacialis* (THORELL), *H. vexatrix* (CAMBRIDGE), and *H. nivalis* HOLM. *Hilaira whymperi* and *H.* (*Notioscopus?*) *curvitarsis* are synonyms of *H. vexatrix*. ÅKE HOLM, in his paper of 1937, gives a detailed list of synonyms.

Possibly we are here merely concerned with three geographic races; but since HOLM found a constant, though inconsiderable, difference be-

tween the palps of the males (1937) and later (1956) demonstrated that the females, also, belonging to *H. glacialis* and *H. vexatrix* are distinguishable from one another by the epigynum, it must be considered most correct to regard them as three different species.

Holm (1958 p. 55) states that *Hilaira glacialis* is endemic on Spitsbergen, and that *H. nivalis* is indigenous on Novaya Zemlya and in Siberia.

### 9. Meioneta nigripes (Simon).

*Microneta nigripes* Simon 1884 p. 439; *Micryphantes nigripes* Brændegård 1946 p. 32, figs. 17, 18; *Meioneta nigripes* Locket & Millidge 1953 p. 346, fig. 207.

*Occurrence in Peary Land:* Heilprin Land near Jørgen Brønlund Fjord, August 16, 1948: 1 ♂ ad.; June 18, 1949: 1 ♀ ad., 1 ♂ jun.; June 21, 1949: 2 ♀♀ ad., 1 ♂ juv.; at Klaresø, northern Heilprin Land, August 8, 1949: 4 ♀♀ ad., 4 ♂♂ jun., 1 juv.; at the south side of Jørgen Brønlund Fjord, August 6, 1947: 1 ♀ jun.; August 10, 1947: 1 ♀ ad., 1 ♀ jun.; 5 km. up Børglum Elv valley, August 7, 1949: 1 ♀ ad.

*Distribution:* North Greenland (Peary Land); East Greenland (north of 65°55′ N. lat.); West Greenland (67°20′—68°42′ N. lat.) (unknown from southern Greenland and Agpatôq, but seems to be replaced here by the nearctic race *Meioneta n. jacksoni* Braendegård); Jan Mayen; Spitsbergen; Novaya Zemlya; Iceland; the Faroes; Scotland (about 800 m. a.s.l.); Sweden (Lapland: 800—1300 m. a.s.l.); the French, Swiss, and Tyrolian Alps.

*Meioneta nigripes* is a palaearctic species; the only nearctic area whence it is known is northern Greenland. The species may be characterised as an arctic-alpine-boreal species. Possibly *M. nigripes* together with *M. nigripes jacksoni* form a circumpolar group; but neither the main species nor the race is known from Siberia, Alaska, or Canada.

*Ecology:* The species has been found on dry south-facing slopes, which in one case were covered with Salix and Kobresia, likewise on arctic steppes with Dryas and Carex; but it has also been found under stones on moist ground along the shores of Klaresø. This is in accordance with the reports on the biotopes of the species in East Greenland. There can hardly be any doubt that it belongs to the euryoequous fauna element of Greenland (Brgd. 1946 pp. 33 & 77).

# GENERAL REMARKS

## *1. Natural Conditions*

Peary Land is a peninsula of the size of Switzerland. On the north and east it is bounded by the Polar Sea, on the south and west by the large Independence Fjord, the inland ice, and J. P. Koch Fjord.

Peary Land is principally a plateau land (800—1000 m. a.s.l.) intersected by broad valleys. The land is situated entirely outside the area of the inland ice, and only minor stretches are covered by perpetual snows and ice. At the present day these glaciers are receding rapidly; but in earlier times the greater part of the peninsula was covered by ice.

To-day the surface of the lowland is in the main raised sea bottom or river deposits. Dunes of blown sand occur, too; but by far the greater part of the surface is a bare, or almost bare, fellfield. Only some few per cent of the surface are covered by a continuous vegetation. Such a vegetation may occur as meadows along the rivers, where the soil is moist. In other places the moisture of the soil may be due to snow patches, and here, too, a rich vegetation may be met with. Minor heaths of Cassiope tetragona likewise occur, which particularly near the coast and in the interior of the large fjords may be fairly extensive. Altogether ca. 100 species of higher plants have been found in this almost desert-like land, and the animal population is not quite inconsiderable either. Thus the zoologist of the expedition, PALLE JOHNSEN, estimates the musk-ox population of Peary Land at at least 2000 animals; however, earlier reports show that the animal population may vary considerably. On the "Second Thule Expedition" 1916—18 the members of the expedition nearly succumbed from hunger, as they failed to come across any game fit for hunting, and one of the members, the Swedish botanist THORILD WULFF, died from starvation and exhaustion.

## *2. Climate*

The climate is higharctic and markedly continental with a temperature amplitude of 37.2°, while the southernmost part of Greenland, where the climate is oceanic, has an amplitude of only 11.5° (fig. 5). The continental climate does not grow very much milder along the coast, for the sea is covered with polar ice practically all the year round. The whole

expedition, personnel as well as equipment and materials, therefore had to be transported by aircraft from the southern base at Zackenberg Bugt (74°28′ N. lat.) to Jørgen Brønlund Fjord, on the south side of which the

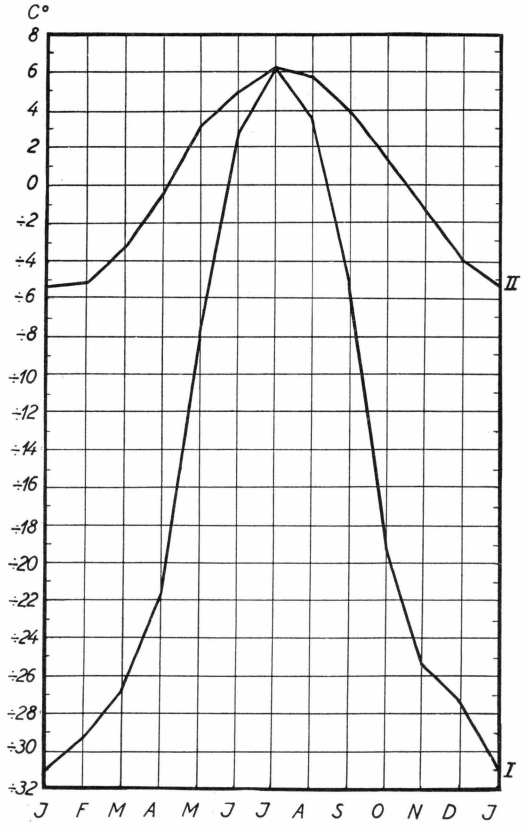


Fig. 5. Annual variation of temperature in: I Peary Land, at Jørgen Brønlund Fjord (82°10′ N. lat.) and II Nanortalik (60°08′ N. lat.) in South Greenland.

wintering house of the expedition was built. It was located in 82°10′ N. lat., 31°30′ W. long.

At Jørgen Brønlund Fjord the sun was continuously in the sky for five months; on the other hand, the polar night lasted for four and a half months. On only forty days in spring and just as many days in the autumn does the sun rise and set. The average temperature is positive during only the three months of June, July, and August, being highest in July (6.2° C.). The highest temperature registered at daytime (18° C.) occurred in August 1948, while the lowest summer temperature (—5.5° C.) was registered in June 1950. On south-facing slopes the microclimatic conditions are far more favourable than the macroclimatic conditions.

During the year 1948—49, 2232 sunny hours were registered, or somewhat more than the average in Denmark. Considering the long polar

night, sunshine must be abundant in Peary Land. In spite of the high northerly location of the land, the summer was favoured by having sixty consecutive days with positive temperatures.

Observations made on sledge journeys in winter indicate that in other parts of Peary Land the temperature is lower than at Jørgen Brønlund Fjord, where foehn winds often blow.

The relative humidity of the air is low. During the summer months May—September it varies between 54 and 78 per cent (mean 69 per cent). The relative humidity rarely rose to 100 per cent, and occasionally it might be below 50 per cent. The lowest relative humidity measured was 19 per cent.

The precipitation is low and especially falls in the form of snow in the winter. On account of the low humidity of the air, the precipitation evaporates quickly in the summer, and this would also be the case in winter if the heavy winter gales did not sweep the snow together in snow patches, which will melt the succeeding summer, thus giving off moisture to the soil. This provides good possibilities for a luxuriant vegetation.

### *3. Arctic-alpine-boreal species.*

In these and in the following considerations, Tegenaria domestica, which is not indigenous in Peary Land, will be entirely disregarded (see p. 11). The eight species which then come into question are: *Dictyna borealis*, *Lycosa glacialis*, *Tarentula exasperans*, *Collinsia spitsbergensis*, *Collinsia thulensis*, *Erigone psychrophila*, *Hilaira vexatrix*, and *Meioneta nigripes*. Apart from the last-mentioned one, the types of the other seven species have been found in what might be termed "The Far North" (Grant Land, Greenland, Spitsbergen). Hence these species have quite naturally been termed "high-arctic".

Gradually as a better knowledge of their distribution was acquired, it turned out that the greater number of them occurred in boreal regions, also; but there they lived in alpine or, more correctly, superalpine localities. This applies to *Dictyna borealis* (see p. 7), *Collinsia spitsbergensis* (see p. 11), *Erigone psychrophila* (see p. 13), and *Hilaira vexatrix* (see p. 14). They cannot, therefore, still be called higharctic, but more adequately arctic-alpine-boreal species. This also applies to *Meioneta nigripes* (see p. 15). However, this species was first found in the Alps and described as alpine by Simon. Later it has turned out that *M. nigripes* has its main range of distribution in the Arctic.

*Tarentula exasperans* (see p. 8) and *Collinsia thulensis* (see p. 12) are so far only known from higharctic regions, and both of them from very few localities only, so thus far nothing definite can be said about their geographic distribution. As to *Lycosa glacialis* it applies that thanks to

Emerton there is still so much nomenclatural confusion that it is impossible to say anything definite about its distribution outside the arctic regions (Brgd. 1946 p. 15). It will be wise not to use the term "high-arctic", or, at any rate, to use it with some reservation, for most likely it is an adequate term for very few spiders, only, possibly none at all.

### *4. Peary Land and East Greenland*

If we are to make a zoogeographic estimate of the spiders of Peary Land, it will be natural to compare them in the first place with the spiders of East Greenland, of which we have a fairly good knowledge (Brgd. 1946). Moreover, Peary Land and East Greenland are directly connected with each other.

It will be seen from table II that Peary Land is poorer in families and species than East Greenland, a fact that is not to be wondered at if it is taken into consideration that East Greenland extends from 59°55′ N. lat. (Kap Farvel) to 81°30′ N. lat. (Nordostrundingen), and that the southern area has a decidedly oceanic climate, while in the northern area the climate is continental, as in Peary Land (see fig. 5), and farthest north distinctly arid (Brgd. 1946 figs. 39 and 40, pp. 67 and 69). The southern part of East Greenland is accordingly inhabited by humid species, which are not met with at all in Northeast Greenland (see Brgd. 1946, table VII p. 73). It should not be forgotten, either, that our whole knowledge of the arachnid fauna of Peary Land is limited to what is known from the collections made by the Danish Peary Land Expedition, while in East Greenland collections have been secured by several expeditions.

Table II.

| Families | Number of species | |
|---|---|---|
| | East Greenland | Peary Land |
| *Dictynidae* | 2 species | 1 species |
| *Gnaphosidae* | 2 — | 0 — |
| *Thomisidae* | 2 — | 0 — |
| *Lycosidae* | 7 — | 2 — |
| *Agelenidae* | 1 — | 0 — |
| *Theridiidae* | 1 — | 0 — |
| *Tetragnathidae* | 1 — | 0 — |
| *Linyphiidae* | 22 — | 5 — |
| Total... | 38 species | 8 species |

The spider fauna of East Greenland consists in the main of the following three climatic-ecological faunal elements: the humid, the arid

arctic, and the euryoequous faunal element. The species of the humid faunal element live between Kap Farvel and Scoresby Sund (70°30′ N. lat.). Those belonging to the arid arctic faunal element occur, in fact, only north of Scoresby Sund. It is chiefly heliophilous species that belong to this group (BRGD. 1946 p. 74). The species of the euryoequous faunal element inhabit both the southern humid and the northern arid areas. They are Micro-Araneida, which in the northern area occur under stones and vegetation, or in the upper loose layers of the soil. For here the microclimate has a higher relative humidity than the macroclimate.

Of these three faunal elements, only the arid arctic and the euryoequous elements might be expected to be represented in Peary Land. This has certainly turned out to be the case, the eight species from Peary Land consisting of five arid and three euryoequous species (see table III). In a zoogeographic respect four species are nearctic, three circumpolar or amphi-Atlantic, and only one is palaearctic. *Collinsia thulensis*, which is only known from Spitsbergen and Greenland, must provisionally be regarded as amphi-Atlantic; quite probably, however, it is circumpolar.

Table III.

Climatic-ecologic and zoogeographic grouping of the species.

| | | Nearctic | Palae-arctic | Circum-polar or amphi-Atlantic |
|---|---|---|---|---|
| *Arid* | *Dictyna borealis* | × | | |
| | *Lycosa glacialis* | × | | |
| | *Tarentula exasperans* | × | | |
| | *Collinsia thulensis* | | | × |
| | *Hilaira vexatrix* | × | | |
| *Euryoequous* | *Collinsia spitsbergensis* | | | × |
| | *Erigone psychrophila* | | | × |
| | *Meioneta nigripes* | | × | |

From tables III and IV it will be seen that as in East Greenland, the nearctic species are dominant in Peary Land, while the palaearctic element is sparsely represented. As to their percentage representation in Peary Land and East Greenland, the various zoogeographic groups show great agreement (table IV).

The palaearctic species constitute a small minority, while the nearctic species are so numerously represented that the fauna as a whole must be termed nearctic. As the circumpolar species *Collinsia spitsbergensis* and *Erigone psychrophila* are also known from the nearctic area proper, it

Table IV.

Occurrence of the main zoogeographic groups in Peary Land and East Greenland.

| | Peary Land | | East Greenland | |
|---|---|---|---|---|
| | Number of species | % | Number of species | % |
| Nearctic | 4 | 50 | 17 | 44 |
| Circumpolar or amphi-Atlantic | 3 | 37.5 | 16 | 41 |
| Palaearctic | 1 | 12.5 | 6 | 15 |

means that at least 75 per cent of the araneid fauna of Peary Land may have immigrated from the west.

Since practically the whole of Peary Land has previously been glaciated, it can be taken for granted that the fauna has immigrated from nearctic areas, possibly as late as after the last ice age (Würm). Only the palaearctic *Meioneta nigripes* must have immigrated from the east. Considering the exceedingly common occurrence of this species on Jan Mayen and Bear Island (Bristowe 1925 and 1933), there is nothing unnatural in such an assumption.

From Peary Land the arid nearctic species has spread to East Greenland north of Scoresby Sund. Here the humid climate of Blosseville Kyst prevented them from spreading farther southward. The euryoequous species may just as well have immigrated to East Greenland and Peary Land from the south as from the west; for this climatic-ecological group is practically circumgreenlandic.

It will be seen from table V that while the arid arctic spiders known from Peary Land, in East Greenland occur only as far as Scoresby Sund (70°30′ N. lat.) or a little south thereof (68°05′ N. lat.), the same species generally have a far more southerly distribution in West Greenland, due to the fact that the ice-free coastland of West Greenland south of Upernavik is, as a rule, very broad and accordingly has an arid hinterland, where these species may find suitable life conditions. In East Greenland, however, the icefree coastland south of Scoresby Sund is so narrow that practically the whole of this stretch has an oceanic climate, and this is the reason why the arid species do not spread beyond Scoresby Sund or a little south thereof. Something similar applies to other arctic animal groups, e.g. mammals and Lepidoptera (cf. Brgd. 1946 p. 106). The euryoequous species, however, may possibly be met with all around Greenland.

These distributional conditions were demonstrated several years ago (Brgd. 1946 fig. 44 p. 75 and table XI p. 106); in this connection, however, it is of special interest that similar conditions were observed for the

Table V.
Distribution within Greenland of the arid arctic spiders of Peary Land.

| Name of species | West Greenland | Thule district | Peary Land | East Greenland |
|---|---|---|---|---|
| *Dictyna borealis* ..... | 59°55′—74°44′ | (+) | + | 76°50′—68°05′ |
| *Lucosa glacialis* ..... | 64°10′—74°44′ | 78°20′ | + | 76°50′—68°05′ |
| *Tarentula exasperans*... | 64°40′ | 76°40′ | + | (+) |
| *Collinsia thulensis* ..... | (+) | (+) | + | 76°50′—70°50′ |
| *Hilaira vexatrix*..... | 68°45′—72°50′ | 76°40′ | + | 76°50′—70°25′ |

(+) Species not yet identified, but supposed to live in the area.

flora. The botanist of the Peary Land Expedition, KJELD HOLMEN, writes as follows (1957 p. 144): "Seen against the background of the distribution of the species in Greenland, the Peary Land flora comprises representatives for a number of different distributional types. Two types are especially richly represented in the Peary Land flora, namely 1) species widespread in Greenland, "circumgreenlandic", and 2) species, which in East Greenland are not known south of the Scoresby Sund area. About 35 per cent of the species in Peary Land belong to the group of species widespread in Greenland."

The corresponding group (the euryoequous species) of the araneid fauna of Peary Land constitutes 37.5 per cent, or about the same proportion.

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