On a New Collection of Aphids from Iceland.

By
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Introduction.

Hille Ris Lambers (1955) summarised existing knowledge of the Icelandic Aphid fauna in Volume 3, Part 52a, of The Zoology of Iceland. He examined earlier records by Mohr and Lindroth, corrected some of these, and gave an account of 27 species known from the island.

From July 24 to August 8, 1958, a visit was paid to Iceland by one of us (R. N. B. P.) during which aphids were collected whenever opportunity occurred. The following account presents the results of this collecting, which provided records of nine species not hitherto known from Iceland, and augmented existing data on some others that were known already.

We are much indebted to Dr. Hille Ris Lambers, Bennekom, Netherlands, for helpful discussion of the material, and for checking identifications of certain species against type specimens. We also gratefully acknowledge the loan of specimens for comparison by Mr. F. H. Jacob, Harpenden, and Miss C. A. Prevost, Mr. J. P. Doncaster and Dr. V. F. Eastop of the British Museum (Natural History). Miss Prevost also kindly lent us the draft manuscript of her description of a new *Hyperomyzus* species. Dr. F. Ossiannilsson, Uppsala, Sweden, kindly compared type material of *Schizaphis graminum,* ssp. *gigjai* Stroyan, with material of *Schizaphis* in his collection. For help in checking the identity of *Cavariella konoi* Tak. we are indebted to Drs. R. Takahashi, Kuroyama, and C. Chia-chu Tao, Taipeh. During Prior's stay in Iceland valuable help was received from Mr. Geir Gigja, Reykjavik, in the naming of plants, and we are happy that this is commemorated in the naming of an endemic subspecies of *Schizaphis graminum* (Rond.) after him. Prior was also greatly helped over administrative details of his visit by Mr. Thorsteinn Bernhardsson of Reykjavik, to whom a new subspecies of *Hyperomyzus boerneri* Prevost has been dedicated in recognition of his

kindness. We offer our thanks to all these colleagues for their invaluable help in the preparation of this paper.

Material of the species discussed has, when possible, been deposited in the collections of the Zoological Museum, Copenhagen, and the British Museum (Natural History). The main part of the collection remains at the Plant Pathology Laboratory, Harpenden, England.

1. Topographical and Ecological Notes.

The area worked was confined to the south-western quarter of the country, bounded by latitudes 63° 55' N and 65° 05' N, and by longitudes 20° W and 24° W. A total mileage of 750 miles (1200 km.) was covered by motor bicycle. By cycling slowly, and stopping to collect whenever new species of plants, or areas appearing different from the terrain already explored, were seen, it was possiple to cover a widely varying range of plant associations, and to amass a collection of aphid samples representing most of these associations. A rough classification of the types of habitat worked has been made, and is as follows:

(1) Basalt mountains with marginal scree. Characteristic of the road between Reykjavík and Borgarnes, which runs at the base of the scree and follows a much indented coastline along the sides of the fjords. Vegetation mainly confined to the narrow strip between road and sea, and to patches of grass and occasional alpine plants among the scree.

(2) River-cut ravines with abundant rock crevices. Such ravines, encountered at the Laxá waterfall 20 miles from Reykjavík, and at one point on the Vegamót-Stykkishólmur road, provided sheltered habitats for many plants such as *Hieracium* species, *Saxifraga ?caespitosa, Sedum villosum* and *Cerastium alpinum*. A somewhat similar habitat was provided by a rocky gorge at the outfall of Þingvallavatn, where very abundant *Rho-*

diola rosea harboured a very few specimens of *Thuleaphis ?acaudata* H. R. L.

(3) Seashore. A sand and pebble beach at Akranes carried two large stands of *Elymus arenarius* from which

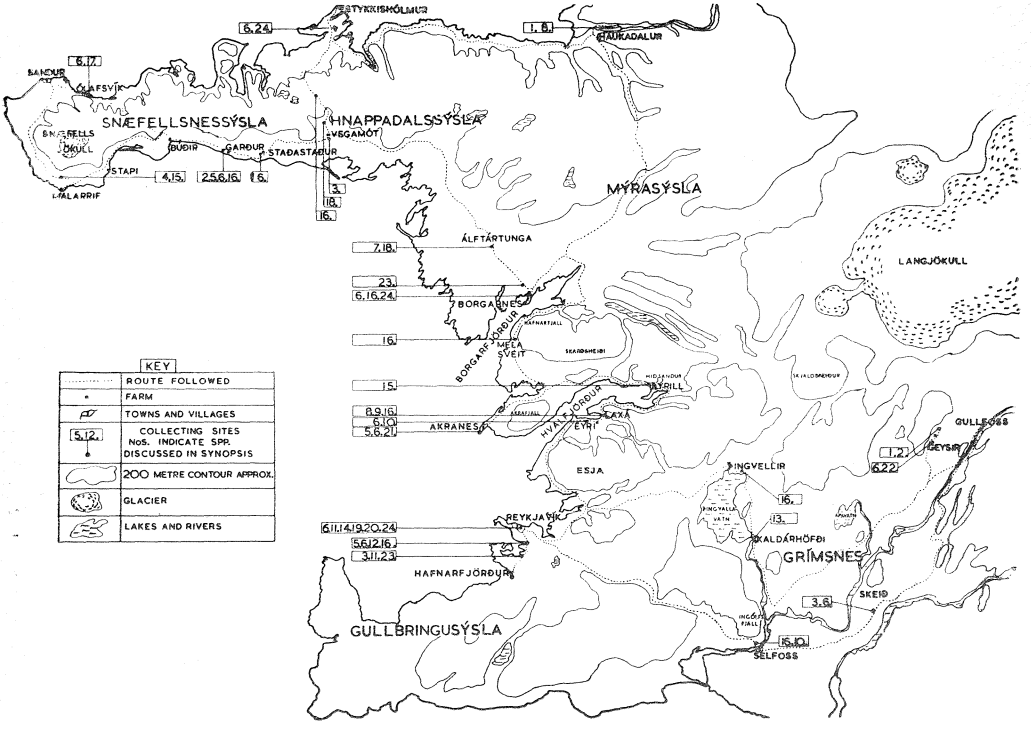

Fig. 1. Map of south-west Iceland showing itinerary followed and sites of aphid collections.

a new subspecies of *Schizaphis geijskesi* H. R. L. was obtained. A stretch of shore in Skerjafjörður near Reykjavík yielded aphids from grass, *Matricaria* and *Stellaria media,* and at Ólafsvík grass growing under old planks and stones on the shore produced *Jacksonia papillata* Theob.

(4) Flat sandy terrain with dominant willow

scrub. An area traversed by the road from Borgarnes to Staðastaður was characterised by much willow scrub dominated by *Salix phylicifolia* and *S. lanata*. In this area aphids were taken on the willows and on *Carex* in roadside ditches, *Potentilla crantzii* and *Silene maritima*.

(5) Lava flows and fields. Very extensive lava fields were traversed at the base of the glacier Snæfellsjökull on the north side of the Snæfellsnes Peninsula between Stykkishólmur and Haukadalur, and smaller ones between Borgarnes and Staðastaður. These areas are practically barren apart from lichens and mosses, and only one collection of aphids was made from such an area, from a plant not identified at the time, but now deduced, from the identities of the aphids collected, to have been perhaps *Vaccinium uliginosum*.

(6) Cultivated farmland. Characterised by a number of rather characteristic weed species absent from the poorer natural soils. Several such farms were visited at Staðastaður, and aphids were collected on *Vicia cracca, Stellaria media* and *Capsella bursa-pastoris*.

(7) Banks of lakes and streams. A rather varied assemblage of habitats, characterised by different plants in different localities. *Filipendula ulmaria* was only found in one locality beside a lake in Haukadalur, and another near the Great Geysir; but yielded aphids in both places. *Alectorolophus minor* and *Euphrasia frigida* grew among grass near Hafnarfjörður and Selfoss respectively, and produced two hitherto unrecorded species of *Hyperomyzus*. Two species of *Hieracium* grew with *Filipendula* near Haukadalur, and *Nasonovia compositellae* (Theob.) was collected from these.

(8) Margins of hot springs. In the Great Geysir area such hot springs are typically surrounded at a distance of a few feet by a growth of an unidentified grass, which grows in warm, almost perpetually moist soil. In this specialised habitat occurred two species of aphid,

one an apparently new subspecies of *Schizaphis graminum* (Rond.).

(9) Urban parks and gardens. These habitats in Reykjavík contained planted *Salix* species and *Ribes rubrum*; both of these were inhabited by mixtures of aphid species, all of which could apparently be heteroecious, i. e. with host alternation to other plants in the Icelandic summer.

The flora of Iceland contains 411 species of Pteridophyta and Spermatophyta, according to the Flóra Íslands of Stefánsson (2nd Ed., 1924). Of these, 45 identified species were examined during the fortnight available for collecting, and aphids were collected from 31 species. The data available to Hille Ris Lambers for his account of Icelandic aphids contain records of a bare dozen identified host plants, apart from unspecified grasses. While it is certainly not possible to extrapolate from figures such as those quoted above, the very small number of Icelandic plants so far examined for aphids gives some idea of the work still required to produce a satisfactory list of the Icelandic aphid fauna, and to fill in the gaps in our knowledge of the biology of those species already known.

2. Synopsis of the Species.

Figures in parentheses quoted in locality data refer to the rough habitat classification given in the last section.

1. *Macrosiphum cholodkovskyi* Mordv.

Hille Ris Lambers, 1955, p. 2.

Additional locality records: near Great Geysir (7), 3. viii. 58; Haukadalur (7), 31. vii. 58; both collections from *Filipendula ulmaria*.

2. *Acyrthosiphon pisum* (Harris).

Hille Ris Lambers, 1955, p. 3.

Additional locality record: near Garður (6), 28. vii. 58; from *Vicia cracca* and *Capsella bursa-pastoris*.

These host records confirm Hille Ris Lambers' supposition that *V. cracca* should be an important host of this aphid in Iceland, with *Capsella* as an alternative host in summer.

3. *Acyrthosiphon boreale* Hille Ris Lambers.
Hille Ris Lambers, 1952, p. 5; 1955, p. 3.

Additional locality records: Vegamót (6), 27. vii. 58, on *Potentilla crantzii* (det. G. Gígja); near Hafnarfjörður (7), 8. viii. 58, from mixed herbage by stream; near Skeið, east of Selfoss, 5. viii. 58, 3 apterae thrashed from grass, perhaps with some admixture.

Host records for *A. boreale* have hitherto not been available. The association of one of the samples collected with *Potentilla crantzii* is consistent with the morphological relationships of the species, which is close to *A. agrimoniella* (Ckll.) from *Agrimonia* and *A. rogersii* (Theob.) from *Fragaria*, both of these hosts belonging to the same subfamily of herbaceous Rosaceae as *Potentilla*. The mixed herbage from which the second sample of *A. boreale* was thrashed also contained a yellow-flowered plant which, while not at the time identified, was probably *P. crantzii*.

4. *Acyrthosiphon brachysiphon* Hille Ris Lambers.
Hille Ris Lambers, 1952, p. 6; 1955, p. 4.

Additional locality record: Snæfellsjökull (5), 29. vii. 58, on an unidentified host.

These aphids occurred together with *Ericaphis latifrons* (Börner) (see Hille Ris Lambers, 1955). This suggests that the unidentified host should be Ericaceous, and was quite probably *Vaccinium uliginosum*. The same host was thrashed in various other localities, but yielded no aphids. Colour notes describe the aphids as waxy green when alive. The identity of the only two adult apterae obtained has kindly been checked by Dr. Hille Ris Lambers.

5. *Acyrthosiphon auctus* (Walker)

syn. *A. silenicola* H. R. L., *A. shawi* Stroyan.

Walker, 1849, p. xxxiii, part; Hille Ris Lambers, 1955, pp. 1, 4, fig. 1; Stroyan, 1957, p. 313, fig. 1, pl. III; Heie, 1958, p. 214.

Additional locality records: Akranes (3), 25. vii. 58, 1 apt. and 2 larvae from *Gentiana* sp.; near Reykjavik (3), 6. viii. 58, 1 apt. from *Stellaria media*; near Garður (6), 28. vii. 58, from *Stellaria media, Capsella bursa-pastoris* and *Silene maritima* (a total of 5 apt.).

The host records for *A. auctus* show that the species is rather polyphagous; to the hosts quoted above must be added *Honkenya peploides* (the type host) and *Cakile maritima,* on which it has been found in Scotland. It appears at least possible that the *?Aphis* sp. listed by Lindroth from *Cakile,* and referred to by Hille Ris Lambers (1955), was *auctus.* The morphological characters given by Stroyan (1957) for separation of *shawi* from *silenicola* have been found to be unsatisfactory when the material from the 1958 collections is taken into account. The caudal shape, length of siphunculi and cuticular rugosity of adult apterae are all more variable than seemed to be the case when only the original heavily potashed material of *silenicola* and the Scottish aphids from *Cakile* and *Honkenya* were available for study. The synonymy of *shawi* with *auctus* was demonstrated by Heie (1958). Dr. Hille Ris Lambers has notified us in a letter of his agreement that *silenicola* is a further synonym. We are indebted to Dr. Heie for a loan of Danish material of *auctus.*

Known distribution outside Iceland: Great Britain, Denmark.

6. *Metopolophium festucae* (Theob.).

Hille Ris Lambers, 1955, p. 7.

Additional locality records: Ólafsvík (3), 29. vii. 58, on *Poa* sp.; near Borgarnes, from ditch side, 26. vii. 58; Staðastaður (6), 28. vii. 58; near Garður (6), 28. vii.

58, on *Festuca* sp.; near Reynivellir, Hvalfjörður (1), 25. vii. 58; near Stykkishólmur (7), 30. vii. 58; near Reykjavík (3), 6. viii. 58; Akranes (3), 25. vii. 58, on *Elymus arenarius*; Great Geysir (8), 4. viii. 58; near Skeið, east of Selfoss (7), 5. viii. 58. Hosts unidentified grasses, except where indicated. Reykjavík (6), 24. vii. 58, on grass among Carex near the University.

Next to *Myzus polaris* H. R. L., *M. festucae* was recorded more frequently, and from a wider range of habitats, than any other species of aphid. It occurred in almost all localities where aphids could be collected on grasses. Unfortunately most of the grass hosts were not identified; but *Elymus arenarius* appears to be a new host record for *festucae*.

7. *Metopolophium dirhodum* (Walker).

Walker, 1849a, p. 43; Hille Ris Lambers, 1947, p. 277, 281.

Occurrence in Iceland: Alftártunga (4), 27. vii. 58, thrashed from mixed herbage including grasses and *Calluna* among rocks. 1 apt. and 4 larvae.

From the morphology and chaetotaxy of the adult aptera we can only place this sample in *M. dirhodum*, to which it comes down in the key of Hille Ris Lambers (1947). The pigmentation character of the antennal joint apices is somewhat obscured by a general slight darkening, as is rather typical of aphids developing in low temperatures, but the dusky apices are still just visible, particularly with a hand lens. The antennae, and especially the processus terminalis, are rather long, an unusual feature in Icelandic representatives of species whose main distribution lies further south; but apart from this there seems no reason to doubt the identity. This is a new species record for the Icelandic fauna. Whether or not *M. dirhodum* can complete a migratory (heteroecious) cycle in Iceland is not clear from the record, but there are indigenous *Rosa* species in Iceland which might serve as primary hosts.

8. *Nasonovia compositellae* (Theob.).

Stroyan, 1953, pp. 109—118; Hille Ris Lambers, 1955, p. 8.

Additional locality records: Haukadalur (7), 31. vii. 58; Laxá Waterfall (2), 1. viii. 58; both records on *Hieracium* spp.

The material collected included many apterae and some sexual morphs. A further study of *compositellae* from many localities in Britain and in Norway, and of material of *N. nigra* (H. R. L.) from Britain and from the Alps and Pyrenees, makes it appear that the Icelandic population falls clearly into *compositellae,* and is not intermediate between *compositellae* and *nigra* as Stroyan suggested to Dr. Hille Ris Lambers after seeing the original Icelandic specimens. The total variability of the species is considerable, as might be expected from its type of distribution in small isolated colonies persisting from year to year on small localised populations of *Hieracium* apomicts. Discrimination of viviparae from those of *nigra* is not always a simple matter, and the relationship of the two forms to one another cannot be regarded as solved. However, such evidence as has accrued in Britain from the study of insectary populations points to a biological discontinuity as well as a morphological one; since it appears that populations attributable to *nigra* on morphological characters also overwinter by means of viviparae on the basal rosettes of *Hieracium,* while *compositellae,* in five populations so far kept in culture from England, Scotland and Wales, overwinters only as eggs. Hopes of obtaining cross-pairings between *nigra* and *compositellae* were entirely frustrated by this characteristic of southern English *nigra* populations, which produced no sexual morphs at all when reared in the same cold greenhouse as the colonies of *compositellae.* Field collections of viviparae made in December and January confirmed viviparous overwintering as occurring also in the wild state. On the other hand sexuales of *nigra* oc-

cur in the Alps, and it is possible that they may be found to occur in more northerly latitudes as further collecting and rearing is done.

It appears that the differences in rhinarial distribution and antennal joint proportions recorded between *nigra* and *compositellae* (Stroyan, 1953), which were perhaps originally climatically induced (Hille Ris Lambers, 1955), are now genetically fixed. The various colonies reared together in the experiments mentioned above, and belonging to both species, have over more than a year shown no significant changes which could be interpreted as a damping down of the morphological differences between the two species, although they have been kept in the same environment, and could have been expected to show such a damping down had the differences between them been purely phenotypic.

As sexual morphs of *compositellae* have not yet been described, some morphological notes from Icelandic and British material are given below.

Apterous ♂. Slender in build, body from 1.27 to 2.13 mm. long in specimens measured, Icelandic males being on the average rather the larger (1.41—2.13 mm., against 1.27—1.75 mm. in British males). Morphologically similar to apterous female morphs, but with more elongate appendages; a marked tendency, particularly in small specimens, for the dorsal sclerotic "carapace" to become broken up or perforated by membranous fenestrae; and a shorter, more tapering cauda, the caudal hairs being concentrated towards the apex more than in the apterous females. Antennae rather uniformly dark, the flagellum subequal to or longer than the body; processus terminalis from just over 4 to $6^1/_2$ times basal part of joint VI ($4^3/_7$ to $5^1/_2$ times as long in Icelandic specimens); secondary rhinarial distribution as follows: joint III 10—27 (British), 23—30 (Icelandic); joint IV 4—10 (British), 6—10 (Icelandic), joint V 1—7 (British), 5—8 (Icelandic),

base of joint VI 0—1 (British and Icelandic). Legs with the basal two-thirds of femora and most of tibiae palish sclerotic, the tarsi and the apices of femora and tibiae darkened. The hind tibiae occasionally bear a few (up to 10) pseudosensoria of the type found normally in oviparae. Tarsal joint 1 of hind leg with typically 2 hairs, fore and mid tarsi with 3. The hind tibia in British material varies from 0.61 to 0.77 of the length of the body and from 1.68 to 1.90 times as long as the hind femur; the same figures for Icelandic males are 0.70 to 0.79 of the body length and 1.77 to 1.86 times the length of the hind femur (the latter measured from the trochantro-femoral suture to the apex).

For measurements of specimens see Table I.

Oviparous ♀. Very similar to the apterous vivipara. Small specimens may show a reduction of the dorsal sclerotic "carapace", as in small males and viviparae. The hind tibiae are somewhat incrassate over the proximal two-thirds to three-quarters, and bear a variable number of pseudosensoria. Icelandic specimens so far seen have a consistently much smaller number than British specimens: 40 being the maximum recorded, and the mean number being about 18, against 59 to 108, with a mean of about 84. The antennae and legs are pigmented as in the viviparae, and the former bear secondary rhinaria as follows: joint III 6—19 (British), 13—19 (Icelandic); joint IV 0—4 (British), 0—2 (Icelandic). First tarsal joint chaetotaxy typically 3, 3, 2.

For measurements of specimens see Table I.

It is possible that the small differences noted above between British and Icelandic sexuales of *compositellae* are indicative of an incipient local subtaxon in Iceland; but as the biology of the Icelandic population is apparently not in any way different from that of the British colonies studied, and the viviparae agree very closely in their morphology, we at present regard the Icelandic

Table I: Biometric data for sexuales of *Nasonovia compositellae* (Theob.)

Morph	Body length	Ant. flag.	Joint ratios (III—VI) of antennal flagellum	Siph.	Cauda	Cdl. hrs.	Ap. rost. segm.	2nd seg. hd. tars.	Secondary rhinarial no.				Hair length maxima		
									III	IV	V	VIb	III	3T	8T
Apt. ♂	1.64	1.86	124:68:72:28+124	0.30	0.14	6	0.139	0.116	28/28	9/6	6/6	1/0	28	40	40
„	1.64	1.65	108:60:64:24+114	0.27	0.13	5	0.136	0.112	30/30	9/7	8/7	0/0	26	40	60
„	1.50	1.69	108:60:62:24+124	0.27	0.13	5	0.138	0.117	25/23	7/8	6/5	0/0	32	40	52
„	1.57	1.62	108:60:58:23+114	0.26	0.12	5	0.136	0.110	23/23	8/7	7/7	1/0	22	38	40
„	1.75	1.79	116:72:60:26+126	0.29	0.16	7	0.142	0.110	25/23	7/10	6/6	1/1	28	40	56
„	1.36	1.46	100:56:48:24+98	0.23	0.12	6?	0.125	0.098	13/11	4/4	1/3	0/0	22	32	50
„	1.30	1.39	84:64:54:20+130	0.21	0.13	5	0.132	0.107	17/20	6/8	5/5	0/0	25	35	40?
Ovip. ♀	2.13	1.79	110:72:68:28+122	0.37	0.23	8	0.152	0.124	19/17	0/0	0/0	0/0	28	40	60
„	1.85	1.47	94:56:54:24+102	0.30	0.19	9	0.136	0.120	13/14	1/2	0/0	0/0	25	40	58
„	1.41	1.38	84:48:48:24+105	0.31	0.18	9	0.140	0.118	14/16	0/0	0/0	0/0	28	38	48
„	1.78	1.44	92:55:51:24+100	0.30	0.20	8	0.142	0.112	14/12	3/4	0/0	0/0	35	52	56
„	1.59	1.21	70:42:40:20+100	0.23	0.16	8	0:128	0.101	- / 6	- /0	- /0	- /0	20	35	60
„	1.87	1.48	95:56:48:22+110	0.32	0.20	7	0.138	0.108	15/14	0/0	0/0	0/0	37	40	60
„	2.02	1.66	106:64:61:24+116	0.39	0.21	8	0.157	0.115	16/15	1/2	0/0	0/0	32	36	53

No. 1—3, 8—10 from Laxá Waterfall, 1. viii. 58; No. 4 from Haukadalur, 31. vii. 58; Nos. 5, 11, from Armathwaite, Cumberland, England, Sept. 1957; No. 6 from Tobermory, Mull, Scotland, Sept. 1957; Nos. 7, 12, from Ambergate, Derbyshire, England, Oct. 1957; No. 13 from Pontrhydygroes, Cardigan, Wales, 3. x. 58; No. 14 from Pwll Peiran, Cardigan, Wales, 3. x. 58.

All length measurements in millimetres, except hair length maxima which are in microns.

III = Third antennal joint. 3T = Third abdominal tergite. 8T = Eighth abdominal tergite.

aphids as falling within the limits of *compositellae* s. str.

Known distribution outside Iceland: Great Britain, Norway.

9. *Nasonovia (Neokakimia) saxifragae* (Doncaster & Stroyan).

Doncaster & Stroyan, 1952.

Occurrence in Iceland: Laxá Waterfall (2), 1. viii. 58, on *Saxifraga ?caespitosa* (det. G. Gígja); 2 apt., 4 ♂♂, 6 ovip. ♀♀.

This species is hitherto only known from the type material, a single damaged aptera (perhaps a fundatrix?) and a few larvae from Jan Mayen Island. The following morphological details are given to supplement the original description.

Apterous viviparous ♀. The Icelandic specimens are smaller than the holotype. In both the body length is 1.71 mm. General facies as described for holotype. Antennal flagellum relatively rather longer, about $^{11}/_{17}$ of body length (little over half in holotype); joint proportions about as in holotype, processus terminalis a little shorter than joint III and from $2^{3}/_{4}$ to just over $3^{1}/_{4}$ times basal part of VI; joint III with 12—16 secondary rhinaria irregularly arranged along whole joint; IV and V without secondary rhinaria. Apical rostral segment as in holotype but a little shorter, 0.144—0.146 mm. long, or about $1^{4}/_{5} \times$ second joint of hind tarsus; with 14—16 secondary hairs besides the three subapical pairs. Antennal hairs as in holotype, on joint III maximally from $^{2}/_{3}$ to $^{3}/_{9}$ of the articular diameter of the joint in length. Mid-dorsal abdominal hairs (3rd tergite) maximally 24 μ to 28 μ long; those on 8th tergite 4 in number and maximally 40 μ long. Hairs of typical Nasonoviine spear shape apically (the original description by an unfortunate printer's error reads "pear-shaped" for the holotype). Siphunculi and cauda as in holotype. Distribution of dorsal pigmentation about as in holotype or a little less extensive (dorsal

carapace not fusing laterally with marginal sclerites in one specimen). Chaetotaxy of first tarsal joints 3, 3, 3.

Apterous ♂. Body length about 1.20 to 1.33 mm. Facies rather as in *N. compositellae* (Theob.) but not so slender, legs more uniformly pigmented (only apices of tibiae a little darker and bases of femora paler than the remainder) and antennae distinctly shorter (flagellum about $^5/_6$ of body length) and stouter. Joints III—V (but not base of VI) bearing secondary rhinaria, the numbers in the specimens available being: III 20—29, IV 7—13, V 5—8. Processus terminalis ± 3 times as long as basal part of VI. Rostrum with apical segment as in apterae, bearing 14—15 secondary hairs. Tarsi with second joints short, about $^6/_{11}$ to $^3/_5$ length of apical rostral segment; chaetotaxy of first tarsal joints 3, 3, 3. Hind tibiae and femora very similar in proportions to those of *N. compositellae*; the hind tibiae being from 0.62 to 0.70 of the body length, and 1.80 to 1.88 times as long as the hind femora.

Oviparous ♀. Generally similar to apt. viv. ♀, but rhinaria on antennal joint III fewer in number (3—10), and dorsal sclerotic pattern reduced. The individual spinal, pleural and marginal hairs stand on separate sclerites of varying size. Fusion between neighbouring sclerites on the same tergite may occur, but apparently not fusion across segmental boundaries. Antennae and legs rather uniformly darkish, the latter with the femoral bases somewhat paler. The somewhat swollen hind tibiae bear about 40—55 pseudosensoria in the six specimens available for study. Apical rostral segment with 14—15 secondary hairs. Chaetotaxy of first tarsal joints 3, 3, 3.

For measurements of all morphs see Table II.

10. *Hyperomyzus boerneri* Prevost, ssp. *thorsteinni* Stroyan.
Syn. *H. euphrasiae* (Wlk.) Börner, 1952, nec Walker, 1849.
Prevost, 1959; Stroyan, 1960, p. 250.

Occurrence in Iceland: near Reynivellir, Hval-

Table II: Biometric data for *Nasonovia (Neokakimia) saxifragae* (Donc. & Str.).

Morph	Body length	Ant. flag.	Joint ratios (III—VI) of antennal flagellum	Siph.	Cauda	Cdl. hrs.	Ap. rost. segm.		2nd seg. hd. tars.	Secondary rhinarial nos.			Hair length maxima		
							Length	Sec. hrs.		III	IV	V	III	3T	8T
Apt. v. ♀	1.71	1.12	72:43:46:24+66	0.24	0.18	5	0.144	16	0.080	12/13	0/0	0/0	21	24	40
„	1.71	1.14	80:42:40:22+72	0.27	0.18	5	0.146	14	0.084	16/16	0/0	0/0	24	28	40
Apt. ♂	1.33	1.17	80:48:46:22+66	0.21	0.12	5	0.125	14	0.076	26/23	13/9	7/8	20	25	33
„	1.20+	1.06	72:40:40:22+64	0.20	0.09	5	0.126	15	0.074	22/21	9/9	5/6	20	25	32
„	1.23	1.03	72:40:38:20+60	0.20	0.11	5	0.132	15	0.072	21/20	8/7	5/6	20	24	36
„	1.26	1.08	73:42:42:20+64	0.19	0.11	5	0.132	15	0.076	29/29	12/11	6/7	17	20	33
Ovip. ♀	1.60	1.02	64:38:38:22+66	0.25	0.17	5	0.140	15	0.079	9/10	0/0	0/0	22	25	38
„	1.55	0.97	63:35:40:20+60	0.23	0.18	5	0.134	14	0.078	6/9	0/0	0/0	17	28	44
„	1.47	0.95	58:33:37:21+63	0.23	0.16	6	0.129	14	0.074	8/8	0/0	0/0	20	26	36
„	1.37	0.82	48:28:32:19+56	0.20	0.14	5	0.124	15	0.072	3/3	0/0	0/0	15	24	44
„	1.39+	0.98	58:37:40:20+64	0.24	0.16	5	0.132	14	0.073	7/8	0/0	0/0	17	22	38

All specimens from Laxá Waterfall, 1. viii. 58.

Abbrevations and units of measurement as in Table I.

fjörður (1), 25. vii. 58, 1 apt. and larvae; Selfoss (7), 5. viii. 58, 8 apt., 5 ♂♂, 1 ovip. ♀; both collections from *Euphrasia frigida* (det. G. Gígja).

This species has recently been described by Prevost (1959) from Austrian and Swiss material. The name replaces Börner's misinterpretation of *Aphis euphrasiae* Wlk. (Börner, 1952). The Icelandic population appears to be at least subspecifically distinct, and has been described as ssp. *thorsteinni* Stroyan; the description is cited above. This is the first member of the subgenus *Hyperomyzus* Börner, s. str., to be recorded from Iceland.

Recorded distribution outside Iceland: Thuringia, France (Börner); Austria (Prevost); Switzerland (Hille Ris Lambers).

11. *Hyperomyzus (Hyperomyzella) rhinanthi* (Schout.).
Hille Ris Lambers, 1949, p. 298.

Occurrence in Iceland: Hafnarfjörður (7), 7—8. viii. 58, from calyces of *Alectorolophus minor;* Reykjavík (9), 8. viii. 58, from *Ribes rubrum.*

This is a new species for the Icelandic fauna. Hille Ris Lambers (1955, p. 23) mentioned only two Icelandic aphid species which can, at least in theory, complete a heteroecious cycle: *Cavariella archangelicae* (Scop.) and *C. aegopodii* (Scop.). The possibility has already been alluded to in the present paper that *Metopolophium dirhodum* (Wlk.) may have such a heteroecious cycle in Iceland. It now appears certain that *H. rhinanthi* is a further species which can also complete such a cycle, since material from both secondary and primary hosts was collected, that from *Alectorolophus* including nymphs with wing pads, from which alate males and gynoparae could be reared, while the aphids from red currant included alate gynoparae and some adult oviparae. Icelandic specimens are quite typical morphologically.

12. *Brachycaudus helichrysi* (Kaltenbach).

Occurrence in Iceland: near Reykjavík (3), 6. viii. 58, from *Matricaria ambigua* growing among stones; 3 immature apt.

This is a new species record for Iceland. *B. helichrysi* is a very abundant and widely distributed species in Europe, with a typical heteroecy between *Prunus* species and many species of Compositae, Scrophulariaceae etc. The present find may represent a small colony founded by a wind-blown migrant; in the absence of the primary hosts it is unlikely that *B. helichrysi* can establish itself permanently in Iceland (cf. Hille Ris Lambers, 1955, p. 24, on *Rhopalosiphum padi* (L.) and *Myzus (Nectarosiphon) persicae* (Sulz.)).

13. *Thuleaphis ?acaudata* Hille Ris Lambers.
Hille Ris Lambers, 1960, p. ?.

Occurrence in Iceland: Grímsnes, near outfall of Þingvallavatn (2), 3. viii. 58, from *Rhodiola rosea*; 1 al. and sexuales.

This is a new species record for Iceland. The generic identity for the Icelandic specimens has kindly been checked by Dr. Hille Ris Lambers. We are not sure that the Icelandic material from *Rhodiola rosea* is conspecific with *T. acaudata* H. R. L. Aphids from *Rhodiola* found in Wales by Mr. F. H. Jacob agree with our specimens in having longer tarsi and a longer apical rostral segment than cotypes of *T. acaudata* kindly lent by Dr. Hille Ris Lambers. If the *Rhodiola* aphids should prove to be distinct, the right of description will belong to Mr. Jacob, who took his material in Wales in 1953. At present, in view of the paucity of available specimens and absence of biological data, judgment on the question must be suspended, and we record the species, with reservations, under *T. acaudata*.

14. *Cryptomyzus galeopsidis* (Kaltenbach), s. lat.
Hille Ris Lambers, 1955, p. 9.

Additional locality record: Reykjavík (9), 8. viii. 58, from *Ribes rubrum*; 6 apt., 1 al., 1 ovip. ♀, 1 larva.

Hille Ris Lambers (1955) discussed the taxonomic status of Icelandic *galeopsidis*, but as he could only examine an ovipara, an alate and a few larvae he was only able provisionally to refer the material to ssp. *citrinus* H. R. L. The present collection contains six apterae in addition to an alate and an ovipara, and some colour notes are available. These notes are inconclusive, the apterae collected being either 'yellowish with green markings' or 'whitish'. It is possible that the biology of *galeopsidis*, s. lat. in Iceland may be different from the biology in Europe, at least so far as the division into subtaxa with differing cycles is concerned; but the available sample offers no basis for an opinion on this point. Since *Galeopsis* is found in Iceland there would seem to be a reasonable probability that a heteroecious cycle from *Ribes* to *Galeopsis* could take place, and this probability is rendered more credible by the increasing evidence of successful heteroecy in other Icelandic aphids.

15. *Ericaphis latifrons* (Börner).
Syn. *E. empetri* Ossiannilsson
Myzodium lagarriguei Remaudière.

Börner, 1942, p. 262; Remaudière, 1952, p. 242; Ossiannilsson, 1954, p. 18; Hille Ris Lambers, 1955, p. 9.

Additional locality records: Snæfellsjökull (5), 29. vii. 58, from unidentified host (see also *Acyrthosiphon brachysiphon* H. R. L.); Þyrill, Hvalfjörður (1), 1. viii. 58, from *Calluna vulgaris*.

This species has not previously been recorded from *Calluna vulgaris*, the known hosts being *Vaccinium uliginosum* and *Empetrum nigrum*. Icelandic material seen by us differs slightly from British *Empetrum* samples in its smaller size, shorter antennae and shorter, stouter siph-

unculi. Slight differences observable in the original descriptions of *empetri* Oss. and *lagarriguei* Rem. suggest a tendency for the species to form morphologically distinguishable races in different parts of its markedly discontinuous range (Alps, Pyrenees, Sweden, North Wales, Scottish Highlands and Iceland). But as variation in the direction of shorter appendages may occur in a number of other species living in arctic regions (see Hille Ris Lambers, 1955, p. 8), no reliable taxonomic conclusions can be drawn from these slight characters without more adequate material and some biological investigation.

16. *Myzus (Nectarosiphon) polaris* Hille Ris Lambers.
Hille Ris Lambers, 1952, p. 11, pl. III; 1955, p. 10.

Additional locality records: Laxá Waterfall (2), 1. viii. 58, from *Silene maritima* and *?Draba* sp.; Þingvellir (4), 2. viii. 58, on *Silene maritima*; near Borgarnes, in quarry, 26. vii. 58, on *Silene maritima* and *S. acaulis*; near Garður (6), 28. vii. 58, from *Capsella bursa-pastoris, Silene maritima, Stellaria media, Cerastium caespitosum* and *Gentiana aurea*; Melarsveit, near Borgarnes, from *Silene maritima* growing in sand and gravel desert, 26. vii. 58; road between Vegamót and Stykkishólmur (2), 30. vii. 58, from *Sedum villosum* and *Cerastium alpinum*; near Selfoss (7), 5. viii. 58, from *Stellaria media* and an unidentified host, believed to be *Polygonum aviculare* s. lat. from fragments present in the sample tube.

M. polaris heads the list of species collected in 1958 in terms of general abundance. The principal hosts appeared to be *Silene maritima* and *Stellaria media*, but the type host, *Cerastium alpinum*, was infested in one locality, and various other Caryophyllaceae, Cruciferae, Crassulaceae, Polygonaceae and Gentianaceae can also serve as hosts. Sexuales were found on *Sedum villosum*.

After examining representative samples of our material, Dr. Hille Ris Lambers has kindly supplied the fol-

lowing comments: "(The) type material is by its thick siphunculi and their shortness greatly different from *M. certus*. However, later samples from Greenland and certainly the material from Iceland has slightly longer siphunculi than the type material and one might wonder whether there is a reason to separate *polaris*, and whether *polaris* is a good species at all. Now the Iceland specimens have a shorter processus terminalis than West European material and they are rather between the types of *polaris* and European *certus* morphologically. I saw in Washington D. C. typical *polaris*, intercepted from Denmark, animals about the identification of which I have no doubt. Therefore I believe that there is a *polaris* and I am inclined to consider all the *Myzus* material that you submitted to be *polaris*."

It is interesting to note that in Iceland, where the very polyphagous *M. (N.) persicae* (Sulz.) has not been recorded, *M. polaris* exhibits a wider degree of polyphagy than does its very close relative *M. (N.) certus* (Wlk.) in continental Europe or in Britain, and that some of its hosts (e. g. *Capsella, Sedum, Polygonum(?)*) are recorded as hosts of *persicae* in areas where that species is the dominant *Nectarosiphon*.

17. *Jacksonia papillata* Theobald.

Hille Ris Lambers, 1955, p. 11.

Additional locality record: Ólafsvík (3), 29. vii. 58, on etiolated grass under stone and wooden plank; two samples, apt. only.

18. *Cavariella aegopodii* (Scop.).

Hille Ris Lambers, 1955, p. 11.

Additional locality records: Vegamót (2), 27. vii. 58, from *Salix lanata*: Álftártunga (4), 27. vii. 58, from *Salix phylicifolia*. Both collections consisted only of apterae.

19. *Cavariella archangelicae* (Scop.).

Hille Ris Lambers, 1947a, p. 310; 1955, p. 12.

Additional locality record: Reykjavík (9), 8. viii. 58, on *Salix* sp. (?hybrid) planted in park; 1 al. gynopara and apterae.

The single alate vivipara collected proved from a rhinarial count to be a gynopara of the type produced normally on *Angelica* (but perhaps also on *Salix*?), these having a smaller number of secondary rhinaria than the spring migrants, almost without overlap. A single plant of a large white-flowered Umbellifer, almost certainly *Angelica* or *Archangelica,* was seen heavily infested with green aphids in the umbels on a plot of waste land in Reykjavík, but could not be reached to collect the aphids, which were believed to be *Cavariella,* probably belonging either to this species or the following one.

The name *archangelicae* is here interpreted in a sense derivable from the key of Hille Ris Lambers (1947a). This ascribes to the alatae "numerous rhinaria, 8—16 in number" on ant. IV, a character that eliminates nearly all alatae of the following species, *C. konoi* Takah., in which the rhinarial number on IV does not exceed 8 in any specimen seen by us. On this interpretation of *archangelicae,* the records from Aðalból and Laugarvatn (Hille Ris Lambers, 1955) are referable to *konoi,* according to slides kindly lent by Dr. Hille Ris Lambers. Further evidence, e. g. from topotypical (Carniolan) material, is desirable to establish with greater certainty the true identity of Scopoli's *archangelicae,* and our usage here is therefore to be regarded as a tentative one.

20. *Cavariella konoi* Takahashi.

Takahashi, 1939, p. 117.

Occurrence in Iceland: Reykjavík (9), 8. viii. 58, on *Salix* sp. (?hybrid) planted in park; many alate and apterous viviparae and immature forms. Also (see above)

records from Aðalból and Laugarvatn (Hille Ris Lambers, 1955).

The existence in Iceland of a third species of *Cavariella* became apparent when the Reykjavík collection was examined. Subsequently material of the same species was found, identified as *C. archangelicae,* in collections from Britain, Norway, Austria and North America. Hosts included various *Salix* species, *Angelica* and celery. *C. konoi* Takahashi was described from Japan, and the description, referring to the presence of two small dark spots on the mid-dorsum of abd. 6 (where *C. archangelicae* has a transverse bar) fits the present species very well. The type material of *konoi* was kindly lent for study by Dr. Chia-chu Tao of Taiwan, following information of its whereabouts from Dr. Takahashi. Apart from a slightly longer processus terminalis (up to $2\frac{1}{2}$ times base of VI, against up to twice base of VI in European material) no important differences could be found between European and Japanese specimens, and we accordingly use the name *konoi* for the Icelandic aphids at the present time. It appears not improbable that *Rhopalosiphum salicis* Monell, 1879, from the United States, is an earlier name for the species, but a slide labelled "9845, *Siphocoryne salicis* (Monell) Oestl., on *Salix lucida* (Cotypes), Minneapolis, Minn., June 26", kindly lent by Dr. L. M. Russell, Washington, is not in a condition permitting certainty on this synonymy; and is in any case a subsequent designation, the original material having been from St. Louis, Mo. The description of *Cavariella gigliolii* Del Guercio, 1911, does not permit a firm decision as to which of the two *Cavariella* species from *Angelica* Del Guercio had before him, since both species may have five-jointed antennae on *Angelica*; but the character is rather commoner in *archangelicae* than in *konoi,* and the ratio of 4 : 1 for siphuncular to caudal length lies somewhat nearer to *archangelicae* than to material of *konoi* seen by us. There-

fore in the absence of type material we do not wish to use *gigliolii* to replace *konoi* without further evidence. It is hoped to prepare a further account of the matter for publication at a later date.

21. *Schizaphis geijskesi* H. R. L., ssp. *priori* Stroyan.
Stroyan, 1960, p. 253.

Occurrence in Iceland: Akranes (3), 25. vii. 58, from *Elymus arenarius*; apt. viviparae and ♂♂.

This subspecies, which lies close to *S. geijskesi* s. str. and is known at present only from Iceland, has been described as indicated above.

22. *Schizaphis graminum* (Rondani), ssp. *gigjai* Stroyan.
Stroyan, 1960, p. 259.

Occurrence in Iceland: Great Geysir (8), 4. viii. 58, from unidentified grass; apt. and al. viviparae only.

This small *Schizaphis* is also new to the fauna of Iceland, and the single collection appears to represent an endemic subspecies of the very widely distributed *S. graminum* (Rond.), sensu Passerini, ?nec Mordvilko. For the original description and taxonomic discussion see the citation above.

23. *Thripsaphis (Trichocallis) cyperi* (Wlk.),
ssp. *arctica* Hille Ris Lambers.
Hille Ris Lambers, 1955, p. 19; 1960, p. ?.

Since Hille Ris Lambers gives the distribution of this species in Iceland as universal, it is unnecessary to detail our records, the identities of which have been checked by Dr. Hille Ris Lambers. In his letter he adds: "It is a question of taste whether one wants to consider the subspecies of *vibei* [Hille Ris Lambers, 1952, p. 25] or of *cyperi*." Since the name *cyperi* is used in his paper on Iceland aphids we retain it here. The literature citation in "Zoology of Iceland" is incorrect, in as much as the publication of "Additions to the Aphid Fauna of Greenland" did not take place in 1955, but is due in 1960.

24. *Thripsaphis (Trichocallis) thripsoides* H. R. L.
Hille Ris Lambers, 1955, p. 19.

Additional locality records: near Borgarnes, 26. vii. 58, from grass by roadside ditch; near Stykkishólmur (7), 30. vii. 58, from *Carex* sp.; Reykjavík (6), 24. vii. 58, from *Carex* sp. in damp meadow.

The record of *T. thripsoides* from grass, while unexpected, is confirmed to some extent by the presence in the sample of an aptera of *Metopolophlum festucae* (Theob.). But as the sample was thrashed, and the aphids were not seen sitting on the blades of the host, the possibility of an admixture of *Carax* with the grass in the ditch is not excluded.

3. General Discussion.

A. Biology.

Perhaps the most important addition to our knowledge of the biology of Icelandic aphids arising from the 1958 collection is the strong circumstantial evidence that *Hyperomyzella rhinanthi* completes a migration to and from a secondary host during the Icelandic summer. Hille Ris Lambers (1955) recorded this possibility for *C. archangelicae* and *C. aegopodii,* but was not able to state with certainty if the heteroecy played an important role for the survival of the species in Iceland. The finding of return migrants of *H. rhinanthi* makes it clear that heteroecy is by no means a mere relic of the condition prevailing in regions with a longer summer. The single record of *Metopolophium dirhodum* from grass is also of considerable interest, since this species is typically heteroecious from *Rosa* to Gramineae, and there is a possibility of its completing its cycle in Iceland. *Cryptomyzus galeopsidis* raises the number of potentially host-alternating species to six, one sixth of the present recorded total of 36 Icelandic aphid species.

Another interesting feature of the present collection

is the light shed on the biology of *Myzus polaris,* which emerges as the most abundant Icelandic aphid in 1958 in those localities and habitats where collecting was done. *M. polaris* is evidently capable of a wide-ranging polophagy, as sixteen samples from hosts belonging to five different plant families testify. Whether a complete cycle can be passed on all the hosts utilised during the summer, it not known, but it seems likely that Caryophyllaceae are the typical hosts, as they are for the closely related *M. certus.*

The finding of further samples of *Acyrthosiphon auctus* (Wlk.) on a number of different hosts has provided biological links between *auctus* and *silenicola* H. R. L., confirming earlier suspicious based on the morphological similarities between the two, that only one species was involved (Hille Ris Lambers, 1959). The species is apparently rather polyphagous, with a somewhat similar host range to that of *Myzus polaris:* the families Caryophyllaceae, Cruciferae and Gentianaceae are common to both, and mixed colonies of the two have occurred in three instances.

Other host records of importance are that of *Acyrthosiphon boreale* on *Potentilla,* linking the species biologically as well as morphologically with the Rosaceae-inhabiting members of the *A. malvae* group, and the occurrence of *Acyrthosiphon pisum* on *Vicia cracca* and *Capsella bursa-pastoris,* confirming the prediction of Hille Ris Lambers (1955). Also of interest are the records of *Ericaphis latifrons* on *Calluna* and *Metopolophium festucae* on *Elymus.*

B. Endemism.

Hille Ris Lambers (1955) discribed two new species from Iceland: *Acyrthosiphon silenicola* and *Aphis atuberculata.* Of these the first is now known to occur also in Britain and Denmark as *A. auctus.* The present collec-

tion suggests that endemism in the Icelandic aphid fauna is somewhat more frequent than the material available for the earlier account revealed. Three of the species collected in 1958 differed sufficiently from their counterparts in the rest of Europe to justify description as new subspecies. Apart from these, two other species, *Ericaphis latifrons* and *Nasonovia compositellae,* differ slightly from British and continental material, although not sufficiently to warrant treatment as distinct subtaxa without further evidence.

C. Zoogeography.

The additions to the Icelandic fauna recorded in 1958 may be assigned to the categories used by Hille Ris Lambers (1955, pp. 25—26) in the following way:

a. Endemic subspecies.
Hyperomyzus boerneri Prev., ssp. *thorsteinni* Stroyan.
Schizaphis geijskesi H. R. L., ssp. *priori* Stroyan.
S. graminum (Rondani), ssp. *gigjai* Stroyan.

b. Cosmopolitan species.
Brachycaudus helichrysi (Kltb.).

c. Holarctic species.
Cavariella konoi Takah.
Metopolophium dirhodum (Wlk.).

d. Boreal species.
Hyperomyzus (Hyperomyzella) rhinanthi (Schout.).

e. Atlantic species.
Thuleaphis ? acaudata H. R. L.

This might be considered an arctic species, had it not occurred in North Wales as well as Greenland and Iceland, on which account it is placed here.

f. Arctic species.
Nasonovia (Neokakimia) saxifragae (Donc. & Stroy.).

This species is known only from Iceland and Jan Mayen. The distribution of the subgenus is boreal, and related species are known from the Alps and from Britain.

References.

Börner, C., 1942: Weitere neue europäische Blattlausarten. Veröff. Dtsch. Kol.- u. Übersee-Mus. Bremen, **3**: 259—66.

—, 1952: Europae centralis Aphides. Mltt. thüring. bot. Ges., Beiheft 3, 488 pp.

Del Guercio, G., 1911: Intorno ad alcuni Afidi della Penisola Iberica e di altre localitá, raccolti dal Prof. J. S. Tavares. Redia, **7**: 296—333.

Doncaster, J. P., & Stroyan, H. L. G., 1952: A New Subgenus and New Species of Aphid from Jan Mayen Island. Ann. Mag. nat. Hist., (12) **5**: 984—7, 2 figs., 1 pl.

Heie, O., 1958: About the Identity of *Aphis aucta* Walker. Ent. Medd., **28**: 214—8.

Hille Ris Lambers, D., 1947, 1949: Contributions to a Monograph of the Aphididae of Europe, III and IV. Temminckia, **7**: 179—320, 2 figs., 7 pl.; ibid. **8**: 182—323, 3 figs., 6 pl.

—, 1947a: On Some Mainly Western European Aphids. Zool. Meded., **28**: 291—333, 14 figs.

—, 1952: The Aphid Fauna of Greenland. Medd. Grønland, **136**: 1—33, 5 pl.

—, 1955: Hemiptera 2. Aphididae. Zoology of Iceland, **3**, Part 52a: 29 pp., 3 figs.

—, 1959: Notes on European Aphids with Descriptions of New Genera and Species (Homoptera, Aphididae). Mitt. Schw. ent. Ges., **32**: 271—86.

—, 1960: Additions to the Aphid Fauna of Greenland. Medd. Grønland, **159**, No. 5 (in press).

Monell, J., 1879: Notes on Aphidinae, with Descriptions of New Species. Bull. U.S. Geol. Survey, **5**: 18—32.

Ossiannilsson, F., 1954: *Ericaphis empetri,* n. sp., a New Swedish Aphid. Opusc. ent., **19**: 18—20, 1 fig.

Prevost, C. A., 1959: *Hyperomyzus boerneri* sp. n. Entom., **92**: 137—43, figs. A—G.

Remaudière, G., 1952: Contribution à l'étude des *Aphidoidea* de la faune française. Description de quelques *Aphididae* nouveaux, et addition à la liste des *Myzinae* et *Dactynotinae.* Rev. Path. vég., **31**: 231—63, 5 pl.

Stroyan, H. L. G., 1953: A New Account of *Aphis compositellae* Theob. Proc. R. ent. Soc. Lond. (B), **22**: 109—18, 1 pl.

—, 1957: Further Additions to the British Aphid Fauna. Trans. R. ent. Soc. Lond. **109**: 311—60, 6 figs., 3 pl.

—, 1960: Three New Subspecies of Aphids from Iceland. Ent. Medd., **29**: 250—65, 3 figs.

Takahashi, R., 1939: Some Aphididae from Hokkaido. Ins. Mats., **13**: 114—28.

Walker, F., 1849: Descriptions of Aphides. Zoologist, **7**: xxxiii (*Aphis aucta*).

—, 1849a: Descriptions of Aphides. Ann. Mag. nat. Hist., (2) **8**: 43 (*Aphis dirhoda*).

Anmeldelse.

T. E. Hughes: **Mites, or the Acari.** London (Athlone Press) 1959, 225 pp., 53 plates. 42 shill.

Denne Bog er nærmest at opfatte som en "Imms" over Mider og er et fortræffeligt, helstøbt og afrundet Værk. Dets Opdeling er lidt usædvanlig, begyndende med Biologi og endende med Morfologi og Anatomi; den omvendte Rækkefølge synes mig at give bedst Mulighed for Forstaaelsen af Biologien. De biologiske Afsnit — fritlevende Mider, Miders Forbindelse med andre Dyr, Ecto- og Entoparasitisme, Sygdomsoverførere — giver et Væld af Oplysninger, vel ordnede, et godt Grundlag for yderligere Studier. Det undrer dog, at Trombicula-Larven betragtes som ren Pattedyr-Parasit, medens den jo herhjemme saa overvejende plager Fugle (foruden Mennesker!).

Morfologien optager 114 af Siderne og er meget omhyggeligt fremstillet, ikke mindst i Forbindelse med Systematik og Fylogeni (f. Ex. Mesostigmat-Fylogeni p. 101); (at Pedipalpen betegnes som to-grenet med en "exite, being the palp, [and] the endite or inner ramus" (p. 135) er dog en lidt ulykkelig Distraktionsfejl). En saa klar og velskreven Oversigt har jeg ikke tidligere læst, og dertil kommer det meget fine Illustrationsmateriale; alle 53 Tavler bringer Originaltegninger af Forf. og hans Hustru, der begge er højt anskrevne Acarologer og aabenbart ogsaa meget fine Tegnere af baade rene Habitusbilleder og Detail-Tegninger.

Der er med denne Bog givet et førsteklasses Grundlag for et Studium af Miderne; i Betragtning af deres store Artsrigdom ogsaa herhjemme, deres Forekomst overalt og deres økologiske Betydning, maa man haabe at denne Bog ogsaa her i Landet maa virke inciterende.

S. L. Tuxen