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Bryophytes Collected in Arctic Tundra of the Chamberlin Region (Western Spitsbergen) in 1987 and 1988

Mszaki zebrane na tundrze arktycznej w rejonie Chamberlin (Zachodni Spitsbergen) w r. 1987 i r. 1988

INTRODUCTION

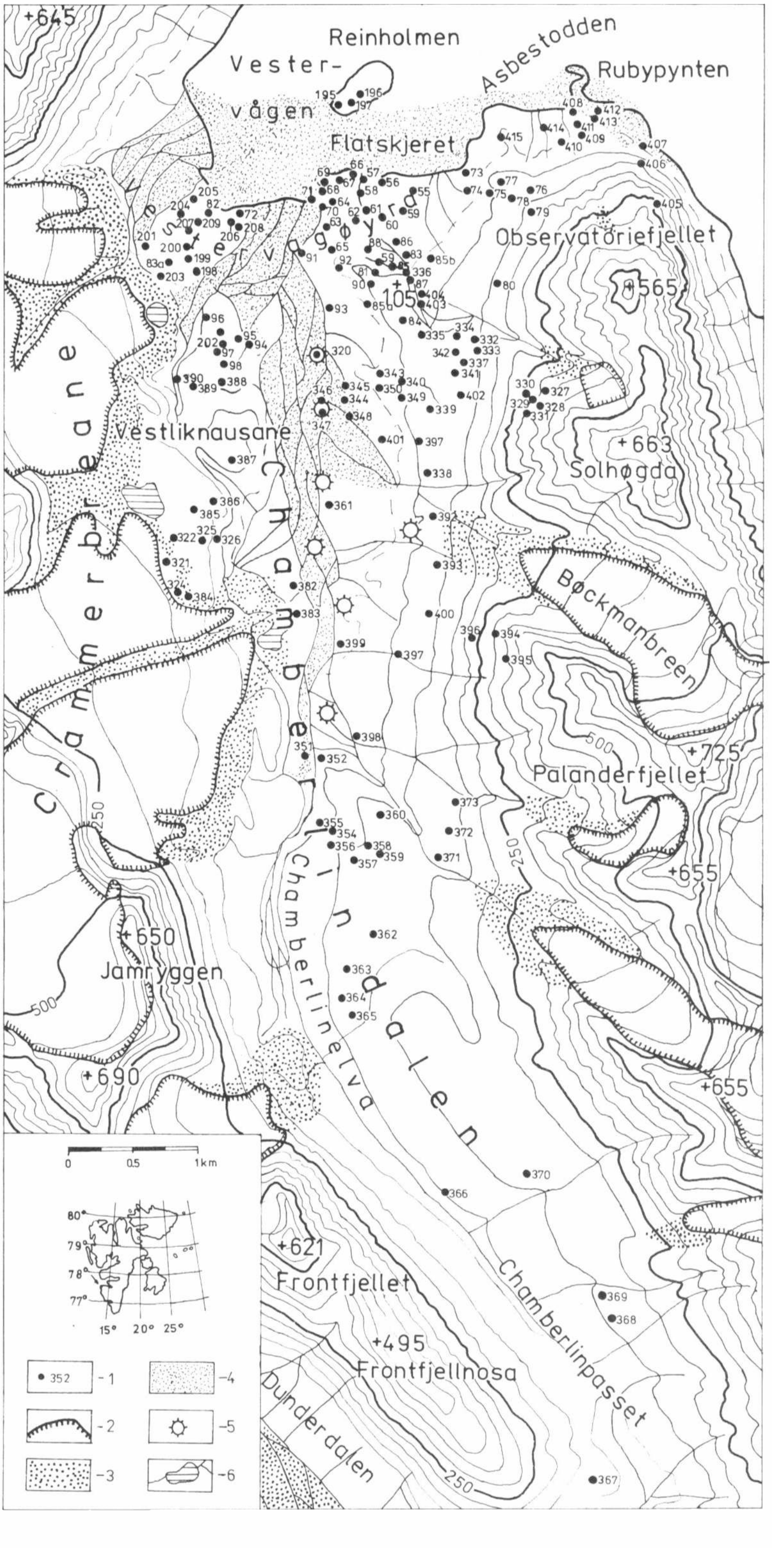
The vast area of Chamberlin (Fig. 1) is greatly differentiated with respect to geomorphology, various types of arctic tundra and rich flora of the bryophytes. The field botanical studies were carried out in the summer during the Geographical Expeditions II (1987) and III (1988) organized by Maria Curie-Skłodowska University on NE coast of Bellsund (12).

The collected material covers over 5,000 specimens among which there were discovered new as well as rare species of bryophytes on Spitsbergen (1, 5–10, 15, 17). Table 1 includes 135 species of mosses and 16 of liverworts in 7 main types of tundra and 16 lower taxa.

METHODS AND RANGE OF INVESTIGATIONS

Studies of the bryophyte flora were carried out in 146 numbered stations covering 100 m² which were situated in the accessible places. They represent locally the best developed tundra patches which were temporarily classified into 23 ecological-floristic groups of Spitsbergen tundra characterized earlier (16) and in a separate chapter of the paper. Table 1 presents briological relations in the Chamberlin region. In description of flora there were considered ecological-floristic groups of tundra, their typical composition and percentage of species in the patches. A list of localities of the studied bryophytes (Fig. 1) was given numerically according to their arrangement in Table 1. The ecological-floristic tundra group, topographic location and general settlement properties of the studied patch background were given. Besides, Table 1 includes the data about exposition, slope inclination, absolute heights and dates of investigations. All bryophyte localities given in the paper were collected by F. Święs.

The abbreviations used at the beginning of bryophyta localities descriptions point to smaller geomorphological units: Chn — Chamberlindalen, Cht — Chamberlinpasset, Rn — Reinholmen, Va — Vestervagoyra, Ve — Vestliknansane.


+645
Reinholmen
Vester-
vågen
Asbestodden
Rubypynten
Flatskjeret
Vestervågøyra
Observatoriefjellet
+565
+105
+663
Solhøgda
Vestliknausane
Chamberbreane
Chamberlindalen
Chamberlinelva
Bøckmanbreen
+725
Palanderfjellet
+655
+655
500
250
250
500
+650
Jamryggen
+690
+621
Frontfjellet
+495
Frontfjellnosa
Dunderdalen
Chamberlinpasset
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80°
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78°
77°
15°
20°
25°
352 - 1
- 2
- 3
- 4
- 5
- 6

THE AREA OF STUDIES

The Chamberlin region is situated on Western Spitsbergen in the north-west part of Jarlsberg Wedel Land at Recherche Bay belonging to the main fiord of Bellsund (Fig. 1). It forms a vast and partly glaciated mountainous valley of a prolonged triangle shape with the main axis from SE to NW (12). On SE it borders with the Dunder region sharing a pass and on the north it is closed by the coasts and arms of the Bellsund fiord. The maximum heights of the range peaks found both on the western and eastern parts of Chamberlin valley are 690–725 m a.s.l. (Figs. 2–7). The studied region consists of three landscape forms: lower, delta type (Vestervagoyra), middle ravined and upper of pass type (Chamberlinpasset). In the northern part in the Vesterwågen Bay, a relatively large hummocky island Reinholmen of maximum ridge height 36 m a.s.l. attracts the attention.

Chamberlindelva is a main basin. From the middle part to its estuary into Vestervågen, the river is of thawing character of the overflow-arm maximum width up to 1 km (Figs. 2 and 3). Its bed in the whole middle and lower parts is flooded with sea water during the day and night incoming tides (Figs. 1 and 2). The whole southern part of the Vestervågen bay and lower part of Chamberlindelva overflow-arms constitute a characteristic incoming tide plain. It is composed of muddy, sandy and gravelly river and sea drifts disclosing itself during the sea outcoming tide. In the lower part of Chamberlindelva basin there are found hummocks (13) of pingo type (Fig. 3). The system of isostatically raised marine terraces is very complicated (12). Generally a few step terraces of 2–5 to 50–60 m a.s.l. are found on the edge of Chamberlin lower part in the form of partially plunging narrow ledges, belts and lens. The oldest rocky background is formed by Hecla Hoek formation consisting of green slates, dark grey tyllites, grey quartzites, limestones, dolomites and other rocks (2, 4). However, small elevations are mainly built of gabbro type rocks.

In the forefield of glaciers on elevation slopes various kinds of moraines are found. At the bottom of steepy elevations talus fans and stone dumps can be often observed. Old and contemporary stony-gravelly outwashes are found in many places on the main river and at the mouth of glacial streams. They are sometimes covered with muddy or loamy silts.

Some soil types were temporarily characterized in the Chamberlin regions (11). Shallow initial or brown soils are found on the dry loamy-slate or clayey-stony background. They are most frequently observed on flat ridges and slopes of marine terraces, pingo hummocks and higher or lower elevations. Clay

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← Fig. 1. The area of studies in the Chamberlin region: 1 — studied localities of the bryophytes, 2 — glaciers, 3 — glacial moraines, 4 — river and river-marine drifts in the tidal zone, 5 — pingo hummocks, 6 — rivers and lakes soils boggy or peaty types are found constantly on wet loamy and loamy-slate settlements. On constantly wet solifluction, loamy-slate or clayey stony grounds there is a mosaic of shallow or deep glen or brown soils spread in the area. Alluvial soils made of various gravelly, stony, sandy and loamy silts can be observed in the valley of river overflow-arms. On glacial eroded moraines there is a level of fossil soil with plant remains occurring not deeply. However, soils of lythosol and rigosol (11) occur on rocky weakly weathered background. Dry and stony-loamy settlements are rich in soils containing $CaCO_3$ of neutral or basic reaction. However, muddy, loamy, gley and peaty soils are $CaCO_3$ free and acidified (11).

The Chamberlin region is probably cooler and wetter as compared with the neighbouring areas on Bellsund edge from Calypsostranda to longe (3, 14). The spatial domination of constantly wet ground is noticeable. On the other hand there are no high peat-bogs typically shaped and few lakes as well as no outlet flood waters are found.

PLANT COMMUNITIES OF ARCTIC TUNDRA

A number of the bryophytes in Chamberlin valley was studied in 23 ecological-floristic groups of compact tundra classified into 7 types, 9 subtypes and 7 forms (Table 1). A simplified structure of loose patches of plant community of initial tundra type (No. 1) is found on the loamy-stony moraines of Cramer glacier (Fig. 5) in places with not deeply situated fossil soil with subfossil vegetation.

Another type of tundra, dry lichen and moss tundra (No. 2) is found quite frequently but mostly on small and scattered patches. At present 4 subtypes of tundra are distinguished. Among them the first subtype of grey lichen tundra with *Cetraria delisei* is very rare (2.1). It is developed on flat edges of marine terrace ridges and small heights on dry, loamy-stony or loamy-slate ground. Another type of dry tundra with *Dryas octopetala* (2.2) occurs on flat edges of small heights and top planation on loamy-slate ground of rugged surface often with small terraces and slits resulting from frost cracks. The third subtype of dry tundra with the predominant species of *Luzula* type (2.3) is most frequently formed on the flattened hummock-inselberg ridges, rarely on sloping or slightly convex ridges and slopes of greater heights (Fig. 4). In the third subtype of dry tundra with *Luzula* sp. (2.3) there are distinguished 3 forms of plant communities: with *Cetraria* sp. (2.3.1), with *Cladonia mitis* and 4 species of *Dicranum* (2.3.2) and typical tundra with *Luzula* sp. (2.3.3). These forms of tundra do not show greater differences with respect to settlement conditions. The fourth which is the last subtype of dry moss-grown tundra with *Racomitrium lanuginosum* (2.4) is differentiated into 2 floristic forms: with *Luzula* sp. (2.4.1) and typical with

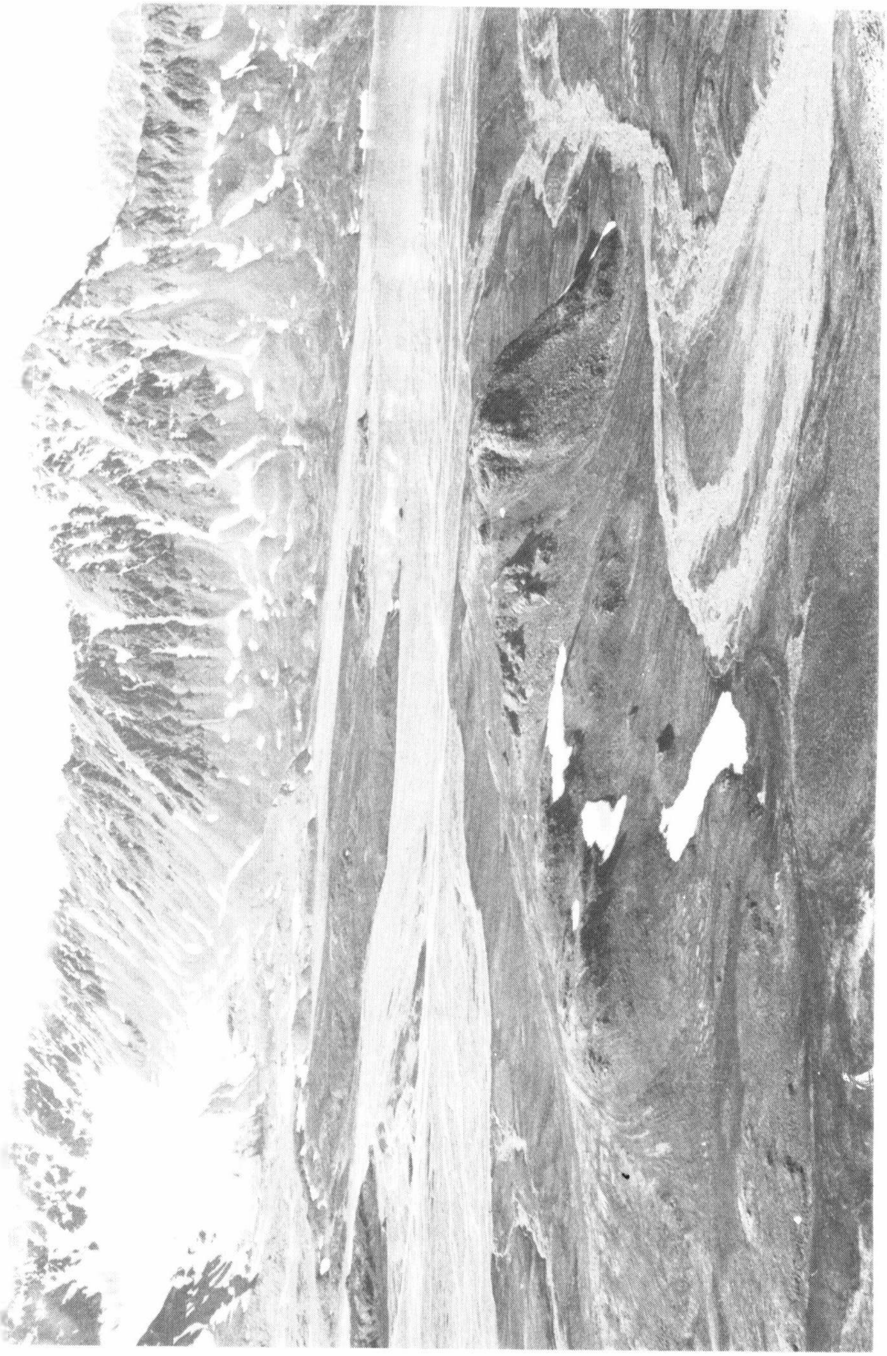

Fig. 2. Chamberlindalen; Vestervagoyra region

Phot. F. Święs

Fig. 3. Chamberlindalen, NE part of Vesliknausane region: pingo hummock on the edge of glen river
Phot. F. Święs

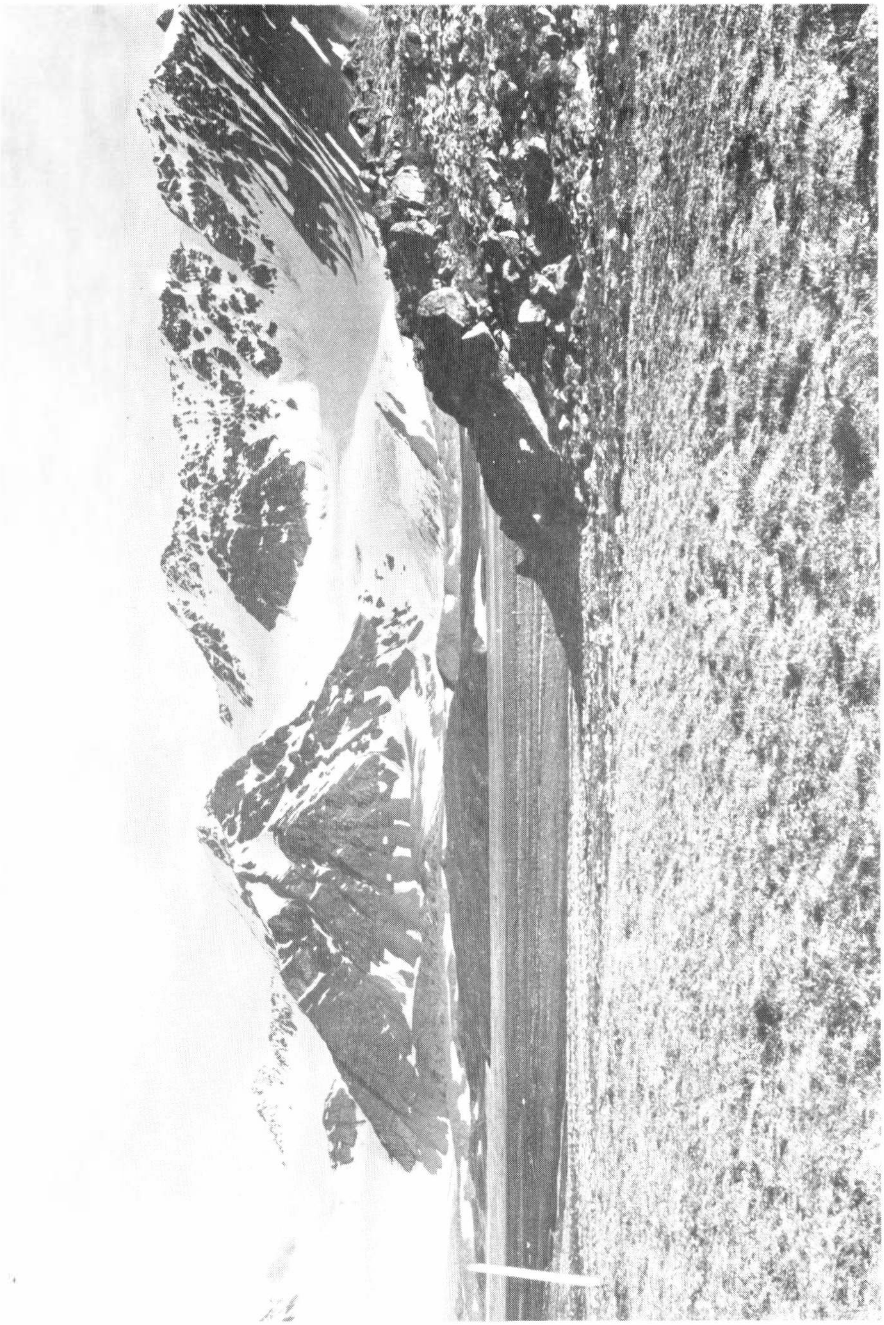

Fig. 4. Chamberlindalen, NW part; in the first part of the view — tundra from *Luzula* sp., in the farther part — a mountain range with Cramer glaciers

Phot. F. Święs

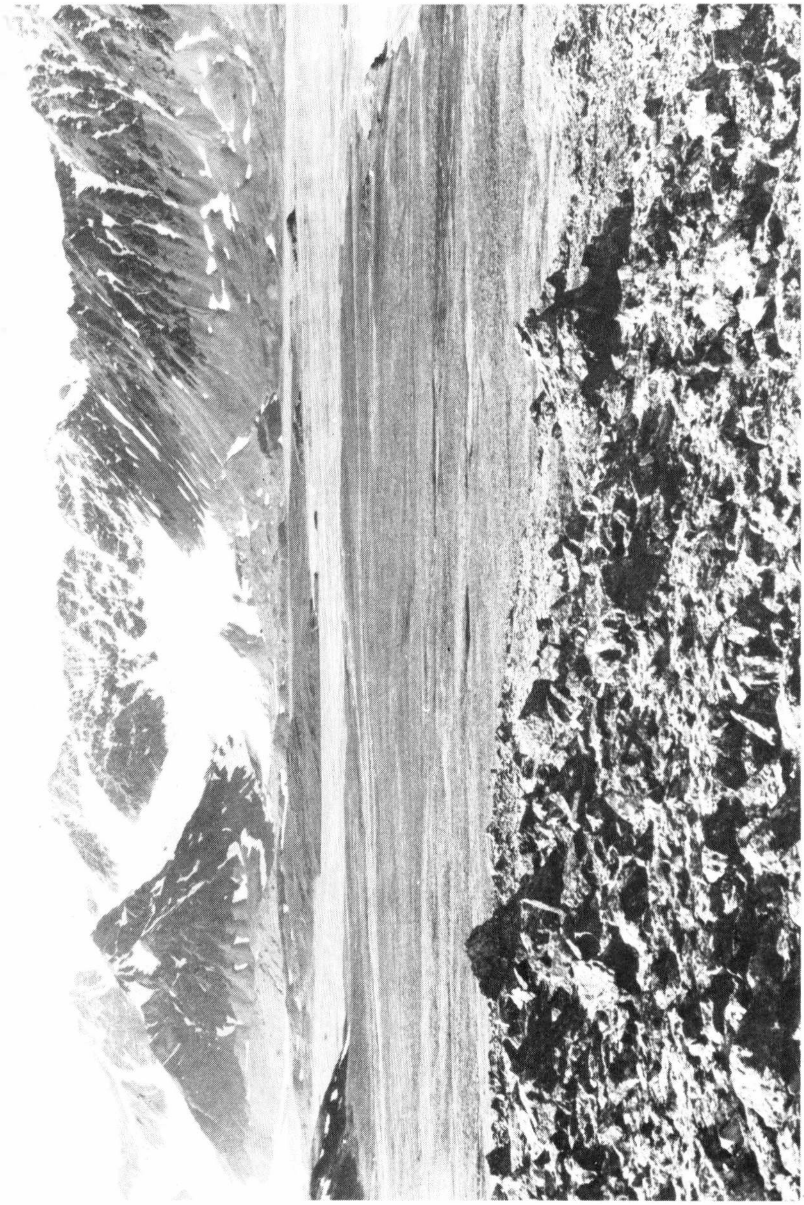

Fig. 5. Chamberlindalen, N part; in the first part of the view — dry moss drown tundra with *Racomitrium lanuginosum* on the stony slope of Observatoriefjellet 569 m a.s.l., deep inside — the bottom of the valley and the mountain range with Cramer glaciers

Phot. F. Święs

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Fig. 6. Chamberlindalen, NE part; in the first part of the view — tundra of the wet thuphuric morass at the bottom of the valley, in the farther part — Solhøgda top 663 m a.s.l.

Phot. F. Święs

Fig. 7. Chamberlindalen, SE part; in the first part of the view — partly dried, vanishing tundra of thuphuric morass on the slope of Palanderfjellet — 725 m a.s.l., deep inside — the bottom of the valley and the Jamryggen mountain range 650 m a.s.l.

Phot. F. Święs

Racomitrium lanuginosum (2.4.2). They occur with the same frequency on vapid mineral-humus rocky dumping ground or on loamy-slate or stony-loamy ground. In the first case this mainly takes place on flat ridge shelves and small height slopes (Fig. 5) but in the last two cases they are mostly slightly convex edges of ridges and slopes of different heights.

The third type of tundra which is mesophilous moss tundra (No. 3) is differentiated into 3 subtypes often found scattered from the valley bottom to ridges of the greatest heights. The first subtype of this tundra which is mixed on solifluction ground (3.1) is characterized by codomination of mosses, lichens and flower plants. The tundra is made up in two distinct forms. The first form which is dry and compact (3.1.1) occurs on dry, hard and homogeneous loamy-silty ground not subjected to solifluction processes. This mainly takes place on slightly convex feet of slopes and top planations. Another form of mixed tundra which is wet and polygonal (3.1.2) occurs on solifluction loamy or loamy-silty ground always wet with distinct slits and polygonal overflows. In this case they are most frequently terrace depressions on wide ridges and slopes of smaller heights. The second type of mesophilous moss tundra on silty-stony sediments (3.2) is formed in constantly wet silty-stony settlements situated in gully hollows close to the slope. The third type of mesophilous moss tundra on gravel-stony sediments (3.3) is found on old outwashes of glen rivers and at the mouths of glacial streams.

The fourth type of tundra which is mesophilous morass of snow beds is quite frequently found (No. 4). It is characteristic of stony gully incisions long snow covered, slope shelves and cryoplanation terraces.

In the studied area a well formed tundra of wet thuphuric morasses is exceptionally frequent (No. 5). It is spatially predominant at the mouth of Chamberlin valley from the bed of the main river to more steep slopes of the greatest heights. It is found on loamy-slate grounds which are either flat or sloping with dripping water streamlets (Fig. 6). Under Chamberlin conditions similar to those of thuphuric tundra there is found a boggy moss and grass-grown tundra with *Deschampsia alpina* (No. 7). It is formed on flat or partly sloping, boggy, loamy areas with some rock bits, sometimes with the area marked by slight polygonal cracks. The last type of the tundra of partly flooded morasses (No. 7) is formed in two subtypes: moss grown tundra on rocky water broads (No. 7.1) and moss-grown tundra on loamy-gravely edges of lakes (No. 7.2). Community of this tundra rarely occurs as patches of several areas mainly in the middle part of Chamberlin valley (Fig. 1). The bryophytes were not studied in the Chamberlin region beyond the patches of compact tundra and they occurred on rocky settlements both in lower and upper parts of the area (Figs. 2–7). The bryophytes of the compact arctic tundra on steep and rocky slopes of mountain ridges were not carefully studied either. The slope coprophilous morasses on nitrogenous substrata also occur beyond the boundary of the studied area at the foot of NE slope Observatoriefjellet 565 m a.s.l. (Fig. 1).

LOCALITY OF BRYOPHYTES

1. Type: initial tundra

322. Ve, SSW, under Cramer II glacier. Ground, stony-clayey moraine.

321. Ve, SSW, the ridge of old moraine Cramer II glacier. Rocky ground with no deep level of fossil soil with subfossil vegetation.

324. Ve, SSW, the highest ridge of old moraine Cramer II glacier. Rocky ground slightly concave with no deep level of fossil soil with subfossil vegetation.

384. Ve, SSW, the highest ridge of old moraine of Cramer II glacier. Rocky ground with no deep level of fossil soil with subfossil vegetation.

2. Type: dry lichen-moss tundra

2.1. Subtype: grey-lichen tundra with *Cetraria delisei*

69. Va, NNE, E edge of Flatskjeret coast. The old, dry, stony-gravel riverside outhwash.

85b. Va, SSE, about 120 m from the mouth of depression between the hill 105 m high and Observatoriefjellet 565 m. The old, dry, stony-gravel riverside outhwash.

361. Ve, SSEE, the valley bed below Bøckmanbeen glacier. The old, dry, gravelly-stony outwash of glacier river.

2.2. Subtype: tundra with *Dryas octopetala*

385. Ve, SE, a flat ridge of the hill close to the moraine of Cramer II glacier. Slate-loamy ground of wrinkled and cracked surface.

92. Chn, NE, W slope of SW ridge edge of the hill 105 m high. Slate-loamy ground of wrinkled and cracked surface.

97. Ve, NNW, E slope of hill edge. Slate-loamy ground of wrinkled and cracked surface.

199. Va, SW, SE slope of the edge of hill range 49 m high. Slate-loamy ground of wrinkled and cracked surface.

202. Ve, NN, the slope of hill ridge. Slate-loamy ground of wrinkled and cracked surface.

209. Va, NNW, the slope of ridge of hill range 49 m high. Loamy-slate ground of wrinkled and cracked surface.

320. Chn, NE, E edge of glen river. The ridge of clayey-gravelly polygonal cracked pingo hummock.

329. Chn, NE, NW slope of Solhøgda part, 663 m high. Loamy-slate slightly convex ground.

337. Chn, NE, the pass between Solhøgda, 663 m high and the hill 105 m high. The hill ridge, loamy-slate ground of wrinkled surface.

342. Chn, NE, the pass between Solhøgda, 663 m high and the hill 105 m high. The height slope, slate-loamy, cracked ground.

347. Ve, NEE, the concave ridge of pingo hummock on the glen river. Gravelly-clayey, polygonal cracked ground.

389. Ve, NE, hill ridge. Slate-loamy ground of slightly wrinkled and cracked surface.

2.3.1. Form: with *Cetraria delisei*

206. Va, NNW, the flattened ridge of inselberg hill. Clayey-stony ground.

2.3.2. Form: with *Cladonia mitis*

55. Va, NEE, marine terrace. A flat ridge of inselberg hummock, loamy-slate.

56. Va, NNE, marine terrace. W edge of Flatskjeret coast. The flattened, slate-loamy ridge of inselberg hummock.

60. Va, SSE, marine terrace. The flattened, slate-loamy ridge of inselberg hummock.

77. Chn, NNEE, a flat foot of NW Observatoriefjellet, 565 m a.s.l. Slate-clayey ground.

88. Va, SSE, marine terrace. A flat, loamy-slate ridge of inselberg hummock.

325. Ve, SSW, under the hill ridge below Cramer II glacier. Slate-loamy ground.

336. Va, SSE, the hill slope, 105 m high. Slate-loamy ground.

350. Chn, NE, the ridge of SW part of hill range, 105 m high. Loamy-gravelly-slate ground.

356. Chn, a middle-southern part, about 600 m in south of a main river ravine. A slate-loamy edge of height ridge.

364. Chn, the middle-southern part, about 1800 m in south of the main river ravine. Slate-loamy slopes of the height.

372. Chn, the middle-eastern part. The loamy-slate foot of the hill, 699 m high.

2.3.3. Form: typical with *Luzula* sp.

353. Chn, SE, about 200 m in SE of the main river ravine. The loamy-slate foot of the height.

367. Cht, SSW. The loamy-slate foot of SE part of Frontfjellnasa, 495 m a.s.l.

393. Chn, SE, at S edge of glacial moraine. The foot of NW part of Palanderfjellet, 725 m a.s.l., the loamy-slate ground of wrinkled surface.

83a. Va, SSW, a flat ridge of inselberg hill. The loamy-slate ground.

91. Va, SSE, a marine terrace on the river. The flattened loamy-slate ridge of inselberg hummock.

71. Va, NNE, N edge of marine terrace at the river mouth. A flat, loamy-gravelly ridge of inselberg hummock.

366. Cht, NNW, the pass slope at Steinegg side, 695 m a.s.l. The loamy-slate ground.

391. Ve, NN, the loamy-slate edge of height ridge.

415. Ch, NNEE, about 200 m from Asbestodden coast. The foot of Observatoriefjellet, 565 m a.s.l., the slate-loamy ground.

2.4. Subtype: moss tundra with *Racomitrium lanuginosum*

2.4.1. Form: with *Luzula* sp.

57. Va, NNE, a marine terrace on W edge of Flatskjeret coast. A flat ridge of stony inselberg hummock. The stony, mineral-humus ground.

83b. Va, SSEE, a marine terrace about 200 m in NE of the top, 105 m high. A flat, clayey-stony ridge of inselberg hummock.

195. Rn, SSWW. The clayey-stony slope of the hill.

196. Rn, SSE. They clayey-stony ridge of the hill.

200. Va, SE. The slate-loamy ridge of the hill.

208. Va, NNW, about 100 m from the sea shore. The flat stony-loamy ridge of the hill.

2.4.2. Form: typical with *Racomitrium lanuginosum*

326. Ve, SSE, the edge of height ridge under Cramer III glacier. The weathered rocky terrace.

327. Chn, NE, the slope of Solhøgda, 663 m a.s.l. The loamy-slate ground.

331. Chn, NE, the slope of Solhøgda, 663 m a.s.l. The loamy-slate mesophilous ground.

352. Chn, the middle part in N side of the main river ravine. The hill ridge is a hard rocky terrace.

359. Chn, SE, about 600 m in SE of the main river ravine. The height ridge is a weathered rocky terrace.

360. Chn, about 500 m in SE of the main river ravine. The convex ridge of the height, weathered rock talus.

394. Chn, E, the slope of NW part of Palanderfjellet, 729 m a.s.l. The weathered rock terrace.

386. Ve, SSW, the flat ridge of the hill in front of Cramer III glacier. The weathered rock terrace.

387. Ve, the middle part, the edge of the highest ridge of the height. The weathered rock terrace.

3. Type: mesophilous moss tundra

3.1. Subtype: mixed tundra on solifluction soils

68. Va, NNE, W edge of Flatskjeret coast. The marine terrace, the loamy-gravelly solifluction ground.

73. Va, NNE, NW edge of Flatskjeret coast. The marine terrace, loamy-gravelly solifluction ground.

82. Va, NE, about 60 m from the sea shore. The marine terrace, depression between rocky hummocks, loamy-gravelly solifluction ground.

94. Ve, NE, the edge of hummocky terrain at the river intersection. The loamy-gravelly solifluction ground with indistinct polygons.

328. Chn, NE, the slope of NW part of Solhøgda, 663 m a.s.l. The loamy-slate solifluction ground of wrinkled surface.

368. Cht, SEE, the valley slope at the hill side, 575 m a.s.l. The loamy-slate solifluction soil.

395. Chn, NNEE, the foot of NE part of Observatoriefjellet, 565 m a.s.l. The clayey-stony solifluction ground of wrinkled surface.

414. Chn, NNEE, the foot of NE part of Observatoriefjellet, 565 m a.s.l. about 100 m from the sea shore. The loamy-stony ground with indistinct polygons.

3.1.2. Form: wetter, polygonal

84. Chn, NE, SE the part of hill ridge, 105 m high. The loamy ground with slate bits, polygonal.

201. Va, SWW, the foot of hill on the river. Loamy-slate, polygonal, solifluction ground.

204. Va, NW, the foot of hill on the river. The loamy-slate, polygonal, solifluction ground.

335. Chn, NE, SE part of the hill ridge, 105 m high. Loamy ground with bits of slates, polygonal.

339. Chn, SSE part of the pass between the hill 105 m high and Solhøgda, 663 m a.s.l. The loamy-slate ground with indistinct polygons.

358. Chn, the middle part, on E river side. The loamy-slate, polygonal terrace shelf on the hill slope.

370. Cht, NNEE, the foot of NW part of Steinegg, 655 m a.s.l. The loamy-slate polygonal slope terrace shelf.

382. Ve, NE, depression between the hills. Loamy-slate solifluction ground of wrinkled surface.

396. Chn, NE, the slope of NW part of Palanderfjellet, 725 m a.s.l. Loamy-slate ground with indistinct polygons.

401. Chn, NE, the hummock slope on the valley side close to Solhøgda, 663 m a.s.l. Loamy-slate ground with indistinct polygons.

411. Chn, NNEE, above Rubypynten, the foot of N part of Observatoriefjellet, 565 m a.s.l. Loamy-stony marine terrace with indistinct polygons.

3.2. Subtype: moss tundra on muddy-stony drifts

334. Chn, NE, the pass between Solhøgda, 663 m a.s.l. and the hill 105 m high. Loamy-stony solifluction ground.

371. Chn, SEE, the slope foot of SW part of the hill, 655 m a.s.l. Wet and stony ground with muds.

3.3. Subtype: moss tundra on gravelly-stony drifts

61. Va, NEE, about 300 m from Flatskjeret coast. The flat marine terrace, old riverside gravel heap.

62. Va, NE, about 350 m from the edge of Flatskjeret coast. Marine terrace, loamy-gravelly river drifts.

66. Va, NNE, NW edge of Flatskjeret coast. Marine terrace, gravelly-muddy river drifts.

67. Va, NN, NW edge of Flatskjeret coast. Marine terrace, gravelly-muddy river drifts.

86. Va, SSE, about 60 m from the hill foot, 105 m high. Marine terrace, gravelly-muddy river drifts.

205. Va, NNW, between the river mouth and sea. Marine terrace, muddy riverside gravel heap.

333. Chn, NE, the foot of NW part of Solhøgda, 663 m a.s.l. Stream overflow-arm, weathered, mineral-humus rocky dumping ground.

344. Ve, NEE, on N side of glen river. The old stony riverside outwash with muds.

346. Ve, NEE, N slope of pingo hummock on the glen river. Gravelly-clayey ground.

348. Ve, NEE, N edge of old outwash of the glacial river. Stony-gravelly ground with muds.

351. Chn, The middle-southern part, below the main river ravine. The stony-gravelly, muddy island of the riverside outwash.

392. Chn, NEE, the foot of the slope under the moraine of Bøckmanbreen glacier. The old stony-gravelly outwash of glacial river with muds.

408. Rn, SSW, under the marine cliff. The old gravel riverside terrace.

410. Chn, NNEE, about 200 m SW of Rubypynten. The old stony streamside outwash.

4. Type: tundra of mesophilous morasses of snow-beds

79. Chn, NNEE, the slope of NW part of Observatoriefjellet, 565 m a.s.l. A stony slope gully.

87. Va, SSE, NE slope of the hill, 105 m high. A stony and muddy slope gully.

89. Va, SSE, the foot of N hill slope, 105 m high. A gravelly and muddy gully under the slope.

95. Ve, NE, foot of height over the river. The edge of flat stony riverside terrace.

98. Ve, NE, under the height top. A stony, slope gully with muds.

341. Chn, NE, the valley edge under NW part of Solhøgda, 663 m a.s.l. A stony-gravelly gully under the slope.

365. Chn, SSE, on E side of the river, under NW edge of hill foot, 655 m a.s.l. The stony-loamy terrace depression under the slope.

390. Ve, NW, depression between height ridges. A stony, poorly mudded gully under the slope.

400. Chn, E, the valley slope under NW part of Palanderfjellet, 729 m a.s.l. Stony-gravelly terrace depression under the slope.

406. Chn, NNEE, the foot of NE part of Observatoriefjellet, 565 m a.s.l. Gravelly-stony terrace depression under the slope.

5. Type: tundra of wet thuphuric morasses

58. Va, NNE, about 200 m from NW edge of Flatskjeret edge. Loamy-gravelly, wet marine terrace with indistinct polygons.

63. Va, SE, near the glen river. Muddy-gravelly, flooded marine terrace.

64. Va, E, about 150 m SE of W edge of Flatskjeret coast. Loamy-gravelly, flooded marine terrace.

65. Va, SSE, the foot of NW part of the hill, 105 m high. Loamy-gravelly wet marine terrace.

70. Va, NNE, about 70 m from the glen river mouth. Loamy-gravelly, flooded marine terrace.

74. Va, NEE, the loamy-slate foot of height of NW part of Observatoriefjellet, 565 m a.s.l.

75. Va, NEE. The loamy-slate foot of height of NW part of Observatoriefjellet, 565 m a.s.l.

76. Va, NEE. The loamy-slate foot of NW part of Observatoriefjellet, 565 m a.s.l.

80. Va, SSEE. The loamy-slate, wet foot of NWW part of Observatoriefjellet, 565 m a.s.l.

85a. Va, SSE, SW slope of the hill, 105 m high. Loamy-slate, wet ground.

93. Chn, NE, the valley slope SW of the hill top, 105 m high. Loamy-slate, wet ground.

96. Ve, NNW, the foot of height over the glen river. Loamy-stony, wet ground with indistinct polygons.

197. Vn, SSEE. Loamy-slate, wet foot of height.

203. Va, SSWW, near the moraine of Cramer II glacier. Loamy-slate, wet foot of the slope.

207. Va, NE, about 300 m SW from the sea shore. Loamy-slate, wet foot of the slope.

330. Chn, NE, the slope of NW part of Solhøgda, 663 m a.s.l. Loamy-slate, wet and niche like ground.

332. Chn, NE, N foot of NW part of Solhøgda, 663 m a.s.l. Loamy-slate, wet and gully like ground.

338. Chn, NE, the foot of SW part of Solhøgda, 663 m a.s.l. Loamy-slate, wet and sloping ground.

340. Chn, NE, the slope of valley under NW part of Solhøgda, 663 m a.s.l. Loamy-slate, wet and solifluction ground with indistinct thuphuric forms.

343. Chn, NE, the foot of NWW part of Solhøgda, 663 m a.s.l. Slate-loamy, wet ground.

383. Ve, SSE, the foot of slope on W part of the river. Loamy-slate, wet ground.

397. Chn, E, the foot of NW part of Palanderfjellet, 725 m a.s.l. Stony, wet ground with muds.

398. Chn, E, the slope of valley under SW part of Palanderfjellet, 725 m a.s.l. Stony-loamy, wet ground.

399. Chn, E, the slope of valley under NW part of Palanderfjellet, 725 m a.s.l. Loamy-gravelly wet ground.

402. Chn, NNE, the foot of NW part of Solhøgda, 663 m a.s.l. Loamy-slate, wet ground.

403. Va, SSEE, the valley at foot of E hill slope, 105 m high. Loamy-slate, floody ground.

404. Va, SSEE, at the foot of E hill slope, 105 m high, about 70 m NW of station No. 403. Loamy-slate, floody ground.

6. Type: boggy moss-grass tundra with *Deschampsia alpina*

59. Va, NNE, about 200 m south of West edge of Flatskjeret coast. Loamy-stony, wet, flat marine terrace.

72. Va, NNW, between the glen river and sea. Marine terrace.

198. Va, SSW, SE edge of hummocky terrain over the glen river. Loamy-gravelly, flat marine terrace.

349. Chn, NE, the slope of valley under NW part of Solhøgda, 663 m a.s.l. Loamy-slate, wet ground.

355. Chn, SS, about 300 m S of the main river ravine. Stony-muddy wet, river terrace.

409. Chn, NNEE, about 250 m S of Rubypynten. The foot of N slope of Observatoriefjellet, 565 m a.s.l. Loamy-slate boggy ground.

7. Type: tundra of flooded morasses

7.1. Subtype: moss tundra on stony river overflow-arms

345. Ve, NEE, NE edge of glacial river old outwash. Stony-gravelly, muddy water overflow-arm.

354. Chn, SS, about 350 m SE of main river ravine. Stony-gravelly, flat valley slope, muddy water overflow-arm.

357. Chn, SS, about 700 m SE of main river ravine. The bottom of the lateral valley. Stony-gravelly and muddy water overflow-arm.

362. Chn, SSE, about 1200 m SE of the main river ravine. The bottom of the lateral valley. Stony-gravelly, muddy water overflow-arm.

363. Chn, SS, about 1500 m S of the main river marine. A local depression on the valley slope. Stony-gravelly, muddy water overflow-arm.

369. Cht, SEE, the pass slope. A local depression at the height foot. Stony-gravelly, muddy water overflow-arm.

373. Chn, SEE, the slope foot of Palandersfjellet, 725 m a.s.l., N hill, 655 m a.s.l. Stony-gravelly water overflow-arm.

7.2. Subtype: moss tundra on muddy-gravelly lake shores

413. Chn, NNEE, the sea coast, on SEE side of Rubypynten local lowering under the cliff. A muddy-gravelly shore of the lakelet.

412. Chn, NNEE, the sea coast on SEE side of Rubypynten. Local lowering under the cliff. A muddy-gravelly shore of the lakelet.

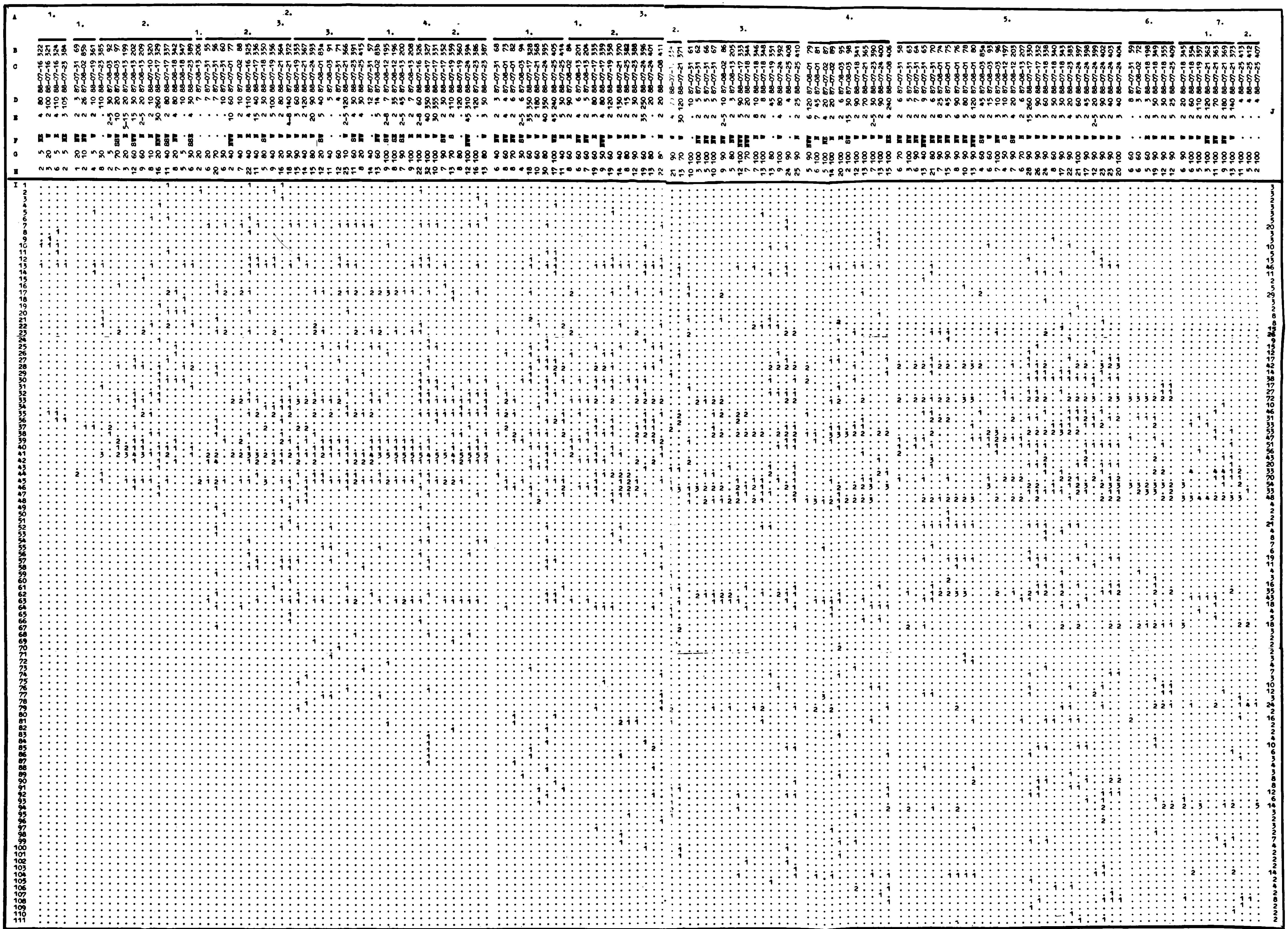
407. Chn, NNEE, the sea coast under SE slope of Observatoriefjellet, 565 m a.s.l. Local lowering under the cliff. A muddy-gravelly shore of the lakelet.

A LIST OF MOSSES AND LIVERWORTS
(according to numbering, Table 1)

1. *Bartramia ithyphylla* Brid. 2. *Polytrichum piliferum* Hedw. 3. *Andreaea rupestris* Hedw. 4. *Platydictya jungermannioides* (Brid.) Crum. 5. *Bryoerythrophyllum recurvirostre* (Hedw.) Chen. 6. *Schistidium apocarpum* (Hedw). B.S.G. 7. *Sphenolobus minutus* (Schreb.) Berggr. (h). 8. *Distichium hagenii* Philib. 9. *Encalypta streptocarpa* Hedw. 10. *Bryum pallescens* Schwaegr. 11. *Mniobryum wahlenbergii* (Web. et Mohr) Jenn. 12. *Polytrichum strictum* Brid. 13. *Pohlia cruda* (Hedw.) Lindb. 14. *Orthothecium strictum* Lor. 15. *Fissidens osmundoides* Hedw. 16. *Dicranum spadiceum* Zett. 17. *D. groenlandicum* Brid. 18. *Dicranoweisia cirrata* (Hedw.) Milde 19. *Encalypta alpina* Sm. 20. *Distichium inclinatum* (Hedw.) B.S.G. 21. *Brachythecium turgidum* (Hartm.) Kindb. 22. *Dicranoweisia crispula* (Hedw.) Milde. 23. *Dicranum elongatum* Schwaegr. 24. *Myurella julacea* (Schwaegr.) B.S.G. 25. *Lophozia groenlandica* (Nees) Macoun (h). 26. *Racomitrium canescens* (Hedw.) Brid. v. *canescens*. 27. *Cephaloziella grimsulana* (Gott. et Rabenh.) Lac. (h). 28. *Tomenthypnum nitens* (Hedw.) Loeske. 29. *Bryum rutilans* Brid. 30.

Distichium capillaceum (Hedw.) B.S.G. 31. *Dicranum fragilifolium* Lindb. 32. *Polytrichum fragile* Bryhn. 33. *Aulacomnium turgidum* (Wahl.) Schwaegr. 34. *Conostomum tetragonum* (Hedw.) Lindb. 35. *Ditrichum flexicaule* (Schwaegr.) Hampe. 36. *Orthothecium chryseon* (Schwaegr.) B.S.G. 37. *Oncophorus wahlenbergii* Brid. 38. *Drepanocladus uncinatus* (Hedw.) Warnst. 39. *Ptilidium ciliare* (L.) Hampe (h). 40. *Hylocomium splendens* (Hedw.) B.S.G. 41. *Racomitrium lanuginosum* (Hedw.) Brid. 42. *Dicranum fuscescens* Turn. 43. *Philonotis tomentella* Mol. 44. *Drepanocladus fluitans* (Hedw.) Warnst. 45. *Polytrichum alpinum* Hedw. 46. *Drepanocladus revolvens* (Sw.) Warnst. 47. *Campylium polygamum* (B.S.G.) C. Jens. 48. *Calliergon sarmentosum* (Wahl.) Kindb. v. *sarmentosum*. 49. *Pohlia ludwigii* (Schwaegr.) Broth. 50. *P. sphagnicola* (B.S.G.) Broth. 51. *Cephalozia ambigua* C. Mass. (h). 52. *Blepharostoma trichophyllum* (L.) Dum. v. *trichophyllum* (h). 53. *Tetraplodon mnioides* (Hedw.) B.S.G. 54. *Pohlia crudoides* (Sull. et Lesq.) Broth. 55. *Barbilophozia hatcheri* (Evans) Loeske (h). 56. *Timmia austriaca* Hedw. 57. *Blepharostoma trichophyllum* (L.) Dum. v. *brevirete* Bryhn et Kaal. (h). 58. *Tritomaria quinquedentata* (Huds.) Buch (h). 59. *Aplodon wormskjeldii* (Hornem.) R. Brown. 60. *Drepanocladus vernicosus* (Mitt.) Warnst. 61. *Catoscopium nigritum* (Hedw.) Brid. 62. *Aulacomnium palustre* (Hedw.) Schwaegr. 63. *Polytrichum juniperinum* Hedw. 64. *Splachnum vasculosum* Hedw. 65. *Drepanocladus latifolius* (Lindb. et Arn.) Broth. 66. *Anisothecium crispum* (Hedw.) C. Jens. 67. *Calliergon richardsonii* (Mitt.) Kindb. 68. *Pohlia proligera* (Kindb.) H. Arn. 69. *P. bulbifera* (Warnst.) Warnst. 70. *Bryum cryophilum* O. Mart. 71. *Solenostoma sphaerocarpum* (Hook.) Steph. v. *nanum* Schust. (h). 72. *Sphagnum squarrosum* Pers. v. *imbricatum* Warnst. 73. *Polytrichum norvergicum* Hedw. 74. *Orthothecium intricatum* (Hartm.) B.S.G. 75. *Tortella fragilis* (Hook. et Wils.) Limpr. 76. *Oncophorus virens* (Hedw.) Brid. 77. *Drepanocladus exannulatus* (B.S.G.) Warnst. 78. *Cephalozia bicuspidata* (L.) Dum. (h). 79. *Calliergon stramineum* (Brid.) Kindb. 80. *Kiaeria starkei* (Web. et Mohr) I. Hag. 81. *Calliergon turgescens* (Th. Jens.) Kindb. v. *turgescens*, 82. *Timmia megapolitana* Hedw. 83. *Scapania scandica* (H. Arn. et Buch) Macv. (h). 84. *Pohlia obtusifolia* (Brid.) Koch. 85. *Cinclidium arcticum* (B.S.G.) Schimp. 86. *Bryum schleicheri* v. *schleicheri*. 87. *Meesia uliginosa* Hedw. 88. *Rhizomnium andrewsianum* (Steere) Kop. 89. *Bryum pallens* Sw. 90. *Cyrtomnium hymenophyllum* (B.S.G.) Holm. 91. *Bryum pseudotriquetrum* (Hedw.) Gaertn. et al. 92. *Plagiomnium ellipticum* (Brid.) Kop. 93. *Meesia triquetra* (Richter) Ångstr. 94. *Calliergon sarmentosum* (Wahl.) Kindb. v. *fallaciosum* (Berggr.) Roth. 95. *Trichostomum arcticum* Kaal. 96. *Sphagnum squarrosum* Pers. v. *squarrosum*. 97. *Dicranella cerviculata* (Hedw.) Schipm. 98. *Bryum nitidulum* Lindb. 99. *Cynodontium polycarpum* (Hedw.) Schipm. 100. *Pohlia nutans* (Hedw.) Lindb. 101. *Philonotis*

Table 1. Bryological relations in the Chamberlin region



Sporadic species /Gatunki sporadyczne/: 112 - 2.1. 85b/1; 113 - 2.3.2. 55/1; 114 - 2.3.2. 325/1; 115 - 2.3.3. 367/1; 116 - 2.3.3. 71/1; 117 - 2.3.3. 366/1; 118 - 2.3.3. 366/1; 119 - 2.4.1. 57/1; 120 - 2.4.1. 83b/1; 121 - 2.4.2. 327/1; 122 - 2.4.2. 386/1; 123 - 2.4.2. 386/1; 124 - 2.4.2. 386/1; 125 - 2.4.2. 386/1; 126 - 3.1.1. 368/1; 127 - 3.1.1. 395/1; 128 - 3.1.2. 396/1; 129 - 3.1.2. 396/1; 130 - 3.1.2. 411/1; 131 - 3.1.2. 334/1; 132 - 3.2. 344/1; 133 - 3.2. 344/1; 134 - 3.2. 344/1; 135 - 3.2. 344/1; 136 - 3.3. 348/1; 137 - 3.3. 348/1; 138 - 3.3. 408/1; 139 - 3.3. 408/1; 140 - 4. 406/1; 141 - 5. 64/1; 142 - 5. 75/1; 143 - 5. 330/1; 144 - 5. 332/1; 145 - 5. 338/1; 146 - 5. 397/1; 147 - 5. 403/2; 148 - 5. 403/1; 149 - 6. 59/1; 150 - 6. 59/1; 151 - 7.2. 412/1.

A. Tundra vegetation communities: 1 — type of initial tundra, 2 — type of dry lichen-moss tundra in subtypes: 2.1. grey-lichen tundra with *Cetraria delisei*, 2.2. tundra with *Dryas octopetala*, 2.3. tundra with *Luzula* sp. (2.3.1. from with *Cetraria delisei*, 2.3.2. from with *Cladonia mitis*, 2.3.3. — from typical with *Luzula* sp.), 2.4. — moss tundra with *Racomitrium lanuginosum* in forms: 2.4.1. — with *Luzula* sp., 2.4.2. — typical with *Racomitrium lanuginosum*, 3 — type of mesophilous moss tundra in subtypes: 3.1. — mixed tundra on solifluction soils (3.1.1. — drier, dense form, 3.1.2. — wetter, polygonal form), 3.2. — moss tundra on muddy-stony drifts, 3.3. — moss tundra on gravelly-stony drifts, 4 — type of tundra of mesophilous morasses of snow beds, 5 — tundra of wet thuphuric morasses, 6 — boggy moss-grass tundra with *Deschampsia alpina*, 7 — tundra of flooded morasses in subtypes: 7.1. — moss tundra on stony water overflow-arms, 7.2. — moss tundra on muddy-gravelly lake shores.

B. Number of locality; C. Date of moss collection; D. Position of the studied moss locality in m a.s.l.; E. Ground inclination in gradients; F. Exposition; G. General covering of mosses in %; H. Total number of moss species; I. Numbers of moss species of names given in the paper and their covering in 5-degree scale (1 to 1–5%, 2–6–20%, 3–21–50%, 4–51–80%, 5–81–100%); J — General number of moss localities.

fontana (Hedw.) Brid. 102. *Pottia latifolia* (Schwaegr.) Vent. 103. *Pseudobryum cinclidioides* (Hueb.) Kop. 104. *Paludella squarrosa* (Hedw.) Brid. 105. *Orthothecium rufescens* (Brid.) B.S.G. 106. *Bryum crispulum* Hampe. 107. *B. caespiticium* Hedw. 108. *B. purpurascens* (R. Brown) B.S.G. 109. *Calliergon obtusifolium* Kar. 110. *Bryum teres* Lindb. 111. *Cinclidium subrotundum* Lindb. 112. *Seligeria polaris* Berggr. 113. *Plagiobryum zieri* (Hedw.) Lindb. 114. *Pohlia elongata* Hedw. 115. *Dichodontium pellucidum* (Hedw.) Schimp. 116. *Lophozia sudetica* (Hueb.) Grolle (h). 117. *Racomitrium canescens* (Hedw.) Brid. v. *ericoides* (Hedw.) Hampe. 118. *R. fasciculare* (Hedw.) Brid. 119. *Tortula ruralis* (Hedw.) Gaertn. et al. 120. *Anthelia juratzkana* (Limpr.) Trev. (h). 121. *Saccobasis polita* (Nees) Buch (h). 122. *Chandonanthus setiformis* (Ehrh.) Lindb. (h). 123. *Pleurozium schreberi* (Brid.) Mitt. 124. *Gymnomitrion concinnatum* (Lightf.) Corda (h). 125. *Racomitrium lanuginosum* (Hedw.) Brid. f. *aterimum* (Sael.) Podp. 126. *Pogonatum urnigerum* (Hedw.) P. Beauv. 127. *Myurella tenerrima* (Brid.) Lindb. 128. *Bryum pendulum* (Hornsch.) Schimp. 129. *Hypnum bambergeri* Schimp. 130. *Leiocolea badensis* (Gott.) Jørg. (h). 131. *Cinclidium stygium* Sw. 132. *Meesia longiseta* Hedw. 133. *Campylium zemliae* C. Jens. 134. *Bryum calophyllum* R. Brown. 135. *B. neodamense* Itzigs. 136. *Aongstroemia longipes* (Sommerf.) B.S.G. 137. *Cynodontium tenellum* Limpr. 138. *Tortula norvegica* (Web.) Lindb. 139. *Encalypta rhabdocarpa* Schwaegr. 140. *Rhizomnium pseudopunctatum* (Bruch et Schimp.) Kop. 141. *Sphagnum teres* (Schimp.) Ångstr. 142. *Tritomaria scitula* (Tayl.) Jørg. (h). 143. *Isopterygium pulchellum* (Hedw.) Jaeg. 144. *Drepanocladus badius* (Hartm.) Roth. 145. *Calliergon turgescens* (T. Jens.) Kindb. var. *tenue* Berggr. 146. *Bryum inclinatum* (Brid.) Bland. 147. *B. schleicheri* Schwaegr. v. *latifolium* (Schwaegr.) Schimp. 148. *Calliergon orbiculari-cordatum* Ren. et Card. 149. *Cnestrum schisti* (Web. et Mohr) I. Hag. 150. *Scapania curta* (Mart.) Dum. (h). 151. *Campylium stellatum* (Hedw.) C. Jens.

RESULTS OF STUDIES

1. In the Chamberlin region the bryophytes were studied in 146 localities (Fig. 1) representing 7 types, 9 subtypes and 7 ecological-floristic tundra vegetation communities. Compared with other parts of Wedel Jarlsberg Land coast, this region is characterized by a limited dry grey-lichen tundra with *Cetraria* sp. subtype.

2. Totally there were found 151 species of the bryophytes including 133 leafy mosses, 16 liverworts and 2 peat-mosses.

3. As follows from the data included in Table 1 the qualitative and quantitative

composition of the bryophytes in 23 studied arctic tundra groups is clearly differentiated. In one patch of tundra of the area 100 m^2 there are 2–32 species of the bryophytes. The smallest number of species is found in the communities of initial and dry lichen-moss tundra and the largest number in the forms from mesophilous moss tundra to wet thuphuric morasses.

4. The Bryophyta of the greatest biocoenotic role in all studied groups of wet vegetation communities of tundra cover such most common species as: *Drepanocladus revolvens, D. uncinatus, Calliergon sarmentosum, C. stramineum, Aulacomnium palustre, A. turgidum, Meesia triquetra, Orthothecium chryseon, Racomitrium lanuginosum, Tomenthypnum mitens, Dicranum fuscescens, Oncophorus wahlenbergii, Polytrichum alpinum, Hylocomium splendens,* among liverworts: *Blepharostoma trichophyllum* and *Sphenolobus minutus.*

5. Among the species found in patches only in one station there are 40 units of classification of the Bryophyta (Table 1, Nos. 112–151). Most frequently they are rare species on whole Spitsbergen and characteristic of specific settlements which are rocky inselbergs and crevices, eroded slopes and others. The examples of this group of the Bryophyta are: *Chandonanthus setiformis, Cnestrum schisti, Meesia longiseta, Pottia latifolia, Seligeria polaris,* rare species of *Bryum* and *Pohlia* and others.

6. The examples of the rare mosses in the Chamberlin region and on whole Spitsbergen are: *Aongstroemia longipes, Calliergon orbiculari-cordatum, Cinclidium stygium, C. subrotundum, Cnestrum schisti, Meesia longiseta, M. uliginosa, Pseudobryum cinclidioides, Rhizomnium andrewsianum, Seligeria polaris, Trichostomum arcticum,* as well as species *Sphagnum,* among liverworts: *Chandonanthus setiformis, Saccobasis polita* and *Scapania curta.*

7. In ecological respect the most interesting mosses as well as liverworts are in other valleys of Spitsbergen groups of calciphilous, nitrogenous and peat species were found (8).

8. All bryophytes collected in the Chamberlin region belong to 5 main geographical groups. The most numerous are species of the arctic element (7%), arctic-alpine element (33%), arctic and subarctic-alpine elements (44%), subarctic and subalpine elements (14%) and cosmopolitan element (2%).

REFERENCES

1. Berggren S.: Musci et Hepaticae Spitsbergenses. K. Svenska Vet.-Akad. Handl. 13 (7), 1–103 (1875).
2. Dallmann W. K. et al.: Geological Map of Svalbard 1: 100,000, B 11 G Van Keulenfjorden. Norsk Polarinst., Oslo 1990.
3. Gluza F. A., Piasecki J.: Rola cyrkulacji atmosferycznej w kształtowaniu cech klimatu południowego Bellsundu na przykładzie sezonu wiosenno-letniego 1987 r. Wyprawy Geograficzne na Spitsbergen. UMCS, Lublin 1989.

4. Hauser E.: Geological Map of Northern Wedel Jarlsberg Land, Spitsbergen, 1: 50,000, msc. 1980.
5. Karczmarz K., Święs F.: Brioflora południowego wybrzeża Bellsundu (Spitsbergen Zachodni). Wyprawy Geograficzne na Spitsbergen. UMCS, Lublin 1988.
6. Karczmarz K., Święs F.: Mszaki (*Bryophyta*) rejonów Lognedalsflya, Dyrstadflya i północnej części Chamberlindalen na południowo-wschodnim wybrzeżu Bellsundu (Spitsbergen Zachodni). Wyprawy Geograficzne na Spitsbergen. UMCS, Lublin 1989.
7. Karczmarz K., Święs F.: Bryophytes Collected in Arctic Tundra of the Eastern Slopes of Activekammen (Western Spitsbergen) in 1987–1988. Wyprawy Geograficzne na Spitsbergen. UMCS, Lublin 1990.
8. Karczmarz K., Święs F.: Bryophytes Collected in Arctic Tundra of the Dyrstad Region (Western Spitsbergen) in 1988. Ann. Univ. Mariae Curie-Skłodowska, sectio C **45**, 127–139 (1990).
9. Kuc M.: Flora of Mosses and Their Distribution on the North Coast of Hornsund (S. W. — Svalbard). Fragm. Flor. Geobot. **9** (3), 291–366 (1963).
10. Kuc M.: A Review of the Mosses of Svalbard. Revue Bryol. Lichenol. **39** (3), 401–472 (1973).
11. Melke J., Uziak S.: Gleby obszaru Lyellstranda i Chamberlindalen (Spitsbergen Zachodni). Wyprawy Geograficzne na Spitsbergen, UMCS, Lublin 1988.
12. Pękala K., Repelewska-Pękalowa J.: Główne rysy rzeźby i osady czwartorzędowe doliny Chamberlin (Spitsbergen). Wyprawy Geograficzne na Spitsbergen. UMCS, Lublin 1988.
13. Repelewska-Pękalowa J., Pękala K., Wojciechowski K.: Formy typu pingo w Chamberlindalen i na Hornsundneset (Spitsbergen). XIV Sympozjum Polarne. UMCS, Lublin 1987.
14. Rodzik J.: Termiczno-opadowe zróżnicowanie południowego wybrzeża Bellsundu w sezonie letnio-jesiennym 1988 r. Wyprawy Geograficzne na Spitsbergen. UMCS, Lublin 1988.
15. Rzętkowska A.: Contribution to the Moss Flora of Calypsostranda in Wedel Jarlsberg Land, Spitsbergen. Pol. Polar Res. 9 (4), 489–495 (1988).
16. Święs F.: Zróżnicowanie geobotaniczne tundry na południowym wybrzeżu Bellsundu (Spitsbergen Zachodni). Wyprawy Geograficzne na Spitsbergen. UMCS, Lublin 1988.
17. Święs F., Karczmarz K.: Bryophytes Collected in Arctic Tundra of the Logne Region (Western Spitsbergen) in 1988. Wyprawy Geograficzne na Spitsbergen. UMCS, Lublin 1991.

STRESZCZENIE

Przedstawiono udział mszaków w różnych zbiorowiskach tundry rejonu Chamberlin na Spitsbergenie Zachodnim (ryc. 1). Mszaki zebrano na 146 stanowiskach (tab. 1), reprezentujących 23 główne grupy (7 typów, 9 podtypów i 7 postaci) ekologiczno-florystyczne arktycznej tundry (16). Badania terenowe zostały przeprowadzone latem 1987 i 1988 r. W opracowywanych grupach tundry stwierdzono występowanie 151 gatunków mszaków, w tym 133 mchów liściastych, 16 wątrobowców i 2 torfowców. Wszystkie gatunki należą do 5 głównych grup geograficznych. Najliczniej reprezentowane są mszaki elementu arktycznego (7%), arktyczno-alpejskiego (33%), arktyczno- i subarktyczno-alpejskiego (44%), subarktyczno-subalpejskiego (14%) i kosmopolitycznego (2%).