FORAMINIFERA FROM POSTGLACIAL DEPOSITS OF THE LUNDERGÅRD AREA IN VENDSYSSEL, DENMARK

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KNUDSEN, K. L.: Foraminifera from Postglacial deposits of the Lundergård area in Vendsyssel, Denmark. *Bull. geol. Soc. Denmark,* vol. 22, pp. 255–282. Copenhagen, December, 7th, 1973.

Quantitative analysis of the foraminifera faunas in marine Quaternary deposits of the Lundergård area in Vendsyssel show that the Postglacial fjord extending from the Limfjord north-westward over Store Vildmose to the Løkken area, also covered a part of Lundergård mose. Foraminifera faunas of the Postglacial deposits of Lundergård mose indicate, as already suggested by Jessen and Nordmann in 1905 on the basis of morphology and mollusc faunas, that this area has been separated from the North Sea by a western barrier, whereas Postglacial faunas from borings west of this barrier show great similarity to the Recent North Sea faunas.

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The Lundergård area is situated in the western part of Vendsyssel, North Jutland (fig. 1). A flat moor, the Lundergård mose, occupies approximately 10 km² of the area. To the south and west of this moor the land is covered by aeolian sands, and to the east and north the moor is bordered by glacigenic highland (see also the geologic map of the area, Knudsen, 1972, p. 290, fig. 2).

For the present investigation a series of borings were carried out in the Lundergård area. The location of these borings is indicated on the map, fig. 2. Borings IV, V and VIII were made with a piston sampler as described by Knudsen 1973, whereas the borings VI, VII, IX and X are shorter borings made with a shovel auger. The westernmost borings W. 1–W. 4 (fig. 2) are well borings, from which samples were kindly made available by the Geological Survey of Denmark. The samples from these four borings were taken as average samples for certain depth intervals.

The samples were treated in the laboratory according to the methods described by Feyling-Hanssen et al. (1971) and Knudsen (1973). For the quantitative analysis foraminifera in the size fraction 0.1–1.0 mm were concen-

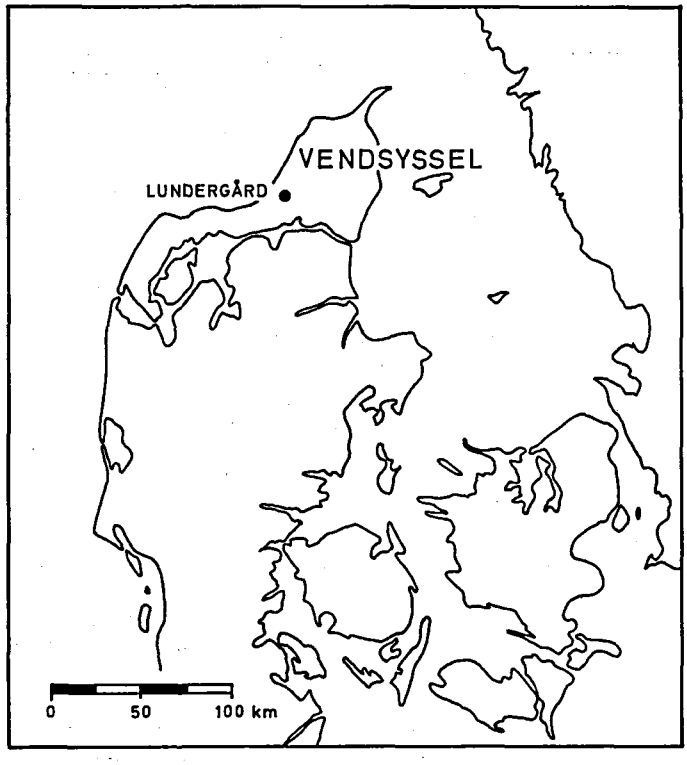

Fig. 1. Location of the Lundergård area in Vendsyssel, Denmark.

trated by the heavy liquid carbon tetrachloride (CCl_4). It was attempted to count at least 300 specimens in each sample. The number of species within the counted part was recorded, as well as the total number of species in the sample. In poor samples the entire content of foraminifera was counted.

The Postglacial faunas of Lundergård mose

The location of borings in Lundergård mose is seen on the map, fig. 2. The sites of borings IV and VII are in the central part of the moor, where the terrain surface is about 7 m above sea level. The frequencies of selected species of foraminifera from the upper part of these two borings are entered in the range chart, fig. 3.

Boring IV contains about 1.5 m of marine clay which is sandy in the middle part. In this layer *Ammonia batavus* is the dominant species. *Protelphidium anglicum, Elphidium articulatum* and *E. margaritaceum* are frequent, and *Elphidium albiumbilicatum, E. gerthi, E. magellanicum, E. excavatum* and the arenaceous species *Miliammina fusca, Ammoscalaria runi-*

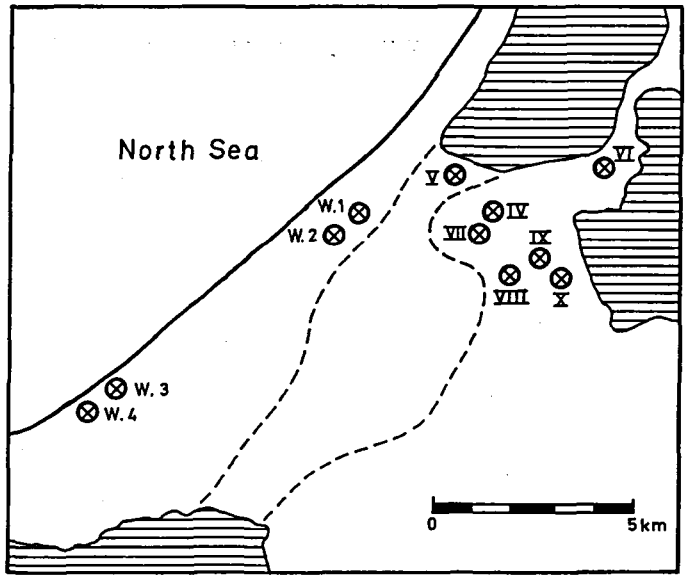

Fig. 2. Borings in the Lundergård area. Borings IV and VI–X are located in Lundergård mose, boring V on the Postglacial barrier, and borings W. 1–W. 4 west of this barrier. The dotted lines indicate the extent of the Postglacial barrier (after Jessen, 1920), and the hatching shows land area during the Postglacial.

ana, Jadammina polystoma and *Trochammina inflata* occur in most of the samples. The faunal diversity, which is the number of ranked species that accounts for 95 % of the counted fauna (Walton, 1964), is rather low in this boring (between 3 and 8).

The marine sequence of boring VII, which consists of about 1 m sandy clay, contains a fauna very similar to that of boring IV, but with even lower faunal diversity (3–4).

The present faunas compare with Recent boreal faunas of shallow and brackish water (Haake, 1962; Murray, 1965; Lutze 1965 and 1968), and also with Postglacial faunas from the Løkken area, some 20 km north of Lundergård (Knudsen, 1971). Thus the marine sequences of borings IV and VII were deposited during a higher sea level in Postglacial time. In 1899 Jessen in fact considered these layers to be of Postglacial age (Also called the *Tapes* or the *Littorina* layers (Jessen, 1918 and 1936)).

The low faunal diversity indicates extreme ecological conditions, and in the present case low salinity and shallow water were probably limiting factors for the fauna. On the other hand, there is a great number of specimens in the deposits which may indicate a rich supply of nutrients to the area.

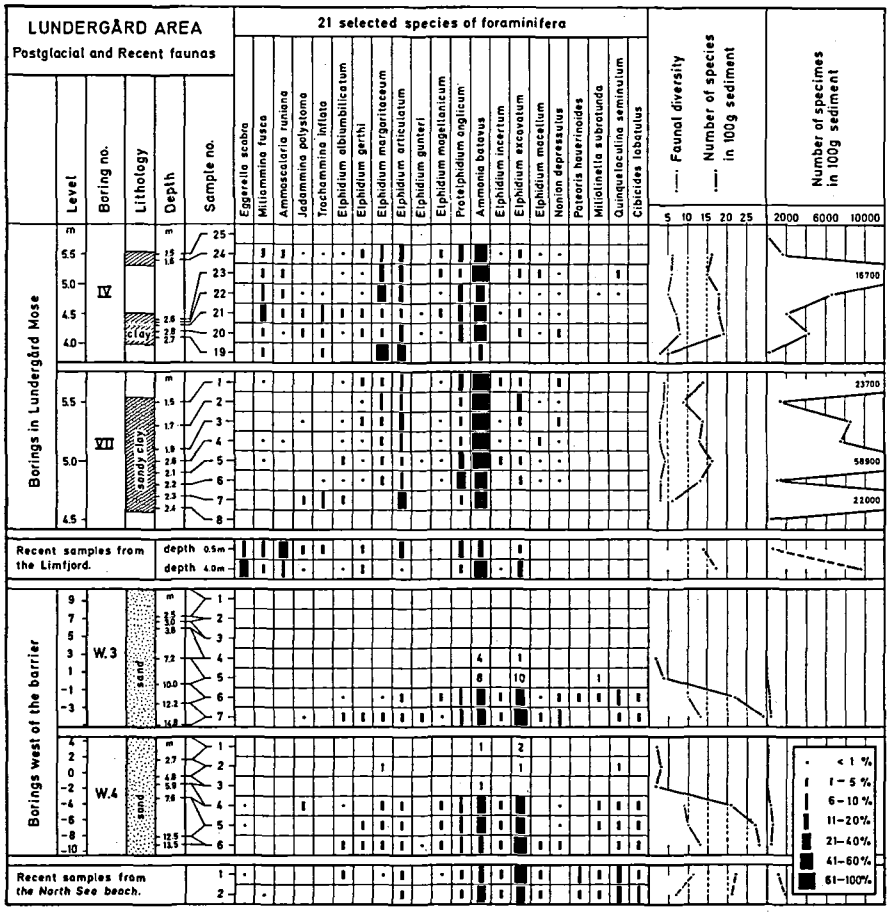

Fig. 3. Distribution chart for Postglacial and Recent samples from the Lundergård area. Borings IV and VII are situated in Lundergård mose east of the Postglacial barrier, and the faunas show resemblance to the two Recent samples from the Limfjord, whereas borings W. 3 and W. 4 are located west of this barrier and contain faunas similar to the Recent North Sea faunas.

Depth of deposition

The deepest samples from each of the two marine Postglacial sequences in borings IV and VII (see range chart, fig. 3) contain much plant material, and *Elphidium articulatum* is particularly frequent (37 % and 33 % respectively). *E. articulatum* is usually common in very shallow water, and the faunas of the two samples probably represent an early transgressive facies in the area. *E. articulatum* tolerates a salinity as low as 2–8 ‰ (Lutze, 1965) and is one of the dominant species at water depths less than 1 m in the Bottsand-

Lagune of the western Baltic Sea (Lutze, 1968). In samples from the Recent Limfjord fauna this species is usually dominant at water depths of about 0.5 m. The percentage of *E. articulatum* is 22 in a sample from Lundbæk, Nibe Bredning, at a depth of 0.5 m and a salinity of 13 ‰. The highest Postglacial beach deposit known in the Lundergård area lies 7.5 m above sea level (Jessen, 1936). As the deepest sample from marine Postglacial deposits in Lundergård mose comes from about 4 m above sea level, the maximum depth of the Postglacial sea in this area was approximately 3.5 m.

Extension of transgression

The marine deposits of the area are usually covered by 1–3 m of peat and aeolian sand. In order to estimate the extension of the Postglacial transgression in Lundergård mose, a few borings were made in the peripheral parts of the moor area, viz.: borings I, II, III, VI, IX, VIII, X. Three of these, I–III are not indicated on the map, fig. 2.

Boring VI, in the northern part of Lundergård mose, revealed Postglacial marine deposits. A sample from these (100 g dry weight) contained the following assemblage (¼ of the sample counted):

Lundergård mose, bor. VI, 5 m above sea level

Species	Frequency	Percentage
Ammonia batavus	390	78
Elphidium articulatum	47	9
Protelphidium anglicum	37	7
Elphidium excavatum	14	3
Ammoscalaria runiana	3	1
Elphidium margaritaceum	3	1
Miliammina fusca	2	< 1
Elphidium incertum	2	< 1
Total	498	

The species *Elphidium albiumbilicatum* and *Bolivina pseudoplicata* were also observed in the sample. The number of specimens is approximately 12,000 per 100 g sediment, and the faunal diversity is only 4 in this sample. The fauna is very similar to the Postglacial faunas in the central part of the moor.

The continuation of the transgression to the northeast is not investigated here, but Jessen (1899 and 1920) suggested that there was a connection with Store Vildmose through a narrow sound north and northeast of the glacigenic highland between Store Vildmose and Lundergård mose (fig. 4).

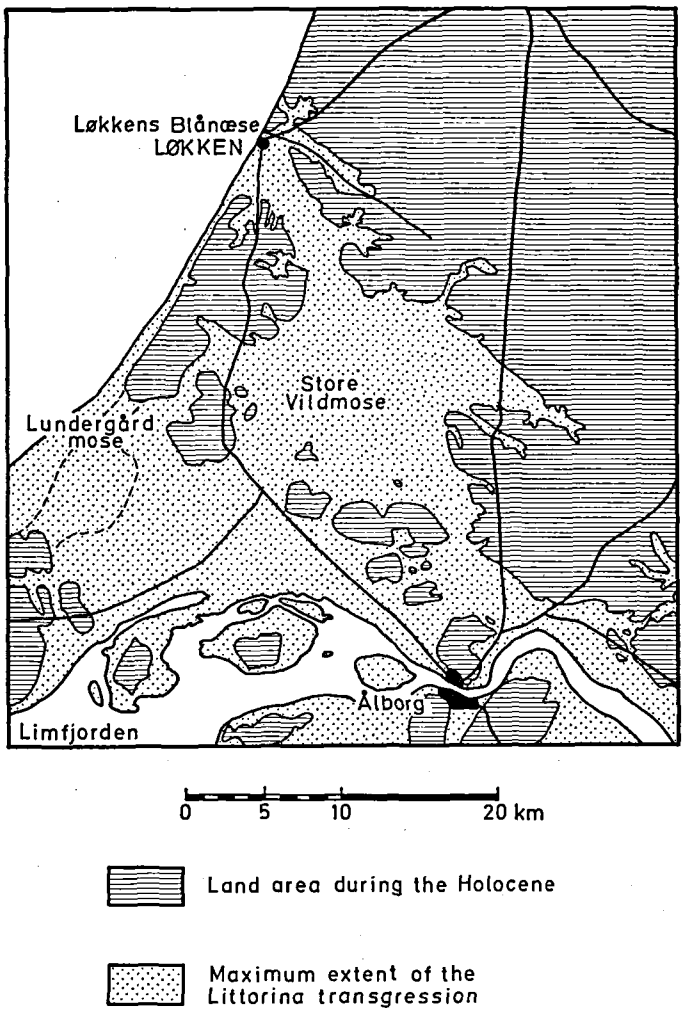

Fig. 4. Maximum extent of the *Littorina* transgression in the western part of Vendsyssel. The dotted lines west of Lundergård mose indicate the barrier which separated the fjords from the open sea. After Jessen, 1920.

In three borings situated 1.6 km, 1.9 km and 2.3 km east of boring IV, marine Postglacial deposits are not present (cf. borings I–III, Knudsen, 1973).

A marine sequence, consisting of alternating clay and sand layers, is found at 6.0–6.5 m above sea level in boring IX (fig. 2). The foraminifera fauna in this sequence corresponds closely with the faunas from Lundergård mose described above. *Ammonia batavus* is dominant, *Protelphidium anglicum* and *Elphidium articulatum* are frequent species, and the faunal diversity is as low as 3 in samples from this sequence.

In the more southerly boring VIII (fig. 2) no marine deposits are found, whereas boring X farther to the southeast contains a marine Postglacial sequence at 6.5–7.0 m above sea level. The sediment consists of sand with a very high content of plant material, and only arenaceous foraminifera are preserved in the deposit. The presence of tectinous wall base from calcareous foraminifera indicates that decalcination, probably accomplished by acid ground water, has occurred. A sample (50 g) from 6.8 m above sea level of boring X contains 75 specimens of *Jadammina polystoma,* 31 specimens of *Trochammina inflata* and 6 specimens of *Miliammina fusca.*

Jessen (1899) found marine Postglacial clay in a boring 1 km south of boring VIII (fig. 2) and also at several places farther to the south. The Postglacial sea in Lundergård mose has thus undoubtedly surrounded the glacigenic highland to the south and has been connected eastward to Store Vildmose and southward to the Limfjord (fig. 4).

Environment

As it is of interest to compare the Postglacial foraminiferal fauna from Lundergård mose with assemblages from other Postglacial deposits, samples from some adjacent localities are considered below.

A sample from Postglacial deposits in the eastern part of Store Vildmose (fig. 4) revealed the following fauna:

Store Vildmose, 6 m above sea level. Coll. Knudsen, 1969.

Species	Frequency	Percentage
Ammonia batavus	269	69
Ammoscalaria runiana	25	6
Elphidium articulatum	25	6
Elphidium excavatum	22	6
Elphidium margaritaceum	19	5
Miliammina fusca	15	4
Protelphidium anglicum	9	2
Elphidium gerthi	5	1
Elphidium albiumbilicatum	2	1
Nonion depressulus	1	< 1
Total	392	

The species *Elphidium incertum* is also observed in the sample; the total number of species is 11, the faunal diversity is 6, and the number of specimens is approximately 70,000 per 100 g sediment. This fauna compares well with the Postglacial faunas of Lundergård mose, but the faunal diversity of the Lundergård faunas is usually lower than 6.

A sample from marine Postglacial deposits in the area south of Store Vildmose and Lundergård mose (see also Jørgensen, 1971, p. 128), contains a fauna, which indicates slightly more turbulent water. The sediment consists of fine sand; 1/10 of a 100 g sample contained the following foraminifera:

Birkelse, 1.7 m above sea level. Coll. Jørgensen, 1969.

Species	Frequency	Percentage
Ammonia batavus	227	60
Elphidium excavatum	63	17
Protelphidium anglicum	35	9
Elphidium incertum	17	4
Elphidium magellanicum	13	3
Elphidium articulatum	7	2
Elphidium margaritaceum	5	1
Anomalina globulosa	4	1
Elphidium albiumbilicatum	4	1
Jadammina polystoma	2	1
Eggerella scabra	1	< 1
Total	378	

A few other species are observed in this sample. The total number of species is 16, the faunal diversity 6. According to studies of Recent foraminifera faunas (Richter, 1964; Lutze 1965 and 1968), the high frequency of *Elphidium excavatum* together with the lower frequency of *Elphidium articulatum* probably indicates more turbulent water in this area than in Lundergård mose and the eastern part of Store Vildmose. This also agrees with earlier evaluation of mollusc faunas in the area, as Jessen (1899) found mollusc faunas to be more richly developed in the southern and western part of the Vildmose fjord, where connections to Limfjord must have been rather open.

The Postglacial foraminifera faunas of Lundergård mose also compare well with faunas described from borings in Løkken and from the coast cliff of Løkkens Blånæse (Knudsen, 1971). The deposits in Lundergård mose thus seem to represent a westerly branch of a fjord which extended northwest from the Limfjord over Store Vildmose to the Løkken area. The resemblance of these Postglacial faunas to Recent Limfjord faunas is illustrated by the range chart (fig. 3) where selected species of two Recent Limfjord faunas are entered (see also Knudsen, 1971). The relatively higher frequency of arenaceous forms in the Recent faunas is probably due to secondary destruction of these tests in Postglacial deposits. The arenaceous tests may have been destroyed during and after the sedimentation of these deposits.

The borings W. 1–W. 4 are located in the westernmost part of the Lundergård area (fig. 2). The foraminiferal faunas from two of these borings are shown in the range chart (fig. 3) and demonstrate a foraminiferal distribution different from that of the faunas reviewed above. The dominant species in these faunas are *Elphidium excavatum* and *Ammonia batavus,* and the species *Protelphidium anglicum, Quinqueloculina seminulum, Miliolinella subrotunda, Cibicides lobatulus, Elphidium magellanicum, E. margaritaceum* and *E. articulatum* are commonly represented. The faunal diversity varies between 8 and 13. The deposit in these borings consists mainly of coarse sand, and the number of specimens per 100 g sediment is low (fig. 3).

These faunas also compare well with Recent boreal faunas of the North Sea (see below) and represent assemblages from a Postglacial transgression into this western part of the area. A sample (100 g) from the marine Postglacial deposits of boring W. 1 contains the following foraminifera:

Boring W. 1, average sample between 8.4 m below and 1.9 m above sea level

Species	Frequency	Percentage
Elphidium excavatum	111	35
Ammonia batavus	93	29
Protelphidium anglicum	39	12
Quinqueloculina seminulum	28	9
Cibicides lobatulus	11	3
Elphidium incertum	8	3
Elphidium articulatum	6	2
Pateoris hauerinoides	5	2
Cassidulina crassa	3	1
Bulimina marginata	2	1
Elphidium margaritaceum	2	1
Miliolinella subrotunda	1	< 1
Uvigerina peregrina	1	< 1
Rosalina vilardeboana	1	< 1
Anomalina globulosa	1	< 1
Hyalinea baltica	1	< 1
Nonion labradoricum	1	< 1
Elphidium magellanicum	1	< 1
Elphidium subarcticum	1	< 1
Protelphidium orbiculare	1	< 1
Indeterminate	2	1
Total	319	

The number of specimens is 20 and the faunal diversity 8, which is higher than the corresponding values for Postglacial deposits in Lundergård mose. Also the faunal composition is different, the present fauna having a higher

frequency of *Elphidium excavatum* and of porcelaneous forms, whereas the percentages of *Elphidium articulatum* and *Protelphidium anglicum* are comparatively lower. The faunas from the westerly borings W. 1–W. 4 have much more in common with faunas from the Recent North Sea coast than with those from Lundergård mose, Store Vildmose and from the Recent Limfjord. To illustrate this the foraminiferal content of a 100 g sand sample from the North Sea beach is presented (¼ of the sample counted):

North Sea, Løkken beach. Coll. Knudsen, 1971.

Species	Frequency	Percentage
Elphidium excavatum	140	34
Ammonia batavus	119	29
Quinqueloculina seminulum	80	19
Cibicides lobatulus	40	10
Miliolinella subrotunda	5	1
Elphidium articulatum	5	1
Elphidium macellum	5	1
Protelphidium anglicum	5	1
Pateoris hauerinoides	4	1
Elphidium incertum	3	1
Uvigerina peregrina	2	< 1
Bulimina marginata	1	< 1
Buccella frigida	1	< 1
Rosalina obtusa	1	< 1
Cibicides pseudoungerianus	1	< 1
Pullenia bulloides	1	< 1
Elphidium barleeanum	1	< 1
Elphidium subarcticum	1	< 1
Protelphidium orbiculare	1	< 1
Total	416	

A few other species are observed in the sample, so that the total number of species is 21; the faunal diversity is 7. The frequency of selected species from two Recent North Sea samples are shown in the range chart (fig. 3) and the diagram illustrates a clear similarity between these faunas and the Postglacial faunas of borings W. 3 and W. 4. The differences between these faunas and the Lundergård mose fauna can also be seen from this diagram (fig. 3).

Boring V, which has been described by Knudsen (1973), is situated at the western margin of Lundergård mose, the surface of the bore site being 12.0 m above sea level. The lower 12.5 m of this boring consists mainly of coarse sand with scattered pebbles, and contains a poor arctic fauna of foramini-

fera. The upper 5.5 m of the boring consists of alternating layers of well-sorted sand and peat without marine fossils, possibly aeolian.

Conclusions

Jessen described the Postglacial deposits of the present area in 1899. He found that the *Littorina* deposits in the western part chiefly consist of beach sand, whereas clay and mud are dominant in the Lundergård mose area to the east. At that time (1899) Jessen supposed that there had been an open connection from the North Sea in the west to Lundergård mose and to Store Vildmose in the east. After comparisons of mollusc faunas (Nordmann, 1905) in the present Postglacial deposits with the Recent coast faunas in the North Sea and in the Limfjord, Jessen (1920) came to the conclusion that some kind of a barrier must have existed, separating Lundergård mose from the North Sea. This agrees with the indications of the present study of foraminifera faunas, the borings W. 1–W. 4 representing deposits west of this barrier towards the open North Sea, boring V representing the barrier itself without marine Postglacial deposits, and the borings in Lundergård mose representing deposits east of the barrier.

To further illustrate the different types of faunes in the Lundergård area, the ratios of three foraminiferal groups – hyaline, porcelaneous and arenaceous forms – are plotted in a triangular diagram (fig. 5). Foraminifera with hyaline calcareous tests dominate all the faunas, but in North Sea faunas and in Postglacial deposits west of the barrier porcelaneous tests are usually rather common, whereas arenaceous tests are of importance in the Postglacial deposits of Lundergård mose and in the Recent Limfjord faunas. As already mentioned, the arenaceous forms seem to be secondarily underrepresented in the Postglacial deposits of Lundergård mose (cf. p. 262). Considering this, there is a clear division in to two fauna types: the brackish Limfjord type with an element of arenaceous forms, and the full marine North Sea type with an element of porcelaneous foraminifera.

The faunas of the beach deposits in borings W. 1–W. 4 as well as faunas from the Recent North Sea beach represent thanatocoenoses, which may differ from the original composition in the borings and from the living fauna of the North Sea. The most fragile calcareous forms and the arenaceous forms may have been destroyed in the surf zone, and in addition the faunas may contain allochthonous elements. Very few examinations have been made concerning Recent foraminifera of the North Sea, but Jarke (1961) who investigated Recent representation and distribution of different test types of foraminifera in the North Sea, found very few arenaceous tests in shallow water along the Danish North Sea coast. Presence of an allochthonous element would affect the composition of the Recent and the fossil (W. 1–

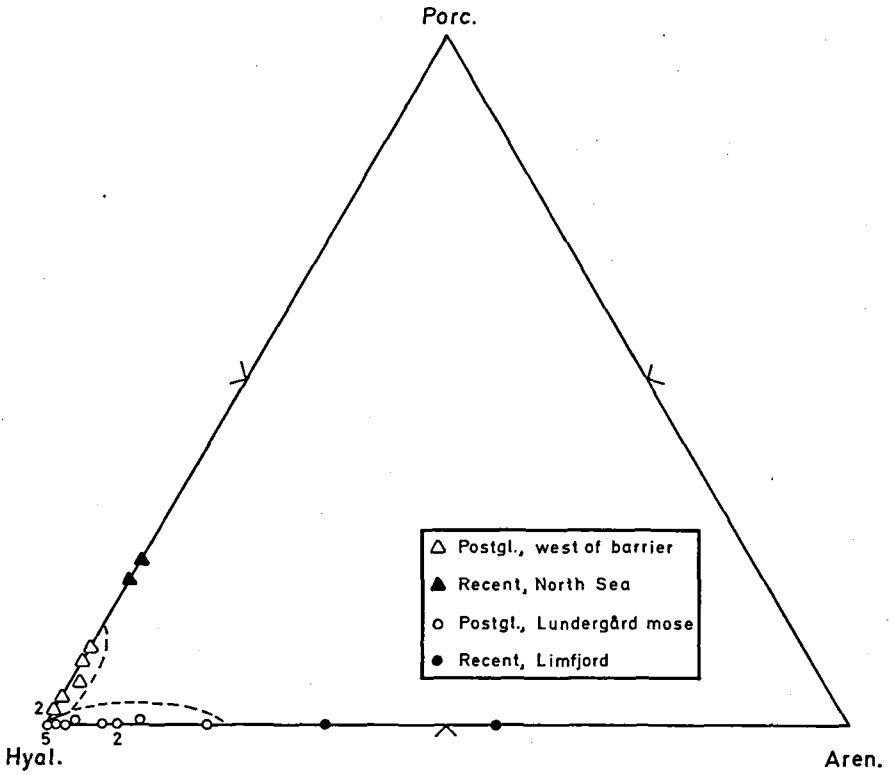

Fig. 5. Triangular plot of the three foraminiferal groups, hyaline, porcelaneous and arenaceous forms.

W. 4) assemblages in the same way, and thus be without any importance in the present comparison.

In fig. 6 diversity indices are recorded as α values (Fisher, Corbett and Williams, 1943; Murray, 1968, 1969, 1970). The relationship between the two parameters, number of counted individuals and number of species within this quantity, is shown in the diagram. As with Walton's (1964) faunal diversity, a low α value seems to indicate extreme ecological conditions, whereas higher α values show more normal marine conditions.

Fig. 6 shows that α values for Postglacial faunas in Lundergård mose range from 1 to 3.5, whereas with faunas from Postglacial deposits west of the barrier the α values varies between 4.5 and 8. The Fisher α indices for the two Recent samples of the Limfjord are about 2.5, and samples from the Recent North Sea beach have α values of about 4. There is a clear tendency towards higher α values in the North Sea type of faunas. Fig. 3 shows that Walton's (1964) faunal diversities are also highest in the North

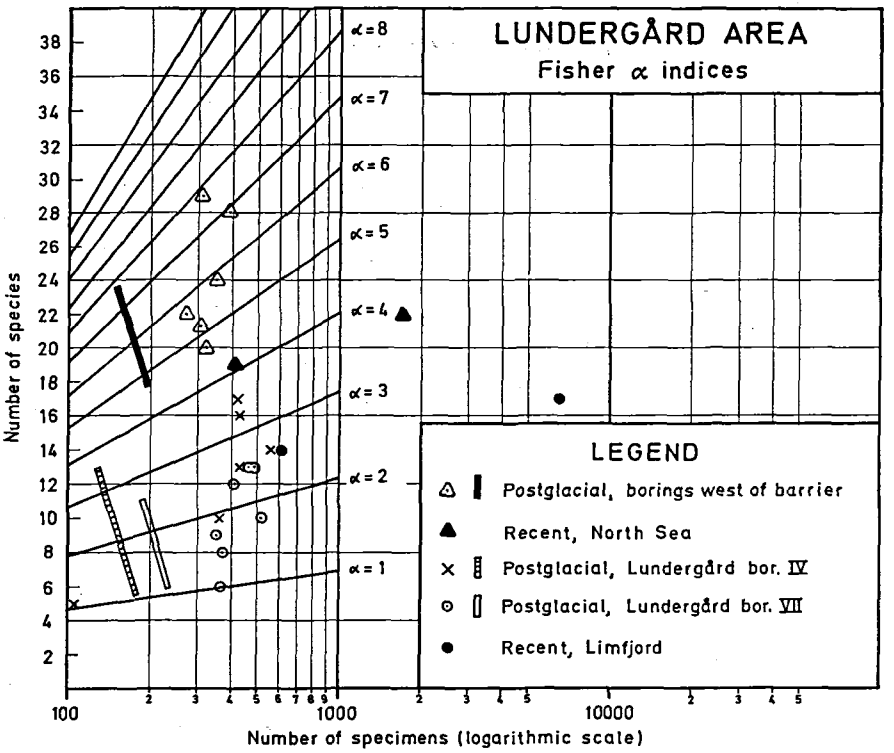

Fig. 6. Fisher α indices of Postglacial and Recent faunas from the Lundergård area. To simplify the diagram, connected points are projected on transverse lines.

Sea faunas and in the Postglacial faunas west of the barrier. Both diversity measures thus indicate more normal marine ecological conditions in these deposits.

Rarer species do not have much effect on Walton's (1964) faunal diversity, whereas the Fisher α index also takes the rarer species into account. Therefore, as also pointed out by Murray (1968), the α values are probably more suited to interpretation of the ecology of living populations than of fossil ones. Palaeothanatocoenoses (taphocoenoses) may contain allochthonous forms which will affect a Fisher α value in an undesired way, whereas an allochthonous element, consisting of a few specimens of foreign species is partly excluded when using Walton's faunal diversity in the interpretation.

In fig. 7 Postglacial and Recent faunas of the Lundergård area are compared by similarity indices. This method was described by Sanders (1960), and used by Murray (1969 and 1970) for studies of Recent foraminifera faunas. The indices are calculated as follows: the percentage occurrences of species in the two samples to be compared are listed side by side. The lowest

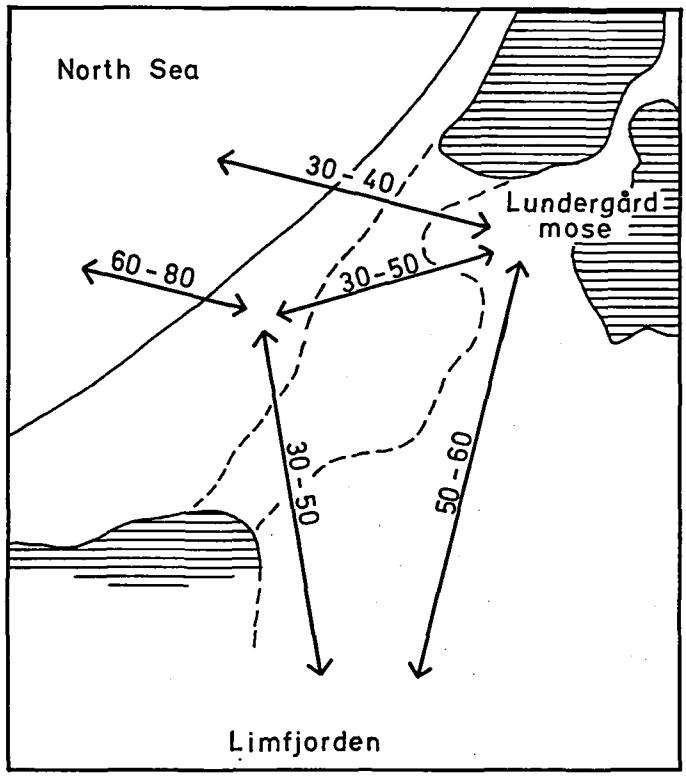

Fig. 7. Sketched map of the Lundergård area, showing some comparisons by similarity indices between the different types of Postglacial and Recent faunas of the area. The similarity indices are calculated as described on p. 267. Large numbers show high similarity between the compared faunas, whereas smaller numbers indicate less resemblance.

percentages for each species common to the two samples are summed, and the total value is the similarity index. High values of this index show a strong similarity between the samples, lower values indicating less resemblance.

The assemblages from Postglacial deposits east and west of the barrier at Lundergård, and from Recent deposits of the North Sea beach and of the Limfjord, are compared by the present method. The rough ranges of the similarity indices are shown on the sketch map, fig. 7. The similarity indices of Postglacial Lundergård mose faunas and Recent North Sea faunas are only 30–40 %, and comparing the Postglacial faunas east and west of the barrier, it is about the same (30–50 %). However, there is a greater similarity (50–60 %) between Lundergård mose faunas and the Recent Limfjord fauna (only one of the Limfjord faunas, from 4 m depth, is used for these comparisons); this value would probably have been even higher if the origi-

nal content of arenaceous forms had been preserved in the Postglacial Lundergård mose faunas (cf. p. 262). There is a great similarity between Postglacial faunas west of the barrier and the Recent North Sea faunas (60–80 %), whereas the similarity indices are only 30–50 % when comparing these faunas with the Recent Limfjord fauna.

The present comparisons of different types of faunas in the Lundergård area clearly show, that the Postglacial deposits of Lundergård mose represent a part of a Postglacial fjord connected with the Limfjord and separated from the North Sea.

In the Løkken area similar conditions were described (Jessen, 1920; Knudsen, 1971). In that area the barrier itself has been eroded away by the North Sea, whereas the barrier of the Lundergård area still exists as a flat ridge partly obscured by aeolian deposits.

Systematics

The foraminifera are arranged in accordance with the classification used in Feyling-Hanssen et al., 1971. Usually only the original reference is listed for each species, but for a few of them more recent references are added. For each of the species there are short remarks on the occurrences in Postglacial and Recent deposits of the Lundergård area.

Lituolidea Lamarck, 1809
Rzehakinidae Cushman, 1933

Miliammina Heron-Allen & Earland, 1930
Miliammina fusca (Brady)
Pl. 1, fig. 1

1870 *Quinqueloculina fusca* Brady: *Ann. Mag. nat. Hist. London, (4)* 6, p. 286, pl. 11, fig. 2.

M. fusca is rather common in the Postglacial deposits of Lundergård mose (max. 11 % of the total fauna) and Store Vildmose, and also in the Recent Limfjord faunas. The species is not found in the borings west of the Postglacial barrier at Lundergård, whereas a single specimen is found in the Recent North Sea faunas.

Lituolidae Lamarck, 1809

Haplophragmoides Cushman, 1910
Haplophragmoides canariensis (d'Orbigny)

1839 *Nonionina canariensis* d'Orbigny: *Histoire naturelle des Iles Canaries* 2 (2), p. 128, pl. 2, figs. 33, 34.

Single specimens are found in Postglacial deposits of Lundergård mose and in Recent faunas of the Limfjord.

Ammoscalaria Höglund, 1947
Ammoscalaria runiana (Heron-Allen & Earland)
Pl. 1, fig. 2

1916 *Haplophragmium runianum* Heron-Allen & Earland: *Trans. Linn. Soc., Zool. (2)* 11 (13), p. 224, pl. 40, figs. 15–18.

A. runiana is rather common in the Postglacial deposits of Lundergård mose (max. 5 %) and Store Vildmose. In one of the samples from the Limfjord it accounts for 30 % of the total fauna (Knudsen, 1971, p. 155). This species may, however, have been more common in the original assemblages of Postglacial deposits in Lundergård mose. The loosely cemented tests may have been destroyed during sedimentation.

A single specimen has been found in a sample from the North Sea, but the species did not occur in the borings west of the Postglacial barrier at Lundergård.

Trochamminidae Schwager, 1877

Trochammina Parker & Jones, 1859
Trochammina inflata (Montagu)
Pl. 1, figs. 3, 4

1808 *Nautilus inflatus* Montagu: *Supplement to Testacea Britannica.* Woolmer (Exeter), p. 81, pl. 18, fig. 3.

In the Postglacial deposits of Lundergård mose and in samples from the Limfjord this species is rather common (max. 6 %), but it is not found neither in samples from the North Sea, nor in the borings west of the Postglacial barrier.

Jadammina Bartenstein & Brand, 1938
Jadammina polystoma Bartenstein & Brand
Pl. 1, figs. 5–7

1938 *Jadammina polystoma* Bartenstein & Brand: *Senckenbergiana* 20, p. 381, text-figs. 1–3.

J. polystoma accounts for up to 3 % of the total fauna in samples from Postglacial deposits in Lundergård mose and in the Recent Limfjord faunas (Knudsen, 1971). Only very few specimens are found in the Postglacial deposits west of the barrier at Lundergård.

Ataxophragmiidae Schwager, 1877

Eggerella Cushman, 1933
Eggerella scabra (Williamson)

1858 *Bulimina scabra* Williamson: On the Recent Foram. of Great Britain. *Roy. Soc. Publ.*, p. 65, pl. 5, figs. 136, 137.

Very few specimens of this species are found in the Recent North Sea faunas and in the Postglacial deposits west of the barrier at Lundergård. *E. scabra* is frequent in the Recent faunas of the Limfjord, but it is rare in Postglacial deposits of Lundergård mose. It is probable that the original Postglacial assemblages of Lundergård mose also contained a considerable amount of *E. scabra*, and that its very loosely cemented tests have been destroyed later during the sedimentation.

Miliolidea Ehrenberg, 1839
Miliolidae Ehrenberg, 1839

Quinqueloculina d'Orbigny, 1826
Quinqueloculina seminulum (Linné)
Pl. 1, fig. 8

1758 *Serpula seminulum* Linné: *Systema naturae.* Ed. 10. Lipsiae 1, p. 786, pl. 2, fig. 1.

Q. seminulum is common in Recent samples from the North Sea coast and in the borings west of the Postglacial barrier at Lundergård. Only very few specimens are found in Postglacial deposits of Lundergård mose, and in the Recent Limfjord faunas.

Miliolinella Wiesner, 1931
Miliolinella subrotunda (Montagu)

1803 *Vermiculum subrotundum* Montagu: *Testacea Britannica* Hollis (Romsey) 2, p. 521.

This species occurs in most of the fossiliferous samples from Postglacial deposits west of the barrier at Lundergård and from the North Sea coast, but only a single specimen is found in the Postglacial deposits of Lundergård mose.

Pateoris Loeblich & Tappan, 1953
Pateoris hauerinoides (Rhumbler)
Pl. 1, fig. 9

1936 *Quinqueloculina subrotunda* (Montagu), forma *hauerinoides* Rhumbler: *Kieler Meeresforschungen* 1, p. 206, 217, 226, text-figs.167, 208–212.

1953 *Pateoris hauerinoides* (Rhumbler)-Loeblich & Tappan: *Smithsonian Misc. Coll.* 121 (7), p. 42, pl. 6, figs. 8–12, text-figs. 1A, B.

A few specimens are found in Postglacial deposits west of the barrier at Lundergård and in the North Sea samples, but this species is not found in the Postglacial deposits of Lundergård mose and Store Vildmose and not in the Recent Limfjord faunas either.

Nodosariidea Ehrenberg, 1839
Nodosariidae Ehrenberg, 1839

Lagena Walker & Boys, 1784
Lagena laevis (Montagu)

1803 *Vermiculum laevae* Montagu: *Testacea Britannica.* Hollis (Romsey) 2, p. 524.

A single specimen of this species is found in a sample from boring W. 3 west of the Postglacial barrier at Lundergård.

Lagena striata (d'Orbigny), forma *typica*

1839 *Oolina striata* d'Orbigny: *Voyage dans l'Amérique Méridionale-Foraminifères* 5 (5). (Atlas 9, 1847). Paris, p. 21, pl. 5, fig. 12.
1964 *Lagena striata* (d Orbigny), forma *typica* -Feyling-Hanssen: *Norges geol. Unders.* 225, p. 293, pl. 12, figs. 4, 5.

One specimen is found in a sample from boring W. 4 west of the Postglacial barrier at Lundergård.

Polymorphinidae d'Orbigny, 1839

Guttulina d'Orbigny, 1826
Guttulina lactea (Walker & Jacob)

1798 *Serpla lactea* Walker & Jacob: *In* Adams, G. *Essays on the Microscope.* F. Kanmacher. Ed. 2, London, p. 634, pl. 14, fig. 4.

Only a single specimen is found in the Postglacial deposits west of the barrier at Lundergård (boring W. 3).

Guttulina problema d'Orbigny

1826 *Polymorphina problema* d'Orbigny: *Ann. sci. nat. Paris,* (1) 7, p. 266, no. 61.

Few specimens are found in borings W. 3 and W. 4 west of the Postglacial barrier at Lundergård.

Glandulinidae Reuss, 1850

Glandulina d'Orbigny, 1826
Glandulina laevigata d'Orbigny

1826 *Nodosaria (Glandulina) laevigata* d'Orbigny: *Ann. Sci. nat. Paris,* (1) 7, p. 252, pl. 10, figs. 1–3.

One specimen is found in a sample from boring W. 4 west of the Postglacial barrier at Lundergård.

Oolina d'Orbigny, 1839
Oolina acuticosta (Reuss)

1862 *Lagena acuticosta* Reuss: *K. Akad. Wiss. Wien* 44 (1), p. 305, pl. 1, fig. 4.

A single specimen is found in the Postglacial deposits of boring W. 3 west of the barrier.

Fissurina Reuss, 1850
Fissurina crustosa, forma *devia* (Buchner)

1940 *Lagena crustosa,* var. *devia* Buchner: *Novo Acta Leopoldina, N.F.* 9, p. 518, pl. 22, figs. 469–472.

A few specimens are found in the Postglacial deposits of Lundergård mose.

Fissurina laevigata Reuss

1850 *Fissurina laevigata* Reuss: *K. Akad. Wiss. Wien, math. naturwiss. Cl., Denkschr.* 1, p. 366, pl. 46, fig. 1.

Only few specimens of this species occur in the Postglacial deposits of Lundergård mose.

Fissurina lucida (Williamson)

1848 *Entosolenia marginata* (Montagu), var *lucida* Williamson: *Ann. Mag. nat. Hist., London* 2 (1), p. 17, pl. 2, fig. 17.
1953 *Fissurina lucida* (Williamson)-Loeblich & Tappan: *Smithsonian Misc. Coll.* 121 (7), p. 76, pl. 14, fig. 4.

A few specimens are found in the Postglacial deposits of boring W. 4 west of barrier at Lundergård.

Buliminidea Jones, 1875
Buliminidae Jones, 1875
Buliminella Cushman, 1911
Buliminella elegantissima (d'Orbigny)

1839 *Bulimina elegantissima* d'Orbigny: *Voyage dans l'Amérique Méridionale-Foraminifères.* 5 (5). (Atlas 9, 1847). Paris, p. 51, pl. 7, figs. 13, 14.

A few specimens of this species are found in all Postglacial deposits of the Lundergård area. One specimen is found in the Recent Limfjord fauna.

Bulimina d'Orbigny, 1826
Bulimina fossa Cushman & Parker

1938 *Bulimina fossa* Cushman & Parker: *Cushman Lab. Foram. Res., Contr.* 14, p. 56, pl. 9, fig. 10.

One specimen is found in the Postglacial deposits of the Lundergård area.

Bulimina marginata d'Orbigny

1826 *Bulimina marginata* d'Orbigny: *Ann. Sci. nat. Paris* (1) 7, p. 269, pl. 12, figs. 10–12.

This species occurs in most of the fossiliferous samples from the Postglacial deposits west of the barrier at Lundergård and in samples from the North Sea coast. It is not found in the Postglacial deposits of Lundergård mose nor in the Recent Limfjord faunas.

Virgulina d'Orbigny, 1826
Virgulina fusiformis (Williamson)

1858 *Bulimina pupoides*, var. *fusiformis Williamson:* On the Recent Foram. of Great Britain. *Roy. Soc. Publ.*, p. 63, pl. 5, figs. 129, 130.

1964 *Virgulina fusiformis* (Williamson)-Feyling-Hanssen: *Norges geol. Unders.* 225, p. 307, pl. 14, figs. 15–18.

One specimen is found in a sample from the Postglacial deposits of boring W. 4 west of the barrier at Lundergård.

Virgulina loeblichi Feyling-Hanssen

1954 *Virgulina loeblichi* Feyling-Hanssen: *Norsk geol. Tidsskr.* 33, p. 191, pl. 1, figs. 14–18; text-fig. 3.

A few specimens are found in boring W. 4 west of the Postglacial barrier at Lundergård.

Uvigerinidae Cushman, 1913
Uvigerina d'Orbigny, 1826
Uvigerina peregrina Cushman

1923 *Uvigerina peregrina* Cushman: *U.S. natl. Mus., Bull.* 104 (4), p. 166, pl. 42, figs. 7–10.

Single specimens are found in faunas from the North Sea coast and from Postglacial deposits west of the barrier.

Trifarina Cushman, 1923
Trifarina angulosa (Williamson)

1858 *Uvigerina angulosa* Williamson: On the Recent Foram. of Great Britain. *Roy. Soc. Publ.*, p. 67, pl. 5, fig. 140.

One specimen is found in the Postglacial deposits of boring W. 4 west of the barrier at Lundergård.

Bolivinitidae Cushman, 1927
Bolivina d'Orbigny, 1839
Bolivina pseudoplicata Heron-Allen & Earland

1930 *Bolivina pseudoplicata* Heron-Allen & Earland: *J. roy. micr. Soc. London*, (3) 50, p. 81, pl. 3, figs. 36–40.

A few specimens of this species occurs in most fossiliferous samples from the Postglacial deposits of Lundergård mose. Only single specimens are found in the Postglacial deposits west of the barrier at Lundergård.

Bolivina cf. *robusta* Brady

? 1884 *Bolivina robusta* Brady: *Rep. Sci. Results Explor. Voy. Challenger 1873–76, Zool.* 9, p. 421, pl. 53, figs. 7–9.

1947 *Bolivina* cf. *robusta* Brady-Höglund: *Zool. Bidr. Uppsala* 26, p. 270, pl. 24, figs. 8, 9; pl. 32, figs. 16–18; text-fig. 287.

Very few specimens are found in Postglacial deposits of the Lundergård area.

Cassidulinidae d'Orbigny, 1839

Cassidulina d'Orbigny, 1826

Cassidulina crassa d'Orbigny

1839 *Cassidulina crassa* d'Orbigny: *Voyage dans l'Amérique Méridionale-Foraminifères.* 5 (5). (Atlas 9, 1847). Paris, p. 56, pl. 7, figs. 18–20.

A few specimens of *C. crassa* are found in Postglacial deposits west of the barrier at Lundergård and in the Recent North Sea samples. It is not found in the Postglacial deposits of Lundergård mose, and not in Recent faunas from the Limfjord either.

Islandiella Nørvang, 1958

Islandiella norcrossi (Cushman)

1933 *Cassidulina norcrossi* Cushman: *Smithsonian misc. Coll.* 89 (9), p. 7, pl. 2, fig. 7.

Single specimens are found in Postglacial deposits west of the barrier at Lundergård and in samples from the North Sea coast.

Islandiella teretis (Tappan)

1951 *Cassidulina teretis* Tappan: *Cushman Found. Foram. Res., Contr.* 2 (1), p. 7, pl. 1, fig. 30.

One specimen is found in the Postglacial deposits of boring W. 4 west of the barrier at Lundergård.

Discorbidea Ehrenberg, 1838

Discorbidae Cushman, 1927

Buccella Andersen, 1952

Buccella frigida (Cushman)

1922 *Pulvinulina frigida* Cushman: *Contr. Canadian Biol., 1921* (1922), p. 12 (144).

A few specimens of this species occur in samples from Postglacial deposits west of the barrier at Lundergård and also in samples from the North Sea coast.

Rosalina d'Orbigny, 1826
Rosalina obtusa d'Orbigny

1846 *Rosalina obtusa* d'Orbigny: *Foraminiferes fossiles du Bassin Tertiaire de Vienne.* Gide et Comp., Paris, p. 179, pl. 2, figs. 4–6.

A single specimen is found in a sample from the Recent North Sea coast.

Rosalina vilardeboana d'Orbigny

1839 *Rosalina vilardeboana* d'Orbigny: *Voyage dans l'Amérique Méridionale-Foraminifères.* 5 (5). (Atlas 9, 1847). Paris, p. 44, pl. 6, figs. 13–15.

A few specimens are found in samples from Postglacial deposits west of the barrier at Lundergård and from the Recent North Sea coast.

Asterigerinidae d'Orbigny, 1839

Eoeponidella Wickenden, 1949
Eoeponidella laesoeensis Michelsen

1967 *Eoeponidella laesoeensis* Michelsen: *Meddr dansk geol. Foren.* 17, p. 230, pl. 3, figs. 5–8; text-figs. 3–7.

Only single specimens of this species are found in Postglacial deposits west of the barrier at Lundergård.

Asterigerina d'Orbigny, 1939
Asterigerina gürichi gürichi (Franke)

1912 *Discorbina gürichi* Franke: *In* Koch, E., Gripp, K. and Franke, A.: *Beih. Jb. Hamb. wiss. Anst.* 29 (4), p. 29, fig. 8.

1963 *Asterigerina gürichi gürichi* (Franke)-Kümmerle: *Abh. hess. L-amt Bodenforsch.* 45, p. 60, pl. 11,fig. 1 a–c.

Very few specimens occur in samples from Postglacial deposits west of the barrier at Lundergård.

Anomalinidae Cushman, 1927

Anomalina d'Orbigny, 1826
Anomalina globulosa Chapman & Parr
Pl. 1, figs. 10–12

1937 *Anomalina gobulosa* Chapman & Parr: *Australasian Antarctic Exp. 1911–1914, Sci. Repts., Ser. C* 1 (2), p. 117, pl. 9, fig. 27.

A. globulosa occurs in most of the fossiliferous samples from Postglacial deposits in Lundergård mose, but the species never accounts for more than 1 % of the total fauna. A few specimens are found in the Postglacial deposits west of the barrier and in the Recent North Sea faunas.

Hyalinea Hofker, 1951
Hyalinea baltica (Schroeter)

1783 *Nautilus balthicus* Schroeter: Einleitung in die Conchylienkentniss nach Linné. *J. J. Gebauer (Halle)* 1, p. 20, pl. 1, fig. 2.

Very few specimens are found in Postglacial deposits west of the barrier at Lundergård.

Orbitoididea Schwager, 1876
Planorbulinidae Schwager, 1877

Cibicides Montfort, 1808
Cibicides lobatulus (Walker & Jacob)
Pl. 1, figs. 13–14

1798 *Nautilus lobatulus* Walker & Jacob: *In* Adams, G.: *Essays on the Microscope.* F. Kanmacher. Ed. 2, London, p. 642, pl. 14, fig. 36.

C. lobatulus accounts for up to 3 % of the total fauna in Postglacial deposits west of the barrier at Lundergård, and it is also common in samples from the North Sea coast (max. 10 %). This species is not found in Postglacial deposits of Lundergård mose nor in the Recent Limfjord faunas.

Cibicides pseudoungerianus (Cushman)

1922 *Truncatulina pseudoungerianus* Cushman: *U.S. geol. Surv. Prof. Paper* 129-E, p. 97, pl. 20, fig. 9.

One specimen is found in a sample from the Recent North Sea coast.

Nonionidea Subbotina, 1959
Nonionidae Schultze, 1854

Nonion, Montfort, 1808
Nonion barleeanum (Williamson)

1858 *Nonionina barleeanum* Williamson: On the Recent Foram. of Great Britain. *Roy. Soc. Publ.,* p. 32, pl. 3, figs. 68, 69.

A single specimen is found in the Postglacial deposits of boring W. 3 west of the barrier at Lundergård.

Nonion depressulus (Walker & Jacob)
Pl. 1, fig. 15

1798 *Nautilus depressulus* Walker & Jacob: *In:* Adams, G.: *Essays on the Microscope.* F. Kanmacher. Ed. 2, London, p. 641, fig. 33.

1971 *Nonion depressulus* (Walker & Jacob)-Murray: *An Atlas of British Recent Foraminiferids.* Heinemann Educational Books, London, p. 192, pl. 82, figs. 1–8.

A few specimens occur in most of the fossiliferous samples from Postglacial deposits of the Lundergård area.

Nonion labradoricum (Dawson)

1860 *Nonionina labradorica* Dawson: *Canadian Nat.* 5, p. 191, fig. 4.

Only very few specimens are found in samples from Postglacial deposits west of the barrier at Lundergård.

Pullenia Parker & Jones, 1862
Pullenia bulloides (d'Orbigny)

1826 *Nonionina bulloides* d'Orbigny: *Ann. Sci. nat. Paris,* (1) 7, p. 293, no. 2.

Single specimens of *P. bulloides* are found in Postglacial deposits west of the barrier and in samples from the Recent North Sea coast.

Elphidiidae Galloway, 1933

Elphidium Montfort, 1808
Elphidium albiumbilicatum (Weiss)
Pl. 2, fig. 1

1954 *Nonion pauciloculum* Cushman, subsp. *albiumbilicatum* Weiss: *U.S. geol. Survey, Prof. Paper* 254-G, p. 157, pl. 32, figs. 1, 2.

This species occurs in nearly all fossiliferous samples from Postglacial deposits of the Lundergård area (max. 2 %), and also in Recent samples from the Limfjord and from the North Sea coast.

Elphidium articulatum (d'Orbigny)
Pl. 2, fig. 2

1839 *Polystomella articulata* d'Orbigny: *Voyage dans l'Amérique Méridionale-Foraminifères.* 5 (5). Atlas 9, 1847). Paris, p. 30, pl. 3, figs. 9, 10.

1968 *Cribrononion articulatum* (d'Orbigny)-Lutze: *Meyniana* 18, p. 27, pl. 1, figs. 1, 2.

In the Postglacial deposits of Lundergård mose this species usually accounts for 5–15 % of the total fauna. One of the samples from Recent faunas of the Limfjord contains 13 % (Knudsen, 1971, p. 155), whereas the species is more frequent in the shallowest water of the Limfjord. *E. articulatum* accounts for up to 4 % of the Postglacial faunas west of the barrier at Lundergård, and in samples from the North Sea coast it only accounts for 1 % of the total fauna.

Elphidium bartletti Cushman

1933 *Elphidium bartletti* Cushman: *Smithsonian misc. Coll.* 89 (9), p. 4, pl. 1, figs. 9.

A single specimen is found in the Recent fauna of the North Sea coast.

Elphidium excavatum (Terquem)
Pl. 2, fig. 3

1875 *Polystomella excavata* Terquem: *Essay sur le Classement des Animaux qui vivent sur la Plage et dans les environs de Dunkerque.* Paris, p. 25, pl. 2, fig. 2.
1971 *Elphidium clavatum* Cushman-Knudsen, *in* Feyling-Hanssen et al., p. 273, pl. 11, figs. 10–13; pl. 20, figs. 5–8.

This species usually accounts for less than 5 % of the total fauna in the Postglacial deposits of Lundergård mose. In the Postglacial deposits west of the barrier and in samples from the North Sea coast the percentage varies from 34 to 49. Most frequently *E. excavatum* occurs as the boreal forma *selseyense* (Feyling-Hanssen, 1972) in the present material.

Elphidium gerthi van Voorthuysen
Pl. 2, fig. 4

1957 *Elphidium gerthi* van Voorthuysen: *Med. geol. Sticht., N. S.,* 11 p. 32, pl. 23, fig. 12.

E. gerthi occurs in nearly all fossiliferous samples from Postglacial deposits of Lundergård mose and from the Limfjord, usually accounting for up to 1 % of the fauna. Only a few specimens are found in Postglacial deposits west of the barrier at Lundergård.

Elphidium gunteri Cole
Pl. 2, fig. 5

1931 *Elphidium gunteri* Cole: *Florida State geol. Surv., Bull., Tallahassee* 6, p. 34, pl. 4, figs. 9, 10.

A few specimens of *E. gunteri* are found in Postglacial deposits of the Lundergård area.

Elphidium incertum (Williamson)
Pl. 2, fig. 6

1858 *Polystomella umbilicatula,* var. *incerta* Williamson: On the Recent Foram. of Great Britain. *Roy. Soc. Publ.,* p. 44, pl. 3, fig 82a.

In Postglacial deposits west of the barrier at Lundergård and in the Recent North Sea samples this species usually accounts for 2–5 % of the total fauna. *E. incertum* occurs in some of the samples from Postglacial deposits in Lundergård mose and from the Recent Limfjord faunas, but it is usually less frequent in these deposits.

Elphidium macellum (Fichtel & Moll)
Pl. 2, fig. 7

1798 *Nautilus macellus* Fichtel & Moll: *Testacea Microscopica.* Vienna (Second ed. 1803), p. 66, var. B, pl. 10, figs. h–k.

E. macellum occurs scattered in all the Postglacial deposits of the Lundergård area, and also in samples from the Recent North Sea coast.

Elphidium magellanicum Heron-Allen & Earland
Pl. 2, fig. 8

1932 *Elphidium magellanicum* Heron-Allen & Earland: *Discovery Rep., Cambridge* 4, p. 440, pl. 16, figs. 26–28.

This species occurs in nearly all samples from Postglacial deposits of the Lundergård area and also in the Recent fauna from the North Sea coast. It usually accounts for less than 1 % (max. 3 %) of the total fauna.

Elphidium margaritaceum Cushman
Pl. 2, fig. 9

1930 *Elphidium advenum* (Cushman), var. *margaritaceum* Cushman: *U.S. natl. Mus., Proc.* 77, Art. 6, p. 25, pl. 10, fig. 3.

E. margaritaceum is a common species in the Postglacial deposits, where it usually accounts for 2–10 % of the total fauna (max. 43 %). In Postglacial deposits west of the barrier at Lundergård this species accounts for up to 2 % of the fauna, and a single specimen is found in a Recent North Sea fauna.

Elphidium subarcticum Cushman

1944 *Elphidium subarcticum* Cushman: *Cushman Lab. Foram. Res., spec. Publ.* 12, p. 27, pl. 3, figs. 34, 35.

Scattered specimens of this species occur in Postglacial deposits west of the barrier at Lundergård and in Recent faunas from the Limfjord and from the North Sea coast.

Protelphidium Haynes, 1956
Protelphidium anglicum Murray
Pl. 2, figs. 10, 11

1965 *Protelphidium anglicum* Murray: *Cushman Found. foram. Res., Contr.* 16, p. 149, 150, pl. 25, figs. 1–5; pl. 26, figs. 1–6.

P. anglicum is one of the most frequent species in Postglasial deposits of Lundergård mose and in Recent faunas of the Limfjord, where it usually accounts for 5–20 % of the total fauna. In samples from Postglacial deposits west of the barrier at Lundergård and in Recent North Sea faunas, this species usually accounts for less than 10 % of the fauna.

Protelphidium orbiculare (Brady)

1881 *Nonionina orbicularis* Brady: *Quart. J. micr. Sci.* 21, p. 415, pl. 21, fig. 5.

A few specimens are found in Postglacial deposits west of the barrier at Lundergård and in samples from the Recent North Sea coast.

Rotaliidea Ehrenberg, 1839
Rotaliidae Ehrenberg, 1839
Ammonia Brünnich, 1772
Ammonia batavus (Hofker)
Pl. 2, figs. 12, 13

1951 *Streblus batavus* Hofker: *Siboga Exped., Monogr.* 46 (3), p. 492, 501, fig. 340.

This species is one of the dominant in Postglacial and Recent faunas of the Lundergård area. In Postglacial deposits in Lundergård mose it usually accounts for 40–80 %, and in Postglacial deposits west of the barrier it usually accounts for 20–40 % of the fauna.

Acknowledgements. I wish to express my most sincere thanks to Dr. Rolf W. Feyling-Hanssen, leader of the Micropalaeontological department in Århus, for helpful suggestion and discussions during the present work. The borings were carried out by our laboratory workers Mr. S. Aa. Meldgaard and Mr. K. Geer assisted by students. Mrs. L. Ø. Mogensen typed the manuscript, Mrs. Gissel Nielsen drew the figures, Mr. S. Aa. Meldgaard prepared the photographs for the plates, and the English text was improved by Dr. J. R. Wilson. My thanks are due to all these helpers. The Geological Survey of Denmark kindly made material available for comparison and Statens Naturvidenskabelige Forskningsråd provided financial support.

Dansk sammendrag

Marine Postglaciale aflejringer i Lundergård mose repræsenterer, ligesom tilsvarende aflejringer ved Løkken (Knudsen, 1971), de inderste forgreninger af en fjord, som under *Littorina*-transgressionen strakte sig fra Limfjorden over Store Vildmose mod nord og nordvest. Foraminiferfaunaen i de Postglaciale aflejringer i Lundergård mose svarer til Recente boreale brak- og lavtvandsfaunaer. Der er stor lighed, dels med Postglaciale faunaer fra Løkken området og fra Store Vildmose, dels med Recente faunaer fra Limfjorden. Foraminiferfaunaen i Postglaciale aflejringer i Lundergård mose adskiller sig derimod klart fra den Recente fauna i Vesterhavet. Foraminiferfaunaerne bekræfter Jessen's (1905, 1918 og 1920) tidligere antagelse, at den Postglaciale fjord ved Lundergård ligesom ved Løkken har været adskilt fra Vesterhavet. Mens den afspærrende barriere nu er eroderet bort ved Løkken, ligger den bevaret som en flad ryg vest for Lundergård mose. En boring umiddelbart vest for mosen indeholder ingen marine Postglaciale aflejringer, mens fire boringer endnu længere vestpå indeholder Postglaciale faunaer, som har stor lighed med den Recente fauna i Vesterhavet. Disse aflejringer må repræsentere sedimenter fra vestsiden af den afspærrende barriere ved Lundergård.

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Plate 1

Fig. 1. *Miliammina fusca* (Brady) 269
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Fig. 2. *Ammoscalaria runiana* (Heron-Allen & Earland) 270
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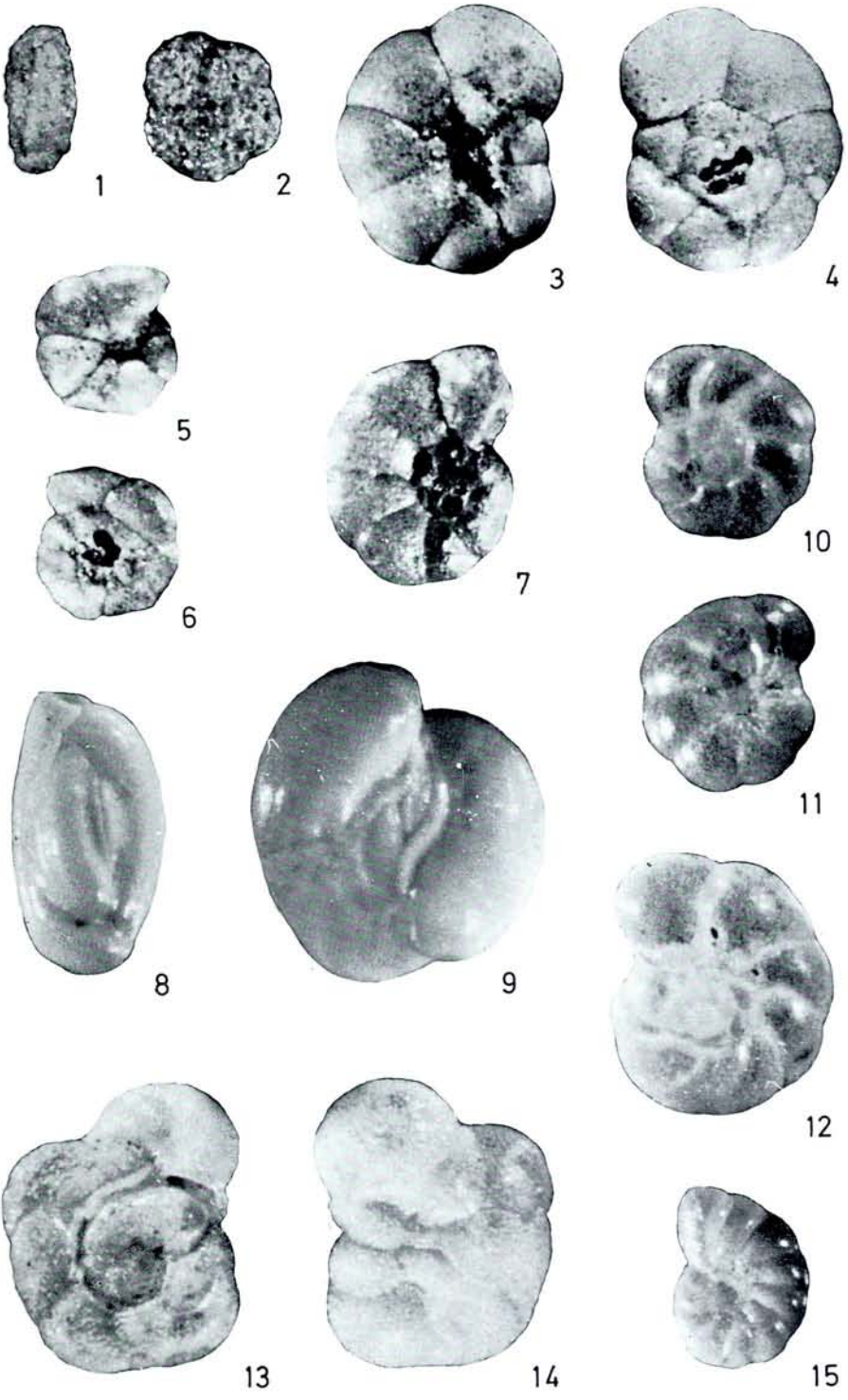
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Plate 2

Fig. 1. *Elphidium albiumbilicatum* (Weiss) 278
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Fig. 2. *Elphidium articulatum* (d'Orbigny) 278
Specimen from Postglacial deposits of boring IV (spl. no. 23) in Lundergård mose; ×75.

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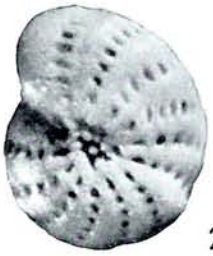
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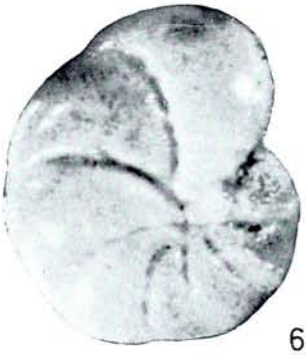
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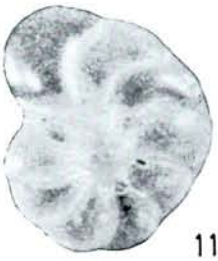
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Plate 3

Fig. 1. Foraminiferal assemblage from the Postglacial deposits of boring VII (spl. no. 6) in Lundergård mose; ×35.

Fig. 2. Foraminiferal assemblage from the Postglacial deposits of boring VII (spl. no. 5) in Lundergård mose; ×35.

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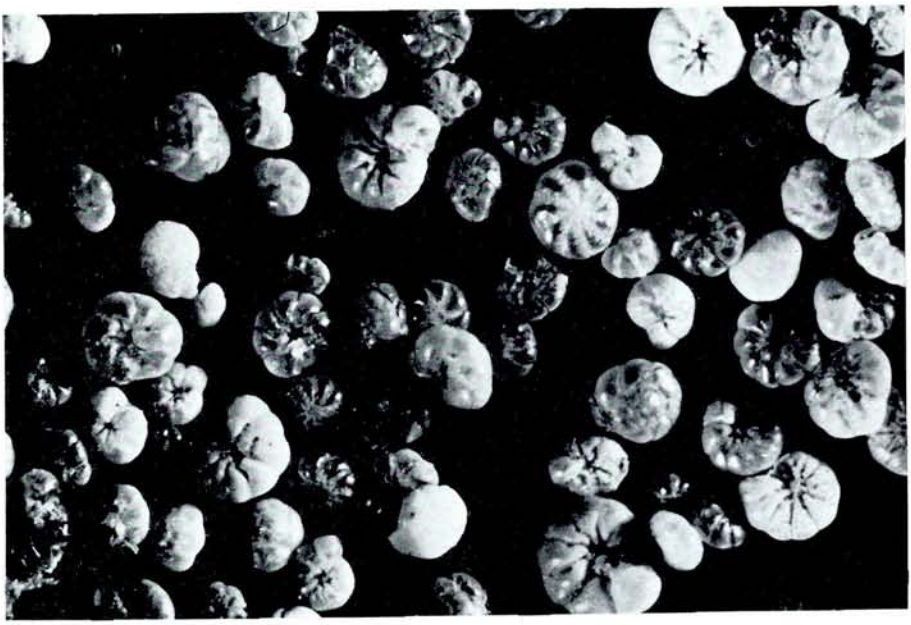

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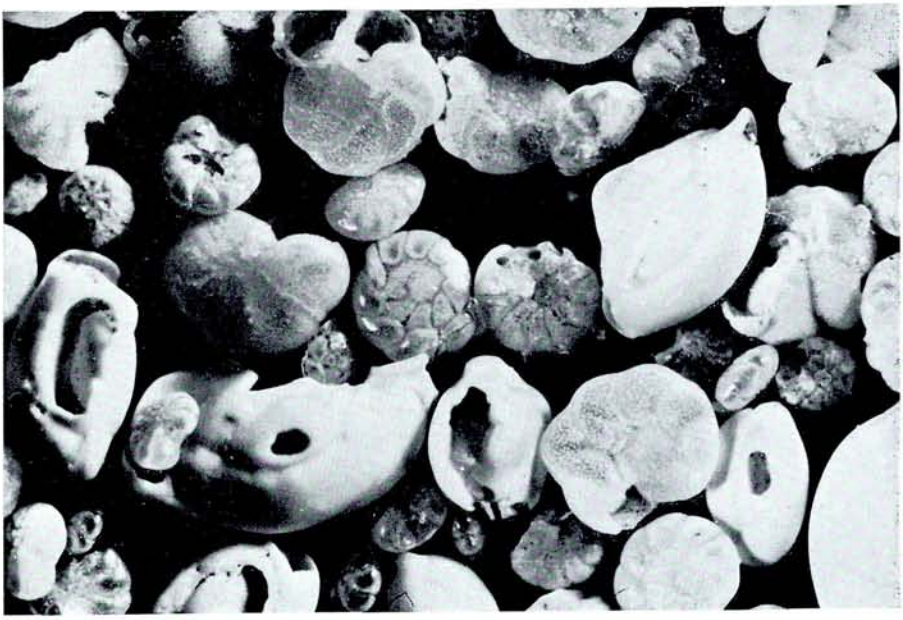
Plate 4

Fig. 1. Foraminiferal assemblage from the Recent North Sea beach; ×35.

Fig. 2. Foraminiferal assemblage from the Postglacial deposits of boring W. 4 west of the barrier at Lundergård; ×35.



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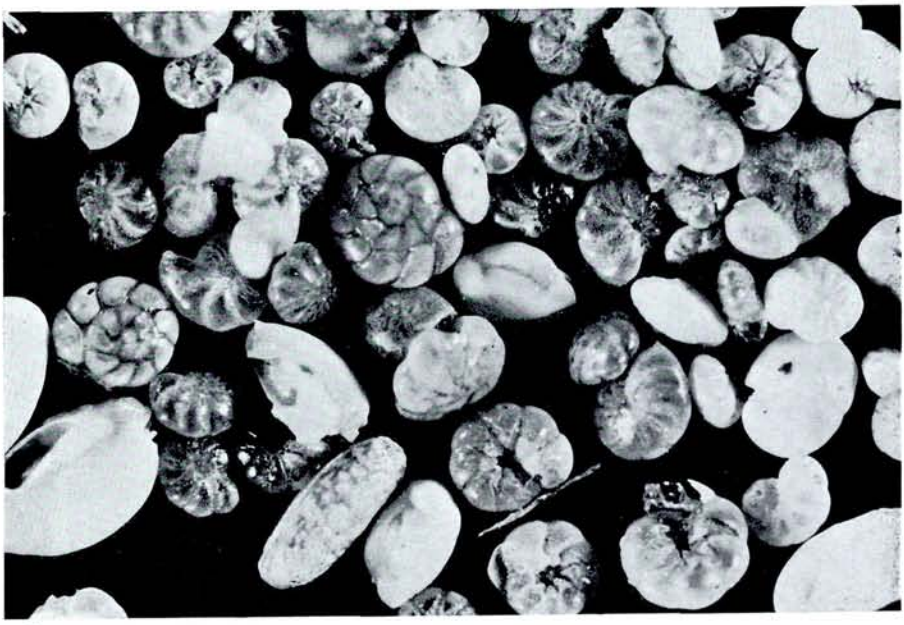

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