

SITE N700

This site has a seabed of fine muddy sand, and there is no evidence of bed modification by benthic currents. Benthic populations were quite small, but diverse when photographed in March 1995; the community was much more populous and vigorous when photographed in August, 1996 - the surface was being reworked continuously, mainly by the irregular spatangoid sea urchin *Spatangus raschi*. There were also dense populations of small, white brittlestars *Ophiecten gracilis*, and tube-dwelling cerianthid anthozoans that are bent over with their tentacle crowns facing in the same direction. (The anthozoans were leaning generally towards the NW at the time of the photographs, but no instrumental benthic current data are available for this site at the time of photography and so the behaviour of these animals cannot be correlated with known current-directions. Comparison with surface-current data derived from tide tables and tidal-stream atlases is too unreliable to be conclusive. It is perhaps likely, however, that the anthozoans face towards the weak currents prevailing at the time.) The site was visited twice: twenty-seven shots were taken in March 1995, and twenty-four were taken in August 1996.

Reference No: **II/53/2/7:**

Site: N700
Cruise: Challenger CH128B
Position: 56° 38.68' N
09° 07.12' W
Depth: 746 m
Date: 2nd August 1996.
Time: 23:48:53 GMT

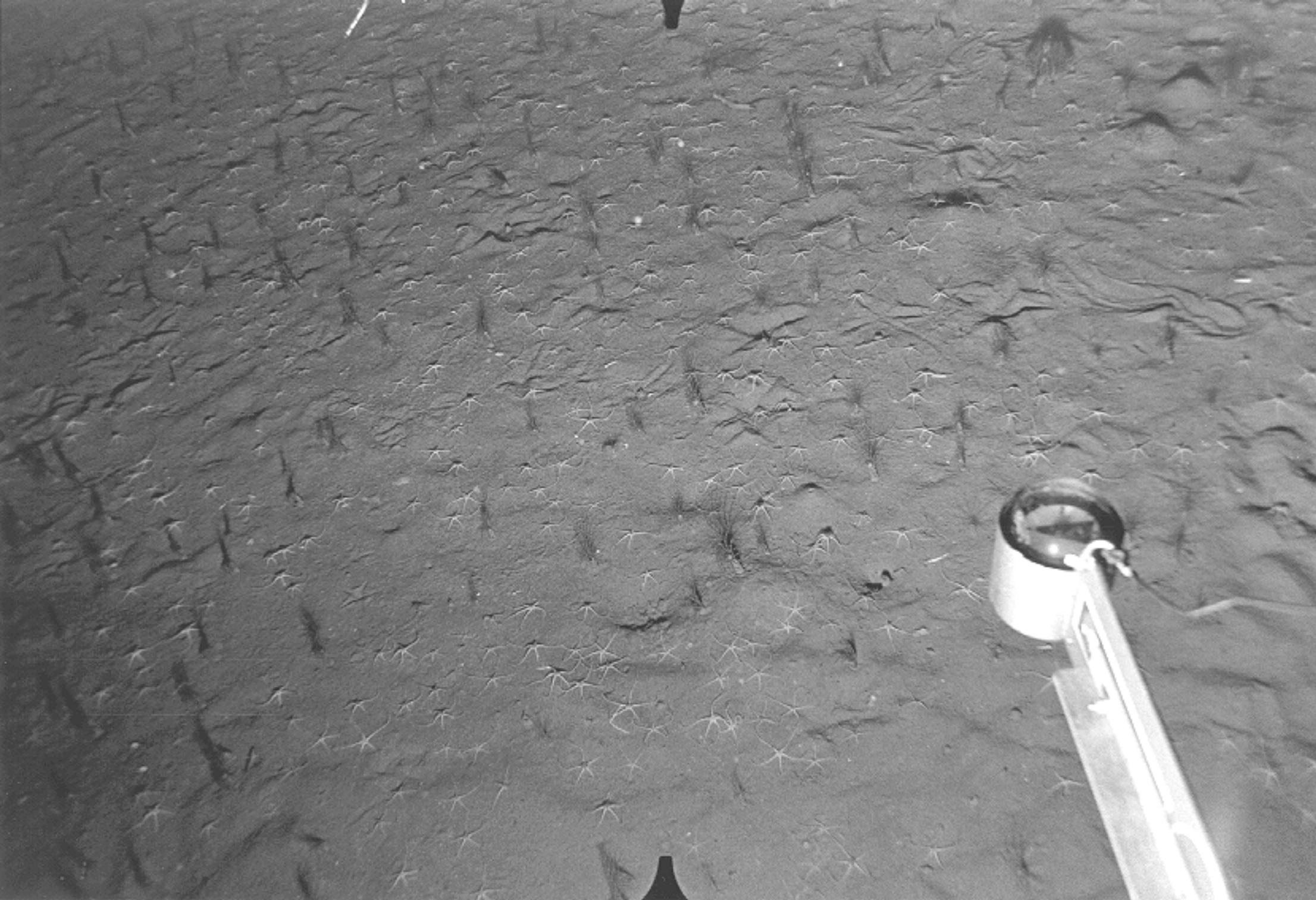
This site, with a seabed of muddy sand or sandy mud, has a quiet hydrodynamic environment - there is no bed-modification by benthic currents. However, the bed is being reworked vigorously by the feeding-activities of sea-urchins and perhaps by a slow "levelling" by the many white brittlestars *Ophiocten gracilis* (up to a disc diameter of about 1 cm, overall diameter up to 3 - 5 cm approx.). Many tube-dwelling cerianthid anthozoans are leaning towards the NNW, arms fully extended. Two irregular spatangoid sea urchins *Spatangus raschi* (8 cm diameter approx.) are seen, together with large starfish imprints (12 cm diameter overall approx.). The view looks towards the ENE.



Reference No: *II/53/2/9*:

Site: N700
Cruise: Challenger CH128B
Position: 56° 38.67' N
09° 07.16' W
Depth: 747 m
Date: 2nd August 1996.
Time: 23:50:46 GMT

This site has a quiet hydrodynamic environment - there was no bed-modification by benthic currents at the time the photograph was taken. However there is a slow levelling of possible old mud or sand ridges by many white brittlestars, *Ophiecten gracilis*, (disc diameter up to 1 cm approx, overall diameter up to 3 - 5 cm approx). Whether the ridges were formed by near-bottom currents or by biological activity is uncertain. There are also many tube-dwelling cerianthid anthozoans leaning towards the NNW, arms fully extended. There is one irregular spatangoid sea urchin *Spatangus raschi* (8 cm diameter approx), several starfish imprints (12 cm diameter overall approx) and two synphobranchid eels (15 cm long approx). Two 'volcano mounds' formed by burrowing benthic organisms are visible at top right. A smaller mound, with an opening visible at its crest, can be seen just right of centre. The view looks towards the ENE.



Reference No: *II/53/3/11*:

Site: N700
Cruise: Challenger CH128B
Position: 56° 38.66' N
09° 07.16' W
Depth: 748 m
Date: 2nd August 1996.
Time: 23:52:56 GMT

This site has a quiet hydrodynamic environment - there is no bed modification by benthic currents. However, there is considerable bioturbation - the long, sinuous feeding-tracks of sea urchins (very probably *Spatangus raschi*) are very clear. There are tube-dwelling cerianthid anthozoans leaning towards the NNW, arms fully extended, and a few white brittlestars, *Ophiecten gracilis* (disc-diameter up to 1 cm approx., overall diameter up to 3 – 5 cm approx.). There are several sea star imprints (to 12 cm diameter overall approx.) and the pale test of a dead sea urchin (3cm in diameter approx.). A "dimpled" track from the lower-left to the upper right could indicate the recent passage of a thick-spined (cidarid) sea urchin. The view looks towards the NE.



Reference No: **II/53/4/17A:**

Site: N700
Cruise: Challenger CH128B
Position: 56° 38.59' N
09° 07.27' W
Depth: 758 m
Date: 3rd August 1996.
Time: 00:00:36 GMT

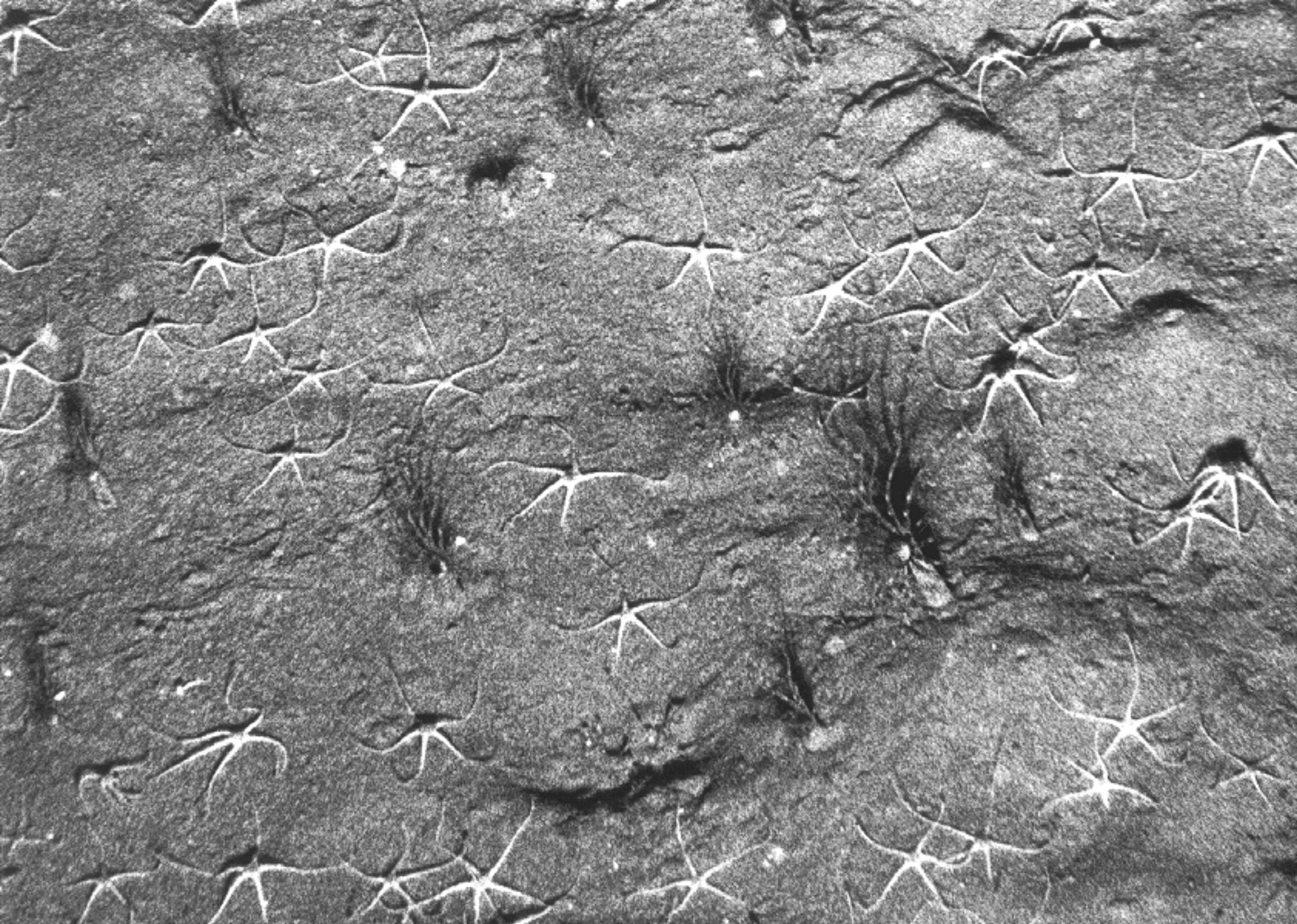
This site has a quiet hydrodynamic environment - there is no bed-modification by benthic currents. There is, however considerable bioturbation - there are a few degraded feeding-tracks of sea-urchins and probably a slow "levelling" by the white brittlestars *Ophiocten gracilis* (up to a disc-diameter of 1cm approx, overall diameter up to 3 - 5 cm approx.). Many tube-dwelling cerianthid anthozoans are leaning towards the NW, arms fully extended. There is one irregular spatangoid sea urchin *Spatangus raschi* (8 cm diameter approx.) and several starfish imprints (12 cm diameter overall approx.). The view looks towards the NE.



Reference No: **II/53/2/9** (part-frame enlargement):

Site: N700
Cruise: Challenger CH128B
Position: 56° 38.67' N
09° 07.16' W
Depth: 747 m
Date: 2nd August 1996.
Time: 23:50:46 GMT

This shows an enlargement of a dense community of the white brittle star *Ophiecten gracilis* (disc-diameter up to 1 cm approx., overall diameter up to 3 - 5 cm approx.), and tube-dwelling cerianthid anthozoans; (the contrast has been maximised to differentiate the anthozoans from the background). The colour-banded arms of the anthozoans appear to be held out stiffly, probably into the weak current prevailing at the time. The arms of the *Ophiecten* overlap in many cases.



Reference No: *II/35/1/7*:

Site: N700
Cruise: Charles Darwin CD91B
Position: 56° 38.37' N approx.
09° 06.31' W approx.
Depth: 686 m approx.
Date: 29th March 1995.
Time: 23:50 GMT approx.

This picture shows a bed of fine muddy sand: the presence of fine biologically-induced marks is interpreted as evidence for lack of hydrodynamic reworking. The surface is, however, being bioturbated by a varied community of sea-urchins and starfish. The thick-spined sea urchins (probably *Cidaris cidaris*, overall-diameter 15 cm approx., test-diameter 4 cm approx.) have left trails of small dimples all over the surface: these dimples are made by their spines during locomotion. The rigid spines are articulated at their basal attachment and are used like oars to propel the urchin along. The irregular spatangoid sea urchins *Spatangus raschi* (diameter 7cm approx.) leave different but characteristic trails resembling tank-tracks. These are made by the wave-like movement of short spines on their lower surface. In this photograph they are not forming the deeper "plough" marks shown in other pictures. There is a small hermit crab beside the sea urchin near the centre of the picture. The large sea star (probably *Plutonaster bifrons*) is about 17 cm across the arms. Small, white brittlestars, *Ophiecten gracilis* (some partially-buried) are seen over the whole picture-area. The benthic community appears rather inactive. The view looks towards the NE.



Reference No: *II/35/1/10*:

Site: N700
Cruise: Charles Darwin CD91B
Position: 56° 38.32' N approx.
09° 06.30' W approx.
Depth: 686 m approx.
Date: 29th March 1995.
Time: 23:56 GMT approx.

In this picture, the bed is of fine muddy sand which shows no evidence of hydrodynamic reworking. There is a moderate population of the white brittlestar *Ophiocten gracilis*, (disc-diameter up to 1 cm approx., overall diameter up to 3 – 5 cm), a thick-spined sea-urchin (probably *Cidaridiscus cidaris*), overall-diameter 7 cm approx., and a sea cucumber (probably *Laetmogone rosea*), length 22 cm approx. The sea star imprint visible just to the right of centre was probably made by the specimen that is almost completely buried, but whose central disc is still just visible at the centre of a faint radial imprint nearer the sea urchin. The view looks towards the North.



Reference No: **II/35/2/14**:

Site: N700
Cruise: Charles Darwin CD91B
Position: 56° 38.30' N approx.
09° 06.28' W approx.
Depth: 686 m approx.
Date: 30th March 1995.
Time: 00:04 GMT approx.

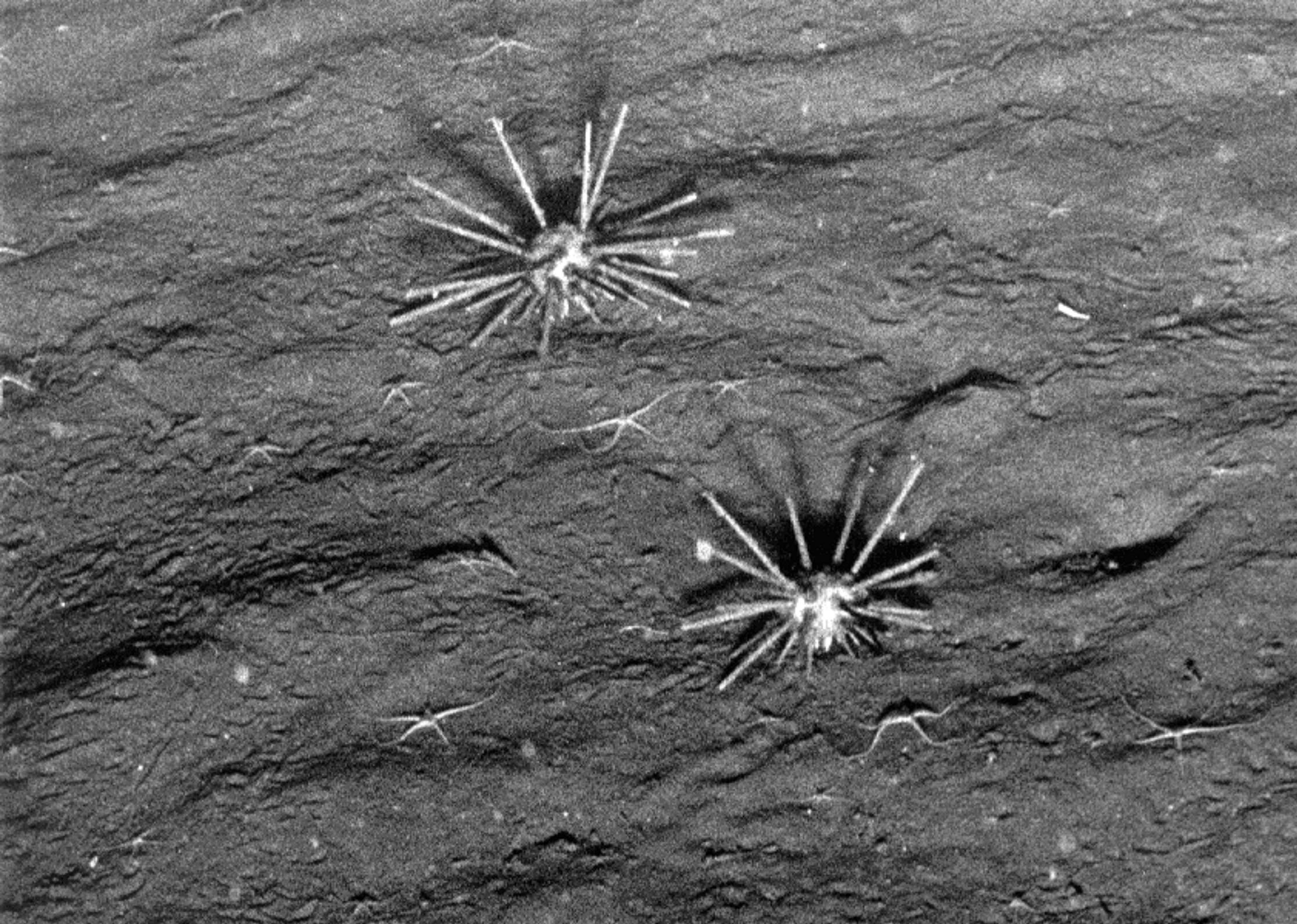
This picture shows a bed of fine muddy sand which displays no evidence of hydrodynamic reworking. *Ophiocten gracilis* (the small, white brittlestars, disc-diameter up to 1cm approx., overall-diameter up to 3 – 5 cm approx.) are present; some show a posture where the central disc is raised off the sea bed, supported by the flexed arms. This is similar to the posture seen in photograph **II/41/5/26**, but contrasts with that seen in others (e.g. photograph **II/57/3/11**) where the brittle stars are flattened against the seabed. Several synphobranchid eels (length 15 cm approx.) and a small flatfish, possibly a halibut *Hippoglossus hippoglossus* (length 20 cm approx.) are also visible. There is an excavation, possibly made by a decapod prawn, in the foreground; it is approx. 20 cm long (but depth cannot be determined accurately) and the steep walls indicate the cohesive nature of the muddy sediments. A small whelk (neogastropod) is leaving a trail to the left of the compass. To the right of the large burrow, a fine but sharp-edged track may be formed by a scaphopod, whose shell may be just visible at the top end of it. The view looks towards the SSW.



Reference No: **II/35/3/16** (part-frame enlargement):

Site: N700
Cruise: Charles Darwin CD91B
Position: 56° 38.29' N approx.
09° 06.27' W approx.
Depth: 686 m approx.
Date: 30th March 1995.
Time: 00:08 GMT approx.

Two thick-spined sea-urchins (*Cidaris cidaris*) are moving across the soft sediment surface leaving characteristic trails of dimples. The spines can be seen to be fouled with attached epizooites. Some of the white brittlestars, *Ophiecten gracilis*, that are visible may be partly buried in the surface layer of sediment.



Reference No: *II/35/4/25* (part-frame enlargement):

Site: N700
Cruise: Charles Darwin CD91B
Position: 56° 38.22' N approx.
09° 06.24' W approx.
Depth: 686 m approx.
Date: 30th March 1995.
Time: 00:30 GMT approx.

White brittlestars, *Ophiocten gracilis*, are showing a posture where the central disc is raised off the bed supported by the five arms that are flexed. In some cases the arm tips are touching the arms of other individuals.

