SITE N2000

This site has a bed predominantly of mud: when photographed in May 1996, there was no evidence of benthic hydrodynamic activity. When photographed in August 1996, however, there was definite evidence of weak, steady currents flowing towards the Northeast. There is an active benthic community, comprised mainly of the bushy growths of the gorgonian soft coral *Acanella arbuscula*, the large brittlestar *Ophiomusium lymani* and sea-urchins, *Echinus affinis*. Twenty-seven photographs were taken in May 1996, and twenty-six were taken in August 1996.

Reference No: II/48/5/22A:

Site:	N2000
Cruise:	Challenger CH126B
Position:	56º 59.74' N
	10º 00.02' W
Depth:	2058 m
Date:	9th May 1996.
Time:	07:30:56 GMT

This picture shows a muddy seafloor that displays no evidence of sediment reworking by benthic currents: however, there is considerable bioturbation. In the centre of the picture, there is a series of recent, irregular gouges, perhaps caused by a fish feeding, close to a partial rosette of feeding grooves (diameter 30 cm approx.) which surround a central hole, possibly made by an echiuran or polychaete worm. In the background there are several large brittlestars *Ophiomusium lymani* (disc-diameter 15 – 20 mm approx., and overall diameter 15 cm approx.), and at the top-left, the coiled "bedspring" may be the egg-cocoon of an undescribed parasitic turbellarian worm (family, Fecampidae). In the central foreground there is a small, white sea urchin (probably *Echinus affinis*) which appears to be leaving a faint track to the right. Towards the lower left, the bushy growth of a gorgonian soft coral, *Acanella arbuscula*, (seen feeding actively, with polyps extended fully), about 15 cm high and 8 cm across rises from a "root" about 1 cm thick, which also supports a much smaller (perhaps younger?) growth about 2 cm high. The "root" lies in a depression, and appears, from the lineation in the sediment, to have been exposed by the movements of the large brittlestar *Ophiomusium lymani* (disc diameter 2 cm approx.) at the base of the gorgonian; this association was seen many times in the pictures taken at this depth. However, *Ophiomusium lymani* were sometimes seen in depressions without *Acanella*, as in the central background: the pit nearby has a clear radial pattern of marks around its sides. Close inspection of the original photograph shows the whole area to be covered with faint linear tracks. The view faces towards the ENE.

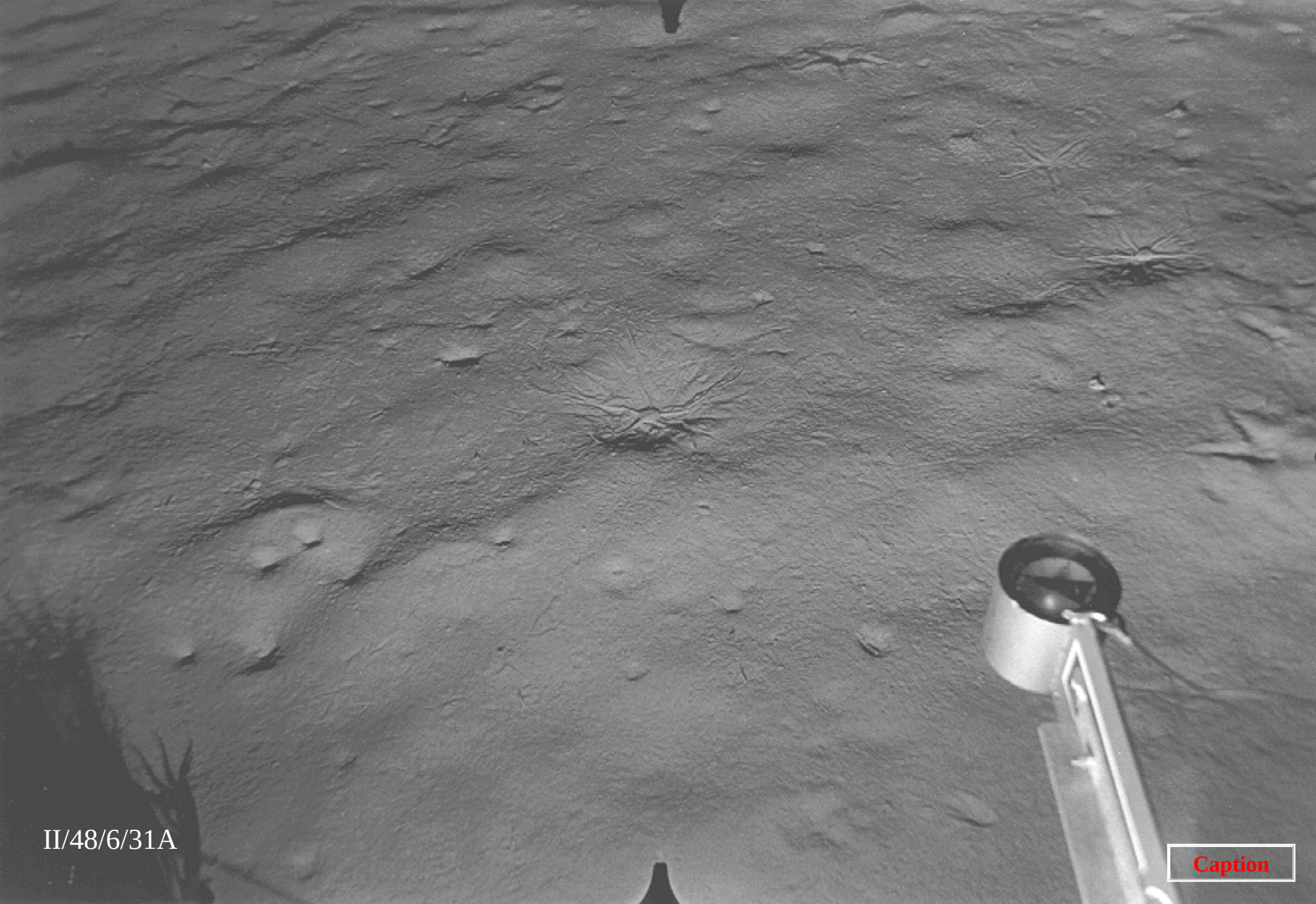
II/48/5/22A

Caption

Reference No: II/48/6/31A:

Site:	N2000
Cruise:	Challenger CH126B
Position:	56º 59.69' N approx.
	10º 00.06' W approx.
Depth:	2057 m
Date:	9th May 1996.
Time:	07:44:55 GMT

This picture shows a muddy seafloor which displays no evidence of sediment-reworking by benthic currents: however, there is extensive bioturbation, much of it in the form of pits, many of which have openings. At the top left, there is a degraded spoke pattern around a central hole. In the centre of the picture, a large brittlestar *Ophiomusium lymani* (disc diameter 2.5 cm approx., overall diameter 30 cm approx., tip to tip) rests in a depression: the animal is actively moulding the walls of the depression by the movement of its arms, which can be seen to have created a series of sinuous radial grooves. Another individual is doing similarly near the top right: nearly the whole of the picture-area shows faint signs of surface-disturbance by these or similar creatures. At the bottom left, there is a large, dark, branched colonial coelenterate (maybe 15 cm+ high). The view faces towards the ENE.



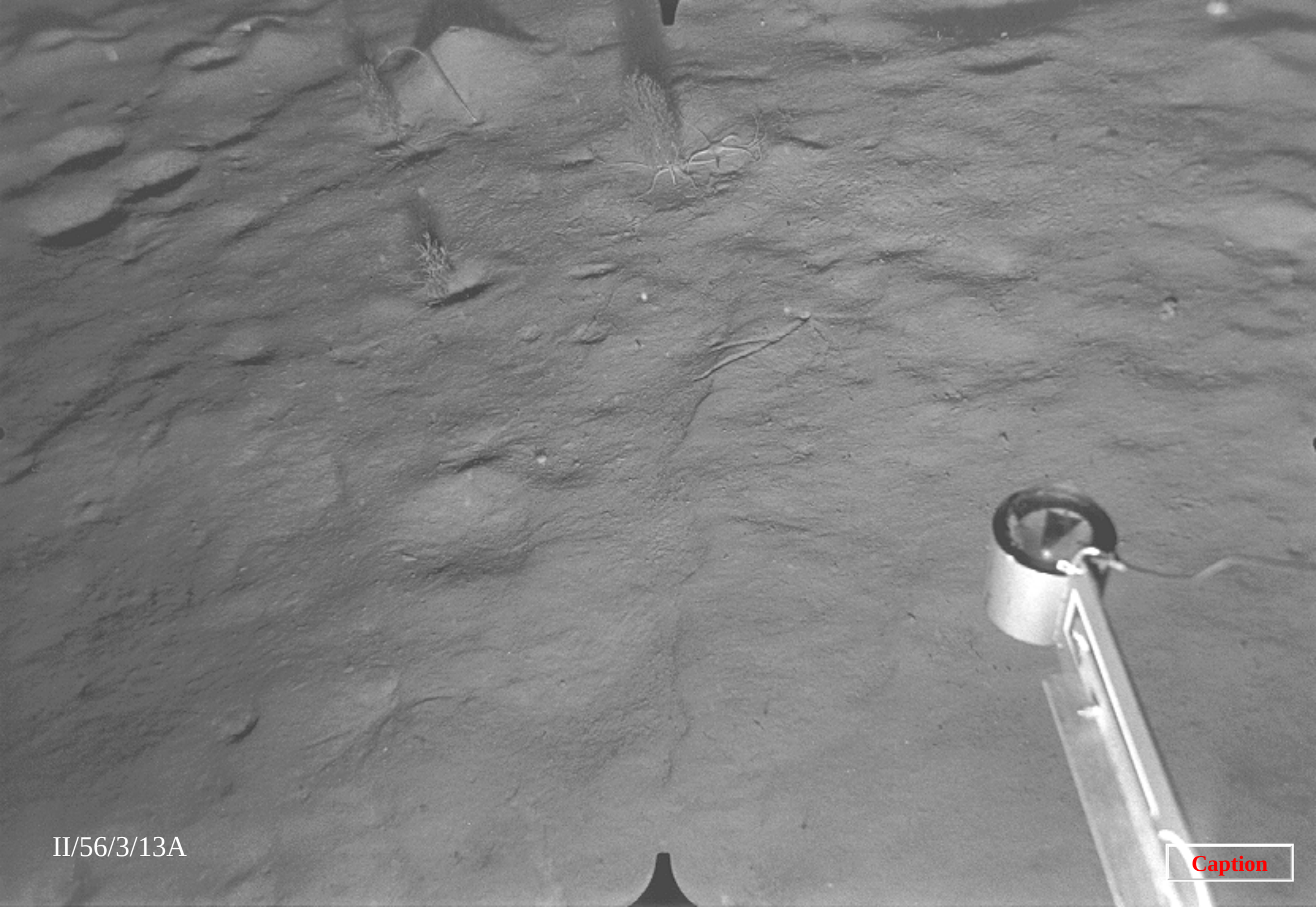
II/48/6/31A

Caption

Reference No: II/56/3/13A:

Site:	N2000
Cruise:	Challenger CH128B
Position:	56º 59.68' N
	10º 01.15' W
Depth:	2069 m
Date:	6th August 1996.
Time:	00:33:51 GMT

This photograph shows a muddy seafloor with a faint extended ridge (at least 80 cm long, extending up the centre of the picture); the origin of this ridge is uncertain. There is also considerable bioturbation, with several mounds and burrows towards the top-left. Near the centre, there is a small white sea-urchin *Echinus affinis*, diameter 1 cm approx., and a hole with a single, bifurcated feeding groove, possibly made by an echiuran worm. In the background, there are three gorgonian soft corals *Acanella arbuscula*: that nearest the camera appears to be dying, showing partially-denuded, white supporting skeleton. The large, healthy specimen (centre-top) is about 15 cm tall and 8 cm across, and is growing up from a slight depression which has probably been dug by the two large brittlestars *Ophiomusium lymani* (disc diameter 2 cm approx.) resting in it. Towards the top-left, a long, thin pennatulid is "rooted" close to the third gorgonian. Blurred, white marks across the picture indicate the presence of light "snow". The view faces towards the SSE.



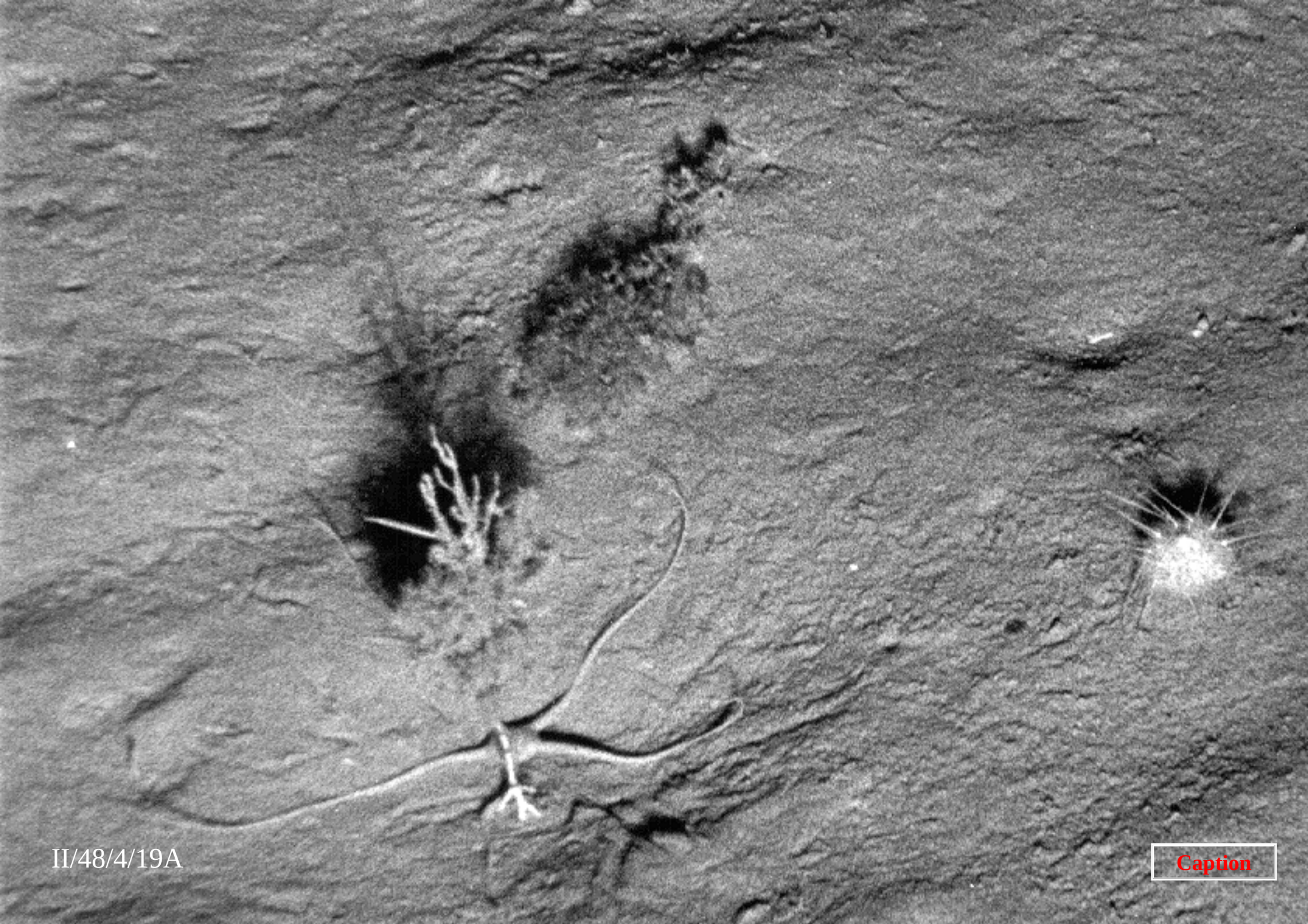
II/56/3/13A

Caption

Reference No: II/48/4/19A (part-frame enlargement):

Site:	N2000
Cruise:	Challenger CH126B
Position:	56º 59.76' N
	10º 00.02' W
Depth:	2057 m
Date:	9th May 1996.
Time:	07:24:46 GMT

A gorgonian soft coral *Acanella arbuscula* rises from a slight depression in the muddy seabed. The depression has probably been caused by the movements of the large brittlestar *Ophiomusium lymani* (disc diameter 1.5 cm approx.), and the white "roots" of the coral have become exposed. This may have affected the health of the Gorgonian colony: the upper branches are white and bare, although the lower branches are still covered in polyps. A second colony lies behind the first: it is covered in active, feeding polyps, but appears to have fallen over. To the right is a white sea-urchin, *Echinus affinis*.



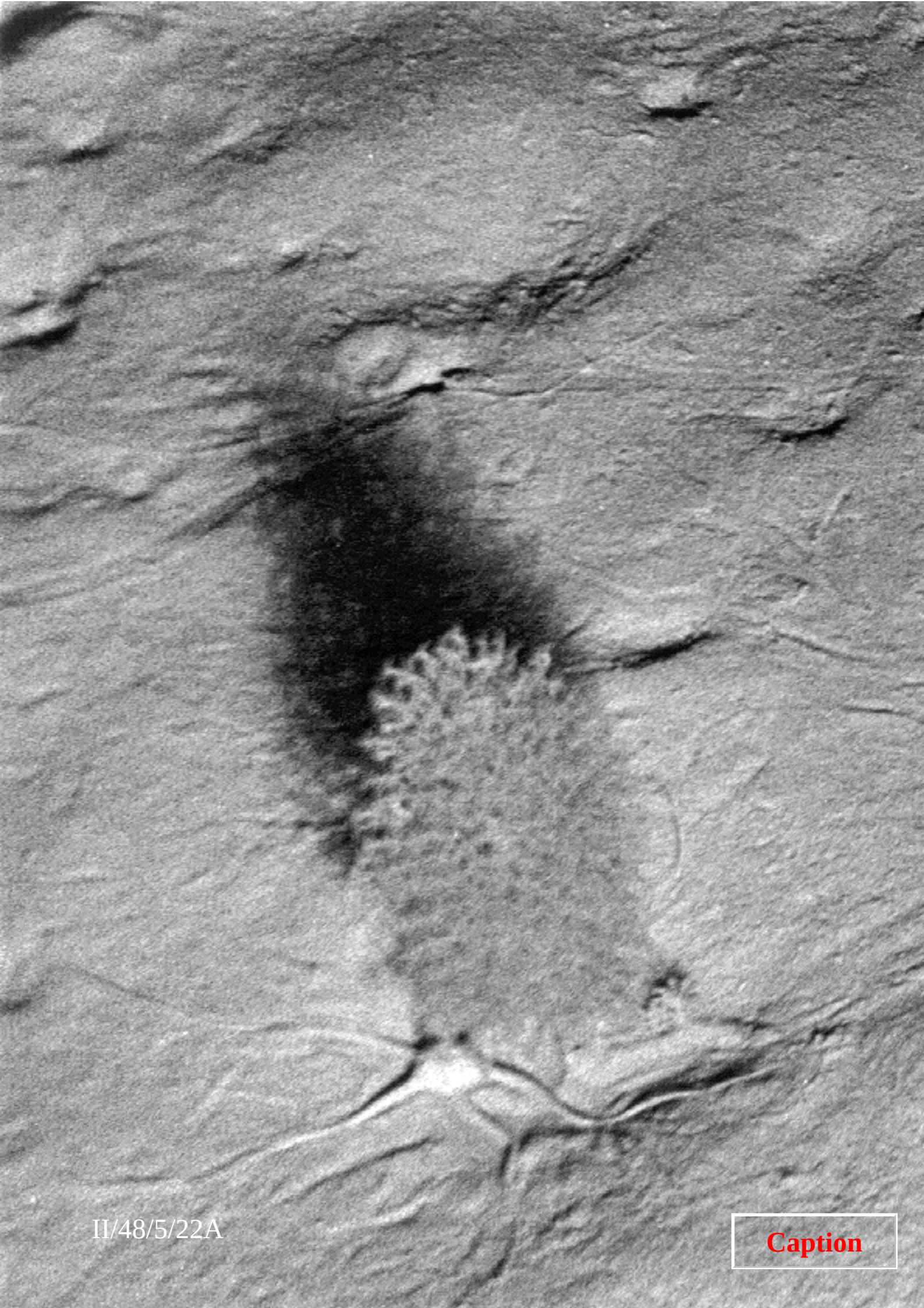
II/48/4/19A

Caption

Reference No: II/48/5/22A (part-frame enlargement):

Site:	N2000
Cruise:	Challenger CH126B
Position:	56º 59.74' N
	10º 00.02' W
Depth:	2058 m
Date:	9th May 1996.
Time:	07:30:56 GMT

A gorgonian soft coral *Acanella arbuscula* rises from a slight depression in the muddy seabed. The depression has probably been caused by the movements of the large brittlestar *Ophiomusium lymani* (disc diameter 1.5 cm approx.), and the "root" of the gorgonian (thickness approx. 1 cm) has become exposed: from this "root", what appears to be a small, developing colony, approx. 2 cm high, is growing close by. The larger colony is covered with active, extended, feeding polyps, and may be about 15 cm high and 8 cm across. The muddy surface is densely marked with tracks and the faint resting traces of many sea stars (probably brittle stars) and with burrow openings, some of which are large and funnel-shaped. Further, there may be tracks of other animals present, (perhaps of sea urchins and gastropods): these are not visibly degraded by any hydrodynamic activity.



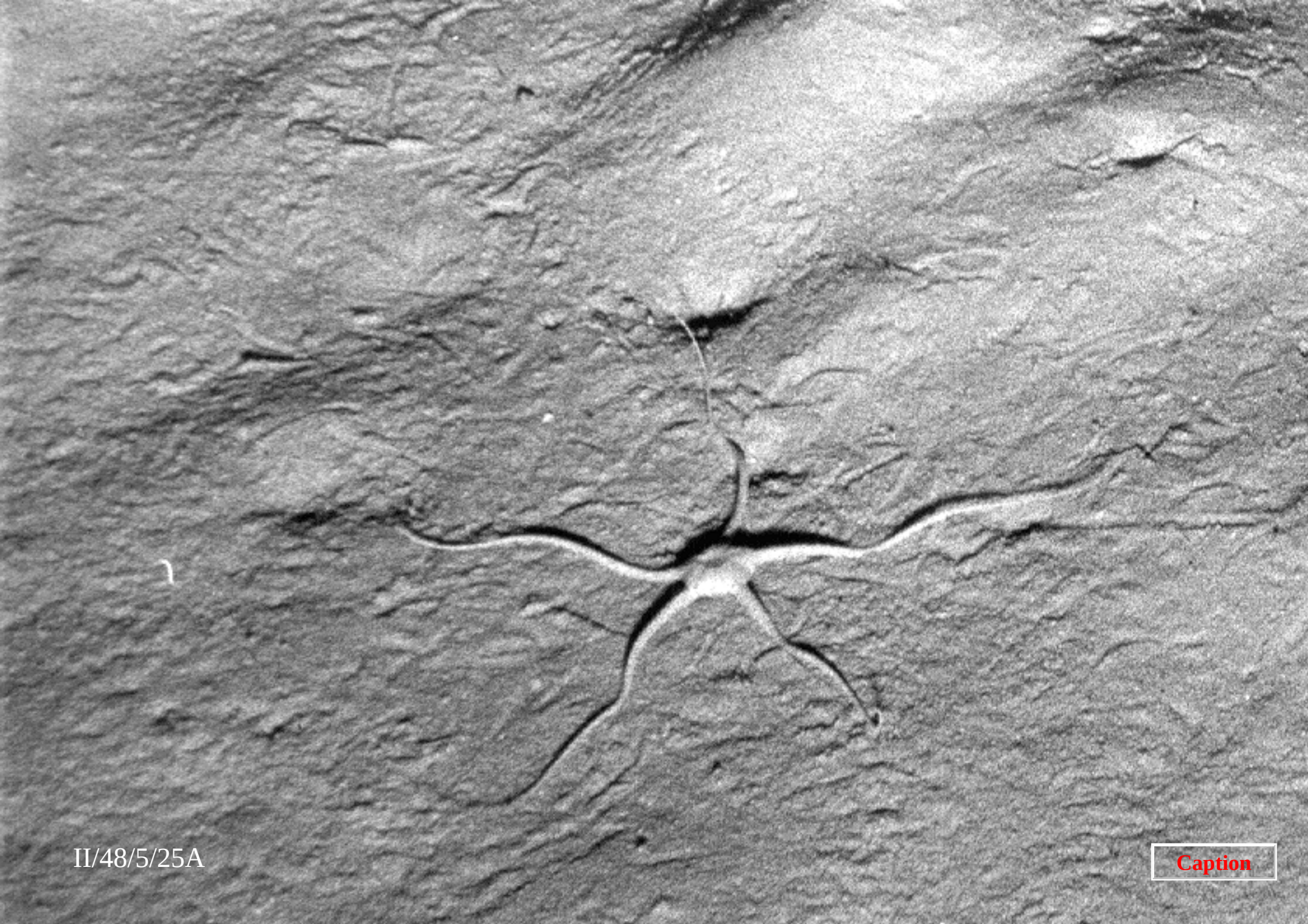
II/48/5/22A

Caption

Reference No: II/48/5/25A (part-frame enlargement):

Site:	N2000
Cruise:	Challenger CH126B
Position:	56º 59.72' N
	10º 00.03' W
Depth:	2058 m
Date:	9th May 1996.
Time:	07:36:48 GMT

A large brittlestar, *Ophiomusium lymani*, lies on the muddy surface which is extensively marked, probably by the passage of this and many similar animals. This brittle star (see also photograph II/56/4/22A) has a noticeable depression in the central disc that is not obvious in trawled specimens brought to the surface. Pits and mounds are seen in the background.



II/48/5/25A

Caption

Reference No: II/48/5/27A (part-frame enlargement):

Site:	N2000
Cruise:	Challenger CH126B
Position:	56º 59.71' N
	10º 00.05' W
Depth:	2058 m
Date:	9th May 1996.
Time:	07:40:47 GMT

A white sea-urchin, *Echinus affinis*, rests on the muddy seabed which exhibits a number of holes and mounds. The stippled "texture" in the bed near the sea urchin and around the mound at bottom left may have been caused by the spines of the urchin in the course of movement and feeding. Near the top-right, there is a conical mound of faecal pellets and there is a blurred fleck of marine snow towards the top left.

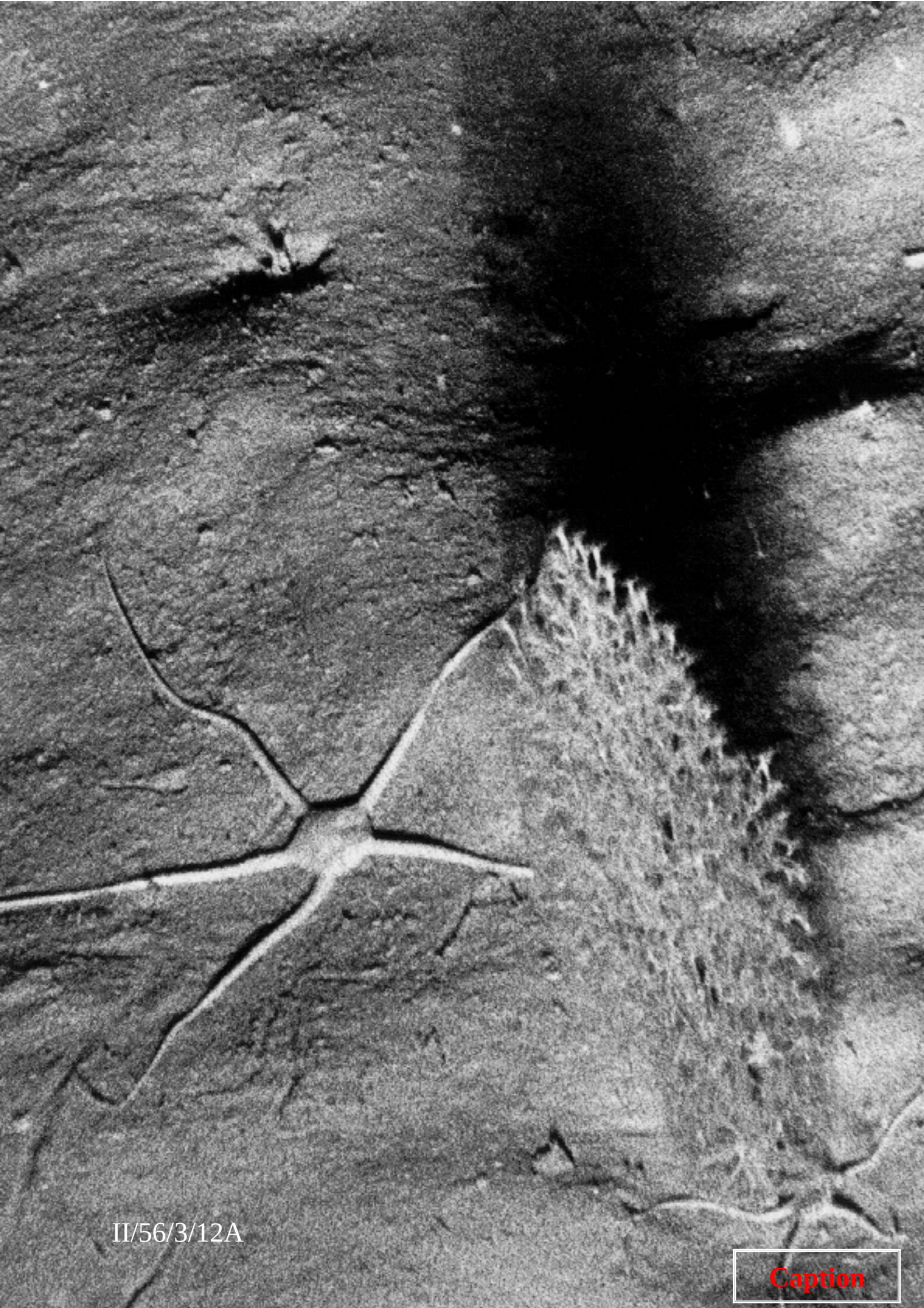
II/48/5/27A

Caption

Reference No: II/56/3/12A (part-frame enlargement):

Site:	N2000
Cruise:	Challenger CH128B
Position:	56º 59.68' N
	10º 01.14' W
Depth:	2069 m
Date:	6th August 1996.
Time:	00:32:23 GMT

Two healthy colonies of the gorgonian soft coral *Acanella arbuscula* rise from the muddy seabed. The colonies are perhaps 15 cm high and 6 cm wide, and are separated by about 10 cm (separation of the colonies is not clear because they are almost in line). The polyps of both colonies are feeding with bodies extended and tentacles outspread. There is a large brittlestar *Ophiomusium lymani* (disc-diameter >2 cm) in the background; there is a smaller specimen at the base of the nearer gorgonian. The larger specimen shows a deformity in the inter-radius between the two arms on the right that probably represents a regeneration scar after a fish "bite". The sediment is heavily bioturbated, with an abundance of burrow openings and low mounds. This picture has been processed for maximum contrast to differentiate the organisms from the bed.



II/56/3/12A

Caption

Reference No: II/56/3/13A (part-frame enlargement):

Site:	N2000
Cruise:	Challenger CH128B
Position:	56º 59.68' N
	10º 01.15' W
Depth:	2069 m
Date:	6th August 1996.
Time:	00:33:51 GMT

In the foreground, a gorgonian soft coral *Acanella arbuscula* appears to be dying, showing partially exposed, white "branches". The large, healthy specimen to the right is about 15 cm tall and 8 cm across, and is growing up from a slight depression which has probably been dug by the two large brittlestars *Ophiomusium lymani* (disc diameter 2 cm approx.) resting in it. Towards the top-left, a long, whip-like pennatulid is "rooted" close to the third gorgonian, the latter showing some signs of stress - it is less "thick and bushy". The "volcano" mound behind the pennatulid has an apical hole from which sediment is probably ejected periodically by the burrowed animal.

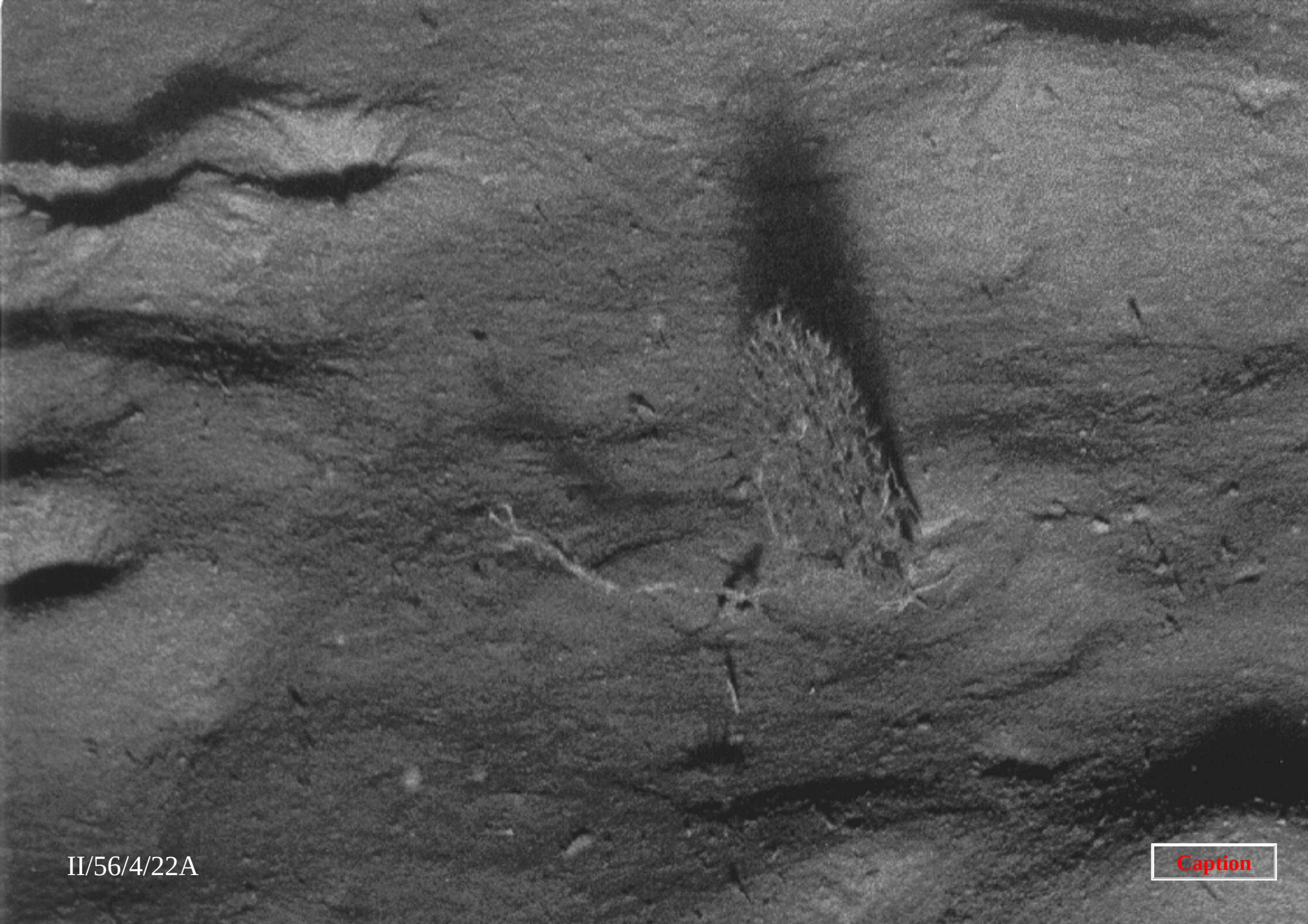
II/56/3/13A

Caption

Reference No: II/56/4/22A (part-frame enlargement):

Site:	N2000
Cruise:	Challenger CH128B
Position:	56º 59.68' N
	10º 01.21' W
Depth:	2070 m
Date:	6th August 1996.
Time:	00:42:55 GMT

This healthy gorgonian soft coral is growing close to the remains of another specimen (perhaps derived from the same "root"? - cf. photograph II/48/5/22A). Only the "trunk" and a few terminal "branches" of the dead colony remain, lying prostrate across the muddy surface.



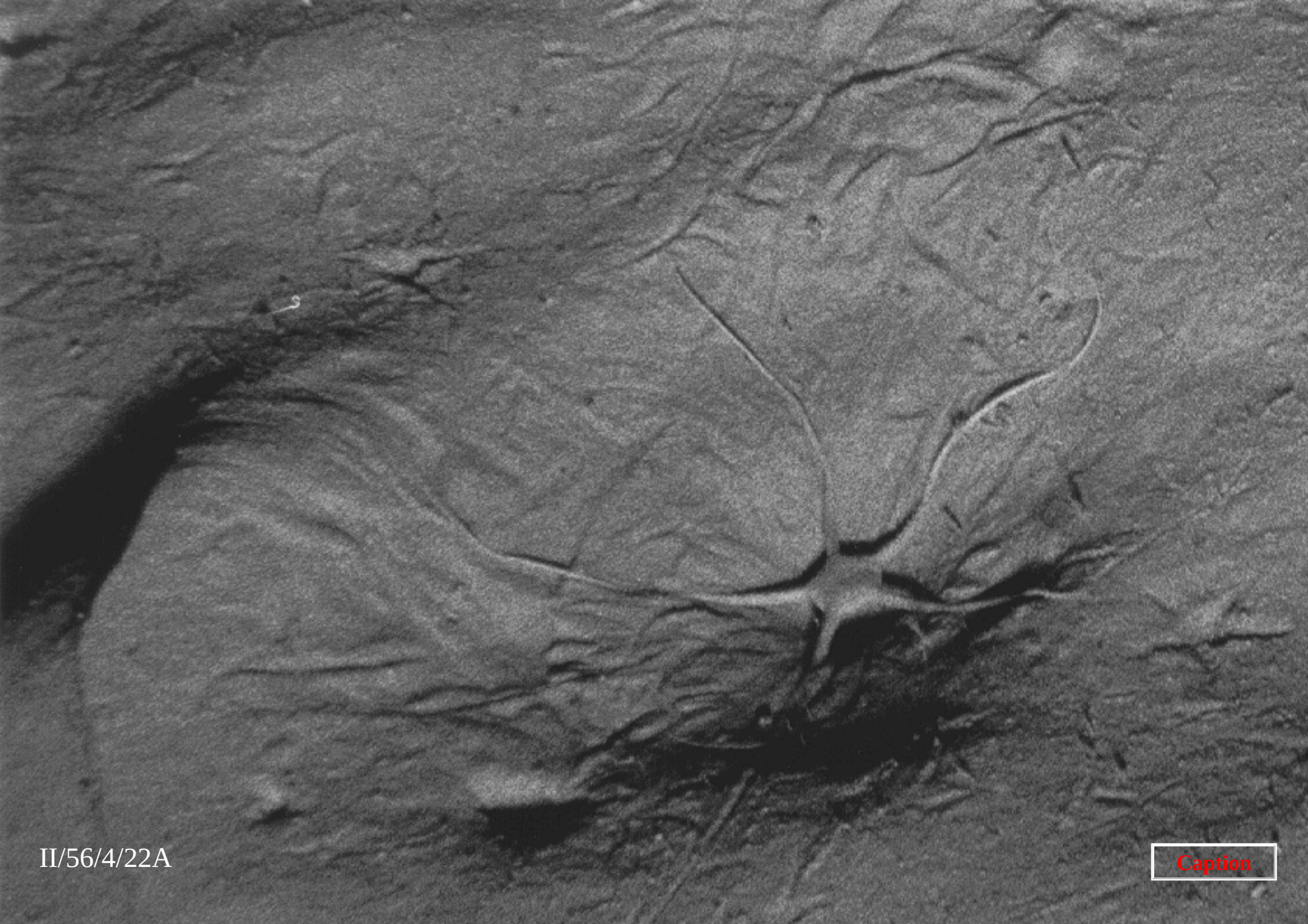
II/56/4/22A

Caption

Reference No: II/56/4/22A (part-frame enlargement):

Site:	N2000
Cruise:	Challenger CH128B
Position:	56º 59.68' N
	10º 01.21' W
Depth:	2070 m
Date:	6th August 1996.
Time:	00:42:55 GMT

A large brittlestar *Ophiomusium lymani*, with a depression in the upper surface of its central disc (see also photograph II/48/5/25A) which has a diameter of 1.5 cm approx., rests on the muddy seabed. The mud surface has been finely marked, probably by this and other brittle stars. There is a blurred fleck of "snow" near the left-hand edge.



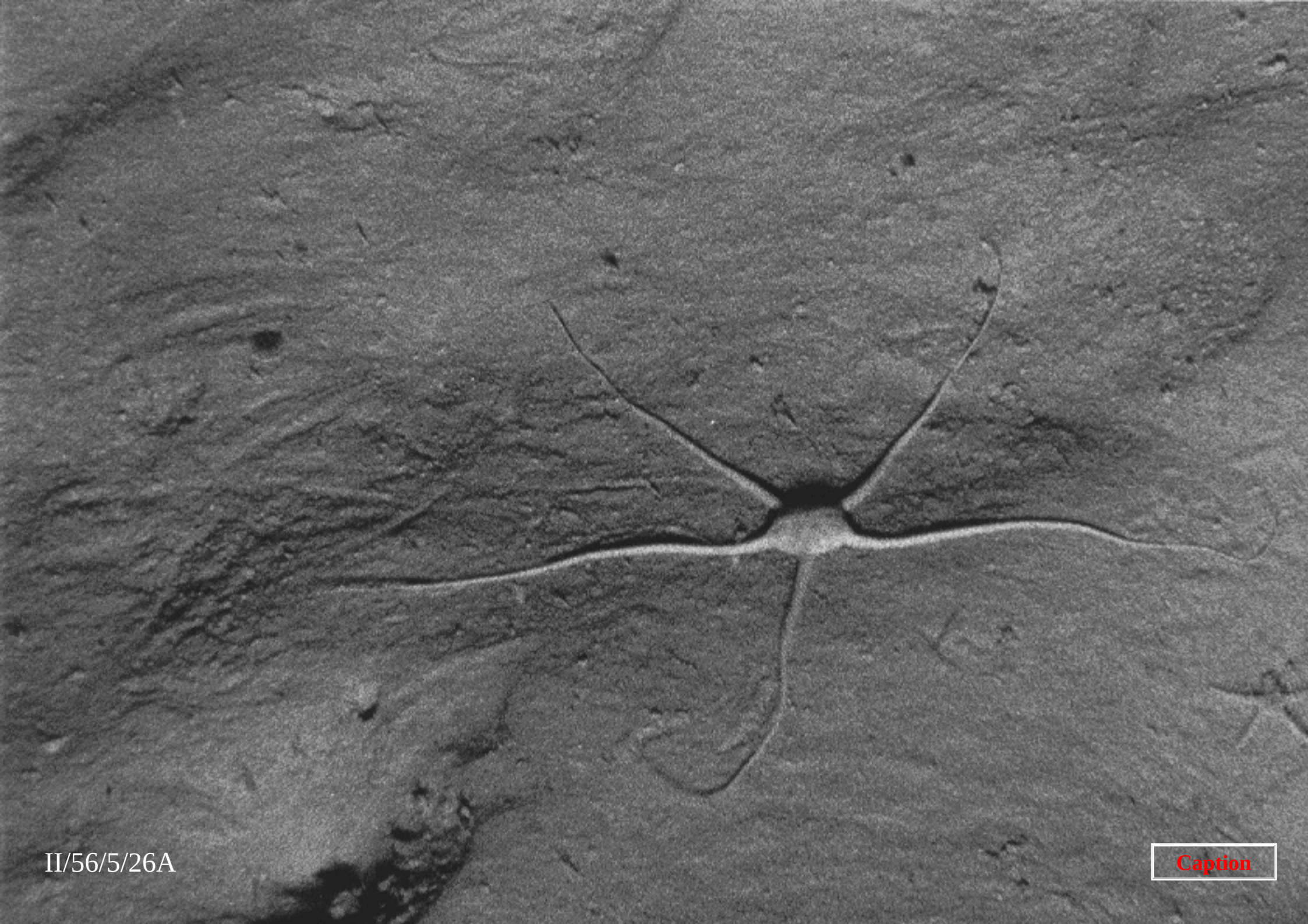
II/56/4/22A

Caption

Reference No: II/56/5/26A (part-frame enlargement):

Site:	N2000
Cruise:	Challenger CH128B
Position:	56º 59.70' N
	10º 01.24' W
Depth:	2071 m
Date:	6th August 1996.
Time:	00:47:37 GMT

A large brittlestar *Ophiomusium lymani* seems to be actively digging in a hole in the muddy seabed: one of its arms is partially buried in the wall of the hole. However, it is unknown whether these animals are capable of excavating sediment in this way, or merely re-moulding an existing depression. The crest of the mound to the left is being peaked by a current moving towards the left. There are several small star-shaped resting traces visible that may have been formed by sea stars as well as brittle stars.



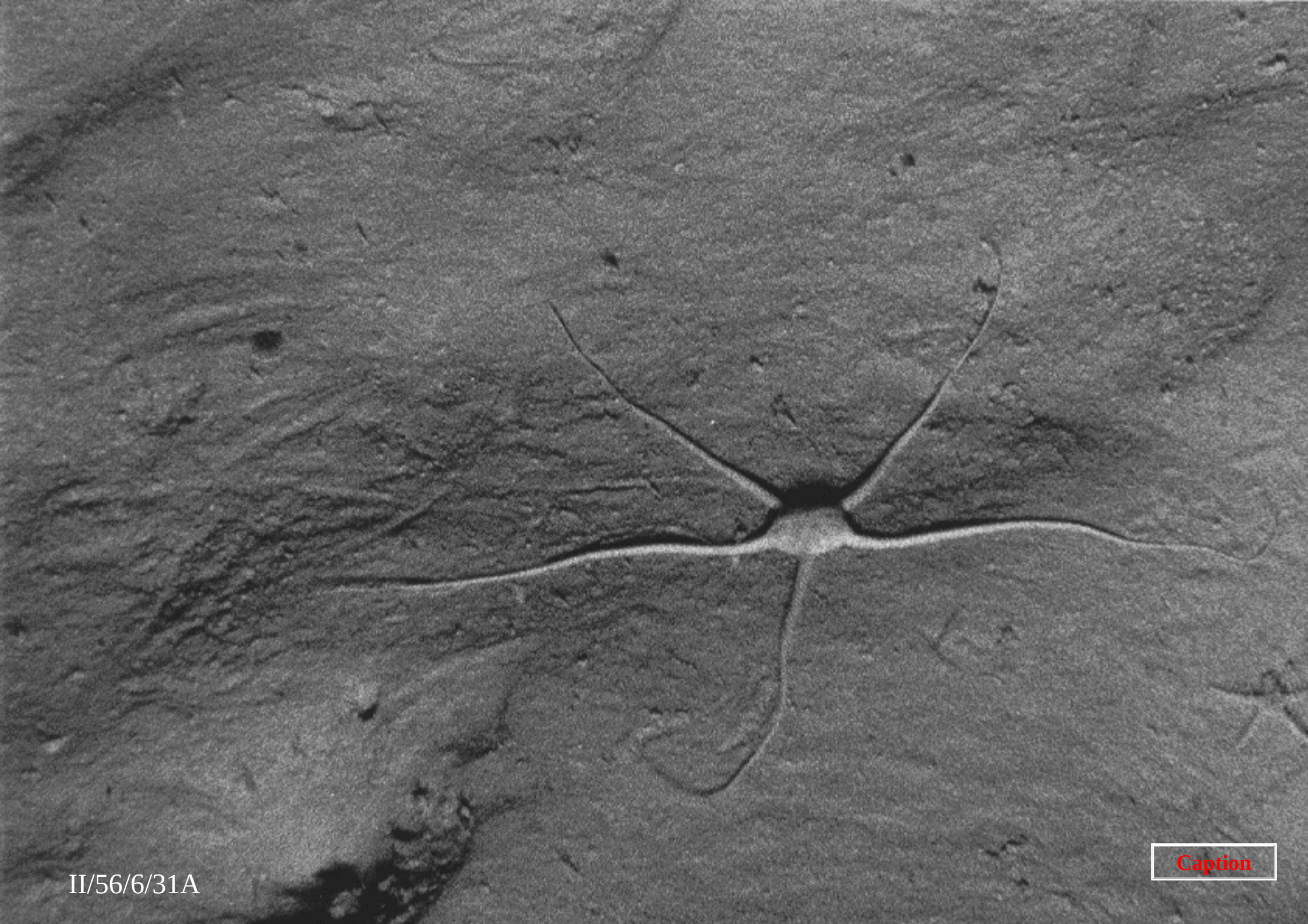
II/56/5/26A

Caption

Reference No: II/56/6/31A (part-frame enlargement):

Site:	N2000
Cruise:	Challenger CH128B
Position:	56º 59.70' N
	10º 01.28' W
Depth:	2070 m
Date:	6th August 1996.
Time:	00:52:07 GMT

A large brittlestar *Ophiomusium lymani* rests on the muddy seabed, together with a much smaller, and different species of brittle star. The central disc of the large specimen shows some radial marking and is about 2 cm across. The crestlines of shallow bedforms produced by bioturbation display slight modification by currents moving towards the left of the picture.



II/56/6/31A

Caption