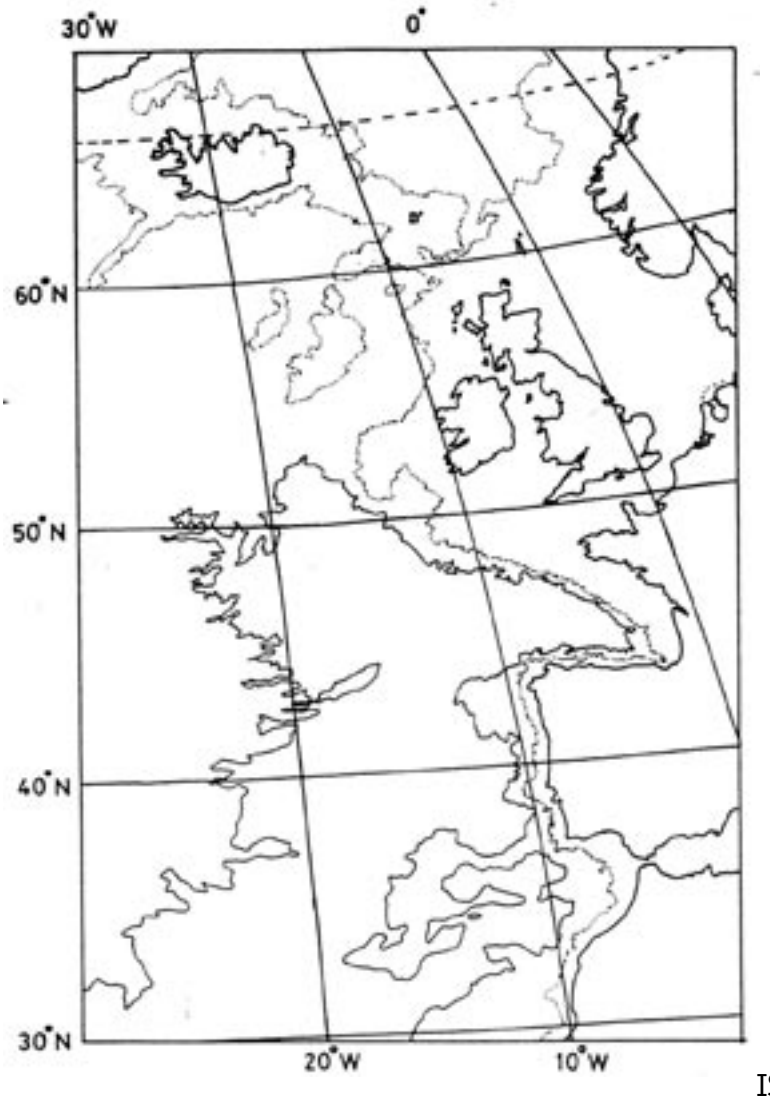
PORCUPINE MARINE NATURAL HISTORY SOCIETY

NEWSLETTER

February 2006 Number 19



ISSN 1466-0369

Porcupine Marine Natural History Society

Newsletter

No. 19 Feb 2006

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Porcupine MNHS welcomes new members- scientists, students, divers, naturalists and lay people. We are an informal society interested in marine natural history and recording particularly in the North Atlantic and 'Porcupine Bight'. Members receive 3 newsletters a year which include proceedings from scientific meetings.

Individual £10 Student £5

www.pmnhs.co.uk

Contents

EDITORIAL

In this issue there should have been a report detailing the data collected during the Wash and North Norfolk field trip last year. Unfortunately those involved (including myself) have not had time to collate the results and compile the species lists and it will have to wait until the next issue. This is I'm afraid, a fact of life. For those of us who are 'self-employed' marine biologists it is always difficult balancing earning your living with carrying out equally important and interesting voluntary work. Luckily for Porcupine and other voluntary bodies with a marine interest, there are also many employers who are happy to allow their employees to take an active part in fieldwork and conferences either during work time or in their own time but with some or all expenses paid. To all those employers out there, a big Thank You! The data collected by the 'voluntary sector' including Porcupine plays a vitally important part in Marine Conservation and Marine Natural History. The latter has always benefited considerably from individuals willing to give up their time to paddle in rock pools, wade through mud flats and dive in unlikely places. Marine Natural History, Past, Present and Future is the subject of this years conference in the Isle of Man and in the next issue papers from that meeting will be published in the Newsletter. I hope that many of you will be able to come to the meeting.

2006 FIELD TRIP

Continuing this theme we are planning another Field Trip in the summer. Details will be published in the next newsletter, put up on the website and e-mailed to those of you happy to use this avenue of communication. We are hoping to visit the Isle of Wight and the likely dates are 10-13th August. However, a final decision has yet to be made but meanwhile put these dates in your diary!

COPY DEADLINES

April 15th for June issue; September 15th for November issue.

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COUNCIL MINUTES

MINUTES OF THE COUNCIL MEETING

held on Saturday 26th November 2005 at the Natural History Museum, London

Present: Frances Dipper, Jon Moore, Tammy Horton, Peter Tinsley, Sue Chambers, Roger Bamber, Anne Bunker, Paul Brazier, Peter Barfield, Seamus Whyte, Vicky Howe, Roni Robbins, Andy Mackie

Apologies:

Lin Baldock, Alison Shaw

The Chairman thanked everyone for attending in view of the bad weather.

Minutes and Matters Arising

The Minutes of the last meeting were published in Issue 17 of the newsletter.

The production of a banner for use at the annual meeting and other occasions was discussed. Julia Nunn had experience of this recently and reported that a 3-panel free-standing banner (called a FRED) had cost Ulster Museum £705 plus VAT. Design had cost £510. After some discussion, and a check on the financial situation it was agreed such a banner would heighten the profile and standing of the Society and could also be used at other meetings such as MCS to promote the Society. It was agreed that the design could be done in-house, and that a sub-committee consisting of Tammy Horton, Peter Tinsley and Peter Barfield would produce a draft for discussion by January. The background colour should be the same as the Newsletter cover and the logo, name of the Society, short text and photographs should be included. Julia Nunn will ask Judy Foster-Smith and Frank Evans if they know where the original drawing of the logo (by David Hall) is. All Council members to send suitable photos to Tammy Horton. Julia Nunn will also ascertain further details about the dimensions and weight of the banners.

ACTION: Julia Nunn, Peter Tinsley, Tammy Horton, Peter Barfield.

Finances

A summary of the present financial position was presented by the Treasurer Jon Moore. Income from subscriptions remains similar to last year. Outgoings on the Newsletter are slightly higher. A profit from the AGM meeting of £760 has resulted in a current surplus of £976, although this will reduce before the end of the financial year after current newsletter and other expenses. The total in current and savings accounts stands at £6889.

Membership

Seamus Whyte reported that there are currently 210-218 members including libraries. The 'variability' is due to awaiting replies from some members with outstanding arrears. Further progress has been made on refining the membership, and all members 3 years in arrears have now been contacted. The process continues. Eleven new members have joined this year and membership remains stable. A new member's package has not yet been produced, but is planned. It was agreed to aspire to having 250 members by the 30th anniversary in 2007.

Recording scheme

Roni Robbins reported that she had not yet had time to make much progress. Marlin has requested via Jon Moore that Porcupine allow them to put our records on their database. This could be possible by the end of the financial year. There was a discussion concerning the direction in which the Recording Scheme should go and where our species records from field trips should be deposited. Andy Mackie reported that there had been duplication of his work records (not Porcupine records) via the NBN Gateway. It was also noted that there are a plethora of recording projects. It was agreed that the Porcupine Recording Scheme was still useful for collecting unstructured records i.e. observations, that are unlikely to be submitted to other schemes. It was agreed that a forum be set up via the website to allow contributors to post unmodified records and 'non-science' records. It was also agreed that Porcupine should obtain a copy of the MS *Access* database *Marine Recorder*, which would ensure that Porcupine records will be uniquely tagged. Records from field trips will be entered onto this database, and can then be exported to the

NBN Gateway without danger of repetition or loss of data as the source remains labelled as Porcupine. Field trip convenors should enter their species lists onto MS *Excel* spreadsheets. Jon Moore will provide a model. Roni Robbins will write an article for the February Newsletter to explain the new system.

Voucher specimens from field trips should be deposited in one of the four national museums as appropriate. The existence of voucher specimens to back up records can be included in *Marine Recorder*.

ACTION: Roni Robbins, Jon Moore

Web Site

Anne Bunker reported that she was not receiving much information for the web site from Council members or others. Material for articles had been promised but not delivered. The IOM conference details and booking form are up on the site, as are the contents of the current issue of the Newsletter.

ACTION: All Council members

Newsletter

Peter Tinsley reported that the current issue (no. 18) is with the printers. The contents list had been passed to Anne Bunker for the web site.

Frances Dipper said she had sufficient material for the February Newsletter if all that was promised was forthcoming, and there should therefore be no problem with producing 3 issues next year. The perennial problem remains in persuading speakers at the AGM to write up and submit their papers. It was agreed that for the IOM and subsequent meetings, speakers would be asked beforehand if they wished to publish their papers. If so, then they would be told that in order to guarantee publication they need to submit their written version at the time of the meeting.

It was agreed that it would be desirable to obtain a 'commissioned' (unpaid) article for each issue of the newsletter on a topic of current interest. The recent sighting of a live giant squid was cited as an example. Vicki Howe agreed to tackle this. Roger Bamber and Sue Chambers will write their articles on 'Why I became a Marine Biologist' for the February issue.

Peter Barfield reported that he was making progress with the electronic publication of past Newsletters, and it should be possible to complete this by the 2007 AGM meeting (30th anniversary). He can scan and use *Acrobat* to retain the historical look, and the texts will be searchable.

ACTION: Roger Bamber, Sue Chambers, Vicki Howe

Conference 2005

Roger Bamber and Roni Robbins reported that around 69 people had attended the conference. About 20 people stayed on for the Sunday 'field trip' work in the collections laboratory. Feedback from the meeting had been positive, and the meeting had made a profit, although the intention had simply been to break even! The Chairman thanked Roger and Roni for an excellent meeting. It was agreed that Julia Nunn should write an official thank you letter to the Museum, which had provided the venue free of charge.

ACTION: Julia Nunn

Wash and Norfolk Field trip 2005

Seamus Whyte and Frances Dipper reported that this had been very successful and that a report on the activities and participants is in the current Newsletter (no. 18). Eastern Sea Fisheries had been thanked for their generous support in the form of their research vessel and crew. Species lists and scientific reports will hopefully be in the next newsletter (no. 19)

Conference IOM 2006

Seamus Whyte reported that the administration side of things was going well. He had made a visit to the IOM (sponsored by the IOM Tourist Board), and various travel and accommodation packages will be available. There will be laboratory space available as well as the conference room plus a foyer for posters. There will not be a charge for these, except that we may have to pay the projectionist. The Tourist Board have offered to print material for the meeting (abstracts etc.) at no charge. The conference dinner has been booked at the Cherry Orchard Hotel, and a menu agreed.

Speakers are now the priority. Trevor Norton has agreed to speak and possibly Jean Luc-Solandt (MCS) on basking sharks. Fiona Gell from the IOM Conservancy board is another

possibility. It was suggested that ex-IOM people now working in other labs be traced and asked if they would like to contribute plus Ph.D. students currently at the lab. Andy Mackie also agreed to give a talk.

Peter Barfield agreed to help do the administration side and deal with participants applications etc. Julia Nunn will do an introduction at the conference that includes a short piece about the Society.

Publicity is now paramount. Frances will produce a poster for distribution to Council to use in their workplaces etc. Julia will send a copy of the e-mail list used for publicity to Seamus.

ACTION: Seamus Whyte, Peter Barfield, Julia Nunn, Frances Dipper and all Council members

AGM 2006

Notice of the AGM must appear in the February Newsletter. There are no proposed constitutional changes. Two people need to step down, but can stand for re-election. Julia Nunn will find out who has served longest.

ACTION: Julia Nunn, Frances Dipper

Field trip 2006

Possible venues were discussed. The south-east of England was suggested. Julia will contact Jan Light, and MCS SE might also be interested in being involved.

ACTION: Julia Nunn

Conference 2007

This will be the 30th anniversary, and will hopefully be held at the Dove Marine Laboratory. Julia will contact Judy Foster-Smith to see if she would be interested in running this. It is hoped to produce a 'History of Porcupine' for this event.

ACTION: Julia Nunn, Frances Dipper

AOB

There was no further business.

Date of next meeting

At the IOM conference in March.

Porcupine Marine Natural History Society AGM 2006

The Annual General Meeting of the Society will be held at Port Erin Marine Laboratory, Isle of Man during the annual conference on March 24th-25th 2006.

In accordance with the Constitution, at least two Council Members must retire each year, but may make themselves available for immediate re-election. Retiring members this year are Roger Bamber and Sue Chambers. Both are available for re-election. Any proposals for additional candidates are welcome, and names should be sent to the Chairman Julia Nunn.

Office-bearers retire annually, and are normally available for immediate re-election. This year all office-bearers are available for immediate re-election. These are:

Chairman: Julia Nunn
Hon Treasurer: Jon Moore
Hon. Editors: Frances Dipper and Peter Tinsley
Hon. Secretary: Frances Dipper
Hon. Membership Secretary: Seamus Whyte
Hon. Records Convenor: Roni Robbins

Voting will take place at the AGM, and will be restricted to members present. Anyone wishing to suggest Agenda items for discussion should contact Julia Nunn.

MEETINGS

PORCUPINE MARINE NATURAL HISTORY SOCIETY

The Isle of Man Conference, 24th-26th March 2006

Marine Natural History: Past, Present and Future

For anyone who has not yet booked for this event, we are happy to have last minute bookings! Details below and on the website www.pmnhs.co.uk

PMNHS will be holding its annual meeting at Port Erin Marine Laboratory, Port Erin, Isle of Man. There will be two days of talks (Friday and Saturday) followed by a field trip on the Sunday. Laboratory space will be available and it may be possible to arrange diving for any truly hardy people! The Isle of Man has extensive and varied rocky shores and sandy coves and also has superb scenery, walks and many other tourist attractions. So you may wish to extend your visit by a few days. Unfortunately the Laboratory will be closing permanently in July 2006 so this may be your last opportunity to visit.

Speakers include:

Trevor Norton : tourism, fisheries and marine biology on the Isle of Man

Fiona Gell : overview of marine conservation on the Isle of Man

Jean-Luc Solandt : management applications of basking shark sightings data around the UK

Jackie Hall: the IOM basking shark recording scheme

Roberto Miguez : storage of wet collections - The Spirit of the Museum

Frank Evans : naming of the copepod genera Temora and Oithona

Kevin Kennington: Long term changes in the Irish Sea, hydrography/plankton

Frances Dipper: the Natural History of coral reefs in the Semporna Islands Project)

Séamus Whyte

Costs: The conference fee, which includes tea and coffee is £30 (£20 for students and unwaged). Non-Porcupine members may join the Society during the conference (by standing order only) for £5, a 50% reduction. If you wish to take advantage of this offer the total fee will be £35.

Porcupine dinner: A dinner has been arranged for the Friday night. The cost will be approximately £20 payable on the night.

Call for papers: We would be delighted to hear from anyone who would like to present a paper at the conference. Speakers will not be charged the conference fee but will be asked to make a small contribution for refreshments. Offers of papers to Séamus Whyte (s.whyte@enviromuir.co.uk).

Posters: There is a space for posters adjacent to the lecture hall for easy viewing during coffee/ tea breaks. Offers of posters to Séamus Whyte (s.whyte@enviromuir.co.uk).

Details including location map, accommodation list, provisional programme & membership form (where appropriate) will be sent on completion of the attached booking form.

Booking Enquiries: Peter Barfield - peter@seanature.co.uk or 01208 851040

Peter Barfield, Yeadon, Higher Penquite, St Breward, Bodmin, Cornwall, PL30 4NX

OTHER MEETINGS

9-12 May 2006 ECSA 40. Sustainable co-development of enclosed coastal seas:our shared responsibility.

Caen, France. Contact: Dr Jean-Paul Durcrotoy j-pduc@wanadoo.fr

26-29th April 2006. Conchological Society Field Meeting Anglesey.

Contact: Tom Clifton Clifton@seaspray.fsnet.co.uk.

August 5th -12th 2006 & August 12th -19th 2006. Marine Survey and Identification Courses, Isle of Wight.

Suitable for undergraduates and postgraduates. Contact : Roger Herbert, roger@medinavalleycentre.org.uk, www.medinavalleycentre.org.uk

4-8 September 2006. 41st European Marine Biology Symposium, Cork.

Topics include: Challenges to marine ecosystems; Marine protected areas; Global climate change and marine ecosystems; Sustainable fisheries and aquaculture. Visit:

www.embs41.ucc.ie.

25-27 October 2006. Beaches, Yachting and Coastal Ecotourism (MCRR2). 2nd International Conference on the Management of Coastal Recreational Resources, Gozo, Malta.

Contact: Antonella Vassallo; ICoD – antonella.vassallo@fis.org.mt

Michelle Cassar; ICoD – michelle.cassar@fis.org.mt

Naming of the copepod genera *Temora* and *Oithona*

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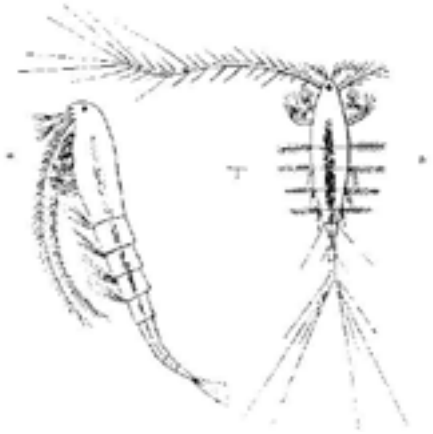
Nowadays it is the usual practice, when awarding a scientific name to a new genus or species, to indicate in the description the meaning or significance of the chosen name.

This has not always been so. Sometimes the reference is obvious as, for example, in the Linnaean copepod genus *Monoculus* where the reference to a single eye is clear. But from Marshall and Orr (1955) we learn that the name *Calanus*, formerly *Monoculus*, is derived from a saying of "a Jain ascetic, one of a strict and ancient sect which abhorred possessions so much that its members gave up even clothing. He followed in the train of Alexander the Great from India to Baghdad and there walked living into the pyre because his life had become worthless to him from illness." Leach, who gave the name *Calanus* to the copepod in 1819 described none of this.

The names of two other planktonic copepod genera, both common in our waters, are traced here. The first, *Oithona*, was given by Baird in 1843 (Baird 1843, p.59). The second, *Temora*, also by Baird, was given in 1850 (Baird, 1850, p.227). William Baird (1803-1872) (Davis, 1983; DNB, 2004) was a Scot, born in Eccles, Berwickshire where his father was the minister of the parish kirk. After schooling in Edinburgh he studied medicine in Edinburgh, Dublin and Paris. In 1823 he became a surgeon with the East India Company, making a total of five voyages to India and China before coming ashore in 1829. He developed a keen interest in natural history and having left the sea and set up in private practice, he helped to establish (with Dr. Johnstone) the famous Berwickshire Naturalists Club, a club which still survives and thrives. From 1833 to 1841 he had a medical practice in London.

He was a zoologist of considerable ability, publishing in the journals of the Zoological and Linnaean Societies and elsewhere. In 1841 he accepted an appointment in the zoological department of the British Museum. From there his establishment of the genus *Temora* referred to above appeared in his major Ray Society publication of 1850 (Baird, 1850, p.227). He was elected to the Royal Society in 1867.

The names *Oithona* and *Temora* come from an unlikely source, *The Poems of Ossian*. These prose poems, occupying over four hundred pages of a modern republication, were collected from Highland material extending back to the third century, translated, rewritten, embellished and to an unknown extent simply made up by James Macpherson (1736-1796). Ossian, the warrior bard and supposed creator of the poems, was the son of Fingal, a Scottish king really derived from the legendary Irish chieftain Finn MacCoul. Fingal's kingdom was translated from Ireland into north west Scotland in the narrative. Historically the Scots came from Ireland and displaced the native Picts. The enigmatic texts created a great sensation on their first appearance in 1862 and were especially welcomed in Macpherson's native Scotland but were denounced by Dr. Johnson among others, as the concoctions of a charlatan. Yet according to Howard Gaskill (1996), regardless of their validity the chronicles are one of the most important and influential literary works ever to have emerged from these islands. They have undoubtedly had a major effect on subsequent writers. Clearly they had an effect on Dr. William Baird.



Oithona splendens (nov.)and *Oithona plumifera* (nov.). Baird, 1843.

In the stories Oithóna (so spelt), a chieftain's daughter, is abducted and raped. Her betrothed, one Gaul, confronts her abductor in battle having first rescued and sheltered her in a cave. Unknown to him she leaves the cave and joins the battle and is mortally wounded. She retires to the cave where she is discovered dying by Gaul. The event is described in a short poem.

Temora is much lengthier being an epic poem of that title in eight books, all probably created by Macpherson. It is the name of the legendary royal palace of the early Caledonian kings (Fingal's Cave on Staffa was another mythical residence) and the scene of much blood-letting. It is also rendered Teambrath and other variants, but appears to mean "Timorri", the house of the great king. The place-name Tara is derived from it.

While Baird does not tell us why he made the odd choice of the generic names *Oithona* and *Temora* for his new copepods, clearly his Scottish birth and studies and perhaps Scottish pride suggested them. They have proved stable for a hundred and fifty years.

Acknowledgement: I am indebted to Mrs. Emma Woodason of the National Marine Biological Library, Plymouth Marine Laboratory for kindly providing references to Baird and for other help.

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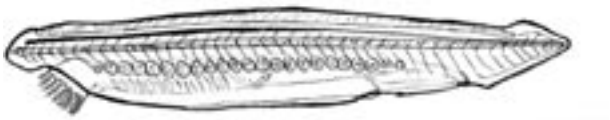
Two Cornishmen, a German, an Englishman and an Italian: the story of how the Lancelet *Branchiostoma lanceolatus)* was discovered and named

Stella Turk



The first of the two Cornishmen was John Hawkins FRS of Trewithen (1759-1841) who was in his teens when he found this strange-looking creature cast up on a Cornish shore after a storm. 1774 is the year given in a discursive account of the Lancelet in *Purnell's Encyclopedia of Animal Life,* edited by M. and R. Burton (?1960s). John Hawkins sent the specimen, in alcohol, to the German naturalist Peter Simon Pallas, who in 1778 described it as new to science in his *Spicilegia Zoologica* Fasc. No 10.

Despite his eminence, Professor Pallas was very far astray in his classification of this hitherto unknown creature. He thought it was a type of slug and named it, in a footnote, *Limax lanceolatus*, adding a brief description.

There was no further mention of this animal until 1831 when the second Cornish naturalist, Dr Jonathan Couch, found one on the shore at Polperro following a storm. After sketching it, he sent it to the English fish expert William Yarrell, who was assembling material for *A History of British Fishes.* The first edition was published in 1836 with a description and drawing of the animal, which he considered to be a primitive fish. He was made aware of Pallas's work, much of which was carried out in St Petersburg, and, following the law of priority, he kept the specific name *lanceolatus* but placed it in a new genus,

Amphioxus.

The Italian, Costa, now enters the story. In 1834, two years before Yarrell's work appeared, Costa had published a description of a specimen that he had found on a Naples shore, placing it in a new genus - *Branchiostoma*.. This name must take date precedence over *Amphioxus* and it is now correctly known as *Branchiostoma lanceolatus*. As nearly a century elapsed before Costa's publication was widely known it took zoologists a long time to accept that *Amphioxus* had become a synonym.

Between 1862 and 1865 Jonathan Couch's four volume work, *History of the Fishes of the British Isles,* was published with fine illustrations of fish, which he had painted from life whilst their colours were still vivid. He recounts a history of the Lancelet in the fourth volume, giving John Hawkins Esq. as the person who sent the first specimen to Peter Pallas.

As for the obscure creature itself, like the tadpole larva of the tunicates (sea-squirts), it has a dorsal nerve cord, protected by a notochord, precursor of the vertebrate backbone. That and various other characters combine to make it a primitive ancestor of back-boned animals. It is now known to be widespread on the shores and in the shallow water of Britain and mainland Europe. As it reaches only about 6 cm long, is semi-transparent and very thin, it is not easily found except by the keenest observers. It occurs in numbers in the Eddystone gravels, and has been found in hundreds in the sub-fossil maerl (calcified seaweed) in the Falmouth area.

Fish farms and jellyfish

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In recent years there has been a new wave of anxiety for fish farmers in various parts of the world due to unpredictable swarms of jellyfish. The main fish species affected in the UK are salmon, trout, halibut and cod. In 1997 a Shetland aquaculture company reported that larval jellyfish had been the cause of death of two consecutive year classes of sea trout. There were further reports in 1998 and in August/ September 2002 of attacks on fish farms in the Western Isles leading to losses of 625 tonnes of salmon valued at £1.8 million (The Oban Times 23.05.03). Algal blooms can also be partly responsible for fish deaths; recent data was provided by the Fisheries Research Service (see Figure 1).

These large impacts cause millions of pounds of stock damage similar in scale to the loss due to salmon lice. In 2002, a similar pattern affected Norway; jellyfish were thought to be responsible for the loss of a thousand tonnes of fish. Since 1997 Tasmania and New Zealand have been reporting fish losses due to jellyfish swarms. Although the popular press and farm workers have suggested that scyphozoa have been responsible for farmed fish mortalities, it is unclear which species are involved.

Another probable cause of mortality within the fish pens could be a combination of factors, such as stress from poor husbandry, overcrowding, environmental factors and poor health. Environmental considerations e.g. high water temperatures, low oxygen saturation, algal densities, particularly at a time of plankton blooms, may adversely affect fish health. Also fish originating from weak genetic stock are more vulnerable to interference.

Large jellyfish swarms may be due to different reasons at different times of the year, but jellyfish are only found in abundance in Scottish waters, from around April to September.

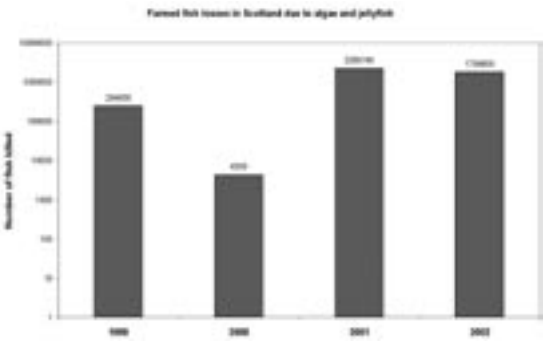

Figure 1. Data courtesy of Fisheries Research Services in Aberdeen.

Physiological effects

The jellyfish, at various stages of maturity, can be washed through the net pens and come into contact with the farmed fish species. Larger fish have also been observed with skin lesions that were thought to be due to large tentacle damage. However, the main effect on the fish is thought to be due to gill damage leading to asphyxiation. Aberdeen University, Fisheries Research Services with 12 other European partners are working on the EUROGEL programme (EUROpean GELatinous Zooplankton). The main objectives are to identify key factors regulating abundance, understanding the role of jelly plankton in marine ecosystems and forecasting outbreaks. The preliminary results suggest fish death may be due to toxin haemolysis of red blood cells causing suffocation (pers. comm. Dr B Johnston, Aberdeen University). Results of hydrodynamic modelling of water currents and isolation, identification and synthesis of specific jellyfish toxin will be due for publication in 1-2 years. Further information can be found on the EuroGel website www.ifm.uib.no/eurogel/ .

Jellyfish Species found in British waters

There are four common species present in British Waters likely to cause damage:

Fig. 2 Aurelia aurita photographed at Weasel Loch, Eyemouth Photo: P Tinsley

Moon Jellyfish *Aurelia aurita* **Linnaeus, 1758.**

This species can be identified when swimming by the lack of trailing tentacles, a delicate short fringe around the bell edge and four opaque horseshoe-shaped reproductive organs which are visible through a transparent bluish-purple bell, diameter up to 300mm. Four oral arms protrude from the centre of the aboral surface. Humans do not usually feel the stinging cells, nematocysts, because our skin is too thick, preventing envenomation (Naylor, 2000). *Aurelia aurita* is a pelagic species that forms breeding aggregations in late summer and early autumn. It migrates using the sun as a compass (Gibson et al. 2001) and after the summer, it retreats into deeper water or dies. *A. aurita* distribution is coastal cosmopolitan (Russell, 1970).

Lion's Mane *Cyanea capillata* **Linnaeus, 1746.**

Identified by its reddish/brown coloration and relatively large size, up to 1000mm in diameter. The edge of the umbrella has definite lobes, the long tentacles are arranged in eight bunches of more than a hundred tentacles per bunch, and the four short oral arms surround the mouth. Older individuals are often dark red in colour (Naylor, 2000). The sting is described by scuba divers as similar to nettle stings. *Cyanea capillata* distribution is coastal northern boreal and it commonly occurs along the east coasts of England and Scotland (Russell, 1970).

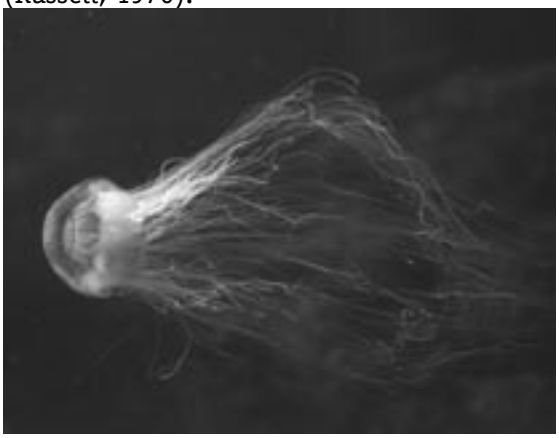

Fig. 3 Cyanea capillata photographed at Weasel Loch, Eyemouth. Photo: P Tinsley

Blue jellyfish *Cyanea lamarckii* Peron and Lesueur, 1809.

This jellyfish is very similar in general appearance to *C. capillata* but is white/purple in colour (Erwin & Picton, 1995) and smaller with a bell up to 300mm in diameter. It is a pelagic species with a southern boreal distribution recorded from all around the British Isles (Russell, 1970).

Fig.4 Rhizostoma octopus photographed in Worbarrow Bay, Dorset Photo: P.Tinsley

Barrel or Root Mouth jellyfish *Rhizostoma octopus*, **Linnaeus, 1788.**

This species can be identified from the white umbrella trimmed with a dark rim. There are no peripheral tentacles, only eight central arms fused together for most of their length. Instead of having one mouth opening *R. octopus* has hundreds of tiny openings. It has a large bell up to 900mm in diameter. The stinging cells are deadly to its prey but harmless to humans. More commonly found in the warmer waters off the British south and west coasts, a southern boreal distribution (Russell, 1970), during late summer and autumn.

Records and jellyfish survey

There is remarkably little known about the distribution of jellyfish in British continental waters as very few organisations keep records. They are also quite difficult to preserve in good condition, consequently specimens in museum collections are inadequate to reliably interpret information about distribution.

The Marine Life Information Network for Britain & Ireland (MARLIN) and The Marine Biological Association of the UK (MBA) provide useful information on jellyfish ecology and identification.

A current programme organised by the Marine Conservation Society called the "Jellyfish Survey", aims to collate quantitative data from coastal sightings around Great Britain then publish their results in 2-3 years time. Information about the survey can be found on their website (www.mcsuk.org) and identification sheets can be down loaded. If you wish to find out more contact Peter Richardson, Species Policy Officer on 01989 566017, email peter@mcsuk.org

If you have specimens of Scyphozoa from around the British coasts and you would like their identification confirmed send them to s.chambers@nms.ac.uk

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COUNCIL CONFESSIONS

Why PMNHS council members became marine biologists

Susan Chambers

For me this is a strange statement as I would like to answer a different question which is "How I became a marine biologist". The pathway to what may often seem an idyllic career, was not straight or planned.

I left school at 18 with dreams of becoming a professional dancer but my parents had other ideas even after supporting me for the previous 10 years. Instead I was persuaded to learn a new skill that I could return to if my dancing career was unsuccessful. As a dutiful daughter for 2-3 years I tried various jobs in research labs in medical institutes and hospitals in North London as a laboratory technician but this was no substitute for dancing.

Eventually, I found a job at the Natural History Museum and started work on the 1 January 1970 as a trainee entomologist. This was the start of 5 years of fun and brilliant training in identification, taxonomy and life. The problem was I didn't fall in love with insects, although many are beautiful and interesting. I know it sounds odd but you have to like the animals you are working with and after 5 years I failed.

If I wanted to change my life and make progress I had to have a degree, so I went to Royal Holloway College, University of London. Here, I thought I had found the subject I really wanted to study – primate behaviour and in many ways this was true, as I also met my partner of the last 30 years who with magnificent skill coached me through 1st year undergraduate chemistry, even though I had never studied this before in my life!

After university we moved to Scotland and I found a research assistant post at Stirling University and went to Senegal for 6 months to study Baboons. It was very exciting living in the forest and I wanted to stay but my future was with my partner in Edinburgh.

On my return I wrote to the Royal Scottish Museum for a job and they offered me a temporary post in entomology. "Oh no not again!" I said, but I had to take it as I had to live. Another stroke of luck occurred when a permanent job became vacant in the marine invertebrate section. My only experience with the marine world was a two week field course at Millport Marine station. I was offered the job and the only other marine invertebrate person resigned after two weeks.

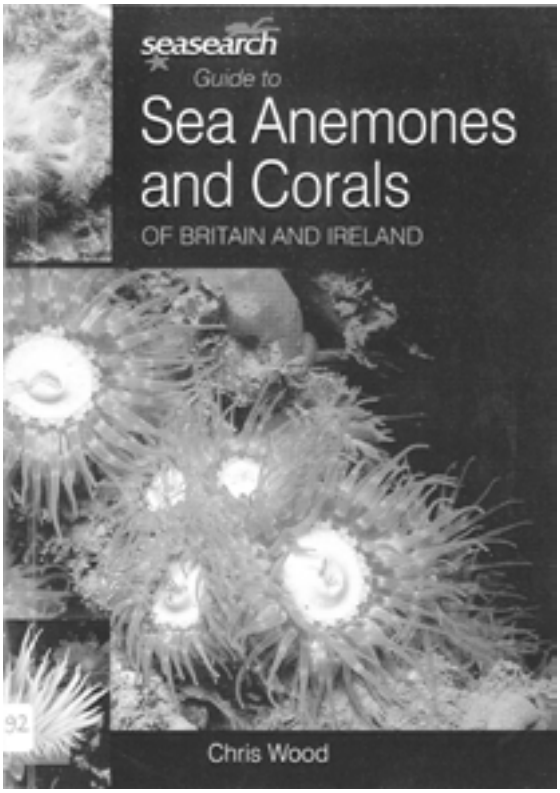
I carried on working with a large Bryozoan collection when the current director Norman Tebble asked me to be his research assistant. Again I had to be honest and say "I know nothing" but he wanted someone who knew about taxonomy and had a willingness to learn about polychaetes. I was lucky as he was an excellent tutor and set me on the path of polychaete taxonomy where I have stayed ever since. I will always be grateful to him for an introduction to a subject which was not popular even then.

It has been a fantastic journey and I am always amazed at how beautiful living polychaetes are although dead ones are a different story. I love them all and feel lucky as I have been able to look at polychaetes in many parts of the world and meet other madly inspired polychaete workers. On the way I have learnt to dive and been on a couple of cruises, but I am hopeless at sea. I continue working in the general field of marine biology because it is beautiful, awe inspiring and keeps me in touch with reality as it is such a big subject.

BOOK REVIEW

Seasearch Guide to Sea Anemones and Corals of Britain and Ireland

by Chris Wood. Marine Conservation Society, 2005.



Reviewed by Frances Dipper

Way back in 1980, the Underwater Conservation Society (now MCS) produced a 'miniprint' guide to the Anthozoa of the British Isles, written by Dick Manuel. This was photocopied and illustrated with 'miniprint' photos. This was an extremely useful publication as it was the only anemone guide available with colour photos. A year later the Linnean Society and ECSA Synopsis No. 18 'British Anthozoa' was published, also written by Dick Manuel. This was updated as a second edition in 1988 but although fantastically useful and comprehensive, is only illustrated with line drawings. So the appearance of Chris Woods' little book with excellent colour photos of all the species is extremely welcome.

Produced to help Seasearch volunteers (www.seasearch.org.uk) learn to identify these colourful and fascinating animals, this guide would be at home with any diver or non diver even vaguely interested in the marine life around our shores. Each species is carefully described with additional information on habitat and behaviour. Yes, even sea anemones can 'behave' and some can even move about. As well as all the obvious species, rare anemones and even a few undescribed species are included. By flagging these up, more divers will know what to look out for and soon we may have new additions to the British fauna. If we don't know we've got it then we can't conserve it! A section at the end of the book on conservation of sea anemones and corals around our shores flags up problems such as destruction of sea fans in trawl nets and discusses conservation measures current and future.

At only £9.95 from the Marine Conservation Society, this book is well worth having.

PORCUPINE 2005.
COLLECTIONS, COLLECTORS, COLLECTING

PMNHS meeting held at the Natural History Museum 18-20 March 2005

The distribution and character of *Sabellaria alveolata* reefs around Wales.

Natasha Lough
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CCW's Phase 1 intertidal survey has enabled accurate distribution maps to be made for all intertidal communities in Wales. This has been particularly useful when dealing with communities that are of conservation importance.

The reefs formed by the honeycomb reef worm *Sabellaria alveolata* are one such community. *Sabellaria alveolata* reefs are a BAP habitat and the *Sabellaria* biotope MLR. Salv is considered to be of national importance by JNCC. The reefs are important because they can add to biodiversity and are geographically restricted. They can stabilise mobile shores, which can increase the heterogeneity of shores. This is usually in the form of increased crevices and rockpools. However new colonies of *Sabellaria* can actually lower the biodiversity of the shore and decrease the niches available for animals and plants. As the reef gets older, the reef becomes colonised by algae and crevices increase. (Holt, et al. 1998)

Sabellaria (order: Terebellida) is a tube dwelling worm, about 30-40mm long. It cements sand grains together to form tubes of up to 10-20cm long. The head and tentacles of the worm protrude from a characteristic 'porch' opening when covered by water. These tubes aggregate forming reef- like structures. It is typically found from the midshore extending to the lower shore. It can be subtidal, with populations known within the Severn Estuary. *Sabellaria* is found in areas where there is sufficient suspended sediment and water movement, usually on moderately exposed beaches. The larvae are known to be chemically attracted to existing areas of reef, whether this is living or dead. Recruitment is variable, the worms live for 3-5 years and the reefs last for 4-5 years. The reefs are potentially vulnerable to activities that affect the availability of sediment, such as aggregate extraction and coastal developments, and direct impacts such as trampling. (Holt, et al. 1998).

There are three types of aggregation (based on Cunningham et al. 1984):

- Sheets – these are low lying structures that tend to be found on homogenous beaches;
- Hummocks – these radiate from the point of settlement and are found on more heterogenous, boulder shores;
- Reefs – these are formed when hummocks fuse together and are generally found on mixed boulder shores.

The distribution of *Sabellaria alveolata* reefs is restricted to the south west of the UK, extending from the Solway Firth in Scotland, south to Lyme Bay and along the Atlantic coast to the Mediterranean Sea.

Figure 1
Distribution of Sabellaria *reefs around the UK (from Holt et al, 1998), dots are MNCR records of MLR.Salv, lines signify reefs as described by Cunningham.*

Distribution in Wales

Figure 2. The distribution of Sabellaria *reef within Wales as recorded by the Phase 1 Intertidal survey. The graded scale gives you an idea of size of each of polygon.*

The distribution matches that from Holt et al. apart from the south coast of Wales supports large areas of *Sabellaria* reef. The largest of these was found in Swansea Bay. Although not shown on this map, areas of *Sabellaria* have also been recorded on the English side of the Dee estuary near Hilbre Island. The distribution of the species, not as reef is wider and we have found it on Anglesey.

The following is a brief description of the *Sabellaria* reefs around Wales:

Cardigan Bay

Sabellaria reefs are found along most boulder and bedrock platform shores within Cardigan Bay and along the southern shore of the Lleyn Peninsula /Pen Ll n. The majority of the shores here are good examples of how *Sabellaria* reefs have stabilised mobile shores. In some cases these can be extensive sheets that form a blanket over the shore. But in other cases the reefs have bound boulders together impeding water flow across the shore, increasing the number of pools and diversity. See photo. Sabellaria reefs are often overgrown with fucoid algae such as *Fucus serratus* and *F. vesiculosus*, other common species include *Actinia equina, Littorina littorea* and *Mastocarpus stellatus*.

Cardigan Bay - Photograph by Monica Jones

The Gower

On the Gower, *Sabellaria* is found as hummocks and reef on bedrock. As is typical for most of the Gower there is a high abundance of red algal turf, particularly *Osmundea pinnatifida* and *Rhodothamniella floridula*. It is often found within crevices or on the leeward side of bedrock pinnacles where is more shelter.

Brandy Cove - Photograph Monica Jones

Swansea Bay

Swansea Bay has some of the most extensive areas of *Sabellaria* reef in Wales. One area mapped was over 44ha in size. An unusual feature of the reefs here was the competition with mussels *Mytilus edulis*. This type of co-existence was not recorded in any other areas around Wales apart from within the Swansea Bay area. The situation appeared to be dynamic with mussels overgrowing *Sabellaria* reef and vice versa. Large areas of pure *Sabellaria* were found as were mussel beds. A variety of age classes in the reefs were observed, with very new growth of *Sabellaria* along with old

degraded reef covered in ephemeral algae. The eastern side of Swansea dock was particularly interesting, not only for its extensive reef system, but also along the lower shore cobbles were colonised with large sponges and *Pomatoceros*. The reef was interspersed with numerous rockpools supporting hydroids.

Further east around Port Talbot, it seemed that every piece of hard substrata was covered in *Sabellaria*, whether this was sea defences or wrecks.

Swansea Bay. Photo: Paul Brazier

Margam sands. Photo: Kathryn Birch

Glamorgan

From around Porthcawl eastwards the reefs tend to be fairly unusual. *Sabellaria* seems to occupy every possible crevice, often clinging on in caves and faults in limestone platforms. Mid to lower shore bedrock was dominated by *Sabellaria,* often with *Fucus serratus* and *Cladostephus spongiosus*. Lower shore areas are very interesting, the actual reef is colonised by large sponges and a sand-encrusted ascidian *Polycarpa gracilis*. These can be so dense that it is hard to tell whether there is actually any reef underneath. These areas were particularly favoured by various crabs including *Cancer pagurus* and *Pilumnus hirtellus*. Pools around here are of particular interest. Instead of being algae dominated as is found further west in clearer waters, bryozoan turf dominates. Species commonly found were *Bowerbankii citrina* and *Anguinella palmata*. See photo.

Porthcawl Photo: Monica Jones,

Anguinella palmata. Photo: Paul Brazier

Sponges and Polycarpa. Photo: Paul Brazier.

Sully Island and the Severn Estuary

The influence of the Severn estuary becomes more apparent at Sully Island. Red algae are almost absent as are spirorbid worms on fucoid fronds The *Sabellaria* here is just

a crust on the bedrock with fucoid growth. Moving into the Severn estuary itself, there is only a handful of areas where *Sabellaria* is found. When it is present it is only as a crust on bedrock and cobbles with very little associated species as on Flatholm. Near Goldcliff this is mostly empty worm tubes on cobbles. No alive worms were found on bedrock at the second crossing either and the tubes form only a very sparse crust.

Goldcliff. Photo Paul Brazier

Sully Island. Photo Monica Jones

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Deep-Sea Scavenging Amphipods from the Faroe-Shetland Channel

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Introduction

The deep mobile scavenging fauna is not easily captured by traditional trawling and coring methods yet forms an important component of the deep-sea food web. According to the studies of Smith (1985) and Christiansen & Boetius (2000), large food falls (on which scavengers feed) can represent between 10-30% of the annual particulate organic carbon (POC). It has been calculated that a single 40t whale (~2 x 10^6 g C) represents an equivalent amount of organic carbon as background input to 1 hectare over 100-200 years (Smith & Demopoulos, 2003). The large numbers of animals that arrive at baited traps (thousands) and the speed at which they arrive (in less than an hour), illustrates how important this trophic method is in the deep sea.

In August 2002 during a survey of the SEA4 area (part of the Department for Trade and Industry's Strategic Environmental Assessment of the UK marine environment see http://www.offshore-sea.org.uk/site/ for further information), three baited traps were set in deep waters to study the mobile scavenging invertebrate population. Eight traps were also set during the 1996 AFEN cruises. The survey area of both cruises was the Faroe-Shetland Channel at depths ranging from 200m to 1600m. Work is now underway to characterise this scavenging fauna according to spatial and bathymetric distribution.

Despite the fact that this area has been the subject of many studies of the fauna over the years, the scavenging amphipod fauna remains problematic taxonomically. This is largely due to the highly speciose family in which scavenging amphipods belong – the Lysianassoidea. This super-family comprises over 150 genera and over 800 species.

Methods

Amphipods were collected using a variety of methods, and since spatial and bathymetric distributions were being studied, the methods were qualitative rather than quantitative. Work in deep waters often requires an opportunistic approach since the rigid experimental approaches applied to shallower waters are frequently overcome by factors such as cruise schedules, weather problems and gear failure. The baited traps set during both the 1996 and 2002 cruises were both freefall, acoustically-released designs. These consist of one or more traps containing bait attached to a larger framed structure. To this frame is attached the ballast, buoyancy and the acoustic release mechanism (see figure 1). The trap set is released from the ship and freefalls to the seafloor where it is left in-situ for about 24 hours (times may vary due to ship schedule constraints but at least 6 hours and not longer than 48 hours is recommended). An acoustic signal is then sent from the ship to the release mechanism on the trap that releases the ballast allowing the buoyancy to raise the trap to the surface. The contents of the trap are then collected and preserved for later study.

Fig. 1 Deploying amphipod trap

Table 1 and Figure 2 show the locations and corresponding depth information of the traps included in this study.

Results & Discussion

Table 2 gives a breakdown of the current identification of the amphipod species found in the traps. They are ordered by approximate depth of trap. By looking at the traps in this way a pattern emerges indicating that the traps can be placed into three approximate groupings by depth. Although the specimens have not yet been counted, the dominant species have been noted.

Shallower traps: 200-500m (5 traps: 200m, 300m (2), 500m (2))

In shallow traps the scavenging species *Tmetonyx cicada* was the dominant species. It was found in great numbers and the only other species found at the very shallowest depth (200m) was a very small number (10) of *Scopelocheirus hopei*.

Mid depth traps: 775-900m (3 traps: 775m, 781m, 888m)

At these depths the greatest number of species was recorded of which the *Anonyx* and *Tmetonyx* species were co-dominant. Three species from each of these two genera were found. Taxonomic work is continuing on the *Tmetonyx* species, which are proving very difficult to separate and it is likely that there are one or more new species in the samples. *Anonyx nugax* which was recorded in the Faroe-Shetland Channel samples at depths greater than 800m is probably circumpolar in distribution (Steele & Brunel, 1968). It has been recorded from the Kara Sea west to the Berin Strait and has also been recorded in Siberian Seas (Gurjanova, 1962). In the North West Atlantic it has been recorded as far south as the Scotian Shelf (Steele & Brunel, 1968). It is probably temperature restricted and the more southerly records are from deeper waters, as in this case. It has not been found south of the Wyville-Thomson Ridge (Norman, 1900, in Steele & Brunel, 1968).

Anonyx lilljeborgii was also recorded in samples at depths greater than 800m. This is an amphiboreal species and has a more southerly distribution than *A. nugax*. It is also likely to have a temperature dependant distribution since according to the literature it can be found from the intertidal down to several hundred metres, yet in this study was only found in deeper, colder waters.

Anonyx ochoticus previously encountered by Steele & Brunel (1968) and Gurjanova (1962) is reported as occurring from 15 -315 m from the Sea of Okhotsk to Norwegian sea (Steele, 1989). This is therefore a new depth

and locality record for this species.

At this depth some specimens of the giant scavenging amphipod *Eurythenes gryllus* were also collected along with three other species found in smaller numbers.

Deeper traps: 1000-1600m (3 traps: 1069m, 1396m, 1611m)

At these depths *Eurythenes gryllus* was the dominant species, certainly in terms of biomass if not numbers. Only one species of *Anonyx* was found at these depths (*A. nugax*), and two species of *Tmetonyx*. At this depth species of the genus *Paracallisoma* are also found. This genus is only found in these deeper waters and is very problematic taxonomically. Following on from this study a complete family revision of the Scopelocheiridae (to which *Paracallisoma* belongs) has been undertaken and is nearing completion.

Summary

Scavenging amphipods from the Faroe-Shetland Channel were collected by the means of baited traps as part of the DTI's Strategic Environmental Assessments. In total 11 traps form part of this qualitative study of the scavenging species in the area. The traps all collected a large number of specimens and these are now in the process of being formally identified and enumerated to assess the species diversity of the different study depths and locations. At the current state of identification the traps can be split into three groups – shallow, mid-depth, and deeper traps for which the corresponding dominant species are *Tmetonyx cicada*, *Anonyx* & *Tmetonyx spp*, and *Eurythenes gryllus* respectively. Work on these collections continues and involves a taxonomic revision of the Scopelocheiridae, species of which were recorded from the deeper traps.

Table 1 : Baited trap deployment details

Trap number	Date	Station Number	Depth	Approx depth	Latitude (degrees minutes)	Longitude (degrees minutes)
1	21/07/96	53759#1	498	500	60 59.4918	2 29.9137
2	22/07/96	53768#1	781	800	61 7.7262	2 42.2231
3	23/07/96	53778#1	289	300	60 53.8092	2 22.0973
4	25/07/96	53799#1	508	500	61 26.6526	1 31.5477
5	26/07/96	53809#1	294	300	61 32.3922	1 9.0164
6	27/07/96	53817#1	775	800	61 24.8094	1 57.177
7	28/07/96	53826#1	1069	1100	61 18.036	2 29.8276
8	16/08/96	53979#1	1396	1400	61 28.719	2 47.6602
9	13/08/02	57060#1	1611	1600	62 39.16	1 13.97
10	15/08/02	57077#1	888	900	62 15.645	0 19.266
11	19/08/02	57101#1	198	200	61 34.593	0 29.464 E

Table 2: Scavenging amphipod species composition of baited traps set in the Faroe-Shetland Channel (in increasing depth order

Trap #	Depth m	Approx Depth/m	Number of Species	Species composition
11	198	200	2	Tmetonyx cicada, Scopelocheirus hopei,
3	289	300	1	Tmetonyx cicada
5	294	300	1	Tmetonyx cicada
1	498	500	1	Tmetonyx sp.
4	508	500	1	Tmetonyx sp.
2	781	800	7	Eurythenes gryllus, Anonyx nugax, A. sp., Tmetonyx cicada, Tmetonyx sp., Orchomene, Cyclocaris guilelmi.
6	775	800	4	Anonyx nugax, Anonyx sp., Tmetonyx sp. Orchomene sp.
10	888	900	12	Eurythenes gryllus, Anonyx nugax, A. lilljeborgii., A. ochoticus, 3 x Tmetonyx spp. (spp. A, B, C), Tryphosella sp. nov, Cyclocaris guilelmi, 3 other unidentified species.
7	1069	1100	3+	Eurythenes gryllus + unsorted 1l jar
8	1396	1400	6	Eurythenes gryllus, Anonyx nugax, Tmetonyx sp. Orchomene sp., Paracallisoma alberti, Paracallisoma sp.1.,
9	1611	1600	8	Eurythenes gryllus, Anonyx nugax, Tmetonyx sp.A, Tmetonyx sp. B, Tryphosella sp. nov., Paracallisoma alberti, Paracallisoma abyssi, Paracallisoma sp.2.

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The following abstracts were received from speakers at Porcupine 2005 who have not submitted a full paper.

Viewing the depths of the sea

(Subtitle: Collecting underwater photographs from February 1856 to February 2005 – an history of failure)

Brian Bett
George Deacon Division for Ocean Processes, Southampton Oceanography Centre

Perhaps the biggest change in deep-sea biology since the time of the original Porcupine expeditions is our current ability to image the deep-sea floor. This presentation will examine the use of photography (and other imaging techniques) in deep-sea biology: from the early "Monster Cameras" to the latest imagery from Autonomous Underwater Vehicles.

The first underwater photograph was taken in Weymouth Bay in February 1856 by a noted marine specimen collector, William Thompson, because he "could not use a pencil". Today photography plays a key role in deep-sea investigations, allowing researchers to access some of the remotest and most hostile of marine environments. Last month (February 2005) an autonomous underwater vehicle (AUV) tried, and failed, to photograph the seafloor deep beneath an Antarctic iceshelf. This month (March 2005) an AUV is attempting to locate and photograph new hydrothermal vents on the Mid-Atlantic Ridge.

'George Johnston of Berwick upon Tweed: 'the father of marine invertebrate zoology".

Peter Davis
International Centre for Cultural and Heritage Studies, The Bruce Building, University of Newcastle, Newcastle-uon-Tyne, NE1 7RU

George Johnston is best known for founding the first 'Naturalists Field Club' in Berwick in 1831, which helped to transform field natural history into a socially acceptable passtime, and for his catalytic role in the birth of the Ray Society. However, he was also at the cutting edge of research in marine biology, writing important books on hydroids, molluscs and worms. He had an extensive network of correspondents and friends with whom he exchanged information and specimens, and had particularly close relationship with naturalists based in Newcastle upon Tyne, including Joshua Alder and Albany Hancock. This presentation explores Johnston's life and work and makes reference to the fate of Johnston's collections.

Nematodes and the environment: taking the long view with short worms

Tim Ferrero
Dept. Zoology, The Natural History Museum, Cromwell Rd., London SW7 5BD

Nematodes are ubiquitous and the most numerous metazoan fauna of the region of interest to Porcupine members and indeed, worldwide. They can be studied on a variety of scales and from the viewpoint of most biological disciplines: taxonomy, phylogeny, morphology, ecology, physiology, behaviour etc. The Natural History Museum has a long history of nematode studies and has been particularly involved with studies aimed at detecting the impact and recovery from environmental perturbations. The Thames Estuary has been subject to chronic pollution and anthropogenic impact for centuries, but over the last few decades, has been the subject of one of the more widely publicized cleanup operations. In contrast, chronic pollution of the Arabian Gulf continues to this day and has been accompanied by large-scale impacts from petrochemicals associated with war and political unrest in the region. In situations such as these, baseline data is often lacking and impacts and recovery can be difficult to detect over relevant timescales. This presentation gave an insight into how we

are trying to address these problems using nematode worms as monitoring organisms, and illustrated how the study of nematodes can be undertaken by many.

How long-term collecting has increased our knowledge about community dynamics in the Bristol Channel

P. A. Henderson
Pisces Conservation Ltd & Dept of Zoology, University of Oxford

Populations of 81 fish and 15 macro-crustaceans living in Bridgwater Bay in the outer Severn Estuary, England have been monitored monthly since 1980. These time series provide a near-complete record of abundance for the estuarine macrofauna of the Bay. The abundance of the majority of species remained stable until 1989 when notable changes began to be observed. There has also been an almost linear increase in species richness since 1980 resulting in greater food web complexity. Studies of individual species show that for many species these changes can be related to climatic variables such as water temperature and the North Atlantic Oscillation. For example, Atlantic prawn, Palaemon serratus, sole, Solea solea and bass, Dicentrarchus labrax have increased in abundance with increasing water temperature while sea snail Liparis liparis and dab, Limanda limanda have declined. Other factors, such as the closure of cooling water intakes and improvements in water quality may also have allowed some species enhanced population growth. The net effect of all these changes has been a marked increase in fish and crustacean standing crop. Given the notable change in climate and species abundances that have been observed over the last 25 years it is remarkable that the abundance of the common shrimp, Crangon crangon, the most abundant large animals in the system, has shown no detectable change. No theoretical argument would have anticipated such a combination of change and stability indicating the primary importance of field observations.

The future value of observations such as those from Bridgwater Bay will, in part, be related to their usefulness for helping us to predict future change. In this presentation, the dynamics of the Bridgwater Bay food web over the last 25 years was demonstrated and how these data can be used to predict future dynamics was briefly introduced.

Molecular data on preserved fish specimens from the collection of the Natural History Museum, London

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Museum collections contain huge amounts of unexplored genetic information giving the possibility of following molecular changes as species develop through time. In particular there is the possibility of studying rare or extinct species, or samples that come from inaccessible and difficult-to-sample localities (e.g. the deep sea).

Molecular data was presented from two case-studies of fluid-preserved, museum fish specimens:

(1) Fifteen and twenty year old specimens of formalin-fixed *Nezumia* (Macrouridae) – deep-sea fish that were genetically uncharacterised and with no available DNA sequence data.

(2) Four-year-old specimens of mackerel (*Scomber scombrus*; Scombridae) preserved in a variety of different alcohol and formalin-based preservatives - a well-studied species,

for which nuclear and mitochondrial gene sequences are available.

Generally, in the study of *Nezumia*, it was much more difficult to perform molecular investigations because of the very damaging effect of formalin on the quality and yield of extracted DNA, as well as the absence of existing molecular information. The first molecular data on *Nezumia aequalis* and *N. micronychodon* were produced, and validated on additional formalin-fixed, DMSO- and ethanol-preserved samples. Specific PCR primers were designed, and reproducible DNA sequences were submitted to the GenBank nucleic acid database under accession numbers: AY826774 – AY826792.

The second study, with mackerel, involved determining the most appropriate protocols for DNA extraction from tissues exposed to the different preservatives, and testing the success of PCR amplifications against known targeted nuclear and mitochondrial sequences.

The results of these studies were presented and recommendations about approaches made.

Regional Collection Planning for Lower Vertebrates and Invertebrates

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Zoos and public aquariums have traditionally planned their collections based on availability of specimens, public demand and curatorial interest. In aquariums improved collecting and shipping methods along with advances in life support systems allow a diverse and continually growing array of species to be acquired and maintained. The public appetite for seeing key species such as sharks, seahorses and living corals is ever growing and expectations are high.

Today it is recognized that aquariums can play a key role in species conservation, not only as reservoirs for holding critically endangered species but also as places for relaying strong educational messages and carrying out important research. A modern aquarium must therefore balance its collection by holding charismatic species that the public audience expects to see with important conservation, education and research species that have lesser public appeal.

Collection planning for aquariums today includes species of public interest and those recognized by the wider aquarium community as important for conservation, education or research. Taxon advisory groups (TAGs) help direct the collection planning process for key species in the wider zoo and aquarium community. Together, European zoos and aquariums form a larger collective population of key species in their institutions. These populations form the regional collection plan (RCP).

In 2004 the mid-year meeting of the EAZA Lower Vertebrate and Invertebrate Taxon Advisory Groups (TAGs) was held in Riga Zoo, Latvia (23-25th April 2004). Twenty-seven participants from eight European countries participated in the meeting. The overall goal was to progress the Regional Collection Plans (RCPs) for the Amphibian and Reptile TAG (ARTAG), Fish and Aquatic Invertebrate TAG (FAITAG) and Terrestrial and Freshwater Invertebrate TAG (TITAG). This was the third year a joint meeting was held, providing an opportunity to discuss the issues relating to species taxonomic groups that offer both unique and common challenges in the development of an RCP when compared to other TAGs. The result of the meeting was the development of a new RCP strategy with three broad categories: Conservation, Research and Education. Within these categories are sub-categories that help define a species place within the RCP. Each species in the collection has a defined Action Plan with a set time frame. The Aquarium at London Zoo is applying the new strategy to its current collection planning process and is finding it a useful tool.

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Brown, M. T. and Lamare, M. D. 1994. The distribution of *Undaria pinnatifida* (Harvey) Suringar within Timaru Harbour, New Zealand. *Japanese Journal of Phycology* **42**: 63-70.
Dipper, F. A. 2001. *Extraordinary Fish*. BBC Worldwide Ltd. 96pp.

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