

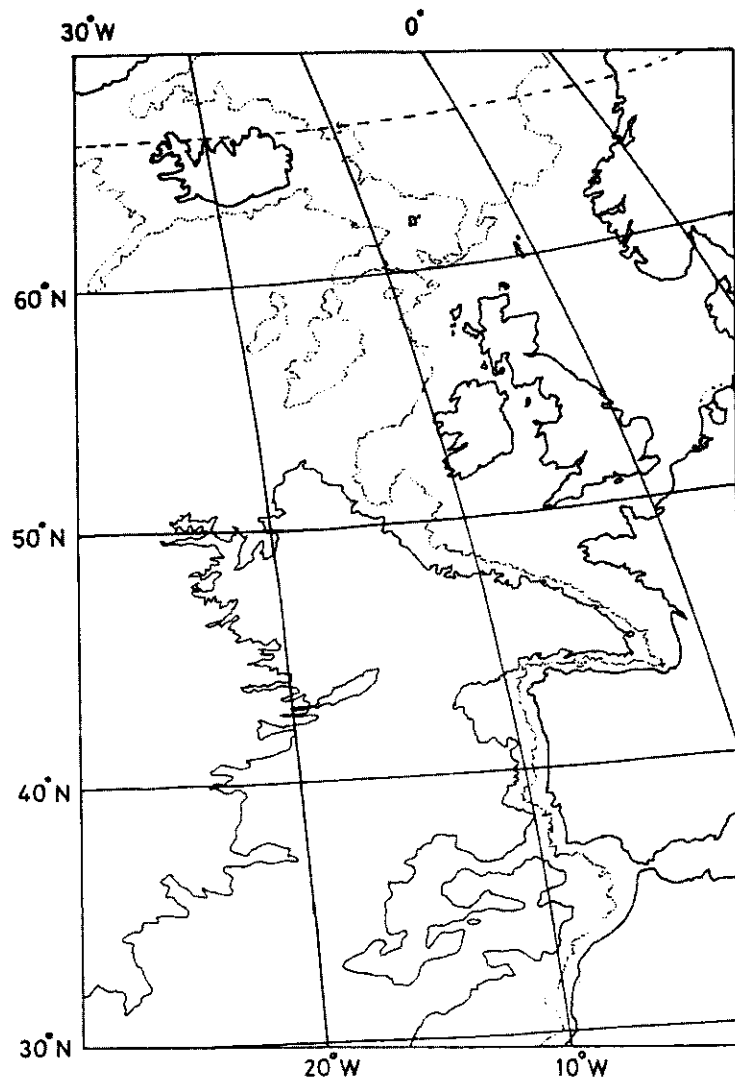
PORCUPINE MARINE NATURAL HISTORY SOCIETY

NEWSLETTER



February 2004

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Porcupine Marine Natural History Society

Newsletter

No. 14 February 2004

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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

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EDITORIAL

By the time you receive this issue of the PMNHS newsletter, our annual meeting and AGM will be imminent. Full details and a booking form are again included both within the newsletter and as a separate sheet. Hopefully many of you will already have booked but if not, then please do so ASAP. You can even turn up unannounced on the day!

In this issue there is a report on the 2003 annual Porcupine Field Trip that took place at the end of August on (and off) the shores of Northumberland. This year (2004) we will be visiting the shores of Dorset during May following on from the 'southern' theme of the Annual meeting. A visit to North Norfolk and the Wash is planned for 2005. For the experienced amongst you, these field trips provide an excellent opportunity to extend your own research or interests – worms seemed to be the order of the day in Northumberland. On the other hand, students and anyone with a general interest in things marine can take the opportunity to learn from the 'experts' present. This is what Porcupine is all about. You don't have to know anything to come on the field trips. But you certainly will at the end! There is no charge and the opportunity should not be missed. In this issue Vicki Howe describes her experiences of taking marine geography students on field trips to the Maltese islands. We have not as yet, ventured anywhere so exotic but there is an amazing amount to learn and see around our own shores.

For the October issue of the newsletter each year, we are proposing to have a theme and to invite papers and discussion on the issue. This year the theme will be 'maerl'. Maerl beds are diverse, fascinating and relatively rare. They are the subject of a UK BAP Habitat Action Plan and they are under threat from trawling damage and extraction for use in horticulture and agriculture. If you dive on, work on or have concerns for particular maerl beds or areas and would like to contribute to this issue, then please get writing now. Anything from short observations or photos from your patch, to full length papers will be considered.

Finally I had a note from Chris Mettam in response to my comment in the last issue (13) that perhaps there were so few *Convoluta roscoffensis* (small green flatworms) at Aberthaw because Porcupiners have large feet! He said: "*Convoluta* are sensitive to footfalls but we cannot blame the heavy tread of Porcupiners for their limited visibility. They stuck around even when agitated, poked and photographed by enthusiastic Porcupiners".

COPY DEADLINES

April 20th for the June issue

August 20th for the October issue

December 15th for February issue

SUMMARY OF MINUTES OF THE COUNCIL MEETING

Held on November 8th 2003 at the Natural History Museum, London

Present: Peter Barfield, Julia Nunn, Jon Moore, Frances Dipper, Roger Bamber, Peter Tinsley, Frank Evans, Andy Mackie, Shelagh Smith, Sue Chambers, Paul Brazier, Seamus Whyte.

Apologies: Anne Bunker, Vicki Howe, Lin Baldock, Roni Robbins

The Chairman welcomed the new council members elected at the AGM in March and thanked the outgoing members. It was agreed that meeting minutes will be circulated to Council Members by the Hon. Secretary using e-mail. After correction and approval a summary will be published in the newsletter.

Finances and membership

The current finances were presented by Jon Moore. The 2002 Accounts still require auditing. Finances remain sound thanks in large part to the 2002 and 2003 AGM meetings. Andy Mackie and his helpers were thanked for their hard work. It was agreed that a letter should be sent to the Director of the Cardiff Museum to thank him for the excellent facilities and generosity in considerably reducing their charges to us.

There are still many members who have not paid. The total in the bank currently stands at £5608. Membership remains static in spite of new members gained at Cardiff, due to persistent non-paying members being removed from the list. Total membership (including libraries) stands at 200.

Newsletter

Frances reported that the newsletter was running smoothly in spite of the usual difficulties of obtaining copy especially papers from meetings. It was agreed that in future every effort must be made to obtain manuscripts from speakers **before** or at the AGM symposium. Lin Baldock is aware of this. An 'Instructions to authors' sheet is still required.

Following consultation by e-mail it was agreed that 'Plan 2' be implemented re the

timing of the newsletter: one issue at beginning of **June** (not May as erroneously stated by FD at the council meeting) containing papers from the March meeting, one issue at the beginning of **October** with any other papers etc and one issue at the beginning of **February**, to be replaced by an Information bulletin (produced in house) if there is insufficient copy for a full Newsletter. It was agreed that the February issue should, if possible, have a major topic with invited papers/pieces. It was agreed that maerl (and possibly aggregate dredging) should be the February topic if time permits.

It was agreed that the new layout of the newsletter was excellent and Peter Tinsley was thanked for his hard work on this. There will need to be minor adjustments in view of comments from the printers. FD had investigated the possibility of including colour. It is currently too expensive at our print run to go to full colour. However, it was agreed that, funds permitting, occasional colour pages might be included. The cover was discussed and it was agreed to leave it as it is but to remove the two superfluous letters on it.

Website

A report from Anne Bunker was presented by the Chairman. The site has been updated with the information for the 2004 AGM and field meeting. Many useful suggestions for the links page have been received and appropriate links will be set up. Short features for the site are still needed.

Field trip 2003

This was not very well supported with only 10 participants. However, those taking part had all achieved useful records and it had been worthwhile. Shelagh Smith said that the dredging had been poor compared with the previous visit to this area. Marginal weather had not helped.

Field trip 2004

The field trip is a joint venture with the Conchological Society. Details (apart from diving) have been published in the newsletter. The boat will be dredging in the morning and diving in the afternoon. The cost is £35 per person per session. A deposit of £25 is required from PMNHS and from Conch. Soc. Lin will need to liaise with Conch Soc re bookings to ensure fair play. Records from the trip will be made available to the local Records Centre, and so will become freely available. There were no objections to this.

Field trip safety policy

Risk assessment and safety were discussed. It was agreed that proper risk assessments should be done and documented prior to all Porcupine field trips. As part of this, all participants must be properly briefed. There are plenty of relevant procedures available. Council members agreed to send examples to Julia who will compile a draft risk assessment, which needs to be in place for the 2004 field trip. Seasearch has procedures for diving trips. Liability Insurance was also discussed. The Belfast Naturalists Field Club has a simple fieldwork insurance that covers participants who 'sign in' for a trip. Julia will look into this.

A seashore code should also be available to participants (eg the MCS one). The possibility of compiling a fieldwork 'pack' for field trip leaders was raised. It is also important to ensure that any necessary access permissions are obtained eg. from National Trust, English Nature etc.

Conference 2004

Thanks were given to FD, LB and JM who had met informally in Swindon to discuss the conference and initiate ideas. The conference will be held over the weekend of 20-21st March 2004 at Bournemouth University. The theme is 'Species at the limits of their range'. A report from Lin Baldock on progress on arrangements and speakers was presented by the Chairman. Details have been published in the October newsletter. Arrangements for publicity, speakers, papers, timing, field excursion and cost were discussed.

Publicity for conference 2004

Anne Bunker has offered to co-ordinate publicity for the conference. Various ideas were put forward and discussed. It was agreed that a list of publicity actions is needed to save re-inventing the wheel each time.

Conference 2005

This will be held at the Natural History Museum, London and convened by Roger Bamber. The theme could include collectors and collecting, databases, photos and archiving.

Field trip 2005

Possibilities for 2005 were discussed. The southeast of England or Norfolk were discussed. It might be possible to arrange useful dredging in the Wash through the Eastern Sea Fisheries who have a suitable boat. The Norfolk coast has many possibilities for sediment shores, saltmarsh and a (very) few rocky shores. There are also saline lagoons etc. FD and SW agreed to investigate possibilities.

AOB

Memorial: Jon Moore has identified an ideal site on Milford Haven at the entrance to the Pembroke River. He is liaising with the developers of this site who seem keen on the idea and is awaiting permission.

History of Porcupine: SM reported that there has been no progress with this project and that she has no time to take it forward at the present. FD offered to try to start the project off and gather data.

Seasearch: It was suggested that Seasearch forms could be filled in following Porcupine field trip dives. Discussion required with the coordinator Chris Wood.

Membership secretary: Jon Moore said that with his present work commitments he was unable to service the membership properly as well as being Hon Treasurer. This meant that memberships remained unpaid and lists and correspondence were not kept up to date. Peter Barfield and Seamus Whyte volunteered to take this task on. A flyer will be included with the newsletter mailing to encourage members to recruit others and this will have SW's contact details on it (*this has been done - ed*). Membership contact details to be included on

inside cover of newsletters. Jon Moore was thanked for all his hard work.

Questionnaire: FD would like to send a questionnaire out to the membership to find out what their interests are and what they would like to see in the newsletter etc. A draft will be prepared (fold over A4) and circulated to council.

Council Meetings and Date of next meeting

The next Council meeting will be at the AGM conference in March 2004. It was agreed that as this meeting is always very pressured for time, as much pre-preparation as possible should be done beforehand by e-mail.

Porcupine Marine Natural History Society AGM 2004

The Annual General Meeting of the Society will be held at Bournemouth University during the annual conference over the weekend of March 20th-21st 2004.

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 Shelagh Smith and Frank Evans. 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 re-election. These are:

Chairman: Julia Nunn

Hon. Treasurer: Jon Moore

Hon. Editors: Frances Dipper and Peter Tinsley

Hon. Secretary: Frances Dipper

Hon. Records Convenor: Jon Moore

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.

PORCUPINE 2004: Marine Species at the Limits of their Range

20-21st March 2004 Bournemouth

This is the second announcement for the 2004 Porcupine meeting, this year being held at the Talbot Campus of the **University of Bournemouth**, (for more information on the university visit: www.bournemouth.ac.uk). The theme for the conference talks and posters is 'Marine Species at the Limits of their Range'. Keeping with tradition the two-day programme of presentations will be followed by a field meeting on Monday 22nd March and the conference dinner will be held on the evening of the first day.

The registration fee for the conference is **£30** including teas and coffees (but not lunches or dinners). There are facilities on the University site, otherwise it is rather isolated from local hosteleries. There is a reduced fee of £10 for both students and those presenting a talk. There are no reductions for poster presenters.

How to find the university

For an idea of how to find the venue, which is on the Talbot Campus, follow this link: <http://www.bournemouth.ac.uk/contacts/bournemouthmap.html> or visit <http://uk.multimap.com/> and put in the university's post code, BH12 5BB. Maps will be supplied to those attending. There is free parking on the campus for those attending the conference by car. There are good rail services to Bournemouth and for those coming from further afield Bournemouth International airport.

Preliminary Programme of Presentations

Further offers of talks and poster presentations to Lin Baldock (lin.baldock@virgin.net)

Ken Collins, School of Ocean and Earth
Science, Southampton University

Dorset Maerl

Jason Hall-Spencer, Department of Biological
Sciences, University of Plymouth

*The ecology and distribution of the giant limid bivalve Aesta
excavata.*

Roger Herbert, Medina Valley Centre

*Over the limit - the current status of southern
intertidal indicators on the central south coast of
England*

Tammy Horton, George Deacon Division for
Ocean Processes, Southampton Oceanography
Centre

*Ceratothoa steindachneri (Isopoda) - A cryptogenic
species in UK waters*

Robert Irving, Sea-scope

Leptopsammia pruvoti at Lundy: teetering on the brink

Mike Kendall & Nova Mieszkowska, MarClim
Programme, Marine Biological Association

*Distribution of Osilinus lineatus and Gibbula umbilicalis
in the English Channel.*

Colin & Lexie Munro, Reef Research

Genetics as a Tool for Conservation of the Pink Seafan

Julia Nunn, CEDaR, Ulster Museum

*Osilinus lineatus and other Mollusca near range limits in
Northern Ireland*

Jo Preston, Plymouth Marine Laboratory

*Possible edge of range speciation in Osilinus, and the
use of population genetics in conservation of species
living at their biogeographic limit.*

Richard Stanford, Devon Wildlife Trust

Conservation of Lyme Bay Reefs

Nigel Thomas, EMU Environmental

Black Bream off the Sussex coast

Steve Trehwella

Slides of Marine Species of the English Channel Coast

Posters

There is space for posters adjacent to the lecture hall for easy viewing during coffee/tea breaks.

Accommodation

An accommodation list will be available for those who **request** it on the booking form but if you would like to book sooner then the telephone number for the Bournemouth Tourist Information Centre for accommodation bookings only is: 01202 451700.

This websites may be useful:

<http://www.bournemouth.co.uk>

The Conference Dinner

If you would like to attend the dinner please include a deposit of **£10** when booking.

PORCUPINE FIELD MEETING

5TH-9TH May 2004

Contact: Lin Baldock (01305 852585, lin.baldock@virgin.net)

A field meeting combined with the Conchological Society of the British Isles is to be held to visit sites along the Dorset coast. Dorset provides some of the most easterly records on the north side of the English Channel for a number of marine species, some of which are being monitored as indicators of possible climate change for example the top shell *Osilinus lineatus* and the brown alga *Bifurcaria bifurcata*. There will be shore site visits to Osmington Mills and others probably Durlston Bay, Chapman's pool, Portland Bill, Golden Cap and Lyme Regis. There will also be a dredging trip from Lyme Regis and a Diving trip from Lyme Regis (alternating morning and afternoon). Full details were published in the previous newsletter (No 13 October 2003) and can also be obtained from Lin Baldock.

Conference Booking Form

If you would like to attend the conference please photocopy and complete the following form:

Name:

Postal address:

Telephone:

Email:

Please tick this box if you would like an **accommodation list** ☐

Please tick this box if you would like to attend the **conference dinner** ☐
(all interested should include £10 deposit to guarantee a place)

Please indicate if you have a preference for vegetarian food ☐

Please tick this box if you hope to attend the **field** meeting on the

22nd ☐

Please tick this box if you are a **speaker** ☐
(reduced fee of £10 to cover refreshments)*

Please tick this box if you are a **student** (reduced fee of £10)* ☐

Please tick this box if you are a non-member (fee of £35) ☐

Please tick this box if you require a **receipt** ☐

Payment

Cheques should be made payable to '**Porcupine Marine Natural History Society**' (£30 for members, £35 for non-members (or £10*) for the conference, £40 (or £20*) for the conference plus dinner down-payment) and sent with the completed form to:

Lin Baldock, 24 Martel Close, Broadmayne, Dorchester DT2 8PL

OTHER MEETINGS

March 2nd, 2004

CoastNET AGM & Lecture

The Canal Museum, 12/13, New Wharf Road, N1 9RTAGM: 6pm - 7pm & Lecture 7.30pm - 8.30pm

Lecture: Falling off the ocean's edge. Is there life beyond the horizon?

The speaker at the 2004 lecture will be Laurence Mee, Professor of Marine and Coastal Policy at the University of Plymouth, Policy Director for the Advisory Committee on the Protection of the Sea and a senior advisor to the Global Environment Facility. This is timed to be the evening before the CoastNET conference on the Water Framework Directive. For directions to the museum please visit: <http://www.canalmuseum.org.uk/printmap.htm> The lecture is free of charge to all CoastNET members, with a fee of £10 to non-members. Non-members who join CoastNET on the evening of the event will not be required to pay the lecture fee.

Contact: kelly@coastnet.org.uk

March 3rd 2004

The Water Framework Directive Implications for Estuaries and Coasts. A CoastNET Conference. SOAS University of London.

Many view the Water Framework Directive as a major opportunity to improve the planning and management of the water and land environment. Its jurisdiction extends to include estuaries (transitional waters) out to 1nm offshore (3nm in Scotland) and market research has demonstrated that it is of considerable interest to the coastal and marine community. The simple aim of this meeting will be to brief delegates on a range of issues surrounding the directive and its application to the estuarine and coastal environment.

Contact Bob Earll:

bob.earll@coastms.co.uk,

Tel: 01531 890415, www.coastms.co.uk.

18th March 2004

GIS in the marine and coastal environment

To be held at the Oceanology International 2004 Conference and Exhibition in the waterfront rooms at London, Docklands 16-19 March 2004.

Contact: Caroline Barraclough

cb@spearhead.co.uk or

020 8949 9849,

GIS website

<http://www.oceanologyinternational.com/meetings/GIS.asp>

April 15th-16th 2004.

The Wash Revisited.

ECSA Local Meeting 2004. To be held at the Le Strange Arms Hotel, Old Hunstanton, Norfolk. The venue is located in a prime site overlooking the Wash Estuary and only a short early morning stroll from the sand dunes of Gore Point at the entrance to the Wash.

Contact: Chris Amos

chris.amos3@btopenworld.com

or Tel. 01485 576133.

17th-18th April 2004.

MCS Marine Life Identification Course, Plymouth

Building on the success of courses organised at Plymouth for the British Sub-Aqua Club, the local MCS group is running a weekend of presentations on how to identify marine life, rock pooling and then, the hard bit, putting names to what you have seen. The weekend course is based at the Marine Biological Association laboratory and includes lectures by Dr Keith Hiscock, Peter Messenger and Dr Frances Dipper as well as a visit to the National Marine Aquarium to test your identification skills.

The cost of the course is £35. If you would like to attend, send your cheque made out to MCS and full contact details including e-mail address to: MCS Plymouth Local Group, 9 Wentwood Place, Thornbury, Plymouth, PL6 8TF. Further information from

mcsplymouthlocalgroup@hotmail.com

or 07971 551256 (Rose Edwards).

21st - 22nd April 2004 Integrated Coastal Zone Management: Fact or Fiction? University of Plymouth

This conference aims to investigate some of the issues relating to ICZM from both the marine and terrestrial standpoints. Discussions will include climate change, conflict of use, coastal stability, local planning and coastal policy. In addition there will be the

opportunity to explore the presence and impact of some of these issues in the Plymouth area during an afternoon boat trip.

The diversity of ICZM creates a network of specialists with both direct and indirect influence on coastal issues. This conference will benefit those working at the coastal zone including local councils and environmental groups and those working further afield including construction, engineering and environmental consultants. In addition the conference will provide a useful base for students and academics from a wide range of subject disciplines.

Contact: Plymouth Applied Scientific Services (PASS),

E-mail: pass@plymouth.ac.uk

www.science.plym.ac.uk/pass.

13th-17th September 2004

ECSA 38, Rouen, France. Changes in land uses: consequences on estuaries and coastal zones.

This is an international conference co-sponsored by ERF. It is organised by the Seine-

Aval programme and ECSA with the principal objective of comparing the Seine-Aval results with those from other estuaries.

Contact: Dr R. Lafitte,

e-mail: robert.lafite@univ-rouen.fr

20th-22nd September 2004

Littoral 2004. Seventh International Conference & Exhibition

Delivering Sustainable Coasts: Connecting Science and Policy

Aberdeen Exhibition and Conference Centre, Aberdeen, Scotland.

A joint EUROCOAST and EUCC-The Coastal Union conference, supported by CoastNET, the UK's national coastal network. Littoral 2004 is a major European event attracting an international audience of coastal researchers, managers, practitioners, and industry. Those wishing to attend, exhibit at, or sponsor the conference should visit www.littoral2004.org to register their interest. E-mail: enquiries@littoral2004.org; Tel: 01223 333438.



Mrs. Alfred Gatty, Author of "British Seaweeds"

Frank Evans

15 Thirlmere Avenue, North Shields, NE30 3UQ

(This article was first published in *The Phycologist* and is reproduced here with their kind permission)

Mrs. Alfred Gatty is today remembered by three separate groups of people for different aspects of her legacy. These are firstly her children's stories, secondly her sundial book and thirdly her seaweed volumes. In all these fields she produced remarkable work.

She was born Margaret Scott on 3 June 1809. Her mother was Mary Ryder who, in 1807 had secretly and against her family's wishes married a clergyman twice her age. The clergyman was Rev. Alexander Scott, DD. He was a former naval chaplain and a man with a considerable claim to fame for Admiral Nelson had died in his arms at the Battle of Trafalgar in 1805.

Immediately after Trafalgar, Scott had come ashore to a parish at Southminster, about three miles north of Burnham-on-Crouch, but from there in 1817 had moved to a larger parish in Catterick. At this time he was also appointed a royal chaplain. Meanwhile Mary Scott had borne him two daughters, Horatia in 1807 and Margaret in 1809, followed by a short-lived son. Sadly Mary had died at the age of only 26 when Margaret was two. The motherless children spent part of their growing years with their father in Catterick and part with the Earl and Countess of Tyrconnel who lived nearby, a couple said to be childless, wealthy and probably bored. They also visited Ryder relatives in Hendon and from there had easy access to London, where the growing Margaret spent much time in the Print Room of the British Museum, copying prints. She possessed many skills and had considerable artistic talent including etching on copper. As a young woman she received painting lessons in the fashion of the time but her forte, as she in time discovered for herself, lay in drawing in pencil. She played the piano

and spoke several languages, being apparently self-taught. These languages included French, German, Latin and Italian and she even attempted Chinese. For a time she kept her diary in German, writing it up in black letter script. Some of her translations from German and Italian including verses from Dante's "Inferno" were published around 1830. This linguistic facility had been inherited from her father and in time passed to her second daughter, Juliana. At one point in her life Juliana noted that her library included books in 25 different languages.

During the period up to her marriage, we may imagine Margaret Gatty pursuing the interests of a young woman of good family in provincial surroundings, supervising the household, formally calling and receiving, and attending balls and functions. However, it is likely that she and her older sister also followed the clerical tradition of the time in acting as unpaid curates to their father.

One day in 1839 a young priest named Alfred Gatty arrived in the Vicarage for a visit. He was the man Margaret was to marry. He had been invited from a parish ten miles away to spend a few days with Rev. Alexander Scott. After some vicissitudes Alfred Gatty and Margaret Scott were wed on 8 July 1839.

Alfred Gatty was born in 1813 and was thus four years younger than Margaret. He was the son of a well-to-do solicitor who practised in central London, and it was there that Alfred was born. A small event of his childhood was his acquaintance with Admiral Bligh, on whose knee he sat from time to time. The admiral wore around his neck a bullet suspended on a blue ribbon. This was the bullet that had been used to weigh out allowances of food during the heroic open boat voyage following the "Bounty" mutiny. From Admiral Bligh the bullet in time came into the possession of the Gatty family.

From Charterhouse and then Eton the young man went up to Oxford, graduating BA in 1836. He entered the church and became curate in charge at Bellerby and it was from here that he visited Alexander Scott. Following the wedding it was arranged that Alfred Gatty should become curate in charge at Southminster, the parish still held in plurality by Alexander Scott. But the unexpected death of the Vicar of Ecclesfield, an aged Ryder

relative of Scott's wife, Mary, altered this arrangement dramatically. The living was in the gift of another Ryder relative, who, despite Alfred's youth proceeded to appoint him to Ecclesfield as vicar. And there he remained for the next 64 years accompanied, for 34 of them until her death, by Margaret.

Married at thirty, Margaret proceeded to bear ten children, eight of whom survived to adulthood and most of them to a considerable age. Of the eight, four were boys and four girls. Some became distinguished and two of the sons were knighted. The oldest boy, Reginald, had a law degree from Cambridge and in time took holy orders, becoming a vicar like his father. The second son, Alfred, rose to become Garter King of Arms. He began his working life as a prolific popular song writer and hymnodist and is perhaps still remembered for his hymns. He changed his name from Gatty to Scott-Gatty and was knighted in 1904. The Gatty family made extensive use of nicknames and Alfred was known in the family as "Brownie". It is said that this name, having crept into one of Juliana Gatty's children's stories, a fairy story called "The Brownies", was picked up by Lord Baden-Powell as the name for the junior branch of his newly formed Girl Guide organisation. Lady Baden-Powell later confirmed this.

The third son, Stephen, also became a lawyer and practised as a barrister before becoming a colonial law officer. His final post was as Chief Justice of Gibraltar. He, too, was knighted. The fourth son, Charles, unlike his brothers did not go to university. He had a varied life as an author, shopkeeper in central London and parliamentary candidate.

Mrs. Gatty's first-born was her daughter Margaret, known as Madge. Madge's life's work appears to have been to marry a local squire and bear him nine sons. The second daughter, Juliana, ("Julie") is probably the one best known to the world. Unlike her siblings she died fairly young, aged only 43 but during her working life she continued in her mother's tradition of writing children's stories. She was renowned in the family as a teller of tales and her mother's publication, "Aunt Judy's Magazine" gave her an outlet for many of them. In all she wrote over a hundred stories

before her unfortunate early death from cancer, leaving behind numerous volumes of tales.

The third daughter was Horatia, known in the family as Dot. (It may be noted that the names Scott, Nelson, Horatio and Horatia abounded among the Christian names of the Gatty children.) Horatia was the child whose interest in collecting most paralleled Margaret Gatty's. She was said to have become a minor authority on seaweeds at an early age. She accompanied her mother on all her seaweed collecting expeditions and undertook much of the laying out and preserving of specimens. She was later to take a large part in continuing her mother's work with "Aunt Judy's Magazine", being first joint editor with her sister Juliana and subsequently sole editor. The year before her mother's death she saw Mrs. Gatty's two books, "The Book of Emblems" and "The Book of Sundials" through the press. Horatia lived to a great age, dying in 1945 within two months of her hundredth birthday.

The fourth daughter of the family was Undine ("Diney"). She was born in 1848 and it was in this year that Mrs. Gatty retired to Hastings for some five months to recover from the birth and it was then that she first took up her interest in seaweeds.

Margaret Gatty, by this time nearly forty and having borne seven children, was doubtless a little weary. Although not very domesticated (for the first 25 years of her occupancy there were no curtains in the vicarage dining room) there were for her the constant strains of motherhood and worries about money. A court case about an inheritance was not settled in her favour until after her death. Her husband's incumbency of the parish was at first a temporary one. But her character has been described as that of a scientist.

During her life she evoked an interest in fungi, she introduced homeopathy into her family and welcomed the use of chloroform, especially in dentistry and childbirth and indeed made use of this new anaesthetic herself on such occasions.

Although much of her energy went into the production of children's stories her interests, her powers of observation, her orderliness, accuracy, curiosity and persistence were those of a researcher. She had always been a collector and her gathering of mottoes,

particularly sundial mottoes, began as a girl. Here, in seaweeds and away from domestic cares, was a new and totally untested field for her to sample.

Her granddaughter, Christabel Maxwell wrote of her: "She threw herself into her new hobby with the enthusiasm of youth and studied voraciously all that she could find on the subject. She collected seaweeds wherever she went and encouraged her friends to do the same; she kept an aquarium and welcomed rapturously any addition to it; and her letters became full of strange drawings and algological names." She began to put together hand-prepared books of seaweeds and to sell them to friends; the profits from this endeavour she distributed among the needy of Ecclesfield parish.

Her absorption in the subject prompted Juliana to compose a parody of Charles Kingsley's "Sands of Dee", the first couple of verses of which ran:

*O Gattys! Go and call your mother home,
Call your mother home
At least in time for tea!
The breakfast, lunch and dinner go and
come
Unheeded, at the sea.*

*The creeping tide came up along the sand,
And round and round the sand,
But not a step moved she.
Her children shouted to her from the
land.
She shouted to the sea.*

It was while she was at Hastings that a local doctor introduced her to the work of Professor William Harvey of Trinity College, Dublin. His *Phycologica Britannica* (1846-51) was currently appearing and Margaret Gatty fell upon it. She commenced an extensive correspondence with him that lasted for ten years until he finally called at the Ecclesfield vicarage to meet her. He described her in the following words: "She is slight, tallish and intellectual looking and withal quiet: at least as yet nothing very mercurial has broken out. But there is evidently the mercury below the surface." Their accord was immediate and she obtained his permission to produce, with some

guidance from him, her popularising version of his book. This appeared in two volumes in 1863 under the title: *British Sea-Weeds. Drawn from Professor Harvey's "Phycologica Britannica"*. In them she attempted to avoid technical terms (*ramuli* become *branchlets*, etc.) and to keep her presentation simple.

A comparison of the two works shows that Margaret Gatty's illustrations are original and she did not make direct use of the plates of the earlier publication. It is likely from an occasional resemblance that she did not see all the species she lists but redrew some of her nearly four hundred figures from Harvey.

The other possible source for her illustrations would have been "Nature-Printed British Seaweeds" by Johnstone and Croall (1859), but the prints of these authors are different again.

Mrs. Gatty's "Seaweeds" was in use by students well into the twentieth century until the nomenclature finally became badly outdated and newer publications displaced it. Modern readers will find the long introduction to her work of historical interest. In it Mrs. Gatty describes the appropriate attire for a lady shore collector of her time. On the subject of petticoats she says: "If anything could excuse a woman for imitating the costume of a man, it would be what she suffers as a seaweed collector from those necessary draperies." Trousers were impossible, of course. And: "Verily we women are all 'more or less' (as seaweed descriptions have it), at the mercy of our dress!" But she strides across the shore devoid of jewellery, in her boy's boots and her woollen skirt, wearing no shawl or draping lace until we may encounter her, as she says, face down on a rock, peering into a rock pool for half an hour at a time, collecting weed. From her introduction we learn of places where she collected, Filey, Scarborough, Berwick, Douglas in the Is. of Man and the Scilly Is., to which must be added Hastings. What remains of Mrs. Gatty's extensive collection of seaweeds is currently held at the University of St. Andrews where they came to rest after the closure of the Gatty Marine Laboratory (named after a Gatty nephew) and additionally there are said to be a couple of thousand of her seaweed slides at the Weston Park Museum, Sheffield.

Algologists at the Natural History Museum are currently enquiring further about this.

During much of her married life Margaret Gatty wrote stories for children. Her first book, entitled "The Fairy Godmothers", appeared in 1851 and by the time her seaweed book was published, twelve years later, the number of her children's books had also risen to a dozen. These included "Parables from Nature", which became a series, continuing until the fifth and last of the issue in 1871. It is indicative that she requested for payment for her "Fairy Godmothers" not a royalty but a copy of "Dr. Johnston's book on zoophytes". This would presumably be the 1847 edition of *A History of the British Zoophytes* by the Berwick physician George Johnston. For the second edition of her own book she received from the publisher a copy of *A History of the British Sponges and Lithophytes* by the same author. Over the years she visited Johnston, collected with him and corresponded with him from the time of her first interest in seaweeds up to his death in 1855.

From 1866 she edited a new monthly magazine for children for the publishers Bell & Daldy, which she called "Aunt Judy's Magazine". For this she was paid £10 a month, all of which she appears to have passed to her husband. The magazine continued for some years after her death, edited first jointly by her daughters Juliana and Horatia and subsequently by Horatia alone until its demise in 1885. During the life of the magazine its readers contributed through Margaret Gatty and her daughters towards a fund for the Great Ormond Street Hospital for Children in London. By 1871 £1000 had been raised and an 'Aunt Judy's Cot' was established, to be joined by a second in 1876, and other gifts followed.

In 1863, at the height of her literary and scientific powers Margaret Gatty's health began to fail. She started to suffer the initial symptoms of the paralysis that would eventually be the cause of her death. Over the next ten years she slowly deteriorated, finding it difficult and then impossible to write, first with her right hand and then with her left, and suffering the advance of what is now believed to have been multiple sclerosis. She died on 4 January 1873. In the year before her death she published two volumes that

represented another aspect of her life's interest. The first was a book of a hundred and twenty four pages entitled "The Book of Emblems". In the book she takes mottoes of various sorts and writes two to four pages about each, with the addition of a picture. Examples of the thirty one rather odd titles are:- "The hunchback sees his neighbour's hump, not his own," and "Roasted pigeons fly into nobody's mouth."

The second book of 1872 was more significant and while the emblem book collected together a few mottoes "The Book of Sundials" represented a lifetime's work of recording sundial mottoes. The first edition was hers with a few continental additions by Eleanor Lloyd, a family friend. It contained 377 sundial mottoes. In 1889 a second edition was produced by her daughter Horatia, again with the assistance of Miss Lloyd. It was much enlarged, listing 759 dials and now included an appendix on dial construction. This was contributed by Wigham Richardson, a Tyneside shipbuilder who in time was to unite with Swan and Hunter to form Swan, Hunter and Wigham Richardson, the builders of the famous liner "Mauretania".

A third edition, little changed from the second, appeared a year later. The fourth edition and the one best known and now much sought after, was brought out in 1900. It was completely rewritten by Horatia and Miss Lloyd, being enlarged to 530 pages and with many line drawings and a few photographs. The number of dial mottoes rose to 1682. Astronomical tables were added, together with a section on portable sundials. The final result is magnificent but most credit must go to Horatia Eden as she had now become. It is nevertheless a most fitting tribute to Margaret Gatty.

And what of her husband following her untimely death? He had settled comfortably into the parish and was respected by his parishioners to the extent that they contributed the sum of £120 to pay for the expense of a Doctorate of Divinity from Oxford for him. (Were such doctorates really bought and sold by universities in those days?) He continued as vicar of Ecclesfield for the next thirty years and in 1887 married again, a woman 24 years younger than himself.

He died in 1903, ending the Gatty connection with the parish and leaving a small literary legacy. But of the many remarkable Gattys the most outstanding of all was the one who always wrote under the name "Mrs. Alfred Gatty".

Acknowledgement.

I am much indebted to Mike Cowham for his help, both directly and through the literature, in the preparation of this account.

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Information requests and observations

Bluefin Tuna record

From Douglas Herdson, Information Officer,
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Plymouth PL4 0LF. Tel: 01752 275216/01752
600301. Email: Douglas.Herdson@national-
aquarium.co.uk

A medium-sized Bluefin Tuna *Thunnus thynnus* was landed at Plymouth Fish Market on 5th December 2003. The fish is 244cm long (Fork length) and weighs 42½ stone (595 kg). It was caught on the evening of 4th December at around 49° 55'N 004° 40'W, (that is about 24 nautical miles east of Lizard Point, SW Cornwall) by the Scottish mid-water trawler *Ocean Star* (FR 894) in a mid-water pair trawl. The last landing of a fish of this type in Plymouth was a 340 kg (750 lb) Bluefin Tuna on 29th October 1998. There have been a few catches of large tuna over the last few years to the south west of Ireland, and a number of reports of probable tunas, mainly of about one metre in length, from around Devon and Cornwall. There were also two Bonitos (*Sarda sarda*) (small tunas) caught at Polperro on the Cornish south coast at the beginning of October 2003.

Slipper Lobsters (*Scyllarus arctus*) in the British Isles

From Douglas Herdson, Information Officer,
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600301. Email: Douglas.Herdson@national-
aquarium.co.uk 03.02.2004

Early in 2002, an unusual little lobster arrived at the National Marine Aquarium from the Isles of Scilly. It had been caught in a lobster pot at a depth of about 60 metres about 3 miles south east of St Mary's, just before Christmas (probably 21.12.2001) by Mr Barry Bennett. Realising that it was an unusual and interesting find Mr Bennett put it in a display tank, which he maintains in the Harbour Master's Office in St Mary's.

After Christmas the Harbour Master, Jeff Penhaligon, 'phoned the National Marine Aquarium, and from the description it was suggested that it was probably a slipper lobster. It was carefully packed in a box of seaweed, flown to Newquay, and brought by train to Plymouth. It arrived in fine condition and was indeed a Slipper Lobster *Scyllarus arctus*, and a fairly large and lively one. It had tiny pincers on the fifth pair of walking legs, showing that it was a female.

There have now been around 23 *Scyllarus arctus* recorded in the UK, excluding the Channel Islands, since the first was recorded in 1758. Most records are from off the Cornish coast, with three around the south coast of Devon, and two in Dorset (Horton, 2002 *pers.com.*) Ten have been discovered in the last eight years and five of these were from around the Isles of Scilly. (More Giant squid *Architeuthis dux* have been found in British waters than slipper lobsters.)

Apparently, it was formerly regularly found in the Channel Islands. Sinel (1907) reports: "Not rare off Guernsey, Sark or Herm, but only once recorded, to my knowledge, from Jersey. Several specimens have been taken off the Minquier reef, South of Jersey". It has probably been caught in Guernsey waters in the last thirty years (Lord, 2002 *pers.com.*)

This crustacean is about 13cm (maximum 16 cm) long, dark brown, with a lobster-like tail. The head lacks the large claws of a lobster, or the long antennae of a crawfish or spiny lobster; instead, it has very short antennae and two large hinged scales or plates at the front of the shell. It has orange-red eyes and a rough granulated texture to the shell. The head scales have an attractive light and dark brown pattern and there are little longitudinal light brown and red markings on the tail. The walking legs have alternating bands of cream and brown, making it look as if it is wearing rugby socks.

In Britain they appear to breed in the summer months with females with eggs ("berried") being found south of the Scillies in the early summer of 2002 and near the

Eddystone Reef in July 2003. *Phyllostoma* larvae were found near the Eddystone in the summer of 1913 (Marine Biological Association, 1957).

Slipper lobsters are found in warm seas throughout the world, and this species is one of the smaller ones. Five species of scyllarids are known from the North East Atlantic. They are variously called Slipper, Shovel-nosed, Flat, or Small Locust lobsters in English, Bärenskreb in German, Cigarra in Spanish, Cigale in French and Um al Rubyan (mother of prawn) in Arabic. Their French name *Cigale* means 'sea cricket' and refers to a snapping cricket-like noise they make under water.

Scyllarus arctus is found in the Mediterranean, and in the Eastern Atlantic from Morocco to the English Channel but is rare north of the Bay of Biscay. They live on stony ground, in caves, and can also be found on muddy bottoms or in seagrass beds. They use the large spade-like scales at the front of the head to burrow into mud, sand, or gravel between and under stones. When startled, they can shoot backwards rapidly by flexing their abdomen. In the Mediterranean they commonly live from 4 to 50 metres, but in Cornwall most have been found at depths of 40 to 100 metres.

My thanks to all the fishermen who have brought specimens to the National Marine Aquarium, as well as Chris Gilbertson, Keith Hiscock, Nick Pope, Andy Horton and Richard Lord for records. Especial thanks to Matt Slater and Richard Smith of Blue Reef Aquarium, Newquay, for details of the slipper lobsters taken to them including the first British gravid female, and Stella Turk for searching the records of the Environmental Records Centre for Cornwall and the Isles of Scilly (ERCCIS).



British Occurrences (as known to us, any other records gratefully received); -

(All Cornwall unless otherwise stated)

1758	Mount's Bay
1856	Penzance
1880	off Polperro
1892	Millbay, Plymouth, Devon
1897	off Plymouth Breakwater, Devon
1900	south of the Eddystone Reef
pre-1906	off Land's End
pre-1906	off the north Cornwall coast
1913	near the Eddystone (<i>Phyllostoma</i> larvae)
1957	off Porthleven
1996	west of the Isles of Scilly
1999	off Wolf Rock
1999	off Mevagissey
2000	10 miles east of the Scillies
2001	3 miles south east of the Scillies, in 60m
2002	100 miles south of the Scillies
2002	10 miles off Berry Head, Devon, in 42m
2002	10 miles south of St Anthony's Lighthouse in 40m
2002	south of the Scillies, in 142 m*
2003	west of the Eddystone, in 50m*

* Berried female

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Calliostoma at Aberthaw

An e-mail received by the editor from Bob Earll Nov 2003

It's always good to see one's work referred to and I was interested to read Chris Mettam's write-up of the Aberthaw Porcupine visit (PMNHS No 13 October 2003) and his comments on *Calliostoma* – the painted top-shell. He referred to the paper that John Moore I had edited which compiled the experience of Porcupine members who attended that meeting, on six species (PMNHS No 4, March 2000).

One of the key points we sought to make in that paper was that distribution maps without accompanying ecological information were not terribly helpful. What is interesting about the Aberthaw records is they indicate that *Calliostoma* has a very widespread range of habitat beyond what was predicted from that meeting in three important respects:

- the site as *estuarine* – implying that reduced salinity does not seem to impair its distribution,
- nor apparently do the *silty* conditions.
- Nor does it seem to need 'weeds', 'other gastropods to show up on weed-free rocks'

The MNCR records seemed to indicate that its occurrence was less common on the

sediment dominated and estuarine shores – even though the Porcupines map gave it a highly likely presence [Presence of viable adult populations highly likely 66-100%] around the entire UK.

The obvious point to arise from the conference exercise we trialled to produce the paper, was that we hadn't provided an opportunity to describe abundance. Chris describes the abundance of *Calliostoma* of 10 per square metre at Breaksea Point, Aberthaw.

Adult *Calliostoma* are a very conspicuous species underwater and this year I recorded over 20 on a 30 minute dive in 20m (circalittoral) off the east of Knivestone the most easterly rocks on the Farnes islands; I also remember it being common on the exposed sublittoral sites of Shetland. The conditions on the shore of Aberthaw and on exposed sublittoral rock off the east coast are quite different habitats but perhaps we should expect this of non species-specific predatory species in terms of predicting their distribution.

Certainly I hoped that Porcupines would take the ecology and distribution map idea further since it seemed to be a great way to combine both their recording and ecological knowledge; Chris's observation and the Aberthaw visit suggest to me that the *Calliostoma* part of the Earll and Moore paper needs revising! I'd like to try this approach again at the next meeting in Bournemouth.

Calliostoma at Aberthaw 2

An e-mail sent to Bob Earll from Chris Mettam in reply to the above

Thanks for your note. I made a deliberate effort to refer to previous PMNHS newsletters in my comments on the Aberthaw field records, partly in case some readers cannot easily access much other literature but also to inspire some internal discussion. It makes a newsletter more interesting if its readers are engaged and respond as you have done. Of course I should have responded similarly to your paper Earll & Moore 2000 and to those of Bamber & Irving 1993 and Smith 1995. Better late than never maybe.

Unfortunately I was without earlier PMNHS newsletters at the time of writing (they reside, along with so much other stuff, in boxes since eviction from my university

office) so it was not possible to check exactly what you had written about *Calliostoma*. Frances even had to find the reference details herself from copies archived in her attic - that's really taking editorial duties to heart!

As far as your points go:

Salinity - it is variable at Aberthaw (several publications indicate the range as salinity changes with seasonal rainfall)

Silt - it is always silty there

'Weeds' - your quote reads rather oddly to me; if you need a quote, you might put instead: It was one of the 'gastropods to show up on the weed-free rocks'.

Abundance - it would not be fair to say that *Calliostoma* has an 'abundance' of >10 per square metre. I didn't say that. I referred to 'a group' at that density. It was an exceptional group of 26 specimens, including a few (I did not record how many) white-shelled animals, all seemingly clustered in a sheltered pocket among the rocks. They would all have been visible from the same standing point if it were not for concealment by overhangs or boulders. I have not seen so many together before or since. Where I said *Calliostoma* was 'very abundant and conspicuous at St Donat's Bay', I was thinking of something more like 1, 2 or 3 animals per ten square metres.

I very much agree that ecological notes, such as estimates of abundance, add value to distribution records.



Calliostoma on kelp

P Tinsley

***Serpula* at Connemara**

*Extracted from an e-mail sent to the editor
from Dick Hammond referring to Sue Chambers
article in PMNHS Newsletter Issue 13 October 2003
and her reply*

Could the supposed *Serpula* from the Salt Lake in Connemara (which I take to be a brackish lagoon) have in reality been *Mercierella enigmatica*? which I have found in this sort of habitat in Australia. It was extremely brittle and the large clumps of it crumbled under my feet because it could not bear my weight, whereas from all that I have read the true *Serpula* is totally marine, requires Atlantic water and is much stronger. They are both very large serpulids and superficially much alike.

Reply from Sue Chambers

I am sure Salt Lake was totally marine but very sheltered which is why *Serpula* can survive there. The polychaete was definitely *Serpula* and we have samples in the collection. It is currently *Serpula vermicularis* although there are molecular studies currently in operation which may reveal more than one species. There is also a major revision of the genus by G Pillai? The calcareous reef structure is not hard enough to withstand the weight of anybody as it is brittle and easily damaged which is one of the reasons it needs protection.



Creature feature

Notes on the natural history of the edible crab, *Cancer pagurus* Linnaeus, 1758.

by Peter Barfield, Sea-nature Studies

(website: www.seanature.co.uk)

e-mail: peter@seanature.co.uk)

Introduction:

Take a look into some of the cracks and crevices of the intertidal zone on the north coast of Cornwall and it won't be long before you find a juvenile edible crab staring back at you. These exposed shores are part of an extensive nursery area for the species.

Cancer pagurus Linnaeus, 1758 is commonly known as the edible or brown crab. 'Cancer' is the Latin for crab and it seems possible that *pagurus* derives from 'pagur' which was the Latin name for a type of fish, now unknown. So the literal translation of it's scientific name might be 'crab-fish', an interesting connection with the common convention to refer to many different crustaceans, molluscs and fin-fish as 'fish'.

Edible crabs are most common on rough grounds. Adults can often be found on shingle and shell gravels and have, exceptionally, been found down to depths of 520m. Juveniles live intertidally and in shallow inshore waters. One study in Pembrokeshire (Crothers, 1969) recorded peak abundances of small crabs between 5.5 and 11m depth.

It takes between 3 and 5 years for crabs to reach sexual maturity and they may live for up to 20 years. They continue to moult throughout their lives and may therefore grow to a very large size. The largest edible crab on record was a male or 'cock' crab with a carapace width of 267mm, landed from the English Channel fishery. The Channel is known to produce exceptionally large male specimens of the edible crab.

Food and Feeding:

Edible crabs will feed on a wide variety of prey. They are important predators of molluscs, taking gastropods such as dog

whelks and winkles, mussels, scallops and burrowing bivalves, which they may dig down to depths of at least 20cm to find. But they will also attack other species of crab as well as echinoderms such as the sea urchin *Paracentrochus*. Edible crabs themselves fall prey to local predatory fish such the sea-bass, herring gulls, cormorants, octopus and of course, man.

The edible crab uses its powerful claws to crush molluscan prey. In the shore crab, *Carcinus maenas*, one cheliped has a crushing roll, the other a cutting, but in *Cancer pagurus* things are simplified and ambidextrous brute force prevails. Small gastropods are easily crushed by the powerful chelipeds, but the larger ones are more likely to suffer apertural breakage (Lawton and Hughes, 1985). A degree of finesse is required though, because the key to successfully breaking a shell is in the handling. Direct developers such as the dog whelk, *Nucella lapillus*, reflect this with shell shapes tending towards elongate forms with small apertures on shores with heavy crab predation. These forms increase the handling difficulty for the edible crab. *Littorina littorea* has an avoidance strategy to predation. It will climb higher up the shore to escape attacks. This response coupled with its dispersive pelagic larval phase means adaptations of shell shape are much less obvious, if seen at all, in this species.

Cancer pagurus is entirely non-selective in its choice of prey and will, for instance, indiscriminately attack all sizes of dog whelk. Picking up a large unprofitable gastropod, it may succeed only in damaging the shell without actually getting to the flesh. Indeed it has been observed to spend up to several hours on a single prey item even when others are available. They are clearly persistent creatures in this regard and coupled with their strength, the phrase 'brute force and ignorance' seems to strike fairly close to the descriptive-mark for *Cancer pagurus*!

One of the key strategies adopted by the crab when hunting agile epifaunal prey such as shore crabs, is the ambush (Lawton, 1989). The ambush can be expressed in three different ways. The first and most common is simply a grab response.

The second is a pounce and the third is to actively stalk the prey. These attacks on crabs such as *Porcellana platycheles*, *Pisidia longicornis*, *Pilumnus hirtellus*, *Galathea squamifera* and *Carcinus maenas* are not always successful. The edible crab may fumble the attack, mishandling the prey which makes its escape. Alternatively the prey may make a successful retaliation or if held fast it can shed the trapped limb just as *Cancer* itself will if one of its own legs is held fast by a predator. The ambush tactic used against the broad-clawed porcelain crab *Porcellana platycheles*, was more successful than head-on attacks.

In the subtidal environment the edible crab will forage over an area searching for and feeding on, prey like sedentary mussels and slow moving gastropods. Although unconfirmed in the wild it is thought that between these forays it will ambush opportunistically, any prey which happens to wander too close to its shelter.

Juveniles are likely to centre their own foraging behaviour around a shelter. They may seek to limit the time spent away from the relative safety of this shelter and in so doing, reduce the likelihood of falling victim to predation themselves. Prey items are therefore unlikely to be consumed in outside, exposed situations. This has been seen for juvenile lobsters, which leave their shelter only long enough to grab, non-selectively prey such as a mussel, before returning to the shelter to consume their food. If true for the edible crab, this would indicate that the availability of shelter is of no small importance to their survival.

Reproduction:

It is thought that a pheromonal identification and attraction mechanism may be in play as part of the mating process. Pairing occurs between crabs prior to mating when the female is about to moult and the male is between moults. Observations indicate that the male may help the female to shed the exo-skeleton she has outgrown. Copulation can then occur between the soft, newly moulted female and the male. It is thought that he then remains with the female until her soft covering has begun to harden.

The female stores the male's sperm within

an enlargement of the genital duct called the spermatheca and the genital opening becomes sealed off by a structure referred to as the sperm plug. Perhaps it is the formation of this he is waiting for to ensure his undiluted reproductive success. The female may now choose to delay fertilization of her eggs for up to 15 months, so although she has mated she may not spawn until the following year. She also has the option of using her store of sperm to fertilize not just one but several batches of eggs.

Spawning usually takes place in late autumn or early winter. The female will search for areas of sand or gravel substrate, a soft area of seabed, where she can make a small hollow for her abdomen. Placing her abdomen in this depression she ensures the successful attachment of the fertilized eggs to her pleopods where they will develop, protected, for the next 7 to 9 months. With the eggs attached in this way she is said to be 'berried' or somewhat less poetically, ovigerous, and in this state she will overwinter without feeding.

At each spawning a female may produce between a quarter of a million and 3 million eggs depending on her size, with the larger females having the greater number of eggs. The main hatching period for North Sea and English Channel populations is from May to July and the newly hatched larvae enter the planktonic stage of their development which may last for up to 2 months. Mortality is high during this period and the rate at which the larvae develop as they are dispersed on the prevailing currents, is temperature dependent. By hatching during a period of increasing water temperature the time spent in the plankton is reduced. Although May-July is the main hatching window, edible crab larvae have been found in the plankton from March through to December. In the northeast Atlantic as a whole, numbers of crab larvae show seasonal peaks in April, June and August.

The size at which sexual maturity is reached depends on where the crab comes from and for females in particular this size may vary widely. The size of a crab is measured as the width across its carapace (the carapace width or cw). The smallest berried females reported by Bennett (1995) were as follows: English

Channel, 133mm; Irish Sea, 152mm; northern North Sea, 115mm; central North Sea, 129mm.

An earlier study by Edwards (1979) suggested a single figure for females of 127mm and for male crabs that those over 110mm were likely to be sexually mature. Edwards (1971) found that by their 4th year of development crabs had reached a cw of about 89mm and that it might not be until their 5th year that they exceed a cw of 110mm. In broader terms however crabs will reach sexual maturity in 3 to 5 years.

Juvenile crabs are found intertidally and in shallow inshore waters. It is worth highlighting here that there are critical gaps in our knowledge of juvenile edible crabs with only a limited understanding of behaviour, feeding, habitat needs, growth, mortality, predation or where settlement takes place. In addition there is little data on either stock or recruitment of juveniles.

Growth and moulting:

Tagging, or mark-and-recapture studies are used to gain an understanding of the frequency with which crabs moult and therefore of their growth. For juveniles the size increments at which moulting occurs are similar for both males and females.

In adults the case is very different and growth patterns can vary both within and between the sexes. One aspect that helps generate the gender divergence in growth is that females may partition energy towards egg production and this, of necessity, will limit their ability to grow. More broadly, growth patterns for *Cancer pagurus*, as with any animal, will vary considerably depending on key factors such as food supply and temperature. Imagine too the energy required to re-grow a lost limb and the consequent limitations placed on body-growth during that time.

Edible crabs which are about to moult, or have recently moulted will remain in a suitable shelter while the new shell hardens. Soft-shelled crabs are known to be more vulnerable and predators such as sea bass are adept at detecting this vulnerability. The crabs need calcium for the shells to harden and they may obtain this by consuming young specimens

of the common mussel, *Mytilus edulis* (Karlsson and Christiansen, 1996). If the shelter is a little tight and the crab is somewhat jammed in against the rock then it may end up with some distortion to its carapace until the next moult.

In the English Channel the frequency with which the crabs moult decreases as they get bigger and females tend to moult less frequently than the males. In contrast, in the North Sea, while the general rule that moult frequency decreases with size holds true, the females tend to moult more frequently than the males. A comparison of the moult frequency of adult males between the two locations indicated that the males in the English Channel moulted with greater frequency than their counterparts in the North Sea.

To add further complexity to the story it has also been seen that within the English Channel population the annual growth rates for females in the south were higher than those in the north.

Lastly it is very important to qualify these findings by mentioning the confounding factors inherent in their derivation:

- the timing of the separate studies with relation to actual moulting periods;
- the fact that how catchable an individual is changes depending on where they are in the moult-cycle;
- the trap used may introduce a selection bias;
- the survival rates of moulted and non-moulted crabs is different;
- tags lost during moulting;
- tagged animals moving out of the study area;
- the stage of the reproductive cycle;
- annual variation ('good' and 'bad' years);
- genetic differences between stocks;
- environmentally derived controls or inducements.

All of which should indicate that in the application of growth models and size frequencies in any management strategy for the species, it is not only desirable but also necessary to adopt a precautionary, conservative approach.

One interesting aspect of growth and moulting is autotomy. Imagine an edible crab is under attack and one of its limbs has been seized by a predator. How can it save itself? One option it may resort to is known as evasive autotomy. To escape its attacker the crab may sacrifice the limb. Autotomy is a Greek word derived from 'autos', self, and 'tomos', cutting. In practice this means that *Cancer pagurus*, in common with other crabs, is able to shed the seized or damaged limb along a predestined breakage plane. However the lost limb can only be replaced by moulting and the process may generate abnormalities.

Movement and range:

Male edible crabs are essentially nomadic and move in fairly random, localised ways with the larger ones ranging over greater areas. Conversely mature females may travel over large distances in a specific direction. These journeys are made against the prevailing residual current so that when eggs hatch the inevitable larval drift is compensated for to some degree (or so the theory goes). Does this make any intuitive/evolutionary sense? If the conditions for survival were optimal in the area that nurtured you, then perhaps it does.

In the North Sea off England the females, in addition to making seasonal inshore/offshore movements, will also journey great distances north up to southeast Scotland. In the English Channel the journey is to the west, except that for those females already in the west, the movement is to the south.

Another well-known migration is that which happens each autumn off the south coast of Devon. Large mature females move down into deeper waters where good spawning substrate can be found and where larvae can be dispersed by the prevailing easterly currents.

In temperatures of less than 5°C edible crabs will neither migrate nor feed. But when they are on the move individual crabs have been known to travel over 18km in a week.

Fisheries:

There are three 'true' crabs (i.e. brachyurans) fished for in UK waters, the thornback spider crab *Maja squinado*, the velvet swimmer crab *Necora puber* and the

edible crab *Cancer pagurus*. Of these it is the edible crab that forms the basis of one of the most valuable income streams for our shellfisherman (Ingle, 1996). The classic pie-crust look to the front margins of the carapace of *Cancer pagurus* lends it an entirely edible look even before we taste its flesh. Conversely the common or thornback spider crab presents a somewhat spikier problem for the marketing people both in looks and name.

Each of these species has a minimum landing size (mls). The first mls for the edible crab was set in 1877 at a carapace width (cw) of 108mm with the taking of berried crabs banned in the same year. In 1951 the mls was changed to 115mm. From January 1st 2000 the UK mls for edible crabs caught off Devon, Cornwall and the Isles of Scilly was set at a cw of 140mm for females and 160 mm for males. The European Union mls in the same waters is gender non-specific and set at 140mm.

Berried females and soft-shelled crabs may not be landed. Unfortunately there is no objective test for what constitutes a 'soft' crab and, in the English Channel at least, you are likely to find moulting crabs in most months.

The largest edible crabs are found offshore and the average size of trapped crabs increases with depth (true for both genders, juveniles and adults).

In one study, Bennett (1995) found that in the first half of the year in the western Channel most females caught were about 160mm. The mean cw of males caught was highest in spring and at this time the sex ratio of crabs caught was 1:1. By August the size of the females was up to 175mm and they made up 96% of the catch. In the eastern Channel male crabs consistently dominated the catch.

The catchability of females can vary widely. Berried females fast overwinter and are therefore only rarely caught. Post-ovigerous females in June/July are consequently more readily caught as they are hungry following their fast and need to build up their body reserves again. By autumn the females will have richly developed ovaries and those caught may give high yields of meat.

Pre-spawning aggregations are known to form in both the English Channel and North

Sea and during these times, the crabs are easily caught. This leaves them highly exposed to possible over-exploitation. It is thought that this autumn fishery could therefore prove damaging to stock recruitment and hence the long-term health of both the species and the fishery. On a somewhat less alarming note it may also be true that spawning grounds are spread more widely than the fishery.

Other threats to edible crabs in the offshore environment that should not be forgotten, particularly with regard to their possible impact on overwintering ovigerous females, include beam trawling, scallop dredging and aggregate extraction.

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The following references were consulted in the production of much of the above material, though, as ever, any mistakes, musings and misapprehensions are entirely my own. The 1995 paper by Bennett was an especially rich source of information and as such would be a good starting point for those interested in delving further into the scientific studies on the extraordinary edible crab.

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Addendum to previous 'Creature Feature' article, 'Distribution of the Celtic sea-slug' (PMNHS Newsletter 13, October 2003)

Please note that there are several records of *Onchidella celtica* from the west coast of Scotland. However I have it on good authority (thanks are due to Shelagh Smith) that these finds probably represent adventitious and not over-wintering populations. To further confound expectation the two Scottish records were both collected from the sublittoral. As such it is my opinion that we should currently consider the west coast of Scotland finds to be ephemeral and not as yet, part of the established geographic distribution for *O.celtica*. Though of course the intriguing and interesting question remains, just how on earth did these animals get to the west coast of Scotland?

For those interested in a little more background on the Scottish question I refer you to the following two references:

Smith, S. (1987). *Onchidella celtica* (Forbes & Hanley, 1852) and other mollusca occasionally visiting western Scottish seas. *Porcupine Newsletter* **3** (10), (old series) 274-280.

Tween, T.C. (1987). *Onchidella* and the sublittoral. *Porcupine Newsletter* **4** (1), (old series) 19-23.

UWTV observations on the orientation of *Liocarcinus* spp. and *Inachus* sp. (Crustacea: Decapoda) at rest in tidal currents

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The swimming crabs *Liocarcinus depurator* and *L. holsatus* are amongst the organisms frequently seen when remote underwater television equipment is deployed over sand and muddy sand grounds in NW European coastal waters. During a cruise in the English Channel in August 2002 a sledge-mounted camera system was being used to investigate commercial fish habitats. At one station in the eastern Channel, with mainly *L. holsatus* taken in small mesh trawls and where swimming crabs were particularly common, it was noticed that the individual *Liocarcinus* sp. were not resting in random orientations relative to the current near the seabed. Most crabs seemed to be positioned obliquely to the current, whether they had lodged themselves in shallow pits or were at rest on the sediment surface. The camera sledge deployment happened to be made at a time when, to judge from the streaming of particles across the field of view, there was quite a strong near-bed current.

Having made the initial serendipitous observation, the digital videotape from this station was subsequently re-played and the orientation of each crab relative to the current was then noted from freeze-frame images. Crab orientations were initially allocated to 16 equal sectors, using a schematic drawing of a crab overlain by radiating lines. No difference was apparent between left or right aspects, so the data was combined to give the frequency distribution by 8 sectors. Forty nine crabs were seen at rest during the 30 minute tow with the camera sledge moving over the ground at < 0.5 knot. Crabs seen to move in response to the sledge or adopting a

threat posture to it were excluded from the analysis.

Around 18% of the crabs were resting within 22° of being rear on to the current, but 80% were obliquely rearward to the current (orientations 90° - 157°). Very few faced the current even with it obliquely forwards. A chi-square test showed highly significant departure from random orientation.

The oblique rearward resting position of *Liocarcinus* sp. was tentatively assumed to be chosen because portunid crabs have walking legs adapted to sideways movement and hence they may be better able to gain purchase when aligned side on to a current. At the same time, presenting the aerofoil shape of the carapace partly rearwards to the current may help hold them more firmly in place on the sediment,

Another serendipitous observation from the same sledge mounted cameras was made in July 2003 in Caernarfon Bay, Irish Sea, when a number of *Inachus* sp. were seen on a rippled sand bed at a depth of about 30m. If the orientation of the ripples is taken to indicate the current, then it appeared that virtually all the *Inachus* sp. were aligned side on to the probable flow. The crabs seen on the seabed photographs seemed to be extending their limbs out rather stiffly to the side unlike the curved orientations in which the limbs have often been drawn in identification guides.

Orientation (degrees)	Numbers
0 - 22	0
23 - 45	0
45 - 67	1
68 - 90	2
90 - 112	14
113 - 135	15
135 - 157	10
158 - 180	9

Table 1. Distributions by eight sectors, after pooling left or right aspects of the orientations of *Liocarcinus* sp. numbers relative to the current. Directly forward facing into the apparent current was 0° and directly to the rear was 180°

New records of *Styela clava* Herdman, 1882 (Tunicata, Ascidiacea) in Europe

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Abstract

The solitary ascidian *Styela clava* Herdman, 1882 is recorded for the first time in 40 European harbours.



Introduction

The solitary ascidian *Styela clava* is native to the northwest Pacific. It was first recorded in British waters as *Styela mammiculata* sp. nov., in 1953 in the estuary of the Lynher River, near Plymouth (Carlisle, 1954); Millar (1960) demonstrated that this "new species" was synonymous with *S. clava* Herdman, 1882. It is thought that it was introduced into Plymouth Sound by military craft returning from the northwest Pacific after the Korean War in 1952.

The water temperature regime in the English Channel is similar to that of the northwest Pacific, so it rapidly became established. It is intolerant of consistently low salinity (Kelly, 1974) and wave exposure, so colonies are most frequently found in sheltered, high salinity sites. Once established, it can be found on walls and piles from about mid-tidal level down to at least

4m below low water (Holmes & Coughlan, 1975), though individuals have been dredged from at least 10 m depth in the UK (Barnes *et al.*, 1973) and up to 40 m depth off the French coast (Dauvin *et al.*, 1991). We have found specimens attached to pebbles exposed on the open beach tens-of-centimetres above low water level (Poole Harbour and Southampton Water) and attached to jetty supports a metre above low water level (Cairnryan), but we find that examining buoys and floating pontoons provides the easiest and most rapid method of determining the presence of *S. clava* in an area. However, inability to find specimens does not necessarily mean that there are no colonies in the area.

It appears that, once established, *S. clava* rarely spreads any great distance to neighbouring suitable habitats. New colonies have generally been attributed to inadvertent introductions by man, rather than natural spread by dispersal of larvae. Lützen (1999) reviewed the distribution of *S. clava* along the North Sea coast of Europe; we present here 40 new records of *S. clava* populations from Scotland to Spain to compliment that study.

Description of the adult

S. clava is a large solitary ascidian; mature individuals range from 70 mm to 160 mm total length. The firm body is elongated, shaped like an Indian club, with two terminal four-lobed openings. It is attached to the substratum by a short narrow stem-like stolon, which usually represents about one third of its total length. The base of the stolon forms an expanded membranous plate, the hapteron, which adheres the organism to the substratum.

The thick leathery tunic (epidermis) on the stolon and body has longitudinal grooves; the anterior (free end) tunic also has lateral grooves, which produce a mammillated (knobbly) pattern. The stolon and body are usually fouled with, for example, other ascidians, hydroids and algae. The exposed tunic is dark yellow-brown; under fouling organisms, particularly colonial ascidians, the tunic is a lighter brown colour and less mammillated.

The oral (inhalant) siphon is terminal and the atrial (exhalant) siphon is set close by

on the true dorsal surface. Both siphons are raised and tapered; they are distally marked with four chocolate-brown stripes that alternate with four narrower, pale stripes. Each of the four brown stripes is subdivided by a central paler stripe that does not quite reach the edge of the siphon.

The distribution of *S. clava*

The distribution of *S. clava* can best be described as patchy. A sheltered high salinity site appears to be necessary for the initial development in any area but, with the exception of harbours in the Solent, it rarely spreads any distance to neighbouring suitable habitats. The following description of the distribution is not exhaustive; it merely indicates the spread of *S. clava* by highlighting its presence in European harbours and ports. Following its initial discovery in Plymouth, it spread east to Poole, Southampton and Shoreham Harbours (Holmes, 1968), Fawley (Davis, 1997), Langstone Harbour (Houghton & Millar, 1960), Chichester Harbour (Stubbings & Houghton, 1964) and Bembridge, Isle of White, (Wells, 1987). There are unconfirmed reports of its presence in Dover Harbour (Coughlan, 1985) and Portsmouth Harbour (Wells, 1987), although it is often quoted as being present in Portsmouth Harbour. Two small specimens were seen in Ramsgate inner harbour in 1989, but none could be found there in 1992 (J. Coughlan, pers. comm.), and it was found in Portland Harbour in 2002 (R. Bamber, pers. comm.).



To the west and north of Plymouth, *S. clava* has been recorded in Milford Haven (Coughlan, 1969), Heysham Harbour (Coughlan, 1985) and Cork Harbour (Guiry & Guiry, 1973). It has been found on oysters in Loch Ryan in 1987 (S. Smith, pers. comm.) and in 2003, specimens from the Albert Dock, Liverpool, featured in a BBC television natural history programme.

It was first recorded in North France (Dieppe) in the late 1960s (Monniot, 1970) and spread up the channel to Ambleteuse (Buizer, 1980) and the port of Dunkerque (Davoult *et al.*, 1993). It spread further up the North Sea coast of Europe, being recorded in the Belgian harbours of Knokke-Heist and Zeebrugge (d'Udekem d'Acoz, 1986; Dumoulin, 1987) and Ostend (Eneman, 1995); in the Netherlands at Den Helder Harbour (Huwaë, 1974), 't Horntje on the island of Texel (Huwaë & Lavaleye, 1975) and in the Oosterschelde (Westerweel, 1975); in Germany at Wilhelmshaven and the harbour of List on the Island of Sylt (Lützen, 1999); and in Denmark in the Limfjord (Christiansen & Thomsen, 1981; Lützen. & Sørensen, 1993), at Havneby (Island of Rømø, adjacent to the Island of Sylt), at Esbjerg and in the Kattegat (Lützen, 1999).

To the south of Dieppe, it spread to Paluel (Davoult *et al.*, 1993), the port of Le Havre (Breton & Dupont, 1978), Cherbourg and nearby Saint-Vaast-la-Hougue and Querqueville (G. Breton, pers. comm.), Dinard (Lacourt, pers. comm., in Huwaë & Lavaleye, 1975), Saint-Servan and Lézardrieux (Monniot *et al.*, 1986), Roscoff and Brest (Minchin & Duggan, 1988; Dauvin *et al.*, 1991), Morlaix (Dauvin *et al.*, 1991), Arcachon (Bachelet *et al.*, 1980); Cambados, ría de Arosa and Figueras, ría del Eo (Ortea & Vizcaino, 1981) and Ría de Ferrol, Galicia (Vázquez & Urgorri, 1992) in northwest Spain; and Leixões (Porto), Cascais and Lisboa in Portugal (Davis & Davis, in prep.).

Recent surveys of 190 sites by the authors between June 2002 and October 2003 confirmed many of the published records and showed previously unrecorded populations of *S. clava* to be present at the sites in Table 2

Although *S. clava* is reported to be able to survive exposure to salinity of 10‰ (Kelly

New UK distribution records

Gunwharf Quay, Portsmouth*	50°47.70'N	01°06.45'W
Haslar Marina, Gosport	50°47.32'N	01°07.25'W
Southsea Marina	50°47.45'N	01°01.25'W
Brighton Marina	50°48.68'N	00°06.15'W
Dover Marina*	51°07.50'N	01°18.70'E
Ramsgate Marina*	51°19.88'N	01°25.26'E
Sheerness Docks	51°26.80'N	00°44.70'E
West Mersea	51°46.70'N	00°53.85'E
Harwich Town Quay	51°56.91'N	01°17.12'E
Lowestoft Marina	52°28.32'N	01°45.05'E
Grimsby Harbour	53°34.65'N	00°04.20'W
Lymington Marina	50°45.42'N	01°31.90'W
Cowes, Isle of White	50°45.70'N	01°17.78'W
Yarmouth, Isle of White	50°42.33'N	01°30.14'W
Wooten Creek, Isle of White	50°44.06'N	01°12.80'W
Weymouth Harbour	50°36.45'N	02°27.50'W
Exmouth Marina	50°37.08'N	03°25.44'W
Torquay Marina	50°27.60'N	03°31.70'W
Brixham Marina	50°23.95'N	03°30.40'W
Darthaen Marina, Kingswear	50°21.05'N	03°34.25'W
Falmouth Marina	50°09.25'N	05°04.10'W
Holyhead Marina	53°19.20'N	04°38.55'W
Fleetwood Marina	53°55.00'N	03°00.65'W
Cairnryan, Loch Ryan*	54°57.83'N	05°01.00'W
Stranraer, Loch Ryan*	54°57.50'N	05°01.70'W
Ardrossan Marina	55°38.40'N	04°49.10'W
Elizabeth Marina, Jersey	49°10.85'N	02°07.00'W
St Helier Marina, Jersey	49°10.90'N	02°06.65'W
Qu. Elizabeth II Marina, Guernsey	49°27.55'N	02°31.85'W

New European distribution records

Fenit Harbour (Ireland)	52°16.25'N	09°51.75'W
Breskens Marina (The Netherlands)	51°23.70'N	03°34.35'E

France:

Calais	50°57.70'N	01°50.65'E
Cherbourg*	49°38.80'N	01°37.35'W
St Malo Harbour	48°38.95'N	02°01.33'W
Pornichet Marina	47°15.52'N	02°20.75'W
Pornic Marina	47°06.60'N	02°68.00'W
Les Sables d'Olonne Marina	46°30.20'N	01°47.60'W
La Rochelle Marina	46°08.70'N	01°09.70'W

Spain:

Santander Marina	43°25.70'N	03°48.60'W
Gijon Marina	43°32.75'N	05°39.85'W

* Confirmation of a previous unrecorded observation.

in Christiansen & Thomsen, 1981), it was not found in areas with salinity consistently lower than 20‰. Of the total of 190 harbours and marinas examined in this study, populations were present at only 54 sites, all of which contained water of salinity greater than 22‰ at the time of sampling. This is consistent with the observation that larvae can metamorphose only at salinities between 20‰ and 32‰ (Kashenko, 1996, in Lützen, 1999).

Of the 136 sites where *S. clava* was not found, 69 contained water of salinity greater than 20‰ at the time of sampling and most of these supported populations of other solitary ascidians (mainly *Ciona intestinalis* and *Ascidella aspersa* in the UK, with *Styela partita* and *Mogula manhattensis* also present in southern European harbours). These apparently suitable sites were interspersed with the sites supporting *S. clava* populations, with the exception of the few sites examined between Ardrossan and Holy Loch on the west coast of Britain, and Grimsby and Amble on the east coast of Britain. This suggests that the distribution is not extended by the colonisation of neighbouring sites resulting from natural larval dispersion.

Note: Since submitting this paper we have discovered the following reference to the presence of *S. clava* in deep water approximately two miles off the coast of Guernsey:

Lord, R., 2000. Battle beneath the waves. Article in: *The Guernsey Press and Star*, 7 July 2000. Our observation confirms its presence in inshore waters.

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Fieldwork, students and seahorses

by Dr Vicki Howe

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"There will be a prize for the first person to spot a seahorse and show me its location". Is this bribery? Is it treating students as small children? Maybe. Nevertheless it certainly captures the students' interest. Such enticement can help focus the students on a task that requires excellent observation skills and a good eye for detail. Seahorses are difficult to find but everybody knows what they look like so maybe it's a good place to start. Isn't that what natural history is all about? Sparking an interest and building on skills to follow that interest still further?

"Seahorses? Are there really seahorses here?" "Well the answer is a sort of yes and no. Yes there are seahorses, *Hippocampus hippocampus*, around the Maltese Islands but most have been found at depths greater than we will be snorkelling in. But you never know!" Such is a typical conversation early on in a field trip to Malta where the students are enthusiastic, the weather is good the staff are relaxed as everything is going according to plan.

Organisation starts in the beginning of October with flights and accommodation to be booked. In January group research projects are devised and the students are asked to rank, in order of preference, the projects they would most like to undertake. All students are studying for a degree in Marine Geography. There are sixty in the year group, three separate destinations and seven different projects. Student to staff ratio works out at approximately 9:1. The next step is to decide who goes where. It is always difficult to persuade the students they should choose a project based on the subject and not member of staff or location. A project involving snorkelling surveys in Malta seems to be quite popular. It is very tricky to assign students fairly to a particular project and inevitably there is some disappointment. However, once all students have been allocated to a project then preparatory work including workshops and background research begins with enthusiasm.

Three staff and twenty-seven students will be going to Malta after Easter to conduct three different research projects. Two projects involve snorkelling. One of these will involve a comparison of the ecology of two locations and the second the development of survey techniques. Perhaps not as exotic as a tropical location, especially in April when the weather can be, let's say variable, Malta has much to offer for the marine geographer. I am sure many will have seen some spectacular images of clear blue seas with superb underwater visibility, huge expanses of seagrass, *Posidonia oceanica*, and impressive coastal geomorphology. These are certainly the images the students conjure up when questioned. Snorkelling in Malta may sound like holiday for some but after Workshop 1,

the students begin to realise that there is a challenge in front of them that requires teamwork, knowledge and practical skills.

Although we only take students who can swim we do not restrict these projects solely to divers and those who have experience snorkelling in warmer waters than the UK. The fieldwork is open to all students and is a valuable opportunity for those that have not had a chance to snorkel or observe marine life in water other than through the glass wall of an aquarium. This often means we have a real mixture of students, abilities and interests. During the first meeting the students are provided with a project title, a short background, timetable of workshop dates and deadlines, and a reading list. It is then up to the students during a series of supervised and independent meetings to develop the project through their own ideas, experiences and research.

By the end of the term the students should have aims and objectives and a methodology outlined. They should all have a good level of background knowledge regarding the project and the environment they are to work in. This also means they should have started to learn about the marine life and the names of the organisms they are likely to meet. This can actually be very difficult as the students do not really know what to expect and it is often the first time they have had to develop a research idea without specific and direct guidance from a member of staff.

The first day in Malta involves an orientation with a couple of talks by lecturers at the Maltese University and a coach trip around the main island visiting some of the key sites and points of interest. The students are keen to begin their projects, which start with a visit to a local dive shop to kit everyone out in wet suits. The water temperature is approximately 17° C. This causes much hilarity and some are still unconvinced that full suits are necessary.

The first evening involves the much talked about Fish Test! Though informal and located in the bar, the test is taken seriously by all as most students have put effort into learning the target species.

What they don't know is that they will be tested using different images from the ones that they used for learning. This clearly makes the test much harder but also, from the staffs' point of view, more fun. The one with the lowest score in each group has to buy the staff member and student with the highest score a drink. More bribery but it works! Though the marks can indicate the level of commitment of each student and poor scores are noted, the exercise is also a learning experience and repeated on at least two more occasions.

Once at the survey site the students are split into small groups for a snorkel and safety lesson. This is the first time the students have the opportunity to obtain a feel for the environment they are to conduct the work in. The water temperature, underwater visibility, the size and abundance of marine life and the nature of the survey areas now become a reality. Although the cold hits some quicker than others enthusiasm is not dented. It is often at this stage that concerns regarding the suitability of the proposed methods emerge and differences of opinion between group members become apparent. This can cause heated debate and even dissent. Interestingly the team leader allocated back in the UK may not turn out to be the natural leader of the group and so Day 1 becomes far more of a demanding task than any students anticipated. Through diplomacy the group dynamics generally settle down though this can take a couple of days. The students enjoy the first day being alternately surprised and concerned about what they do know as well as what they do not know.



"Ready to start surveying", April 2003

From the very first snorkel the students find all sorts of organisms and shouts between team members fill the air. Some organisms do not look quite how they expected. For example certain fish such as the saddled sea bream, *Oblada melanura*, are much smaller than they anticipated and others, such as the red scorpionfish, *Scorpaena scrofa*, are more camouflaged. The students are encouraged to refer constantly to identification guides and keys to improve their identification skills. Some are very quick to put a name to organisms and incorrect identification often occurs. Through discussion and prompting, identification of the more difficult organisms gradually becomes more accurate with the students helping each other both in water and on land.

Over the next few days the projects develop and the running species list increases with some interesting finds. For example the stargazer *Uranoscopus scaber*, the nudibranch *Fabellina affinis* (a prize winning discovery for good observation skills while snorkelling) and by-the-wind-sailors *Velella velella*. Some students start to mutter about learning to dive so they can stay down longer and get a better view of the underwater world. Fish identification and the species list even becomes a primary topic over dinner. Are these marine geography students turning into biologists?

The students are now well organised and undertake their data collection in an ordered and efficient manner. The weather has not been quite the blue skies and hot sun of the postcards, with the occasional squall of cold wind and rain ensuring everyone runs for cover into the nearby café. Nevertheless all have shown good team spirit and commitment to their projects.

The final day of the project arrives and already team members of each group are in the water and then, quickly out of it. The question "do jellyfish sting?" springs from their lips. Well really it depends upon the jellyfish. So in we go again, if a little more tentatively than previous days, to investigate. The underwater visibility has dropped and a huge swarm of luminous jellyfish, *Pelagica noctiluca* now occupy the bay. This obviously is not going to make surveying very easy. The

tentacles of the jellyfish always seem to find the sensitive bit of skin between the bottom of the mask and top lip as well as any other exposed part of the anatomy. Thank goodness for wetsuits. Although the stings are relatively harmless they are not pleasant and the experience is disconcerting. From the shrieks near the shore it is clear that some students are not going to make it into the water at all. So for the last day some rapid thinking and a reorganisation of the team is crucial if the objectives are to be fulfilled and data collection is to be complete. This becomes one of the key lessons during this field visit. A timely reminder to all who work in the field that an adaptable and flexible approach to field studies is essential as nature has her ways to ensure that everything does not run smoothly all of the time!

With the surveys more or less complete and time running out, the students return the wet suits. The last night in Malta is always a bit of a big one. Prize giving for the highest fish test scores as well as students, who have, shall we say, surpassed themselves in other ways, makes a lively start to the evening. The processing of results, analyses and drawing of conclusions will be left until the return to college.

Another field trip successfully and safely accomplished. The field reports were all handed in on time. Each was to a high standard with good presentation and attention to detail. Feedback from the students was extremely positive and provides encouragement that we must be providing a worthwhile learning experience that provides a good balance between intellectual and practical skills and enthuses the students to take an interest in marine ecology. Previous students who have participated in one of the snorkel projects in Malta have gone on to do Master degrees in marine ecology and are still furthering their interest and knowledge in marine natural history.

In case any of you are wondering, we have yet to find a seahorse while snorkelling in Malta. Maybe one day.

Reports from the Porcupine Field Visit to Northumberland 28th August to 1st September 2003

Ten people took up the opportunity of a field trip organised by Shelagh Smith in 2003. Despite the perennial bane of the field worker i.e. dodgy weather, and that the dredging was not as good as had been seen in some previous visits, the participants were rewarded with both useful and worthwhile records at a personal and professional level. This small but intrepid band of Porcupiners visited shores at Boulmer, Newton-by-the-Sea and Lindisfarne. Dredging from *R.V. Bernicia* was carried out in the Trink and off Blyth in rather bumpy conditions. Andy Mackie and Teresa Derbyshire from the National Museum of Wales collected worms; Shelagh Smith and David Hurd collected molluscs; Sue Chambers from National Museums of Scotland and Pete Garwood were also worm hunting; Paul and Hannah Brazier (+ 10 month old Sarah) from CCW recorded algae and shore animals/habitats in general along with Frank Evans.

Reported below are the results of the National Museum of Wales worm hunt and the CCW general hunt. A comparison of molluscs collected by Shelagh Smith from a shore on Lindisfarne during the present survey and a previous one in 1978 will hopefully be published in a later issue.

A report on the Polychaeta

by Teresa Derbyshire

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***R.V. Bernicia*; 28.08.2003**

6 stations were sampled with either Van Veen grab or dredge in and around the area known as 'The Trink', off Blyth. The samples were washed through a 0.5 mm sieve.

45 species from 29 families of Polychaeta were identified in total from the samples. Several old scallop shells and some stones were found covered in *Sabellaria spinulosa*, but no large chunks of *Sabellaria* reef were

recovered. One large, complete specimen of '*Chaetopterus variopedatus*' was recovered in the last grab. This was an interesting find, as these animals are particularly fragile and to recover a whole specimen of that size (approx. 10 cm long) in a grab was unusual. The precise identity is unclear as all *Chaetopterus* species are generally identified as *C. variopedatus*. Mary Petersen (Zoological Museum, University of Copenhagen) is currently investigating these and describing a number of new species.

Boulmer; 29.08.2003

The shore at Boulmer reaches out to sea as a long curving spit, made up of large boulders and rocks, interspersed with areas of very coarse, rippled sand. Several stations were sampled along the spit.

One area, a large rock pool (station B2), was rich in polynoid scaleworms with specimens being found on the underside of many rocks. Further out, towards the end of the spit (station B3), several different species of *Malacoceros* (Spionidae) were found that require further investigation as to their proper identification. Specimens of *Eulalia aurea* (Phyllodocidae) and *Schistomeringos neglecta* (Dorvilleidae) were also collected from the latter station, although these species were not previously recorded as present in *The Marine Fauna and Flora of the Cullercoats District** (2000 edition) which covers this region.

In total, 20 species of polychaete from 14 families were collected and identified.

Low Newton-by-the-Sea; 30.08.2003

An expanse of fine-medium graded sand, the Low Newton beach is divided into a series of bays in the lower shore region by stretches of rock platforms, much of it slate. This slate harbours a rich diversity of Polychaeta that can be sampled by splitting the slate to access the sediment-filled crevices within (stations N2 & N5).

20 species representing only 9 families were collected, the Spionidae being the most populous family. Several species of *Malacoceros* (likely to be the same as those from Boulmer) are again included under the

one identification pending further investigation.

One small bay of particularly clean, fine sand (station N3), yielded specimens of the cirratulid *Chaetozone christei*, a (relatively) recently described** species of which this beach is the type locality; a useful addition to our collections. At the same station, large numbers of *Streptosyllis websteri* were also collected. Both the latter species were very small and were only identified by microscope viewing of the sievings from a 300µm sieve. The spionid *Spio* cf. *martinensis* was also present in very large numbers at both this station and station N4 (further along the beach at the same tidal level). However, although station N4 would appear to be exactly the same type of habitat as N3, in terms of sediment grading and tidal position, no specimens of *C. christei* or *Streptosyllis* were present.

Lindisfarne; 31.08.2003

The final day of collecting was on the island of Lindisfarne. Polychaetes were collected from a small area within the region known as 'the harbour', on the south of the island, between the land and another tiny island with the ruined remains of an old chapel. The area sampled consisted of mud and anoxic clay, overlain by some pebbles and larger rocks. The sediment was not rich and similar species to those that had been collected from previous days were found. Some small patches of seagrass existed, within which were the common intertidal orbinid, *Scoloplos armiger*. Rocks were overturned to find some common scaleworms and a few spionids.

Further along the shore were patches of mussels overlying soft mud. Within this region, investigations discovered some very large king ragworm (*Nereis virens*). Although we did not collect any, the glimpses we had assured us that these specimens would be well over 30 cm in length.

The sampling was not intensive due to the logistics of fixing specimens in the back of a car in the car park! Therefore, the species list of collected polychaetes from Lindisfarne is short, consisting of only 6 species representing 5 families.

Storage of Specimens

The specimens listed here have all been incorporated into the collections of the National Museums & Galleries of Wales, Cardiff. Although no distinctions have been made in the table, some of these specimens were fixed in formalin and later transferred to 80% IMS, whereas others were fixed directly in 100% ethanol for possible later use in DNA sequencing work.

Table 1. Species list of Polychaeta collected during the period 28-31 August 2003

Species	Stn	Locality	Sediment	Depth
<i>Asclerocheilus</i> sp.	1	The Trink, off Blyth	gravel	56 m
<i>Prionospio</i> Juv.	1	The Trink, off Blyth	gravel	56 m
<i>Hydroides norvegica</i>	1	The Trink, off Blyth	gravel	56 m
<i>Lepidonotus squamatus</i>	1	The Trink, off Blyth	gravel	56 m
<i>Pholoe</i> sp.	1	The Trink, off Blyth	gravel	56 m
<i>Polycirrus</i> sp.	1	The Trink, off Blyth	gravel	56 m
<i>Pomatoceros triqueter</i>	1	The Trink, off Blyth	gravel	56 m
<i>Sabellaria spinulosa</i>	1	The Trink, off Blyth	gravel	56 m
<i>Nereimyra</i> Juv.	1	The Trink, off Blyth	gravel	56 m
<i>Typosyllis</i> sp.	1	The Trink, off Blyth	gravel	56 m
<i>Lepidonotus squamatus</i>	2	The Trink, off Blyth	?	50 m
<i>Anobothrus gracilis</i>	3	The Trink, off Blyth	muddy sand	50 m
<i>Chaetozone setosa</i>	3	The Trink, off Blyth	muddy sand	50 m
<i>Diplocirrus glaucus</i>	3	The Trink, off Blyth	muddy sand	50 m
<i>Goniada maculata</i>	3	The Trink, off Blyth	muddy sand	50 m
<i>Goniadella</i> sp.	3	The Trink, off Blyth	muddy sand	50 m
<i>Nephtys hombergii</i>	3	The Trink, off Blyth	muddy sand	50 m
<i>Notomastus</i> sp.	3	The Trink, off Blyth	muddy sand	50 m
<i>Podarkeopsis capensis</i>	3	The Trink, off Blyth	muddy sand	50 m
<i>Scoloplos armiger</i>	3	The Trink, off Blyth	muddy sand	50 m
<i>Spiophanes bombyx</i>	3	The Trink, off Blyth	muddy sand	50 m
<i>Spiophanes kroyeri</i>	3	The Trink, off Blyth	muddy sand	50 m
<i>Tharyx killariensis</i>	3	The Trink, off Blyth	muddy sand	50 m
<i>Trichobranchus roseus</i>	3	The Trink, off Blyth	muddy sand	50 m
<i>Aricidea minuta</i>	4	The Trink, off Blyth	muddy sand	48 m
<i>Chaetozone setosa</i>	4	The Trink, off Blyth	muddy sand	48 m
<i>Diplocirrus glaucus</i>	4	The Trink, off Blyth	muddy sand	48 m
<i>Goniada maculata</i>	4	The Trink, off Blyth	muddy sand	48 m
<i>Lagis koreni</i>	4	The Trink, off Blyth	muddy sand	48 m
<i>Lumbrineris gracilis</i>	4	The Trink, off Blyth	muddy sand	48 m
<i>Ophelina acuminata</i>	4	The Trink, off Blyth	muddy sand	48 m
<i>Poecilochaetus serpens</i>	4	The Trink, off Blyth	muddy sand	48 m
<i>Sphaerodorum gracilis</i>	4	The Trink, off Blyth	muddy sand	48 m
<i>Spio decorata</i>	4	The Trink, off Blyth	muddy sand	48 m
<i>Sthenelais limicola</i>	4	The Trink, off Blyth	muddy sand	48 m
<i>Aphelochaeta</i> sp.	6	The Trink, off Blyth	muddy sand	50 m
<i>Caulleriella zetlandica</i>	6	The Trink, off Blyth	muddy sand	50 m
<i>Chaetopterus variopedatus</i>	6	The Trink, off Blyth	muddy sand	50 m
<i>Chaetozone setosa</i>	6	The Trink, off Blyth	muddy sand	50 m
<i>Cirratulus caudatus</i>	6	The Trink, off Blyth	muddy sand	50 m
<i>Diplocirrus glaucus</i>	6	The Trink, off Blyth	muddy sand	50 m
<i>Drilonereis filum</i>	6	The Trink, off Blyth	muddy sand	50 m
<i>Eteone foliosa</i>	6	The Trink, off Blyth	muddy sand	50 m
<i>Exogone hebes</i>	6	The Trink, off Blyth	muddy sand	50 m

<i>Gattyana cirrosa</i>	6	The Trink, off Blyth	muddy sand	50 m
<i>Glycinde nordmanni</i>	6	The Trink, off Blyth	muddy sand	50 m
<i>Glyphohesione klatti</i>	6	The Trink, off Blyth	muddy sand	50 m
<i>Lanice conchilega</i>	6	The Trink, off Blyth	muddy sand	50 m
<i>Lumbrineris gracilis</i>	6	The Trink, off Blyth	muddy sand	50 m
<i>Nephtys hombergii</i>	6	The Trink, off Blyth	muddy sand	50 m
<i>Ophelina acuminata</i>	6	The Trink, off Blyth	muddy sand	50 m
<i>Pholoe sp.</i>	6	The Trink, off Blyth	muddy sand	50 m
<i>Podarkeopsis capensis</i>	6	The Trink, off Blyth	muddy sand	50 m
<i>Poecilochaetus serpens</i>	6	The Trink, off Blyth	muddy sand	50 m
<i>Prionospio fallax</i>	6	The Trink, off Blyth	muddy sand	50 m
<i>Sabella pavorina</i>	6	The Trink, off Blyth	muddy sand	50 m
<i>Scalibregma inflatum</i>	6	The Trink, off Blyth	muddy sand	50 m
<i>Scoloplos armiger</i>	6	The Trink, off Blyth	muddy sand	50 m
<i>Spio decorata</i>	6	The Trink, off Blyth	muddy sand	50 m
<i>Spiophanes kroyeri</i>	6	The Trink, off Blyth	muddy sand	50 m
<i>Sthenelais limicola</i>	6	The Trink, off Blyth	muddy sand	50 m
<i>Tharyx killariensis</i>	6	The Trink, off Blyth	muddy sand	50 m
<i>Trichobranchus roseus</i>	6	The Trink, off Blyth	muddy sand	50 m
<i>Aonides oxycephala</i>	B1	Boulmer	in algal turf on rocks	Mid-Low Shore
<i>Cirriformia tentaculata</i>	B1	Boulmer	in algal turf on rocks	Mid-Low Shore
<i>Fabricia sp.</i>	B1	Boulmer	in algal turf on rocks	Mid-Low Shore
<i>Notomastus sp.</i>	B1	Boulmer	beneath algal turf on rocks	Mid-Low Shore
<i>Perinereis cultrifera</i>	B1	Boulmer	beneath algal turf on rocks	Mid-Low Shore
<i>Pygospio elegans</i>	B1	Boulmer	beneath algal turf on rocks	Mid-Low Shore
<i>Aonides oxycephala</i>	B2	Boulmer	under rocks in rock pool	Low Shore
<i>Harmothoe imbricata</i>	B2	Boulmer	under rocks in rock pool	Low Shore
<i>Lagisca extenuata</i>	B2	Boulmer	under rocks in rock pool	Low Shore
<i>Lepidonotus squamatus</i>	B2	Boulmer	under rocks in rock pool	Low Shore
<i>Psamathe fusca</i>	B2	Boulmer	on rock in coarse sand	Low Shore
<i>Sphaerodorum gracilis</i>	B2	Boulmer	under rocks in rock pool	Low Shore
<i>Typosyllis sp.</i>	B2	Boulmer	under rocks in rock pool	Low Shore
<i>Cirratulus cirratus</i>	B3	Boulmer	under rocks on spit	Low Shore
<i>Cirriformia tentaculata</i>	B3	Boulmer	under rocks on spit	Low Shore
<i>Eulalia aurea</i>	B3	Boulmer	under rocks on spit	Low shore
<i>Eulalia viridis</i>	B3	Boulmer	on rocks among boulders and coarse sand	Low Shore
<i>Fabricia sp.</i>	B3	Boulmer	muddy sand	Low Shore
<i>Glycera lapidum</i>	B3	Boulmer	under rocks in coarse sand on spit	Low Shore
<i>Harmothoe imbricata</i>	B3	Boulmer	under rocks on spit	Low Shore
<i>Malacoceros spp.</i>	B3	Boulmer	in coarse sand under rocks	Low Shore
<i>Pholoe tuberculata</i>	B3	Boulmer	under rocks on spit	Low Shore
<i>Psamathe fusca</i>	B3	Boulmer	coarse sand under rocks on spit	Low Shore
<i>Schistomeringos neglecta</i>	B3	Boulmer	under rocks on spit	Low Shore
<i>Sthenelais boa</i>	B3	Boulmer	under rocks in coarse sand on spit	Low Shore
<i>Nephtys cirrosa</i>	N1	Low Newton-by-the-Sea	medium - fine clean sand	Low Shore
<i>Nephtys kersivalensis</i>	N1	Low Newton-by-the-Sea	medium - fine clean sand	Low Shore
<i>Scoloplos armiger</i>	N1	Low Newton-by-the-Sea	sand	Low Shore
<i>Spiophanes bombyx</i>	N1	Low Newton-by-the-Sea	medium - fine clean sand	Low Shore
<i>Aonides oxycephala</i>	N2	Low Newton-by-the-Sea	in split slate	Mid Shore
<i>Cirratulus cirratus</i>	N2	Low Newton-by-the-Sea	in split slate	Mid Shore
<i>Malacoceros spp.</i>	N2	Low Newton-by-the-Sea	in split slate	Mid Shore
<i>Malacoceros vulgaris</i> ?	N2	Low Newton-by-the-Sea	in split slate	Mid Shore
<i>Nicomache personata</i>	N2	Low Newton-by-the-Sea	mud in split slate	Mid Shore

<i>Perinereis cultrifera</i>	N2	Low Newton-by-the-Sea	in split slate	Mid Shore
<i>Polydora</i> sp.	N2	Low Newton-by-the-Sea	in split slate	Mid Shore
<i>Psamathe fusca</i>	N2	Low Newton-by-the-Sea	in split slate	Mid Shore
<i>Pygospio elegans</i>	N2	Low Newton-by-the-Sea	in split slate	Mid Shore
<i>Syllidae</i> sp.	N2	Low Newton-by-the-Sea	in split slate	Mid Shore
<i>Aricidea minuta</i>	N3	Low Newton-by-the-Sea	fine clean sand	Low Shore
<i>Chaetozone christei</i>	N3	Low Newton-by-the-Sea	fine clean sand	Low Shore
<i>Scoloplos armiger</i>	N3	Low Newton-by-the-Sea	fine clean sand	Low Shore
<i>Spio</i> cf. <i>martinensis</i>	N3	Low Newton-by-the-Sea	fine clean sand	Low Shore
<i>Streptosyllis websteri</i>	N3	Low Newton-by-the-Sea	fine clean sand	Low Shore
<i>Paraonis fulgens</i>	N4	Low Newton-by-the-Sea	fine clean sand	Low Shore
<i>Scoloplos armiger</i>	N4	Low Newton-by-the-Sea	fine clean sand	Low Shore
<i>Spio</i> cf. <i>martinensis</i>	N4	Low Newton-by-the-Sea	fine clean sand	Low Shore
<i>Typosyllis</i> sp.	N5	Low Newton-by-the-Sea	in split slate	Low Shore
<i>Harmothoe imbricata</i>	L1	South Lindisfarne	under rock	Mid Shore
<i>Aonides oxycephala</i>	L2	South Lindisfarne	mud/clay on underside of rock	Mid Shore
<i>Malacoceros</i> sp.	L2	South Lindisfarne	mud/clay on underside of rock	Mid Shore
<i>Nicomache personata</i>	L2	South Lindisfarne	in hard tube under rock	Mid -Low Shore
<i>Notomastus</i> sp. D ?	L2	South Lindisfarne	mud / clay	Mid Shore
<i>Scoloplos armiger</i>	L3	South Lindisfarne	among seagrass roots	Mid Shore

*Garwood, P.R. 2000. Polychaeta. In The Marine Fauna and Flora of the Cullercoats District. Marine Species Records for the North East Coast of England. 1. (ed. J. Foster-Smith), pp. 83-170, Penshaw Press, Sunderland.

**Chambers, S.J. 2000. A redescription of *Chaetozone setosa* Malmgren, 1867 including a definition of the genus, and a description of a new species of *Chaetozone* (Polychaeta: Cirratulidae) from the northeast Atlantic. Bull. Mar. Sci. 67; 587-596.

List of algae and additional shore species Newton by the sea – 30.08.03

by Paul Brazier

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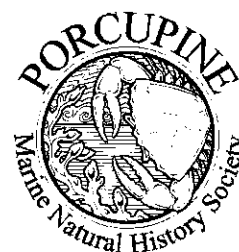
Algae

Palmaria palmata
Rhodothamniella floridula
Corallina officinalis
Coralline crust
Cystoclonium purpureum
Dilsea carnosus
Dumontia contorta
Furcellaria lumbricalis
Chondrus crispus
Mastocarpus stellatus
Phyllophora pseudoceranoides
Polyides rotundus
Plocamium cartilagineum
Lomentaria articulata
Ceramium sp
Plumaria plumosa
Membranoptera alata
Phycodrys rubens
Odonthalia dentata
Osmundea pinnatifida
Polysiphonia sp
Leathesia difformis
Cladostephus spongiosus
Alaria esculenta
Chorda filum
Fucus vesiculosus
Laminaria digitata
Laminaria hyperborea
Laminaria saccharina
Ascophyllum nodosum
Saccorhiza polyschides
Halidrys siliquosa
Fucus serratus
Fucus spiralis
Pelvetia canaliculata
Himanthalia elongata
Prasiola stipitata
Enteromorpha sp
Ulva sp
Cladophora rupestris
Verrucaria mucosa

Animals

Halichondria panicea
Obelia dichotoma
Actinia equina
Pomatoceros triqueter
Spirorbids
Verruca stroemia
Semibalanus balanoides
Pagurus bernhardus
Cancer pagurus
Necora puber
Bryozoan crust
Electra pilosa
Ophiothrix fragilis
Botryllus schlosseri
Pholis gunnellus

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