

Porcupine Newsletter

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NEWSLETTER. This issue of PN was held back to cover the December meeting at Reading. The next issue will be in March. There are normally three issues of PN a year.

MEMBERSHIP of PORCUPINE continues to increase and is at a record level. The reading public is informed that the membership subscription is £3 p.a., payable to the Secretary, "Porcupine", The Royal Scottish Museum, Chambers Street, Edinburgh EH1 1JF.

THE SOCIETY. PORCUPINE is a society to promote interest in the ecology and distribution of marine fauna and flora in the NE Atlantic. Its name is derived from that of the surveying ship H.M.S. "Porcupine" which in 1869 and 1870 was engaged on scientific expeditions in the NE Atlantic and Mediterranean, resulting in the giving of her name to the Porcupine Bank, W. of Ireland.

FUTURE MEETINGS. 1. The next meeting and AGM will be held at the Marine Science Laboratories, Menai Bridge, Wales on Saturday, 26 and Sunday, 27 February 1983. (The AGM agenda appears on p. 122). The theme will be "Biogeographic boundaries in British seas - the role of marine recording". A shore excursion to the W. coast of Anglesey is offered. Further details are included with this mailing.

2. A summer field meeting is proposed at the Fal Estuary, Cornwall. Members might consider planning a holiday around this event. Further details will be given in the next PN.

Frank Evans, Editor,
Dove Marine Laboratory, Cullercoats, North Shields NE30 4PZ,
England.



ANNUAL GENERAL MEETING - PRELIMINARY NOTICE

The Annual General Meeting of PORCUPINE will be held at the Marine Science Laboratories, Menai Bridge, Anglesey, on Sunday, 27th February 1983 at 9.30 a.m.

The Agenda will include:

1. Hon. Secretary's Report.
2. Hon. Treasurer's Report.
3. Hon. Editor's Report.
4. Record Convenor's Report.
5. Election of Office Bearers and Council Members.

In connection with the election of Office Bearers and Council Members, attention is drawn to the relevant Rules of Procedure.

- (2) The maximum and minimum numbers of members on the Committee shall be left open.
- (4) The Office Bearers retire annually and are normally available for immediate re-election.
- (5) Council Members shall at present serve for three years, at least two retiring each year, who are not normally available for immediate re-election.
- (6) Voting shall take place at the AGM and shall be restricted to members present.
- (7) Names of persons seeking election to the Council (as chosen by the Council) will appear in a notice prior to the AGM together with an intimation that proposals from ordinary members of additional candidates are welcome. Candidates must give their assent in person or in writing before voting takes place.

The Office Bearers available for re-election are as follows:

Hon. Secretary	Shelagh Smith
Hon. Treasurer	David Heppell
Hon. Editor	Frank Evans
Hon. Records Convenor	Bob Earll

The present Council Members are:

Roger Bamber	Celia Pain
Roger Brehaut	Eve Southward
Peter Davis	Jóhn Wilson
John Gordon	Fred Woodward
David McKay	

Proposals from the floor are welcome.

6. Election of Honorary Member.
7. Future meetings.
8. Any other business. If members have a point which they wish to be discussed, particularly if they will be unable to come to the AGM, please will they contact Shelagh Smith.

REPORTS OF THE JOINT MEETING WITH THE UNDERWATER CONSERVATION
SOCIETY AT READING, 11-12 DECEMBER 1982

The meeting, attended by some 48 people, was concerned with the field identification of sessile animals settled on rock. The meeting's progress differed in form from previous patterns. Problems of the identification of sponges, hydroids, bryozoans, ascidians and algae were set out by leading speakers, together with hints on their resolution. Each session developed into a general airing of difficulties and the putting forward of suggestions for improving field guides and in particular for the advancement of the well-known UCS miniprint sets. Many hundreds of slides were shown in the course of the two days with the purpose of conveying information and sometimes in the hope that the species photographed could be identified by members of the audience.

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THE IDENTIFICATION OF SESSILE GROUPS: SEaweEDS

Dr. W. Farnham
Portsmouth Polytechnic, Marine Laboratory, Ferry Road, Hayling Island.

Although benthic marine algae (seaweeds) are important in many subtidal communities, they are often ignored or given cursory treatment by many diving groups. This is to be regretted, but it is not too surprising in view of the difficulties involved in identifying these marine plants. There are over 500 species of seaweeds recorded for the British Isles and literature for their identification is not always easy to obtain. Earlier accounts of British seaweeds are either unobtainable or expensive and require present day knowledge to update them in such aspects as nomenclature, etc. The main problem in identifying seaweeds is that they are generally extremely "plastic", i.e., they may change their shape and form (morphology) in response to environmental changes. More taxonomically reliable characters can be obtained from anatomical and reproductive investigations but this "laboratory approach" requires such facilities as a microscope, etc. Nevertheless, it is possible for the amateur to be able to recognise a substantial proportion of the seaweeds commonly encountered during dives. The current preparation of an algal miniprint set by C. Maggs and C. Howson would help towards this objective.

The British Phycological Society is involved in mapping seaweeds and authentic records are always welcome. Preserved material can be sent in the post for identification, either having been previously soaked in 4% formalin-seawater or made into herbarium specimens by floating out on to card and then drying in a press.

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RECOGNISING LIVING BRITISH MARINE SPONGES

Graham Ackers
11 Heathrow, Gomshall, Guildford.

For a variety of reasons, the identification of British marine sponges has given non-specialists a considerable amount of difficulty.

The taxonomic problems in the group are not helped by the dearth of spongologists in the U.K. Indeed, a recently published report (Smith, 1979) virtually fails to recognise any sponge taxonomic problems, whilst citing shortcomings in many other groups, from viruses to chordata. "Users" canvassed for these opinions, such as the Agricultural Research Council, N.E.R.C., etc., had taxonomic requirements with economic implications and so sponges (plus hydroids, bryozoans and ascidians incidentally) were omitted.

The "latest" British sponge monograph (Bowerbank, 1864-82) is difficult to use, out of date, and deficient in description of the living animal. Access to descriptions in life (and preferably even in situ) are most important for the diving/field naturalist, because their first encounter is with the living specimen. However, this problem is not trivial because most sponges are polymorphic, making the writing and interpretation of descriptions difficult. Further difficulties occur because spicule/skeletal examination is required to make (or confirm) an identity and this can be offputting for an amateur, or busy field ecologist. Indeed, some practice is required in the preparation and interpretation of sponge microslides.

In contrast to many other groups, no field guide exists for sponges. They do figure in some popular guides, but the description, plates, and low numbers of species included are misleading for identification purposes.

Out of this situation arose the UCS Sponge Guide, first conceived in 1977. Until that time, the works of Arndt (1935) and, to a lesser extent, Bowerbank, plus various taxonomic papers, were used for identification. Using a combination of descriptive text and colour mini-print photographs, the Guide facilitates the identification of sponges by non-specialists. However, at this early stage its primary function is as a working document, to stimulate feedback from any marine naturalist having occasion to look at sponges. Hopefully, some form of more static field guide will emerge eventually, but many less common sponges are likely to remain problematical for some time.

In its descriptions of living material, the Sponge Guide uses various characters, four of which are Form, Colour, Smell and Consistency. "Form" is the narrative description which, when taken alone is currently only marginally helpful. This is because of the polymorphic nature of sponges, and a suitable language is still evolving to cope with this. However, the combination of narrative, in situ photographs and specimens becomes a very powerful identification tool.

"Colour" as a descriptive character is more immediately helpful. Users of the Sponge Guide are being encouraged to make colour comparisons of living material with the Methuen Handbook of Colour (Kornerup and Wanscher, 1978). This enables an accurate colour citation which, together with colloquial narrative ("greyish-orange", "dark red", etc.) and a photograph conveys accurate colour information. Although a degree of colour variability occurs in some sponges, there is sufficient consistency for this to be a valuable character.

Whether "Smell" turns out to be a valuable character remains to be seen. For the time being it is well worth while collecting the information, even if the language used is somewhat variable ("characteristic and unpleasant", "freshly-cut cucumber", "iodine", etc.). Language to describe smell has become more refined in other disciplines such as wine-tasting. Although more eloquent ("acetic", "bouquet", "musty", etc.) it is equally imprecise for the uninitiated.

"Consistency" is certainly a valuable character, but it does entail some damage to a specimen. Again, terms ("fragile", "resilient", "hard", etc.) are still evolving, but their definitions are being consolidated. The main problem with this character is that it cannot easily be tested on small or thinly encrusting sponges - often the ones most difficult to identify.

The importance of photography has already been emphasised. Underwater photographs show living characteristics which are lost on collection. For example, the main "gross" physiological activity of a sponge is to pump large amounts of water through its chambers. This is reflected in the oscula structures in life, which collapse on collection (e.g., Polymastia boletiforme, Dysidea fragilis, Axinella damicornis). Soft, encrusting sponges, such as Oscarella lobularis and Hymedesmia bronstedii collapse (and even partially fragment) on collection, and an underwater photograph is the only way of recording their true form.

Underwater photographs can give valuable habitat and ecological information - e.g., substrate, sedimentation, orientation, other species/communities, epifaunal associations, colour and scale (from clues such as the presence of species of relatively stable size - e.g., Caryophyllia and Corynactis).

Because underwater photography is such a valuable tool, it is as well to point out some limitations. Relatively few underwater photographers achieve consistently acceptable results, and so valuable opportunities can be lost. "Nuisance" factors, such as mucky water, film running out, the specimens being unaccessible or the gear being wrongly configured, often prevail. "Red encrusters" are difficult sponges which have fewer external characters to show up on photographs. In any case, an underwater photograph is unlikely to show all the significant morphological features - e.g., the axinellid sponge Homaxinella subdola has a characteristic wing "stalk" which does not seem to show on photographs. A final problem concerns the reproduction of photographs in the mini-print format, where colour, contrast and framing can be poorer than the original.

Participation is the essence of the UCS Sponge Project. Many of the descriptions in the Guide are specimen descriptions rather than species descriptions. We thus need to collect more information to make up "composite" description and to this end a comprehensive recording form has been devised. By the same token, feedback on the ease and accuracy of identifications made with the Guide are sought, plus general comments on any of its aspects. Participants are urged to take photographs to accompany specimens collected, because this enhances the value of the specimen and creates a broader base from which to choose future mini-prints. Currently, two "sub-projects"

are underway. One is to collect more information about the group of sponges known loosely as "the Haliclonas". Although there are a number of distinctly recognisable entities, their skeletons are so similar that assigning names is very difficult. The second "sub-project" is to map the distribution, within eight defined geographical regions, of some better-known sponges.

The study of sponges presents an ideal opportunity for both amateur and professional biologists. Many observations made in the British Isles are likely to break new ground, and the UCS Sponge Project enables these observations to be shared. Sponges have considerable aesthetic value, showing a variety of colours and form, and enhancing the beauty of many underwater seascapes.

References

- Arndt, W., 1935. Porifera. Tierwelt N.-v. Ostee. 3a, 140 pp.
- Bowerbank, J.S., 1864-82. A monograph of the British Spongiadae. 4 vols. ixxxii + 1295 pp. London (Ray Society).
- Kornerup, A. and Wanscher, J.H., 1978. Methuen Handbook of Colour. 3rd Edition. London (Methuen). 252 pp.
- Smith, E. (Chairman), 1979. Taxonomy in Britain. Advisory Board for the Research Councils. London (HMSO). viii + 126 pp.

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IDENTIFICATION FOR ALL - AN EVOLVING SKILL.
(Preliminary note)

P.F.S. Cornelius.
British Museum (Natural History), London.

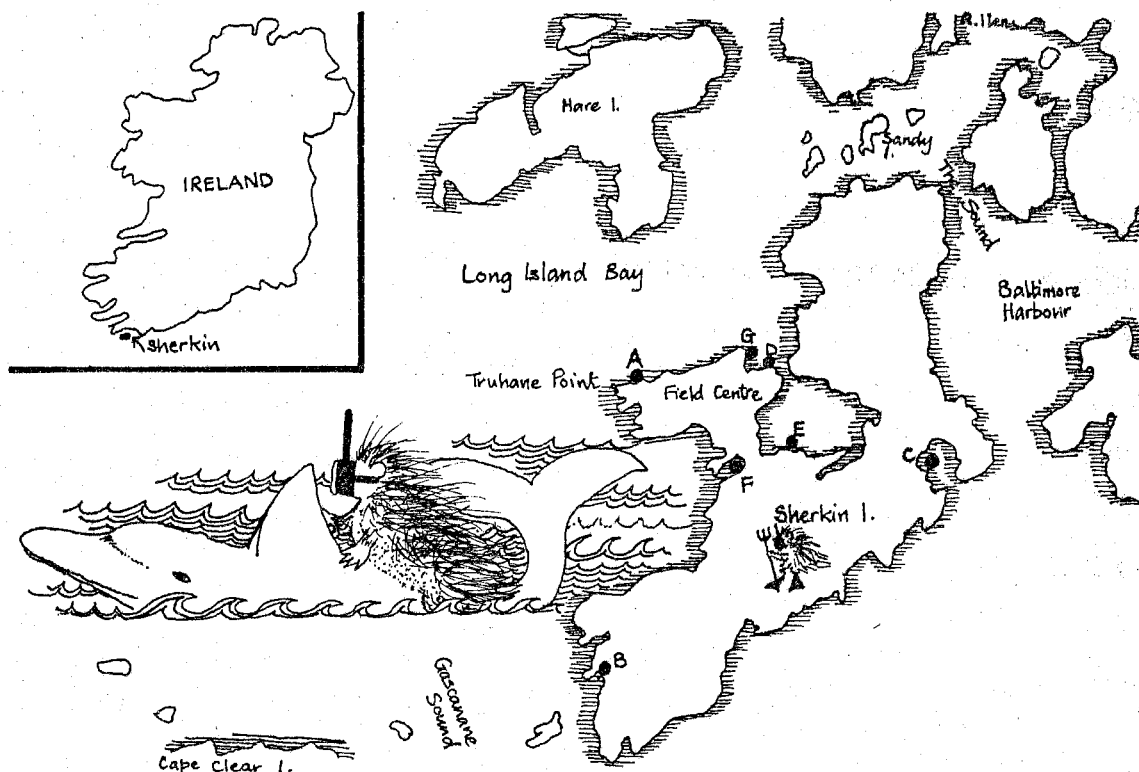
Specialist taxonomists should distil from their experience the characters by which they instantly recognise familiar species, and include these 'best' characters in identification keys. The easiest keys to use are visual ones and the hardest, verbal. Many taxonomists fail to popularise their identification skills. This is changing, but scholarly works still appear with keys that are hard to use even for general biologists. Identification clues in little known species are sometimes hard to derive. These points were illustrated where possible by reference to hydroids, and a novel, field-guide approach to that group was demonstrated.

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(It is hoped to include reports on the remaining groups in the next PN)

PORCUPINE EXPEDITION TO SHERKIN ISLAND, AUGUST 1982

Sherkin Island in SW Ireland lies shoreward of the Fastnet Rock, between the mainland and Clare Island, thus mostly protected from the Atlantic (see map). Most shores are rocky, short and steep, but there are some sandy and muddy bays. Offshore there are rocky cliffs and pinnacles, and wide areas of sediment.



The marine station on Sherkin was founded in 1975 as an addition to an already established outdoor pursuits centre. Its pattern of development has been as follows. At the time of its foundation a baseline survey of the island's marine fauna was begun with a series of shore transects. In the first year a field course on oil pollution was run by Jenny Baker of Orielton; this was succeeded over a number of years by field courses from Menai Bridge conducted by Member Ivor Rees. Diving was early introduced in furtherance of research, by a team led by Keith and Sue Hiscock in 1975; it has figured prominently in subsequent work.

In 1978 a red tide devastated the farmed fish in Dunmanus Bay. At the same time kills of littoral organisms were observed in Kinish and Horseshoe Harbours on Sherkin and in the North Harbour of Clare Island. The implicated organism was the dinoflagellate Gyrodinium aureolum. The Sherkin establishment responded by beginning a long-term study of red tides in the locality.

Additionally, studies have been initiated on selected groups of animals and plants at Sherkin; on sponges, beetles, wasps, butterflies

and moths, birds and sea mammals; a vegetation map is begun. In recent years about 25 young postgraduates have worked annually at the station. The laboratory publishes a journal, "The Journal of Sherkin Island".

"Porcupine" held a field week in Sherkin from 7-14 August 1982. Ten people, Members and associates, attended. All undertook research projects, although in the case of your Editor his research topic, shore barnacles, was little more than a cover story for an idle and delightful week. But much earnest work was accomplished by everyone else.

Shelagh Smith and David Heppell of the Royal Scottish Museum: About 120 species of molluscs were found, of which 15 have not been recorded living since 1950 and 27 are new live records to Sea Area 37 (Seaward, 1982). A number of these are on the Sherkin Island list. Additionally, about a further dozen appear to be new to the Sherkin area. Most of the new records are in one of two groups: a handful of species such as Littorina spp. which have been segregated, and rissoids and others which are difficult: species found offshore which apart from Colpodaspis pusilla M Sars (previously recorded from Sherkin) and Onchidoris luteocincta (M Sars) were all taken by dredging, most of them from two adjacent hauls of muddy sand with Phyllophora crispa. These include -

<u>Lepidopleurus cancellatus</u> (Sowerby)	<u>Epilepton clarkiae</u> (Clark)
<u>Callochiton achatinus</u> (Brown)	<u>Mysella bidentata</u> (Montagu)
<u>Manzonia crassa</u> (Kanmacher) (Alvania)	<u>Tellina fabula</u> da Costa
<u>Lunatia alderi</u> (Forbes) (Natica)	<u>Thracia phaseolina</u> (Lamarck)
<u>Haedropleura septangularis</u> (Montagu)	
<u>Bela nebula</u> (Montagu) (Mangelia)	
<u>Chrysallida obtusa</u> (Brown)	
<u>Odostomia acuta</u> Jeffreys	
<u>Odostomia rissoides</u> Hanley (scalaris)	
<u>Turbonilla fenestrata</u> (Jeffreys)	
<u>Philine catena</u> (Montagu)	
<u>Philine scabra</u> (Montagu)	
<u>Tetusa truncatula</u> (Bruguiere)	

Alison Trew of the National University of Wales collected and dived, principally for molluscs. The Museum aims to build up a representative collection of the marine invertebrate fauna of the British Isles preserved in spirit. To this end she also made a collection of Sherkin woodlice. She wrote: "We have an excellent collection of dry mollusc shells in Cardiff but hardly anything worthwhile in spirit, so we are slowly trying to correct this. We regard our province as the north-east Atlantic, not just Wales, so I have also been to the Channel Isles last year as well as to Ireland twice."

Morag McKinnan: "I came to Sherkin as a diver and photographer and found that both activities were a bit curtailed by the recent stormy weather, which left the visibility as low as 2 m on occasions. However, there was lots to see and the size and variety of sponge species was most impressive. The best dives locally were at Crab Rock to the south and Sandy Is. to the north. Coming from Scotland I was most impressed with the colours of Corynactis viridis and Caryophyllia smithi which are not too common in the Clyde area!"

Geoffrey N. Swinney and Isabel M. Donaldson of the Royal Scottish Museum: Part of the work undertaken on PORCUPINE's Summer field collecting expedition to Sherkin Island (7-14 August 1982) was a preliminary examination of the fish fauna of the island. Because of the limited time available, systematic collecting was confined to 7 sites (A-G: see map) on the more accessible shores. Two principal techniques were employed.

On rocky shores (A-D: see map) collections were made by treating pools with the fish specific anaesthetic, quinaldine. Quinaldine, $C_6H_4CH:CH.C(CH_3):N$, is available from BDH chemicals. This was used as described by Gibson, 1967 (J. Anim. Ecol. 36, 295-301) as a 20% solution in acetone and this mixture then added to the pools so as to give a final concentration of approximately 15-20 ppm. Whenever possible this technique was used on a rising tide so that any fish which remained uncollected in the pools were subjected to a relatively short exposure to the anaesthetic.

On sandy shores (E-G) fish were collected using a "Micromesh" beach seine. "Micromesh" is a trade name for a knotless netting of approx. 3 mm mesh size, supplied by C.J. Field (Polynet) Ltd., Macclesfield. Details of the construction and operation of nets of this material have been reviewed by Coles & Butterworth, 1976 (Fish Mgmt. 7 (3), 53-56). The particular net used measured approximately 15 m in length by 1.5 m in depth and was set by one of the netting team wading and/or swimming it out from the shore.

A total of 28 species were recorded. Specimens of most of these have been deposited in the Royal Scottish Museum and registered as RSMNH 1982.031. A more detailed account of the fish is currently in preparation and will be published elsewhere.

Frank Evans: Specimens of six species of barnacle were found on the shore. They were: Chthamalus stellatus (Poli), C. montagui Southward, Balanus balanoides (L.), B. crenatus Bruguière, Verucca stroemia (O.F. Müller) and Elminius modestus Darwin.

Chthamalus spp. occurred in the more exposed regions where they were sometimes found together and sometimes further mixed with Balanus balanoides. On some moderately exposed shores they were displaced entirely by B. balanoides from about mid tide level downwards; this may be seen, for instance, at Tranavrank. Verucca stroemia was generally present on the shores that supported Chthamalus spp. On the more sheltered shores Chthamalus spp. were absent and B. balanoides was joined by small numbers of Elminius modestus (examples were found on the S side of Kinish, at Rugher Strand and at the Dock). On the lower shore in parts of Kinish harbour specimens of B. crenatus were taken.

Search and enquiries were made for Policipes cornucopia (Gmelin) but no record of this species was found.

Susan Chambers of the Royal Scottish Museum: About 18 species of polychaete were collected, of which 5 had not been recorded previously. They were Harmothoe imbricata, H. extenuata, Pholoe minuta, Polynoe scolopendrina and Stylaroides sp.

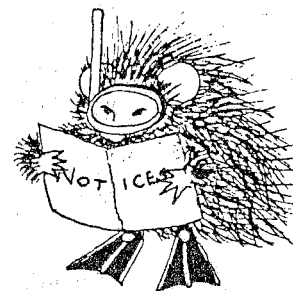
Other species collected which are of interest were the starfish Luidia ciliaris found on the mid shore west of Tranaplousa and the scyphozoan Chrysaora sp., also found on the shore, near Sherkin Point.

NOTICES

NOTICE 1.

SMALL ESCALLOPS (PECTEN MAXIMUM). REQUEST FOR ASSISTANCE

From Member Peter Walker, FSM 3, MAFF Fisheries Laboratory, Pakefield Road, Lowestoft, Suffolk, NR33 OHT.



The Shellfish Group at Lowestoft is currently studying the life history and population dynamics of scallops in a number of stocks around England and Wales. We would be interested to hear of any observations of scallops smaller than 6 cm, and to have details of the associated substrate.

If you know of any area where specimens of such size are to be found, please contact us at the above address.

NOTICE 2.

REQUEST FOR RECORDS OF STARFISHES

From Member Ailsa Clark (British Museum of Natural History) and Maureen Downey (U.S. National Museum).

Being engaged on a comprehensive book on Atlantic Asteroids (N.S.E. and W.) we would be very glad to hear of any additional records (since Mortensen, 1927) of the following inshore species only partially distributed around the British Isles:

Hippasteria phrygiana from the Firth of Clyde or southward or from S. of Cullercoats in the North Sea (i.e., only recorded from the rest of Scotland and Northumberland).

Porania pulvillus from the E. of Scotland.

Asterina gibbosa and/or phylactica from the N. of Scotland (including Orkneys and Shetlands), the North Sea or the Channel E. of Dorset/Channel Is.

Solaster endeca from Anglesey southwards or from S. of Cullercoats.

Henricia sanguinolenta (as opposed to oculata which has coarser more opaque and irregular spinelets, those of sanguinolenta having only a central core opaque and several hyaline flanges ending in flared points) from W. of Scotland and England and the North Sea S. of Cullercoats.

Leptasterias muelleri from either side of England.

Marthasterias glacialis from the Channel E. of Devon/Channel Is.

Please contact Miss A.M. Clark, Department of Zoology, British Museum (Nat. Hist.), Cromwell Road, London SW7.

NOTICE 3.

THE COELENTERATE GROUP

From Mr. M.C. Holley, Department of Zoology, South Parks Road, Oxford OX1 3PS.

The next meeting of the Coelenterate Group will take place on 29th March, 1983, at the Department of Zoology, Oxford. A detailed notice of this meeting will be despatched in December 1982. If you think that you are not on the mailing list, and wish to attend, please contact Mr. Holley.

NOTICE 4.

CHALLENGER SOCIETY 80th ANNIVERSARY MEETING

From Member M.V. Angel, Institute of Oceanographic Sciences, Wormley, Godalming, Surrey GU8 5UB.

On 28th January 1903 a group of gentlemen (all male chauvinists because ladies were excluded) met for dinner and started the Challenger Society. This coming January 28th the Society is to hold another meeting - this time at the Zoological Society's lecture theatre in London, since Dr. Fowler (an ex-principal scientist on the Porcupine) is no longer in residence in the private house where the first meeting was held. In between courses, there is to be a series of lectures on chemical fluxes in the ocean in which there will be a significant biological contribution (euphemistically called detritus (latin) or * (anglo-saxon). There will be a grand finale 'The First John Raymont Lecture' before coffee and liquors on the subject of the FORE report. What FORE? Well 'The Future of Oceanographic Research' was commissioned by IOC (Intergovernmental Oceanographic Commission) to crystal-ball gaze up to the end of the millenium. Full details will be sent to anyone (in a plain envelope) or anyone else normally attired who cares to write to me at IOS.

NOTICE 5.

ROSELAND MARINE NATURE CONSERVATION AREA

From Member Stella M. Turk, University of Exeter.

Following the lead at Purbeck, Dorset, and at Wembury, Devon, efforts have been made to protect a particularly important section of

the Fal Estuary in Cornwall. In June, just under 100 local and national organisations and individuals with commercial, leisure, planning, educational and conservation interests in the estuary, were contacted and sent a map of the proposed area with notes on its importance and the reasons for the need for action; with the statement was a form on which recipients were asked to notify intention to attend a meeting in July, or invited to make any comments in lieu of attending. On July 6, 1982, 40 representatives of some of the organisations referred to above met in Truro, and the acting Roseland Marine Nature Conservation Group received the endorsement that it sought. It was agreed that the Conservation Area should be a purely voluntary one with no legal powers, and that its primary purpose would be informational. With this in view, a code of conduct will be prepared.

The Area encompasses all the estuary within tidal influence to the east of the shipping channel, from the mouth of the Fal to St. Just-in-Roseland. This includes St. Mawes Bank, unique in southern Britain for its bed of living rhodoliths (Phymatolithon calcareum) known in commerce as maërl or calcified seaweed, and Place Cove where there is a particularly rich assemblage of marine life in the very sheltered but fully marine conditions. Beds of Zostera or eel-grass, the intertidal extent of which has been reduced in recent years, occur within the designated area, and within the Conservation Area reefs show text-book zoning with good rock pools in places and plenty of weed cover, overhangs and niches for fauna. Nearer to St. Just-in-Roseland, the shores are covered with slate clitter which gives cover to a variety of species.

The aim of the Group is to prevent unwitting damage, such as is known to result from excessive bait-digging, trench transects dug by parties of students, and unnecessary over-collecting of specimens with destruction of habitats (not replacing overturned stones, etc.)

The Calcified Seaweed Company, which has a licence to dredge subfossial deposits of maërl on the Mylor side of the estuary, and Falmouth Harbour Commissioners (which own the funds of all the Conservation Area except Percuil River, owned by the Duch) are aware of the importance of the Bank. There is evidence, gleaned during recent exploratory dives, that anchors can damage both the living maërl and the Zostera, but as the Bank is used as a Water Ski area it is largely an exclusion zone for everything else. This particular reconciliation of commercial, leisure and conservation interests may have been fortuitous, but illustrates the manner in which a Conservation Group might help to resolve potentially conflicting usages.

Already littoral and sublittoral surveys are underway, organised by the University of Exeter, so that the present extent of the various communities can be mapped.

The Roseland Marine Nature Conservation Area Advisory Group has representatives from the University of Exeter, the Cornwall Naturalists' Trust, the Marine Biological Association U.K., and the Nature Conservancy Council, as well as other interested parties. Acknowledgement of its aims has been received from the National Trust, the Underwater Conservation Society, Porcupine, and the Conchological Society.

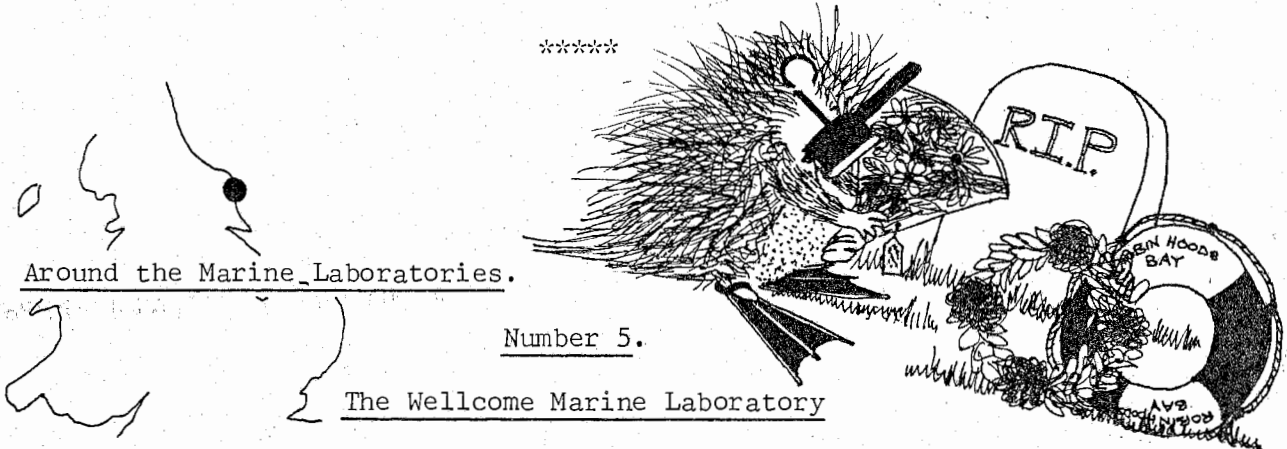
Further information can be obtained from the joint Project Co-ordinators: Mr. Roger Burrows, B.A., M.I.Biol., Staff Tutor in Natural History, Extra-Mural Dept., Univ. of Exeter, 5 Walsingham Place, Truro, and Mrs. Stella M. Turk, M.Sc., Hon. Research Fellow, Extra-Mural Dept., Univ. of Exeter, Shang-ri-La, Reskadinnick, Camborne, or the Secretary to the Group, Miss Caroline Rigby, B.Sc., Conservation Officer, Cornwall Naturalists' Trust, Trelissick, Feock.

NOTICE 6.

SEAWEED WORKSHOP

The SE branch of the UCS is holding a weekend workshop on marine algae on 23-24 April 1983 at Portsmouth Polytechnic Marine Laboratory on Hayling Island. This will be led by Dr. W. Farnham and the topics covered will include the ecology, collection, preservation, identification and uses of seaweeds. We hope to organise a dive, too.

For further details contact Sally Roger, Marchants Hill Centre, Hindhead, Surrey - enclosing a S.A.E.



Around the Marine Laboratories.

Number 5.

The Wellcome Marine Laboratory

In 1911, when Walter Garstang was Professor of Zoology at Leeds, the universities of Leeds and Sheffield embarked on the joint venture of hiring part of the old Coastguard Station building at Robin Hood's Bay as a marine field station. Each university paid £4 per annum for what was then known as the Yorkshire Universities Marine Laboratory. By hiring more of the accommodation the universities extended their foothold; the position was consolidated by purchasing the building in 1922, then Sheffield withdrew from the partnership in 1928. The laboratory was used primarily as a field centre for student courses. It was also a base for research, although there are few papers specifically attributable to its existence in this phase. During both world wars the front of the laboratory housed a coastal defence gun.

In 1963 things stirred when the Wellcome Trust provided funds for rebuilding and turning the station into a well equipped research laboratory. This involved the demolition of the old station for the construction of a new, National Park approved building. When work started there was uproar - the village was appalled and the press had a field day. The writer Leo Walmsley expressed his strong disapproval.

Walmsley had been "Honorary Curator" and worked in the laboratory in the early days before the first war; now he wrote "Oh, for a super north-easter that will smash the thing to bits and to hell with the biologists". On the university side, it was explained that this development was valuable and necessary, both for marine biology and for zoology in general.

When the dust of building and protest settled, there was a return to tranquility. The presence of a small nucleus of young people, albeit engaged in somewhat arcane pursuits, seemed to enhance the village. As well as the new lab., now the Wellcome Marine Laboratory of the University of Leeds, the university had acquired the old school house which it converted into residential accommodation for visiting workers. There were two permanent university academic staff who attracted a nucleus of students and assistants. Research output shot up: since the formal opening in 1967 more than 100 papers have been published. Topics were diverse within the general areas of rocky shore ecology and the biology of meiofauna, with a mix of 'pure' and 'pollution oriented' work. In 1974 the laboratory became fully independent of the Department of Zoology, and an additional building was purchased and converted. Also, the staff complement was raised from 2 to 3 by the creation of a fellowship named after Garstang.

These developments were to be thrown into reverse. Slightly anticipating the economic blizzard to come, Leeds University froze the Garstang fellowship when it became vacant in January of 1980 and appointed a committee to examine the future of the laboratory. After consultation and deliberation Leeds decided that despite the quality of work done at the laboratory, it could no longer afford it. Therefore it would redeploy the staff and sell the buildings.

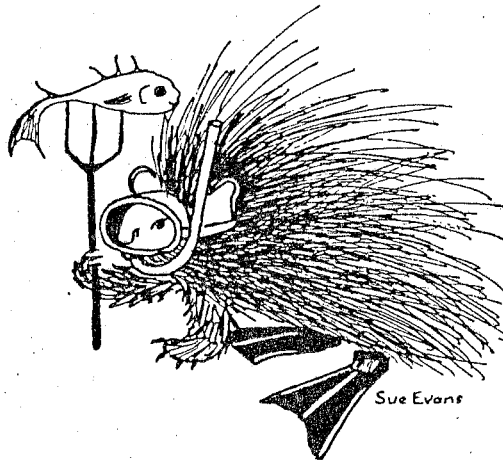
Again, the village was appalled. As were those of us in the laboratory. Those with longer memories wondered why a facility deemed so valuable in 1966 was disposable in 1982. There is no good answer - but the closure has gone ahead, with effect from the end of 1982.

' "ET AUGEBITUR SCIENTIA", SED DE MARI NIHIL'.

(Classically-educated "Porcupines" will recognise the Leeds University motto, "And let knowledge increase", followed sourly by "but about the sea, nothing". Ed.).



Porcupine Notes and News



THALASSIOHYSTRIX SCUBA Smith & Heppell - Problems in Nomenclature. Members will recall that in the last issue we sought further specimens of this species for breeding purposes and for the consequent elucidation of the sex of the holotype, currently lodged in the editorial office. The numerous offers we have received indicate that the animal is not as rare as was at first thought; however, we have now recollected the correspondence initiated by C.T. Canon in PN 1, 5 and further letters from D. Heppell and R.V. Melville in PN 1, 7.

Rereading these letters, we have decided that there is no way in which we are going to permit a pregnant holotype; the nomenclatural problems regarding the status of the offspring are too dreadful to contemplate. We thank all who responded to our request for assistance, nonetheless.

On the same subject, it seems that Thalassiohystrix scuba lacks an agreed vernacular name. Our specimen responds most readily to the word "dinner", but this may not be an acceptable sobriquet. Any suggestions?

**

SIR FREDERICK RUSSELL, the former director of the Plymouth Lab., was invited as an honoured guest to our recent meeting in Reading. He now lives close by at Goring on Thames but being, as he said, not very good on his pins, he regretfully declined. He sent PORCUPINE his good wishes, though, which drew applause when relayed to the meeting. At 85 he is still working in the marine field, he told PN.

**

VENOMOUS ATTACK ON "PORCUPINE" SECRETARY. Shelagh Smith writes: "On 22 September I was handling a small Eledone cirrhosa, mantle length 60 mm. It suddenly clamped itself across the palm of my hand and bit - painfully. Having bitten with its beak, so far as I could feel, it then rasped with its radula and injected venom with its salivary papilla. The result was a fleeting burning sensation followed by numbness, paralysis and considerable swelling of the palm of my hand and base of my thumb. I could just wiggle the ends of my fingers. First aid was applied in the form of 70% industrial methylated spirit to the wound, which was very small and did not bleed, and 70% proof spirit was taken internally. The numbness, paralysis and swelling lasted for four hours and then disappeared rapidly. The site of the attack remained sore for about a week and still gives an

occasional twinge. I was surprised how strongly the Eledone clung to my hand, much harder than the normal crawling attachment; it gripped so hard I thought I would have to kill it to get it off. I wouldn't like to tangle with a large cephalopod.

Peter Boyle (Zoology Department, Aberdeen University) (in litt.) states, "I do not know of any other report of the bite of this species on a person. About 3000 have been taken into this department over the last few years. It surprised me to know that the rasping of the radula and injection of venom was so quick because they take quite a while to penetrate crab shells." David McKay (Marine Laboratory, Aberdeen) (pers. comm.) says that it is well known that Eledone has a powerful bite. They are used in practical jokes by fishermen. Placed on someone's back a large Eledone will cling and bite through oilskins.

Why did the Eledone consider me prey? I had been handling it very gently, it had shown no fear, no blushing, no inking. I had been working on the shore and could have picked up an attractive odour. But I have added Eledone cirrhosa to my list of animals to be treated circumspectly."

**

ELUSIVE GOBY. Alwyn Wheeler in his little book on the fishes of northern Europe describes the leopard-spotted goby, Thorogobius ephippiatus as "difficult to capture before the use of scuba diving became widespread". For "before" read "before and after". Divers have found the species to be quite common on the Northumberland coast, at St. Mary's Island and in Brown's Bay (new records for the English North Sea coast) and have photographed it. But when diving biologists Steve Howard, Nigel Wright and Graham Rands set out to capture a specimen, although they saw about a dozen different fish (which are territorial) they failed to catch one in four days' diving.

**

WELLCOME PHOENIX. The work of the Robin Hood's Bay Lab. (see "Around the Labs", this issue) is to continue. The NERC team is transferring to Newcastle University and is to be increased to a total of four people. The long-term monitoring of shore animals around the British coast will be focussed especially on limpets and top-shells. Professor R.B. Clark of Newcastle will supervise the programme while Dr. J.R. Lewis, the former director at Robin Hood's Bay, will continue to advise on the research.

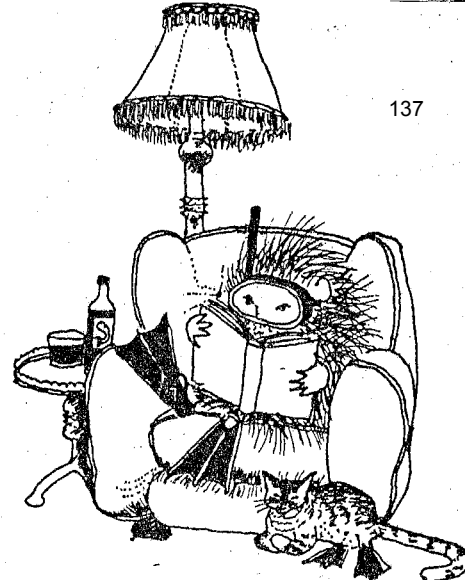
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"PN IS BECOMING more like "Tiny Tots' Weekly" with every issue", says a friend. Fair comment. And much preferable to silence. Hallo! Hallo! Is there anybody out there? Our letters column needs you. Communicate....Communicate.....

Porcupine Reviews

Dennis Seaward, Ed., 1982. Sea Area Atlas of the Marine Molluscs of Britain and Ireland.
Nature Conservancy Council. Shrewsbury. £5.

Reviewer: Shelagh Smith, Royal Scottish
Museum, Edinburgh.



At long last this Atlas has appeared. Since it has been so irksomely long in the publishing - the blame to be taken by the Nature Conservancy Council and not the Editor - it is well and truly out of date. It should have been called what it is, a Provisional Atlas. It is hoped that the gap between compilation and publication will prove a virtue rather than a fault and will be all the greater encouragement, a) for more records to be made available, and b) for a second edition to be produced without the faults present in this one. Unfortunately the faults stand out. The poor quality of the paper means that a used copy will all too quickly become tatty, the paper is soft and some inks may go right through and cause problems when it is annotated. The quality of reproduction is patchy, some sheets are very faint and outlines can be removed with a pencil eraser. Considering the amount of effort and expense which has gone into production of this atlas, this penny-pinching will not do.

It would have been helpful for the introductory sections to have indicated in more detail the sources of records, and to have made more of the already published "Marine Molluscs of Britain and Ireland" since this, listing the species found in each Sea Area, is complimentary. Seaward regards it as obsolescent. There are discrepancies between the earlier lists and the present Atlas. While many of them are due to additions and corrections and thus very welcome, some are simple errors which should have been picked up at the proof stage. Discussion of these discrepancies with Seaward leads me to consider, in hindsight, that complete proof copies should have gone to each Area Representative. The Atlas would have been more authoritative if some comment had been made on the existence or otherwise of voucher specimens, at least indicating where major collections of these are held. Possibly some acknowledgement could have been given of distribution maps of British marine Mollusca already published, for instance, information for East Scotland (Sea Areas 5, 6, 7 and part of 9) was provided from McKay & Smith's Atlas). The slowness of publication has meant that Seaward's wish for exchange of methods of collecting has been granted by the publication (1981) by the Conchological Society of a Paper for Students "How to Collect Marine Mollusca". There has been all too obvious difficulty in deciding upon suitable order in which to put species (returning in part to Winckworth (1932) is unhappy), and what to call them. This is because there is not an acceptable British list of marine Mollusca. (This Atlas is not a viable alternative.) It is a full time occupation to keep up with taxonomic literature, and compilation of such a list is a major occupation. Even so, for this Atlas there

seems to have been lack of consultation with appropriate experts, resulting in inconsistencies. Sometimes Seaward follows recent work as in the removal of Onoba from Cingula, sometimes he accepts records without enquiry regarding the name, as in Putilla tumidula. If tumidula is placed in Putilla so also should Cingula alderi be, and possible also C. semistriata. On other occasions he quotes literature but does not say why he does not follow it, e.g., Spirotropis carinata = monterosatoi. The result is that the Atlas is rather difficult to follow without frequent recourse to the systematic list and the Index. One is also unclear whether names are used s, l, s. s., agg. or auct. For instance, a map is given for a species called Rissoa violacea. This species is Mediterranean, as stated in the systematic list. There are also maps for British segregates. The violacea map is used in the sense of R. violacea auct, a rag-bag for all the non-segregate records, whereas it might have been more useful and acceptable if it were R. violacea agg. and included all records for the group of species. Although in other cases where segregations are made the authority is given, it is not so here. There are other matters which could be tidied up in a future addition: in a work of this nature where many names are used the genus should always be written out in full to avoid confusion, which here exists especially where the generic name appears with the first species of a genus and subsequent species are overleaf. Could more species be in alphabetical order within genera or subgenera?

The reviewer, with experience of compiling an Atlas, knowing the amount of work involved when dealing with such a large phylum as Mollusca, congratulates Seaward on the Sea Area Atlas. The concept and layout work very well. There is a useful preamble showing the limits of Sea Areas and listing Area Representatives who can be contacted, systematic list, index, references, and distribution maps of 745 species by Sea Area, indicating whether the species has been recorded only as previous workers have tended to separate records into pre-1950 and 1950 onwards). The half-circles, indicating live records pre-1951 are useful, although it is likely that most of them could be filled in without difficulty.

We may be getting near a reasonable knowledge of true distribution of species, but as Seaward says, this could more easily be done with more literature such as field guides. The difficulty is that literature must be suitable for a wide range of users and, even if not describing all species, should list them and refer to other works where they are described. Not only lack of literature, but also lack of repetition of old work, which was chiefly dredging or obtaining specimens from fishing boats, accounts for the lack of recent records in difficult species. Nowadays people are, correctly, less enthusiastic in their identification of such, and was Marshall always right in his "Additions to 'British Conchology'" whence came most old records of difficult species, or was he guilty of including subfossils and of elevating slight variations to specific level? I would be loathe to say without qualification that species have contracted in their range. The Atlas also draws attention to records in strange places which may be erroneous. It is hoped that these will be queried and that voucher material will be sent to experts. This Atlas can indicate genuine changes in distributions of species.

Unfortunately all changes will be seen to be for the worse because one cannot show that a species not found previously was not there, whereas one can assume that if there has been a thorough search over a number of years without success then a species is absent. We now have no excuse for not having reasonable coverage of our shores. Considering the size of its membership the Conchological Society should have done much more. The proportion of members contributing to this Atlas is very small, indicating a general lack of commitment of the Society to British marine Mollusca. There is much yet to be learned from the shallow sublittoral. Divers and dredgers consistently find different species even at exactly the same site. Exploration down to 100 m or so might be more useful to general scientific knowledge and certainly more cost-effective than deeper water surveying. Seaward's Atlas shows up large gaps and many smaller ones. Let us hope that it is used not so much as a static work of reference but as a growing basis for more Atlases and further work.

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Polychaetes from Scottish Waters. Part 1 Family Polynoidae. £4.
By Norman Tebble and Susan Chambers

Reviewer: Peter R. Garwood, Dove Marine Laboratory, Cullercoats.

This guide to the scaleworms of the family Polynoidae provides a key to some 29 species, together with species descriptions based on the authors' own observations. It represents the first in a series aimed at dealing in detail with all polychaetes recorded from Scottish waters, and is a very welcome addition to the polychaete literature, particularly as up to date taxonomic works on European species in the English language are presently sadly inadequate. By considering one family at a time, the authors are able to combine in one publication an important revision of Scottish polynoids with a tool for their identification of considerable value to the inexperienced as well as to the experienced polychaete worker. In this connection, I found the section on the Examination of Polynoidae particularly useful, setting out exactly what the authors mean by the terms used in the keys and species descriptions, and pointing out what to look for (and where to look for it) in order to identify polynoids.

My criticisms are very few in number and relatively trivial in nature, reflecting mainly differences in approach. As a consequence of dealing with each morphological feature in sequence in the species descriptions, there is a certain amount of repetition of information, tending to obscure those characters of importance in distinguishing species. I have some reservations about using the relative lengths of the palps and lateral antennae as a taxonomically useful character, and I would have preferred the notes on rarity to be removed from the key to the descriptive section. These slight differences in opinion, however, have in no way detracted from its usefulness to me in the identification of some of the specimens marked 'Polynoidae sp.' in my collection.

The family Polynoidae has always been a difficult one for identification and, although this volume is a great step forward, I am sure that the authors would agree that incomplete specimens, particularly those lacking their dorsal scales, may remain unidentifiable. I believe that the next part in the series, dealing with the remaining scaleworm families, is well under way, and I feel sure it will live up to the high standard set by the first.

THE UNDERWATER CONSERVATION SOCIETY AND PORCUPINE - CLOSER LINKS?

Bob Earll

UCS Project Co-ordinator and "Porcupine" Records Convenor, Candle Cottage, Kempley, Gloucestershire.

"At the recent (March 1982) PORCUPINE AGM a proposal for closer informal contacts between PORCUPINE and the UNDERWATER CONSERVATION SOCIETY was warmly supported."

Following my explanation of why I thought UCS and PORCUPINE should have closer links at the March PORCUPINE meeting your trusty editor thrust a piece of paper into my hand with the above title and, although I couldn't meet the publication deadline, what I would have written then is just as relevant now.

The background to the above proposal is briefly set out below. A group of us, including Shelagh Smith, Roger Mitchell and Frances Dipper were on a NCC survey to Coll & Tiree in 1981 when we had several conversations about UCS - Porcupine and the overlapping aims and aspirations of the two Societies. Several meetings between members were then arranged during 1981 at both Edinburgh and Portsmouth where a variety of proposals were discussed. In this process UCS agreed to have a PORCUPINE member as a nominated member of the UCS Representative Council; that member is Shelagh Smith. At the March 1982 PORCUPINE meeting the above proposal was agreed.

Before going into those areas of mutual interest, perhaps I should say a little about what UCS is and its aims and organisation. Many PORCUPINE members will know of UCS through the mini-print sets - many PORCUPINE members will have used the nudibranch or anthozoan guides in the past few years. UCS is however concerned with a much wider range of activities. The Society was founded in the late 1970's through the co-operative activities of conservation organisations, professional marine biologists and amateur diving groups. Its stated aim is as follows: "The Society seeks to promote the study and the protection of the natural and historical features of the underwater environment of value and interest to mankind". This aim is achieved through a wide variety of activities covering projects, expeditions, publications (a newsletter and reports), educational aids, and lobbying in relation to conservation issues.

The Society produces three newsletters a year, with an additional mailing which is usually geared to the Annual Meeting in November.

Through the activities of a full time Project Co-ordinator, Bob Earll, a programme of projects and expeditions are put forward each year which enable mainly divers to take part in project work on their dives, although this is likely to expand in the near future to include greater participation by the general public. UCS also provides an 'enquiry service' both through its Officers and a group of 25 experts who provide advice on a wide range of marine biological and conservation topics. Weekend and weeklong courses are organised covering a wide range of subjects. UCS is a member of the Council for Environmental Conservation's Wildlife Link Committee and through this and its own conservation committee has played an important part in getting the Marine Nature Reserve legislation into the Wildlife and Countryside Act. The Society has produced and distributes a wide range of literature on marine biological and conservation topics. The mini-print sets covering common sublittoral animals, nudibranchs, Anthozoa and sponges are particularly well known but there are also slide sets, guides to coral genera, etc.

UCS is a constituted Society directed by a Representative Council. It has a membership of 650 and annual turnover of approximately £15,000 a year.

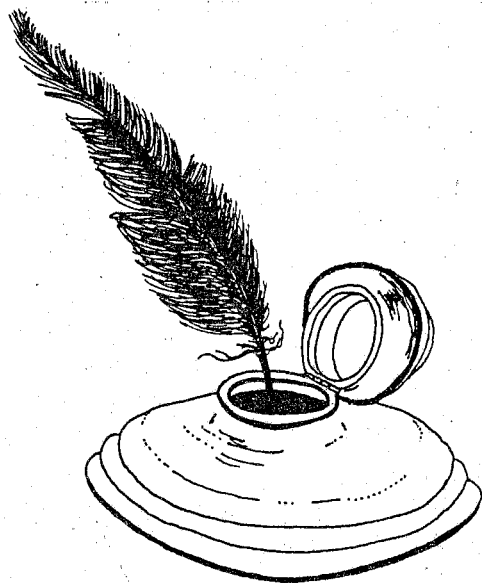
What are the areas of overlap that prompted the discussions in the first place?

The main area of common interest concerns the biology of marine species, in particular their distribution and systematics. Whilst there are differences of emphasis there are many topics of overlapping interests. If one looks at particular environments for example I would think that both Societies share equally large proportions of members who are interested in the intertidal environment. The shallow sublittoral zone, especially the rocky sublittoral, is the main area of expertise among many UCS members, whilst the off-shore sediments and deep sea environments are in general much better covered by Porcupine members.

With regard to the systematic and taxonomy of marine groups UCS's areas of expertise give a high emphasis to sessile organisms, whereas Porcupine's membership is more often concerned with molluscs and the mobile infauna of sediments. While these rather broad generalisations do have some foundation, one is struck more by the overlapping interests of many members. Indeed when last I counted something in excess of 1/5th of Porcupine's members were also members of UCS. This overlapping interest is well evidenced by the recent joint workshop meeting on "Sessile groups" organised jointly by the two Societies. Both Societies share a common interest in understanding the distribution of marine species, and an interest in marine recording; for example, 8 out of the 12 speakers at the March 1982 meeting were members of both Societies.

The outcome of the discussions which took place are embodied in the proposal with which I started this article. Whether such co-operation will ever require more formal organisational links will no doubt be a matter for continuing debate. What is clear, however, is the enormous potential for co-operation. There are many areas, such as that of marine recording where an effective lobby could (and should) resolve the less than satisfactory progress being made by BRC co-ordinated efforts. Similarly co-operation on a UK marine faunal

checklist, the use of micro-computers in ecology and taxonomy, the question of marine nature reserves, the style and nature of taxonomic guides, and more formal publication of general observations and scientific results are all areas where greater co-operative efforts which are rather overdue, would bear fruit.



Letters to the Editor

From Dr. M.M. Parker, Department of Fisheries,
Fisheries Research Centre, Abbotstown, Co.Dublin.

Dear Editor,

The letter from "Pelagos" in your July issue on morphological resemblances between adult and larval structures ends with the suggestive question "(can) some species... create and recreate their most characteristic organ with ease, like playing a familiar tune over again?"

Both the question and its style are very reminiscent of a strange book published last year, entitled "A new science of life: the hypothesis of formative causation" by Rupert Sheldrake (Blond & Briggs, UK). In so far as I understand it (and the hypothesis requires a paradigmatic shift in thinking), Sheldrake postulates the existence of morphological fields (by analogy with magnetic fields) whose occurrence affects future morphologies; it is a conservative but epigenetic rather than truly genetic principle.

Nature savaged the book both in an editorial ("A book for burning?" 24 September 1981; Vol. 293, p. 245) and a book review ("A haunted house of cards" by D.R. Newth, 5 Nov. 1981, Vol. 294, p. 32) but provoked a flood of outraged correspondence about this treatment, particularly from embryologists.

The book is interesting but I remain sceptical; nevertheless, "Pelagos" may find its answers at least of interest in relation to his question.

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From Prof. D.R. Newth, Monevechadan, Lochgoilhead, Cairndow, Argyll.

Dear Editor,

As my memory serves me my review of Sheldrake's book in Nature did not cause any protest; indeed it is hard to imagine any sane person taking exception to it. The outraged correspondents were unhappy about an unsigned Nature editorial on the same subject. The only embryological reaction to Sheldrake (apart from my own) that I can remember was that of Professor Lewis Wolpert in the New Scientist. He was scathing.

As to the point raised by "Pelagos" I really feel that a more extended treatment would be necessary before one could begin to be convinced that there was a phenomenon deserving of notice. If, in the course of development, animals destroy transitory organs only to replace them by functional equivalents we should not be surprised if sometimes the replacements are formally reminiscent of their predecessors.

THE CAPTAIN OF THE "PORCUPINE": EDWARD KILLWICK CALVER, R.N., F.R.S.

Peter Davis

The Hancock Museum, Newcastle-on-Tyne.

The golden dredge with its 'hempen-tangles' which adorns the cover of 'The Depths of the Sea' is a symbol of the contribution made by one man to the success of the Porcupine voyages - Edward Killwick Calver, captain of the surveying vessel. Syville Thomson makes many references to Calver's abilities - in the preface, for example, 'I need here only renew my thanks to... Captain Calver and the officers of the 'Porcupine', without whose hearty sympathy and co-operation our task could never have been accomplished...', or on p.82/3, 'The working of the dredge was superintended throughout by Captain Calver, whose trained ability very early gave him so complete a mastery over the operation that he found no difficulty in carrying it down to depths at which this kind of exploration would have been previously deemed out of the question. It is impossible to speak too highly of the skill he displayed, or too warmly of the sympathy he showed in our work'. So who was the man deserving of such accolades, and what experiences had made him such an indisputable member of the expeditions?

Edward Killwick Calver was born at Southwold, Suffolk, on 6 December 1813. He began his naval career at the age of 15 as a second-class volunteer on board H.M.S. "Crocodile" on service in the East Indies where he spent much time 'absent in the boats in search of pirates, along the shores of the Malay peninsula' (Dawson, 1885). During this period he reached the rank of Master's Assistant, and on returning to England in the autumn of 1832 he joined H.M.S. "Satellite", blockading the coast of Holland and later cruising for slavers off Brazil. Calver began to show an aptitude for surveying early in his career, and seized upon any opportunity to advance his skill. Plans of ports in the East Indies, Australia and South America were executed by him, and were apparently much approved of by his commanders and by the naval authorities in England. His progress through the ranks continued, and he passed his second-master examination at Valparaiso on 11 October 1834.

Calver's surveying abilities were recognised in 1836 when he returned to England, being appointed in April of that year to the Navy's Hydrographic Department as Assistant Surveyor to the east coast of Scotland survey, at first under Commander Michael Atwell-Slater and then under Captain John Washington (eventually Rear-Admiral Washington, Hydrographer of the Admiralty), under whose direction his responsibilities were extended to a general survey of the North Sea. During this period he served in the "Mastiff" (October 1841-March 1841) as Second-Master, then in "Shearwater" (March 1841-January 1843) as Second Master, and on gaining his Master's certificate on 28 January 1842 as Master of that vessel. This was followed by a period as Master in "Blazer" from January 1843 to October 1847. During this eleven-year period, in addition to the offshore deep-sea surveying in the North Sea, Calver executed plans at Harwich, Yarmouth and Lowestoft and prepared reports for the Harbours of Refuge Commission on Dover, Eastbourne and Seaford.

From October 1847 up until his retirement in March 1872 he was attached to "Fisgard" on surveying duties, continuing his work on the

east coast of England, and occasionally venturing on to the west coast when his services were required. He compiled sailing directions for the Shetlands, Orkneys, north and east coasts of Scotland, east and west coast of England including Wales, and for the continental coast from Calais to the Elbe. He surveyed Dover Bay, Redcar, Spurn, Yarmouth and Lowestoft roads, Hartlepool Bay, the Thames Estuary and the rivers Clyde, Ribble, Humber, Tees and Tyne. His survey of the latter was shown at the Great Exhibition of 1851 and highly acclaimed. In 1852, Sir Francis Beaufort commented of Calver, 'I do not believe there is an officer in the whole Navy who has more fully justified the confidence that has been reposed in him, or more entirely merited the protection and favour of their Lordships'. He passed the qualification for a line-of-battle ship in July 1855, and in August 1858 was appointed to the post of Secretary to the Harbours of Refuge Commission - a post from which he soon resigned due to ill-health. His involvement with harbours is shown not only in his reports, but by his published pamphlets - 'On the Conservation and Improvement of Tidal Rivers' (1853), 'Proposal for the Improvement of Southwold Harbour' (1856), 'On the best site for a Harbour of Refuge on the east coast of England' (1857) and 'On the construction and principle of a wave-screen designed for the formation of Harbours of Refuge' (1858).

Considering Calver's career it is not surprising that he was chosen to command H.M.S. "Porcupine" in her surveying and dredging operations. He had been promoted to the rank of Staff-Commander in June 1863, and took charge of the "Porcupine" on 8th August of that year. His first comment in the ship's log records 'an easy vessel both under way and at anchor'. "Porcupine" had seen many years of service, having been built at Deptford on the Thames in 1844; she was a wooden paddle-steamer of 382 tons with 132 h.p. engines built by Maudslay and Sons. Wyville-Thomson commented favourably on the vessel (p. 82) 'The "Porcupine", though a small vessel, was well suited for the work; thoroughly seaworthy, very steady, and fitted up for surveying purposes. Captain Calver and his officers had long been engaged in the arduous and responsible duty of conducting the survey of the east coast of Britain, and were trained to minute accuracy and thoroughly versed in the use of instruments and in the bearings of scientific investigation. The crew were chiefly known and tried men, Shetlanders who had spent many successive summers in the "Porcupine" under Captain Calver's command; returning to their homes in Shetland for the winter, while the vessel was laid up and the officers employed in bringing up their office work at their head-quarters in Sunderland'. Calver's association with Sunderland seems to have begun in 1858, when he is recorded as living at 16 Roker Terrace with his wife Jessie, a native of Bishopwearmouth, Sunderland. However, one published account (Anon. 1894) indicates 'he first came to Sunderland in the capacity of Commander of H.M.S. "Active" (afterwards named the Durham) ... when that vessel was sent to this port as training-ship for the Royal Naval Reserve'. An earlier connection is possible then, but it is known that he lived at Roker until 1874, a period of 16 years during which he became closely involved with the town, promoting its museum and raising money for philanthropic causes (Davis 1980). His contribution is recognised by the designation of 'Calver Street' adjacent to the Monkwearmouth Hall he had erected. He was undoubtedly a popular figure in the town,

and the local newspaper, the "Sunderland Times" (13 April 1869) records the departure of the "Porcupine", 'On Monday last Captain Calver R.N. sailed from Sunderland in H.M.S. "Porcupine" on his voyage of examination into the Gulf Stream'. Calver's comment in the ship's log is less dramatic, '8 April, 1869 - 7.00 lighted fires, steam up, moving ship to South Outlet'. Most of the entries in the log (held at the P.R.O., Kew) are of a similar, brief nature, and although giving an outline of the dredging voyages, and the comings and goings of scientific personnel, do not make exciting reading. One gets the feeling of efficiency, without fuss or frills, an attitude which Wyville-Thomson obviously appreciated, paying great credit to Calver's ability with his ship, recording instruments and sampling gear.

One real innovation of the Captain's devising was the use of 'hempen-tangles' attached to the dredge-bag. Wyville Thomson's account of these is reproduced below:

'In many of our dredgings at all depths we found that, while few objects of interest were brought up within the dredge, many echinoderms, corals, and sponges came to the surface sticking to the outside of the dredge-bag, and even to the first few fathams of the dredge-rope.

This suggested many expedients, and finally Captain Calver sent down half-a-dozen of the 'swabs' used for washing the decks attached to the dredge. The result was marvellous. The tangled hemp brought up everything rough and moveable which came in its way, and swept the bottom as it might have swept the deck. Captain Calver's invention initiated a new era in deep-sea dredging. After various experiments we came to the conclusion that the best plan was to attach a long iron transverse bar to the bottom of the dredge-bag, and to fasten large bunches of teased out hemp to the free ends of the bar (Fig. 51). We now regard the 'hempen tangles' as an essential adjunct to the dredge nearly as important as the dredge itself, and usually much more conspicuous in its results. Sometimes, when the ground is too rough for ordinary dredging, we use the tangles alone. There is some danger, however, in their use. The dredge employed under the most favourable circumstances may be supposed or hoped to pass over the surface of the floor of the sea for a certain distance, picking up the objects in its path which are perfectly free, and small enough to enter into the dredge mouth. If they chance to be attached in any way, the dredge rides over them. If they exceed in the least the width of the dredge-opening, at the particular angle at which the dredge may present itself at the moment, they are shoved aside and lost.

The Mollusca have by far the best chance of being fully represented in investigations carried on by the dredge alone. Their shells are comparatively small solid bodies mixed with the stones on the bottom, and they enter the dredge along with these. Echinoderms, corals, and sponges, on the contrary, are bulky objects and are frequently partially buried in the mud or more or less firmly attached, so that the dredge generally

misses them. With the tangles it is the reverse. The smooth heavy shells are rarely brought up, while frequently the tangles loaded with the spiny spheres of *Cidaris*, great white-bearded *Holteniae*, glistening coils of *Hyalonema*, relieved by the crimson stars of *Astropecten* and *Brisinga*, present as remarkable an appearance as can well be imagined. On one occasion, to which I have already referred, I am sure not fewer than 20,000 examples of *Echinus norvegicus* came up on the tangles at one haul. They were warped through and through the hempen fibres, and actually filled the tangles so that we could not get them out, and they hung for days round the bulwarks like nets of pickling onions in a greengrocers shop. The use of the tangles which seem so singularly well adapted to their capture, gives therefore a totally unfair advantage to the radiate groups and the sponges, and this must always be taken into account in estimating their proportion in the fauna of a particular area.

The tangles certainly make a sad mess of the specimens; and the first feeling is one of woe, as we undertake the almost hopeless task of clipping out with a pair of short nail-scissors the mangled remains of sea-pens, the legs of rare crabs, and the dismembered disks and separated arms of delicate crinoids and ophiurids. We must console ourselves with the comparatively few things which come up entire, sticking to the outer fibres; and with the reflection that had we not used this somewhat ruthless means of capture, the mutilated specimens would have remained unknown to us at the bottom of the sea.'

Thomson paid Calver the ultimate compliment by naming an echinoderm *Calveria hystrix* 'for I have named this genus and species after our excellent Commander and his tidy little vessel, in grateful commemoration of the pleasant times we had together.'

His deep-sea dredging days over, Calver and the "Porcupine" returned to Sunderland in October 1870, to continue their east-coast surveying duties. Calver had been promoted to Staff-Captain in March 1870, and retired with the rank of Captain in March 1872, after a period of 44 years of unbroken naval service. The command of the "Porcupine" was passed to Staff-Captain J. Parsons, the vessel continuing surveying duties until 1885 when she was replaced by H.M.S. "Triton".

Calver had been elected an Associate of the Institution of Civil Engineers in 1866, and after retirement was made a Fellow of the Royal Society in 1873. Although retired from active service he continued to take great interest in all questions relating to the Navy and harbours, publishing in 1876 a pamphlet 'The Cry for National Harbours, and its connection with our Defective System of Public Harbour legislation'. This created some controversy, being directed against the proposed extension to Dover harbour.

Captain and Mrs. Calver left Sunderland in 1874, moving to Redhill, Surrey, then to Cannes in the hope of improving Mrs. Calver's health. Leaving Cannes in 1892, the couple settled in Vevey, Switzerland. It was here that the Captain died on 28th October 1892.

Much remains to be discovered about the life, achievements and personality of Edward Killwick Calver. No portrait of the man survives (although could the uniformed figure shown on the deck of the "Porcupine" (p. 248 of "Depths of the Sea") be our man? Yet a large quantity of his correspondence covering the period 1866-1872 is preserved at the Navy's Hydrographic Department, Taunton, which deserves examination. Of even greater significance and also kept at Taunton are Calver's personal records of the dredging voyages - 'H.M.S. "Porcupine" Atlantic Journal 1869' and 'H.M.S. "Porcupine" Atlantic and Mediterranean Journal 1870'. Will these provide the inside story that the ship's log omits?

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LATE NOTICE.

THE UNDERWATER ASSOCIATION will hold a symposium at the Natural History Museum, London, on "Methods in Underwater Research", 11-12 March 1983. Contact address: Dr. John Gamble, DAFS Marine Laboratory, Aberdeen.

