

# Porcupine Newsletter

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- 1 -

## CONTENTS

<b>Editorial</b>	2
<u>Reports from the Swansea Meeting</u>	
PAUL F.S. CORNELIUS. Relationships between the Cnidarian classes and the loss of the medusa stage	3-6
STEPHEN KERSHAW. Problems in interpreting growth forms: example of Silurian stromatoporoids	6-7
M.B. JONES. Adaptations to sewage by estuarine crustaceans	7-8
<b>Future Meetings</b>	8-9
JAN LIGHT & IAN KILLEEN. Pandora's secret.	9
P.A. HENDERSON. The Buttock - a simple passive trap for small invertebrates and fish.	10
<b>AGM Reports</b>	11-13
<b>Note</b>	13
<b>Letters to the Editor</b>	14-15
<b>NCC NEWS RELEASE</b>	16
<b>Notes and Notices</b>	17-18
House of Lords Sub-Committee on Systematic Biology Research	19-22

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Roger Bamber, Hon. Editor  
 Marine Biology Unit, National Power,  
 Fawley Power Station, Fawley  
 Southampton SO4 1TW, U.K.



## PORCUPINE

**Hon. Secretary**  
 Ian Killeen  
 163 High Road West,  
 Felixstowe IP11 9BD, U.K.  
 0394 274618

**Hon. Treasurer**  
 Jonathan Moore  
 FSCRC, Fort Popton, Angle,  
 Pembroke, Dyfed SA71 5AD, U.K.  
 0646 641404

**Hon. Records Coordinator**  
 Dennis R. Seaward  
 Barn Court, Hamlet, Chetnole,  
 Sherborne, Dorset DT9 6NY, U.K.

### EDITORIAL

I welcome the Readership to Volume 5, and to a new word-processing system which will hopefully mean that we can avoid the problems of duplication quality experienced during Volume 4. And any contributions sent on disc in Wordperfect 5.1 will make my task so much easier (thank you Paul). Otherwise, I shall attempt to adhere to the appearance of the previous volumes until I hear howls of objection (or constructive suggestions?) from readers.

This year's Annual General Meeting saw a major upheaval in the office-bearing faction of the Council (see above). Dennis Seaward, now free of his recording role for the Conchological Society, is to put his apprenticeship to good use as our Hon. Records Coordinator (depending of course on some input of information and records from Members), a post vacated by Jon Moore as he has moved to greater accountability as the Hon. Treas., and we welcome Ian Killeen to the Hon. Secretaryship and the immediate "deep-end" of Council. There was the normal absence of volunteers to relieve your Hon. Ed., so we appear to be stuck with each other for another year. Which means you know where to send all those articles, letters, notes, new records, requests, etc., etc., for which I am waiting!

I am sure that I express the feelings of the entire Membership in wholeheartedly thanking Martin Sheader and Antony Jensen for their efforts as Hon. Sec. and Hon. Treas. respectively over the last 5 and 4 years respectively (sorry to quibble, Martin!). And particularly, in my case, for the help they have given in the duplication and collation of the Newsletter; have I got to work now? Luckily, they are transferred to Council, so we can still depend on their input.

Congratulations to the Polychaete Society (so to speak) and particularly Sue Chambers and Gordon Paterson for the successful Polychaete Colloquium earlier this month, enjoyed by all despite the typically wet Edinburgh weather. Plans are in hand for next year's event in Cardiff (where at least they do sell brown ale!). Abstracts from the presentations at the Colloquium will appear in the Polychaete Research Newsletter (and of course fuller papers are welcome in this organ).

Finally, certain prospective (and existing) student Members should be pleased with the announcement of a two-tier subscription rate from next year, with the bargain rate of £5.00 to bona fide full-time students (especially those who know what bona fide means): we look forward to the resulting increase in Membership.

Roger Bamber, Hon. Ed.

Porcupine Newsletter, 5 (1), 1991.

## RELATIONSHIPS BETWEEN THE CNIDARIAN CLASSES AND THE LOSS OF THE MEDUSA STAGE

Paul F. S. Cornelius

51 Green Court Road, Crockenhill, Swanley, Kent BR8 8HF

Three main kinds of life cycles have traditionally been recognized in the Cnidaria. The Scyphozoa ('true' jellyfish) have been said fundamentally to strobilate successive medusae from the distal end of the scyphistoma (the sessile, polyp stage). Hydrozoa of the Order Hydroida (the hydroids and hydromedusae, or leptolids) fundamentally have a single medusa production from each site though there are typically many such sites on a colony. The Cubozoa have been said for the past 20 years or so typically to have in the life cycle a single polyp metamorphosing totally into a single medusa. Analogies between the medusae have been used as justification for uniting the three groups into one subphylum, the Medusozoa, contrasting with the Anthozoa which are held never to have had a medusa stage in the life cycle.

This classification is challenged. Some cubozoan polyps have long-since been known to have buds and 'Restkorper' so that the notion that [in all species] there is total metamorphosis is wrong. They 'bud' in a way analogous to, and possibly homologous with, the Hydroida. In the Hydroida, medusa morphogenesis starts by ectodermal cells proliferating through transverse divisions, the basal portions of the ectodermal cells forming a nodule or entocodon which soon differentiates to form a new medusa. Thus ectodermal cells give rise to both ecto- and endo-dermal components of the medusa. New polyps form from old by growth and 'outpushings' of both cell layers, so that there is a limit to the degree of homology that may be assumed between polyp and medusa in this group. The method of medusa production in the Scyphozoa is superficially at least quite different, the end of a polyp nipping off completely (and another beneath it, and so on). Both ectoderm and endoderm of the polyp contribute, and nothing like an entocodon is formed. The difference is so great that two separate origins of their medusa stages from polypoid ancestors might be postulated. Interestingly, although several species of cnidarians are known in which the polyp has secondarily adopted a floating or swimming way of life in no example yet found is buoyancy due to a thickened mesoglea (Cornelius 1990).

The perceived life-cycle differences between Cubozoa and Hydrozoa may be invalid and the appropriate systematic distinction between them be at a lower level than widely inferred in recent years. The cnidarian classification of some 20 years ago, into the three classes Anthozoa, Hydrozoa (including the cubozoans) and Scyphozoa, may reflect the evolution of the group more correctly than that involving the united Medusozoa. A synopsis of the literature on the subject was provided by Bouillon (1981).

The position of the stauromedusae, whether ancestral to the Scyphozoa or derived from them, was briefly mentioned without conclusion. The Siphonophora, derived from the Hydroida, were not discussed. The relevance of the enigmatic actinula is also omitted from the present account.

Within both the Scyphozoa and the Hydrozoa reduction of the medusa stage has occurred, this having been likened by several past authors to paedomorphosis. In the first group, the 'bucket polyp genus' *Stephanoscyphus* strobilates ephyrae (young jellyfish) of the order Coronatae, mostly deep-water forms such as *Nausithoe*, *Periphylla*, *Atolla* and so on. Many are maroon in colour. In a series of certain species, notably some which have a branching, evolutionarily derived, polyp stage, the medusa

Porcupine Newsletter, 5 (1), 1991.

stage has become progressively reduced. First, a somewhat vestigial medusa is released and then, further along the series, the medusa stage is almost totally suppressed, remaining attached to the parent 'polyp'. Planula development and release occurs within and from this reduced medusa, so that superficially it appears that planulae are released directly from the polyp (Werner, 1984, e.g. pls 38, 49).

A similar evolutionary trend is much better known in the Hydroida (Naumov 1969 Table 1; present Table 1), making a remarkable parallel. In fact, medusa reduction has occurred apparently independently several times within the Hydroida, even with certain families (references in Cornelius 1990). In the Hydroida too, as in the few scyphozoans in which examples are known, medusa loss has gone hand in hand with increasing colony complexity and seems correlated also with perennation. Relatively simple colonies may also perennate: but the overall trend is clear when the 400 or so genera are surveyed.

**TABLE 1. LOSS OF THE MEDUSA STAGE IN THE HYDROIDA.** Data extracted from Bouillon, 1985. The figures are numbers of genera.

**A. DISPERSIVE STAGES IN 'NORMAL' HYDROID GENERA**

(excluding Stylasteridae, Velleloidea, Milleporida, Actinulida, fossil forms).

1) Releasing fully-developed hydromedusa	217	(56 %)
2) Releasing short-lived medusoid	17	(4 %)
3) Releasing planula	127	(33 %)
4) Don't know	27	(7 %)
5) Total genera	388	

\*\*\*\*\*

**B. DISPERSIVE STAGES IN HYDROID GENERA HAVING LARGE &/OR ARBORESCENT COLONY**

1) Releasing fully-developed hydromedusa	8	(7.5 %)
2) Releasing short-lived medusoid	6	(5.5 %)
3) Releasing planula	91	(86 %)
4) Don't know	1	(1%) s
5) Total large &/or arborescent genera	106	

\*\*\*\*\*

In some Scyphozoa and some Hydrozoa it is the polyp stage which has become reduced and lost but these are red herrings (*Clupea rufa*) and aside from the main evolutionary course. Thus within the Hydroida the groups having small and/or totally suppressed polyps occur in specialized habitats: freshwater, parasitic, or open-ocean plankton. A well known example of a scyphozoan lacking a polyp

Porcupine Newsletter, 5 (1), 1991.

stage is the open-ocean venomous *Pelagia noctiluca*. Among the more conventional of the Hydroida a similar case is known, the minute *Eirene hexanemalis* in which the polyp stage remains planktonic and which really does totally metamorphose completely into a single hydromedusa with no budding (Bouillon, 1983). Such examples are freaks rather than forms of fundamental evolutionary significance, but they do indicate the extraordinary evolutionary plasticity of the group. Convergences occur so widely as to bedevil the systematist. To quote [Elaine] Robson's Second Rule 'If it's evolved once it can evolve twice' - a good maxim for any cnidarian systematist. Much nonsense has been talked about the group because of the failure of people who should have known better to realise this. Typically, groups which are plainly derived have been taken as fundamental simply because they exhibit features believed to have been passed through by ancestral groups: such Recent forms, however, represent a re-evolution of similar states.

Loss of the medusa stage having been described, albeit briefly and with too few examples, the questions may be asked 'Why has this occurred?' and 'If it is advantageous, why have not all medusae been dispensed with?'. It has become fashionable in discussions on other groups in recent years to quote larval philopatry as a possible cause. This is the settlement of the dispersive stage (in cnidaria, it would be either planula or medusa) close to the parent. The advantages of finding a good spot are thought perhaps to outweigh the disadvantage of competition; and loss of larvae into oblivion is assumed to be reduced. Several hydroids have been cited as conforming to this stereotype (review in Cornelius, 1990) but only several: most planulae, and most medusae, nevertheless seems to travel longer distances than would be prudent if relocating in favourable locations near to the 'parent' colony were important. It seems well demonstrated that hydroids found in oceanic locations tend not to have a medusa stage (Cornelius, in press), a parallel of the situation in several other groups. If loss of dispersive stages is advantageous, then quite how remains poorly understood. However, the process is considered to have evolved in several other marine groups (review in Jackson 1986; see also Hughes 1989).

The question was discussed as to whether the planula should be considered a larva or whether - as propounded by a variety of (but not all) authors - the hydroid stage should be considered the larva. The discussion hinges partly upon zoological terminology and even philosophy. The question of whether the hydromedusa should be considered a modified polyp or a second life-cycle stage was thought not yet resolved satisfactorily, and certain crucial tests are needed. The medusa of the Scyphozoa, however, may be more clearly derived from the polyp.

#### ACKNOWLEDGEMENTS

I am grateful to Profs Jean Bouillon and Nando Boero, and Dr Elaine Robson, for helpful discussion on several occasions.

#### REFERENCES

- BOUILLON, J. 1981. Origine et phylogénèse des cnidaires et des hydropolypes-hydroméduses. Annals de la Société Royale Zoologique de Belgique 111: 45-56.
- BOUILLON, J. 1983. Sur le cycle biologique de *Eirene hexanemalis* (Goette 1886) (Eirenidae, Leptomedusae, Hydrozoa, Cnidaria). Cahiers de Biologie Marine 24: 421-427.
- BOUILLON, J. 1985. Essai de classification des hydropolypes- hydroméduses (Hydrozoa-Cnidaria). Indo-Malayan Zoology 2: 29- 243.
- CORNELIUS, P. F. S. 1990. Evolution in leptolid life-cycles (Cnidaria: Hydroida). Journal of Natural History 24: 579-594.

Porcupine Newsletter, 5 (1), 1991.

- CORNELIUS, P. F. S. (In press) Azores hydroids and the rafting habit: a species club? Arquipélago
- HUGHES, R. N. 1989. A Functional Biology of Clonal Animals. London: Chapman & Hall.
- JACKSON, J. B. C. 1986. Modes of dispersal of clonal benthic invertebrates: consequences for species' distributions and genetic structure of local populations. Bulletin of Marine Science 39: 588-606.
- NAUMOV, D. V. 1969. Hydroids and hydromedusae of the U.S.S.R. Fauna S.S.S.R. 70: 1-660, 463 figs, 30 pls. [Jerusalem, Israel Program for Scientific Translations cat. no. 5108]
- WERNER, B. 1984. Stamm Cnidaria, Nesseltiere. In: Lehrbuch der Speziellen Zoologie (co-ordinated by A. Kaestner), Band I: Wirbellose Tiere (edited by H.-E. Gruner), 2 Teil: Cnidaria, Ctenophora, Mesozoa, Plathelminthes, Nemertini, Entoprocta, Nemathelminthes, Priapulida. Stuttgart, G. Fischer; pp. 11-305.



## PROBLEMS IN INTERPRETING GROWTH FORMS: EXAMPLE OF SILURIAN STROMATOPOROIDS

by Stephen Kershaw

Palaeobiology Research Unit, West London Institute, Borough Road, Islewoth, Middlesex TW7 5DU

Fossil sessile benthic marine groups of calcareous sponges, cnidarians and bryozoans, generating calcareous skeletons, show a comparable range of gross morphology which varies from very flat, through dome-shaped, to columnar and bulbous, plus varieties of branching and irregular forms. Many of these groups have living representatives. In addition, stromatolites (cyanobacterial-bound sediments) form some similar morphologies.

Parameters which may be expected to control the morphologies of such organisms include sedimentation, water turbulence, nature of substrate, nutrient and oxygen supply, light and taxonomic controls. Many environmental parameters are directly or indirectly related to water depth.

Separation of the effects of some of these factors on growth forms of modern organisms has shown to be difficult, and examples of these problems can be found in one of the most important fossil sponge groups, the stromatoporoids. These dominated reef and related sedimentary rocks in the Palaeozoic era, and representatives occur on the Silurian island of Gotland, Sweden. In both reef and non-reef types, there are clear indications that turbulence and sedimentation played a part in modifying form, and, in some cases, taxonomy exerted a significant effect, just as it does in modern corals. However, the underlying reasons why differences in growth forms developed have not been resolved. In the fossil record, many successful stromatoporoid reefs are dominated by low profile growth forms and it is suggested that these developed an ability to outcompete other organisms for space. If this is

Porcupine Newsletter, 5 (1), 1991.

true, then columnar growth forms found amongst low profile ones in one reef on Gotland may have responded to competition by upward growth. In this case, columnar and low profile examples are different species, implying successful competitive growth in the lower-profile-forming species.

Analogues for the stromatoporoid reefs are not found with certainty amongst modern reefs, because the dominating forms of the latter normally consist of strong branching corals such as *Acropora*, and because no proven symbiosis with nutrient-supplying organisms such as zooxanthellae is known in the fossils. However, since there are great similarities of growth forms across several groups of organisms in ancient and modern reefs, resolution of problems of form may lie in recognition of common form-controlling factors.

\* \* \* \* \*

## ADAPTATIONS TO SEWAGE BY ESTUARINE CRUSTACEANS

by M.B. Jones

Dept. of Biological Sciences, Polytechnic South West, Plymouth, Devon PL4 8AA

The sewage treatment works at Looe, Cornwall, is unusual in that it operates with saline, rather than the more typical freshwater, sewage. Sea-water enters mainly by seepage through the open-jointed pipes carrying raw sewage under the Looe River Estuary, such that there is a tidal cycle of salinity change within the works which mirrors that of the adjacent estuary (13 to 35‰). This saline intrusion has resulted in mechanical problems and biological changes to the community of the percolating filters. The species diversity of the percolating filter is reduced, compared with the traditional freshwater filter, and all members of the film community are euryhaline marine species.

More obviously, the freshwater macro-invertebrate grazers have been replaced by two species of estuarine amphipods, the common estuarine gammarid *Gammarus duebeni* and the beach hopper *Orchestia gammarellus* (Talitridae). Both species have been present since the works opened in 1973 and have permanent breeding populations within the works, though occupying different sites. *Orchestia gammarellus* occurs mainly in the surface layers of the filter beds, whereas *G. duebeni* occurs in the filter beds and settlement tanks. The presence of these amphipods in the works offers a unique opportunity to study the long-term effects of sewage on life history traits and on physiological responses. Also, comparison of the responses of works amphipods with individuals from the estuary (the presumed donor population) may offer some insight into the mechanisms of evolution of tolerance to sewage pollution. Work to date has concentrated on *G. duebeni*.

The consistently lower oxygen levels in the works compared with the estuary are reflected in differences in respiratory physiology. 'Sewage' individuals are able to maintain high levels of activity (e.g. swimming) under anoxic conditions and, when exposed to anoxia, have significantly higher survival and significantly lower rates of lactate accumulation (as lactic acid) compared with estuarine amphipods. Also, 'sewage' amphipods recover more rapidly from anoxia and have a lower critical oxygen tension ( $P_c$ ) than estuarine amphipods. Works amphipods are exposed to relatively high levels of heavy metals associated with the sewage, and zinc concentrations are particularly elevated compared with the estuary (ranging between 30 and 144.5  $\mu\text{g l}^{-1}$  in the works, between 14 and 28.5  $\mu\text{g l}^{-1}$  in the estuary). Exposure to elevated zinc concentrations results in similar patterns of body zinc uptake at different salinities, with zinc regulation occurring to a threshold of 200  $\mu\text{g Zn l}^{-1}$ ; however, survival

Porcupine Newsletter, 5 (1), 1991.

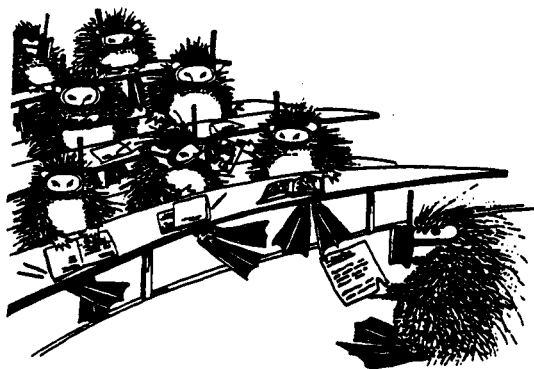
of estuarine amphipods is reduced compared with 'sewage' individuals at all zinc/salinity combinations. No consistent inter-population differences in the effect of zinc on osmoregulation have been identified.

It would appear that works *Gammarus* have significantly different metabolic responses to low oxygen concentrations compared with estuarine *Gammarus*, and these differences are interpreted as adaptive. Although there were no consistent significant differences identified in uptake mechanisms and osmoregulatory capacity under elevated zinc concentrations, estuarine *Gammarus* had significantly higher mortalities at each zinc-salinity combination than did works *Gammarus*. The latter suggests that estuarine *G. duebeni* have a lower capacity to detoxify accumulated zinc than do those living in the works, resulting in a greater proportion of the body burden being in a toxic form. Investigation of differences in zinc-binding proteins would be a fruitful line of study as one possible mechanism to explain the mortality difference.

#### BIBLIOGRAPHY

- Agnew D.J. & Jones M.B., 1986. Metabolic adaptations of *Gammarus duebeni* Liljeberg [sic] (Crustacea, Amphipoda) to hypoxia in a sewage treatment plant. Comparative Biochemistry and Physiology, **84**; 475-478.
- Johnson I. & Jones M.B., 1989. Effects of zinc/salinity combinations on zinc regulation in *Gammarus duebeni* (Liljeberg) from the estuary and the sewage treatment works at Looe, Cornwall. Journal of the Marine Biological Association, U.K., **69**; 249-260.
- Johnson I.T. & Jones M.B., 1990. Effect of zinc on osmoregulation of *Gammarus duebeni* from the estuary and the sewage treatment works at Looe, Cornwall. Ophelia, **31**; 187-196.
- Jones M.B. & Johnson I., 1991. Effects of saline sewage on the biological community of a percolating filter. IN: P.C. Reid, C.M. Turley & P.H. Burkill (Ed's): Protozoa and their Role in Marine Processes. Springer, Berlin; pp.131-141.

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## FUTURE MEETINGS

An Autumn Field Meeting is planned for the Isle-of-Wight, around the 9th September 1991. This date is to coincide with the best spring tides for the area. This island offers a diversity of shore types, including beds of *Zostera marina* at ELWS (hence the need for springs!), boulder and sandy beaches, rock ledges, etc. (see PN, 4 [8]; 177-179), oh, and of course some fine brackish lagoons. We hope to be based at the Medina Valley Field Centre. Local expertise will be available for those wishing to dive. Full details will be given in the next issue of PN, but in the meantime would those interested in attending please contact the Hon. Sec., Ian Killeen (see P.2).

The next Porcupine meeting is collaborative with the Irish Biogeographical Society, the Irish

Porcupine Newsletter, 5 (1), 1991.



Marine Sciences Association and the University of Dublin, on 16 and 17 December 1991 at Trinity College, Dublin, on the theme of **Biogeography of Ireland: Past, Present and Future**. Offers of papers concerning (a) marine biogeography, (b) the future (e.g. implications of climatic change), (c) the past 10,000 years and (d) new reviews on particular biotopes or faunal and floral groups, or of course papers on other subjects, should be sent as soon as possible to Dr Mark Costello, Environmental Sciences Unit, Trinity College, Dublin 2, Ireland (01-772941 ext.2075); all communications regarding this conference should be directed to either Mark or the Hon. Sec., Ian Killeen. Full written papers available on the day of the conference will be submitted for publication in an Occasional Publication by the Irish Biogeographical Society. There will be a conference fee, with reductions for paid up members of the sponsoring organizations (e.g. Porcupines).

The 1992 Annual General Meeting is being planned for Oban (Dunstaffnage) next spring, and a 1992 field meeting on the Helford River VMNR.

Further details of all of these meetings will be published in the next issue of PN, but don't let that delay you.



## PANDORA'S SECRET

by Jan Light and Ian Killeen

Whenever one is recording marine molluscs it is always tantalising to find dead shells of interesting species. What do such records mean? Are they an indication that the animal is living offshore and you haven't yet found it, have they been transported some distance, or are they even sub-fossil? Ever since we began surveying the Isle of Wight in 1987 we have faced this problem with the bivalve *Pandora inaequalis* (L.) [= *P. albida* (Roding)]. It is an inhabitant of sand and sandy-mud and is essentially southern and south-western in British waters. Odd shells have turned up at several stations in the east Solent between East Cowes and St Helens, and we were beginning to wonder if *P. inaequalis* was another of those species which have apparently disappeared from the Solent in the last 30 years.

This year our recording efforts have been focussed in the east Solent and a thorough search of suitable habitats, particularly *Zostera* beds, has at last resulted in the discovery of living *Pandora*, not just at one site but three between East Cowes and Ryde. At two of them we only found one semi-adult by sieving sand at ELWST, but at the third there was a sizeable population.

An ancient Grecian myth represents Pandora as possessing a box filled with winged blessings which mankind would have continued to enjoy if curiosity had not prompted her to open it, when all the blessings flew out, except Hope. The moral of this tale is, of course, don't give up. Get to know your quarry's habitat preferences and persevere. After all, a dead record doesn't really mean much.

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Porcupine Newsletter, 5 (1), 1991.

## THE BUTTOCK - A SIMPLE PASSIVE TRAP FOR SMALL INVERTEBRATES AND FISH

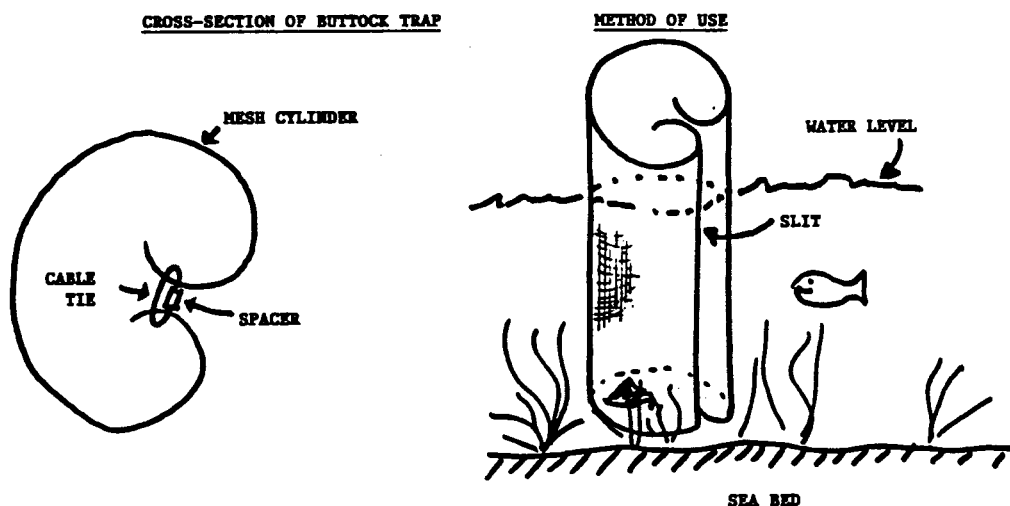
by P.A. Henderson

Marine & Freshwater Biology Unit, Fawley Power Station, Fawley, Hants SO4 1TW

Passive trapping can be a useful sampling method for active animals such as prawns, mysids and fish. They are particularly advantageous in shallow waters where rocks, wood and weed make netting difficult or even impossible. Over the last 10 years we have experimented with a number of trap designs for use in lagoons and sheltered inshore waters. During a trip to the Brazilian Amazon I met Colonel Buttock who used a simple trap with great success to catch small fish and shrimps in flooded forest. We have found a modified version of his design effective and think that other biologists might find the Buttock trap useful.

We construct the trap from fine mesh Netlon®. A strip of Netlon® is rolled to form a cylinder. As can be seen in the cross-sectional diagram the edges of this cylinder are turned into the interior and a slit is formed. This shape is made permanent by attaching cable ties across the slit. To ensure a constant slit width spacers made from tubing are placed on the cable ties across the slit. We have used slit widths of up to 1 cm. A circular Netlon® base is then attached to one end of the cylinder and the trap is complete.

We use this trap by placing it base down in water shallower than the length of the cylinder with a rock placed inside to keep it upright. Active animals enter via the slit but find it much more difficult to leave. It has been found to be an effective trap for gobies and prawns. Unfortunately it does not work for some British fish such as the sand smelt. A floating version of the trap (which we have termed the balls-and-buttock trap) is constructed by attaching two small buoys to the open end. This version has been found to trap juvenile grey mullet.



Porcupine Newsletter, 5 (1), 1991.

AGM Reports

MINUTES OF THE FOURTEENTH ANNUAL GENERAL MEETING OF  
 PORCUPINE, held at Swansea University on  
 7<sup>th</sup> April 1991 at 09.05 am.

Shelagh Smith was in the chair; fourteen members were present. Apologies for absence were received from the Hon. Secretary. The Minutes of the Thirteenth Annual General Meeting (Published in PORCUPINE NEWSLETTER, Vol.4 No.8) were approved. Arising from these, the Meeting was informed that Fred Woodward had contacted the Fisheries Department in Dublin with regard to the proposed introduction of *Patinopecten yessoensis*; in Fred's absence we await the result of his communication.

The Hon. Secretary's Report and the Hon. Treasurer's Report were presented by Antony Jensen and approved.

The Hon. Editor's Report was presented by Roger Bamber and approved.

The Hon. Records Coordinator's Report was presented by Jon Moore and approved.

Antony Jensen and Martin Sheader (as notified at the last Annual General Meeting) retired from Hon. Treasurer and Hon. Secretary respectively, becoming available for election to Council. The following Office Bearers were elected:

Hon. Secretary	Ian Killeen
Hon. Treasurer	Jon Moore
Hon. Editor	Roger Bamber
Hon. Records Coordinator	Dennis Seaward

The following Council Members were elected:

Iain Dixon	Jan Light
Frank Evans	Ivor Rees
Bill Farnham	Ralph Robson
Willie Fowler	Martin Sheader
Robin Harvey	Shelagh Smith
Christine Howson	Brenda Thompson
Antony Jensen	Fred Woodward
David Lampard	

Frank Evans was elected as a Life Member in recognition of his services to Porcupine since its inception.

The auditor was thanked for his work last year, and Nick Light was re-elected as auditor for the coming year.


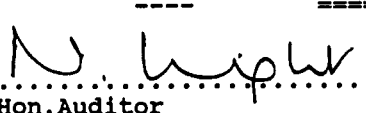
Future meetings were announced for the Autumn of 1991 in Dublin, for the next Annual General Meeting in Dunstaffnage (Spring 1991), with the possibility of Newcastle for the Autumn of 1992.

A new reduced subscription rate for full-time students of £5.00 was introduced; normal Membership remains at £8.00. A new "recruitment" poster was mooted, and it was suggested that Frank Evans would be the ideal designer.

The Meeting closed at 09.36 with the chair proposing thanks to those involved in the organization of the Swansea Meeting.

Porcupine Newsletter, 5 (1), 1991.

**PORCUPINE  
RECEIPTS AND PAYMENTS ACCOUNT**  
for the period 21 February 1990 to 31 December 1990

<u>05.03.89 to 20.02.90</u>		<u>21.02.90 to 31.12.90</u>	
£	£	£	£
<b>RECEIPTS</b>			
186		60	
627		260	
-		77	
-----		-----	397
	813		
	-	Donation	25
	17	Sale of P.N. back numbers	-
	-	Bank Interest	133
	-	"T" Shirt sales	377
	-----	-----	-----
	830	Total Receipts	932
<b>PAYMENTS</b>			
601		742	
188		173	
40		29	
-----		-----	
829		944	
32		-	
31		-	
-	892	471	1415
-----	-----	-----	-----
		<b><u>SURPLUS (SHORTFALL) BEFORE MEETINGS (483)</u></b>	
<b>MEETINGS</b>			
(153)		-	
-		(37)	
-	(153)	(90)	(127)
-----	-----	-----	-----
		<b><u>SURPLUS (SHORTFALL) FOR THE PERIOD (610)</u></b>	
	2341	<b><u>BALANCE BROUGHT FORWARD</u></b>	2126
	-----		-----
<b><u>BALANCE CARRIED FORWARD</u></b>			
635		291	
1491	2126	1225	1516
-----	=====	-----	=====
 ..... Hon. Treasurer		 ..... Hon. Auditor 26 March 1991	

Porcupine Newsletter, 5 (1), 1991.

NB. Apropos the accounts, as decided at the last AGM, the accounting year has been changed to run to December 31st each year to encompass better the payment of subscriptions (due on January 1st). 1991 membership subscriptions are therefore not included in these accounts, hence the comparative "shortfall". This apparent discrepancy will be picked up in the next accounting year.

### Hon. Secretary's Report 1990-1991

During this year **Porcupine** has undertaken an active programme of meetings, including the spring AGM. This, the 13th Annual General Meeting of **Porcupine**, was held at the University of Dundee on 3 - 4 March 1990 and was on the theme of **Marine Recording**. The meeting, organized by Jon Moore, provoked active discussion of the subject, on which a broad range of views were aired (quite vigorously at times).

The autumn meeting, organized by Frank Evans and Roger Bamber at Fawley Power Station (Southampton) was on the theme of **Plankton**, a broad topic, with contributions on organisms ranged across the size spectrum.

The Field Meeting this year was organized jointly with the Conchological Society of Great Britain, and was held at Anglesey on 5 - 7 October 1990. Ivor Rees kindly provided local information and support.

Can I take this opportunity to thank those who were involved in organizing these meetings, and urge others to suggest themes, topics or places where future events might be held, or even to volunteer as local organizers. Since its inception, the policy of **Porcupine** has been to hold its meetings at sites throughout the length and breadth of the country and, despite increases in travelling costs, this is a policy we consider well worth retaining.

Membership has remained steady during the current year. Once again, I must encourage Members to bring the society to the attention of students, colleagues and friends whose interests fall within the broad remit of **Porcupine**. In most universities and polytechnics, the number of applicants for marine biology / ecology courses has increased considerably over the last two years. Perhaps we should consider a reduced student membership fee?

In my last AGM Report I announced that I would be unavailable for re-election this year owing to increased teaching / work commitments. Many thanks for the support I have received as Hon. Secretary over the last four years.

Martin Shearer, Hon. Secretary

26.3.91

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**LAGOON EPHEMERALITY:** Those members who were present on the Shingle Street field meeting in October 1988 will be dismayed to learn of the demise of lagoon #2 (see Shearer & Bamber, 1989; PN 4 [4]; 79-84). At that time it was the largest of the Shingle Street lagoons, at some 2.5 ha; during a visit by two **Porcupines** in August 1990, subsequent to the odd bout of extreme stormy weather, we had trouble finding this lagoon! We eventually identified it as a muddy pond of approximately 30 m<sup>2</sup>, the seaward shingle bank having moved landward and all but filled it in! Which goes to show what temporary features even undisturbed brackish lagoons can be.

**Porcupine Newsletter, 5 (1), 1991.**



## Letters to the Editor

From Norman Hammond  
Aspatria Carlisle  
22 November 1990

Roger Bamber's article: WHY (MARINE RECORDING) OR SO WHAT (Porcupine Newsletter: Vol.4 No.9 July 1990) is an interesting attempt to set out the reasons for recording, but skillfully avoids any attempt at explaining why, as far as 'Porcupine' is concerned, it has not been an unqualified success. Why hasn't it worked?

We need to look well away from 'Porcupine' and at recording as a whole within the natural history world and more importantly try to see the problems from grass roots level.

Possibly recording works at its best within the bird world and the emergence about two decades ago of the 'twitcher' movement gave emphasis to this. Throughout Europe today 'twitchers' operate en masse and more eyes ensure that virtually any bird that moves is seen and recorded. More eyes confirm and establish the facts and then move on to something else. The botanical movement closely follows up with enthusiasts nationwide who plod on steadily observing, confirming and recording.

Whatever aspect of study, there is no doubt that a proportion of it is used to advantage regarding the species concerned, and to the overall satisfaction of all who take part. However much recording today is a virtual waste of time, being riddled with petty jealousies, intrigue, internal politics, and one-upmanship.

Recording should be a two-way process with mutual respect, as, without that, all is lost. Having had an interest in marine matters for some six decades, I have lost count of data submitted to various individuals/organisations, or of problems of identification which were at one time a pleasure to pursue with those with a common interest.

Today, politics often arise at a very early stage and one is soon aware that observations may be suspect to a point that one soon wonders whether in fact one was there at the time. In recent years I have received many requests for information, from various sources, and in some cases demands from others who set themselves up as recorders for new emerging organisations.

Having studied the Cumbrian and Solway coastal areas for over 40 years, a few years ago a small new group of 'Coast Watchers' came together and the leader telephoned me asking for a complete synopsis of my observations, but wasn't prepared to cover cost or agree to a mutual exchange of records. University students often write requesting material or data, and over the years I have supplied a considerable amount, but have seldom had an acknowledgement, or thank you. During the past 12 months I have submitted over 35 records and details of observations to various recorders, and in all not a single acknowledgement!!

Porcupine Newsletter, 5 (1), 1991.

There is an emerging selfish aspect to our national way of life today and this is now very evident within the natural history movement as a whole. More and more people want to organise, more organisations are being set up and, over all, the phrase "too many chiefs and not enough Indians" well applies.

To my mind there is a clear breakdown in the relationship in many cases between the 'recorder' and the 'field worker' and, for recording to be successful, the 'recorder' must liaise and ensure that whatever is sent to him is of use and not apparently dropping into a bottomless pit.

In recent years we have seen many who have had a long association and interest in marine matters drop out while a few names keep cropping up in what is a business-like take-over of various areas.

Accurate identification is the foundation stone for all field work, which means that the essential need for all field workers is to have a sound knowledge of the species in their area of study; however, human frailty will ensure that some observations are, unfortunately, incorrect, but from that the dedicated will learn, whilst a few will always make more of an issue than it is worth, but I firmly believe that the majority have a genuine honest interest.

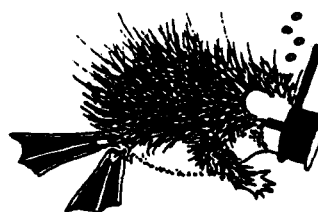
The traditional and historical manner of recording has changed from that of a constructive interest, on behalf of enthusiastic field workers, to recording for a purpose with scientists, academics, companies, and organisations promoting a study to prove their point. Scientific papers set out to prove that a particular pollutant or waste product is not to blame in a clear case of 'he who pays the piper calls the tune', and confirming that such research is biased towards the firm, company or organisation financing it. To that point much which is interesting to read must be very suspect in many aspects as regards accuracy.

With a small organisation such as Porcupine, I would have thought that the problems outlined could have been easily overcome. The 'customer' should have an acknowledgement and should see that his/her efforts are not wasted. Irrespective of published data, information should be available on a two-way basis should any 'customer' with a special interest desire it, and this is not the case.

At the very successful Irish Sea Conference in the I.O.M. recently it was acknowledged on several occasions that there was in fact a considerable amount of information available as regards the condition and natural history of the Irish Sea. Most of it, however, was tucked away in files and often not made available to other workers. Porcupine did not feature at that conference at all. It should have done, it should also have provided a mass of Irish Sea records collected since its inception.

It would then have shown its true position as an independent body of knowledgeable enthusiasts among a mass of delegates from government sponsored organisations with a common patronising line of thought.

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Porcupine Newsletter, 5 (1), 1991.

## NEWS RELEASE

### NCC LAUNCHES REVIEW OF BRITAIN'S ESTUARIES

The survival of Britain's estuaries and their wildlife depends on the cooperation and vision of conservationists, decision-makers and estuary users. That is one of the key findings published today by the Nature Conservancy Council (NCC) in its new report "Nature Conservation and Estuaries in Great Britain".

The report contains results of NCC's Estuaries Review. The Review was set up in 1988 in response to widespread concern about the threats to British estuaries and their wildlife. Its aim was to provide guidance for the development of conservation strategies for British estuaries. The Estuaries Review has provided a national overview of British estuaries, their wildlife, together with their conservation status, and human activities in them.

"Estuaries are wetlands that form at the margin of land and sea and so are fertile and productive ecosystems", said Sir William Wilkinson, NCC Chairman. "They support abundant and varied wildlife, much of it highly dependent on estuaries for part or all of its life, making them of great conservation importance both nationally and internationally. Estuaries are one of Britain's most valuable natural assets. Britain has international commitments to protect and enhance these spectacular places. Yet they are continually being degraded. We must no longer treat them as wasteland."

The Estuaries Review has identified 155 British estuaries. Half are in England and almost one-third are in Scotland. They occupy almost half of the British shoreline. A typical estuary contains between four and nine major habitat types including mudflats, saltmarshes, sand-dunes and grazing marshes.

Other major findings are that:

- effective wildlife conservation in estuaries needs the maintenance of the range and variety of the estuary system, nationally and internationally;
- because estuaries occur at the interface between land and sea domestic and international conservation safeguards are difficult to apply;
- the continued widespread destruction of British estuarine ecosystems including internationally important areas shows that existing conservation safeguards, required under international commitments, are not effective.

"Each estuary must be considered as an entire ecosystem if it is to be conserved effectively", said Dr Nick Davidson, Co-ordinator of the Estuaries Review. "Unfortunately, many human activities have adverse impacts on estuaries and these, together with new proposals, are focused on the remaining parts of a dwindling resource. Over one quarter of our estuarine habitat has already been reclaimed since Roman times, more losses are affecting at least 45 estuaries and there are proposals that would affect another third including some of the most internationally important sites."

"In the future we need a national policy to sustain estuaries and we must obtain statutory site safeguard mechanisms to ensure effective estuary conservation. Conservationists must work with local interests at the level of individual estuaries to develop integrated management and conservation strategies", added Dr Davidson.

"*Nature Conservation and Estuaries in Great Britain*" by N.C. Davidson *et al.*, 1991 (422pp.) is available, price £30.00 post free, from NCC (Dept. PR), Northminster House, Peterborough PE1 1UA.

Porcupine Newsletter, 5 (1), 1991.



## Porcupine Notes and News



### **THE DISTRIBUTION OF THE MARINE MOLLUSCS OF NORTH WEST EUROPE** by D.R. SEAWARD Published Dec 1990 by NCC with Conchological Society.

In 1982 I produced the Sea Area Atlas of Marine Molluscs of Britain and Ireland which was published for the Society by NCC. I have now brought this up to date with many new records and the addition of much historic data from an extensive literature search. As the title suggest, the new work covers a greatly extended area, from Bergen to Brest and the whole North Sea, while still including deep water in the eastern Atlantic. Modern nomenclature has been incorporated.

Copies are available from: Nature Conservancy Council, Publicity Services Branch, Northminster House, Peterborough PE1 1UA, UK, at £9.50 including postage and packing, or at the special price to Conchological Society members during 1991 only of £5.00 including p&p - state that you are a member if claiming privelege.

There are now no stocks of the 1982 Atlas remaining at NCC, but I have some copies left which are available from me at the address below at £7.00 including p&p.

Dennis R. Seaward, Barn Court, Hamlet, Chetnole, Sherborne, Dorset, DT9 6NY, UK.

**THE IMPORTANT STATUS OF MARINE BIOLOGISTS**, as recognized by the American military, was highlighted in the national press recently, from which I unattributedly quote: 'American soldiers said that for the first time middle-class professionals were joining the refugee exodus, which until now has mainly comprised the peasantry. "We've had a surgeon-general, physicians, lawyers, even a marine biologist," said Captain William Curtis....' [my emboldening].

**AND WHILE ON THE SUBJECT OF GOOD QUOTES**, I thank Olivier Hamerlynck that his recent paper on goby identification states "Formalin or alcohol preserved individuals usually have hardly any pigmentation on their dorsal half, except when spawning." Will nothing stop their promiscuity?

### **CRUISES ON CUMULUS**

'Cumulus' is one of the Meteorological Office's Ocean Weather ships. She is stationed in the Northeast Atlantic, usually at Ocean Station LIMA (55°N 20°W). She makes routine port calls at Greenock. Provided that her mission as a weather ship is unaffected, the Director General of the Met. Office has agreed to the exploitation of her spare capacity. As a result, Oceanscan Master Services Ltd.

Porcupine Newsletter, 5 (1), 1991.

can offer the ship's facilities for use in training, education and equipment testing at a fraction of the cost of a dedicated oceanographic research vessel. The resources of the ship can be offered at prices comparable to those you would pay at any reasonable hotel.

The company itself offers taught courses in marine science and technology, observational methods and the realities of seagoing. Alternatively, clients can take the ship in order to put on their own 'customized' courses. The company is also offering to take on board observers who wish to enjoy the experience of sailing on an ocean weather ship and learn about her operation.

Scheduled for 1991 - Taught Courses: Realities of Seagoing (4.7.91 to 20.7.91); Observers (20.7.91 to 6.8.91); Marine Resources etc. (8.8.91 to 24.8.91). Trips for Observing the Operation of O.W.S. Cumulus: 23.5.91 to 8.6.91; 8.6.91 to 25.6.91; 24.8.91 to 10.9.91.

Researchers for scientific usage may sail on the ship, time and costs by negotiation. A free berth is available for an experienced researcher who would undertake the role of accompanying scientist on the May/June, June and August/September cruises.

Brochures describing the ship and her facilities, details of costs of trips for individuals or groups, can be obtained from Dr Celia Ellis (0483 421133 evenings) or Dr Tony Rees (0483 860351 daytimes).

**CEPHALOPODS AND ORAL SEX?** Many Members will recall reports in the Newsletter of past attacks by small (and thereby underestimated?) cephalopods on unsuspecting Porcupines (PN, 2; pp 135 and 209). Abroad, there can be other risks! I am moved to quote yet another extract from the literature (Jap. J. Sanit. Zool. would you believe?), most of the abstract of a paper on *Todarodes pacificus* reading as follows: "The male patient was one of the authors of this report, aged 26 years, who was injured in his oral cavity immediately after eating uncooked internal-organs of a squid by mistake. He complained of severe pain and foreign-body sensation (*sic*) in the oral cavity. On examination, more than 15, small spindle-shaped stings stuck in mucous membrane of the tongue, soft palate and upper lip. Stings were removed surgically in hospital, and they were identified as squid spermatophores ....."

**GOOD IS TOO BAD?** To get this month's "hobby-horse" out of the way, how much longer must we hear/read of the dreadful environmental - sorry, Environmental - degradations of "eutrophication"? I may be perverse in reading the Oxford English Dictionary, and certainly cannot claim any formal training in Greek, but the prefix "Eu-" does mean "well" (as in "good") (with "-trophic" - of nutrition). Thus, eutrophic means "tending to promote nutrition", i.e. pretty good stuff, really. And much better overall than oligotrophic (no allusion to any spherical hotels in Pembroke intended - Polychaete Workshop In Joke!). Environments where excessive nutrient input leads to some degree of debilitation are in fact **hypertrophic**. It must be time to start an "Encourage Eutrophication" campaign (or an encourage correct English campaign?). Personally, I'm somewhat eurytrophic.

Porcupine Newsletter, 5 (1), 1991.



## HOUSE OF LORDS SUB-COMMITTEE ON SYSTEMATIC BIOLOGY RESEARCH

The Select Committee on Science and Technology have appointed a Sub-Committee, under the Chairmanship of Lord Dainton, with terms of reference "to consider systematic biology research in the United Kingdom". PORCUPINE had the opportunity, at short notice, to respond to a number of issues being considered by the Sub-Committee as listed in a notice from their Clerk. In the hope of adding the (presumed) opinion of the Membership to the information potentially influencing government policy on an area of science particularly dear to the hearts of Members, a response was compiled by Council, and sent under the name of the Hon. Ed. on the behalf of the Society. Although the time-scale precluded fuller consultation, I hope I have represented at least the majority viewpoint fairly; below are the issues and the responses as sent.

TO: Mr R.H. Walters  
Science and Technology Committee  
Committee Office  
House of Lords  
London SW1A 0PW

15th April 1991

### SELECT COMMITTEE ON SCIENCE AND TECHNOLOGY SUBCOMMITTEE II - SYSTEMATIC BIOLOGY RESEARCH

Porcupine is an international (though predominantly British) Society, of professional and amateur marine biologists, which exists to investigate and promote interest in the ecology, distribution and recording of marine fauna and flora in the north-east Atlantic area. (Its name derives from the surveying vessel HMS *Porcupine* which in 1869 and 1870 was engaged on scientific expeditions in the N.E. Atlantic and Mediterranean; she also discovered and gave her name to the Porcupine Bank, west of Ireland.)

As well as producing a Journal three times a year (Porcupine Newsletter; ISSN 0309-3085), the Society organizes weekend seminars and field excursions. As such it acts as a forum for researchers interested in particular in aspects of biogeography and taxonomy and the relevance of these topics to other fields of marine biology.

#### SUMMARY

It is the opinion of the Society that systematic biological research is of fundamental importance to all other fields of biology. In the light of the specialization necessary to understand fully the systematics of the various groups of plants and animals occurring in our ambit, and the fact that such research acts as a service to other fields of research, such systematic research is ideally centrally and nationally based, at such institutions as the national museums. Being of fundamental national importance, it also deserves the full financial support of government.

#### Particular Points

##### (i) What is the utility of systematic biology research?

It is not possible to undertake biological research without a correct knowledge of the identity of the subject plant or animal species. Currently sensitive biological issues verify this contention.

There is at present concern over the possibility of "global warming", which may result in changes in the fauna and flora of an area: such changes, occurring as they would between different

Porcupine Newsletter, 5 (1), 1991.

species of the same genus, can only be detected by correct identification of those species. Similarly, environmental surveys for impact assessment, now a justifiable commitment from the EC, necessarily involve the identification of the diverse species present in communities in order to be sufficiently sensitive to potential changes and adverse effects. The continuing introduction (often passively, often deliberately for sound commercial reasons) of exotic species into our fauna and flora requires an understanding of the systematics of the relevant groups on a larger than national scale. The use of (particularly marine) species as indicators of pollution requires an accurate knowledge of the systematics of closely-related complexes of very similar sibling species if the interpretations of such monitoring are not to risk being erroneous (and therefore any resulting actions excessively costly).

These are examples of areas where the support of accurate taxonomic research is essential. This is particularly the case in the marine field, where so much taxonomic investigation remains to be undertaken.

(ii) Does the need to specify particular organisms in connection with eg intellectual property rights, regulatory provisions etc. impinge upon your work?

Identification of organisms to the species level is very important, for example in the fields exemplified under (i). Since closely related ("sibling") species can demonstrate quite different responses to climatic conditions or pollution, for example, identification of such material only to higher taxa is insufficient. This has implications in fields as diverse as ecology, physiology, animal behaviour (migrations of commercial species), aquaculture and regulatory monitoring. With many applied researchers having to study complex communities, or evolving from specialities other than taxonomy, they have recourse to sending material to specialist systematists for confirmation of identity - if such specialists are available.

(iii) Is the Level of UK research appropriate. If so, how does one determine an appropriate volume? How does it rank with competing biological and other disciplines?

The level of UK research in systematics is clearly inadequate. The increasing workload of researchers and applied scientists in other fields precludes the possibility of their becoming sufficiently expert in more than a few taxonomic groups; equally, the emphasis on applied research in Universities over recent years has reduced the support for taxonomic research in those institutions (despite NERC publishing a report entitled "The Importance of Taxonomy in Ecology" in the 1970s). In the marine field in particular there remains a very large amount of taxonomy to be unravelled, and it is hard to see how this can be achieved adequately with present levels of national support for systematic research. Our continued reliance on the small input which can be made by amateurs (whose work is nonetheless laudable) is embarrassingly outdated.

(iv) Is UK research in the right areas? Are there guiding principles which could help a "national policy" within which the existing facilities would operate eg importance in ecological/economic terms of groups of organisms; existing spread of expertise within the country; quality of resources available?

Since systematic research in the UK is currently under-staffed (see iii), it cannot be in all the "right areas"; coverage is necessarily "patchy" and cannot reflect needs fully. There is a need for flexibility in availability of expertise in order to cater for changing emphases in demand in the future; it is therefore difficult to prioritize importance. Conversely, it is axiomatic that areas recently neglected, notably marine invertebrates, are those where more emphasis is needed.

The ideal is full coverage and we should strive to achieve that on a national basis, most efficiently in the light of available collaborative expertise from abroad. The quality of resources available is only represented by the quality of expertise of taxonomists presently working in the field (whether professionally or as a "sideline" in their main career), undoubtedly of a high standard despite

Porcupine Newsletter, 5 (1), 1991.

the *ad hoc* nature of much of their application to such research.

(v) What is the extent of our need for {illegible} collections including foreign material (type collections, living culture collections, etc) as a base for systematic research? Is provision for their storage and their curation adequate? Do we have particular responsibilities to the world scientific community as a consequence of the historic circumstances of our holdings?

An underlying requirement for taxonomic research is the establishment of collections of both reference and type material, to be held at reputable institutions (classically and historically the National Museums), where they can be registered and curated. This practice has been going on for more years than I can estimate, and such institutions are now the national repository for such material, which has been donated to them in all good faith, to be held in trust for both the nation and the world, for the present and the future. This is potentially an awesome responsibility.

Type material is irreplaceable. The current disparity in funding (at our national museums) between, for example, technological or artistic exhibits (often replaceable) and systematic voucher material (irreplaceable) is alarming. As techniques and resources for systematics evolve, so it can be necessary to re-evaluate type material. Similarly, the existence of historic collections allows retrospective research on trends in pollution, climate, evolution, migration, to name but a few.

It is also most desirable for our national institutions to act as repositories for the supporting literature for collections of material and for systematic research.

(vi) What new methods are there and how will this affect future UK research? Is the availability of information technology (computerised databases) to systematic research being adequately exploited? Is UK research taking cognizance of the full range of new developments in this field?

There are new methods both of collation and curation of taxonomic material, and of the fundamental systematic research, involving computer databases (for literature and collections), electrophoresis, electron-microscopy and high-resolution photography, for examples. The costs of most of these systems are outside the resources of amateurs and individual researchers, and are difficult to justify for applied researchers, no matter how dependent they are on taxonomy. Great strides are being made in computerization of museum collections, for example, but the complexity of plant and animal taxonomy requires large systems; centrally based large systems are the most economic way of fulfilling this requirement, when allowing full access by systematic researchers. The use of such technology cannot be fully exploited until sufficient technology is made available to sufficiently supported teams of systematists.

(vii) Is the current "institutionalised" base of much of the research appropriate? Is their funding base secure? Should OAL or DES be responsible for the NHM?

The concept of basing the national core of systematic research at the national museums is sensible insofar as that complements the holdings of the internationally important collections of material, and facilitates their efficient and secure exploitation. This should in no way detract from taxonomic research which is carried on outside such institutions; indeed, the museums appear inadequate to undertake all the taxonomy that is necessary. Clearly the maximum collaboration between researchers in this field from whatever base is desirable to avoid repetition or confusion, and to optimise use of resources, to the national benefit.

We are in no position to comment on the funding base.

(viii) If research is to be continued who pays?

(i) Should burdens of expense be shared with other countries - e.g. a UN programme? Can

Porcupine Newsletter, 5 (1), 1991.

ESF help to rationalise activities?

(ii) Within UK, how much more should Government pay for and how best can budgets be protected?

(iii) What role can industry play?

Systematic research and its results are a most important national resource, and as such should be protected. Their significant underpinning of other fields of research, with commercial, technological and quality of life repercussions, justify the fullest financial support by government. Equally, the improved efficiency incurred by international collaboration would maximize "value-for-money". That industries involved in biological work (health research, monitoring, etc.) require the support of competent taxonomy suggests that they should offer some contribution, although they are likely to target such funding "selfishly" instead of supporting the general base of systematics. The funding of taxonomy should not be considered a "burden" but a sound investment. Indeed, the establishment of a sound national expertise in the field would produce an internationally marketable resource, particularly as so many third world countries are realizing the need for competent systematics to underpin their (and our) desire for environmental sensitivity and responsibility in their development of both industry and civilization.

(ix) Is teaching adequate?

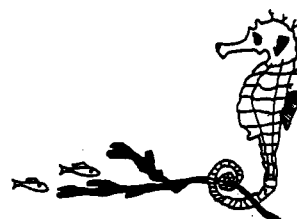
Teaching is inadequate. As much as we (the nation) require resources and institutions to support systematic research, so also do we require the competent scientists to undertake that research. Few universities teach systematics (in today's concept of emphasis on "applied" work, it appears to be considered unfashionable), and as a consequence the grasp of taxonomy by graduates is often embarrassingly poor. Increased funding at postgraduate level and in education within museums, etc., together with some emphasis on systematics in the undergraduate syllabus is needed.

(x) What can we learn from abroad, especially the USA?

Other countries within Europe maintain centres of taxonomic excellence (e.g. The Instituut voor Taxonomische Zoologie, Amsterdam); in the United States there has been recent realization of the inadequacy of their own systematic research resource, to the detriment of their environmental programme; and in third world countries, as the international community tries to educate them into environmentally competent development (industrial, commercial, etc.), there is a growing realization that one of their major problems is a lack of adequate understanding of their local plant and animal taxonomy. The value of properly maintained and studied collections of type and voucher material is recognized by the international scientific community.

The geographic boundaries recognized by plants and animals are other than our political ones - we used to lead the world in systematic research, and would benefit from doing so again.

Dr R.N.Bamber F.L.S.  
Hon Editor, Porcupine  
Marine Biology Unit, Fawley Power Station  
Fawley, Southampton SO4 1TW



Porcupine Newsletter, 5 (1), 1991.