Porcupine Newsletter

Volume 2 Number 4 ISSN 0309-3085

MARCH 1982

CONTENTS

*****

NEWSLETTER. As promised, the new letter page begins on p. 86. It can continue only to the extent that Members contribute to it. PN would be glad to hear from you.

This issue is a bumper one. PN would like to thank our typist, Audrey Twizell, and the artist, Sue Evans, for all their labours. Please accept our damp and quilly paw.

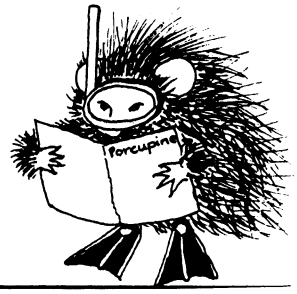
MEMBERSHIP. As Secretary Smith reports, our membership is increasing. You have manifestly been introducing new people to the Society. Good! And remember that while our subscription rises to £3 from January 1983 the entrace fee has been cancelled; so it will still cost no more to join PORCUPINE in 1983 than it does now.

FRED DOES FLASK. Council Member Fred Woodward has taken over from Treasurer David Heppell the project of producing Faunal Lists And Systematic Keys, described in PN 1, 3, p.39. If you have material for this, contact F.R. Woodward, Kelvingrove Museum, Glasgow G3 8AG (041 334 1134). More details in our next issue.

FUTURE MEETINGS. 1. A Joint meeting with the Conchological Society will be held in the Isle of Skye from Saturday 19 June to Saturday 26 June 1982. This marine week will be centred on Portree. Members wishing to attend must make their own arrangements for accommodation and travel. For a free 'Where to stay' list and preliminary arrangements send s.a.e. to T. Pain, 47 Reynolds House, Millbank, London, SW1P 4HP (01 821 7674).

2. There are still a few places available for the PORCUPINE field meeting on Sherkin Island, SW Ireland, to be held from Saturday 7 August to Saturday 14 August. Families and friends welcome. Price around £50 all in. Contact Shelagh Smith, Royal Scottish Museum, Edinburgh EH1 1JF (031 225 7534).

3. The autumn meeting will probably be in Reading.



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

ACCOUNTS FOR THE YEAR ENDING 30 NOVEMBER 1981

Income and Expenditure Account

Dr.				Cr.			
		£	p			£	p
To	Donations ...	4	58	By	Printing and Stationery ...	270	92
	Entrance fees ...	11	00		Postage ...	102	86
	Subscription for 1979 ...	2	00		Meetings ...	6	19
	Subscriptions for 1980 ...	6	00		Refund of subscription overpayment ...		50
	Subscriptions for 1981 ...	248	50		Bank charges and commissions ...	8	33
	Subscription for 1982 ...	2	00		Excess of Income over Expenditure		
	Sale of Newsletters ...	9	80		transferred to Balance Sheet ...		23
	Interest from Deposit Account	96	81				
	Refund of bank charges ...	8	34				
		£389	03			£389	03

Balance Sheet

Dr.				Cr.			
		£	p			£	p
To	Subscriptions paid in advance	6	00	By	Cash at bank (deposit account) ...	720	00
	Balance at 1 December 1980	780	71		Cash at bank (current account) ...	64	55
	Transferred from Income and				Petty Cash in hand ...	2	39
	Expenditure Account		23				
		£786	94			£786	94

Charles Pettitt, Norman A. Holme
Hon. Auditors
February 1982.

David Heppell
Hon. Treasurer
29 January 1982.

THE 1982 A.G.M.

Minutes of the Fifth Annual General Meeting held at Kelvingrove Museum on Saturday, 6th March 1982 at 16.45 hrs.

Shelagh Smith took the chair. Approximately thirty members were present. The Minutes of the 1981 A.G.M. were approved.

Reports of Office Bearers were given and approved.

Members approved the recommendation of the Committee that the Annual Subscription as from 1st January 1983 will be £3.00 with no entrance fee for new members. This addition will barely cover expected expenditure but Porcupine's finances are considered sufficiently buoyant (see balance sheet) to cover unforeseen items or inflation.

Incumbent Office Bearers were re-elected. Geoff Swinney has retired from the Council after serving since Porcupine's inauguration. Adrian Norris's retiral was intimated in the last number of the Newsletter. Peter Davis, Hancock Museum, with an interest in ichthyology, was elected to the Council, whose members now are:

Shelagh Smith (Secretary)	Roger Bamber	Celia Pain
David Heppell (Treasurer)	Roger Brehaut	Eve Southward
Frank Evans (Newsletter editor)	Peter Davis	John Wilson
Bob Earll (Records convenor and UCS representative)	John Gordon	Fred Woodward
	David McKay	

Proposals for future meetings were discussed and members were reminded that Shelagh Smith and Robin Harvey will be running a weekend course on shore organisms at St. Andrews on 21-23 May 1982 and that there is to be a Porcupine field meeting at Sherkin Island on 7-14 August 1982.

Norman Holme gave the background to a request from Stella Turk that Porcupine should add its name to the list of those interested in creating a Reserve in part of the Fal Estuary (see p. 90). This was agreed, but Porcupine members voted that, as now, any such request should be considered only at an A.G.M. The support of Porcupine should not be given lightly and each request should be considered on its merits.

The A.G.M. closed at 17.45 hrs.

*****

HON. SECRETARY'S REPORT

Shelagh Smith

1981 was a particularly active year for Porcupine. The membership to 31st December was higher than ever at 129. Meetings were very well attended.

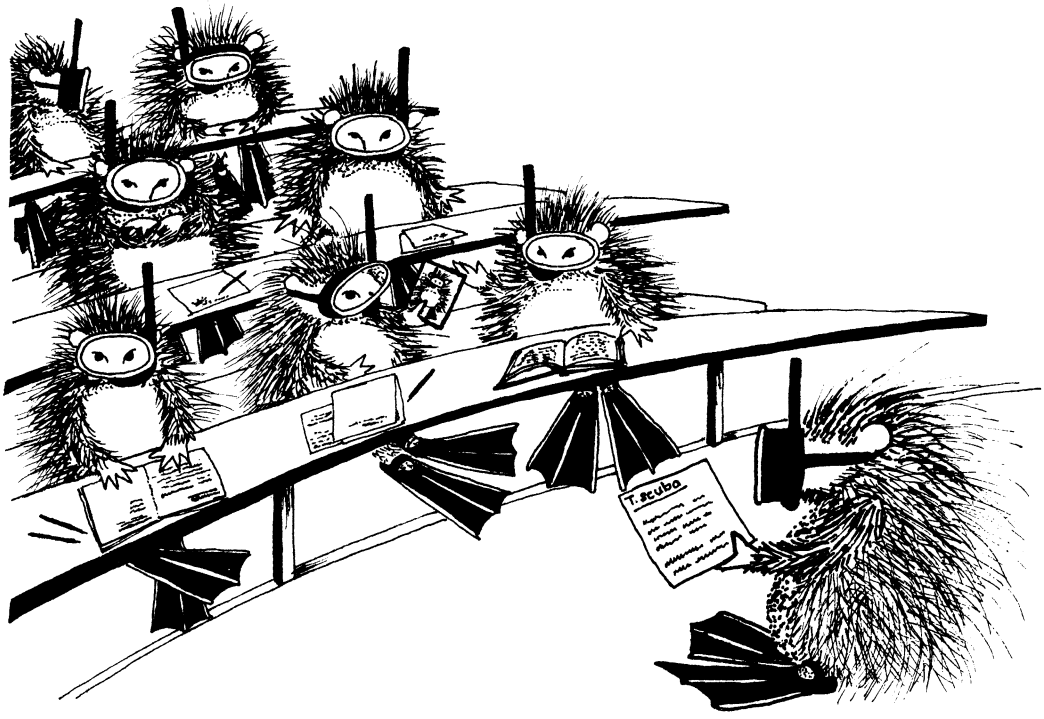
At the Plymouth meeting 21-22 March, the theme was "Biological results from underwater photography". During the A.G.M. there was discussion on the Wild Life and Countryside Bill with the result that members individually and the Hon. Sec. as representing Porcupine were encouraged to write to the Department of the Environment with their comments on the proposals. Copies of the DOE

consultative document were sent to all Members. My letter was long, mostly comprising adverse but constructive criticism that the provisions envisaged were not sufficiently realistic to be successful for the mangement of the marine environment.

At Portsmouth, 26-27 September, there was a joint meeting with the Coelenterate Group on "Biology of Coelenterates in European waters". In addition there was a joint field meeting with the Conchological Society at Rhossili, 19-20 September; this was poorly attended and the weather was worse (PN 2, 3, pp. 44 and 50). The new style Newsletter has been very well received. The chief praise is that it is very readable. More readable articles please!

There was a suggestion from the Underwater Conservation Society that there should be closer links between UCS and Porcupine. To this end there have been committee meetings at Portsmouth and Rhossili where all interested could express opinions, and a more formal committee meeting in Edinburgh in September at which Bob Earll and Frances Dipper as UCS members were present. The consensus of opinion was published in PN 2, 3. Since then I have been voted on to the Council of UCS as Porcupine representative, which balances the UCS presence on the Council of Porcupine. The present linkage is useful in that we can know early of each other's plans and scope with a view to complementing each other's activities. Porcupine will, of course, remain a separate organisation. Although there are a number of people who belong to both, there is a considerable divergance of membership and concomitant differences in viewpoint and interests. It has been suggested that any further linkage would most probably include better publications. PN would remain as it is or grow. The most difficult matters to solve are financial. There is considerable difference between the subscriptions to Porcupine and UCS, and if Porcupine were to receive any of the additional material put out by UCS, or become eligible to buy UCS material at members' prices, this would be reflected in the subscription.

*****



REPORTS OF THE MEETING IN GLASGOW, 6-7 MARCH 1982

RECORDING BRITISH CRABS

Paul F. Clark & Ray W. Ingle
Department of Zoology, British Museum (Natural History), London.

Introduction

Ingle (1980) published a monograph on British Crabs which entailed documentation of NE Atlantic crabs material deposited in the British Museum (Natural History) and literature references citing records or descriptions. In 1973 Ingle and the Biological Records Centre officially initiated the crab recording scheme.

Progress

Approximately 2700 Marine Record Cards (MRCs) have been completed. Data was collected from BM(NH) crab material; Ingle's literature records; crab field record cards returned by individuals, institutions and organisations; various marine biological surveys; numerous collecting expeditions. The final phase of this recording scheme commenced in 1981 with the submission of a revised crab field record card to the Biological Records Centre, Monks Wood Experimental Station, Huntington, for printing; an appeal for NE Atlantic crab material stored in institutions other than the BM(NH) and a request for data in the possession of several co-workers.

Problems

We envisage another two years work before publication can be considered. Much ex-officio time has been devoted to completing MRCs already filed. A considerable amount of time was required to establish co-ordinates for many coastal marine localities not found in gazetteers. The assigning of map co-ordinates to correct sea areas also presented problems. During the search for additional crab material it was obvious that some collections had not been retained.

Atlas information

The information stored on MRCs is currently used for answering enquiries at the BM(NH) relating to geographical distribution, depth distribution, breeding strategies and regional faunas. But some species maps already plotted reflect only marine stations and picturesque areas to collect etc. Sparsity of east-coast records may be due to absence of the species or to lack of adequate sampling. This applies particularly to deep water species of which there are even fewer records. Expeditions to collect onshore and offshore to a depth of about 180 metres are necessary. In the past, problems of identification have been acute in the absence of reliable keys. These aspects reduce the value of distribution maps. A few common crabs (for example, Cancer pagurus, Carcinas maenas and Liocarcinus puber) have a well documented distribution.

Recommendations

Before future recording schemes of this type are initiated, serious thought should be given to: production of identification keys; use of suitable computer aids to deal with clerical compilation; provision for adequate personnel; clear objectives - including a target date for completion of atlas.

Reference

Ingle, R.W. 1980. British Crabs. British Museum (Natural History) & Oxford University Press vi + 222 p. London & Oxford.

*****

RECORDING THE DISTRIBUTION OF BENTHOS IN THE NORTH SEA

M.F. Dyer & P.D. Fry
Marine Benthos Laboratory, Putteridge Bury, Luton.

The M.A.F.F. Ground Fish Survey is the main source of our records. This survey has been made annually since 1977 during August and September. The survey comprises 48 primary stations sampled each year, and up to 3 hauls are made at each primary station with a Granton trawl. The problems of recording benthos on such a survey are ones of sorting and identification.

Sorting

The sorting problem arises because the benthos is mixed up with the fish catch, and so the benthos must be picked out as the fish are sorted. The benthos is then laid out on the deck, sorted and photographed, and the numbers of each species trawled are recorded on a check list. These records are then stored, along with the fish catch records, on the ship computer. On-board identification is now possible for about 95% of benthic species, and the species which cannot be identified are preserved for later identification in the laboratory. At some stations, particularly in the southern North Sea, large catches of small fish results in the need to sub-sample the catch. Large fish are picked out and the remaining catch is mixed and basketed, and about 1 in 10 baskets are sorted. The same procedure is used for the benthos at these stations, with the large specimens being picked out, and the smaller benthos estimated from the sub-sample. Usually, only 1 hour is available for sorting before a fresh haul is landed, and so speed is of the essence in sorting and recording the benthos.

Identification

As many of the species are not to be found in the common guides, which tend to concentrate on littoral species, we have produced a 'North Sea benthos catalogue' for the identification of the larger benthic species caught during trawling, and this contains photographs of fresh specimens on deck. These guides are now issued to M.A.F.F. research vessels, and photographs taken during the past year will allow us to up-date the catalogues in the near future.

Recently, the size (and when appropriate, sex) of benthic species important in the diet of demersal fish have been recorded in an attempt to estimate mortality rate by analysing size-class distributions. Large specimens are sized and sexed on board, but because of the limited time available, small specimens are preserved and later measured in the laboratory.

During the 1981 survey, an Agassiz trawl was used at most primary stations in the southern North Sea in an attempt to sample the benthos more efficiently, and on future cruises it should be possible to use the Agassiz at most primary stations, and at several new stations. The sorting of the Agassiz haul puts further constraints on time, and so Agassiz hauls are photographed, and then often preserved in total and sorted at a later date in the laboratory.

All benthos records have been set out as a matrix of 103 species and 48 stations. The matrix has been analysed using a computer programme which implements a similarity 'cluster' analysis of the primary stations and shows benthic regions in the North Sea. Records made each year at the same station may also prove useful in detecting and large changes in benthic populations. Such a change was detected at 2 primary stations off the Danish coast in 1981. Compared with the previous year, very low fish catches were recorded, though the benthos trawled was much greater. The underwater photographs taken with a headline camera revealed that the large benthos catch was a result of infauna coming onto the surface of the sand, probably as a result of low O_2 levels following the collapse of an algal bloom.

*****

TEN YEARS OF SEAWEED MAPPING

Trevor A. Norton
Department of Botany, University of Glasgow, Scotland.

The British Phycological Society's scheme to map the distribution of seaweeds has been in operation for 10 years and there are now 260 registered contributors including both professional phycologists and amateur collectors.

Except for the Cyanophyta all the species of seaweed found in British waters are recorded. False records based on misidentifications are minimized by the necessity of tendering voucher specimens with all records of rare or critical species. There are also two networks of referees, one of specialists to determine the voucher specimens submitted, and another of regional referees to help the non-professional collector on a personal basis.

As seaweeds are usually found close inshore their position can be related to landmarks and designated with reference to the National Grid of the Ordnance Survey. However detailed the location of records received, for mapping, the presence of individual species is plotted for every 10 km square of the National Grid. About 1000 such squares

are likely to contain some seaweeds and records have been received for about 60% of these squares, with the biggest gaps on the coasts of Ireland.

In collaboration with the Biological Records Centre a few preliminary maps have been printed and it is hoped to publish a provisional atlas containing distribution maps of about 100 species by 1983. To achieve this target many more records are required. Anyone interested in contributing should contact the author.

The production of an atlas should not however obscure the limitations of the information they display. Until comprehensive collections of algae have been made from all around our coasts the resultant maps may reflect the distribution of collections as much as the distribution of individual species of seaweed.

Furthermore, there will always be a tendency for the maps to display more accurately the distribution of distinctive species rather than taxonomically difficult ones. Similarly, large, conspicuous plants are more likely to be recorded than are obscure small ones. The dense clusters of dots which abound on the maps of common species are also likely to display distribution patterns more convincingly than the sparse scatter of dots that will characterise the map of a rare species.

In keeping with many other mapping projects, the seaweed scheme records only the presence of species. The absence of a record from a collection may indeed result from the failure to find that particular species during a comprehensive search. More often however apparent absences will reflect species that have been accidently overlooked or were never looked for at all. Moreover, merely recording presence without any measure of abundance, may render the scheme insensitive to variations of great ecological interest.

Nonetheless, in spite of these reservations, the atlas will contain striking and useful distribution maps. I hope that for many species it will also highlight the inadequacies of our collecting, for this should stimulate more intensive recording and lead eventually to a much better understanding of the distribution of seaweeds around our coasts.

*****

SPECIES AND HABITAT RECORDING

N.A. Holme
The Marine Laboratory, Citadel Hill, Plymouth

There can be no doubt that much of the information obtained during a person's lifetime remains buried in the memory, in notebooks, or in other unpublished form. Data recording is about communication - not only with contemporaries - but with generations to come. Information not passed on remains purely a personal experience, of no lasting scientific value.

The systematic recording of distributional and habitat data on the other hand, is a time-consuming process, and it has been reckoned

that the collation and entering of such data on to computer could represent some 30% of the total effort put into a survey.

Habitat recording. Field cards and instructions have been produced for describing the main features of sediment and rocky shores (Holme and Nichols, 1980). These for sediment shores, being based mainly on a description of the physical features of a beach, have proved to result in reasonably consistent descriptions, aided by use of a grain-size comparator for measuring particle size against known standards. The rocky shore card presents rather more problems, in that the descriptions require identification and description of plant and animal populations in addition to a physical description, and more experience is required to produce consistent results.

Species recording. The system evolved at Monks Wood (Heath and Scott, 1977) involves a species-list card containing an agreed set of names for the particular phylum or group, together with an individual record card which allows entry of more detailed information on abundance, habitat data, etc.

A system is described for recording benthic species, based on the above individual record card, but provided with 80 boxes in which all the data to be transferred to computer are entered, so allowing any operator to use the system (Holme, 1974). From the cards data are transferred to 80 column computer cards, or paper tape, and then to disc for editing, finally to magnetic tape for long-term storage.

The main features of this system are:

(a) there is considerable replication of data entry, since the same ancillary information has to be entered for each species recorded from a single station;

(b) there is space outside the 80 boxes for additional information, which is not put on to the computer. This is not possible if the apparently more convenient data entry sheets, ruled into columns, are used;

(c) population density (and certain other features) are often coded, so reference must be made back to the original card for more precise details;

(d) although the population density scale allows for it, the problem of 'negative' records has not been entirely resolved.

The end products are:

(a) Printout of records, each of which occupies one line, which can be arranged in serial number order, or by species, date, etc.

(b) The records can be conveniently grouped into grid squares (based on 10 x 10 subdivisions of ICES rectangles, i.e., 3' latitude x 6' longitude), which allows manual searching of the printout for occurrences in particular areas.

(c) The above grid squares (or groupings of them) can be used as the basis for distribution maps. For each square presence, number of records, or highest density being represented.

(d) Such maps usefully summarise situations, but one must continually refer back to the individual computer records, and often to the original data for fuller information.

The main snags, which may relate only to the particular computer system in use, and which may be alleviated in time are:

(a) It takes a long time to enter data on to the cards, and to check these cards, and subsequent computer entries;

(b) Some apparently simple sorting of records takes a long time for the computer to accomplish;

(c) The computer in use is not really geared for storage and retrieval of the very large amounts of data which are accumulated in these recording schemes.

(d) Records can be "lost" through incorrect entry (e.g., by mis-spelling), and may need a retrieval programme for recovery and correction.

To summarise: we have the facility to transfer the information in our memories and notebanks into a data bank for long-term storage. The entry of such data is a time-consuming process, and at present there is no compatability between systems adopted by different users. Perhaps we would find their printouts as indigestible as their note-books!

Over the past twenty years there have been a series of events which have generated incentives to make records, but most of the records have not been satisfactorily incorporated into data recording systems. In my own experience we have gone from the era of Productivity (IBP) in the 1960's, through Pollution ('Torrey Canyon'), and Population Monitoring, to Protection (Wildlife and Countryside Act), with "Porcupine" appearing somewhere on the way. Let us hope that the future is not cramped by Poverty, but that Progress, based on modern methods, will result!

References

Holme, N.A. and Nichols, D., 1980. Habitat survey cards for the shores of the British Isles. Occasional Publications of the Field Studies Council, No. 2, 16 pp.

Heath, J. and Scott, D., 1977. Instructions for Recorders (2nd edition). Biological Records Centre, Monks Wood, Huntingdon, 28 pp.

Holme, N.A., 1974. Recording schemes for benthic macrofauna. International Council for the Exploration of the Sea, C.M. 1974/K: 17, 5 pp.

*****

REGIONAL RECORDING OF MOLLUSCA

Shelagh Smith & David McKay
The Royal Scottish Museum, Edinburgh.
Airyhillock Cottage, Bourtie, Inverurie, Aberdeenshire.

This is a personal view of regional recording and mapping of

marine Mollusca; what we have done, are doing, and why.

In 1966 we started to be interested in the Mollusca of our local shores and began to send records to the Conchological Society Marine Mollusc Recording Scheme. In 1972 the system of Area Representatives was set up to lighten the load upon Stella Turk, then Marine Recorder for the Scheme, and we took our place in this organisation. In 1974 when Stella Turk retired, Smith was asked to take charge of this recording scheme, but within two years there was a parting of the ways because the Conchological Society and the Biological Recording Centre appeared to envisage that the end product would be an atlas based on the same methods and with the same lay-out as those for the non-marine schemes and atlases, but we realised that this was not possible. The main overt cause of argument concerned grids, although with hindsight one realises that not only is this (now) no problem at all, but that it concealed the real issue which was that the Conchological Society and BRC seemed to have a different answer from ourselves to the questions "Who is going to use the data produced?"; "Who is going to provide the data?". The inadequacy of BRC"s attitude to marine recording was abundantly obvious at the Biorec '75 symposium in Dundee, where out of over 100 participants there were only three with experience of and interest in marine recording, up against entrenched attitudes that the current (1975) methods of dealing with data were excellent and could not be changed. At this date the Conchological Society and BRC wished to produce marine maps showing Orkney and Shetland in the middle of the North Sea! The offshore data was not even considered, there was a feeling that marine recording for Britain would do nicely if the mainland shores were covered to the exclusion of all else. We had a wider view. The shores are a very minor part of the marine environment and the shore and offshore have an inextricable relationship, and that so far as Mollusca are concerned there are so few species whose distribution is predominantly littoral as to make recording of littoral data alone meaningless. Even then we could see that although people providing data would be and should be many and varied, in practice about 95% of data is both provided and used by professional marine biologists who do at least some of their work offshore.

The break from Conchological Society in 1976 allowed two things to happen· time to form Porcupine and the decision that we should so far as an atlas was concerned go it alone since we were not happy to wait for other people to make up their minds about how to deal with mollusc records. We should go ahead in our own region in our own way, show what could be done and demonstrate publicly that our ideas were workable.

In a matter of days we had "Marine Mollusca of East Scotland" planned almost to the last detail and moreover did not need to modify these plans, whether the logistics of the work or the layout of the final product. We wanted to produce a broad-spectrum coverage of the distribution and ecology of the marine Mollusca of East Scotland. We wanted to show that an atlas did not necessarily require great resources of time, money and hardware. With our slim resources, on the scale we envisaged and with a large number of species to be found (over 400) a region of manageable size was necessary, but we extended the area covered by Sea Areas 5, 6 and 7 south from the unsuitable boundary at 56°N to 55°30'N.

We were not altogether sure who would use our product. This was likely to be the first published atlas of British marine Mollusca covering more than a small research area and including data on all species. We hoped that we would provide a catalyst and that others would follow, using whatever methods they might. We considered maps on their own to be of very limited value, and therefore we also made a checklist of species, containing ecological and other data, and a bibliography, and started to revise the woefully inadequate nomenclature of British marine Mollusca. Although at first we transferred our raw data on to master cards for each mapping rectangle, the system used by theConchological Society, we discovered that for the purposes of producing a regional atlas this was a complete waste of time, it was better to go straight from the notebook or previous published work to a dot on the map. We first drew our maps and put our initial dots on them. Then we were in a position to explain what we planned to people whom we approached for data. We started with feedback, which provided the key to the success of the project. (Previously, when working under the Conchological Society scheme, we had not had any co-operation from other people, who were not interested in something which seemed to them to be ill-planned and lacking a concrete objective). We accepted data in whatever form it was offered. Providers of data did not have to fill in cards, did not have to do any work themselves. We recognised that most people, especially fulltime research workers, have no time or remit to process data for other people, but we gained entry into such professional records because their owners believed in the value of what we were doing and could see that the way in which we wished to use and publish the data would not prejudice their own work or poach upon it.

In 1979 "Marine Mollusca of East Scotland" was published. Much of the work, including collection of our own data and all the processing, had been done outwith working hours.

We are now doing the same for "Marine Mollusca of West Scotland". We are getting yet more help and data from yet more people. What is even better, in view of the inaccessibility of West Scotland, much mutual benefit has accrued to the Nature Conservancy Council (reports and site data), the Royal Scottish Museum (voucher specimens) and ourselves through contract surveys by Smith covering 40% of the coastal rectangles found in the area covered (McKay and Smith, 1980). We are using the same techniques as for East Scotland and are not using a computer to store our data or to produce the atlas. The first reason is because we have not got access to one, the second is because, within the parameters set for our project, a computer is not necessary. As we have already shown, an atlas per se can most economically be produced directly from raw data, especially if this atlas is seen as a publication. A master copy can be updated by hand, and enquiries on the distribution of individual species answered by photocopy. Our own data is available to a national data bank once it has been tidied up for another purpose (even we have no time to do more). Previously published data can be traced to source through our bibliography, but we cannot release site data belonging to our helpers.

East and West Scotland have provided considerable contrasts in collection of data. For East Scotland, as with much of the rest of Great Britain (not Ireland) the coastline is virtually straight and hence fairly uniform on a broad mapping scale and much of the coast is accessible by virtue of being near roads and reachable by day trips.

There has been considerable offshore effort. On the West the problems are different and greater, the topography both onshore and offshore is intensely convoluted which results in rapid changes in environments. There is an enormous problem of access, both for shore and offshore work, and these factors mean that for a given area or site, work is complex and expensive.

We envisage recording of Mollusca thus:

1. Collection of data, which is expensive and time-consuming but can and probably should be done as part of other research.

2. Output of data, which is the most important aspect of recording and is the seed corn leading to further efforts. The methods of processing, and indeed of collection of data, depend on the nature of the output. This should not be envisaged as only what is required by the collector or processor of data, as has been done in the unfortunate past. It should be what can, realistically and within the resources known to be available, be achieved, and what can satisfy the requirements of potential and actual users. Ideally, any project, while being planned around the aims of the first users, should have sufficient flexibility to allow use of data in ways not originally planned.

Processing of data can take several paths:

a) Production of an atlas as a single project, one which is a cheap and effective means of providing feedback to a large number of people, and can be done without a data processor or computor.

b) Storage of data for use as a data base. This is theoretically extremely flexible, but the use of computers should be examined, since storage in this manner is expensive and may be of limited value if the data is to be accessed only occasionally, or if the data is used by only a few people, or if it is not readily available for scientific research. In this respect MIAS (Marine Information Advisory Service) has set an example which could be followed.

References

McKay, D.W. and Smith, S.M., 1979. Marine Mollusca of East Scotland. Royal Scottish Museum, Edinburgh. pp. 185.

McKay, D.W. and Smith, S.M., 1980. Marine Mollusca of West Scotland. Porcupine Newsletter. 1: 158-159.

*****

THE CONCHOLOGICAL SOCIETY NATIONAL MARINE MOLLUSC RECORDING SCHEME

D.R. Seaward
(Marine Recorder, Conchological Society) 3 Summerlands, Yeovil, Somerset.

This scheme is run by a Marine Recorder appointed by the Society. For practical purposes the seas around Britain and Ireland are divided into some forty sea areas in each of which an

Area Representative is responsible for the detailed work of recording, while the Marine Recorder coordinates and acts nationally.

Records have accumulated for some years for an Atlas portraying detailed distribution. It was decided to test recording cover both geographically and for taxa by producing a preliminary atlas to indicate presence on a sea area basis.

Maps were drawn by hand from sea area species lists provided by the area representatives. The list of species has extended from that drawn up for the scheme in 1973 by Mrs. Stella Turk, a previous Marine Recorder, since additional and deeper sea areas have been included. Nomenclature has also been revised in some groups. Nature Conservancy Council offered to publish the Atlas and it should be available by mid-1982.

The maps have been designed with symbols indicating different categories of record (i.e., live post-1950, live pre-1951, any other), which may be easily updated by anyone interested, from additions and amendments which will be published regularly by the Marine Recorder in the Journal of Conchology, largely from information provided by the Area Representatives, thus providing the feedback essential to maintain interest in the Scheme and an up-to-date Atlas. However, the main purpose of the sea area Atlas is to stimulate and direct further recording towards a better and more detailed Atlas several years hence; thus the feedback emphasis will move towards sample detailed map production and special efforts in under-recorded groups or localities.

Hopefully it will be possible to obtain co-operation with Continental workers to produce (perhaps jointly?) a North European Atlas of Marine Molluscs.

Comments from Porcupine members on these proposals would be appreciated and I should be grateful if anyone obtaining relevant mollusc data, particularly from offshore, who is prepared to make it available for the Scheme, will contact me. Even the detailed Atlas will use a fairly coarse grid, so that confidentiality of location can be assured where necessary.

*****

SOME ASPECTS OF MONITORING PHYSICAL AND CHEMICAL PARAMETERS IN THE SEAS AROUND THE BRITISH ISLES

John Ramster
MAFF Fisheries Laboratory, Lowestoft

Atlases are a good way of introducing new generations of students to the known facts about distributions of physical and chemical parameters in the marine environment they are also a convenient way of providing practising oceanographers of all kinds with reference material and new insights into the relationships that might exist in the map area.

It was found in the early 1970s, when the guidelines for the exploitation of North Sea oil and gas were being discussed, that there was no readily accessible source of basic information about the region. Consequently, the Fisheries Laboratory, Lowestoft, compiled and circulated in 1976 an "Atlas of the Seas around the British Isles" consisting of 26 A4 black-and-white maps. This ran through two further editions (1977 and 1979) and in 1981 a colour version at A3 size consisting of 75 maps and notes was published.

It was relatively easy to put together the physical and chemical maps because there is an 80-year long tradition in the International Council for the Exploration of the Sea of jointly amassing and circulating data on this region. This tradition includes the co-sponsorship of field experiments, and in the 1930s involved long-term collection of current measurements from light-ships and the taking of water samples by lightships and commercial vessels. It continues with exercises like JONSDAP 76 where 300 current meters were deployed in the North Sea basin for a 40-day period.

Such exercises have their place in investigations of relatively short-term phenomena but the links between the fish populations and the physical-chemical environment, for example, are more likely to stem from long-term (i.e., 5-8 years +) factors. It is thought in some circles that a network of data buoys will be found to be the most cost-effective way of monitoring the region at such a time scale.

*****

THE ROLE OF SYSTEMATICS IN MARINE RECORDING

Bernard E. Picton
Ulster Museum, Belfast

The relationship between recording, collecting and systematics is a circular one; recording and collecting provide the raw material for the systematicist to work on but the naming of species and the study of relationships between species generate many of the questions which are answered by recording. The names provide the pegs on which the information recorded is hung.

The information that the biologist wants to collect about a species can be broadly classified under three headings; appearance - the colour, shape and structure of the organism, autecology - the habitat, food, reproductive strategy, etc., and distribution. This information is a prerequisite to any study of ecology. Distributional information is necessary for biogeographical work, which is a vital part of the study of evolution and the origin of species.

Compared with a terrestrial vertebrate group such as birds, our knowledge of most marine invertebrate groups is scant. The problems stem from unstable taxonomics, a lack of adequate identification literature, and poor knowledge of distributions. As a result most

theories of speciation are based on groups such as birds and little is known about speciation mechanisms in the sea. Study of speciation in marine invertebrates is likely to throw new light on questions such as parapatric versus allopatric speciation, especially in view of the comparative shortage of physical barriers to species distributions in the marine environment.

The practical problems of recording stem from the inadequate and outdated identification literature available for the most groups and the need for further taxonomic research. This is a direct result of a shortage of specialists in the taxonomy of marine groups. Where new work has been done and a new identification guide made available (the Linnaean Society synopses are good examples) there is frequently a sudden rise in the knowledge concerning the group, stimulated by the new literature, which therefore rapidly becomes outdated.

In contemplating the starting of a new recording scheme there are several criteria which are vital to its success. The primary one is a good identification guide to the group in question, which may be a looseleaf, cheaply produced guide which can be amended and added to as the scheme proceeds. The second requirement is for adequate feedback to the recorders involved, which will show progress and encourage further efforts.

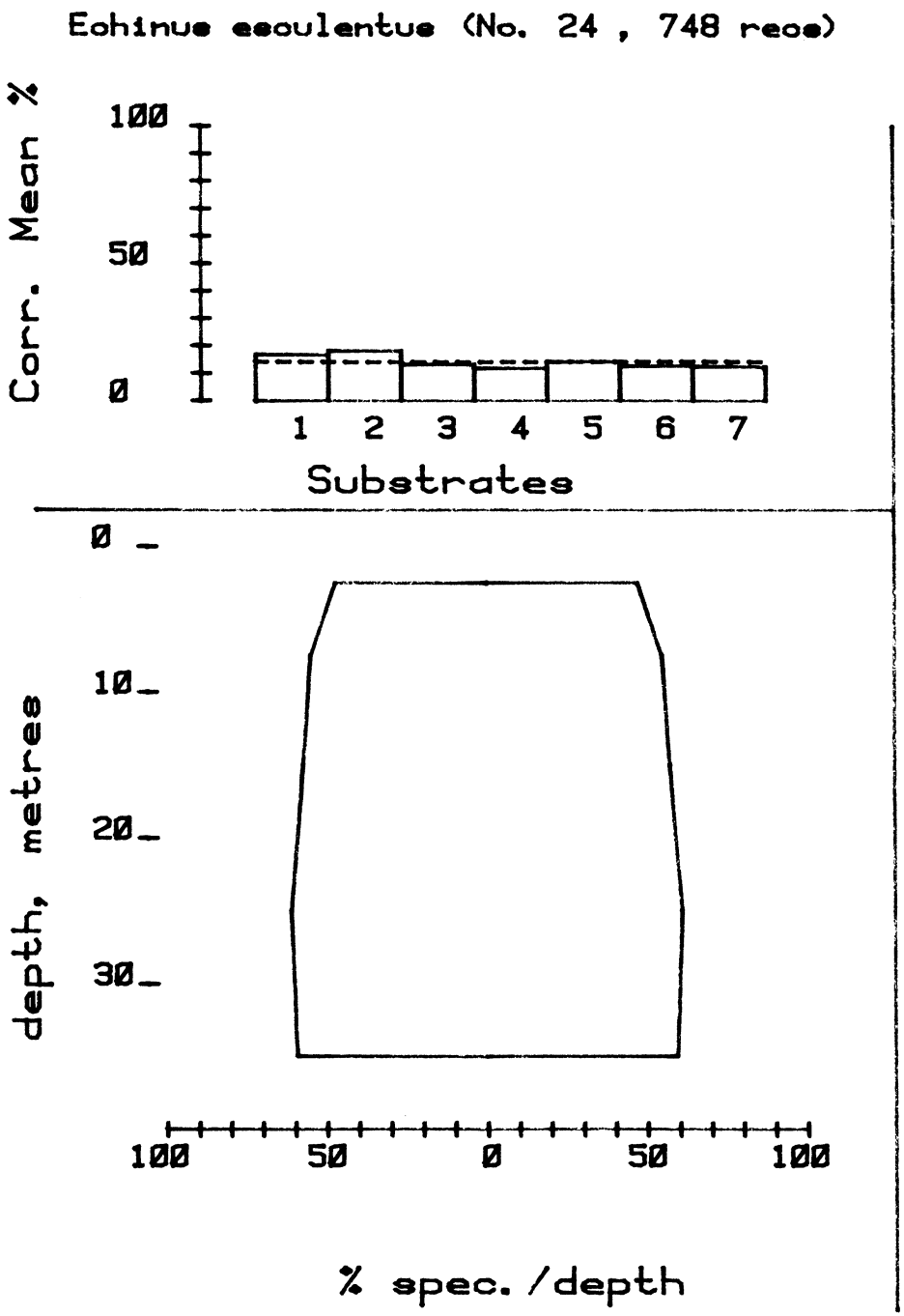
In constructing a recording card or identification guide in a group where there are taxonomic questions still to be resolved it is vital that a "splitter's" rather than a "lumper's" classification be adopted. The reason for this can best be seen by looking at the consequences of the two approaches. If there is too much splitting then information will be collected under too many names, but in the light of a taxonomic review the information for two synonyms can be combined. On the contrary if information is collected for an aggregate of species under one name, then it cannot be split up to be linked with the appropriate species after a taxonomic split, and is therefore of less value. It is important to remember that closely related species pairs are a common feature of most groups, and the study of the distributions and ecology of these species is likely to be of most value to the evolutionary biologist.

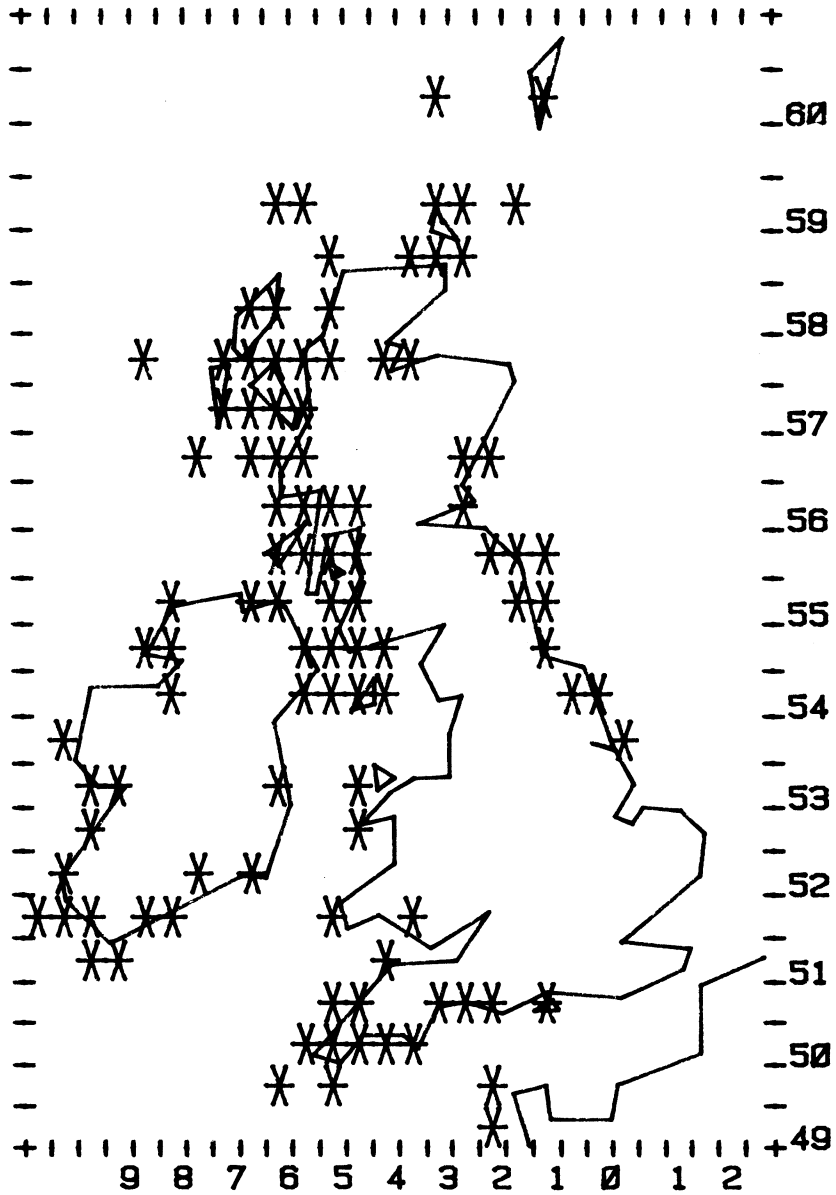
*****

THE USE OF A MICROCOMPUTER FOR SPECIES AND HABITAT RECORDING
or
ONE MAN'S ATTEMPT TO REINVENT THE WHEEL!

David G. Erwin
Department of Botany and Zoology, Ulster Museum.

In an effort to solve data handling problems resulting from the success in participation terms of the Underwater Conservation Society's "Species Recording Scheme", attempts were made to utilise a microcomputer. We wrote small simple programmes which produced more questions than answers. We then wrote new programmes or extensions to the existing ones to solve the problems. Nothing of what we were doing was 'new', and everything to anyone with real knowledge of computers would have been simple to the point of





naivete. However, we were learning what was possible and what was not and even though our programmes were 'inelegant' and extremely 'inefficient', they worked; we understood how they worked and we were in total command of our data without an 'expert' between us and our processing. An example of the output available at this state in our development is shown in fig. 1. Other searches and printouts of information are also available and the results of the scheme will be published in the next year.

The general problem with this type of operation is that it requires SPACE, both in terms of internal handling memory in the computer itself and in terms of the data storage system. The present scheme is limited in the number of species (at present 70) and in the habitat information which can be dealt with. We have, however, now become ambitious and are for the first time trying to do the job properly. We have recently been lucky enough to be awarded a contract by Conservation Branch of the DoE. Northern Ireland, to carry out a survey of the sublittoral habitats present around the Northern Ireland coast. This project is still in its infancy but in computer terms is fairly well advanced. We are putting together by the use of codes and various other "tricks of storage" a system which is intended to hold full site records including records of any species on the British Isles "lists". By the use of a series of indexes and thesauri which, because of their size, will have to be held on "hard disc" we can store up to 500 full sites on a '5¼" floppy' or 30,000 sites on a hard disc.

Our output possibilities appear at present to be virtually unlimited. The system has been designed to answer whatever questions or series of questions may be necessary, e.g.:-

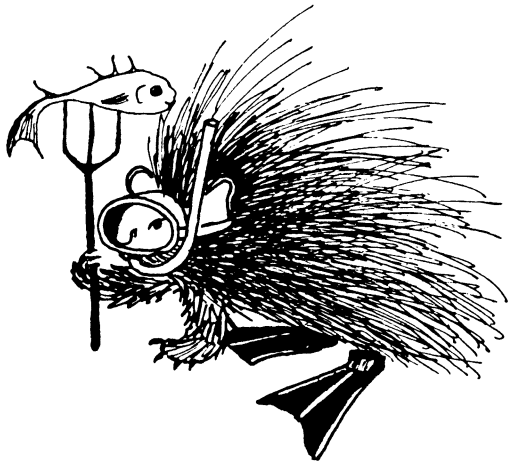
> What species have been recorded from areas which are between 20 and 30 m within specified substratum characteristics where (e.g.) Pachymatisma johnstonia is present?
>
> or
>
> What Echinoderms have been recorded within a set of lat long parameters, large or small?
>
> or
>
> You could ask for a printout of some physical parameter, e.g., the substrate parameters or salinity or both for every recorded occurrence of a species or group of species.

Basically every variable entered including species can be searched for either on its own or in combinations with others against any other single variable or group of variables.

We also hope to further manipulate this output data into the form of maps or graphical presentations of statistical statement. We already have large sections of this package working and at present I can only say that we are very optimistic for it. If it works, and I see no reason at present why it shouldn't, we will NOT have done anything NEW. We will not have achieved anything that someone elsewhere, using probably more efficient methods and systems, has not already done. However, by bringing it together in this way on a desk top, totally under out control, we WILL have managed to re-invent the wheel BUT ON A SMALL SCALE.

*****

Notes & News



WHOOPS! - I NAME THAT SPECIES.....The planktonic copepod Microsetella norvegica, common in "Porcupine" seas, was first named by Boeck in 1864. PN has recently received a translation of his description, which was written in the archaic Norwegian of the last century. It runs: "Setella Dana. I have only observed one species of this genus in the vicinity of Moss (Norway). It seemed to differ from S. messinensis Claus by its less elongate form, but I had only drawn a general sketch of it when it was accidentally lost. I have named it Setella norvegica. It is clear transparent with a yellow tint and short antennae. It was caught in the surface of the water where it was swimming about by bending its body." And that was all! The specific name still stands, on grounds of priority.

**

CLYDE SEA FAUNA LIVES AGAIN. In the last PN we said (p.62) that the Fauna of the Clyde Sea Area, published by the Scottish Marine Biological Association, after producing some valuable lists seemed to have foundered in 1967. A Clyde source tells us that the series is on the march again, sponsored by the Millport Laboratory. The first of the new issues will be one on amphipods by P.G. Moore. Well done, Millport and Geof.

**

PAY ATTENTION, TEACHERS. At the recent Glasgow meeting was a U.S. Navy diver, John Nugent, who brought with him a display illustrating his personal interest in marine environmental research. By this he meant a good deal more than marine biology and physical oceanography, although he includes those. His hope is to see develop what he calls 'a marine literate public', and if we can equate this literacy with, say, the experience of a country walk, where we may encounter aspects of geology, meteorology, wildlife, human artifacts and history, folklore and so on, we begin to see what he means in a marine context. Mr. Nugent has succeeded in interesting schools and other groups in Scotland in a fair radius around his home and is now hoping for more formal seminars with teachers and educators.

Your editor was shown some of the work produced by 10-year old school children inspired by his projects and it looked very interesting. Contact address: J.J. Nugent, 37 Waverly Court, Ardenslate Road, Kirn, Dunoon, Argyll.

**

INTERTIDAL WELCOMES CAR-LESS DRIVERS. Want to make a momentous sacrifice to Neptune? Try driving your car on the beach. From the window of the Newsletter office it is possible every summer to watch a succession of hitherto cheerful but suddenly bereft motorists whose cars are stuck in the intertidal sand. Your editor sees up to a dozen cases a year (and once, long ago, suffered the same fate himself while shore collecting with a van, alone and miles from anywhere). The worst case is when the rising tide just touches the car's back wheels, turning the sand into thyxotropic soup; this happens especially to people launching boats from trailers; time is of the essence here. There are two cures (a) surround the car with 6 - 10 people and heave, (b) run to the nearest farm for a tractor. Trying to drive the car out almost always makes it worse. If you must drive on the beach, stay close to the high water mark. It gives you more time!

**

BRIDLINGTON BOUND. "Bridlington Harbour - Its Plants and Animals" is a spiral-backed volume produced as the result of a project carried out by a group of students of the Adult Education Department of Hull University. The enterprise was supervised and coordinated by Member D.B. Lewis, Lecturer in Adult Education. The publication, 120 pages long, is mostly an annotated and illustrated marine fauna list, including the sea birds. It is a book published by students for students and as such is well worth the £1.70 it costs (from Adult Education, Hull University). The twenty-two pages of photographs with which it opens give a fine impression of the Bridlington littoral and constitute a very helpful introduction to the text. Student groups elsewhere, please copy.

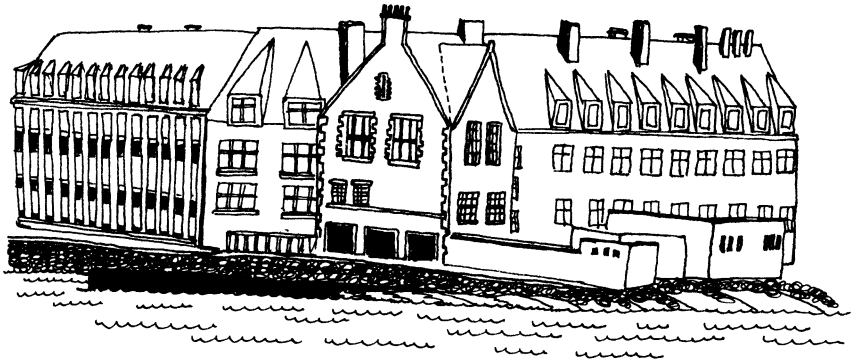
**

SYMPOSIA OF THE ZOO. SOC. NUMBER 34 - A SERIOUS OMISSION. In "The Biology of the Hystricomorph Rodents", ed. I.W. Rowlands and B.J. Weir, 1975, xx + 482 pp. £27.20, which claims to be a comprehensive account of the world's porcupines, the contributors have signally failed to mention our own Thalassiohystrix scuba Smith & Heppell, the type specimen of which, complete with its red holotype spot, is currently eating a dish of small whiting and sea lettuce at your editor's feet. More details of this remarkable beast in the next issue.

**

SPLASH....SPLASH....SPLASH.... How many tins do you suppose are thrown over the side from the world's ships each day? Ten thousand? Fifty thousand? Five hundred thousand? Wrong. Seven million is right. Member Paul Horsman, a marine biologist currently serving with the British merchant fleet, who made this estimate, told PN that dumping of waste is often illegal, e.g., in enclosed waters. The alternative to breaking the law is to bag the rubbish up and pay for it to be removed at the next port. What happens to it then? The port authorities collect it and as often as not take it to sea and dump it.

*****



Around the Marine Laboratories.

Number 3.

Station Biologique de Roscoff

One among Europe's oldest marine laboratories, Station Biologique de Roscoff, was established in 1872 by Professor Henri de LACAZE DUTHIERS, and was initially dependent on the University of Paris. In 1945, C.N.R.S. (Centre National de la Recherche Scientifique) added its own laboratory (Laboratoire d'Océanographie et de Biologie marine) to the Station, and by a mutual accord between the University of Paris and C.N.R.S., the Station Biologique de Roscoff is governed jointly by these two since 1947. This happy union, besides increasing the budget of the laboratory, also increased the laboratory space by way of two new buildings constructed in 1954 and 1967.

The scientific work of the Station centres largely on team work. The three major lines of research are oceanography, animal biology and plant biology. Oceanographers are interested in understanding the functioning of the benthic ecosystems. Recently, the scope of oceanographic research has been enlarged to cover oil pollution and marine chemistry. Animal biologists study ecophysiological aspects and developmental biology in marine animals. The abundant benthic macroalgae along the west Brittany coast keep the plant biologists occupied with their studies on algal ecology and physiology. Two permanent field units of ISTPM (Institut Scientifique et Technique des Pêches Maritimes) and CNEXO (Centre National pour l'Exploitation des Océans), engaged in fisheries and littoral environment research add to the scientific activities of the laboratory.

The Station receives every year a quite respectable number of French and foreign scientists with their own programmes of research for which they are provided laboratory space and working facilities. Many French and European universities also make use of the laboratory facilities to teach their own students. Living accommodation is available for about 100 scientists and students and the Station Canteen provides food at subsidized rates. The Station itself conducts Easter and summer courses in marine biology for students from all over Europe.

Other facilities include boats, library and salt-water aquaria. The fleet of 3 boats ranging in length from 7 to 17 m permits near-shore and offshore work. The library receives every year about 500 journals in oceanography and biology, and almost all of them are available right from their first numbers. Besides the running seawater aquarium to hold study animals, the old Lacaze-Duthiers building also houses the public aquarium and marine museum. In fact, the latter is a major attraction for the tourists in summer.

Another attraction for scientists and students alike is the rich diversity of animals and plants in the intertidal area. The strong tides expose vast stretches of intertidal zone and facilitate easy collection of specimens. Many who forage the intertidal zone can collect any specimen they want, besides the sea-food they can take home for dinner. A lucky one at equinox tides can even pick up a lobster!

Since 1960, the Station publishes an international journal· "Cahiers de Biologie marine", and the scientific publications of the resident staff and visitors also come out as "Travaux de la Station Biologique de Roscoff".

Station Biologique, Place Georges Teissier, 29211 Roscoff, France.

*****

Letters to the Editor

FROM Member (name and address supplied).

Dear Editor, I was pleased to receive the November Newsletter but I think it is giving insufficient attention to people who are not expert marine biologists. Just a few people seem to write most of the articles and there are too many long lists. There is no need to turn the Newsletter into reports of the first seagull in spring but could you not find more room for matters of general interest to everyone in Porcupine. Please leave some space for those who are not specialists.

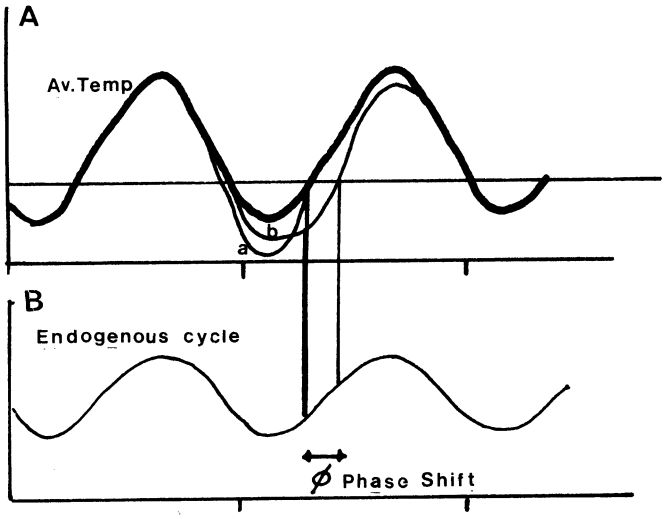
PN replies: Records of animals and plants can never be too many, although they may need summarising for publication. We believe Porcupine is not much about specialisation but a good deal about recording and getting the best out of our identification, as this issue shows. Perhaps other Members have views on these points.

**

FROM Member P.J.W. Olive, Dove Marine Laboratory, Cullercoats, North Shields, Tyne & Wear.

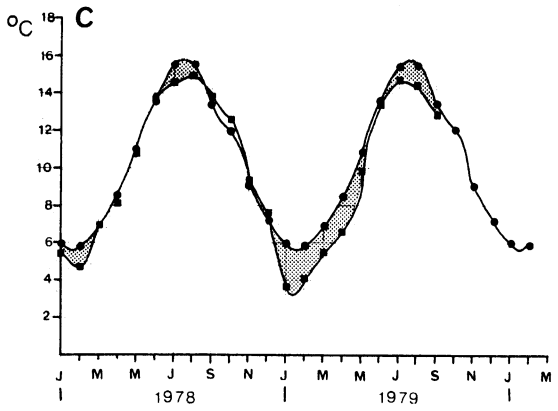
Dear Editor, What constitutes a cold winter? This year we experienced some of the coldest conditions on record but will these have any serious effects on the marine fauna? These questions are prompted by our earlier observations that in some years marine invertebrates may become gravid and sexually mature as usual, yet fail to release gametes.

Instead the gametes are resorbed during a prolonged period of spontaneous oosorption. We observed reproductive failure in this way in two species of polychaete, Nephtys hombergi and Eulalia viridis, in the breeding season of 1979. We don't know whether the breeding failures were caused by low temperature or by an abnormally protracted winter and



A. Annual cycle of average sea temperatures and perurbations representing -
(a) extremely cold winters, e.g. 1981-1982,
(b) cold and prolonged winter, e.g., 1978-1979.

B. Endogenous cycle of annual periodicity, note phase change caused by (b).



C. Temperature anomaly for surface water at Cullercoats Bay in 1978 and 1979, with periods of negative temperature anomaly shaded.

cold summer but the latter is a distinct possibility. It is intriguing that some others making detailed field studies have also seen reproductive failure or recruitment failure for the 1979 year class. J. Lewis, for instance, at Robin Hood's Bay, tells me of a virtual absence of any recruitment of Patella vulgata for 1979 and in a paper at a meeting of the International Society for Invertebrate Reproduction in Newcastle on Tyne last September, M.A. Carter and A.U. Larkman described oocyte breakdown in Actinia species and I believe these observations were on animals collected in 1979.

Through your pages I should like to ask if any Member observed any marked perturbations of reproductive cycles in marine organisms in 1979?

To return to my first question: what constitutes a cold winter. Will 1981-2 turn out to be a cold winter in terms of the reproduction and recruitment of species nearing their northern limits of distribution? If a cold winter is defined by the minimum temperature reached, it should be. In January of this year we observed ice on beaches, frozen rock pools, frozen algae, etc., and the sea surface temperature at Cullercoats fell to about 2^{o}, 3^{o} below the seasonal average. But it has now returned to a normal value. The winter of 1978-9 was not as cold but it was protracted and was followed by a cool summer; my sketch shows the temperature anomalies for 1978-9. The sea surface temperature was 1 - 2^{o} below the running mean for the previous ten years from December till May and the summer sea temperatures were similarly 1 - 2^{o} below the running average.

Perhaps a prolonged period of low temperatures has a more profound effect than a spell of extremely cold weather in mid winter. This idea could be expressed another way; a prolonged negative temperature anomaly interferes with the phase relationship between the temperature cycle and other cycles such as that of photoperiod or, and this may be important, the cycle of a free-running biorhythm with an annual periodicity.

In contrast, a period of extremely cold temperatures in mid winter such as we experienced this year does not necessarily alter the phase relationships of the biological and climatic annual cycles, it alters only the amplitude of the temperature cycle.

I should be extremely interested in hearing from other Members who may have noticed any effects of cold winters on the breeding of marine invertebrates and any comments on my speculations about "cold winter effects".

*****

NOTICES

NOTICE I. PROPOSED ROSELAND MARINE CONSERVATION AREA (In Carrick Roads, Fal Estuary)

From Member Stella M. Turk, Extra-Mural Department, Exeter University.

A group has been formed with the object of creating a Marine Conservation Area in the Roseland district, to include shore and shallow water on the landward side of the navigation channel. Such a conservation area will not interfere with existing commercial usage, but is intended to lessen the chance of inadvertent damage by avoidable interference and pollution. To this end, the voluntary collaboration of all users is sought.

IMPORTANCE OF AREA

The whole area is considered by marine scientists to have national importance for a number of reasons. Off-shore, St. Mawes

or Vilt Bank is of great interest in being the only significantly-sized bed of living mearl (unattached nodules of calcareous seaweed) in South Britain. Maerl, dead as well as living, has a very restricted distribution in Europe. Zostera or eel-grass beds occur on the shore side of the Bank and also near Amsterdam Point. Both the mearl and soft muddy sands shelter rare plant and animal communities. The stretch between Place Cove and Amsterdam Point as well as Place Cove itself, are particularly important sections of this fully marine inlet, and such inlets, or rins, in England are unique to Cornwall and Devon. On shore there is a rich assemblage of marine animals, many of them species elsewhere found only off-shore, and a number of them rarities. Formerly Zostera was found between tide-marks and it is hoped that with protection it will again grow here. From St. Just-in-Roseland to Castle Point there is substrate varying from silt through sand and pebbles to slate cobbles, the last providing cover and shelter for very many species and for vast numbers of individual animals. Zostera comes into the intertidal zone below the National Trust property, Newton Cliff, and the whole length of shore from St. Just to St. Anthony Head is fringed with reefs of varying width, with rock pools and text-book zoning of seaweeds. In Percuil River there are important oyster beds as well as mud communities of various species.

PROTECTION

This unique combination of sites and communities is delicately balanced and there are signs, i.e., the disappearance of Zostera intertidally, that there is need to control digging for bait and/or zoological specimens.

An essential aspect is monitoring the area with frequent checks on water quality, as well as biological observations and measurements. Such care would be to the advantage of all concerned.

Initially sponsored by Cornwall Nationalists' Trust and Department of Extra-Mural Studies, University of Exeter.

**

NOTICE 2. INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE

From R.V. Melville, Secretary, ICZN,
British Museum (Nat. Hist.)

The ICZN is in financial difficulty. At a meeting on 30 March in the Royal Society rooms, chaired by Lord Cranbrooke, it was proposed to approach zoologists by means of a brochure circularised with learned journals, appealing for funds. While the response is not expected to cover the deficit it is then planned to appeal to the various trusts, armed with the goodwill of working zoologists. Porcupine supports this appeal.

*****

A TAXONOMIC KEY TO THE BRITISH MARINE MITES OF THE HALACARIDAE

R.N. Bamber
Marine Biological Unit, C.E.G.B., Fawley, Southampton.

INTRODUCTION

Since Green (1960) bemoaned the back of a single account which could be used to identify all the British species of the Halacaridae, no such work has appeared to ease the problem, and workers in this group must still rely upon such more general European keys as Andre' (1946) or Viets (1936). Owing to the age and zoogeographic limitations of these papers, they inevitably include non-British species, which can lead to unnecessary work, time-wasting and misidentification, and do not include species added to the fauna more recently.

In an attempt to fill this void in the literature, the following is a key to the marine species of the Halacaridae which have been recorded in British waters, based upon the check-list published by Green (loc. cit.). It should be mentioned that the upper shore may harbour non-halacarid mites which are more properly regarded as terrestrial immigrants into the marine environment. Neither these, nor the freshwater species of the Halacaridae are mentioned in this key.

The techniques for preparation of mites as generally quoted for terrestrial and parasitic acarines, such as piercing the body with a needle to remove the contents, are generally inappropriate for the very small marine forms. These are better mounted in polyvinyl lactophenol together with a grain or two of Lignin pink; after a couple of days the body is sufficiently cleared, and the sculpture of the dorsal surface, often necessary for identification, is discernible.

The terminology of the key has been kept as simple as possible for the benefit of the non specialist, but some terms may require explanation. The head region, carrying the mouthparts, in all mites is termed the capitulum and, for taxonomic purposes, the major appendages borne on the capitulum are the palps or pedipalps. The dorsal surface of the body is characteristically ornamented by four plates or shields (e.g., Figs. 6, 9), an antero-dorsal and a posterodorsal plate in the mid line (these two are fused in Isobactrus uniscutatus) and, lateral to the space between these two, a pair of ocular plates which bear the eyes.

Distributional information on this group is lacking, owing to the limited amount of research on and specific identification of marine mites. Hopefully this key will help to rectify this lack.

Key to the sub-families

1. *First leg bearing extension on tibia, acting in prehensile opposition to tarsus (fig.1); palpi 3-segmented (SIMOGNATHINAE) 6*
   First legs not prehensile; palpi 3- or 4-segmented 2

2. *Maxillary palps forming prehensile apparatus with extension of capitulum (hypostome) (fig.2) (LOHMANNELLINAE) 7*
   Palpi and capitulum not contributing to an opposed prehensile apparatus 3

3. *Palps elongate, separate, lateral on anterior of capitulum 4*
   Palps very short, adjacent at centre of capitulum 5

4. *External genital suckers present (F.W. or brackish)(POROHALACARINAE)..9*
   Genital suckers never external (HALACARINAE) 24

5. *Ocular plate present (RHOMBOGNATHINAE) 10*
   No ocular plate - ACTACARINAE (No British species)

Sub-family Simognathinae:

6. *Simognathus minutus (Hodge,1863) - Only recorded British Species (ocular plates present)*

Sub-family Lohmannellinae:

7. *Rostrum not widening distally (Fig 3) .....Lohmannella falcata (Hodge,1863)*
   Rostrum widening distally(Fig 4) .(Scaptognathus).....8

8. *Palp terminating in 3 spines,the centre one long and slender.... S.tridens Trouessart,1889.*
   Palp terminating in 3 spines, the centre one a small bluntly pointed lobe armed with a long fine hair ..... S.trouessarti Halbert,1915.

Sub-family Porohalacarinae:

9. *Caspihalacarus hyrcanus Viets, 1928 - Only recorded British species*

Sub-family Rhombognathinae:

10. *Median claws present on 1st. and 2nd legs 11*
    Median claws absent on 1st and 2nd legs 17

11. *Median claws present on 3rd and 4th legs 12*
    Median claws absent on 3rd and 4th legs 15

12. *Median claw shorter than lateral claws, at most 3/4 x its length; ocular plates with one cornea; lateral claws with comb 13*
    Median claw nearly or as long as lateral claws; ocular plates with two corneae: claws. simple ...(Metarhombognathus)..... 14

13. Median claw 3/4 the length of lateral claws; a pair of setae in membranous area between antero-dorsal and postero-dorsal plates .....*Rhombognathides mucronatus* (Viets 1927)
Median claw 1/2 the length of lateral claws; all dorsal setae within plates .....*R. seahami* (Hodge,1860)

14. Lateral claws bifurcate or trifurcate at end ...*M. nudus* (Viets,1928)
All claws simple and hook-like .....*M. armatus* (Lohmann,1893)

15. Lateral claws with comb .....*Rhombognathides pascens* (Lohmann,1899)
Lateral claws simple, not pectinate 16

16. Two corneae on ocular plate; median claw as long as lateral claws .....*R. trionyx* Trouessart,1900
Single cornea; median claw smaller than lateral claws .....
.....*R. merrimani needleri* (Newell,1947)

17. Front edge of body extended dorsally into a hood over the capitulum.(Fig.5). ..(*Isobactrus*).....22
Front edge not extended into a hood; capitulum cisible from above (Fig.6).....18

18. Claws with a comb of 5 to 20 teeth...*Rhombognathus magnirostris* (Tr.1889)
Claws without a comb 19

19. Claws with accessory tooth .....*R. notops* (Gosse,1855)
Claws without accessory tooth 20

20. Ocular plate with two cornae.....*R. lionyx* (Tr.1900)
Ocular plate with single cornea 21

21. Stout dorsal spine on tarsus - *R. spinipes* (Viets,1953)
No stout dorsal spine on tarsus - *Rhombognathides merrimani merrimani* New 1947.

22. Antero- and postero-dorsal plates fused - *Isobactrus uniscutatus* (Viets,1939)
Dorsal plates separate 23

23. Claws with well developed comb projecting medially from the shaft of the claw .....*I. setosus* (Lohmann,1889)
Claws completely smooth .....*I. levis* (Viets, 1927)

Sub-family Halacarinae:

24. Body flat and wide: first legs at least twice as thick as second legs .....*Agauopsis brevipalpus* (Trouessart,1889)
Body convex; first legs only slightly stouter than second 25

25. *Penultimate palp segment with spinous process (Fig.7) .(Halacarus).....34*
Penultimate palp segment with no such process ...(Copidognathus) 26

26. *Ocular plate elongated as a point posteriorly, tapering often to the posterior of the body 27*
Ocular shield rounded posteriorly OR if pointed then not prolonged to a tapering point 29

27. *First and second legs slender, the 3rd and 5th segments evenly cylindrical ...C.gracilipes (Tr.1889)*
First and second legs robust, the 3rd and 5th segments thickened 28

28. *Legs with foliaceous lamellae .....C.gibbus (Tr.1889)*
Legs without lamellae .....C.oculatus (Hodge,1863)

29. *Hypostome narrow with parallel sides (Fig.8)..C.granulatus (Hodge,1863)*
Hypostome wide to triangular 30

30. *Ocular shield rounded posteriorly ....C.fabricii(Lohmann,1889)*
Ocular plate pointed posteriorly 31

31. *Hypostome not reaching the middle of the 2nd palp segment .....C.rhodostigma (Gosse,1855)*
Hypostome reaching past the middle of 2nd palp segment 32

32. *Antero-dorsal plate with concave posterior outline, wider anteriorly (Fig.9).....C.loricifer Andre,1946*
Antero-dorsal plate convex at posterior edge or wider posteriorly.....33

33. *Frontal edge drawn to a point (Fig.10)....C.lamellosus (Lohmann,1893)*
Frontal edge of body truncate .....C.tabellio (Tr.1894).

34. *First and second legs with fourth segment nearly as long as or longer than 3rd and 5th segments (Halacarus s.str.) 38*
First and second legs with 4th segment distincly shorter than 3rd and 5th segments (s.g.Thalassarachna).....35

35. *Antero-dorsal plate drawn out into a prominent frontal spine .....T.basteri (Johnston,1836)*
Antero-dorsal plate truncate anteriorly, not pointed 36

36. *Elongate sclerite in membraneous area behind ocular plate, cornea absent .....T.subterraneus (Schulz,1933)*
No elongate sclerite behing ocular plate 37

37. *3rd segment of first leg dorsally strongly humped (Fig.11).....*
.....T.southerni (Halbert,1915)
3rd segment of first leg uniformly slender ....T.areolatus (Halbert,1915)

38. *Ocular plates well developed; anterodorsal plate not extended into a thin rostrum (fig.12.) .....H.ctenopus (Gosse,1885)*
No ocular plate; anterodorsal plate extended into a thin rostrum. (fig.13).....39

39. *Dorsal posterior plate present .....H.bisulcus (Viets,1927)*
Dorsal posterior plate absent .....H.actenos Trouessart,1889.

FIGURE LEGENDS:-

Fig. 1 *Simognathus sculptus;* first leg.
Fig. 2 *Lohmannella falcata;* capitulum, lateral.
Fig. 3 *L. falcata;* capitulum, ventral.
Fig. 4 *Scaptognathus tridens;* capitulum, ventral.
Fig.5 *Isobactrus setosus;* ventral.
Fig.6 *Rhombognathus notops;* dorsal
Fig.7 *Halacarus balticus;* palp
Fig.8 *Copidognathus glyptoderma;* capitulum, ventral.
Fig.9 *C.loricifer;* dorsal.
Fig.10 *C. lamellosus;* dorsal.
Fig.11 *Thalassarachna southerni;* basal segments of first leg.
Fig.12 *Halacarus ctenopus;*"rostral" extension of antero-dorsal.
Fig.13 *H. bisulcus;*"rostral" extension of antero-dorsal plate.

REFERENCES

Andre', M., (1946) Halacariens marins. Faune de France, No. 46, 152 pp.

Green, J. (1960) A check-list of British marine Halacaridae (Acari), with notes on two species of the sub-family Rhombognathinae. Journal of the Marine Biological Association of the United Kingdom, 39, 63-69.

Viets, K., (1936). Wassermilben oder Hydracarina (Hydrachnellae und Halacaridae). In: Dahl, Tierwelt Deutschlands, 31, pp. 1-574.

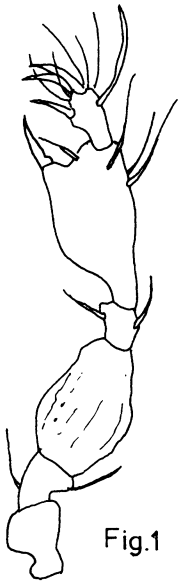
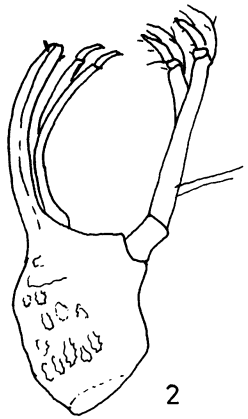
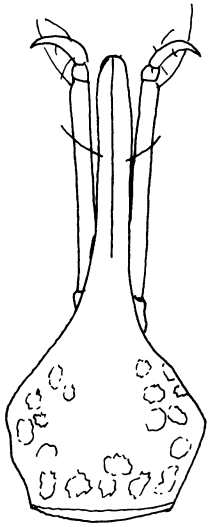


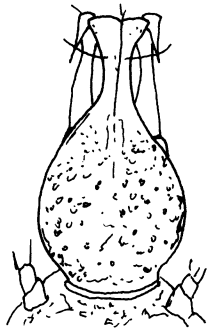
Fig.1



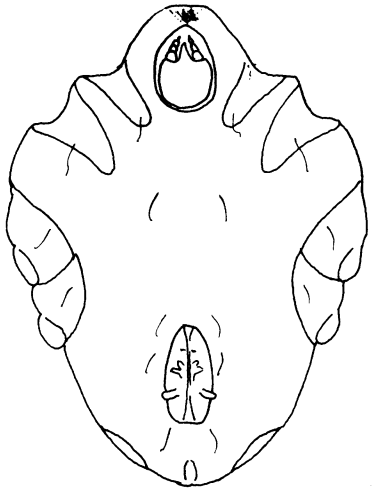
2



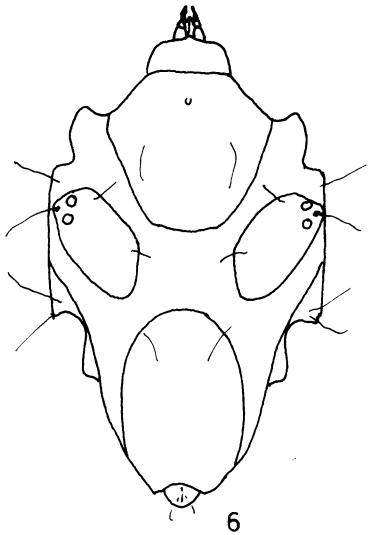
3



4

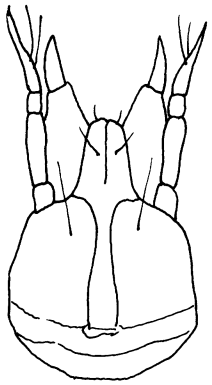


5



6

7



8

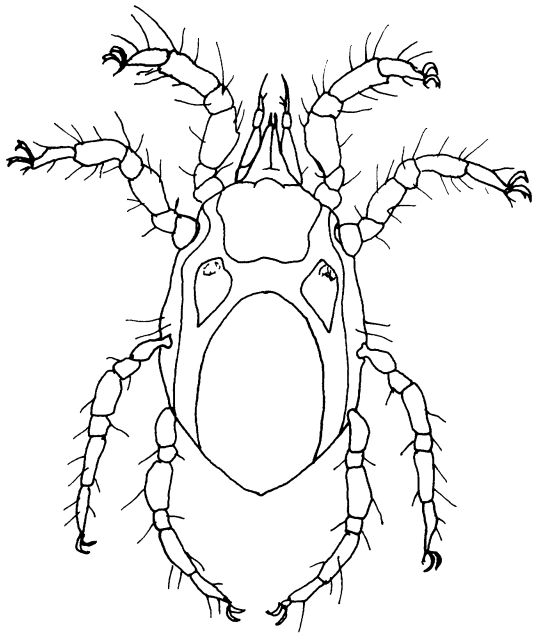
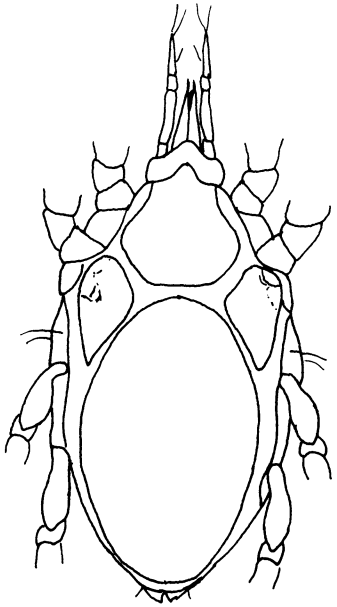
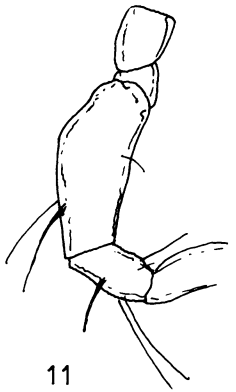


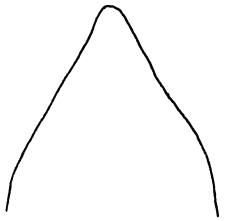
Fig. 9



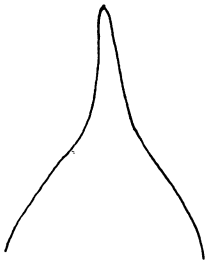
10



11



12



13

COLUS (MOLLUSCA: GASTROPODA) ON PORCUPINE BANK: SHELL MORPHOLOGY IN RELATION TO DEPTH AND SUBSTRATE

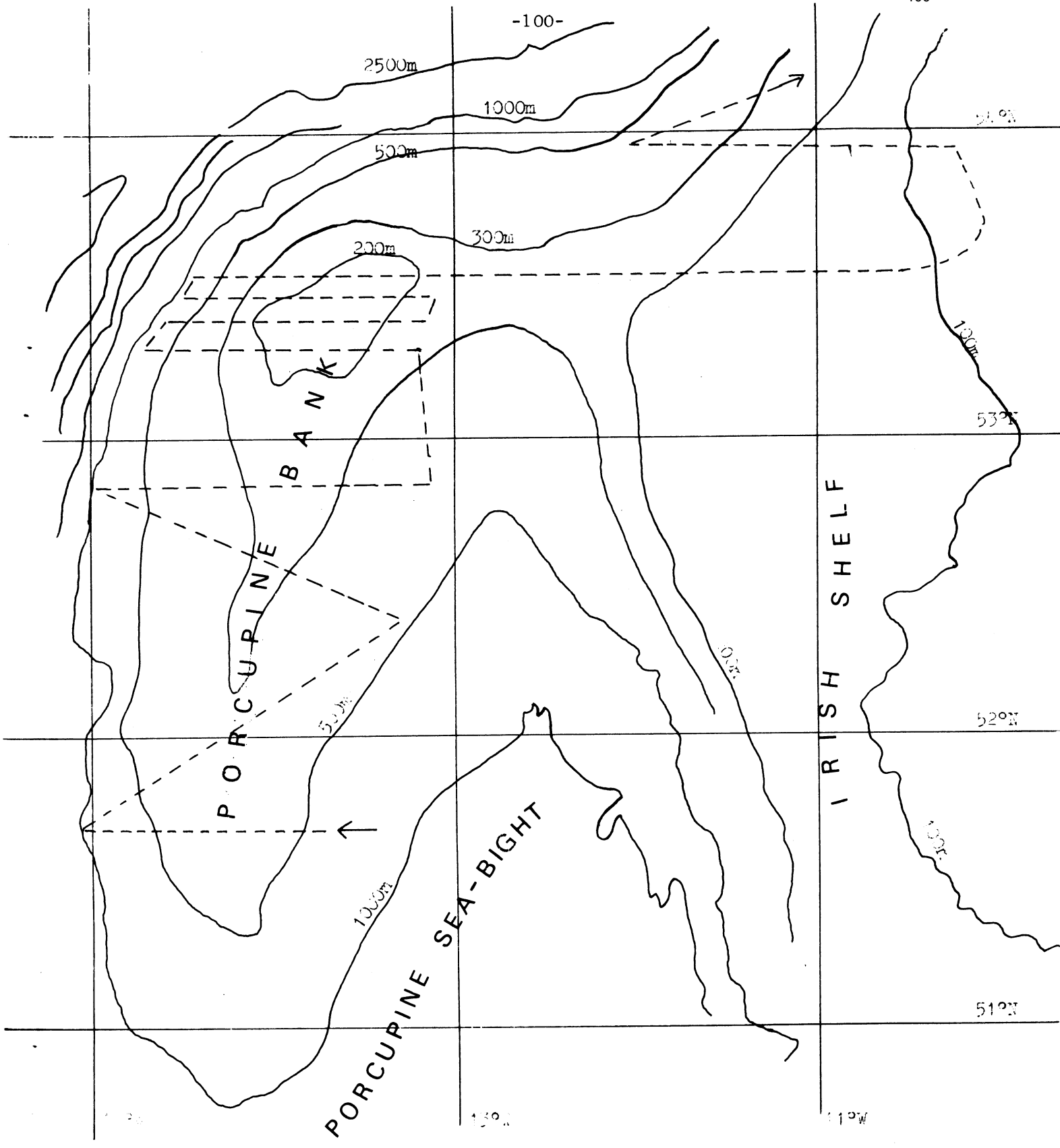
Shelagh Smith
The Royal Scottish Museum, Edinburgh.

Porcupine Bank is an oval bank to the west of Ireland. The top plateau (reaching 165 m) is largely composed of sand, pebbles, and boulders. It is connected to the Irish Shelf by a broad ridge (fine sand) just under 300 m deep. The north and west sides of Porcupine Bank are rocky and drop steeply into the abyss but the south and southeast (find sand and silt) slope gently into the Porcupine Sea-bight.

Colus is a polymorphic genus which has attracted many specific names largely because it exhibits clines controlled by substrate, depth and temperature. Nine distinct shell forms were identified from specimens obtained alive from the Porcupine Bank area during "Challenger" cruise 11/81 in July 1981. These forms exhibited degrees of correlation with septh and substrate. In this small area the temperature was found to be wholly within the range 12^{o}-14^{o}C. Sampling was by rock dredge and pipe dredge in tandem, Colus were obtained from 23 stations, a total of 114 specimens, divided on their morphology into 30 lots. Few stations contained more than one form and if so, one of them was always form I ('togatus'). Since the identifications of some forms is not yet certain, and it is likely that some will fall within the same species, the nomenclature given below is provisional.

Form	No. of specs.	No. of stations	Substrate	Depth
A (islandicus)	2	2	pebbles & sand	500-700m
B (gracilis)	12	2	pebbles & sand	<200m
C ('hirsutus')	8	3	pebbles & sand	200-300m
D ('howsei')	48	9	sand	200-400m
E	1	1	boulders & muddy sand	400-500m
F ('jeffreysianus')	3	3	pebbles & sand	200-700m
G ('marshalli')	20	2	boulders & pebbles	500m
H	3	2	rock	900m
I ('togatus')	16	8	pebbles & sand, boulders, rock	<900m

The clearest correlations of ecology and morphology are shown by the larger forms, form B being found only upon the top of the bank in the shallowest water, being replaced by forms C and D below 200 m. Form C preferred a finer substrate and was found only on the northern flank of the Bank and on the northern side of the Irish Shelf, whereas form D occurred in an arc around all but the northern end of the bank. The distinctive form I was remarkably ubiquitous. Form G occurred on a hard substrate and at a similar depth to that at which I have found it on the



Course of "Challenger" ———————

Rockall Bank.

These notes are for interest only; further information might confirm or confute the relationships suggested here.

*****

THE TYPE SPECIMEN OF THE SPONGE GEODIA GIBBEROSA LAMARCK 1819

Fred. R. Woodward
Natural History Department, Kelvingrove Museum, Glasgow

A fragment of sponge in Kelvingrove Museum is considered to be of holotypic status belonging to the species described by Lamarck in 1819 under the name Geodia gibberosa. Lamarck.

This important find resulted from the discovery of the following letter from James Scott Bowerbank F.R.S., F.L.S., F.G.S., amongst some miscellaneous papers associated with the Reverend Dr. John Fleming's herbarium in the Natural History Department's collections.

"My Dear Sir,

Since I had the pleasure of writing to you I have received portions of the two specimens of Lamarcks Geodia gibberosa from the Paris Museum and have carefully examined them. They both belong to the same species, and what will not surprise you a little, they are identical both generically and specifically with your specimen from Dominica, which, in truth, is neither more nor less, than the best Known specimen of Geodia gibberosa Lamarck. The hollow interior of the Paris specimens is caused by the fleshy central mass having been scooped out to facilitate the drying. The inner surface thus made is covered by no membrane and it is readily apparent by the microscope that the fasciculi (? passing) from the inside of the crust, are there bent right and left and are in a crushed and maimed condition - unmistakably evincing an unnatural surface. Like your specimen from the West Indies they have both been washed and macerated in water to such an extent as to entirely destroy the dermal membrane and the pores but there are plenty of remains of the hair-like external spicula. The form, proportions, mode of arrangement of the spicula and every other organic character are in perfect accordance in all the three specimens, and these characters differ so much from those of any other known species as not to allow of a doubt of their identity. This is to me an unexpected result and that you may be the better enabled to satisfy yourself I send you a portion of the specimen from Martinique, the type of Lamarcks Geodia and you will find portions of both the exterior and interior surfaces.

I hope the box containing your treasures has reached you safely. I conveyed it to the Gt. Northern Railway myself to ensure its safe delivery to that extent.

I remain, My Dear Sir,
Yours respectfully,
J.S. Bowerbank"

Recd. Prof. Fleming D.D.S.

Bowerbank's letter affords an interesting insight into the attitude Victorian Scientists placed upon the importance of type material. From his remarks it is apparent that he considered the original type material to be of immense value in determining the true nature of a particular species and yet, at the same time, gave little regard for its future preservation. His readiness to remove fragments in order to afford Professor Fleming with authentic material for study evinces a conflict of scientific zeal for accuracy coupled with total disregard for future nomenclatural stability, a failing so universal at that time.

Subsequently the importance of Bowerbank's letter has been enhanced by the discovery of a small pill box containing a sponge fragment in Fleming's collection and inscribed in blue ink Geodia gibberosa lamarck in Bowerbank's characteristic hand. An examination of this fragment confirms its identification and due to its associated documentary evidence must be considered as being primary type material.

James Scott Bowerbank, F.R.S., F.L.S., F.G.S., was born in Bishopgate, London, on July 14th 1797 and died 8th March 1877.

In 1847 Bowerbank was instrumental together with William Buckland (1784-1856), Henry Thomas De la Beche (1796-1855), William Henry Fitton (1780-1861) and others in the establishment of the Society for the publication of undescribed British fossils, namely the Palaeontographical Society.

In 1865 his extensive collections comprising 1189 lots were auctioned at Stevens sales room 27th November to 1st December inclusive. The British Museum (Natural History) at South Kensington purchased the major portion for the Nation.

The Reverend John Fleming, D.D., F.R.S.E., was born at the farmhouse of Kirkroads, near Bathgate, on the 10th January 1785 and died on the 18th November 1857. His natural history interests were wide ranging, thus in 1807 he published a paper on Papa Stour, one of the Shetland Islands, whilst his botanical achievements were referred to in 1809 by Robert Maugham in his list of plants around Edinburgh in the Proceedings of the Wernerian Society. Fleming's writings numbered one hundred and twenty nine but perhaps his best known was "British Animals" published in 1828.

During his lifetime his scientific reputation was in high esteem and since, at that time, Edinburgh provided a central arena for the Arts and Sciences his correspondents and friends were of the highest stature. As a result he amassed extensive and highly important collections in all branches of Natural Sciences. Many of his minerals and plants are now in the possession of Kelvingrove Museum, Glasgow, whilst others are in the Royal Scottish Museum, Edinburgh, as well as the British Museum (Natural History), London.

In his redescription of the genus Geodia Bowerbank, 1864 page 168, refers to Lamarck's type of Geodia gibberosa:-

"The type specimen of Lamarck's Geodia gibberosa in the Museum of the Jardin des Plantes of Paris, the organization of which, through the kindness of Professors Milne-Edwards

and Valenciennes, I have had an opportunity of thoroughly examining, is unfortunately in so deteriorated a condition in many respects, and especially in regard to the dermal membrane and pores, that I have been induced to select G. Barretti from which, to a great extent, to describe the interesting and highly organized structures of this genus; and I have the advantage also in this species of having a portion of a specimen which has never been deteriorated by drying, having been pickled in strong salt and water immediately on being taken from the sea, by my friend Mr. McAndrew, and in this state it closely resembles a mass of somewhat indurated animal lives."

In 1866 Bowerbank - further refers to Professor Fleming's specimen in the description of Geordia zetlandica Johnston:- Volume 2 on page 49 thus:-

"When Dr. Fleming favoured me by sending to me the type specimen of his Cydonium mulleri, he sent with it two other specimens; one of them is labelled, "From the island of Dominica, in the West Indies," and proved to be Geordia gibberosa, of Lamarck."

REFERENCES

Fleming, J., 1828. 'History of British Animals'. Edinburgh.

Bowerbank, J.S., 1864. "Monograph of the British Spongiadae", Volume 1. Roy. Society, London.

Bowerbank, J.S., 1866. "Monograph of the British Spongiadae", Volume 2. Roy. Society, London.

Lamarck, 1819. Mem. Mus. Hist. nat., Paris, 1 (4), 334.

*****