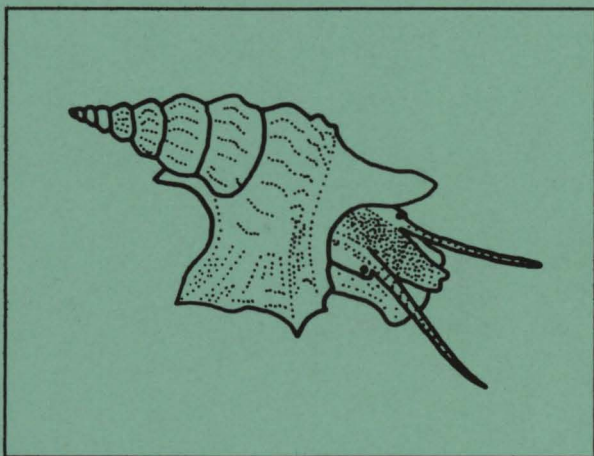


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Shell collecting in the ancient Mediterranean

Janet Ridout Sharpe

Reading

Shells are well-known from archaeological sites all around the Mediterranean. Some quite impressive species lists have been produced by conchologists in the past (for example, Dance, 1961) but until recently few attempts have been made to interpret them: why were they collected and what were they used for?

I have been working sporadically, over the last 15 years or so, on the molluscan remains found on some Neolithic and Chalcolithic (Late Neolithic/Early Bronze Age) sites on Cyprus, dating from about 5000–2500 BC, which have been excavated by a team from Edinburgh University. With flotation techniques, even the really small shells and fragments of shells are included in the boxes of dusty specimens that I receive for analysis. On close examination, these boxes usually contain a wide range of species with examples from marine, freshwater and terrestrial habitats. By linking the specimens with their 'context', which is the archaeological layer, deposit or feature in which they were found, it is sometimes possible to make an educated guess as to how the shells got there and for what purpose they were used. An obvious example is the neat rows of *Dentalium* shells from graves which are interpreted as necklaces used to adorn the dead (Pinn, 1995). Masses of limpets and topshells (mostly *Monodonta turbinata*) in midden deposits have to be food remains, especially when the intact limpet shells show marginal damage where they have been prised off the rocks, showing them to have been collected live. Interestingly, the average size of the limpets tends to be small, suggesting the over-exploitation of the local population (or simply that the smaller individuals were easier to collect). The presence of freshwater species can indicate that a nearby gully that has been dry in living memory once supported a perennial stream and water supply.

An unexpected discovery was the presence of masses of tiny *Truncatella subcylindrica* on the debris of collapsed buildings at

the Neolithic site of Ayios Epiktitos Vrysi on the north coast of Cyprus. Too small to have been deliberately collected in such large numbers, these snails must have been gathered in maritime mud or vegetation used in building construction. Land snails are always numerous. Many comprise species of *Ceciloides* and related genera and not surprisingly most of these are found in graves. Rock-dwelling species, such as *Caracollina lenticula*, are also common in graves, suggesting both that the grave was originally left as an open chamber and that it maintained some connection with the surface, either a gap left for libations to the dead or simply a loosely-fitting capstone. Most of the land snails are typical of dry, open areas, similar to much of Cyprus today, showing that the landscape had already been cleared of trees by the Neolithic. Conspicuous by its absence is the large synanthropic snail *Helix aspersa*, suggesting that it had not yet been introduced into Cyprus.

Other species are not so easy to interpret. *Murex brandaris* is common and its presence automatically conjures visions of rich garments dyed with Tyrian purple. However, these shells are far older than the earliest evidence for the use of this species for dye production in the Mediterranean (c. 1600 BC) and their context in midden deposits together with limpets and topshells suggests that they were simply eaten. Beach-worn shells are frequently found on house floors and here the real problems begin. Some shells, particularly cowries with their slit-like aperture which has been seen to resemble the female genitalia and is therefore associated with fertility, may have had a religious or symbolic function. Cowries are not particularly common on archaeological sites in Cyprus, although there are always some to be found. Instead, other shells with slit-like apertures are common, especially *Columbella rustica*, and are found in various contexts including graves. Even very beach-worn specimens are found, showing that this species was particularly prized. Is it possible to assign a talismanic function to this small shell? We tread on dangerous ground here, but in this particular case there are living memories of this species being prized by Greek women as a love charm (Biggs, 1963).

Archaeologists always try to find an explanation for items that have been brought into a site, assuming a specific function for these items because why else would they have been introduced? Again context comes to the rescue here: shells, especially good specimens, from graves can fairly safely be interpreted as gifts for the dead. But how much further can we go? There has been a tendency to attribute symbolic, usually sexual, connotations to most of the species whose function is not immediately obvious. *Glycymeris* spp., for example, are common on Cypriot sites and some specimens have been deliberately perforated at the umbo. Examination with a lens shows fine parallel striae, where the shell has been repeatedly rubbed against a coarse stone to produce the hole. Some shells show only the beginnings of this process and most are completely untouched. The high frequency of *Glycymeris* shells, some of which were collected in a very worn or even broken condition, suggest that they might have had some special significance. However, it is probably safer to assume that they were used for ornamental purposes: their circular shape makes them attractive as beads and pendants.

Relatively few shells show signs of working, and most of those that do appear to have been used as beads. *Dentalium*, of course, requires no working at all (although the narrow end is often broken off to permit threading). Apart from these and *Glycymeris*, the only species that appears to have been used extensively for beads is the small nassariid *Arcularia gibbosa*, which is glossy and smooth, thanks to its extensive callus. All the numerous examples of this species recovered from Ayios Epiktitos Vrysi had rough holes punched in the body whorl and many were found in graves. Surprisingly, very few were found at the slightly later (Chalcolithic) cluster of sites at Lemba north of Paphos. The 'talismanic' species, such as *Cypraea* and *Columbella*, do not appear to have been perforated for wear as charms – so how were they used? Perhaps we shall never know. Personally, I am inclined to attribute many of the beach-worn and unworked shells from archaeological sites as casual gleaning from the strandline. People do not seem to have changed much over the millennia and I am sure Neolithic children (and adults) enjoyed collecting shells as much as their modern counterparts.

Reese (1978) describes shell 'spoons' cut from large *Charonia* shells at the Neolithic site of Cape St Andreas at the tip of the 'tail' of Cyprus. *Charonia* shells appear to have been particularly prized in the ancient Mediterranean and they are usually interpreted as having been used as trumpets for sacred and ceremonial purposes (Renfrew, 1985). Fig. 1 represents an



Fig. 1. A Minoan priestess blowing trumpet: from an engraving on a seal stone found in Crete

engraving from a Minoan seal stone from Crete. It appears to show a priestess, dressed in a long flounced skirt and blowing a *Charonia* shell trumpet. We know it is a religious scene because she is standing in front of an altar which bears the 'horns of consecration', the stylised bull's horns so typical of Minoan religion. I have found numerous *Charonia* shells, mostly very fragmentary, among the molluscan remains from Cypriot sites, covering a wide time span through the Neolithic to the Early Bronze Age. Only one of these fragments appears to have carefully cut edges, suggesting that it may have been manufactured into a spoon. Virtually all the others show no signs of working and most of the apices are intact or appear to have been accidentally broken. In other words, there is little evidence for their use as trumpets. Indeed, they occur in almost all contexts, with the notable exception of graves, and it is tempting to interpret some of the fragments as food remains. Reese (1978) refers to *Charonia* being sold in the fish market of Marseilles. Many of the specimens appear to be beach-worn;

almost all have been severely eroded by the boring sponge, *Cliona celata*. They are not aesthetic objects and they must have had some other function than the purely ornamental. Only one of the specimens, a large *C. sequenzae*, from the Chalcolithic site of Kissonerga, near Lemba, appears to have been deliberately holed at the apex for use as a trumpet. This is a particularly badly eroded specimen and it has been broken, so it is not possible to put its function to the test. If this was indeed a trumpet shell, it is one of the earliest to be recorded from the Mediterranean at c. 3000 BC.

The number of *Charonia* in archaeological contexts far exceeds their relative frequency in relation to other shell species in nature and they must have been deliberately sought out. The living animals are found at some considerable depth and it is possible that they were collected by divers. The most spectacular specimen of all, a magnificent intact *C. sequenzae*, with almost no sponge erosion and 222 mm high, was recovered from a ritual pit deposit at Kissonerga. This remarkable pit contained a bowl which was in fact a model of a Chalcolithic temple, complete with movable doorway. This bowl was accompanied by a series of pottery bowls, numerous burnt stones, clay and stone figurines – and the *Charonia* shell. Peltenburgh (1991) has interpreted this deposit as the consecrated remains of a 'steam bath' ritual when water was poured over hot stones to produce steam, perhaps for purification purposes although there is evidence that this practice was used at childbirth, itself a sacramental process in ancient Cyprus. One of the clay figurines in the ritual deposit shows a woman seated on a low stool, in the process of giving birth. Perhaps the *Charonia* shell was the sacred 'ladle' for pouring water over the rocks to produce the purifying or healing steam? One can but speculate.

Archaeological sites of all periods produce shells and it was with interest that I picked up a few surface examples while exploring sites in Crete last summer. The Minoan site at Kommos on the central south coast of Crete is still being excavated. However, the site is far more extensive than the fenced-off 'dig' and I recovered several limpet shells (mostly *Patella lusitanica*) from what appeared to be a midden deposit eroding from the dunes. Two

apertural fragments of *Murex brandaris* among the limpets suggests that they were eaten as well. In an erosion gully I found a small complete but beach-worn valve of *Glycymeris* sp. and an intact beach-worn juvenile (11 mm) of *Conus mediterraneus*. For comparison, modern specimens collected from the neighbouring beach included *Arca barbata*, *Anomia ephippium*, *Glycymeris ?violascens*, *Mactra corallina*, *Donax vittatus*, *Dosinia lupina*, *Solenocurtus strigillatus* and juvenile *Sepia officinalis* but no limpets.

The neighbouring Graeco-Roman site, behind the headland at Matala, also yielded *Patella lusitanica*, some of which were very small. Another common food species, *Monodonta turbinata*, occurred with the limpets. Other stray finds included *Gibbula* sp., one *Arcularia gibbosa* which had been holed, *Chlamys* sp. – and fragments of *Glycymeris* and *Charonia*, showing that those species so typical of early Chalcolithic sites in Cyprus continued to be collected in Graeco-Roman times, some 5000 years later! A search on the modern beach yielded only a tiny juvenile (9 mm) *Conus mediterraneus* and a beach-worn *Cerithium vulgatum*. Again, no limpets. This produces another line of thought. Matala is famous for its cliff full of rock-cut tomb chambers. Some of these are elaborate affairs with antechambers and 'bunk beds' for the dead carved out of the sandstone. Their age is uncertain but stylistically they would appear to date from the Roman period. Interestingly, some of the tombs are now below the water line, suggesting that the coastline of central southern Crete has submerged in the comparatively short (geologically speaking) period of time that has elapsed since the Roman period. This submergence may have changed the character of the coastline: at Kommos the wide sandy beach produced mainly sand-burrowing species and limpets now appear to be absent or scarce.

Both these sites are on the coast, so sea shells might be expected. Gortyn, the ancient capital of the Roman province of Cyrenaica, which included not only Crete but also most of North Africa, is situated inland on the Messara Plain about 20 km from the sea. This is a vast site and only parts of it have been excavated. Most is buried beneath olive groves and cultivated

fields, the boundaries of which are piled high with column fragments and other masonry debris. Here and there massive stumps of Roman brickwork rise up to 4 m or so above the ploughsoil. No limpets or topshells were found here, but apertural fragments of two large specimens of *Charonia sequenzae* were found near the baths and also most of a large valve of the spiny oyster, *Gaederopus gaederopus*, which still retained its purple coloration. These were all large and (once upon a time) magnificent specimens of their kind. What were they doing at Gortyn and what function did they fulfil? Other fragments included a worn apex of *Trunculariopsis trunculus* near the main gate and a fine, unworn specimen of *Cerithium* sp. in the forum area.

Shells from archaeological sites can tell us a lot about the people who lived there: what they ate and how they adorned themselves. However, it is tempting to interpret too much from the fragmentary remains they left behind. Surface finds in themselves can tell us little: the CONTEXT of the shell is all-important and can distinguish food remains from ornaments and ritual objects. The CONDITION of the shell is also important: was it beach-worn (probably dead) or fresh (probably alive) when collected? The former are adequate for personal adornment, perhaps, but only the latter are suitable for one's gods or one's stomach. My interests in both Mediterranean and South American archaeology have taught me that man is essentially the same animal in any time period the world over, and will react in a similar way to a given set of circumstances. Shells have always been, and continue to be, appreciated for their intrinsic beauty – and for their food value.

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Report of the Conchological Society *Partula* colony, 1995

J.E. Reynolds

London

1995 began very badly for *Partula mirabilis x taeniata*. Many of the snails became inactive for no apparent reason on 1 January. By the end of the month, 21 snails (including 12 adults) had died, despite the conditions being within the optimum range. Three snails were born during this period. The outbreak of deaths appeared to have all the hallmarks of an epidemic, as the longer the dead snails were left in the tank, the more others appeared to succumb. External factors which might have accounted for the mortality rates are the use of organo-phosphate-based household flea spray, and paint fumes, due to decorating. The latter is considered unlikely as a cause as the 'epidemic' had already started before painting commenced. The flea spray was used on 31 December 1994, with the snails, inside the environmentally controlled box, removed from the room at the time. The room was ventilated for five hours before they were replaced, and the tank and box remained closed until another 12 hours had elapsed. Incidentally my Vet advised that the product used was perfectly safe for use with snails and only advised covering the box with a cloth!

The population remained static throughout February, with a few deaths (mostly non-adult) and an increasing number of births in the spring. In June the tank was housed with London Zoo for a week whilst I was on holiday – one neonate snail died and one neonate and one juvenile went missing during this period. The hot periods of July and August caused deaths to outnumber births once again, but losses were not as serious as during the previous year. Quite a lot of snails also died in November and December, but this was partly offset by a high birth rate in autumn. Overall the population has declined in 1995, mainly attributable to the deaths in January.

One advantage of what has happened is that I have been able to follow more closely the development of individual snails. I was able to determine, for instance, that these snails take approximately 9 months to reach maturity, as those born during

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Adults	16	18	18	18	18	20	24	24	23	26	23	19
Subadults	3	5	5	6	6	3	0	2	5	6	7	8
Juveniles	9	6	6	4	4	4	11	17	14	13	9	7
Neonates	3	2	2	0	4	8	9	3	7	5	2	3

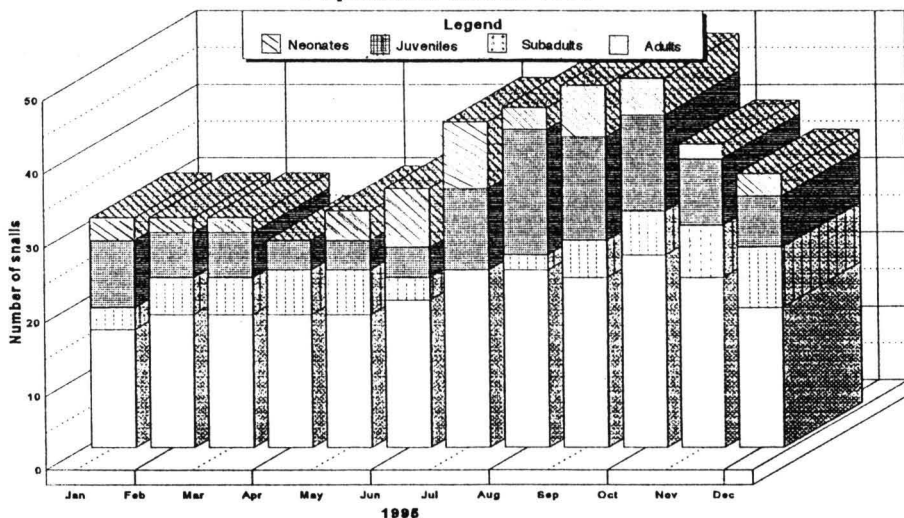
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Births	3	0	5	1	8	9	6	4	6	5	8	4
Adult deaths	12	0	0	1	0	1	1	0	2	2	6	4
Non Adult deaths	9	0	5	3	4	4	6	7	1	4	11	4
Total deaths	21	0	5	4	4	5	7	7	3	6	17	8

Table 1. *Partula mirabilis x taeniata* figures for 1995

January, March and May were the only ones of their size range. Quite a large proportion of neonate snails which do not survive appear to be scalariform. The baby which died in June was born on 2 May and developed almost to juvenile size (it was larger than typical neonates), longer than any other scalariform neonate. I also believe that this species is a fairly short-lived one. Without separating the generations this is impossible to determine exactly, but it seems that most of the remaining adults are now relatively young, and have not yet begun to produce many babies. This may account in part for the increased birth rate in late spring. If so, I hope to see an increase in numbers next May, which, if sustained, should restore the population to 1994 numbers.

Partula mirabilis x taeniata

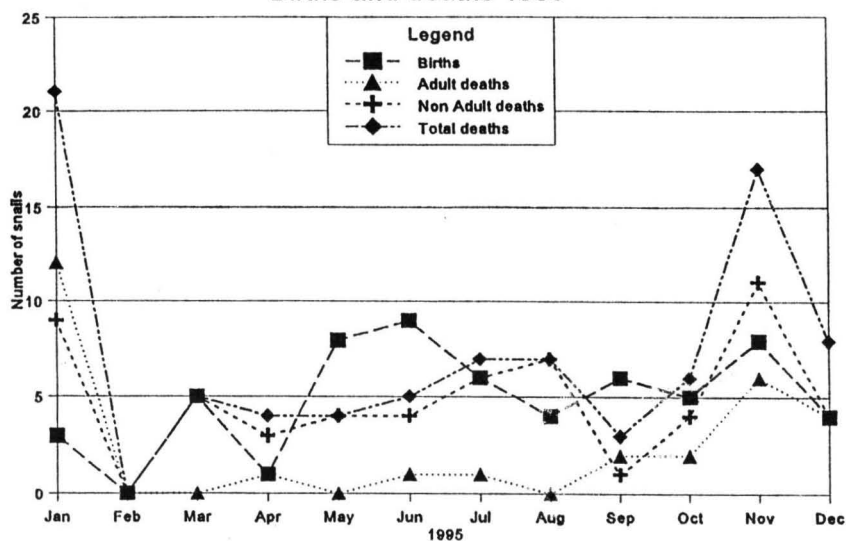
Population trends 1995



Graph 1. *Partula mirabilis x taeniata* population trends split by developmental stage

Partula mirabilis x taeniata

Births and deaths 1995

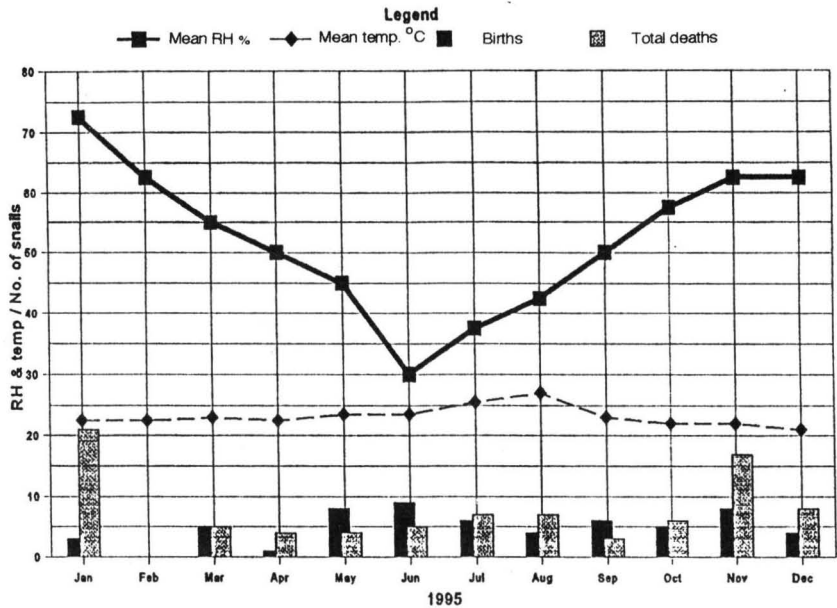


Graph 2. Birth and deaths (split by developmental stage) 1995

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean RH %	72.5	62.5	55	50	45	30	37.5	42.5	50	57.5	62.5	62.5
Mean temp. °C	22.5	22.5	23	22.5	23.5	23.5	25.5	27	23	22	22	21
Births	3	0	5	1	8	9	6	4	6	5	8	4
Total deaths	21	0	5	4	4	5	7	7	3	6	17	8

Table 2. *Partula mirabilis x taeniata* births and deaths compared with Relative Humidity and Temperature (1995 figures)

Partula mirabilis x taeniata **Births & deaths compared with RH & Temp.**



Graph 3. Births and Deaths compared with RH% and Temperature (°C)

Cherchons les mollusques! (Field trip to Brittany – July 1996)

Ian Killeen¹ and Jan Light²

¹ [REDACTED] *Felixstowe, Suffolk* [REDACTED]

² [REDACTED] *Godalming, Surrey* [REDACTED]

The Channel Atlas project (DOMMIC) being promoted by the Society provided the stimulus for a field meeting which was long overdue. Even before the publication of the revised *Marine Mollusc Atlas* (Seaward, 1990), which extended the area of interest of the Society's mapping efforts, data obtained by French workers had been incorporated into the Marine Census. An exploratory trip to a handful of sites in September 1995 had indicated that recording efforts would be rewarded by shores and a malacofauna which would be instantly familiar, yet having additional species and novel attributes to promote further enquiry about the shores on the English side of the Channel.

During the course of a week some fourteen members' collecting and recording efforts were focused on seven shores with additional sites being worked by subsets of the group as individual itineraries permitted. The programme included sites between Ile de Sieck (west of Roscoff) 4°04 W and Pointe d l'Arcouest 3°W. The extent of the shore exposed at low water along this stretch of the coast is a result of the low gradient at which the land gives way to the sea and also the very high tidal range. Unlike the steep beaches beneath the Cornish granite cliffs, the Pink Granite coast of Brittany has beaches which, for the most part, are backed by low and scattered granite outcrop. As the tide falls the shore dips gently away and gives rise to expansive sands. The numerous offshore islets seen at high water become ledge systems and rocky oases whose varying configurations give rise to small platforms and cave complexes amid a fully marine sandflat system.

Ile Callot was the first site to be visited and was an island in the Baie de Morlaix which can be accessed on a falling and rising tide via a cobble and tarmacked causeway – very reminiscent of

St Michael's Mount in Cornwall. The eastern side of this island was explored, there being extensive sands with rock outcrop and pools and ledges. The mixed habitats allowed a good range of species to be found with some 100 being recorded, at least 75 being found alive on site and in weedwashing sortings subsequently. The beaches here are normally the focus of collecting interest by the French with cockle beds to be raked and winkles to be picked either side of the causeway. On this occasion we had the shore to ourselves along with a handful of local people netting for prawns, because red tides had been detected in the area and notices prohibiting collection of edible molluscs were displayed.

Other sites visited by the main group included Ile de Sieck, west of Roscoff; Pointe de l'Arcouest; Ile Grande; Sillon de Talbert and Pointe du Primel. All these shores were extensive and afforded a wide range of habitat – an attribute which maximises efficient recording within map units. Lengthy lists of species were obtained for all the sites although the time of year probably resulted in the low number of nudibranch species seen. A detailed species list is not published here but can be obtained for any of the sites from us on request.

With luck and persistence, field meetings usually yield surprises and give rise to new discoveries. Results from our recordings have revealed something of the ecology of a suite of species for which live records along the English coast are sparse. We have written elsewhere (Light & Baxter, 1990; Light & Killeen, 1992) about the occurrences and habitat of *Lepidochiton scabridus*. Subsequent fieldwork has produced scattered localities for this species along the south coast and elsewhere. During our preliminary trip to Brittany last September we found *Tornus subcarinatus* living in a similar habitat, not only at low water mark but, at one site, relatively high on the shore. During July 1996 we found *Tornus* living at most sites. The shells were usually covered in orange ferrous deposit, as are the partially embedded boulders on which they are found. Associated with *Lepidochiton scabridus* and *Tornus* were two rissoaceans: *Alvania carinata* and *Alvania lactea*. The table below shows co-occurrences of these species.

Site	<i>Leptochiton scabridus</i>	<i>Alvania carinata</i>	<i>Alvania lactea</i>	<i>Tornus subcarinatus</i>
Ile de Sieck	L	L		
Ile Callot		L	L	L
Pointe du Primel	L			L
Ile Grande				S
Sillon de Talbert	L	L	L	L
Pointe de l'Arcouest	L		L	L

These observations represent a satisfactory extension of our knowledge of these molluscs which are seldom recorded alive. When looking beneath rocks during shore survey work, the embedded rocks are often rejected, in some cases with justification when it is clear that the conditions beneath are anoxic. But where boulders are embedded in clean shell gravel or limestone grit they are likely to appear bare of colonising epibiota whilst nevertheless supporting errant molluscs. The species listed in the table are cryptic because of their small size and because they blend into the crevices or the grain outlines on the rock surface. Specimens of *Tornus subcarinatus* and *Alvania carinata* are often found in shellsand samples but live records have been few in recent years. The map for *Alvania lactea* from MMNWE shows its distribution to be idiosyncratic with shell records for south west sea areas, three sea areas in West Scotland and two for the continental coast of Europe (S51 and S53). Seaward suggests that some of these records may be mislocalised or fossil. The only live record is for the Channel Islands and this is not recent. Armed with the habitat information revealed by the Brittany work, we could search similar habitats along the English Channel coast to see if we can extend our records for these four species – or are they genuinely more widely and densely distributed on the French shores?

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Where to go for shells – Exmouth, Devon

June E. Chatfield

Alton, Hants

Field work and collecting trips can have various functions with strandline collecting of empty shells to learn about identification and to start a reference collection or to look for molluscs alive in their habitats and contribute records to the distribution mapping scheme. The latter monitors changes in range over time (hints of global warming?) and involves searching in species-poor as well as species-rich places. This article covers learning to find shells, but the chosen locality of Exmouth with its range of habitats offers scope also to those with more experience. The records below are based on a few days spent in Exmouth during August 1996, during which larger beach shells were collected for hands-on experience in museums. Exmouth is an extremely pleasant place to be with its cliff walks and estuary providing a variety of natural history, geological and scenic interest as well as shells.

From the harbour, at the mouth of the Exe, extends a gently shelving beach with extensive sands and some bands of gravel and small pebbles. Walking along at low tide to the east end of the promenade at Maer Rocks, there are various strandings of seaweeds and empty shells. On the evidence of strandings, beds of eelgrass (a marine flowering plant and molluscan habitat) occur offshore. The greatest variety of shells was found towards the harbour with the most conspicuous and numerous being the white bivalve shells of the Thick Trough Shell *Spisula solida* together with many blue-grey shells of the Edible Mussel *Mytilus edulis*.

Over 30 species of shells were found washed up on the beach at Exmouth (see Table 1) of which 15 were gastropods, 17 were bivalves and 1 cuttlefish (recently dead with flesh and 10 tentacles). Most of the gastropods were fairly worn shells that had originated from nearby rocky shores – examples being Common Limpet (*Patella vulgata*), Grey Top-shell (*Gibbula cineraria*), Purple Top-shell (*G. umbilicalis*), Edible Winkle (*Littorina littorea*),

Rough Winkle (*L. saxatilis* agg.), Flat Winkle (*L. littoralis* agg.) and Common Dog-whelk (*Nucella lapillus*). Of the bivalves the Edible Mussels (*Mytilus edulis*) would also have originated from rocks or other hard surfaces to which they adhere with byssus threads. A glance at the Ordnance Survey Landranger map 192 shows areas of rocks on the shore east of Exmouth which could be visited on another occasion to see the species living in their natural habitat. Other gastropods like the Great Top-shell (*Gibbula majus*), Common Tower shell (*Turritella communis*), American Slipper-limpet (*Crepidula fornicata*), Netted Dog-whelk (*Hinia reticulata*), Common Edible Whelk (*Buccinum undatum*) and European Cowries (*Trivia arctica* and *T. monacha*) would all be found living off-shore or very low on the shore and only exposed on spring tides or washed up on the strand after storms. Timing another visit to coincide with specially low tides would give an opportunity to find some species alive. The large numbers of Thick Trough Shell that characterised the collection from Exmouth, would similarly have an off-shore origin, probably in one of the many sandbanks in the area shown on the Ordnance Survey map. Other off-shore bivalves, often found in a beach-worn condition, are Great Scallop (*Pecten maximus*), Queen Scallop (*Aequipecten opercularis*) and Smooth Cockle (*Laevicardium crassum*). Better specimens of off-shore shells can often be obtained from harbours where fishing nets are brought in. A fourth element of the molluscan fauna in the beach shells from Exmouth is that of mud, here the Exe estuary, which produces Grooved Razor (*Solen marginatus*) and Peppery Furrow-shell (*Scrobicularia plana*).

Most of the shells on the list could be found anywhere around the British Isles, but those with a more restricted range were the limpet *Patella depressa* and razor *Solen marginatus* (south-western); *Gibbula magus* and *G. umbilicalis* (western) and *Crepidula fornicata* (introduced from USA in the 1890s) and Common Piddock *Pholas dactylus*, which are southern species.

In batches of beach-collected shells there are usually some puzzles – ones which are too beach-worn for the diagnostic characters of the species to show clearly (e.g. loss of spines on prickly cockles) and some which may be genuine puzzles or even

hybrids as in limpets. In these cases it is necessary to look for living examples. Within species of shells there can be considerable variation – between those of the same species on exposed or sheltered shores (in dog-shelks and limpets) and in size from position on the shore zone (as in Edible Mussels). Sometimes the unusual or problematical shell, if in good condition, is worth checking with the Society's marine Area Recorder – it could always be something new and exciting!

Exmouth, south Devon is 7 miles south of Exeter. Ordnance Survey map 192 (Exeter, Sidmouth and surrounding area). Exmouth is easily reached by public transport (train to Exmouth or National Express Coach to Exeter, thence by train or bus). There are access points to the shore along the South Devon Coastal Footpath. Accommodation, local tide timetables and other details are obtainable from the Exmouth Tourist Information Centre (Tel. 01395 222299).

Table 1. List of species

Gastropods

<i>Patella vulgata</i>	Common Limpet
<i>P. depressa</i>	
<i>Gibbula magus</i>	Great Top-shell
<i>G. umbilicalis</i>	Flat Top-shell
<i>G. cineraria</i>	Grey Top-shell
<i>Littorina littorea</i>	Common Edible Winkle
<i>L. saxatilis</i> agg.	Rough Winkle
<i>L. littoralis</i> agg.	Flat Winkle
<i>Rissoa parva</i>	(No common name – small c. 5 mm found in shell sand but normally washed live out of seaweed)
<i>Crepidula fornicata</i>	American Slipper Limpet
<i>Trivia arctica</i> and <i>T. monacha</i>	European Cowries
<i>Nucella lapillus</i>	Common Dog-whelk
<i>Buccinum undatum</i>	Common Edible Whelk
<i>Hinia reticulata</i> (= <i>Nassarius</i>)	Netted Dog-whelk

Bivalves

<i>Anomia ephippium</i>	Common Saddle-oyster
<i>Mytilus edulis</i>	Common Edible Mussel
<i>Ostrea edulis</i>	European Flat Oyster
<i>Pecten maximus</i>	Great Scallop
<i>Aequipecten opercularis</i>	Queen Scallop
<i>Acanthocardia echinata</i>	Prickly Cockle

Cerastoderma edule
Laevicardium crassum
Chamelea gallina
 (= *Venus striatula*)
Venerupis senegalensis
 (= *V. pullastra*)
Tapes decussata
 (= *Venerupis*)
Spisula solida
Donax vittatus
Scrobicularia plana
Ensis siliqua
Solen marginatus
Pholas dactylus

Cephalopoda

Sepia officinalis

Common Edible Cockle
 Smooth Cockle

Striped Venus

Pullet Carpet Shell

Cross-cut Carpet Shell

Thick Trough Shell

Banded Wedge Shell

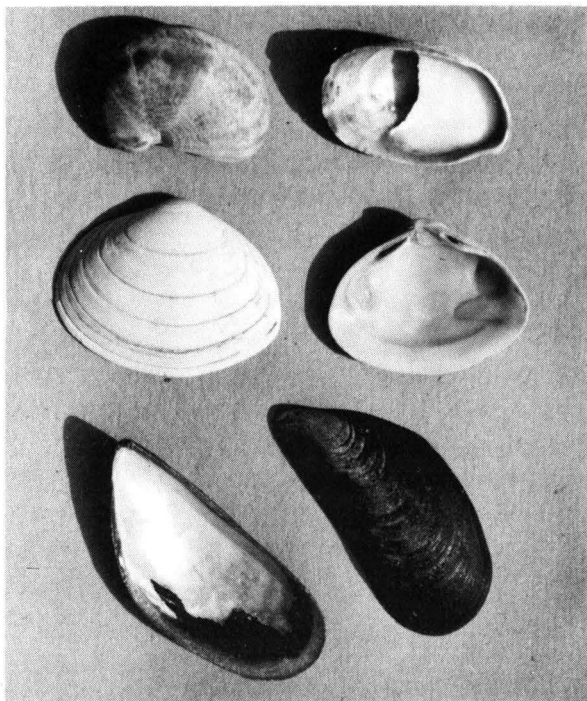
Peppery Furrow Shell

Pod Razor

Grooved Razor Shell

Common Piddock

Common Cuttlefish



Top line: American Slipper Limpet, *Crepidula fornicata*

Middle line: Thick Trough Shell, *Spisula solida* – the muscle scars (adductors, pallial line and pallial sinus) show up well on the inside of this species of bivalve.

Bottom line: Common Edible Mussel, *Mytilus edulis*

A geological excursion to the Isle of Wight, 20–21 April 1996

Bill Pocock

Farnham, Surrey

Why do people read reports on field meetings? Why do people go on field meetings? Why do people NOT go on field meetings? Why do people suddenly find themselves agreeing to lead a field meeting? Why do people find themselves agreeing to write a report on a field meeting which they found themselves agreeing to lead? Just a few questions which came to mind as I went through the period of mental activity prior to actually putting pen to paper. (Actually, the answer to the last question is quite simple – I did not delegate the task before it was delegated to me!) In the absence of statistical information to help answer the other questions, I will weave personal observations into the report on the assumption that I am not completely different from everyone else.

The first question was prompted by the desire to create a report that would be read. I have always been an avid reader of field meeting reports. For me, field meetings are one of the prime reasons for belonging to the Society. A chance to be out in the fresh air, in the company of like-minded companions, adding to one's own knowledge and hopefully gleaning knowledge of use to others. I read reports on field meetings I have attended to relive the pleasure of the trip. Reports on meetings to location I have not visited are an opportunity to store up information on fresh locations to visit in the future. Hopefully this report will cater for both groups.

My interest in Mollusca has a strong leaning towards the palaeontological delights of the Tertiary. (I make a blanket apology at this point for any lack of accuracy and/or being up to date in geological terminology.) I find the interaction between modern British shells, modern foreign shells and fossil British tertiary shells particularly fascinating. This is neatly illustrated by the similarities between the Oligocene fauna collected during the field

trip and modern shells collected just a week or so later during a holiday to southern Florida. Climate and geography of Oligocene times in the Isle of Wight are thought to be similar to conditions prevailing in the Florida Everglades at the present time. And there lies the answer to one of the other questions.

Ian Killeen: Bill, I am putting together the field meeting programme for 1996. Would you act as one of the leaders again?

Bill: Where did you have in mind?

Ian: Well, Barton went well last year. How about a weekend to the Isle of Wight?

Bill: Seems like a jolly good idea.

And there you are, you have agreed to lead a field meeting without experiencing any pain whatsoever. Mind you, part of the equation is a persuasive organiser, who plays to your own particular interests.

Obviously some preparation is necessary. An entry in the newsletter to publicise the meeting. A decision on where and when to meet. An itinerary for the two days. Permission to visit locations as necessary. Where to meet for dinner on the Saturday ... but nothing too onerous. It is worth noting that it is not necessary to get further involved in the detail. Members who come on field trips (very often with their long suffering partners) are keen and very adept at filling the gaps, arranging accommodation, accommodating changes of plan and locations that don't work out, inclement weather, etc.

Acknowledging the long cold spring, the weather was remarkably kind to us; just the odd shower, but otherwise warm and dry. The group consisted of 10 people and everyone arrived on the Friday evening. (A package deal on the ferry and accommodation cut down the costs.) On Saturday we met at Colwell Bay car park and spent the morning working the shore section northwards (SZ 327878) Itinerary XIII in the Geologists' Association *Guide No. 25*. Low clay cliffs with an abundant fauna of well-preserved shells are found. This beach can be worked at high tide. The only equipment required is a knife to lift the fossils

out of the clay and a container to put them in! If they are allowed to dry out and then put back into water, the clay falls off leaving a nice clean specimen. The British Museum (Natural History)'s *British Caenozoic Fossils* is a useful guide for identifying the more common finds. The quality of collecting varies depending on the state of the cliffs, but everyone was satisfied with what they had managed to find with a corresponding lift in the credibility of the leader!

Lunch was taken as a picnic sitting on the sea wall. We then walked round into Totland Bay (SZ 324876) to locate a thin bed of lignite half way up the cliff which contains well preserved teeth of small mammals. Not easy to spot in the field, but bags of material were collected for examination at home.

The remainder of Saturday was spent at Prospect Quarry (SZ 385866). This is private property and an SSSI. Anyone requiring more details please contact me. The quarry exposes Bembridge Limestone and is possibly the best exposure of this particular bed currently available. As well as the more normal Lymnaeas and Planorbids, these beds also contain a diverse fauna of land snails. Anyone familiar with *Strobilops labyrinthica* from the southern USA would recognise one of the shells from Prospect Quarry.

In the evening the party met for dinner at the New Inn in Shalfleet. Whilst not the prime objective of the meeting – good food and wine come a close second. One of the highlights of the meal was watching two of the party work through a WHOLE crab salad, claws, legs and all! (Not a geological hammer in sight, but nut crackers were provided.)

Sunday saw the party together at Widdick Chine (SZ 320866). As long as the weather has been dry it is possible to climb up this cliff through a jumbled mass of fallen limestone blocks and areas of clay. Similar fauna to Colwell Bay, of particular interest was the Neritina Bed with *Theodoxus concavus* with operculum in place and colour preserved. By popular demand the afternoon was spent back at Prospect Quarry. The itinerary altered as the weekend progressed. Flexibility is important. The group decided they preferred to spend longer at each location rather than rush around trying to take too much in.

For those of us present the answer to the question 'Why do people go on field trips?' was not in doubt. Good collecting, good scenery, good companionship, good food. This leaves one question unanswered: 'Why do people NOT go on field trips?'. I do hope that this article might go some way towards persuading members who have not attended before to give it a try – you won't be disappointed. In this context it is appropriate to take the opportunity to give my personal thanks to Ian Killeen for all of his hard work in putting such interesting programmes together over the years. My best wishes to his successor, Dr Rupert Honnor – please support your new Hon. Programme Secretary.

Bibliography

British Museum (Natural History). *British Caenozoic Fossils*.

Geologists' Association, *Guide No. 25, The Isle of Wight*.

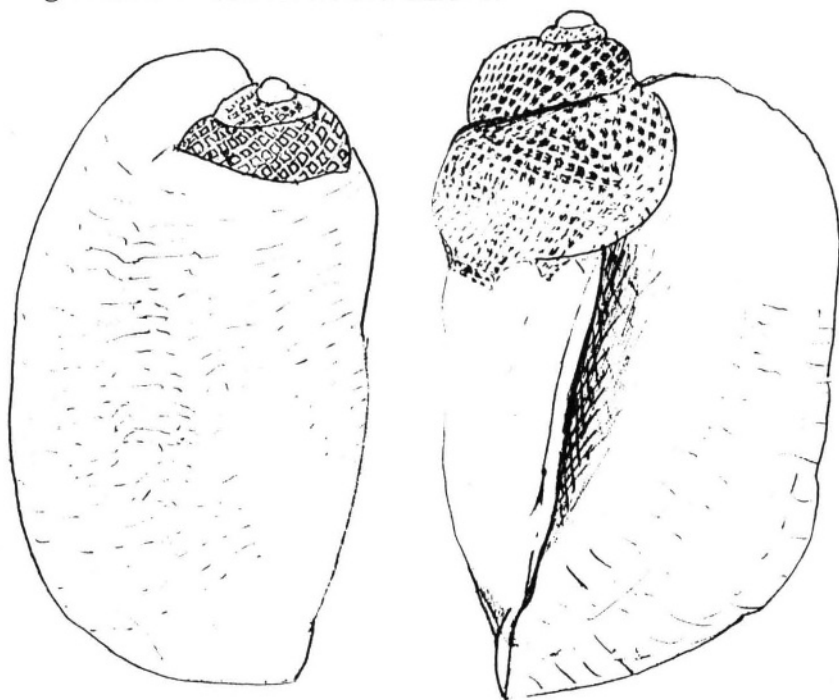


A Cornish problem child – *Simnia patula*

Christine Street

Barkingside, Ilford

I am still looking at the last of the shells and I brought back from the Conchological Society trip to Cornwall last July. Judith Nelson kindly gave me some from the beach close to where she was staying at Porthgwarra. The sand was full of interesting little shells, one of which I found to be stunning at times 40 magnification. What on earth could it be?



At only 2 or 3 mm long and very fragile, I first thought of *Tonna* sp. of which I was reminded but that was unlikely. It was also rather like a *Philine* in shape, but the spire was nothing like that of *Philine*, being of three whorls, yellow and very inflated and with magnificent fine reticulation. It had very fine ridges crossing the outer whorl positioned as in *Philine* and fairly regular growth lines crossing the ridges.

The only other possibility seemed to be a cowrie relative, which has a similar juvenile form. I found a very young *Trivia* to compare the spire, which seemed to have some yellow reticulation but nothing like the fine criss-cross of my shell and no ridges. The protoconch in my specimen was slightly out of alignment with the main body.

It did not seem to be *Erato voluta* because in my specimen the base of the posterior margin of the outer lip projected beyond the spire. This left *Simnia patula* as a possibility. In their description of the species, Fretter & Graham mention the fine reticulation on the early spire which becomes covered by the outer whorl growing over it. I was so pleased when in reply to my request for help, Jan Light and Ian Killeen managed to trace an article in a 1932 issue of the *Journal of the Marine Biological Association of the U.K.* The article dealt with the larval stages of *Simnia patula*, and gave beautiful diagrams of just such as my shell. I am very grateful for their help in identifying a species new to my collection. (Finding a juvenile in July ties in well with spawning which apparently occurs from April to July with eggs being laid on the coelenterate *Alcyonium digitatum*.)

References

- Fretter, V. & Graham, A.**, 1981. The Prosobranch Molluscs of Britain & Denmark. Supplement 9. *The Journal of Molluscan Studies*. Part 6. pp. 333–5.
- Lebour, M.V.**, 1932. The larval stages of *Simnia patula*. *Journal of the Marine Biological Association of the U.K.*, **18**: 107–116.

□

**Conchological Society field meeting in
Northern Northumberland,
5-9 October 1994**

Ron Boyce

Reading

The field trip to northern Northumberland took place for the most part in warm sunny weather. It was organised by Rosemary Hill who had arranged for us to work shore lines at low tide and hunt for land mollusca at other times, sending out a circular in advance with timings and grid references for all the sites, which was just as well since not all of us could be there all the time. Nine members attended the various meetings.

The total species count for the non-marine sites all taken together was 45 land mollusc species and 3 freshwater species.

We also found 127 confirmed species of marine molluscs of which 2 were found at all six sites, 18 at five sites, 13 at four sites, 14 at three sites, 18 at two sites and 62 each present at one site only.

The first meeting was on Wednesday morning at Low Newton-by-the-Sea, an area with mixed rocky and sandy shoreline, where we busied ourselves looking for live material and collecting weed samples and shell sand for later analysis. All together we found 90 marine species here, but the coastal grassland had only nine land molluscs. After lunch we went to Warenford village to investigate a steep-sided stream valley near Twizel House. This was very well fenced and quite difficult to work, and we only found 12 common species here. We had hoped to do better than this, particularly since it was known that *Leiostryla anglica* and *Vertigo antivertigo* had been found near here 150 years ago (Alder; 1848). We only found out later that the interesting area was half a mile further upstream!

The following day we started by visiting Ross Links which is an extensive dune system. The coastal grassland contained only *Candidula intersecta* and *Cepaea nemoralis*, while the sands yielded 16 species of dead marine shell. There were also shells of

Sphaerium corneum and *Potamopyrgus antipodarum*, which was not surprising since the river Waren flows into the sea at this point.

In the afternoon we visited the dunes at Bamburgh. There are old records for *Cerņuella virgata* from here, but we did not find it. However, the 16 land species we did find included *Cecilioides acicula*, which is a new record for VC68, *Balea perversa*, which is also very rare in NE England, and *Pupilla muscorum* which is never common here.

A small group went on to visit an unscheduled site, a small wood on a hillside near Waren Mill, where we found 19 species including *Arion oweni*.

On the Friday morning we visited Holy Island where 53 marine and 16 non-marine species were recorded, including live specimens of *Vertigo antivertigo* which has not been recorded recently in N. Northumberland, and *Puntum pygmaeum* which is generally under-recorded.

In the afternoon we visited Scremerston Dunes reserve near Berwick which is the site of an old lime works. Here we found 14 land species but nothing unusual.

Saturday morning saw us at Bucket rocks just outside the city walls of Berwick on Tweed. We found 61 species including a number of sea lemons *Archidorus pseudoargus* which were also at Holy Island, and several chitons which all turned out to be forms of *Lepidochitona cinereus*.

In the afternoon we worked the river valley woodland at Norham-on-Tweed and found 17 species, including *Ena obscura* which is rare in the area. This was followed by a visit to the riverside woodland at Tiptoe on Till not far away which yielded 12 species. Both these sites had interesting scenery and good advantage was taken of this by the photographers among us.

On Sunday morning we visited the beaches at Beadnell. Here there were numerous individuals of *Cerņuella virgata* above the shore line and 27 marine species below.

I would like to thank English Nature, the National Trust, Northumberland County Council, Northumberland Wildlife Trust

and Mr J. Sutherland of Ross Farms for their permission to survey the various sites we visited during the week concerned.

References

Alder, J., 1848. A catalogue of the Mollusca of Northumberland and Durham. *Transactions of the Tyneside Naturalists' Field Club* 1: 97-209.



Subscriptions

Subscriptions for 1997 will become due on 1 January 1997 and members are asked to remit promptly, without further reminders, to the Membership Secretary:

Mr M.D. Weideli

██████████
Newbury
Berkshire ██████████

Cheques should be made payable to 'The Conchological Society'. Overseas members must pay in sterling. International money orders, Eurocheques, Bankers drafts or transfers to our bank account are acceptable. Our bankers are: National Westminster Bank Plc, Bolton Branch, PO Box 2, 24 Deansgate, Bolton, Lancs. BL1 1BN, Account 0652384602. We regret that we cannot take credit card payments.

Rates are unchanged from 1996 and are:

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Molluscs from the Tien Shan Mountains, Kazakhstan, Central Asia

Nora McMillan

Bromborough, Merseyside

The Tien Shan Mountains (the Mountains of Heaven) are in Kazakhstan, Central Asia, and are not often visited by malacologists. Therefore, when an enterprising botanical friend, Miss Vera Gordon, visited them in June 1996 and most kindly gathered a few shells for me, they seem worth recording.

The area visited lies within the Aksu Dzhabagly Nature Reserve on the south side of the mountain range; the tourist blurb tells of bear, ibex, wild boar, even snow leopard and arhkar (a relative of Marco Polo's sheep) to be seen, and among the birds species to make an ornithologist's mouth water. Also lots of endemic plants.

The molluscs obtained comprised two species, both represented only by empty shells. Small bivalves were *Corbicula fluminalis* (Müller), a widespread freshwater species according to Zhadin (1965). These specimens were taken at a height of between 8000 and 9000 ft 'near the snow'.

The other specimens were half a dozen land-snails of the genus *Cathaica*, collected beside a well-trodden path in the Aksu gorge at a height of 8000 ft.

All the shells were submitted to Mr Fred Naggs of the Natural History Museum and with his permission I quote:

The bivalves do seem to be *Corbicula fluminalis*. A review of the Asiatic species of the genus *Corbicula* III. The species of the genus *Corbicula* from China, South-eastern Russia, Tibet, Formosa, and the Philippines (*Memoirs of the Indian Museum* 9: 49–68).

For terrestrial snails Likharev & Rammelmeier (1962) include coverage of former areas of the Soviet Union. I enclose a photocopy of the section covering *Cathaica*, which seems likely to be the genus of your gastropod specimens. The shell form is very variable and the generic characters are based on features of the reproductive system. I have not found your species in our collections.

(in *Litt.* 15 July 1996)

These Aksu shells have been divided between the Natural History Museum and Liverpool Museum (where I still work).

I am grateful to Mr Naggs for his help with these specimens and to Miss Gordon for collecting them.

References

Likharev, I.M. & Rammelmeier, E.S., 1952 (English translation 1962). *Terrestrial Mollusks of the Fauna of the U.S.S.R.*

Zhadin, V.I., 1952 (English translation 1965). *Mollusks of Fresh and Brackish Waters of the U.S.S.R.*

P.S. Douglas Carruthers gives a wonderful picture of the general area in his book *Beyond the Caspian*.



Introduced succineids in Britain

B. Verdcourt

Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AB

Stella Bridson, the daughter of a colleague of mine at Kew bought a bonsai tree from a shop in Richmond, Surrey and noticed a living snail on it. Knowing of my interest in Mollusca she passed it on to me on 13 July 1994. It was clearly a succineid and since it appeared not to be adult I kept it alive for as long as possible, but it died on 23 August and was preserved. The bonsai was apparently imported directly from China and it is possible that the snail also came from there. The chances of naming a single specimen of an exotic species of Succineidae are very slender even with some knowledge of the animal. The reproductive anatomy should at least allow one to determine the genus but I have not yet

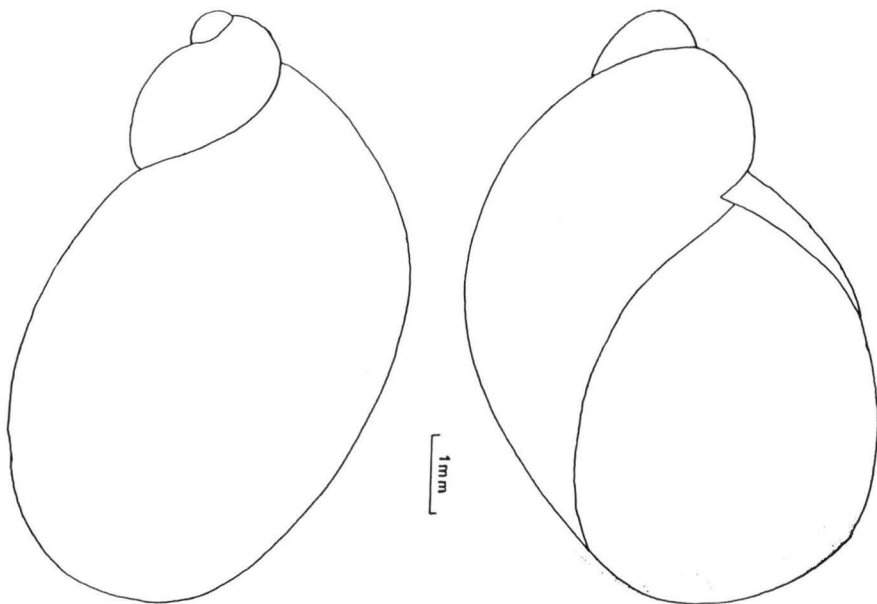


Fig. 1. Drawing of succineid shell of found on bonsai tree

managed to do so. My original guess that it could be the widespread *Quickia concisa* (Morelet) is not correct since the shell of that species has a distinctive granular structure like cut glass. The shell from the bonsai tree is closely striate but shows no sign of this cut glass effect. The mantle edge has dark spots and spots closely placed in vertical lines. When first dissected the epiphallus (EP) and vas deferens led into a large fluffy disintegrating mass, presumably the oviduct. No penial sheath or appendage could be seen but a muscular papilla (PP) is present inside the base of the penis and a penial retractor (PR) is directed backwards. The female part had structures I could not identify but the ocular retractor passed between the male and female parts. On the limited evidence available it seems most likely to be a species of *Quickia*. An outline of the shell and what little I could make out of the anatomy are shown in Figures 1 and 2 and may allow it to be associated with future material. The original specimen is in the Natural History Museum.

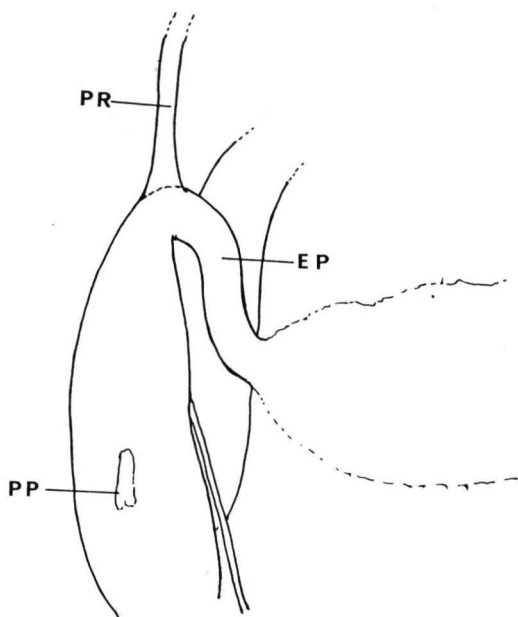


Fig. 2. Dissection of succineid found on bonsai tree

In my garden at Kimbers, Maidenhead, I have set up an ornamental pot with a cistern and pump beneath so that water constantly falls over the side. It is set in a square of stones in which my wife has been planting various, mostly succulent, plants. I was surprised to find a succineid crawling over the pot on 4 June 1995 feeding on the green algae which had soon appeared on it. I at first thought it must be one of our native species, but not only is there practically no way one of these could have reached my garden, but also it did not agree with any of them in its external form. It seems more likely to have been introduced with one of the plants. Although it persisted in this habitat for some time I regret that I did not collect it immediately, since it disappeared, possibly eaten by one of the birds which enjoy bathing on the rim of the pot. It was a considerably larger animal than the bonsai specimen.

It seems likely therefore that both these succineids came from garden centres and plants in such places which have a regular regime of frequent watering could be better habitats for succineids than might have been thought. If this is so, doubtless other collectors have seen specimens and this note has been written to alert collectors to the possibility of finding introduced species in Britain. When sufficient preserved adult material has accumulated it should be possible to work out how many species have been introduced and perhaps their identity. My friend Dr A.C. van Bruggen of Leiden tells me that introduced species have appeared in Holland.

Finally, one point must be emphasised: it is absolutely impossible to name shells of succineids without precise knowledge of their origin.

□

Field meeting in Somerset 30 August – 1 September 1996

Pryce and Christine Buckle

Boxmoor, Herts

Our weekend search for slugs and snails in Somerset began at 2 pm on Friday 30 August when we met Tony Smith, Colin Gillard and Judith Nelson at a car park south of Street, as arranged. We then proceeded to an area of calcareous grassland at Hatch Hill, Compton Dundon to begin the search in earnest. Despite the light rain of previous days, the ground was still very dry, and although we found many of the species associated with calcareous grassland in this area, we were very short of slugs. However, we were promised more slugs later. In all, we recorded 23 species for the survey, at this site.

We returned to our accommodation, and then met again at the Tudor Restaurant in Bridgwater for an excellent meal. We followed this with a slug foray by torchlight along the towpath of the Bridgwater and Taunton Canal, much to the surprise of several courting couples. As had been promised earlier, the slugs were plentiful. So much so that we had difficulty avoiding them, and they suffered some casualties. Although the number of specimens was high, the number of species was low. We found only *Tandonia sowerbyi*, *Arion ater*, agg. (we thought probably *A. ater rufus*, although not dissected), *Limax flavus* and *Deroceras reticulatum*. The only snail we noted was *Helix aspersa*.

We finished at about 11 pm. which was fine for us, as we had only a short walk back to our accommodation, but Tony still had the drive back to his home in Bristol, and Judith and Colin had to return to Taunton.

On Saturday morning, 31 August a much larger group (12, as far as we can recall) gathered near Stoke St Gregory where Tony and Colin were already waiting when we arrived, despite the lateness of the previous night's excursion. The highlight of this day was to be dipping for *Valvata macrostoma*. Tony described the circumstances surrounding its first discovery at this site, and also demonstrated a technique for weed washing, much like that used by collectors of small marine molluscs, which enabled *V. macrostoma* to be found fairly readily. The members present, who

had already armed themselves with a great variety of nets, then set about trying to determine the extent of its presence in the various locations across the site. Of course, other molluscs were not ignored, and a total of 20 species was recorded.

In the afternoon we drove to Swell Wood Nature Reserve, north of the A378 road, and just north of the small hamlet of Swell. Parking was restricted near the entrance to Swell Wood East, so Colin and Judith went to survey that area, whilst the rest of us surveyed Swell Wood West, which was divided into three compartments. We attempted to keep separate records for each compartment, but could find no obvious differences between them as far as the molluscs were concerned, although one compartment was thought to be much older and less disturbed by humans than the others. We met again at the Tudor Restaurant, Bridgwater for the evening and we enjoyed a very good meal and very good company.

Sunday morning, 1 September saw seven of us assembled at Brean Down, north of Burnham-on-Sea, where we were joined briefly by two members of the Somerset Invertebrates Group. Brean Down is a National Trust property and is an outlier of the Mendips. It is an interesting area of calcareous coastal grassland with outcrops of limestone. The day continued to become hotter and brighter, which did nothing to entice the molluscs to show themselves. Careful searching did however reveal 26 species here, all being typical of the habitat.

After lunch we moved further down the coast to Brean Dunes and then on to Berrow Reserve. The latter boasted ponds, but these had dried up. Lists of species, all of which were typical for the sites, were later produced from the data gathered, and will be incorporated into the records for the Somerset mapping scheme.

We dispersed at about 4.30 pm to make our separate ways home.

Colin and Tony are to be congratulated on producing a well planned programme for us, covering a number of interesting and varied sites within easy reach of each other, and we thank them for arranging such an enjoyable, informative and interesting weekend.

□

More children's conchological poems

Robert Pemberton

Shipley, West Yorkshire

While on holiday in South Hams last summer, I visited the excellent High Moorland Visitor Centre at Princetown on Dartmoor. Among the literature on display was the 1996 edition of the *Dartmoor Visitor*, a free information newspaper issued by the Dartmoor National Park Authority. As part of the Park Authority's European Nature Conservation Year activities, Dartmoor primary schools contributed to an exhibition at the Princetown Centre. The newspaper contained some extracts from the exhibition which showed the children's impressions of their local wildlife, including two poems on slugs and snails.

The *Newsletter* has a long tradition of conchological poetry, including those by children (Platts, 1994), and they seemed worthy of mention. Unfortunately the poems were unsigned so no credit can be given to the authors.

The Slug

The slug leaves a trail
wherever he goes
In his slow way
On a leaf, twig, stone or log
He has nothing to do and
nothing to play
Except munch on leaves
all day long
And that doesn't seem much
fun!

The slug leaves his
sparkling art
work wherever he's been
It glistens in the sun and
in the moonlight
But what puzzles me is
He doesn't mean to do
And it looks so nice.

The slug always looks so
glum wherever he is
Even though he has no
expression
His antennae stick out of
his head like worms
All brown, grey and thin.

As Slow as a Snail

I'm as slow as anything, all
The others are faster
Then one came up
To me and said "you are
Faster than all
The other snails."
Then the next morning
There was a race.
I was really
Scared. I ran and I ran
And I ran
And I won.

Reference

Platts, E., 1994. Taking the Ug(h) out of Slug. *Conchologists' Newsletter* 128: 307-309. □



*They're not so bad "on the flat" — but
they're useless "over the sticks"*

Field Meetings 1997

Hon. Programme Secretary:

Rupert Honnor
[REDACTED]

Henley-on-Thames

Oxon. [REDACTED]
[REDACTED]

Important

*Please remember to inform
the leader if you are attending
a field meeting.*

Saturday 19 April

Parkland Walk, London

Leader: Jane Reynolds ([REDACTED])

Terrestrial field meeting. Details later.

Saturday in June

West Sussex

Leader: Martin Willing ([REDACTED])

Terrestrial field meeting. Details later.

Week in July/August

Cornwall, West of Plymouth

Leader: Rupert Honnor ([REDACTED])

Marine field meeting to assist in DOMMIC mapping. Details later.

Sunday, 28 September

Reading, Berkshire

*Leader: June Chatfield ()
and Rosemary Hill ()*

Terrestrial field meeting. Details later.

Saturday, 8 or 15 November

Blockley Quarry, Gloucestershire

Leader: David Long

Geological and terrestrial field meeting. Details later.

Diary of Meetings

Saturday 14 December, London: Conch. Soc. indoor meeting. Christine Street (Barking). 'Islands and Shell-sand'. The Natural History Museum at 14.30.

14 March, 1997, Belfast: The Malacological Society of London Annual Meeting and AGM. Field Meeting at Queen's University Belfast Marine Laboratory, Portaferry. *Organiser:* Dr Dai Roberts, Biology and Biochemistry, The Queen's University, Belfast BT9 7BL. Tel. 01232 245133 ext. 2249. e-mail: d.roberts@qub.ac.uk.

Sunday in May, Reading: Conch. Soc. workshop on limpets, Reading Museum, Berkshire.

Saturday, 29 November, Woking: Conch. Soc. Molluscan workshop, Woking, Surrey.

Date to be arranged: Conch. Soc. slug workshop on slugs, Woking, Surrey.

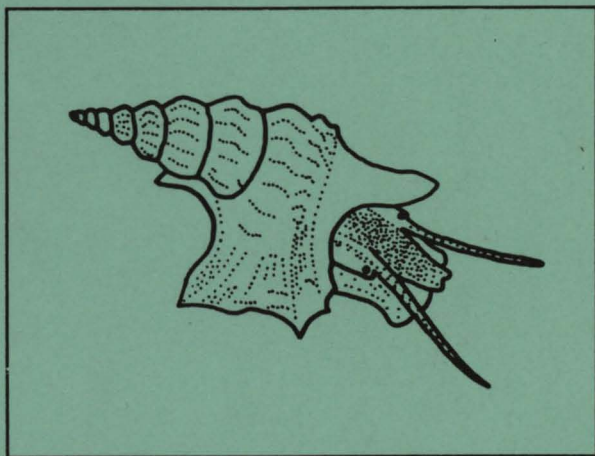


The Conchologists' Newsletter

Volume 8, Part 2

No. 140

March 1997



Conchological Society of Great Britain & Ireland
(Founded 1876)

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Looking at limpets

June Chatfield

Alton, Hampshire

Introduction

The limpet shell shape, a simple cone with a wide base and without the spiral typical of most gastropod molluscs, has evolved in several different groups from both marine and freshwater habitats. In Britain the freshwater river and lake limpets are pulmonates related to pond snails. They have a thin shell that is less than 1 cm long. Most limpets, however, are marine and have thicker shells more than 1 cm in length. The majority of limpets come into three closely related families of prosobranch gastropods, the Fissurellidae (slit and keyhole limpets), Acmaeidae and the Patellidae (true limpets). Smaller numbers of species which superficially look like true limpets, are the Siphonariidae or false limpets belonging to the pulmonate group, but unlike most pulmonates they are marine and in many cases occupy the rocky shore habitat of the true limpets which they resemble. The cone shape is also approached in the Capulidae and Calyptraeidae or hat shells but in these, unlike the other limpets there is a ledge inside the shell of some of these as a vestige of a spiral. The class Monoplacophora, a primitive group of only a few species found in deep sea trenches, also have thin cap-like shells but these are the preserve of deep sea expeditions and are not to be encountered by the field conchologist working from the beach. Whilst some 15 species of slit, keyhole and true limpets occur around the coast of Britain, many more species occur in other sea areas around the world. In the exotic limpets are the most spectacular examples in both size and shell features, with the most remarkable limpet faunas of all being in South Africa.

Features to look for

In looking at limpets with a view to identification there are several features to observe. In shells, note the overall outline shape and proportions, nature of the margin, the steepness of the cone, size, thickness of the shell, the sculpture on the outer surface as

radiating ribs, concentric transverse ribs or both as a reticulate pattern, lack of sculpture, presence of an apical aperture or a slit from the periphery, colour of the shell inside and out, markings often associated with muscle scars on the inside and the degree of shell polish. Whilst it is easy to mistake false limpets for true ones when looking at the dorsal surface of the shell, their identity is soon revealed by examining the inside which is highly polished and lacking the horse-shoe shaped muscle scar of true limpets. False limpets (*Siphonaria*) are also less bilaterally symmetrical and may have a bulge on one side of the ventral margin. When limpets are found alive in their habitat it is possible to examine the animal, and in some groups of species this is necessary for confident identification at the species level.

Limpets around the world

Limpets are a familiar part of the British, European and Mediterranean fauna of the rocky shore but with the common limpet *Patella vulgata* at around 5 cm as the largest, they are not as spectacular as the exotic examples. The blue-rayed limpet *Helcion pellucidum*, typically found on our shores on oarweed stipes and holdfasts, is small with a thin brown shell but the juvenile has iridescent blue rays. These do not retain their brilliance in the collection and need to be seen in the field. The British shore limpets – *Patella vulgata*, *P. depressa* and *P. aspera* (now listed as *P. ulyssiponensis*) can be difficult to separate and are best identified from living specimen using the additional feature of the colour of the foot sole. Occasionally hybrids occur. Further species of *Patella* are found on the Atlantic coast south into Spain and the Mediterranean. The typical Mediterranean limpet *P. coerulea* is known for its very flat shell which seems to relate to the sheltered nature of the shore in that region. *P. crenata*, with its pink shell and marked ribs giving the outline a starlike shape, is the most spectacular European limpet, and it is also comparatively large (c. 5 cm).

The coast of Arabia with isolated waters with the localised and special conditions of the Red Sea and Arabian Gulf and the interconnecting coastline with the more usual Indo-Pacific faunas, provides a small range of limpet species, mostly Fissurellids. The keyhole limpets of Arabia include some colourful examples like the

deep pink *Medusafissurella melvilli* and *Diodora funiculata* with rays of colour. The shield limpet *Scutus unguis* – a slit limpet without a noticeable slit – occurs elsewhere in the Pacific. The true limpets are less well represented in Arabia with only two species *Patella flexuosa* and *Cellana rota*. False limpets, which do not occur in Britain, are represented by six species in Arabia.

The place for the world's most spectacular true limpets is South Africa. Here there are several species on the beach and the largest, *Patella tabularis*, can reach 13 cm and has a very thick shell. A particularly distinctive South African limpet is *Patella longicosta* (Fig. 1), the long-ribbed limpet with projecting spines and a shell length up to 6 cm. The insides of some of the shells are coloured. Other distinctive South African limpets are *P. cochlear* (Fig. 2) (spoon limpet which is narrow at one end), *P. safiana*, up to 7 cm, *P. concolor* (variable limpet), *P. granularis* (granular limpet with a brown body scar), *P. oculus* (eye limpet) up to 10 cm with a yellow body scar and dark brown inside the outer rim and *P. granatina* (sandpaper limpet) (Fig. 3) to 7 cm. Richards (1987) lists for South Africa 15 species of true limpets, of which nine are endemic to the area, and 13 species of slit and keyhole limpet with seven endemic.

Limpets occur around the Pacific area, Australia, New Zealand and Antarctica, where the limpet groups are of different genera. *Cellana*, with many different species in New Zealand, are characteristic of this area and also the brown translucent-shelled copper limpets, *Nacella*, of the Antarctic and Falkland Islands. Both *Cellana* and *Nacella* are true limpets in the Patellidae. Another family of true limpets in the Pacific are the thinner shelled Acmaeidae with several genera including *Notacmaea* and *Patelloidea*, Pacific sugar limpets. In Australasia and the Pacific there are several species of the false limpets *Siphonaria*.

The shores of the American continent, incorporating both northern and southern hemispheres, and the different faunas of the Atlantic and Pacific regions, provide further biodiversity in limpets. Oceanic currents, affecting temperatures of coastal waters also have their effect on the fauna. California in warm waters has some spectacular examples including *Megathura crenulata* (Fig. 4),

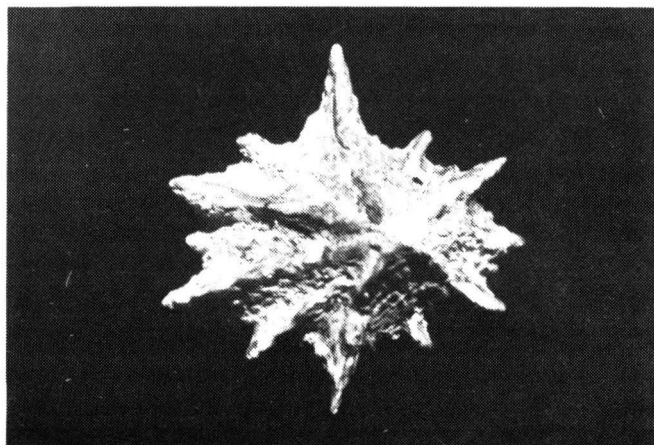


Fig. 1. Long ribbed limpet *Patella longicosta*

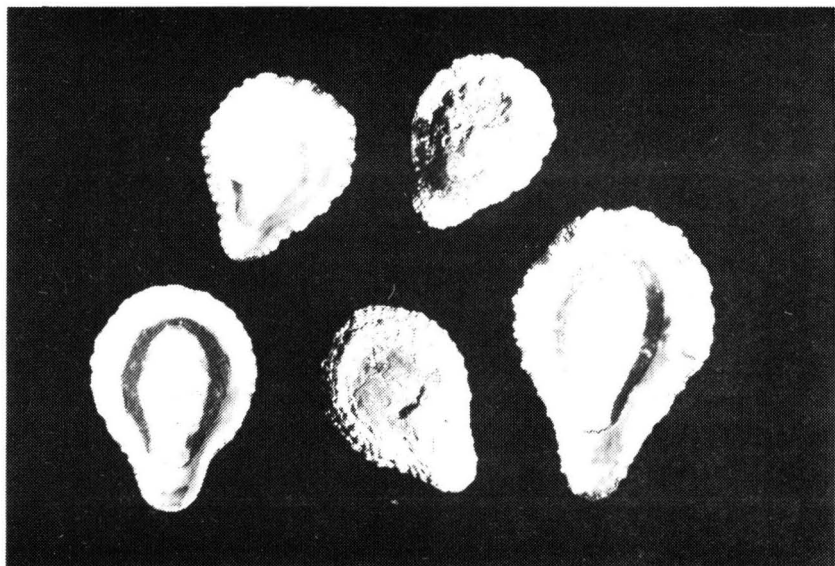


Fig. 2. Spoon limpet *Patella cochlear*

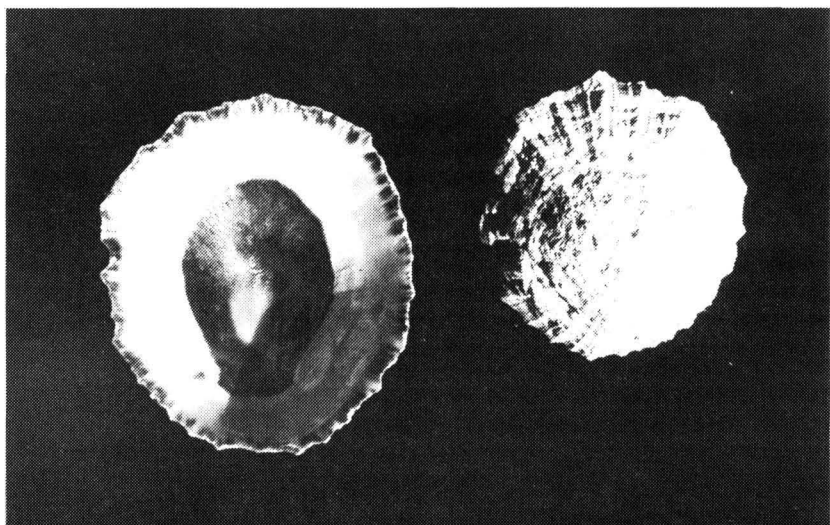


Fig. 3. Sandpaper limpet *Patella granatina*

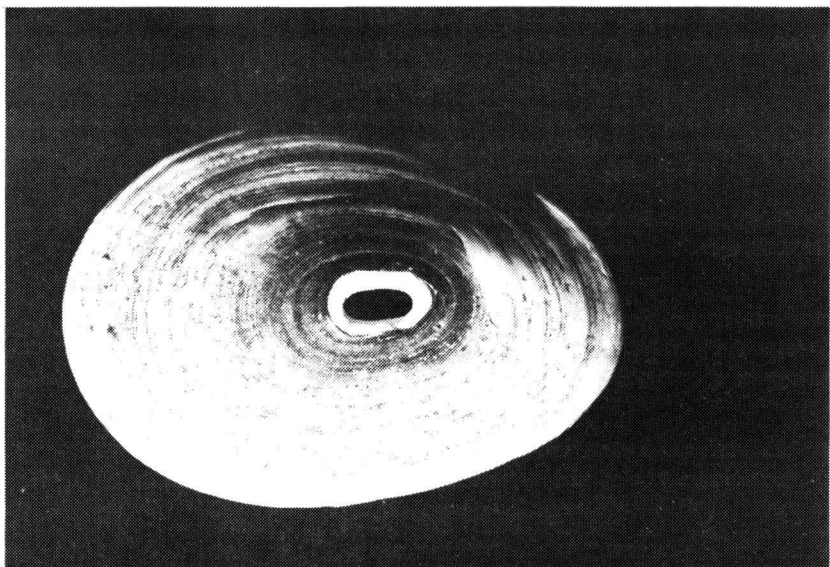


Fig. 4. Great keyhole limpet *Megathura crenulata*

the great keyhole limpet reaching 15 cm in length and found on the lower shore. Its apical hole is proportionately larger than in our keyhole limpets but a comparatively larger apical hole is found in *Megatebennus bimaculatus*, the two-spotted keyhole limpet, a smaller shell of 1.8 cm, also from the Pacific west coast. The largest American example of true limpets is *Lottia gigantea*, the great owl limpet (in the family Lottiidae) but our *Patella* is not found there except for *P. mexicana* the giant Mexican limpet of 15 cm but which can be twice as large. Most American examples of true limpets are the thinner shelled ones of the Acmaeidae which tend to have a coloured perimeter to the inside of the shell: these do not attain such large size as *Patella*. *Acmaea mitra*, the white cap limpet is recognised by its steep cone and there are also species of *Colisella* in the USA. On the east coast and around the Caribbean are a number of attractive keyhole limpets with distinctive features but of smaller size, around 1 cm. *Fissurella barbadensis*, the Barbados keyhole limpet, is pale green inside while the outer surface has strong radial ribbing. Another distinctive central American keyhole limpet is *Fissurella fascicularis*, the wobbly keyhole, deep pink in colour and rather flat and is found on low shore rocks in Florida and the West Indies. The American fauna has a considerable range of slit and keyhole limpets on both east and west coasts.

Differences in the body

One feature of limpets, especially Patellidae, is the strong muscular foot which hangs on to the rocks by suction and can withstand the battering of waves on rocky shores and attempts by predators to dislodge them. However a limpet, when taken by surprise, can be detached. The muscle of the limpet makes it a useful food source in various parts of the world. False limpets (Siphonariidae) do not attach so strongly and can be picked off rocks easily.

The limpet has a distinct head bearing a pair of tentacles with a black eye spot at the base of each. In *Patella* the outer shell has small tentacles around which are secondary or pallial gills. The true gills are lost in the Patellidae. It is the respiratory system and arrangement of gills which distinguish the various limpet

families. The slit and keyhole limpets (Fissurellidae) are the least modified retaining a pair of gills or ctenidia inside the mantle cavity, the Acmaeidae have retained just one gill. Relatively little of the body of *Patella* is visible extended from the shell when they are crawling and the foot stays within the circumference of the shell. Although these three families of limpets are prosobranchs, there is no operculum – they rely on a close seal between the outer rim of the shell and the rock base to take on the function of an operculum. They sometime leave scars on the rocks. The distinctive apertures in the shells of slit and keyhole limpets have anatomical significance allowing waste products to be expelled without fouling the respiratory system. There is an interesting sequence of anatomical change in the various families showing increasing levels of modification.

Way of life of limpets

There is considerable variation between species in the seasonality of breeding and the form of the larval stage. Many have a planktonic larval stage, like our common limpet, which feeds in the plankton for 1–2 weeks giving it a chance to disperse. Other species have shorter pelagic phases and some emerge from the egg at the creeping stage.

Once on the shore limpets do move around to feed but many show strong territorial homing behaviour coming back to the same spot on the rock to rest. In South Africa, where there are many limpets, there may be competition for territory. As well as foot scars, it is possible to see feeding marks made by the scratchy radula teeth as they rasp at seaweed, encrusting growths and detritus. Limpets are essentially herbivorous and the resulting overgrowth of seaweeds on rocky shores where limpets had been killed by detergents used in cleaning up the heavy oil spill of the *Torrey Canyon* in 1967 demonstrated their role as algal browsers.

In tropical regions limpets are capable of withstanding high temperatures when exposed at low tide and also in colder climates of temperatures below freezing. It is usually the Patellid limpets which live higher on the shore, whereas most of the keyhole and slit limpets tend to be low shore or subtidal. Limpets differ not

only in their structure of shell and body but also in their way of life and distribution.

Limpets have not been a group particularly favoured by specialist collectors, but they featured in some variety in a number of Victorian shell collections when they were often obtained through dealers' catalogues. With the opportunity of air travel, the present day conchologist has the chance to see them in their natural habitat and to appreciate them as living animals with a distinctive and adaptive way of life. Being so much associated with rocky shores they are potentially threatened by oil spills and subsequent clean-ups, which would be particularly serious in areas with small-range endemic species.

Some general references

The Malacological Society held a symposium on limpets in 1993 and the abstracts of the lectures were published in the *Bulletin of the Malacological Society of London* (No. 20). Spare copies of this are available from the Editor: Dr S. Bailey, Dept of Environmental Studies, School of Biological Sciences, Williamson Building, University of Manchester, Oxford Road, Manchester. Please enclose an A4 SAE.

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Biodiversity: The UK Steering Group Report – a personal overview

Martin J. Willing

Midhurst, West Sussex

The Prime Minister signed the Biodiversity Convention at the Rio Earth Summit in 1992. In 1994 as an outcome of this commitment, the Government produced *Biodiversity: The UK Action Plan*. This document outlined certain tasks that should take place, including the production of costed targets for species and habitats; a consideration of the way biodiversity data should be handled; how public involvement and awareness might be addressed and the manner in which other commitments might be put into effect. In late 1995 *Biodiversity: The UK Steering Group Report* was published in two parts. Volume 1: 'Meeting the Rio Challenge' set out the philosophy and rationale for action whilst Volume 2: Action Plans, contained lists and selected 'Action Plans' for a range of priority species and habitats.

Although this report is advisory and it is up to the Government to respond to the proposals, it makes encouraging reading. I was surprised to recall that this plan had surfaced under a government whose apparent environmental disregard back in early to mid-1980s had led to so much environmental doom and despondency! Those were times when C.A.P reforms and tax-break afforestation were eroding semi-natural and marginal habitats at an alarming rate throughout the nation. In 1984 the battles to save such important habitats as the Halvergate Marshes in Norfolk and the pristine Flow Country in Caithness, led one to feel that what is now called 'biodiversity', mattered little to the Government. Later in that same decade the dismemberment of the Nature Conservancy Council, for apparently political reasons, seemed to further confirm that this government placed a very low importance on species and habitat conservation. Who would have believed that by the mid-1990s an official government report would extol the value and necessity for biodiversity management?

The report clearly outlines reasons why biodiversity should be retained. It states that, 'We should hand on to the next generation an environment no less rich than the one we ourselves inherited...' The conservation of biodiversity is justified on four main grounds:

1. for *moral and aesthetic reasons*
2. as a *stewardship* of something that has taken considerable time to develop and cannot easily be recreated
3. as a *benefit to society* (maintaining our 'life support systems' in a sustainable way)
4. for its actual or *potential economic value*.

The UK Steering Group Report follows a number of themes. Firstly and refreshingly, the report accepts that the maintenance of biodiversity affects all areas of the country and not just the species and habitats of 'special areas' like SSSIs and nature reserves. Central to the report's philosophy is the fact that it is *not* (as has often been the case in the past) considering the conservation of species and habitat as a bolt-on activity, but an integral part of the economic and social life of the country. It clearly accepts that radical changes are required in farming, forestry, industry, transport and domestic life.

The importance of appropriate information and data handling is recognised as vital to the success of the whole enterprise. The report suggests a three-pronged approach involving (1) making the best use of the considerable amount of biological data that exists in many different forms throughout the country, (2) developing a national biodiversity database (with common standards for recording and the subsequent integration of data) and (3) the creation of a series of local or regional biodiversity centres. It is clear that quick access to good quality, reliable data is vital if the aims, objectives and targets of the report are to be realised. In particular the regular monitoring of species and habitats can only occur if a good quality baseline is available.

A further and sometimes neglected theme (particularly by some academics and specialists) is the need to develop public awareness and involvement. The report views this task in the broadest way, considering the needs and interests of all those with some direct or indirect involvement in environmental matters, in decision making roles and in all other walks of life. The need to involve biodiversity matters in the formal school curriculum is also emphasised. For

biodiversity conservation to be effective and broadly supported, the report recognises that certain barriers concerning broadly held perceptions should be overcome. It is appreciated that people need to understand that maintaining biodiversity is part of establishing a sustainable future. The public also needs to be made aware that day to day behaviour (production and consumption) often has a very direct effect upon the environment. To achieve such a major shift in public understanding will require an imaginative and open approach to community 'education'.

The report lays great stress on the need to develop biodiversity work locally. It states that, 'biodiversity is ultimately lost or conserved at the local level' ..and... 'local Biodiversity Action Plans are perhaps the best way forward'. There is certainly much common sense in the belief that local actions could (and in many cases nowadays do!) 'act as a catalyst to develop the effective partnerships needed to ensure biodiversity in the long term'. Local actions give a sense of proportion and ownership to biodiversity issues, which can otherwise seem remote and divorced from everyday experience. The development of 'Local Ecology Centres' and the involvement of local authorities is also stressed.

The bulk of the report is devoted to lists and selected action plans for key species and habitats. It is realised that if populations and habitats are to be maintained or enhanced, then targets are required. Although national targets are included there is a recognition of the need for similar ones at a local level to maintain regional biodiversity. Species are selected on the basis of meeting at least one of the five criteria:

- globally threatened
- where the UK has > 25% of the world population
- species where numbers or range has declined by more than 25% in the last 25 years
- in some cases where the species is found in fewer than fifteen 10-km squares
- species listed in the EU Birds or Habitats Directives, the Bern, Bonn or CITES conventions or Wildlife and Countryside Act.

This process produced a *long list* of 1250 species; a *middle list* of 286 species (where action plans will be produced before 1998) and a *short list* of 116 species (with action plans incorporated into the report). Species on the middle and short lists are considered to be

either globally threatened or rapidly declining in the UK. Each action plan contains a brief summary of the current status of the species, possible reasons for its decline and proposed targets and actions to maintain or increase populations. The accompanying table outlines the mollusc species included on these lists, together with a simplified summary of other information also presented.

The report also includes habitat action plans and key habitats are selected by qualifying under one or more of these criteria:

- habitats where the UK has an international obligation
- rare or threatened habitats
- areas that are essential for organisms occupying a wider range of ecosystems and areas important for key species.

Thirty-eight key habitats are recognised with costed action plans already present for 14 and the remaining 24 being produced by 1998. The initial 14 key habitats include several such as coastal and flood plain grazing marsh; reedbeds; chalk rivers; saline lagoons and fens which support some of our rarest and most threatened molluscs.

In these times of regular Government cuts one might be surprised at the total expenditure proposed to support species and habitat action plans. These amount to £17 million for the period up to 1997, with a further £67 million in the years up to 2010. The totals devoted specifically to mollusc plans amount to £112,000 (to 1997), £53,000 (to 2000) and £44,000 (to 2010). These seemingly large amounts should, however, be balanced against the very much larger amounts supporting agricultural over-production!

Although the report was chiefly established to develop species and habitat action plans, it goes much further by giving a detailed and reasoned philosophy for maintaining the nation's biodiversity. Despite the tremendous promise and potential contained in the biodiversity report there are, however, certain aspects to criticise.

Some may feel that the language of some of the action plans is not forthright enough in demanding changes or improvements. Also despite the fact that the report recognises that reform of the Common Agricultural Policy is one of the most important factors required to deliver biodiversity objectives, it fails to provide sufficient detailed and rigorous recommendations for change.

One rather 'daft' report proposal is the creation of Action Plan 'champions'. These could be either government organisations or private organisations, companies and even individuals. It is proposed that they should act as co-ordinators or 'facilitators' by establishing an information network and generally stimulating appropriate actions for their adopted plan. This idea seems ill conceived and likely to lead to muddle and confusion. One can imagine that some 'cuddly' species such as dolphins and otters, or attractive plants like Lady's Slipper Orchid, would have prospective 'champions' queuing up to support them. However which company is going to take pride in championing a dung beetle or the Glutinous Snail?

A further problem lies with some of the action plan priorities for molluscs. Arguably there are some species on the priority short list which should not be present. For example there is no sound evidence to support the inclusion of the freshwater mussels *Pseudanodonta complanata* or *Pisidium tenuilineatum*, which have not been demonstrated to be seriously declining or threatened. Also there are some long list species including *Lymnaea glabra* and *Pseudamnicola confusa* which should be much higher priorities. Other species such as *Clausilia dubia* and *Nucella lapillus* seem inappropriate on any of the lists. It is hoped that in future there will be mechanisms to rearrange the conservation priorities of species on the lists.

With so much data being condensed into the report factual errors are not difficult to find. For example it is suggested that *Margaritifera margaritifera* only occurs in one-five 10 km squares (a massive underestimation of its range) and that it has only declined by 0-25% in the last 25 years whereas the true figure is probably much higher.

A final criticism comes with the cost of the full report* which, at £56, is hardly going to encourage the wide readership that this landmark, long term agenda setting publication deserves.

* Full title:

H.M.S.O. (1995). *Biodiversity: The UK Steering Group Report*, London.

Table follows:

Table of Mollusca listed in the UK Steering Group Report: (Data in simplified form)

Species	Listing: Short (S) Medium (M) Long (L)	International threat	International importance of UK (✓ = > 25% of world population in UK)	Possible Decline	British RDB category	EC Directive &/or WCA* (schedules)
<i>Anisus vorticulus</i>	S	✓	-	0 - 24%	2	-
<i>Catinella arenaria</i>	S	✓	-	0 - 24%	1	-
<i>Margaritifera margaritifera</i>	S	✓	-	0 - 24%	-	IIa + 5*
<i>Myxas glutinosa</i>	S	✓	-	0 - 24%	1	5*
<i>Pisidium tenuilineatum</i>	S	✓?	-	50 - 100%	3	-
<i>Pseudanodonta complanata</i>	S	✓	-	0 - 24%	-	-
<i>Segmentina nitida</i>	S	✓	-	50 - 100%	1	-
<i>Vertigo angustior</i>	S	✓	-	0 - 24%	1	IIa
<i>Vertigo genesii</i>	S	✓	-	0 - 24%	1	IIa
<i>Vertigo geyeri</i>	S	✓	-	0 - 24%	1	IIa
<i>Vertigo moulinsiana</i>	S	?	?	0 - 24%	3	IIa
<i>Thyasira gouldi</i>	M	-	-	50 - 100% ?	-	-
<i>Ashfordia granulata</i>	L	✓	✓	25 - 49%	-	-
<i>Atrina fragilis</i>	L	?	-	25 - 49% ?	-	* proposed
<i>Caecum armoricum</i>	L	?	-	0 - 24%	-	5*
<i>Clausilia dubia</i>	L	?	-	25 - 49% ?	-	-
<i>Ena montana</i>	L	?	-	0 - 24% ?	3	-
<i>Gyraulus acronicus</i>	L	✓	-	25 - 49%	2	-
<i>Helicodonta obvoluta</i>	L	?	-	0 - 24% ?	3	-
<i>Helix pomatia</i>	L	✓	-	0 - 24% ?	-	-

Table of Molluscs continued

<i>Hydrobia neglecta</i>	L	?	-	?	-	-
<i>Hydrobia ventrosa</i>	L	?	-	?	-	-
<i>Lauria sempronii</i>	L	?	-	0 - 24%	1	-
<i>Leiosyla anglica</i>	L	?	✓	0 - 24%	-	-
<i>Limax tenellus</i>	L	?	-	25 - 49%?	-	-
<i>Lymnaea glabra</i>	L	✓	-	25 - 49%	2	-
<i>Modiolus modiolus</i>	L	-	-	0 - 24%	-	-
<i>Monacha cartusiana</i>	L	-	-	0 - 24%	3	-
<i>Nucella lapillus</i>	L	?	?	0 - 24%	-	-
<i>Oxyloma sarsi</i>	L	✓	-	25 - 49%	2	-
<i>Ostrea edulis</i>	L	?	-	25 - 49%?	-	-
<i>Paludinella littorina</i>	L	?	-	0 - 24%?	-	5*
<i>Pisidium conventus</i>	L	?	-	25 - 49%?	-	-
<i>Pisidium pseudosphaerium</i>	L	?	-	0 - 24%?	3	-
<i>Pseudamnicola confusa</i>	L	✓	-	0 - 24%	1	-
<i>Sphaerium solidum</i>	L	?	-	0 - 24%	1	-
<i>Stelliger bellulus</i>	L	?	-	0 - 24%?	-	-
<i>Succinea oblonga</i>	L	✓	-	0 - 24%	3	-
<i>Tenellia adspersa</i>	L	?	-	0 - 24%?	-	5*
<i>Thyasira gouldi</i>	L	-	-	50 - 100%?	-	5*
<i>Truncatella subcylindrica</i>	L	-	-	25 - 49%?	-	-
<i>Truncatellina callicratis</i>	L	?	-	0 - 24%	3	-
<i>Truncatellina cylindrica</i>	L	✓	-	0 - 24%	2	-
<i>Valvata macrostoma</i>	L	✓	-	25 - 49%	2	-
<i>Vertigo liljeborgi</i>	L	?	?	0 - 24%?	3	-
<i>Vertigo modesta</i>	L	✓	-	0 - 24%	1	-

Molluscan conservation: a strategy for the 21st century

David Long

Leckhampton, Cheltenham,

The first ever conference to be dedicated to the conservation of molluscs took place in Cardiff from 20 to 22 November 1996. Organised by Mary Seddon and Ian Killeen on behalf of the Conchological Society, the National Museum and Galleries of Wales, and the International Union for Nature Conservation (IUCN) Mollusc Specialist Group, the first two days were based at the National Museum and the last at Cardiff City Hall. Ian Killeen has pointed out that the idea developed from a conversation in a pub, but the conference can also be logically presented as a development from the Alan Solem Memorial Symposium on the Biodiversity and Conservation of Mollusca held at the International Malacological Congress in Sienna 1992 (see the symposium proceedings: van Bruggen A.C., S.M. Wells and Th. C.M. Kemperman, Editors, Backhuys, 1995).

Between 80 and 100 delegates attended. Although most were from Britain there was a sizeable and very important overseas contingent including Mariano Gimenez-Dixon of IUCN, Philippe Bouchet (Musée Nationale d'Histoire Naturelle, Paris), Maria Ramos and Rafael Araujo (Madrid), Arthur Bogan (Raleigh, North Carolina), Vincent Flores (Mauritius) and delegates from Finland, Kuwait, South Africa, Belgium and Eire.

The content of the conference could be divided into:

- general international scene setting on day one;
- problems and particular cases (with an emphasis on Great Britain and Ireland and on *Margaritifera*) on day two;
- and specific international problems (and captive breeding) on day three.

It is intended that the Proceedings will be issued as a Conchological Society special publication in 1997.

Given that the Mollusca are the second largest animal phylum

in terms of numbers of described species and that 40% of the animal extinctions known since 1600 are of molluscs, it is surprising that they do not feature more highly in the consciousness of the wildlife conservation movement.

In terms of relevant 'higher' organisations and documents:

- 197 land mollusc species are listed in the IUCN's 1990 Red List, over half being island species. The IUCN has some 800 governmental and non-governmental **organisations** as members, and aims to help drafting national strategies, to provide management expertise and to help with information on the status of species. The expert input is provided by members of specialist groups like the Mollusc Specialist Group.
- CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora, 1975) is an internationally agreed listing of species whose threatened status means that trade in them is regulated, either by a requirement for an export licence, or for an import licence, or both. 134 states have signed the Convention. Species covered in the list include 32 Unionidae, *Achatinella* species, the Tridacnidae, *Strombus gigas*, *Papustyla pulcherrima* and *Paryphanta* species.
- For members of the European Community there is the 'Habitats Directive' (Council Directive 92/43 EEC) on the conservation of natural habitats and of wild flora and fauna, which is aimed at implementing the Biodiversity Convention agreed at the 1992 Rio Earth Summit. EC Directives must be transposed into national law by member states. Among other things the Directive institutes the designation of Special Areas of Conservation (SACs). It also lists habitats and species of plants and animals which are rare, endangered, or vulnerable – and it obliges member states to take action to protect them. This is why the Countryside Council for Wales is required to monitor, and take action to conserve, *Vertigo angustior* at sites in South Wales, how the Spanish receive funding for work on *Margaritifera auricularia* (now down to 20 known living individuals), how funding was

acquired to move 600 m² of *Vertigo moulinsiana* habitat out of the line of the Newbury bypass, and how research into human threats to the molluscs of maerl beds is resourced.

- Within the UK, the Wildlife and Countryside Act 1981 and its schedule provide protection for a number of mollusc species.

But this legal framework is selective and there is a risk of concentrating resources on 'scheduled' species (even if they really should not be so treated) at the expense of equally deserving cases. The law also risks being sidestepped as Graham Oliver pointed out, for example on the grounds that species 'y' (a recent segregate from species 'x') is not the scheduled species 'x', which is a warning about being too closely bound to the taxonomy used in protected species schedules.

Molluscan conservation efforts have predominantly targeted non-marine species even though there are perhaps 80,000 living marine species compared with 20,000 or so non-marine. This may be because the non-marine element is more obviously exposed to threats, the whole of their habitat being more accessible to human activity, and because the known damage to date is much greater in non-marine species, especially in terms of extinctions. Conservation of marine molluscs has to protect the fauna from less visible threats than, say, deforestation – to some extent out of sight is out of mind.

In many ways the bias towards non-marine conservation and the debate about species versus habitat conservation reflect what is going on in conservation as a whole. But particular difficulties arise with molluscs. For marine and freshwater species one is dealing with a mobile environment. The fauna (perhaps the non-marine fauna in particular) is only well-known in limited parts of the world such as Europe, North America, New Zealand and, possibly, Australia so we do not know what there is to conserve. Degrees of endemism and species' ranges vary; the ranges of non-marine mollusc species in the tropics are often smaller than those of Holarctic species. Island faunas often have a high degree of endemism, now usually degraded. There is clearly much surveying, ecology and taxonomy to be done so as to focus conservation efforts

to best effect. But the pace of events does not permit actions to proceed in series; conservation measures need to be taken now in many cases.

Turning to some of the cases we heard of (besides *V. moulinsiana* at Newbury), there was the narrow-ranged endemic, *Helix ceratina* in Corsica which is not listed in any conservation legislation and lives in a habitat which has no special protection either. The conservation and status of pearl mussels, *Margaritifera margaritifera*, and the one population of *M. auricularia* received a good deal of attention because of their decline in much of Europe and the association with 'treasure hunting'. There have been enormous declines in species richness in some freshwater habitats in the south-east United States. Non-marine mollusc conservation in tropical areas and islands raises special problems besides undescribed faunas; for instance there are the unpredictable effects of introduced predators (*Euglandina* has devastated defenceless *Partula* species, but has less effect on islands where molluscs had developed defences against indigenous predators), and, by way of another case, exotic vegetation (on Mauritius) can shelter native species so attempts to recreate 'native' vegetation can be disastrous for the molluscs.

My impression was that there is much that could be done to improve the conservation of molluscs. However, to do this as a discrete activity is not easy, especially because of the limited share of expenditure and effort on conservation which conservation of molluscs can expect to attract. More account needs to be taken of molluscs within general conservation activities and we should emphasise the importance of molluscs within the context of wildlife conservation at every opportunity.

By the end of the conference it was clear that those attending felt that it had been a success, particularly in developing international links in this field, and that further similar meetings would be valuable. One particular action was that many attendees were prepared to take action in relation to the sale, by the Sainsbury Homebase chain in the UK, of tropical shells, including land molluscs, as 'renewable natural products' (or words to that effect) – a problem drawn to our attention by Sue Wells. As a

result of this action by the Marine Conservation Society, Sainsburys, who appear not to have been aware that the renewability claim might be incorrect, are reconsidering their policy on whether to continue stocking this line of merchandise.

I, and I am sure all the other attendees, are very grateful to Mary Seddon and Ian Killeen for organising such a successful conference and to all those obvious enthusiasts who so willingly took part in it. Can we have another soon, please?

□

Keeping molluscs in captivity

**Do you keep molluscs for captive breeding
or for study?**

Land, freshwater or marine?

Foreign or UK species?

**Please could you let *Jane Reynolds* know
so that she can collate the information
for future membership lists.**

Address: [REDACTED]
London [REDACTED]

W A N T E D

**For purchase (preferably) or temporary loan for
photocopying**

**Journal of Conchology Vol. 26,
Part 2, July 1966**

Required to complete the volume prior to binding.

**Contact: Pryce Buckle, [REDACTED]
Boxmoor, Herts. [REDACTED]**

***Pomatias elegans* in the Ouse Valley, Bedfordshire**

B. Verdcourt

Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AB

In my very premature account of the Mollusca of Bedfordshire (1945) I stated that shells of *Pomatias elegans* are frequent in some woods on the great oolite near Stevington. My old 'nature diaries' (now in the Bedford Museum) give 'loose earthy banks in Stevington Wood (by River Ouse) and in other parts of wood, 13 September 1944.' It appears I visited it again on 22 September 1946: 'quite a lot of shells on a cornbrash-oolite outcrop on a slope in Stevington Wood together with quite common *Helicella itala* var. *minor*' (see Verdcourt, 1947). As far as I remember I only found empty shells.

Kerney (*in litt.* 18 May 1967) referred to my record from 42/95 assuming it was dead shells and some years later (1972) discusses the British distribution of the species and gives a map, an updated version of which of course appears in the atlas (1976: map 7). On 22 April 1972, I made another visit to the wood and was surprised to find that living specimens of *Pomatias* were not infrequent. I have a letter from Kerney dated 25 April 1972 pointing out that finding living specimens was most interesting – 'a very isolated locality for the species. There are ancient (19th century) records some miles to the north in Northamptonshire, also on the Jurassic limestones but no one has seen the species there for many years (Weekly Hall Wood (42/88), Kettering (42/87) and Loddington (42/87)).' He told me he had made a special visit to Stevington some three years previously and looked in a wood about half a mile ESE of Stevington church (42/998531) but found nothing. This small wood bordering the grounds of Oakley House is in completely the opposite direction to what I misleadingly called Stevington Wood. The wood I meant is correctly known as Wood Craft and reached by crossing the water meadows ('The Holmes') to the north-west of Stevington Church holy well. Kerney passed my records to Beryl Rands and I did nothing further. When I thought I

might write up the record in the mid-1980s I found that the actual locality was vague and I decided to make another visit but this was constantly deferred. At last, on 27 September 1996, just over 51 years since I first discovered the occurrence of the species at the site, Beryl Rands and I visited it again to establish the status of the population.

In that half century there appear to have been no changes whatsoever, the area being still free from development; the view across the water meadow and beyond the Ouse is broken by nothing but the odd church spire, but I could not remember exactly where I had found *Pomatias*. The main part of Wood Craft was clearly unsuited for it but on the north-western side of the wood from the part bordering the river a narrow arm sticks out, follows the river and then curves abruptly upwards. The free end of this actually points south-west and is a very steep slope with elder scrub. The contours on the map are too coarse to indicate this steepness. This area looked much more suited to the tastes of *Pomatias* but still we found none, then near the point where this narrow wooded area curves on more or less level ground at the top of the slope near the edge of the wood at 42/9830 5445 a large population was found with many living specimens just beneath the surface of the soil. On the steep slopes a badger's set was found, apparently still active, and a fresh hermit's bothy with a hearth – the sort of thing someone long pre-Saxon might have made!

A fairly recent specimen of *Helicella itala* was found with the *Pomatias* but the abundance of 1946 was not confirmed. This species is everywhere in decline. The cultivated field between the main wood and the curved arm was littered with limestone pieces, a real 'brashy' field, undoubtedly the sort of place where *H. itala* used to occur. *Cernuella virgata* and *Candidula intersecta* still occur but we did not find *Vertigo pygmaea* which I found to be common on the limestone pieces in 1946. The woodland edge is mainly blackthorn, field maple, rose and blackberry. In Nau & Rands (1980) Wood Craft Wood is listed as a site having a 'rich wildlife interest' with a diversity score of 30.

The villages of the Ouse valley date their origin to Saxon times, even to the 5th Century (Grey, 1980) and the outcrop of cornbrash

and great oolite immediately beneath it which stretches through Stevington and straddles the top of the wood around the 40 m contour has been used for 1500 years as a quarry for limestone from which the village has always been built, not to mention the church and a castle. There was a rumour that the castle was built on or near the brashy field mentioned above but no traces have been found of any foundations (Linnell, 1952). It was probably built close to the church.

Fitchett (1943) states that above the town of Bedford the Ouse has cut down below the cornbrash to expose the great oolite series and in places the outcrop is a mile wide; the cornbrash itself is rarely a quarter of a mile wide. Chatwin (1937) states both are used for building.

The 10 km square concerned 42/95 is very well recorded having 82 species in 1972, including freshwater. The total in 1996 according to a copy of the updated card kindly sent to me by Michael Kerney is 109, making it one of the best recorded squares. Mrs Rands and I managed only to add *Monacha cantiana*, surprisingly unrecorded, bringing the total to 110.

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***Pseudamnicola confusa* (Frauenfeld) in the Yare Valley, Norfolk**

R.J. Driscoll

Freethorpe, Norfolk

During the winter of 1976–77 the Nature Conservation Council (now English Nature) commissioned a biological survey of the tidal reaches of the River Bure and River Yare and some of the Yare valley broads in east Norfolk. This survey, and a review of published and unpublished records from the late nineteenth century onwards, showed that many of the aquatic macro-invertebrates recorded from the rivers in the past were still present (Driscoll, 1995; Driscoll & Waterford, 1993). *Pseudamnicola confusa* (Frauenfeld) was one of the few species that was not refound during the survey.

In July 1944 E.A. Ellis (not to be confused with A.E. Ellis, the well-known malacologist) found *P. confusa* living on mud under *Glyceria maxima* (Hartm.) Holmberg along the River Yare near the sugar beet processing plant at Cantley. *P. confusa* was also known from Lake Lothing and the River Waveney between St Olaves and Beccles (Ellis, 1945).

Careful searching at Cantley in March 1977 produced a few *Potamopyrgus jenkinsi* (Smith) but no *P. confusa*. Repeat surveys of the River Yare were carried out in March–April 1982 and February 1990 but these also failed to find *P. confusa* at Cantley or at any of the other sample sites along the river.

Ellis collected his specimens in 1944 by sweeping the vegetation with a pond net and examining the bare mud underneath the vegetation (E.A. Ellis, pers. comm.). The same technique was used unsuccessfully in 1977, 1980 and 1990.

During the 1976–77 survey five samples of aquatic invertebrates were collected from Strumpshaw Broad, a small, slightly brackish water body connected by a channel to the tidal River Yare. The basin was largely overgrown by a mat of vegetation, and very heavily silted, and was virtually dry at low tide. *P. jenkinsi*

was the most common species of mollusc present and nearly a hundred specimens were collected on 18 March 1977 (Grid Ref. TG 338067) and sent to T. Warwick for examination. Warwick found a single specimen of *P. confusa* among these *P. jenkinsi*. In addition to these species *Lymnaea palustris* (Müll.), *Valvata cristata* Müll., *Bithynia leachii* (Sheppard), *Anisus vortex* (L.), *Bathyomphalus contortus* (L.) and an unidentified *Pisidium* were also recorded from the broad.

Strumpshaw Broad lies with Strumpshaw Fen, a nature reserve managed by the Royal Society for the Protection of Birds (RSPB). After years of neglect (before RSPB became involved with the site) recent management has produced an overall increase in the biological interest of the reserve (Tickner *et al.*, 1991). Paradoxically this management may have resulted in the loss of *P. confusa* from the site.

The broad was isolated from the River Yare by damming the channel where it joined the river in June 1978 (although it was 1988 before leakage of river water through the dam and river bank was effectively stopped). The vegetation that clogged the broad was killed by spraying it with herbicides. The mat of vegetation was broken up to a depth of 2 metres using high pressure jets of water and an excavator mounted on a pontoon. Once the remains of the vegetation had been removed the broad was suction-dredged (mud-pumped) and the basin enlarged from less than 1 ha to more than 7 ha in autumn 1983. The broad is no longer brackish and tidal and since 1988 it has been topped up with fresh water from a borehole (M. Blackburn, RSPB pers. comm.). When the broad and associated channels were sampled in 1987 *P. confusa* was not found and a typical freshwater molluscan fauna was recorded (M. Johnson, National Rivers Authority, pers. comm.).

P. confusa still occurs in Oulton Broad and along the lower reaches of the River Waveney (Killeen, 1992).

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***The World of the Snail*
at the Museum of Reading
Sunday 16 March 1997**

As part of SET 97 – National Week of Science, Engineering and Technology – the Museum of Reading will be holding a Snails roadshow entitled *The World of the Snail*. There will be unique opportunities to look at and touch live specimens, discover the Museum's spectacular permanent collection of rare and unusual shells and to bring your own shells in to be identified. Everyone is welcome, and admission is FREE.

The World of the Snail takes place from 2 – 4.30 p.m. at the Museum of Reading, Blagrave Street. For further details about this event and others, please call (0118) 939 9800, or pick up a leaflet.

***Waterfest*
A celebration of water and the environment
Saturday 28 June**

Look out for details in the next Newsletter of this exciting festival on Saturday 28 June, 11 a.m. – 4 p.m. at Blake's Lock Museum. This unique event, which attracts national attention, celebrates the Kennet and Avon Canal and its thriving wildlife. Not to be missed. For further information, contact (0118) 939 9800, or pick up a leaflet.

New colony of *Cochlicella barbara* at Kenfig

Janet Boyd

Langford, Bristol

Kenfig National Nature Reserve is one of the most important sites for wildlife in Britain. Over 500 species of flowering plants occur on this 2,000 acre site with its sand dunes, dune slacks, saltmarsh, woodland, reed beds and 70 acre freshwater lake. It is situated between the M4 and the Bristol Channel, between Swansea and Cardiff and under the grim shadow of Port Talbot steel works. I visit the reserve regularly, either on my way to Dyfed (which is a favourite holiday area) or on my way back home to Churchill, near Bristol. There are usually crowds of summer visitors clustered around the pool, and too many dog-walkers in the vicinity of the car park, but once I have left the car park and pool behind, there are so many paths leading from the Visitors' Centre across the dunes that it is unusual to find someone else who has chosen exactly the same path. Occasionally, the acrid fumes from the steel works blow across the reserve, but this is rare. Normally, there is so much to interest me as I make my way out towards the sea, that progress is slow and there is no time to do more than eat my picnic lunch on the cliff edge, renew my acquaintance with *Theba pisana* and wander back a different way.

However, when I visited the reserve in May this year I decided to make the effort to explore a little more because I had been asked to give a talk about the reserve to our local wildlife group and I found that I was really only familiar with a very small part of it. I walked purposefully out towards the sea and when I reached the edge of the dunes, I turned north along an old haulage track, hoping to reach the northern end of the reserve which I had not seen before. The vegetation is heavily grazed by rabbits in a band either side of the stony track and the lime-rich shell sand shows through the sparse grass and herbs. I see plenty of *Cepaea nemoralis*, *Helix aspersa*, *Candidula intersecta*, *Helicella itala* and *Cochlicella acuta* in this area, but *T. pisana* and *Pomatias elegans*

both seem to prefer the areas of marram grass closer to the beach. As I walked along, I noticed an exceptionally large number of *C. acuta* shells, so much so that my husband commented on the profusion and I stopped to have a closer look. They just didn't look quite right. My first thought was that they were all juveniles because they seemed so small, but as soon as I picked some up I could see that they were adult and therefore might be a different variety or species. They were shorter and fatter than *C. acuta* with stronger growth ridges on the last whorl. On the specimens which had a band, it was milk-chocolate coloured rather than dark-chocolate and it wound all the way up to the apex of the shell instead of appearing only on the last whorl. I found a live specimen aestivating up a grass stem so I took some close up photographs and put a few of the empty shells in a pot to examine later at home. When I checked it with the identification books later, I felt sure that I had found *Cochlicella barbara*, but distribution maps for this Mediterranean species showed only one colony in Britain and that was discovered in 1975 near Torquay. Dr Michael Kerney has since confirmed my identification and informs me that the colony at Torquay has not spread and is barely surviving. Apparently, a colony was artificially established at Charmouth, Dorset in 1977 using specimens from Torquay and is holding its own.

I returned to Kenfig later this summer to try to ascertain the extent of the colony. Again, I was pleased to find several live specimens which seems to indicate that the colony is doing well. The shells occurred in a long narrow band which extended from the short sandy grass either side of the stony track right up into the coarser marram grass closer to the sea where *T. pisana* and *P. elegans* shells are found. However, it was interesting to note that where I found *C. barbara* shells, there appeared to be none of *C. acuta*. The warden of the reserve was pleased to hear about the find and tells me that the mollusc species count for Kenfig has now reached fifty five.

□

A case of predation on *Melanoides tuberculata* by the glossy ibis in Israel

Henk K. Mienis
National Mollusc Collection, Berman Building,
Dept Evolution, Systematics & Ecology,
Hebrew University, 91904 Jerusalem, Israel

The glossy ibis, *Plegadis falcinellus* (Linnaeus, 1766) was until the mix-sixties an uncommon passage visitor at fish ponds, pools and marshes in Israel (Hovel, 1987). However, since 1969 it has established itself as a breeding bird in small colonies especially in the northern part of the country (Hovel, 1987; Paz, 1987). This resident population seems to extend its territory slowly to the south. In the last few years large numbers of glossy ibises are also observed near sewage reservoirs in the central part of Israel, i.e. the Rishon-le-Ziyyon and Ramla areas.

A small breeding population has also become established recently south of the new Hula Lake. Regurgitated food items collected from under the nests in the latter colony on 13 August 1996 revealed the presence of three specimens of *Melanoides tuberculata* (Müller, 1774), Fam. Thiaridae. All the specimen are rather small, are missing the top whorls and show signs of corrosion, yet they were recently alive because each specimen is still provided with an operculum deep within the aperture. The shells were of the following dimensions: 9 x 4.1; 9.7 x 4.1 and 13.6 x 5.3 mm.

This freshwater snail of tropical origin is commonly encountered in most perennial waters throughout Israel. So far it has not been reported from the new lake (Dimentman, pers. observ.), but it is commonly found in the nearby Jordan River and in the Sea of Galilee.

The food of the glossy ibis consists of both terrestrial and aquatic invertebrates and small invertebrates (Roselaar, 1977). It has been reported feeding on molluscs previously. Roselaar (1977) came across the following cases of predation on molluscs: *Mytilus* sp. and *Lymnaea* sp. in Scotland; gastropods, bivalves and

Lymnaea minuta (= *Galba truncatula*) in France, and *Planorbis* sp. and *Ampullaria* sp. (more likely either *Pila* sp. or *Lanistes* sp.). Now *Melanoides tuberculata* can be added to this small list.

I would like to thank my colleague Dr Chanan Dimentman (Jerusalem) for entrusting me with the discussed material.

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Recently Published

Joint Nature Conservation Committee Report No. 240

Rare marine benthic flora and fauna in Great Britain:
the development of criteria for assessment.

ISSN 0963-8091.

The Big Slug Day

Jane Reynolds

Holloway, London

On 7 July I took part in the London Wildlife Trust Garden Centre open day, entitled 'The Big Slug Day'. Somehow I'd overlooked this item in the LWT's programme and so I heard about it quite by chance only two weeks before. I spoke to Helen Firminger, the Garden Centre's Project Manager, and was promptly booked in as guest speaker. She had chosen slugs as the theme for the day because she wanted to raise awareness of *all* wildlife, a motive which I wholly support.

I had a busy couple of weeks sorting out slides and preparing my talk. I also went on a preliminary visit to the site in Marsden Road, London SE15 on the Monday before the event. A photographer from the *South London Press* was there to take some shots of me with a couple of *Archachatina marginata*, which appeared in the following Friday edition (in colour!). Luckily June Chatfield was in London that week and I was able to arrange to collect the CSGBI Display Boards material from her to use.

I arrived at the site with about an hour to set up my stall inside the building. I used some display boards belonging to the Garden Centre. These were only large enough to fit about two-thirds of the material, but as the event was mainly aimed at children I could still make up a suitable display. I took along some live snails, including four giant African snails (of three species), and an assortment of Conch. Soc. leaflets, posters and postcards for sale. After a bit of a rush I got some tea and sat back to wait for things to happen. The *Asperita* were courting when I arrived, but they soon gave up. The event started at noon and the first half an hour was quiet, but after that I never stopped. I was interviewed by the local papers again, and by Channel 1 (Cable TV), where I gave a bit of a plug for the Society, but mostly I was supervising a constant stream of children (and some adults) handling the snails. All four of the giants seemed to take very well to this, there were no mishaps and only one or two children who had to be mildly

rebuked. The other snails were less enthusiastic but very few of the kids were quite as interested in these.

I managed to get a few minutes' break just before my talk. With impeccable timing it began raining at exactly 3 pm, so I had a full house! Afterwards I gave an identification walk. Initially there were lots of little kids all showing me *Helix aspersa* and saying 'I found a snail,' 'I found a snail, too,' 'I've found *four*,' but after a while they trailed off leaving a few genuinely interested individuals. I was able to show them some nice specimens of *Candidula intersecta* and *Cernuella virgata* (introduced with the chalk soil bank?) that the earlier shower had disturbed.

There were several other events, including a fancy dress parade which had a man in a slug costume and a woman on stilts with a snail hat. They had made a giant slug out of bin liners like a Chinese New Year dragon, and most of the kids had a go at taking part in it. There were cardboard cutout snails all around the site, and a nine-foot long orange slug at the roundabout on the main road (I took quite a few of these cardboard snails, and the slug, home with me!) Happy Flower, a work experience enterprise for adults with learning difficulties, had made lots of model snails for sale, and there was even a snail cake as first prize in the raffle.

It was a really well-attended event which everyone seemed to enjoy. Moreover Helen Firminger's aim of making people realise that biodiversity doesn't just apply to pretty things like butterflies and flowers was certainly met. I think I managed to get a few converts, or at the very least a few people who'll think twice before they tread on a snail.

□

Conchological Society of Great Britain and Ireland

MINUTES

**1071st (Ordinary) meeting
held on 4 May 1996 in the Demonstration Room of
the Natural History Museum starting at 2.30 pm**

In the chair: Dr Preece with 34 members and friends present.

Apologies for absence: Mrs McMillan, Mr & Mrs Rands, Mr Dance, Dr Chatfield, Mr de Bartolomé, Mrs Turk, Rev Long, Miss Sawyer, Dr Kerney, Mr & Mrs Negus, Dr Colville, Dr Oliver, Mr Ekins, Dr Willing.

Minutes of the last meeting (of 10 February 1996) : Read and accepted.

Matters arising: None.

Nomination and election of new members: One student member:

Miss N. Moss

Doncaster

Lecture of the day:

Speaker: Dave Aldridge (University of Cambridge)

Title of talk: *Bitterling: Fish with Mussels*

Any other business: The next field meeting is on Saturday 25 May, Surrey, leader Jan Light. The indoor meeting programme resumes on Saturday 28 September when the speaker will be Justin Gerlach on Land Shells of the Seychelles.

Meeting closed at 4.38 pm.

Chairman

Appendix: Members' exhibits

Ms J.E. Reynolds

1. Magazine – *PC Format*
2. Photos of snails
3. Postcard from S.P. Dance
4. Slug cards by Miss J. Pedley for sale

Mr P.T. Wimbleton

Cerastoderma glaucum (Poiret, 1789)
from Portsea Island, Portsmouth.

Mrs C.M. Street

Competition prize-winner *Folio* Magazine,
'Ode To My Pet Slug'

Dr E.O. Bishop

Comparison of *Gibbula umbilicalis* (Da Costa) and *Gibbula pennanti* (Philippi) from Jersey

Mr I.J. Killeen

Biomôr

Mr K. Brown

Book: Kevin Lamprell, *Spondylus: Spiny Oyster Shells of the World'*

+ *Spondylus regius* Linné, 1758

+ *Spondylus anacanthus* Mawe, 1823

+ Press cuttings.

**1072nd (Ordinary) meeting
held on 28 September 1996 in the Demonstration Room
of the Natural History Museum starting at 2.30 p.m.**

Announcement of deaths: Dr E.E. Sandor, member since 1971; Mr A.R. Waterston OBE, BSc, FRSE, FRES, Life Member since 1931; Mr John Armitage, member of the Yorkshire Conchological Society.

In the chair: Dr Preece with 37 members and friends present.

Apologies for absence: Dr Kerney, Mrs McMillan, Mr de Bartolomé, Mrs Turk, Mr & Mrs Rands, Mr Negus, Rev Long.

Minutes of the last meeting (of 4 May 1996) : Read and accepted.

Matters arising: None.

Nomination and election of new members: No list was available.

Announcements and correspondence: Contributions for the *Conchologists' Newsletter* and *Journal of Conchology* are needed.

Lecture of the day:

Speaker: Justin Gerlach (University of Oxford)

Title of talk: *The Land Shells of the Seychelles*

Any other business: None.

Meeting closed at 5.00 p.m..

Chairman

Appendix: Members' exhibits

P. Dansey	Key to <i>Ensis</i> , also Internet mollusc pages and Web sites.
S.M. Davies	Some slugs which can lay eggs again a year after first laying
Peter Topley	Land snails of the Seychelles, etc.
Terry Wimbleton	Marine shells from shell sand Kimmeridge Bay, Dorset
C. Street	<i>Sepia elegans</i> , tideline SW South Uist, Outer Hebrides
Janet Sawyer	<i>Trivia millardi</i> (Care 1979)
E.O. Bishop	Land snail of the Yucatán Peninsula
Kevin Brown	1. Book, <i>Moluscas del Caribe Colombiano</i> by Juan Manuel Diaz Merlano & Monica Puyana Hegedus 2. Caribbean shells 3. Press cuttings 4. European Malacological Index 5. <i>Sheller's Directory of Clubs, Books, Periodicals & Dealers</i>
B. Colville	Some Seychelles snails
Martin Willing	<i>British Wildlife</i>
Jane Reynolds	1. 'The Big Slug Day' – photos and paraphernalia 2. Photos of <i>Megalobulimus oblongus</i> 3. Recent news items 4. Institutional Members' publications 5. Mauritian snail stamps



Diary of Meetings

Conch. Soc. Field Meetings for 1997 are listed separately.

Saturday 15 March, London: Conch. Soc. indoor meeting. Annual General Meeting. Presidential address, Richard Preece: Mapping snails in time. The Natural History Museum at 14.30.

Saturday 5 April, Woking: Conch. Soc. Slug Workshop.

Saturday 12 April, Helmsley: Yorks. Conch. Soc. field meeting. Calcareous springs near Helmsley. Meet at Helmsley Castle car park, SE 610838 at 11.00. Contact: David Lindley [REDACTED]

Saturday 3 May, London: Conch. Soc. indoor meeting. David Reid (Natural History Museum, London). Evolution of *Littorina*: wonderful winkles! The Natural History Museum at 14.30. Please bring exhibits on the theme of winkles, or Littorinids for identification.

Saturday 10 May, Arthington: Yorks. Conch. Soc. joint field meeting with Yorks. Naturalists Union. Meet at Arthington Nunnery, SE 289451 at 11.00.

Saturday 17 to Sunday 18 May, France: Premières Rencontres des Malacologues Continentaux de France. Laboratoire Souterrain du C.N.R.S., Moulis (Ariège). Contact: Alain Bertrand, Laboratoire Souterrain, 90200 Moulis, France. Tel. France 61.66.31.26.

Sunday 18 May, Reading: Exotic Limpet Workshop, to help identify the Museum's extensive collection. Reading Museum Town Hall, Reading, 14.00-17.00. Organiser: June Chatfield. Bring reference books and hand-lens.

Saturday 21 June, Staveley: Yorks. Conch. Soc. joint field meeting with Yorks. Naturalists Union. Meet at Staveley Nature Reserve car park, SE 366635 at 11.00.

Saturday 26 July, Pocklington: Yorks. Conch. Soc. joint field meeting with Yorks. Naturalists Union, at Warter Estate (old woodland with streams and lake). Meet at the Estate Office on B122246 east of Pocklington, SE 8650 AT 11.00.

Saturday 6 September, Dent: Yorks. Conch. Soc. field meeting. Mapping of the Sedbergh area on tetrad scale. Meet at car park in Dent village, SD 704871 at 11.00. Leader B. Colville.

Saturday 4 October, Kettlewell: Yorks. Conch. Soc. field meeting. Springs in Kettlewell area, Wharfedale. Meet at car park in Kettlewell, SD 968723 at 11.00.

Saturday 11 October, London: Conch. Soc. indoor meeting. Peter

Morden (Natural History Museum, London). Land molluscs of the Azores. The Natural History Museum at 14.30.

Saturday 25 October, Leeds: Yorks. Conch. Soc. Annual General Meeting. Leeds City Museum at 13.00.

Saturday 22 November, London. Gentlemen and Players: professionals and amateurs in malacology, 1900–1950. A one-day meeting organised by the Malac. Soc. with the Conch. Soc. and the Society for the History of Natural History, at the Linnean Society, Burlington House, Piccadilly. Programme details and booking form will appear later.

Saturday 29 November, Woking: Conch. Soc. Molluscan Workshop.

Saturday, 13 December, London: Conch. Soc. joint meeting with the British Shell Collectors Club. Kevin Brown (London). What's in a name? The Natural History Museum at 14.30. Please bring exhibits and/or slides on the theme of unusual names.

□

Day Course on Seashells

A day course on British seashells will be held at

Petersfield, Hampshire

on Saturday 26 April 1997

with tuition by June Chatfield.

**Further details from Dept of Adult Continuing Education,
University of Southampton, Highfield, Southampton SO17 1BJ,**

Tel. 01703 594066 or 593469.

Field Meetings 1997

Hon. Programme Secretary:

Rupert Honnor

Henley-on-Thames

Oxon.

Important

Please remember to inform the leader if you are attending a field meeting.

Saturday, 19 April

Hampstead Heath, North London

Leader: Jane Reynolds

Further recording for the 'Survey of Northern Area Inner London Slugs and Snails' at one of London's most famous open spaces. The London Natural History Society have recently adopted the Heath as a 'twin' to the Bookham Common survey in South London, which has been ongoing for over 50 years. This meeting will also form part of the preliminary molluscan data for the LNHS survey, as old records seem to be somewhat sporadic. *Testacella* have been found in recent years, and there are a variety of habitats in addition to heathland, including copses and plenty of ponds. On London Clay, and a great view from Parliament Hill!

Meet at the LNHS hut (tea and coffee making facilities available) in the middle of the Heath Extension (Grid Ref. TQ259 876) at 10 a.m. Bring a packed lunch. For more details contact the leader.

Sunday, 1 June to Saturday, 7 June

Cornwall, West of Plymouth

Leader: Rupert Honnor

Further marine survey work for the 'Channel Atlas' project (DOMMIC). Based around Looe, it is intended to cover the (hopefully) rich coasts between Dodman Point (Grid Ref. SX 003 392) and Plymouth.

see next page ...

Planning is currently underway, and members who contact the organiser will be provided with a summary of the information available. An early expression of interest in this trip would be helpful.

Fallback meeting place (in case all other communications fail): Hannaford Point (West of Looe, Grid Ref. SX 256522). Meet between 08.30 and 10.30 a.m. (yes, 08.30 in the morning!) for low tide at approx. 09.10 a.m. A planning meeting will follow at local pub in Looe on Sunday lunchtime.

Saturday, 28 June

Arun, near Pulborough, West Sussex

Leader: Martin Willing ()

Will include visits to sites for various Red Data Book species, including *Anisus vorticulus*, *Pseudamnicola confusa*, and *Pisidium pseudosphaerium*. Details in June Newsletter.

Saturday, 19 July and Sunday, 20 July

North Wales coast

Leader: Tom Clifton ()

Non-marine sites in the mornings, and survey work on the rocky headlands in the afternoon (due to late low tides). Details in later Newsletter.

Sunday, 28 September

Reading area, Berkshire

Leaders: June Chatfield ()

and Rosemary Hill ()

Revisiting old mollusc localities in the Reading area, 100 years after their original recording. Details in later Newsletter.

Saturday, 8 November

Blockley Quarry, Gloucestershire

Leader: David Long (REDACTED)

Visit to brick clay quarry with exposure of Ibex zone of Lower Lias. Details in later Newsletter.

Other events 1997

■ Saturday, 5 April: Slug Workshop

Organiser: Tony Smith (REDACTED)

Tutor: Stella Davies

Venue: At the home of Judith Nelson in Woking

Instruction in the dissection and identification of British slugs around in the spring. Bring your specimens!

Please confirm attendance with the organiser.

■ Sunday, 18 May: Exotic Limpet Workshop

Organiser: June Chatfield (REDACTED)

Venue: Reading Museum, Town Hall, Reading, 2-5 pm

To help identify the Museum's extensive exotic limpet collection. Bring reference books and hand-lens. Also bring your specimens!

Meet at the entrance to Reading Museum at 1.55 p.m.

Reading Museum is within easy walking distance of Reading (BR) Station. Ample car parking is available at Reading Station. Please confirm attendance with the organiser.

■ Saturday, 29 November: Molluscan Workshop

Venue: At the home of Judith Nelson in Woking (REDACTED)

An opportunity to learn about the British marine and non-marine molluscan faunas. Formal sessions and informal discussion.

Details in later Newsletter.

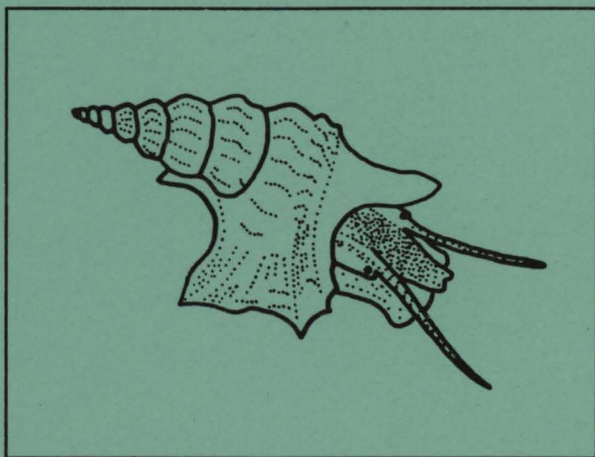
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The Conchologists' Newsletter

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Collectors in East Africa

No. 25: A.B. Percival (1875–1941)

B. Verdcourt

Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AB

Arthur Blayney Percival, who made an enormous contribution to our knowledge of East African molluscs and was Kenya's first Game Warden, was born at St Andrews, Newcastle on Tyne on 7 March 1875 and baptised on 28 April in the Parish of Jesmond. He was the eldest son of Percy Percival, described as an 'agent', and Emily Margaret Percival (née Blayney). His father carried on a business of grocer and wine and spirit merchant in South Shields, Durham for about eight years but about 1880 suffered from a severe attack of typhoid and congestion of the lungs resulting in severe bouts of depression. He was totally incapable of carrying on his business and his trade became unprofitable; finally his capital was all used up. Moreover, he had been advised to move to the south of England. He now had to depend on friends for the support of himself, his wife and his three children, all boys, aged 10 years, 5 years, and 9 months.

Both the older boys were to become bluecoat boys at Christ's Hospital, the 'bluecoat school' (so called from the distinctive uniform) founded by Edward VI in 1552 in Newgate Street on the site of the Greyfriars Monastery, City of London for the education of poor children. A school of the highest standard it provides education and maintenance to children of parents or guardians in need of assistance; it moved in 1902 to Horsham. Its pupils included Coleridge, Leigh Hunt, Constant Lambert and Charles Lamb. Percy Percival's petition to the school dated 1884 was made from the parish of Brockenhurst in Hampshire and signed by a minister, Churchwardens and three housekeepers in that parish. H.P. Gilbey, the presenting governor (whose letter to the school was headed New Gallery, Pantheon, Oxford Street, London W.) said, 'And this boy I found somewhat backward in his education having been rather — ? the first — ? years of his life. He is now strong and will —?— made up lost ground —?— he is intelligent (several words indecipherable). His medical details indicate he had had all the common childhood diseases, measles, chicken pox, whooping cough, ringworm and was subject to bronchial colds. He

was admitted to the school ('clothed') on 15 April 1885 from Jesmond in Northumberland and discharged on 18 April 1890 by his cousin Mr Ernest Rhys, on behalf of his father who resided at Rectory Terrace, Gosforth, Newcastle on Tyne and Perridge House, Shepton Mallet. His younger brother Walter Gilbey Percival was admitted to the same school on 25 January 1888 also from Jesmond and was discharged by his father who resided then at Somerset Court, Brantknoll, Somerset.

A.B. Percival's daughter remembers her father talking about Barrow (?Berrow) Manor near Burnham-on-Sea facing out over Bridgewater Bay in the Bristol Channel where apparently Percy Percival died. Brentknoll, within two miles of Berrow is clearly the same place, Brandt being a variant spelling or perhaps misspelling. The youngest boy did not go to Christ's Hospital. The petition on behalf of Walter Gilbey was made from the Parish of Pilton, Somerset and shows that Percy had now found a position as a companion to a gentleman needing supervision at £100 a year. His wife received £16 a year interest on a legacy. At that time of course many families were living on about two pounds a week. Percy and Margaret's marriage certificate dated 26 November 1873 adds two items of information. Percy's father is described as a 'gentleman' whereas Margaret's, Arthur Blayney, is described as a grocer. I have found out nothing else about young Arthur's early years apart from the fact that he was keenly interested in natural history as a young man. His daughter describes him as a rebellious character who did not take kindly to school. Nevertheless she has a bible presented to him by the school and also one to his younger brother Walter who died of plague in Kenya in 1920.

It seems that all the brothers went to Kenya. Arthur's own books are exasperatingly devoid of personal details, although he does mention he shot a baboon which had gone berserk in his wife's bedroom after it had been treated well. Before going to East Africa he was for some time in South Africa, being in the E. Transvaal in October or November 1896 during the great rinderpest epidemic; presumably it was about this time he was commissioned to collect a couple of live mambas for Phili's Circus then at Barberton. Later he led an ornithological expedition to south-western Arabia between 9 August and 19 October 1899. The manuscript notes of this expedition with rough maps showing the various routes taken by the party are in the archives of the

British Museum (Nat. Hist.). He began in East Africa in the days of Sir Arthur Hardinge who was First High Commissioner during the period 1895–1900, just after the British Government had taken over the administration of the Imperial British East Africa Company. He was appointed Assistant Collector, the equivalent of what in later days became known as Assistant District Commissioner, on 14 June 1900. This involved acting as a Magistrate since he states in his book, 'long ago when it befell me to exercise magisterial functions on the coast I had to deal with a difficult case.' Sir Charles Norton Edgecombe Eliot (1862–1931), a diplomat, orientalist, brilliant linguist and marine biologist, became Consul-General at Zanzibar and Commissioner for the British East Africa Protectorate in 1900. It was he who produced the supplementary part 8 to Alder and Hancock's *The British Nudibranchiate Mollusca* (Ray Society, London 1910) and also several papers on East African sea-slugs. I do not know if he had much unofficial contact with Percival and encouraged him to collect molluscs but it is possible. Actually Sir Charles Eliot himself collected some land molluscs in Kenya. The accession books of the Mollusca Dept. of the British Museum (Nat. Hist.) record 1904.1.20, 1–5 *Martensia*, Kinangop (actually *Trochonanina decussata* (Preston)), and 6–17 freshwater from Victoria Nyanza. Percival himself donated molluscs 1902.11.7, 1–6, Kilimanjaro, British East Africa to the museum which were described by E.A. Smith. Later, however, all his material passed into the hands of Preston the dealer. Blayney's daughter assures me that her father needed no prodding to collect. During his journey up from South Africa he collected specimens of all kinds. It could have been Smith or Eliot who suggested where he should send his material.

Percival was appointed Ranger for Game Preservation on 10 May 1901. His salary was £250 a year with about £100 for expenses (£5 a week in Britain at that time was an excellent wage). His first real expedition was to Meru and the Eusso Nyiro in 1902 and took him nearly two months with an escort of 30 rifles. Later when cars started to appear times were cut dramatically. In the early 1920s a run around Mt Kenya, together with visits to Archer's Post on the Eusso Nyiro and Marsabit as well, took only four days. The old Ford 'tin lizzie' or Model T was a splendid vehicle for rough African tracks since it had enormous clearance. The old foot safaris with gangs of porters obviously gave more time

for collecting and used routes which later on were rarely traversed explaining why some species have never been recollected – some of the places are just too difficult to get to now (and infinitely more dangerous recently now that so many armed rebels are about).

F.J. Jackson, H.M. Deputy Commissioner in 1906, made the decision to establish an adequate and properly organised Game Rangers' Department to help preserve the game, already then decreasing seriously due to the large numbers of 'sportsmen' arriving in the country. Jackson thought highly of Percival whom he described as 'young, active and keen, a fearless rider inured to hardships, a complete stranger to all idea of comfort, a good sportsman and naturalist'. Percival was responsible for the work behind the properly codified game laws which became the East Africa Game Ordinance (1906). In 1907 a separate Game Department was established as a separate unit of the Colonial Service and Percival was Senior Assistant Game Ranger under the first Chief Game Ranger, Col. J.H. De B. Patterson (of Man-eaters of Tsavo fame). He also served under the next chief, R.B. Woosnam who held the post from 1910–1915. In 1909–1910 he accompanied Theodore Roosevelt's safari – also in the party was E.A. Mearns who mainly collected plants, mammals and birds but also made a collection of snails (see this series No. 24 in *Conch. Newsl.* **137**, June 1996).

In 1915 Percival took over control under the new title Game Warden. He also served with Military Intelligence during the East Africa Campaign of the First World War (1914–1918). In 1923 he retired and settled in his soldier-settler farm, Mamandu Estate near Machakos in Ukamba and died there on 20 January 1941, having been ill for some time, leaving a widow, son, daughter and two stepsons. He was buried on his own farm. His daughter told me, 'The District Commissioner arranged an official funeral for him. My younger brother Peter Blayney Percival, Buster to everyone, and I were both at the funeral. Sadly Buster perished in 1944 when the *Khedive Ismail* was sunk off India'. Arthur's first wife was Dolly Edwards who was not a well woman when he married her but a very gentle loving person. His daughter says they did not have many years together and she remembers 'Dad telling me about the time when he was in the Masai Game Reserve on a foot safari several days out of Nairobi. Suddenly he felt he was needed at home. He broke camp at once and taking a few porters

made a forced march arriving at the hospital shortly before Dolly died.' His second wife had been widowed when her husband died of yellow fever in West Africa leaving her with two small boys. Arthur's brother Phillip Percival was also well known in the 'big game world', being one of the most successful hunters in Kenya and president of the East African Professional Hunters' Association.

There is no doubt that Arthur Blayney Percival was very good at his job for the simple reason it was also his life's interest. A small group of amateur naturalists met at the home of the then Governor, Sir Percy Girouard (1867-1932) and founded the East Africa and Uganda Natural History Society in 1909 which by the end of that year had 64 members. Arthur was one of the founder members, on the committee at least from 1912 onwards (and probably earlier) and was Vice-President from 1922-1936. He wrote 13 articles, all on vertebrates in the journal of the society scattered through the first five volumes. He was also a Fellow of the Zoological Society and a member of the British Ornithological Union. Birds and mammals were his particular study and several birds were named after him. He collected rats, mice, bats, birds, fishes, butterflies and other insects, even a few plants and although he collected so many molluscs he does not mention them in his own writings. He presented some 900 birds, 500 small mammals, 250 fish, etc. to the museum in Nairobi.

Noel Simon (1961) quotes many interesting items of information from Percival in a book which is a fascinating but sad and horrifying history of wildlife conservation in East Africa. In the First World War game suffered heavily during the fighting around Tsavo. Percival mentioned that 40,000 head of game were slaughtered in the Southern Reserve to feed the troops and giraffe were killed because they damaged telephone wires essential for communications. Little wonder it always seemed such a barren place some 40 years later. In the Second World War the destruction was even worse although there was no actual fighting south of the then Italian colonies of Ethiopia and Somalia. However, thousands of prisoners of war were held in Kenya and teams of hunters shot out most of the game to feed them, in fact some were given rifles to feed themselves. Year after year train loads of carcasses were on the move. Percival was lucky to have seen the wildlife as it had been before man had made any

noticeable impact on its abundance but he well knew what the future held and that game was not going to be able to compete with the development of the country. He recorded passing through herds of zebra extending for miles even close to Nairobi and between Nakuru and Elmenteita. Ol Doinyo Sabuk, not far north-east of Nairobi, teemed with buffalo. One could still see small herds of five to ten zebra just east of Nairobi in the early 1950s. When I was moving from Amani in Tanzania to Nairobi in late 1950 I saw not a single animal in the 300-odd miles to the Kenyan border but quite a few on the plains near Nairobi. It was (and hopefully still is) possible to see tens of thousands in the Serengeti and Mara Plains.

Perhaps the most amusing story about Percival concerns the desire of H.H. the Maharajah of Gwalior's wish in 1902 or 3 to reintroduce lions into the forests of Scinde where they abounded in former times. He wrote to Lord Curzon (1859-1925) who passed the request on to Sir Charles Eliot who promptly gave Percival the job of rounding up some cubs. He offered rewards to his staff to bring some in and his lurcher bitch 'Lady' acted as foster mother to the first; her own puppies were reduced to two and finally none as two more cubs arrived. Apparently they had to go after frightening a bishop and I am not sure if the Maharajah ever got his lions.

Percival was interested in most field sports and was joint master of the first pack of hounds in Kenya in about 1905; he hunted lion from horseback and was keen on pig sticking. But although he killed a lot of animals - 50 lions himself, 7 in one day all 'rogues', and had seen at least another 150 killed, Percival was at heart far more interested in live animals than dead ones and was deeply concerned with conservation long before it became the popular bandwagon and source of income and jobs it is now. His own land at Machakos was a game and bird sanctuary as well as being a farm. He was, however, alert to the need for a certain amount of collecting for scientific purposes and bona fide hunters and expeditions from museums and scientific societies always received his help. He was instrumental in the early introduction and acclimatisation of the brown and rainbow trout into the highland rivers which was certainly a success.

He wrote two books, *A Game Ranger's Notebook* (1924) which was delayed by other claims on his time and also a serious illness which disabled him for many months; it finally appeared after

being edited by someone else, followed by *A Game Ranger on Safari* (1928). He also contributed articles on natural history to *Blackwoods* (a magazine immensely popular with colonials) and other periodicals in a crisp clear style but I have not looked them up. A number of vertebrates were named after him, e.g. Percival's swamp rat *Otomys percivali* but I have not attempted to investigate how many.

He was a man of cheerful and kindly disposition and extremely popular not only with his colleagues but with a wide circle of friends in many parts of the world. Nevertheless he was quite happy on his own and it is pleasant to record that he was undoubtedly civilised, taking pleasure in real comfort (despite Jackson's earlier recorded comment!). The frontispiece to his 1924 book shows him sitting outside his tent with a siphon and whisky bottle on the table and a glass in his hand. I can attest to the fact that there is nothing better than to be positioned just so with a minimum of the human race within a hundred miles radius. I much regret not having discussed him with my father-in-law, E. McInnes, who was very friendly with Percival.

He was certainly one of the most important collectors of molluscs in East Africa, making an enormous contribution and ranking only with Stuhlmann. E.A. Smith described the first species named after Percival but most were described by H.B. Preston and later by M. Connolly who took over the collection when Preston stopped work on it. I do not know how Preston first made contact with Percival, possibly via Smith. Many species of snail are named after him, all three epithets *percivali*, *arthuri* and *blayneyi* being employed. Preston also produced *Blayneyella* and *Percivalia* both at present in synonymy. A difficulty arises in the case of several papers by Preston where the collector's name is not given and it is not possible to tell whether it was Percival, R. Kemp or C.W. Woodhouse who collected the material although the locality is occasionally suggestive. I am not optimistic that further information will be forthcoming. As is well known, Preston distributed innumerable specimens to many institutions and private collections under names which were never published, many with the epithet '*percivali*'. In the case of BM material Connolly has often indicated what he believes is their correct identity.

It is probable that some type material mentioned in the registration books of the British Museum (Nat. Hist.) but not found

in the type collection is in the general collection and it is certain that other material is in many other British and European museums.

Connolly frequently chose a specimen from the type material by marking it with a red spot, placing blue wool in the aperture, separating a specimen into a separate tube or by making distinctive comments on the box. These are the obvious choice for future lecto-typifications but he did not publish the information and since the *Newsletter* is not now considered a suitable place I have not done so either but referred to 'type material'. I must, however, state my belief that in Connolly's case where there is only one specimen it is to be interpreted as the holotype. It is less likely in the case of Preston who distributed duplicates widely (or rather sold most of them) but material he sent to Tervuren and the BM marked type in his own handwriting must be the first choice when determining the type.

List of molluscs described from material collected by A. Blayney Percival in Kenya and Tanzania

- Africaron marsabitensis* Preston, 1914. Kenya, northern slopes of Mt Marsabit (type material: BM 1937.1.30.1441, specimen marked by Connolly by blue wool in aperture and BM 1912.9.19.29–31, 172–3. *Chlamydarion hians* (Pfr.).
- Blayneella percivali* Preston, 1914. Kenya, Lorigi Plateau (Larogi Hills) (BM 1937.12.30.2014, lectotype). (I indicated 2014 as holotype (Verdcourt 1973) and this stands as a lectotypification). *Halolimnohelix percivali* (Preston).
- Blayneella purpureocincta* Preston, 1914. Kenya, Nairobi (BM 1937.12.30.2033, lectotype, 1912.9.19.89–90, paralectotypes) (I indicated 2033 as 'holotype' (Verdcourt, 1973) and this stands as a lectotypification). *Halolimnohelix purpureocincta* (Preston).
- Conulinus athiensis* Connolly, 1925. Kenya, Athi Plains, *Percival*; Mt Kinangop (Kenangop), *Kemp* (type material: BM 1937.12.30.3805, 1912.9.19.84, but it is not known which specimen is from which locality). *Edouardia athiensis* (Connolly).
- Conulinus nyiroensis* Connolly, 1925. Kenya, Mt Nyiro, 8300' (type material: BM 1937.12.30.2149, 1912.9.19.26–28). *Conulinus ugandae nyiroensis* Connolly.
- Curvella pertranslucens fallooni* Connolly, 1923b. Kenya, Nairobi, *Falloon* (type material: BM 1937.12.30.4184; Igembi Hills, 4000', *Percival* (not found); Darugu R. valley, *Harries* (not found). Same.
- Elgonella discolorata* Preston, 1914. Kenya, Lorigi Plateau (Larogi Hills) (type material: BM 1937.12.30.1968). *Halolimnohelix discolorata* (Preston).
- Ennea arthuri* Preston, 1913a. Kenya, Nyambeni Hills, 4000', Jombene (type material: MAC 17.730). *Gulella arthuri* (Preston).
- Ennea baccata* Preston, 1913a. Kenya, Uaraguess (Urguess) (type material: MAC 17.718). *Gulella baccata* (Preston).
- Ennea claustrum* Preston, 1913a. Kenya, between Laikipia Plateau and Eusso Nyiro (type material: MAC 17.503; BM 1937.12.30.493–4). *Gulella claustrum* (Preston).
- Ennea copiosa* Preston, 1913a. Kenya, Uaraguess (Urguess) (type material: MAC 17.958; BM 1912.8.18.30–2 & 1937.12.30.499–503 & Acc. 2154). *Gulella copiosa* (Preston).

- Ennea copiosa* Preston var. *robusta* Preston, 1913a. Kenya, Lorogi Plateau, 6000–7000' (Larogi Hills) (type material: MAC 18.089; BM 1912. 8.18.33–5). *Gulella copiosa robusta* (Preston).
- Ennea funerea* Preston, 1913a. Kenya, Eusso Nyiro, Chanler's Falls (type material: MAC 17.525; BM 1911.8.22.17 & 1937.12.30.544–5). *Gulella funerea* (Preston).
- Ennea funerea* Preston var. *laevis* Preston 1913a. Kenya, between Eusso Nyiro and Marsabit (type material: BM 1937.12.30.546–7 & 1912.9.19.206–7). *Gulella funerea laevis* (Preston).
- Ennea ingloria* Preston, 1913a. Kenya, Mt Nyiro, 8300' (type material: MAC 17.533; BM 1912.9.19.193 & 1937.12.30.427–8). *Gulella ingloria* (Preston).
- Ennea laqueus* Preston, 1913a. Kenya, Nyambeni Hills, 4000', (Jombene) (type material: MAC 17.556). *Gulella laqueus* (Preston).
- Ennea laqueus* Preston var. *hercules* Preston, 1913a. Kenya, Uaraguess (Urguess) (type material: MAC 19.231; BM 1913.7.31.19 & 1937.12.30.582 but 3 specimens). *Gulella laqueus hercules* (Preston).
- Ennea lima* Preston, 1913a. Kenya, Uaraguess (Urguess) (type material: MAC 17.555; BM 1937.12.30.482). *Gulella lima* (Preston).
- Ennea mirifica* Preston, 1913a. Kenya, Mt Nyiro, 8300' (type material: MAC 17.720). *Gulella mirifica* (Preston).
- Ennea monticola* Preston, 1913a. Kenya, Lorogi Plateau, 6000–7000' (Larogi Hills) (type material: MAC 17.557). *Gulella monticola* (Preston).
- Ennea nyiroensis* Preston, 1913a. Kenya, Mt Nyiro, 8300' (type material: MAC 18.351). *Gulella nyiroensis* (Preston).
- Ennea percivali* Preston, 1913a. Kenya, Mt Nyiro, 8300' (type material: MAC 17.579; BM 1912.9.19.187). *Gulella percivali* (Preston).
- Ennea pervitrea* Preston, 1913a. Kenya, forests to the N. of Mt Kenya (type material: MAC 17.588; BM 1912.9.19.198–200). *Gulella pervitrea* (Preston).
- Ennea pretiosa* (Preston, 1911 var. *nyiroensis* Preston, 1913a. Kenya, Mt Nyiro, 8300' (type material: MAC 18.073; BM 1912.9.19.90–92 & 605–12 & Acc. 2258 ex Tomlin ex H.E.J. Biggs, 29 specimens). *Gulella pretiosa nyiroensis* (Preston).
- Ennea rectangularis* Preston, 1913a. Kenya, Uaraguess (Urguess) (type material: MAC 17.469; BM 1912.8.18.27–29 & 1937.12.30.425–6 (BM label states Larogi Hills but is marked paratypes but that locality not given in original publication). *Gulella rectangularis* (Preston).
- Ennea spatium* Preston, 1913a. Kenya, Lorogi Plateau, 6000–7000' (Larogi Hills) (type material: MAC 17.733; BM 1913.7.31.17–18). *Gulella spatium* (Preston).
- Ennea suavissima* Preston, 1913a. Kenya, Mt Nyiro, 8300' (type material: MAC 17.603; BM 1912.9.19.188–9, 1913.8.1.62–3, but last two not found in type collection). *Gulella suavissima* (Preston).
- Ennea viatoris* Preston, 1913a. Kenya, Mt Nyiro, 8300' (type material: MAC 17.500; BM 1913.9.19.194). *Gulella viatoris* (Preston).
- Euonyma* ('*Enonyma*') *achilles* Preston, 1913d. Kenya, Uaraguess (Urguess) (type material: MAC 16.139; BM 1912.8.18.12–13 & 1937.12.30.7130 but 12–13 not found in type collection; Nairobi). Same but almost certainly needs a new genus.
- Euonyma arthuri* Connolly, 1923b. Kenya, Uaraguess (Urguess) type material: BM 1937.12.30.4137, marked with red spot; 1912.8.18.135–7). Same.
- Euonyma blayneyi* Connolly, 1923b. Kenya, Lorogi Plateau (Larogi Hills) (type material: BM 1937.12.30.4138). Same.
- Euonyma fulgens* Connolly, 1923b. Kenya, N. slopes of Mt Marsabit, 4600' (type material: BM 1937.12.30.4140; 1912.9.19.218). Same.
- Euonyma fulgens* Connolly var. *nyiroensis* Connolly, 1923b. Kenya, Mt Nyiro, 8300', (type material: BM 1937.12.30.4141; 1912.9.19.208–9, not in type collection).

- Euonyma fulgens nyiroensis* Connolly.
- Euonyma percivali* Connolly, 1923b. Kenya, Eusso Nyiro to Marsabit (type material: BM 1937.12.30.4142, with red spot; 1912.9.19.215-17). Same.
- Euonyma topazon* Connolly, 1923b. Kenya, Uaraguess (Urguess) (type material: BM 1937.12.30.4144; 1937.12.30.4145-6 & 1912.8.18.135-7). Same.
- Euonyma topazon igembiensis* Connolly, 1923b. Kenya, Igembi Hills, 4000' (the lid from the original Preston box states Jombene Hills so it is possible Connolly made a slip) (type material: BM 1937.12.30.4145). Same.
- Falloonella exquisita* Preston, 1914. Kenya, Uaraguess (Urguess) (type material: BM 1937.12.30.3652-4, one selected by Connolly with blue wool in aperture but shells are not individually numbered; MAC specimen not found.)
- Trochonanina exquisita* (Preston).
- Falloonella exquisita gudei* Preston, 1914. Kenya, Lorogi Plateau (Larogi Hills) (type material: BM 1937.12.30.3536). *Trochonanina exquisita gudei* (Preston).
- Falloonella larogiensis* Preston, 1914. Kenya, Lorogi Plateau (Larogi Hills) (type material: BM 1937.12.30.3552 - collector given as Kemp on the box).
- Trochonanina larogiensis* (Preston).
- Gudeella bartaensis* Preston, 1914. Kenya, El Barta Plains (type material: BM 1937.12.30.1514, chosen by Connolly and marked with blue wool; 1912.9.19.155-7).
- Thapsia bartaensis* (Preston).
- Gudeella marsabitensis* Preston, 1914. Kenya, N. slopes of Mt Marsabit (type material: BM 1937.12.30.1577, chosen by Connolly 'largest specimen'; 1912.9.19.163-5). *Thapsia marsabitensis* (Preston).
- Gudeella nemorum* Preston, 1914. Kenya, forests to the N. of Mt Kenya (type material: BM 1937.12.30.1602-4, largest of these selected by Connolly but shells not numbered individually, 1912.9.19.169-71; MAC 20.201). *Thapsia nemorum* (Preston).
- Gudeella pallidior* Preston, 1914. Kenya, Uaraguess (Urguess) (type material: BM 1937.12.30.1605). *Thapsia pallidior* (Preston).
- Gudeella urguesensis* Preston, 1914. Kenya, Uaraguess (Urguess) (type material: BM 1937.12.30.1616, chosen by Connolly; 1012.8.18.51). *Thapsia urguesensis* (Preston).
- Gudeella vernhouti* Preston, 1913c. Kenya, Uaraguess (Urguess) (type said by Schouteden to be at MAC but could not be found; type material: BM 1913.7.31.23-5 & 1937.12.30.1618 said to be from 'Jombene Hills and note presumably by Connolly 'type is brightest'). *Thapsia vernhouti* (Preston).
- Gulella calva* Connolly, 1922. Kenya, Taru Desert (type material: BM 1937.12.30.486). Same.
- Gulella cancellata* Connolly, 1922. Kenya, presumably by Lorogi Plateau (Larogi Hills) (type material: BM 1937.12.30.487 (broken)). Same.
- Gulella cancellata* Connolly 'var. ex forma' *minor* Connolly, 1922. Kenya, Lorogi Plateau (Larogi Hills) (type material: BM 1937.12.30.488). I have not investigated the correct name for this - 'var. ex forma' is meaningless and the rules would enforce subspecific rank if the taxon is maintained and since subspecific and specific names compete and *minor* has been used more than once the situation is confused.
- Gulella candela* Connolly, 1922. Kenya, Taru Desert (type material: BM 1937.12.30.491). Same.
- Gulella candela* Connolly 'var. ex forma' *minor* Connolly, 1922. Kenya, presumably Taru Desert (type material: BM 1937.12.30.489-90 (one in tube)). See note after *G. cancellata* var. *minor* above.
- Gulella disseminata kekumegaensis* Connolly, 1922. Kenya, Kakamega (Kekumega) (type material: BM 1937.12.30.515). *Gulella disseminata* (Preston).
- Gulella impedita* Connolly, 1922. Kenya, Kakamega (Kekumega) (type material: BM

- 1937.12.30.555). Same.
- Gulella (Plicigulella) perlata* Connolly, 1922. Kenya, Kakamega (Kekumega) (type material: BM 1937.12.30.590). Same.
- Homorus egregius* Preston 'var. ex forma' *inflata* Connolly, 1923a. Kenya, Lorogi Plateau (Larogi Hills), *Percival* (type material: BM 1937.12.30.7135, marked as 'holotype' by Connolly); Igembi Hills, Darugu R. valley, *Harries* (BM 1937.12.30.7136-7 - also 7138 but not clear who collected it; Lari, *Gooch*, not in the type collection). *Subulona egregia inflata* (Connolly).
- Homorus zebra* Connolly, 1923a. Kenya, Kakamega (Kekumega) (type material: BM 1937.12.30.7083). *Oreohomorus zebra* (Connolly).
- Krapfiella magnifica* Preston, 1913b. Kenya, Uaraguess (Urguess) (type material: MAC 10.339; BM 1912.8.18.10-11, not found in type collection; 1937.12.30.8081, marked as 'paratype' but locality given as Larogi Hills; also at Berlin and Frankfurt). Same.
- Krapfiella princeps* Preston, 1913b. Kenya, El Barta Steppes, 4000', (type material: MAC 10.340; Mt Nyiro, 8300' (BM 1912.9.19.22-3; also at Berlin). Same.
- Larogiella angulifera* Preston, 1914. Kenya, Lorogi Plateau (Larogi Hills) (type material: BM 1913.7.31.32 & 1937.12.30.1949, although 1949 is marked on box as 'type' there is no way of telling which it is). *Halolimnohelix angulifera* (Preston).
- Larogiella venatoris* Preston, 1914. Kenya, Lorogi Plateau, 6000-7000' (Larogi Hills) (type material: BM 1937.12.30.2052) with broken lip; 1912.8.18.71). *Halolimnohelix venatoris* (Preston).
- Ledoulxia crassiplicata* Preston, 1914. Kenya, forests to the N. of Mt Kenya (type material: BM 1937.12.30.3510, selected by Connolly, 1912. 8.18.75 & 1912.9.19.41-3). *Trochonanina crassiplicata* (Preston).
- Ledoulxia decussata* Preston, 1914. Kenya, Lorogi Plateau (Larogi Hills) (type material: BM 1937.12.30.3511). *Trochonanina decussata* (Preston).
- Ledoulxia marsabitensis* Preston, 1914. Kenya, N. slopes of Mt Marsabit (type material: BM 1937.12.30.3565, marked by Connolly with blue wool in aperture; 1912.9.19.44; 1937.12.30.3643-8 & 3566-71 were not found in type collection). *Trochonanina plicatula* (Von Mts.).
- Limicolaria alhiensis* Preston, 1912. Kenya, Athi Plains ('Alhi') (type material: MAC 622; BM 1912.9.19.286-8; Liverpool). *Limicolaria martensiana catharia* Dall.
- Limicolaria nyiroensis* Preston, 1912. Kenya, Mt Nyiro, 8300', (type material: MAC 1.235); between Eusso Nyiro and the S. slopes of Mt Marsabit (BM 1912.9.19.289.90; Crowley & Pain in their revision (1961) chose one of these as lectotype but even if Preston's original indication of type on the specimen he sold to MAC is set aside Schouteden's mention in his published (1936) list of types is at least a lectotypification). *Limicolariopsis nyiroensis* (Preston).
- Limicolaria nyiroensis* Preston var. *flavida* Preston, 1912. Kenya, N. slopes of Mt Marsabit, 4600' (type material: MAC 1.234). *Limicolariopsis nyiroensis* (Preston).
- Limicolaria percivali* Preston, 1913b. Kenya, Rift Valley (type material: MAC 623; BM 1912.9.19.291-2). *Limicolaria martensiana* (E.A.Sm.).
- Limicolaria radius* Preston, 1913b. Kenya, Nyambeni Hills (Jombene) (type material: MAC 620). *Limicolaria martensiana catharia* Dall.
- Limicolaria radula* Preston, 1913b. Kenya, 'northern regions of British East Africa' (type material: MAC 619). *Limicolariopsis inepta* (Preston).
- Martensia inflata* Preston, 1913d. Kenya, Uaraguess (Urguess) (type material: MAC 23.7.46). *Trochonanina inflata* (Preston).
- Martensia nyiroensis* Preston, 1913d. Kenya, Mt Nyiro (type material: MAC 24.171;

- BM 1912.9.19.39-40). *Trochonanina nyiroensis* (Preston).
- Martensia percivali* Smith, 1903. Tanzania, southern slopes of Mt Kilimanjaro (type material BM 1902.11.7.1-6). *Trochonanina plicatula* (Von Mts.).
- Martensia solida* Preston, 1913d. Kenya, between Mt Kenya and Mt Nyiro (type material: MAC 24.186). *Trochonanina solida* (Preston).
- Mikenoella elevata* Preston, 1914. Kenya, Lorigi Plateau, 6000-7000' (Larogi Hills) (type material: BM 1937.12.30.1969). Probably *Vicariihelix gregorii* (E.A.Sm.).
- Opeas araeum* Connolly, 1923b. Kenya, Kakamega (Kekumega) (type material: BM 1937.12.30.4187). Same.
- Opeas (Micropeas) callipeplum* Connolly, 1923b. Kenya, Eusso Nyiro, *Kemp* (type material: BM 1937.12.30.4219 lectotype) (I indicated 4219 as holotype (Verdcourt, 1986) and this stands as a lectotypification); Lorian Swamp, *Percival* (BM, not found in type collection). *Ceciloides callipeplum* (Connolly).
- Opeas euschemon* Connolly, 1923b. Kenya, Kakamega (Kekumega) (type material: BM 1937.12.30.4188). Same (possibly a *Pseudopeas*).
- Opeas marsabitense* Connolly, 1923b. Kenya, Mt Nyiro, 8300' no collector given (type material: BM 1937.12.30.4195 cited and marked type by Connolly, 1912.9.19.245) Mt Marsabit, 4600', *Percival* (BM 1912.9.19.52 & 1937.12.30.4196) also two at Berlin). Same.
- Opeas psephenum* Connolly, 1923b. Kenya, Lorigi Plateau (Larogi Hills) (type material: BM 1937.12.30.4201). Same.
- Opeas (Nothapalinus) suavissimum* Connolly, 1923b. Kenya, Nairobi, *Falloon* (BM 1937.12.30.8823, cited as type by Connolly); Marsabit, *Percival* (BM not found in type collection); Gazi, *Kemp* (BM not found in type collection). Same.
- Percivalia nyiroensis* Preston, 1914. Kenya, Mt Nyiro (type material: BM 1937.12.30.1621, marked by Connolly; 1912.9.19.24-5). Position doubtful, probably a *Trochonanina*.
- Pseudoglessula ingloria* Connolly, 1923a. Kenya, Taru Desert (type material: BM 1937.12.30.8065). Same.
- Pseudoglessula mutabilis* Connolly, 1923a. Kenya, Kakamega (Kekumega) (type material: BM 1937.12.30.8064). *Pseudoglessula mutandana* Connolly.
- Pseudoglessula solitudinum* Connolly, 1923a. Kenya, Taru Desert (type material: BM 1937.12.30.8073). Same.
- Pseudoglessula transenna* Connolly, 1923a. Kenya, forests to N of Mt Kenya (type material: BM 1937.12.30.8066; 1912.9.19.79-81). Same.
- Pseudopeas elachistum* Connolly, 1923b. Kenya, Lorigi Plateau, 7000' (Larogi Hills) (type material: BM 1937.12.30.4251; 1912.8.18.122-4). Same.
- Pseudopeas kekumeganum* Connolly, 1923b. Kenya, Kakamega (Kekumega) (type material: BM 1937.12.30.4268). Same (but the spiral sculpture on the apical whorls is I think imaginary).
- Rhachidina festiva* Connolly, 1925. Kenya, Taru Desert (type material: BM 1937.12.30.3709). Same.
- Sitala urguesensis* Connolly, 1925. Kenya, Uaraguess (Urguess) (type material: BM 1937.12.30.1640; 1913.8.1.60, not on type card nor in type collection but in registration book). *Afroconulus urguesensis* (Connolly) (doubtfully distinct from *A. iredalei* (Preston)).
- Streptaxis desiderata* Preston, 1913a. Kenya, Uaraguess (Urguess) (type material: MAC 16.953; BM 1912.8.18.44 & 1937.12.30.141-2). *Tayloria desiderata* (Preston).
- Streptaxis marsabitensis* Preston, 1913a. Kenya, N. slopes of Mt Marsabit, 4600' (type material: MAC 16.945; BM 1912.9.19.45). *Tayloria marsabitensis* (Preston).
- Streptaxis percivali* Preston, 1913a. Kenya, N. slopes of Mt Marsabit (type material

- MAC 16.939; BM 1912.9.19.46-7; BM 1912.9.19.187 and 1937.7.9.23 are labelled 'paratypes' but are from Mt Nyiro a locality not given in description). *Gonaxis percivali* (Preston).
- Streptaxis urguessensis* Preston, 1913a. Kenya, Uaraguess (Urguess) (type material: MAC 16.943; BM 1912.8.18.39-40 & 1937.12.30.144). *Tayloria urguessensis* (Preston).
- Streptostele clavulus* Connolly, 1922. Kenya, Lorigi Plateau (Larogi Hills) (type material: BM 1937.12.30.163 (separated in tube); 1913.7.31.4-7). Same.
- Streptostele (Raffraya) constricta* Connolly, 1922. Kenya, Kakamega (Kekumega) (type material: BM 1937.12.30.165). Same.
- Streptostele crassicrenulata* Connolly, 1922. Kenya, forest N. of Mt Kenya (type material: BM 1937.12.30.166 (separated in tube); 1912.9.19.134). Same.
- Streptostele crassiplicata* Connolly, 1922. Kenya, Nyambeni Hills, 4000' (Jombene) (type material: BM 1937.12.30.177). Same.
- Streptostele hasta* Connolly, 1922. Kenya, Uaraguess (Urguess) (BM 1937.12.30.196 (separated in tube); 1912.8.18.95-7). Same.
- Streptostele (Graptostele) iota* Connolly, 1922. Kenya, Mt Kenya, 7000-8000', *Kemp* & Igembi Hills to Nyeri, *Percival* (type material: BM 1937.12.30.202,, 1912.8.18.82-4 & 1937.12.30.203-5; not possible to associate numbers and localities). Same.
- Streptostele nyiroensis* Connolly, 1922. Kenya, Mt Nyiro, 8300' (type material: BM 1912.9.19.129-31 & 1937.12.30.211-15, (one separated in tube) and 7 others). Same.
- Streptostele ordinaria* Connolly, 1922. Kenya, Laikipia Plateau to Eusso Nyiro (type material: BM 1937.12.30.219). Same.
- Streptostele osculum* Connolly, 1922. Kenya, Igembi Hills (original reference gives *Percival* as collector but name given on the box is *Kemp*) (type material: BM 1937.12.30.221). Same.
- Streptostele patruelis* Connolly, 1922. Kenya, Lorigi Plateau (Larogi Hills) (type material: BM 1937.12.30.222, marked with red spot; 1913.8.1.91). Same.
- Streptostele urguessensis* Connolly, 1922. Kenya, Uaraguess (Urguess) (type material: BM 1937.12.30.236, marked with red spot; 1912.8.18.93-4). Same.
- Subulina taruensis* Connolly, 1923a. Kenya, Taru Desert, *Percival* (type material: BM 1937.12.30.8123, (Connolly uses the term 'typical form' for Taru specimen); SW Uganda, Mbarara to Kigezi, *Kemp* (BM 1937.12.30.8124). Same.
- Subuliniscus adjacens* Connolly, 1923a. Kenya, Lorigi Plateau (Larogi Hills) (type material: BM 1913.8.1.69 & 1937.12.30.7207 & 7209-10). Same.
- Subuliniscus cornu-orycis* Connolly, 1923a. Kenya, Mt Nyiro, 8300' (type material: BM 1937.12.30.7200; 1912.9.19.237). Same.
- Subuliniscus marsabitensis* Connolly, 1923a. Kenya, Marsabit, 4600' (type material: BM 1937.12.30.7208). Same.
- Subuliniscus nyiroensis* Connolly, 1923a. Kenya, Mt Nyiro, 8300' (type material: BM 1937.12.30.7205-6, one with red spot and one without but not possible to associate with number; 1912.9.19.235-6). Same.
- Subuliniscus urguessensis* Connolly, 1923a. Kenya, Uaraguess (Urguess) (type material: BM 1937.12.30.7198-9). Same. (Material on loan, not seen.)
- Trochozonites suturalis* Preston, 1914 (non D'Ailly). Kenya, Uaraguess (Urguess) (type material: BM 1937.12.30.2186, marked as type; 1912.8.18.49-50, not found in type collection; MAC recorded but not found). *Trochozonites prestoni* Connolly.
- Urguessella esau* Preston, 1914. Kenya, Uaraguess (Urguess) (type material: BM 1937.12.30.1970). *Halolimnohelix esau* (Preston).
- Urguessella urguessensis* Preston, 1914. Kenya, Uaraguess (Urguess) (type material: BM 1937.12.30.2051, not actually found). *Halolimnohelix urguessensis*

(Preston).

Viviparus alhiensis Preston, 1913. Kenya, Athi (Alhi) Plains (type material: MAC 38.794; BM 1912.9.19.17-9, not found in type collection). *Bellamya unicolor* (Olivier).

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□

Pacific Islands Land Snail Group Annual Meeting, 6 and 7 June 1996

J.E. Reynolds

Holloway, London

Paul Pearce-Kelly opened the 10th annual meeting of the Pacific Islands Land Snail Group at the Zoological Society of London meeting rooms by welcoming participants from around the world, including several guests from outside the *Partula* group.

The first report was from Dave Clarke. He had reviewed the IUCN Red Data Book categories for *Partula* in line with the changes to this document. The new category EW (extinct in the wild) applies to many *Partula* species. Dave briefly summarised the changes he had made. These have been sent to Dr Mary Seddon and M. Philippe Bouchet (Mollusc Specialist Group) who are compiling a global update of the Red List. CAMP (Conservation And Management Plan) sheets compiled in 1994 would be similarly updated during the meeting.

The next topic was current and future field projects. The 1995 expedition report was circulated and summarised. The aims of the expedition were:

- to check with the reserve on Moorea
- liaison with authorities on Tahiti with the aim of setting up another reserve there
- to survey the remote areas of Tahiti and the Marquesas for endemic snails.

As many readers of the *Conchologists' Newsletter* will know, monitoring of the reserve had broken down during the second half of the first year (1994). The fences were broken, the electrified wiring had short circuited and *Euglandina rosea* was in the enclosure. However, on a positive note, unmarked adult *Partula* shells and three live *Partula* were found, proving the snails had been reproducing before the defences were breached. The repairs were delayed due to the time taken to obtain suitable materials, so the Marquesan visit was shortened. The second aim of the visit

produced some useful meetings with Tahitian government officials but no site for a reserve was finalised. On Tahiti three isolated groups of endemics were found: the first in two forested valleys where *Euglandina* was present (very few live snails recovered); the second in cloud forest at elevations between 1200–1400 metres on Mt Marau; the third at the far end of the Taiarapu Peninsula, Tahiti-Iti, a very isolated area. *Partula otaheitana* collected at Mt Marau included both sinistral and dextral forms, previously unknown. Extensive collections were made of four *Partula* species, one *Samoana* species and also *Trochomorpha* from the Taiarapu Peninsula, and as no *Euglandina* were seen in the area, this is thought to be the last major region containing unmolested populations of Partulidae. Two species found, *P. clara* and *P. affinis*, were thought to be extinct. The success was due in part to the presence of Eric Loeve, a French biologist working in Tahiti.

The expedition team split into two groups in order to survey as much as possible of the Marquesa Islands. Hiva Oa has three species of *Samoana* documented. Both *Achatina fulica* and *Euglandina rosea* were found in the airport lounge, an inauspicious start. Eventually two Partulids were found on a plateau in the NE of the island, one a *Samoana* species and the other a 'more robust *Partula*-like snail', which has yet to be identified (there has been one case of mistaken identity where '*Partula arguta*' had turned out to be *Diplomorpha*, and this could be a similar situation). A similar snail was found in Tahuata, where no *Euglandina* are present, although the populations are not abundant. Two species were collected from Fatu Hiva, again unidentified, and there was insufficient time to make surveys of some promising looking sites. *Achatina* was present, mostly near human habitation. The islands of Ua Huka and Ua Pou have neither of the introduced aliens present, and both have an endemic *Samoana* species recorded. Specimens of *Samoana* from both islands were collected but those from Ua Huka appeared to belong to two species rather than one. Nuku Hiva has suffered badly from loss of native vegetation from introductions, clearance and grazing, so although *Euglandina* has not reached much of the island, only one specimen of *Samoana* was collected. In many of the other islands *Euglandina* seems to

have been restricted by some form of physical barrier: a road, grazing land or otherwise difficult terrain. All the snails collected from the wild have been photographed and genetic samples taken since being brought into captivity.

Some questions were then asked about the future monitoring of the reserve and the spread and survival of *Euglandina*. The University of California is going to oversee monitoring in future. *Euglandina*'s main agent of spread is human so the way to solve the problem is through education. When no *Partula* are present, *Euglandina* subsist on *Subulina* and *Bradybaena* in the leaf litter.

The 1996 expedition was primarily aimed at restocking the reserve. Two trees on the edge of the reserve had fallen, causing some minor damage to the barriers. These were removed, unfortunately reducing the amount of shading but otherwise necessary. The leaf litter was searched and only a few *Euglandina* were found. A juvenile snail resembling *Samoana attenuata* was found inside the reserve; it was measured, photographed and released, a mystery which will probably never be explained. Forty-four *Miconia* plants were also removed, mostly fairly small seedlings. The barriers were repaired or replenished as necessary. Eighty snails of three species (*Partula taeniata*, *P. tohiveana* and *P. suturalis vexillum*) were marked using a dentist's drill and released into the reserve. A small surplus was given to the Tahiti Museum to care for, where they will form a live exhibit under the care of Manouche Lehartel, the Director of the Museum. These are the first *Partula* to be kept in a Polynesian (or French!) institution, so this is a step forward in public awareness and education. The expedition also collected some live specimens of *Samoana* and *P. otaheitana* from other sites on Tahiti but no other snails were found on Moorea.

PILSG delegates met with two Tahitian government representatives. Another year's data was requested before setting up a reserve on Tahiti, but overall there appears to be a growing concern for the fate of endemic wildlife. PILSG members were shown new legislation (then still to be ratified by government) regarding wide ranging protection of the native fauna and flora. Liaison on identification and distribution of Partulidae was agreed

as well as discussion on educational material about *Partula*, *Euglandina* and *A. fulica*, to be funded and produced by the French Polynesian Delegation of the Environment with full participation by PILSG. A reliable monitor, Tony, who is local and has been involved with the reserve since 1994, will be working at the Moorean reserve for the forthcoming year.

Roy Hills had been working in Vanuatu to establish a nature reserve, where *Partula* were only a small part of the project. The local chief was supporting his work as part of an initiative against logging, and Roy was hoping to return to Vanuatu in the autumn to set up an educational centre and initiate other nature reserves.

Paul Pearce-Kelly gave the reports of fieldwork in other areas of the Pacific. Mike Hadfield in Hawaii had reported that funding restrictions have stopped all his fieldwork, but no details were available. Captive stocks were being maintained, but the proposed greenhouses had not been built. Barry Smith had sent a fax from Guam. He had been instrumental in getting the Partulidae of the Mariana Islands listed as candidate species for protection under the US Endangered Species Act. Secondly his cooperation with local government officials has resulted in recognition of Guam Partulids (*P. gibba*, *P. radiolata* and *S. fragilis*) being recognised as endangered under Guam Law. Barry has also completed 36 months of mark-recapture studies on four sites on Guam and one on Rota Island that will provide valuable data on the biology and ecology of Mariana Partulids, but the artificial canopy project was delayed by the slow transport of materials that finally arrived in the dry season which is unsuitable for releasing snails. Ironically this was also delayed by the need to obtain a permit for the work because they are endangered species. The captive rearing system used by Barry is a 3 x 5 m enclosure that uses an electrified fence which keeps the snails in. Snails live on a range of five host plants and changes to the water filtration system have produced improvements.

Philippe Bouchet reported on work in New Caledonia. There are around 400 endemic species here (no Partulidae). The biggest threat to these snails is not *Euglandina* but loss of native habitat (estimated at over 50%), including bush fires and opencast mining.

Achatina fulica was introduced to New Caledonia in 1972, with *Euglandina* following close behind in 1974–1978. In 1993 Philippe Bouchet and Olivier Gargominy carried out a survey and found that there were only two sites (a third has now been located) where *Euglandina* was established, one of these at low population densities. It has succeeded best in low rainfall areas and does not appear to be spreading although it continues to be imported illegally on to islands in the area. There was a general discussion about how snails defend themselves against *Euglandina*, which is most often either behavioural or due to reproductive strategies.

The meeting then turned to matters of funding, with Georgina Mace of the Institute of Zoology speaking. In the short term the priorities are for the monitor's salary and maintenance of the reserve. The cost of flights for survey visits was also needed in the short term, although some airlines might donate seats if approached. Further survey work and educational material are medium term needs, with much of the short-term publicity costs now being met by the Tahitian Government. Several suggestions were made for possible avenues of funding. It was reported that the Chicago Zoological Society potentially had £5,000 available, and the Peoples Trust for Endangered Species £1,000. In the longer term the group's activities would be expected to broaden, mainly in education but with the possibility of a network of reserves and integration with other wildlife projects such as the South Pacific Biodiversity Programme. Funding from the Royal Geographical Society and Overseas Development Agency was thought to be unlikely as most of the islands are subsidiaries or dependants of developed nations. The RGS had supported Graham Wragg's bird and invertebrate survey in the Austral Islands, so it was felt worth approaching them.

Dave Clarke gave the annual Captive Population Census Report. He commented on the status of each taxon, and also said that two species (*Partula turgida* and *P. arguta*) had become extinct during 1995, but that eight new taxa had been brought into captivity. Guam snails were not included in the inventory. Non-Partulid species were listed including *Diplomorpha* and *Trochomorpha*, some of which have been transferred to the keeping

of Jackie Pedley (CSGBI). Professor Bryan Clarke brought up the issue of funding for the snails at Nottingham University. Approximately one third of *Partula* species held in captivity are held at Nottingham and some of the most important recoveries have been in the care of his assistant Vivien Frame. He was very concerned that the overall number of *Partula* would drop when he retires next year, as funding for the project (which pays Vivien Frame's salary) will go with him. The snails would have to be distributed amongst other institutions. There was also some debate about the taxonomic status of snails in some collections particularly the polymorphic *P. suturalis*, and *P. simulans* where the subspecies is unclear.

Ajay Burlington-Johnston and Georgina Mace then spoke about long-term trends in captive *Partula* numbers. Charts and tables had been produced to demonstrate:

- total and total adult counts for all species
- trends over time in total numbers
- trends in adult numbers and the annual rate of change (excluding transfers)
- average annual growth rate for all species.

These had been compiled from census data from 1988 to 1995. Some data, notably the 1989 census, was missing and had been estimated, but standard error had been incorporated into all the calculations. Work is also being undertaken to compare this data with other factors, e.g. diet type, humidity, keeping system, keeper ('Viv factor'). Some factors may be more significant than others, but only detailed data recording will reveal this. As at previous meetings, emphasis was placed on the importance of collections providing husbandry data, for example *P. faba* is kept in different size and style tanks at Jersey and London Zoos but the same code is used for both systems. This is fine for analysing the results in either location, but not across collections. Probably more codes are needed to cover all possible variables, but it was also thought important for all institutions to have CERC I on disc which has scope for more data than the sheets alone. Questionnaires covering some of these points had not been sent out as hoped, so this will be forthcoming.

Trevor Coote (Institute of Zoology) spoke about genetic analysis of *Partula* but, as Les Noble had sent his apologies, Trevor was unable to answer some questions relating to specific aspects of Les Noble's work. Trevor is sampling mitochondrial DNA, whilst Les is using RAPD techniques. Samples for testing had been taken from species where there were sufficient numbers to have a control tank. Samples consisted of either a small piece of the foot or an eye tentacle, to avoid killing any animals. The first concern was whether there would be any increase in mortality, but this was negligible. As for regeneration, samples from the foot regenerated almost completely, but tentacles did not always do so. The second problem was that the marking system was complex and difficult for keepers to decipher (having tried to do so, I can vouch for this!). Those who marked the shells will be re-examining them. Before more samples can be taken, the proposal has to be brought to the ethics committee of the Zoological Society of London, who meet two or three times per year.

Using computer analysis of the RAPD profiles, Bernd Röttoher, an undergraduate, had produced a paper and phylogenetic trees for *Partula* and *Samoana*. The two genera clustered separately, and most samples of *Samoana* species collected from the same island clustered together, supporting the theory that species radiation occurred from a single colonisation event on each island. The data for *Partula* was not as clear cut. In several cases apparently closely related taxa from the same island clustered with more distantly related taxa from other islands, while in other cases distinctly separate branches were formed. Several suggestions were made as to why these results occurred, one of the chief probable reasons was thought to be captive breeding (the *Samoana* were mostly wild caught animals). Whether this is due to accidental transference of snails, loss of gene pool or other reasons is debatable, but tragically the loss of wild populations means comparison with captive bred animals is no longer possible, and in some cases these too are extinct. However both sampling methods can make use of specimens preserved in 70% ethanol, and there is clearly scope for more research.

Bryan Clarke said that Nottingham University would be having

a research student working with them for a few months. She would be investigating the relationships of Partulidae to other families (especially those found in the Pacific areas). There was some discussion about similar work being conducted and the inherent problems of obtaining DNA samples and genetic work in general. It was requested that the genetics team provide a written report of their work with a simplified explanation of the techniques used.

Andrew Cunningham (Institute of Zoology) and Peter Daszak (University of Kingston) reported on pathology/parasitology of *Partula*. At the previous PILSG meeting Peter had reported on the prevalence of five types of flagellated protozoans found in faecal smears from *Partula* kept at London Zoo. At the time it was not known if these were parasitic, commensalate or symbiotic. A postal survey had been established in order to conduct further culture of the flagellates and to compare prevalence between captive bred and wild caught populations. Over 36% of the samples sent from UK collections had flagellates present, type 3 still predominating and about 15% having more than one type present. The CSGBI collection (only three samples were sent) had 100% infection rate, and one sample had two types of flagellate present. Of the snails released into wild, most were free of flagellates, except those from Bristol Zoo. Samples from most wild caught animals were also negative, although those taken to Bristol were positive and so were possibly contaminated on arrival. Various media used to culture flagellates *in vitro* to facilitate identification had so far failed, but work continues to find a successful technique. More screening, transmission electron microscopy of necroscopied groups and samples, especially of wild caught animals, were needed to continue the work into 1996-7. There was some discussion about how the flagellates 'infect' *Partula*. If they are not found in the wild, but with most of the world populations being held in captivity, any hypotheses are difficult to test.

The final session of the day was a review of keeping systems. Alan Gardner from Britsnail Ltd introduced himself and explained how he had become involved in *Partula* after attending the TITAG Mollusc Sub Group Meeting in January (*Conchologists' Newsletter*

No. 137). He had since visited London Zoo and other *Partula* collection holders, and subsequently written a report reviewing the keeping system and recommending a new diet based in his own commercial snail diet (principally for *escargot*). His aims were to reduce mortality and increase breeding, to reduce keeper time, and provide a better environment for the snails. Alan spoke about his reasons for changing the diet, of which he had developed three versions, one for adults, one for juveniles and subadults and one for neonates. He said that 'Stress' (Vitamins A and D) contained heavy metals, and that likewise de-ionised water was preferable to distilled water, although he refused to divulge the ingredients of his basic diet. He also felt that humidity should be increased so that more activity was promoted and that the lighting regime should be varied by moving the tanks to different locations within the breeding locations within the breeding room on a systematic basis. Changes to the tank itself were also recommended; these involve three removable glass shelves on which the food is placed, suspended two-thirds up the tank on ledges. Attached to each shelf is a double sheet of polythene which hangs down and provides hiding places for the snails. Several trial groups, mostly at London Zoo, but also the Conchological Society collection, have been set up using this system and the new diet.

There was much criticism of Alan's recommendations, most present feeling that they were not based on solid evidence or relevant experience (Alan has never kept *Partula*, only *Achatina* and *Helix*). Some of his objectives, for example faster growth rate, were not considered as important as long term viability, so it was felt that the efforts were misdirected. At this time I had been keeping *Partula mirabilis x taeniata* under this system for about two months. I reported that although there was an apparent preference for the new diet, activity had declined, at least half the snails at any time were not using the plastic sheets or the shelves, and that cleaning, counting and feeding was more awkward and time-consuming than previously. There was insufficient time to debate all the points raised but trials continue. Other trials, on food preferences, are also to be carried out, bearing in mind that the preferred diet is not implicitly best.

The second day began with some slides of fieldwork in Moorea including the repairs to the reserve. Some slides of the system Mike Hadfield was using in Hawaii were also shown. The remainder of the time available was devoted to working groups, which were: update of CAMP sheets, funding, genetics and collections. I joined the collections group, where the discussions centred on the fate of certain populations from Edinburgh, Nottingham and Detroit. It was decided which populations were to be merged, transferred or culled, the details of which are unnecessary to repeat here. All snails would undergo DNA and pathogenic analysis before any culling or transfers could take place and of those culled a proportion would be examined for flagellates as well as for genetic sampling. This drastic measure was deemed necessary for populations where target numbers had been achieved and space was urgently needed for rarer species, especially those currently kept at Nottingham. Some *Partula* have been released into reptile tanks at Jersey Zoo and it was hoped that releases similar to that at the Palm House at Kew Gardens could be set up elsewhere as an alternative to culling. Potential new collection holders were also discussed; it was felt appropriate for institutions entering the programme to start with 'surplus' stock to avoid calamity. Alan Gardner agreed to take a tank to gain hands-on experience of keeping *Partula*.

Many delegates were due to attend a Herp TAG (Taxon Advisory Group) meeting, so the conference ended rather informally. A summing up was given later in the pub.

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18th International Exhibition of Shells and Fossils

Salle Polyvalente, d'Ottmarsheim,
Ottmarsheim, F 68490, France

20–21 September 1997

Contact: Michel Rioual

F 6890 Ottmarsheim, France

Tel. [REDACTED]

A La Ronde Exmouth

En route to the Plymouth field meeting, or when on holiday in the area, members might like to visit A La Ronde, a property recently taken over by the National Trust. It is a sixteen-sided house overlooking the Exe estuary and dates from around 1795 when it was built for two cousins, Mary and Jane Parminter, following their European tour. Special features are interior friezes decorated with local seashells, feathers, seaweed and sand. Most of the shell decorations are on a top gallery, which is not open to the public at the moment but, armed with binoculars, it can be seen from the floor of the central area or octagon which is open to the roof apex. Video displays give a closer view of the shells.

A La Ronde is in Summer Lane, just north of Exmouth, and is open from March to 2 November; Sundays to Thursdays 11–5.30. Closed Fridays and Saturdays. Admission £3.20 adults, £1.60 children or free with National Trust members' card. Tel. 01395 265514.

Progress report on the Action Plan for the Conservation of Land and Freshwater Molluscs

The map on page 822 shows the current progress on country reports. Such a report typically consists of:

1. brief summary of geography, extent of natural habitats (e.g. area of rainforest), and human population pressure;
2. state of knowledge of the land and freshwater mollusc fauna, areas of high diversity, levels and areas of endemism, eventually with maps;
3. threats, endangered and extinct species, local legislation;
4. targets for action.

Key to map

- Unshaded countries are those where we have not yet identified a contributor who is willing to commit him/herself. For some of these countries, contacts have been made, but no positive commitment has yet been expressed.
- For countries shaded in grey, drafts have not been finalised yet, but things are moving forward. A number of drafts are ready (e.g. Southeast Asian countries, Philippines, Solomon Islands), but either still need to be checked or are currently being reviewed (e.g. New Zealand). This section also includes countries for which reports are currently being drafted as a result of contacts established in Vigo, e.g. Costa Rica (Zaidett Barrientos), Cuba (Gloria Pereira), countries of the former Soviet Union (Alexander Suvorov), Equatorial Guinea (Benjamin Gomez), etc.
- Countries and states in black are those where we are satisfied that the reports are adequate. They include such complex faunas as those of Indonesia, Australia, Hawaii and French Polynesia.

Source: *Tentacle*, No. 6, September 1996

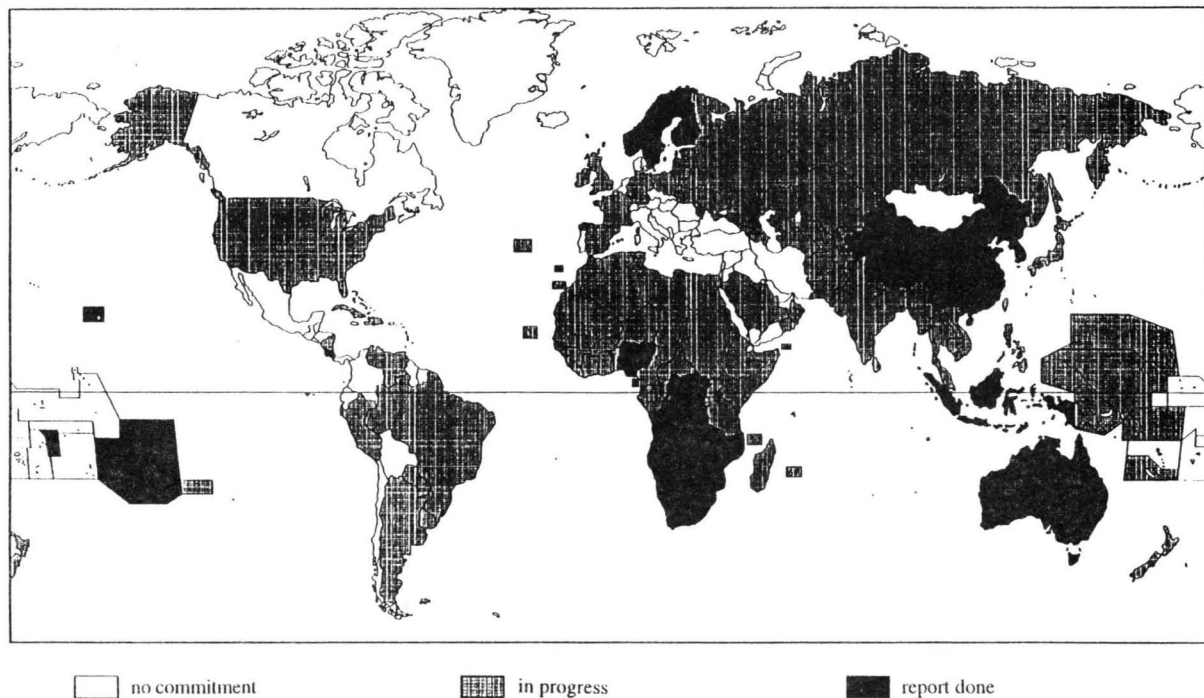


Fig. 1 Map showing the current progress of country reports on the Action Plan for the Conservation of Land and Freshwater Molluscs

The Winckworth Collection of British marine Mollusca

Nora McMillan

Bromborough, Merseyside

A recent enquiry about some Winckworth specimens has prompted this note. The Winckworth Collection was a superb array of British marine specimens based on the P.B. Mason collection and including much 'historic' material, as well as type-material of two species. A full account of the contents of his collection was given by Winckworth in a paper rather misleadingly titled 'The P.B. Mason Collection of British Shells' (*J. Conch., Lond.*, **21**: 186–189, 1940).

The collection was acquired by Liverpool Museum in 1938 and received in the spring of the same year. With it came the invaluable catalogue made by Mason.

Unfortunately, much of the collection, still packed in the boxes it had travelled to Liverpool in, was lost when Liverpool Museum was bombed on the night of 3 May 1941. Repeated pleas by the writer to send the collection to a relatively safe location in Wales (where much other Museum material was placed for the wartime years – and survived! – fell on deaf ears, and the greater part (including the few type-specimens) was lost. Mason's catalogue was also lost.

The lost type-material is:

1. Holotype of *Cerithiopsis clarkii* F. & H. *Hist. Brit. Moll.* pt. 36, p. 368, 1851.
2. Syntypes of *Modiola cuprea* Jeffreys *Ann. & Mag. Nat. Hist.* (3) 3, p. 40, 1859.

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Conchological Society of Great Britain and Ireland

MINUTES

**1074th (Ordinary) meeting
held on 14 December 1996 in the Demonstration Room of
the Natural History Museum starting at 2.30 p.m.**

In the chair: Dr Preece with 35 members and friends present.

Apologies for absence: Mrs McMillan, Mr & Mrs Rands, Rev. Long, Mr Negus, Dr Kerney, Mr Crowley, Mr de Bartolomé, Mrs Turk, Mrs Long.

Minutes of the last meeting (of 9 November 1996) : Read and accepted.

Matters arising: None.

Nomination and election of new members: 2 full members were nominated and elected:

- Dr M.B. Seddon
National Museum and Galleries of Wales, Cathys Park, Cardiff CP1 3NP
- Mr D. Aldridge
Department of Zoology, University of Cambridge, Downing Street,
Cambridge CB2 3EJ.

Announcements and correspondence:

Mr Killeen spoke about the Molluscan Conservation Conference, which had been a great success. Dr Preece had written to Mr Killeen and Dr Seddon, the conference organisers, to thank them for their efforts. He had also written to Mr Colin Ford, the Director of the National Museum and Galleries of Wales, to thank him for the hospitality shown by the museum, and to Dr Oliver, to thank him and the staff of the Museum's Mollusca Department for the effort they had put into the Conference.

Dr Preece had also written to the widow of Dr Sandor to thank her for her bequest made to the Society by her late husband, and to express the sympathies of the Society.

Mr Wimbleton reported that he had investigated the cost of insurance for the Display Boards, and that this was likely to be in the region of £150 p.a.; therefore it was probably easier for the Society to bear the cost of replacing the occasional damaged or lost item. The Boards and material were presently in the keeping of Mr Wimbleton in Portsmouth. They had been used at Pagham, but other venues are sought. Dr Chatfield would be using the Boards at Reading Museum in March for

Science Week (15–20 March), and she would be presenting a feature entitled 'The World of the Snail'. Council would discuss some of the points raised.

Mrs Turk had donated some reprints and copies of the *Journal of Conchology* and other journals which Mrs Light had brought to the meeting. Proceeds would go to the Society. Mr Killeen had details of prices, and any member wishing to purchase these should see him.

Lecture of the day:

Speaker: Christine Street (Barking)

Title of talk: *Islands and shell-sand*

Any other business: None.

Meeting closed at 5.00 p.m..

Chairman

Appendix: Members' exhibits

C.M. Street	Some island maps and books
Rupert Honnor	Programme card 1997
M.B. Seddon	Sainsbury's shell products
Jane Reynolds	1. Institutional Members' publications and <i>Journal</i> exchange request (<i>Gloria Maris</i>)
	2. Newspaper cuttings
	3. Snail puppet
Graham Oliver	New Bivalve to Britain
Kevin Brown	1. Book: <i>Ranellidae and Personidae of the World</i> by T. Henning and J. Hemmen
	2. Specimen of <i>Cymatium</i> (S.L.)
E.O. Bishop	'Mayhews London' and the 'Conus Glory Mary'
J. Chatfield	Guidebook to A La Ronde, National Trust, shell gallery, Exmouth
Light-Killeen-Palmer	Identification service – British species
Brian Coles	Literature and some species of N. American freshwater Mollusca.

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Conchological Society of Great Britain and Ireland

MINUTES

1075th (Ordinary) meeting

**held on 1 February 1997 in the Demonstration Room of
the Natural History Museum starting at 2.30 p.m.**

In the chair: Dr Preece with 37 members and friends present.

Apologies for absence: Mrs McMillan, Mr de Bartolomé, Mrs Turk, Mr & Mrs Rands, Mr Gillard, Mr Negus, Dr Oliver, Ms Chesney, Mr Crowley, Dr Colville, Mr Tracey and Mrs Long.

Minutes of the last meeting (of 14 December 1996) : Read and accepted.

Matters arising: None.

Nomination and election of new members: 6 Full members, 1 Student member and 2 Family members were nominated and elected:

- Full:
- Mr M.J. Ruchinaka
Fortaleza-CE, 60110-970, Brazil.
 - Mr J.P.S. Cabral
4465 S. Mamede de infesta, Portugal.
 - Ms A.J. Trew
Zoology Department, National Museum and Galleries of Wales, Cardiff
CF1 3NP
 - Miss J. Paul
Lincolnshire
 - Mr N. Bruce
Chorley, Lancs.
 - Ms J.F. Ward-Booth
Rectory Gate, Debden, Saffron Walden, Essex CB11 3JU.

Student:

- Ms M. Hall
Ormskirk, Lancs.

Family:

- Mr F. Longrigg
Milngavie, Glasgow
- Mr P.R. and Mrs P.M. Wilson
Colchester, Essex

Announcements and correspondence: Ms Reynolds reminded members to send in their ballot papers and questionnaires as soon as possible.

Lecture of the day:

Speaker: Rupert Honnor (Henley-on-Thames)

Title of talk: *Rocky shores of the world: Molluscan similarities*

Any other business: None.

Meeting closed at 5.00 p.m.

Chairman

Appendix: Members' exhibits

Jane Reynolds	Assorted press items Institutional Members' publications
Rupert Honnor	Rocky shores: unusual exhibits
C. & T. Pain	<i>Nucella</i> spp. from the Pacific Coast of the USA and Dorset, UK.
Kevin Brown	1. A.W.B. Powell, 'Patellid Limpets of the World', <i>Indo-Pacific Mollusca</i> , Vol. 3 No. 15. 2. G.B. Sowerby, <i>Thesaurus Conchyliorum</i> Monograph of <i>Fissurella</i> etc. (reprint) 3. J.H. McLean, 'Systematics of <i>Fissurella</i> in the Peruvian & Magellanic Fauna Provinces' 4. Specimens of <i>Fissurella</i> 5. Uruguayan specimens of <i>Olivan cillaria</i>
J. Sawyer	<i>Lambis lambis</i> (L. 1758) as distributed to benefactors of RNID
Rosemary Hill	World of the Snail (Reading Museums leaflet)
David Long	David Reid's Ray Society book on <i>Littorina</i> .

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Conchological Society of Great Britain and Ireland

MINUTES

**1076th (Annual General) meeting
held on 15 March 1997 in the Demonstration Room of
the Natural History Museum starting at 2.30 p.m.**

In the chair: Dr Preece with 40 members and friends present.

Apologies for absence: Dr Willing, Mrs McMillan, Mr de Bartolomé, Mrs Turk, Mr & Mrs Rands, Mr Woodward, Mr Atkins, Dr Chatfield, Ms Trew, Mr Negus, Dr Oliver, Ms Chesney, Mr Crowley, Dr Rundle, Mr Tracey.

Appointment of Scrutineers: Mrs Pain and Mrs Gillard were appointed.

Minutes of the last Annual General Meeting (of 23rd March 1996): Read and accepted.

Matters arising: None.

Report of the Council by the Hon. General Secretary: Read and accepted.

Report of the Hon. Membership Secretary/Treasurer: Read and accepted.

Report of the Hon. Non-marine Recorder: Read and accepted.

Report of the Hon. Marine Recorder: Read and accepted.

Report of the Hon. Programme Secretary: Read and accepted.

Report of the Hon. Conservation Officer: Read and accepted.

Announcements and Correspondence:

There will be a one-day event at the Museum of Reading, Sunday 16 March, entitled 'The World of the Snail', from 2–4 p.m. Dr June Chatfield will be on hand to identify specimens and the Society's Display Boards will be on show. The Display Boards will be on show at Haslemere Museum in Surrey during May. The Slug Workshop will take place on Saturday 5 April at the home of Judith Nelson, and the tutor will be Stella Davies.

The first field meeting of the year will be on Saturday 19 April at Hampstead Heath in London. The leader will be Jane Reynolds and anyone who wishes to attend should see her for details of where to meet.

The next indoor meeting will be on Saturday 3 May, and the speaker will be David Reid (Nat. Hist. Museum, London) on *Evolution of Littorina: Wonderful Winkles!*

Members are reminded to send their completed questionnaires to Dr Willing as soon as possible. Any members who have brought them to the meeting can give them to the Secretary to forward to Dr Willing.

Presidential address:

Dr R.C. Preece

Title of talk, *Mapping Snails in Time*

Election of Auditors: Mr N. Light and Mr D. Worth were elected.

Results of the postal ballot: The following were elected:

Officers:

President:	Mr B.C. Eversham
Hon. General Secretary	Ms J.E. Reynolds
Hon. Membership Secretary/Treasurer	Mr M.D. Weideli
Hon. Editor (<i>Journal</i>)	Dr P.G. Oliver
Hon. Newsletter Editor	Miss R.E. Hill
Hon. Marine Recorder	Mrs J.M. Light
Hon. Non-Marine Recorder	Dr M.P. Kerney
Hon. Programme Secretary	Dr R.C. Honnor
Hon. Conservation Officer	Dr M.J. Willing

Ordinary Council members (to serve a 3-year term):

Mr D. Aldridge, Dr E. O. Bishop, Mrs E. Platts.

Any other business: None.

Meeting closed at 5.12 p.m.

Chairman

Appendix: Members' exhibits

Jane Reynolds

P. Dansey

Kevin Brown

J. Sawyer

Barry Colville



Institutional Members' publications

Photos of Cardiff

Key to *Ensis*

1. Book, *Coquillages de Djibouti* by Alan Coulombel
2. Book, *Red Sea Shells* by Doren Sharabati
3. Red Sea Endemics
4. Book, *Coral Reef Animals of the Indo-Pacific* by T Gosliner, D. Behrens & G. Williams
5. Press cuttings
'Thou Shalt Not Steal' re: *Chimaeria incomparabilis*
Some snails from the Yemen.

Biodiversity and Conservation of the Mollusca

Proceedings of the 1992 Alan Solem Memorial Symposium
on the Biodiversity and Conservation
of the Mollusca, Siena

This book, the proceedings of the symposium held in 1992 at the 11th International Malacological Congress in Siena, is now available. It is edited by A.C. van Bruggen, Susan M. Wells and Th. C.M. Kemperman. The book contains the invited lectures presented at the conference, some additional commissioned papers, and four of the contributed papers.

Copies can be obtained from the publisher, to whom further enquiries should be addressed: Backhuys Publishers, PO Box 321, 2300 AH Leiden, The Netherlands. The price is Netherlands Guilders 68.00 plus postage and packing.

Mollusca on the Internet

The MOLLUSCA listserver is intended as an informal forum for discussions of molluscan evolution, palaeontology, taxonomy and natural history. There are over 700 subscribers. From time to time it has something of interest related to conservation. To subscribe to the list send e-mail to:

`listproc@ucmpl.berkeley.edu`

Then on the first line of the body of the message:

`sub mollusca <your_name>`

You will get a reply soon after saying that your name has been added. You will then receive anything that is posted to the list. MOLLUSCA is maintained and managed by D.R. Lindberg and R.P. Guralnick of the University of California Museum of Paleontology, Berkeley, USA.

Diary of Meetings

Conch. Soc. Field Meetings for 1997 are listed separately.

Saturday 21 June, Staveley: Yorks. Conch. Soc. joint field meeting with Yorks. Naturalists Union. Meet at Staveley Nature Reserve car park, SE 366635 at 11.00.

Saturday 26 July, Pocklington: Yorks. Conch. Soc. joint field meeting with Yorks. Naturalists Union, at Warter Estate (old woodland with streams and lake). Meet at the Estate Office on B122246 east of Pocklington, SE 8650 AT 11.00.

Saturday 6 September, Dent: Yorks. Conch. Soc. field meeting. Mapping of the Sedbergh area on tetrad scale. Meet at car park in Dent village, SD 704871 at 11.00. Leader B. Colville.

October, London: The Malacological Society of London. Young Malacologists' Forum, Natural History Museum. Contact: John Taylor, Natural History Museum, London SW7 5BD. Tel. 0171-938-9359. E-mail: J.Taylor@nhm.ac.uk.

Saturday 4 October, Kettlewell: Yorks. Conch. Soc. field meeting. Springs in Kettlewell area, Wharfedale. Meet at car park in Kettlewell, SD 968723 at 11.00.

Saturday 11 October, London: Conch. Soc. indoor meeting. Peter Morden (Natural History Museum, London). Land molluscs of the Azores. The Natural History Museum at 14.30.

Saturday 25 October, Leeds: Yorks. Conch. Soc. Annual General Meeting. Leeds City Museum at 13.00.

Saturday 22 November, London. Gentlemen and Players: professionals and amateurs in malacology, 1900-1950. A one-day meeting organised by the Malac. Soc. with the Conch. Soc. and the Society for the History of Natural History, at the Linnean Society, Burlington House, Piccadilly. Programme details and booking form with this issue.

Saturday 29 November, Woking: Conch. Soc. Molluscan Workshop.

Saturday, 13 December, London: Conch. Soc. joint meeting with the British Shell Collectors Club. Kevin Brown (London). What's in a name? The Natural History Museum at 14.30. Please bring exhibits and/or slides on the theme of unusual names.

Thursday, 14 January 1998, London: The Malacological Society of London. Molecules and Molluscs, Natural History Museum. Contact: Dr David Reid, Natural History Museum, London SW7 5BD. Tel. 0171-938-8750. E-mail: D.Reid@nhm.ac.uk.

March 1998, Sunderland: The Malacological Society of London Annual Meeting. Feeding behaviour in molluscs. University of Sunderland. Contact: Mark Davies, Ecology Centre, University of Sunderland. Tel. 01752 222772 Ex. 7215. E-mail: es@md@environment.sunderland.ac.uk.



Pembrokeshire Patter

Fancy ...
Trekking for *Theba pisana*
Meandering to *Margaritifera*
Looking for *Littorina*
or just
Seeking Seashells on the Seashore?

Beautiful Bungalow in
Fishguard
Available for B&B, Self Catering

Contact:
Susan Davies
[REDACTED]
Portishead,
Bristol [REDACTED]
Tel. [REDACTED]

A.E. Ellis' **'Snail poems'**

Older members of the Conchological Society will remember A.E. Ellis and his collection of 'snail poems'. This was quite extensive and it eventually came to me. It has now been deposited in the Conchological Society Archives in Leeds. (The address is West Yorkshire Archives Service, Chapeltown Road, Sheepscar, Leeds LS7 3AP).

My own collection of conchological cartoons has also been placed in the Society's archives as above.

Nora McMillan, [REDACTED] Bromborough, Merseyside [REDACTED]

Field Meetings 1997

Hon. Programme Secretary:

Rupert Honnor

Henley-on-Thames

Oxon.

Important

Please remember to inform the leader if you are attending a field meeting.

Saturday, 28 June

Arun, near Pulborough, West Sussex

Leader: Martin Willing

A freshwater meeting which will include visits to sites along the Arun Valley for various Red Data Book species, including *Anisus vorticulus*, *Pseudamnicola confusa* and *Pisidium pseudosphaerium*.

MEET at Pulborough station at 10.00–10.15 a.m. Trains run from Victoria to Pulborough, and there is expected to be a 09.02 service from Victoria which should arrive at Pulborough at 10.15 a.m. (this is taken from the current timetable, and is not expected to change – but please check when the new timetable becomes available).

Saturday, 19 July and Sunday, 20 July

North Wales coast

Leader: Tom Clifton

Due to late low tides, non-marine sites have been arranged for the mornings, marine sites for the afternoons.

Saturday, 19 July – morning: Deciduous woodlands and streams at the Aber Falls Nature Reserve (subject to permission). Meet at the car park (OS Grid Ref. SH662720) at 9.30 a.m. for a 10.00 a.m. start.

Saturday, 19 July – afternoon: Great Orme's Head, West Foreshore. Stony/boulder beach of limestone down to sublittoral zone. 3.9 ft tide at 5.39 p.m. Meet at 3.30 p.m. on Great Orme Circular Coast Road at OS Grid Ref. SH754842 for roadside parking. Please note that this is a toll road for one-way traffic entering adjacent Llandudno Pier.

Continued on next page ...

Continued ...

Sunday, 20 July – morning: Mixed woodland valleys and streams. Meet at the car park on the A470T in the Conway Valley, at OS Grid Ref. SH802749 at 10.00 a.m. The group will drive to locations from there.

Sunday, 20 July – afternoon: Penmaen Rhos headland. Boulder shore of limestone down to the sublittoral zone. 3 ft tide at 6.26 p.m. Meet on the Old Colwyn sea front road at 5.00 p.m. at OS Grid Ref. SH870787.

Further details available from the leader in the near future.

Sunday, 28 September

Reading area, Berkshire

*Leaders: June Chatfield [REDACTED]
and Rosemary Hill [REDACTED]*

READING MOLLUSCS 100 YEARS ON: revisiting some old localities in the east of Reading around Woodley, and along the Thames to Sonning. Bring lunch. Land and freshwater collecting.

MEET a 10.30 a.m. in the car park of Earley station. By train: either Waterloo–Reading stopping service, or some trains on the Gatwick–Reading Thames Trains line (change at Wokingham). Check nearer the date for engineering works on Sundays. By road: M4, A329 following signs to Earley (**not** Lower Earley). Earley Station is in Station Road leading off Wokingham Road (A329). OS Grid Ref. SU/753718 – Landranger map 175: Reading and Windsor.

N.B. There are no toilet facilities at Earley Station.

Saturday, 8 November

Blockley Quarry, Gloucestershire

Leader: David Long [REDACTED]

Visit to brick clay quarry with exposure of Ibex zone of Lower Lias. Details in later Newsletter.

Other events in 1997

Saturday, 29 November: Molluscan Workshop

Venue: At the home of Judith Nelson in Woking (01483-761210).

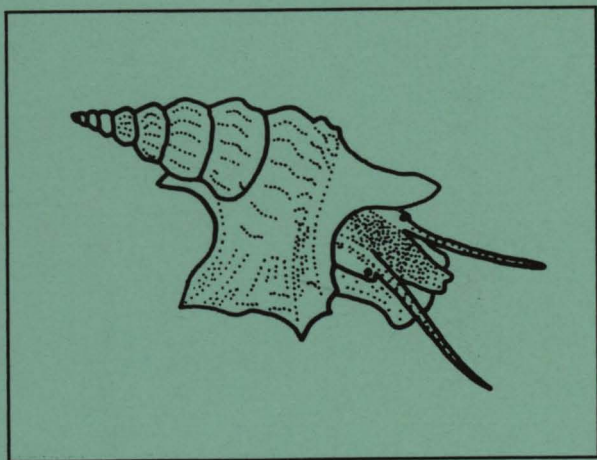
An opportunity to learn about the British marine and non-marine molluscan faunas. Formal sessions and informal discussion. Details in later Newsletter.

The Conchologists' Newsletter

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Conchological Society of Great Britain & Ireland
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Islands and shellsand

Christine Street

Barkingside, Ilford, Essex

The first time my husband and I went to an island in 1974 we were inspired by a Mr Green who said he collected islands. On our travels to islands, we have spoken to many people since then, mainly very happy incomers who are usually ready to chat. Island communities vary considerably in that the more remote ones, less touched by depopulation and replacement incomers, keep the extra communal bond of Gaelic language. This is mainly the case in the remoter Outer Hebrides. Some Gaelic speaking does continue in such places as Tiree but perhaps not to the same extent.

For many years we have followed Mr Green's example in collecting islands. Unfortunately it was not till our sixth island, when we went to Eriskay and saw a beach full of shells, that I caught the bug of shell collecting. We did not intend to return to any previously visited island, but walkable ones with beaches are getting harder to find. It all started as a way of keeping a lively child occupied, but soon I became heavily involved myself. I came home with many questions that the books of the time could not answer. To find the first froth of *Rissoa parva* at the edge of the tide-line was a revelation to me, who had only known cockles and mussels. Since then, with an obliging family, I have walked along many miles of shore and found many of the available species.

As a way of spending holidays, a Hebridean retreat has changed from a way-out idea to being acceptable. To satisfy this new demand the standard of holiday cottages available has improved considerably, from being a use for abandoned out-of-the-way hovels, to an investment with modern facilities. As we have no car we must take care to check on the availability of shops. Being three miles from a shop on Colonsay with a 15-month-old baby was a challenge, but on one occasion we got a lift home in the ambulance. Five miles to shops has been our limit, or too much precious beach time is lost in refuelling. 'Yes, this is the post bus but no it doesn't come back', is the sort of thing we're up against.

Visiting many different island sites has given me a good idea of what is likely to turn up in the various groups of islands around Britain. Nothing for me can beat the excitement of arriving at a new location and walking several miles to the available beaches. Will it be an idyllic strandline empty of people and of plastic rubbish? Or the disappointment of finding a well scoured large bay of often darkish sand and perhaps gravel, but little else? This happens, particularly on northern beaches. Some western ones seem to be stretches of sand only covered by the sea at very high tides, which leaves ships' rubbish and very worn bleached shells. It is quite a lottery looking at maps to decide the best place to go. Only visiting islands at holiday times gives a small view of the shell potential and this view changes with the weather. We have seen this with the variety of shells brought in after a bout of stormy weather, of which the classic case for me is the shore of Colonsay covered with *Velalla* and of finding a *Janthina*. However, this can also be counter-productive if the gales bring in a load of evil-smelling, rotting seaweed as well. A pleasant sandy beach can be transformed overnight. Even this may be a bonus, as I found last year on Tiree. At the centre of the large sheltered Gott Bay small light shells held in suspension in the water were deposited delicately on the fine algae at the centre of the bay in very good condition. Here I found juvenile cowries among others which do not usually survive. Because of the varying weights and buoyancy of various shells and valves, to walk across such a huge bay is most interesting, as the patterns of deposition are of continuing value for study. Shells seem very specific to areas. On a huge bay similar species end up in clusters together. These may change with a change of weather but return to normal with time.

To concentrate on islands has been a boon to me in that my holidays may be considerably extended by the bags of shellsand which I can bring back to examine at my leisure, though this has tended to get out of hand. Luckily we have a car-less garage in which to store the backlog! Even if the tideline shells are few, maybe I will have rare shells lurking in the sand. Species numbers are increased considerably when this sand is searched.

As for the islands we have visited, first came the Hebrides in

May, a lovely time. We have been to Eriskay, Tiree, Iona, Coll, Muck, Berneray, and Islay in May; and to Coll, Tiree, Eigg, Colonsay and S. Uist in August. Our May and August holidays have been for three weeks. Of the Orkneys we have seen Sanday in May, and Stronsay and Westray with Papa Westray in August. The southern islands have been one-week visits. The Scillies were visited in October, St Martins with Tresco, and Bryher. We have also been in February to St Martins, St Mary's, and St Agnes. Most recently we went to the Channel Islands in February – to Guernsey, Herm (three times) and Alderney. All these are British islands, but all the groups and all the separate islands have a character of their own. In all, I have collected a total of 291 mollusc species in the British islands.

We have now spent more than 36 weeks of our lives in the Hebrides. Though it looks bleak, the simple life has much to commend it. Parcels can be left outside shops and doors left unlocked. It would be very difficult to make a quick unseen getaway, even though policemen are rare. The Hebrides are divided into inner islands in the Mich and the long string of outer islands. Of these the southern ones seem very Irish-influenced in accent and by Catholicism, whereas the northern ones owe their cultural influence to the Wee Frees. The climate is mild but the gales make walking hard in winter and a few stunted trees, mainly sycamores, lurk in very sheltered spots. It surprised me to see how hardy are the *Fuchsia*, *Montbretia* and single rose in local gardens. Rhubarb is tough too. The selection of wild flowers is quite impressive especially in areas that are not intensively grazed. Mainly people live by crofting and fishing or doing whatever is needed such as road repairs and post duties, though tourism is gaining ground as alternatives decline. EC subsidies have improved housing and farm fencing but much grass cut for hay is still turned by hand. Food is expensive and not always very fresh at the small shops and is dependent on the boat being able to get across. Meat and fresh fruit and vegetables are at a premium. Rainfall is very high; May and June have the least but the more hilly areas draw in the clouds.

In the nine weeks I have spent in the Outer Hebrides I have

found 64 species of gastropods and 75 of bivalves and cephalopods, making a total of 139 species, while in the Inner Hebrides I have found 231 species of mollusc, 128 gastropods and 103 non-gastropods in the 27 weeks spent there. *Crassostrea gigas* is farmed on Colonsay and escaped young have established themselves. The only place that I have found *Iothia fulva* and *Antalis entalis* is the Inner Hebrides.

Tiree is rather large and very flat, about 12 miles by 7 at its widest with rather scattered communities. The population is under a thousand. It can be reached by plane or car ferry. In fact, Coll and Tiree have a climate like the Scillies, which is suitable for growing early bulbs, but this experiment was ended since apparently the people involved couldn't stand the pace. The centre is still an airfield from wartime and is at or below sea level. Only three hills can be seen far away. On our first visit we stayed at Balemartine in the south-west, near a shop. We went to many beaches but the long straight roads were a bit daunting. Hares were everywhere, even crossing the road in front of us. There was a five-mile walk along the beach to the main town in the east which mainly yielded bleached bivalves. Our favourite was the west of Balephuul Bay which had a good tideline of colourful shells in good condition, while Balephetrish to the north after a long walk was disappointing, dark gravelly shell-less sand.

Our second visit was to the east. We stayed in a house behind the hotel in the centre of Gott Bay, which was fascinating to a conchologist. The bay is a couple of miles across. It was the first time I found *Pleurobranchus membranaceus*. They were in the same area as lots of *Mysia undata* to the west of the bay. Young cowries were in the centre. Shellsand and shell gravel was dumped by the tide at regular intervals westwards, which made my progress very slow, finding *Mangelia powisiana* mixed with *Mangelia nebula* and looking confusingly similar. There are several other beaches eastwards and north which are accessible, so it makes a good centre. There is a northern beach, Traigh Chornaig, hard to reach with no direct marked road, but with good shellsand. So far in Tiree, I have 146 species, 75 gastropods and 71 non-gastropods.

One of my favourite islands is Coll, about 12 miles by 4 with over a hundred residents. It is reached by car ferry. Coll, though close to Tiree, is very different and their inhabitants feel a world apart. The local laird breeds rare farm animals which adds interest, but the bulls roaming free takes a bit of getting used to. The sound of competitive bellowing across the beach is unusual, but we were assured that beef bulls are harmless. The island has two very different halves. The east end town Arinagour, with several shops, is separated from the grassy west by bleak rocky moor. We stayed in the SW, at Breachacha Bay, five miles from the shop in the greener western half. Our view was of two 'castles', at one of which Dr Johnson stayed in the eighteenth century. West of each side of very high dunes with the sound of corncrakes, is to the north, a one-and-a-half mile sandy bay with tideline and southwards a more silty beach with gravel and many *Donax vittatus*. In damp hollows in the dunes wild pansies flourished and all colour forms of *Cepaea*. Beyond these, after what was for us a mile walk across orchidy heath and dunes with bloody cranesbill, is my favourite beach. The west beach of Coll is a collection of continuous sandy coves. Because the island of Gugh is close offshore southwards, the whirling currents dump an extraordinary collection of shells and shellsand there. I have never been able to do it justice. We also stayed a week at Clabhack in the north of Coll. This enabled us to walk across the north coast to Sorisdale which had a lovely tideline with *Philene catena*. I have only ever found *Tridonta montagui* on Coll. Altogether I have 154 species, 80 gastropods and 74 non-gastropods from Coll.

The Inner Hebrides on the other hand are more sheltered. Colonsay is 8 miles by 3 with over a hundred people and is known for its lovely garden of rhododendrons though rather overgrown now. It is in a very protected spot and is reached by car ferry. It is stunningly beautiful in August with a wealth of wild flowers and has become a popular family holiday destination with more affluent canoe and boat equipped families, as the beaches are magnificent. The local people are unhappy that every available house is being taken over for holiday lets by the laird as this is excluding the native population. The northern tip which is reached

by a five-mile walk is unspoiled flower meadow with the possibility of seeing wild goats. The beach there had good shellsand. On the way bog pimpernel made a lovely show at a damp spot as a carpet of pink. At an empty farm we met a man who introduced himself as 'a kind of wandering shepherd' which we will always remember.

Included with Colonsay is Oransay, a tidal island to the south which can be reached at low tide by crossing a mile of mud-flat beach called The Strand. I found several shells only at Colonsay, such as *Tonicella marmorea* and *T. rubra*, *Janthina*, *Ondina diaphana* and *O. warreni*, *Jupiterra minuta* and *Similipecten similis*. The variety of habitats ensure a high shell count of 186 species, 101 gastropods and 85 non-gastropods.

Iona is a strange mix. It is reached by a long bus trip across Mull, then a short ferry ride. Being about three miles by one and half with a population of about a hundred people it is very small, but we found that no hardship. Tourism and crofting are the main occupations. It is a very popular place of pilgrimage with thousands of day trippers, so supports two shops. This mass of people keep to a very well defined paths to and from the abbey and St Columba's beach while to the SW are lovely flowery orchid lined gullies that no-one seems to visit. Port Ban in the west is attractive white barnacle sand with colourful hills. There are also many sandy beaches to the north and west. We stayed at Traigh Mor which is a pleasant quiet spot. We had a day trip to a sandy bay we could see across on Mull but I did not find many shells. Another trip was to Staffa. The unfenced edge of Fingal's cave was rather frightening. As this was an early and as yet unrepeated trip the numbers are quite low for Iona, being 95 species, 57 gastropods to 38 non-gastropods.

One of the most beautiful islands is Eigg, one of the small isles. It is about five miles by three and a half with only 60 or so inhabitants, reached by small ferry with trans-shipping to an even smaller one. It has an air of neglect as it has been unsettled in ownership so has quite a proportion of unemployed incomers to replace the original population. This adds to its air of decline. The islanders are now trying to buy it to give security from landlords wanting to play king. [Editor's note: Eigg has now been purchased

by the islanders.] There is one shop half-way between Cleadale and Galmisdale which are three miles apart. Cleadale is really beautiful, an area of flat land looking across to the hills of Rhum. It is enclosed to the east by a large range of cliff-like hills called Cleadale Heights. The large hill is the Sgurr which dominates the south when approaching. It is a buttress of basalt but is surprisingly climbable. It towers out of attractive woodland planted by former owners. A famous beach is the Singing Sands so called because the dry sand when scuffed gives a strange squeak. I found interesting shellsand there at Laig Bay and I found two shells not usually included on the list because they are washed in from deep water. They are *Delecopecten vitreus* in shellsand from Laig and *Cylichna alba* from the SW beaches which are quite extensive and are sand and mud. Sarah Dawe, with whom I correspond, found *Glossus humanus* there which I have never seen. So far I have 142 species, 72 gastropods to 70 non-gastropods, from Eigg.

We were not believed when we decided to go to Muck for three weeks. 'Whatever will you find to do?' was the question. From the top of the Sgurr of Eigg it looks a tiny flat green patch but we found it very enjoyable. Just over two miles by one and a half it has no shop. To get there you have to trans-ship and we had to land on rocks with cases as the tide was too low for the quay. Food orders have to be given by phone and sent across by sea. When ours didn't turn up we had to live on local eggs and potatoes for a day. There were about 30 people there with several incomers who love it. It still had a button A/B phone in 1986, probably one of the very last. The big event is the Five Island Games followed by a real Ceilidh in a barn with a fiddler and a very good stew provided by the laird. On Muck there is a Shell Bay but that was nearly all *Littorina obtusata*. The bay at Gallanach had shellsand and a tideline. I found 88 species, 49 gastropods to 39 non-gastropods

Islay was our last May holiday. It is rather a large island for us, roughly 25 by 20 miles and about 4000 people, and has plane or car ferry access. It seems very different as it is a collection of small towns clustered around the various distilleries. There are also scattered farms. We stayed in a comfortable flat next door to the

distillery at Bowmore, a pleasant town, but found the long roads rather limiting combined with the basic public transport. We did obtain a lift to the RSPB sanctuary in the north to see the choughs. A highlight for us was actually seeing hares boxing quite near on our walk to the very long SW beach which was disappointing lumpy reddish stuff with few surviving shells. We spent a lot of time paddling across the huge bay at Bowmore, the other side of which had huge piles of shells. As the tideline became more muddy *Haedropleura septangularis* was washed up but there was not much shellsand. Just SW of Bowmore is a stony beach where I found large saddle oysters complete with plug and a lovely pale orange *Chlamys varia* unharmed on the pebbles. In this area there were huge mussel beds forming causeways to islands. I found 121 species, 65 gastropods to 56 non-gastropods.

As for the Outer Hebrides, this year we have been to S. Uist which was not a good tide line collecting area. It is very large for us, 25 miles by 8, so we decided to concentrate on certain areas. It is a very strongly Gaelic speaking area with school lessons given in the language. We were based at Smerclate in the south-west. Luckily the island has a good north to south bus service. Westerly beaches tended to lack tidelines if the weather was at all rough. The deposits consisted mainly of broken shells, much rotting seaweed, many goose barnacles, and crab and *Velalla* remains. Some shellsand was found in slow drainaway spots behind rocks. Other interesting remains included a young seal and a small rotting cetaceous sea mammal. I was put off searching for live molluscs when I broke my wrist slipping on wet rocks. How fortunate that I was only a 70p bus ride from the hospital. Although most of the beaches are silver sand they look a bit messy, particularly to the south-west, because of the large amount of ground-up weed mixed in, and a lot of animal bones. I saw a crofter apparently burying a small animal which he had brought on his trailer. His unease at my watching from a distance made me think this was not legal.

The jetty inlet to the south is rather marshy mud which I did not examine but the next beach at Glendale was much more interesting. It is extremely sheltered and is used by the locals to

collect shellfish for eating, such as cockles, mussels and razor shells. Mussels were attached to small stones and shells in the sand. The shellsand contained a lot of barnacles. At extreme low tide the beach doubles in area but a close watch has to be kept on various projecting rocks which become cut off one by one. Here, any shells are in much better condition and at least 10 species were found only at this site. So far I've found 92 species, 35 gastropods to 57 non-gastropods.

On our last day we took the ferry to Eriskay, the start of my obsession with shells. It is very small at three miles by one and a half with a population of 200 or more. Obviously lessons were in Gaelic here too. Could it be as good as I remembered? The bright start quickly deteriorated into awful wind and drizzle when we reached Prince's Strand or Prince Charlie's Bay, but the tide line was good. I wanted to see if I could find more shells in a day trip than I did in the three weeks of my initiation. Tiny scallops and pygmy tellins make the shellsand brighter than anywhere I've seen. We wanted to see the house we stayed at 14 years before but could find no tin cottage along the road. In fact most of the houses have been improved beyond all recognition in the period with the aid of very generous island grants. No more the house with rain dripping off the light bulb! We spoke to a home counties couple renovating their cottage for retirement. Having had many holidays there, they had decided to stay. There is one busy shop. There was a flourishing fishing industry but I think with the EC quotas that has died. On our first visit we were given 26 lb of fresh caught fish. Roadside shrines give Eriskay a foreign character due to the close Irish religious influence. As a reminder of past times, a group of very tough wild ponies formerly used for farm work live on the hill. It is a lovely spot but rather more populated than most, with not much chance of meeting no one in a day's walk. My first trip found 71 species. So far this time I have 93 species, 37 gastropods to 56 non-gastropods.

Berneray island, four miles by two, with 150 people to the north of North Uist, is far more remote, but accessible from Lochmaddy car ferry or Benebecula airport. Just how remote is shown in that Prince Charles was confident enough to use it for a secret holiday

when we were there in 1987. Few places can have remained so cut off. Gaelic language and culture are still very important here. It obviously houses a very close community. A stretch of fertile flat machair behind the beach is divided and farmed as strip culture with all capable inhabitants having a share. The west beach was of the bleached shell kind, very long but with not many species. Washed up on the beach was *Eledone cirrhosa* in good condition. I was keen to get a photo of the only octopus I've ever seen. There is a very sheltered cockle strand to the south where cockles are dug. A sunny evening made it a pleasant place to swim which is not often a possibility in May in the Hebrides. I found 123 species, 58 gastropods and 65 non-gastropods. I found more bivalves than gastropods there and also in the other two Outer Hebridean isles. The only other islands showing this sort of result are the Orkneys with similar exposure.

The number of species found in the Scillies and Channel Islands seems well above those found in the much greater time spent in the Hebrides but I was surprised to find that the figures are identical at present. Thirty-six weeks in the Hebrides has given 234 species, 128 gastropods to 106 non-gastropods, while 13 weeks in the southern isles has given 241 species, 134 gastropods to 107 non-gastropods.

The Channel Islands being far to the south have some species unique to themselves on the British list, such as the ormer. I have stayed for only five weeks yet the total of 211 species is the second greatest for any island group. These and the Scillies are ideal to visit out of season because of their mild climate but we have seen a harsher side. Luckily it does not last long. At St Agnes in February the locals were moaning at the ice on puddles. Going to Herm one February we were hampered by a very rare fall of snow, with our boat getting lost in a snowstorm and having to moor to shelter by a coal barge till the storm passed. At Shell Bay I was reduced to poking in the snow with cold hands to find the tideline for three days but then all was back to normal.

I loved Alderney, three-and-a-half miles by one mile, which is easily reached from Southampton airport. It has perhaps a couple of thousand people mainly based at St Anne's. Sadly it does not

have a good tideline because of the coarse nature of the reddish sand found on most of its beaches. Because of this, the proportion of gastropods to bivalves is higher than usual at 80 to 31. Telegraph Bay, 'Descend at your own risk', is a lovely sandy bay but there were no shells in February. I was pleased to have found *Ocenebrina aciculata* there in Alderney.

Herm is the place for tidelines. Though so small, perhaps over a mile by a half mile, it is unsurpassed in the variety of species to be found, as its entire coast shows a variety of habitats varying from mud, to stones, to gravel, to washed sand, to sand with many shells accumulated. I have been there three times in February, a wonderful time for a quiet look-around without a single other tourist in sight. It gave a total of 191 species, 108 gastropods to 83 non-gastropods, in just three weeks. *Dikoleps cutleriana*, *Melanella frielei*, *Folinella excavata*, *Alvania lactea*, *Limaria hians* and *L. loscombi*, *Galeomma turtoni*, *Donax variegatus* and *Cardium papillosum* are a few that I have found nowhere else. On the Wednesday was the first boat of day-trippers and the first litter. The chance to make finds is so much greater when alone and uninhibited on the beach.

Guernsey in February was rather different. We stayed on the west coast at Vazon Bay. At roughly ten miles by six it is rather big for us to explore and supports 50,000 or more people. It was a bit bleak with large expanses of scoured greyish sand, but towards the end of our week two miracles happened. We walked farther north to Saline Bay and found a strange area of beach left by the tide looking as if it had been deeply ploughed. There was a wealth of living molluscs sheltering at the bottom of the grooves, mainly Venus shells. The colour and variety was amazing. The second was when we went out on a very dull day. The tide was out but I didn't even take a container as the bare beach looked so hopeless. At a point where the promenade is built up, where the beach invades the land, I noticed a patch of shellsand. My lens showed me my first ever *Graphis albida*, so I had the problem of getting it safely home in the palm of my hand with a sample of the shellsand. In that handful were nearing eighty shell species, which must be a record. This for me showed the fascination of small

island habitats with their rich variety. *Arculus sykesi* was a new find only here. I found 114 species, 62 gastropods to 52 non-gastropods.

The Scillies are favourites of ours, particularly St Martin's, but we have only been there out of season. The Scillies in September are taken over by bird watchers for the migration and so become very busy. They lie 26 miles SW of Cornwall, which means that some southern species are found. There are strange spiky rocks around the coast, scene of many a wreck. The main means of support is the early bulb industry, backbreaking work, in small fields sheltered by New Zealand hedge plants. Employment is augmented by tourism. There is an exotic look with *Daturas* and other plants long ago brought back from South Africa and the West Indies by sailors. I have found a total of 159 species, 81 gastropods to 78 non-gastropods in the total of 8 weeks in the Scillies.

St Martin's is easily reached by helicopter then boat if the sea isn't too rough. It is about two miles by half a mile and is fairly flat with perhaps 80 people. There are many day-trippers but mainly they just walk up the road and back. The western end is heathland while most of the rest is bulb fields. There is one general shop and a small greengrocer's. When we said that it was shut we were told that the key hangs outside, help yourself. February has a bonus if it coincides with the spring tides. St Martin's Flats enlarge unbelievably. We could walk across to a strange castle-shaped rock about a mile away towards St Mary's. We had to watch the tide but saw interesting wildlife such as flower-like sea anemones in profusion. *Lucinella divaricata* only lives in this area and we found quite a few valves. The flats house many scaphanders and sea potatoes, *Jujubinus* species, and beautiful undamaged bivalves may be found around the various rocky outcrops. The bay to the north is also sheltered and sometimes has an interesting tideline. St Martin's is very compact for exploring different habitats and every tide turns up some new treasure. Some finds only made there are *Eulimella ventricosa*, *Retusa umbilicata*, *Palliolium striatum* and *Lucinella divaricata*. I found 158 species, 80 gastropods to 78 non-gastropods.

I found fewer interesting beaches on St Mary's, two miles by three, but a mild February made it a lovely place to be though it is mainly under cultivation. It is the capital of the Scillies and its shopping centre. It has about 1500 inhabitants and a vast number of summer visitors. Carpet shells came with distinctive patterns there. I found 38 species, 22 gastropods to 16 non-gastropods.

Bryher has a population of about 50 people and is one a half miles by a half, and is a beautiful island in the autumn, with wild fruit and flowers. It is reached by boat from St Mary's. The absolute dark nights came as a shock. I soon gave up my attempt to walk to a phone one night after getting lost in a hedge. Only the moving lighthouse beam lights the sky. We had a long chat with a flower grower. He had moved with his wife from the mainland to grow bulbs. It was only at picking time they discovered she was allergic to the sap. The rather muddy beach near the only shop was a rich source of wentletraps. I found 53 species, 31 gastropods to 22 non-gastropods.

St Agnes was very different in February, not least because it was the coldest for five years. Luckily the sea was not too rough to get there from St Mary's. It is under a mile by just over a mile. We still remember the notice outside the only shop which was an old greenhouse, 'No tap dancing tonight'. The sand is very light coloured and coarse and granular, not good for shell preservation, but a friend was thrilled to find half of a 200-year-old wooden bead, cargo from a shipwreck in 'Beady' Bay. The locals showed us a jar full of beads. A beach which had interesting shell finds is the sandy causeway which at high tide links the island of Gugh. Almost all my finds were in this area. I only found 26 species, 17 gastropods to 9 non-gastropods.

I have only had day trips to Treco, about two miles by one mile, but there does seem to be a reasonable tideline. There are 150 people. The gardens are the main attraction, wonderful on a fine February or October day when few other people are about. There is a helicopter from Cornwall, or boats from St Mary's. I found 25 species, 16 gastropods to 19 non-gastropods.

The Orkneys, we have seen, have their own very different

character. They are best compared with the Outer Hebrides in the degree of exposure. The climate is mild, getting warmth from the sea, with new potatoes dug at Christmas despite the northerly situation. It may be bleak and treeless but it has very fertile soil which means that all available land is under intensive cultivation. This unfortunately means that it is not so easy to wander over what looks like open land, because of barbed wire fencing to confine the cattle. The whole area gave the impression of prosperity unknown in the western isles. I was surprised how popular Orkney is as an escape for stressed idealists. The Orkneys can be reached by boat or plane to Mainland Orkney and then boat or eight-seater plane to the outlying islands. The short trip in a tiny plane to a shed in a field which is the airport is quite an experience. We have spent a total of 9 weeks there and have found 134 species, 66 gastropods to 68 non-gastropods, very like the Outer Hebrides total and the species spread is largely similar.

Sanday, our first visit to the Orkneys, has a central position and is a huge spider shape. It is about fourteen by six miles. This means vast shore lines with very large curved sandy bays. Being heavily fenced it is not easy to take short cuts. We had a house in the centre 'body' near the shop, fortunately, as there is no public transport. As an island it is a bit run down and depopulated, but a few incomers are now moving in. They were the ones who wanted to talk. There is a local organised knitting company as a money earner but little tourism so far. We were told of the value of Citizens' Band radio, warning that a policeman was coming on the boat to check motor vehicles. Anything dubious could be tidied away. To explore the various spider legs meant very long walks and it seemed a bit flat and characterless. I found a total of 125 species, 60 gastropods to 65 non-gastropods.

Stronsay is just over seven miles by six. Our house belonged to a fanatical bird-watcher who has set up his own bird sanctuary. He had a 1930s car because the vertical windscreen is good for bird-watching. The best shell beach was Rothiesholm Bay, a very long curve. At the rocks one end were *Amauropsis islandica*, including juveniles. A mile or so farther on was a long stony stretch of green algae-covered round stones six inches across which makes a very

soft bed to protect several species of large shells. I brought home 30 or more near perfect *Colus gracilis*, with juveniles from the other end of the bay. I also had 14 complete *Arctica islandica*. There was a good tideline behind the large stones too. It seems that opposing currents make the centre of large bays interesting for shell deposits. The field above that bay had grass of *parnassus* in flower which is fairly uncommon. This bay also showed why canoe shells are so called as we saw them float in on the tide. I found 95 species, 44 gastropods to 51 non-gastropods.

Westray, more than ten miles by six, was the most prosperous, being primarily a beef-production area. In fact several beaches were polluted with cowshed runoff. The smell of traditional haystacks steaming in the sun was something new. Westray people we spoke to seemed very pleasant and outgoing. As tourists are still uncommon they seemed very uncommercial in outlook giving us a load of fresh-grown vegetables. The main sight of Westray is the puffin colony at the Castle o' Burrian, a huge unscaleable rock with countless puffins planing around in every direction. The next week they had nearly all gone. 72 species were found, 34 gastropods to 38 non-gastropods.

From Westray we took a trip to Papa Westray, which was an interesting contrast because it is small and very underdeveloped, though it does now boast a modern shop. Mainly bivalves were picked up there. There is quite a long sandy eastern beach. Also of interest is the oldest house in NW Europe, at 5000 years or so, a neatly stone-lined basin having lost its roof some time ago. On the grass near the ferry grows *Primula scotica*. I found 53 species, 22 gastropods to 31 non-gastropods.

Conclusion

I am aware that my figures are haphazardly collected at different times of the year and with different lengths of visit, but they do seem to show common factors. The Outer Hebrides and Orkneys, linked by degree of exposure, show similar numbers and gastropod: non-gastropod ratios, but while I would have thought that gastropod shells would have survived better, there seem to be more bivalves.

In comparing western islands with southern ones so that both sites mix exposure with more sheltered conditions, again the figures are very similar, at present 234 species in the western isles, 241 in the southern isles and only 134 in the northern isles. A collection of shells from a different island or group can look remarkably different in size, preservation and colouring because of local conditions. Of the shells I have found, 81 species I've found in all the groups of islands, 41 species in only one island and 75 in only one group.

My love of islands with beaches good or bad is insatiable. My favourites so far are:

1. Herm with 191 of the 213 Channel Island total.
2. St Martin's with 158 of the Scillies' 159 total.
3. As for the Inner Hebrides I am torn between Colonsay with 186 of the Inner Hebrides' 231, and Eigg which is so beautiful and varied with 142 so far, and Coll where the west is away from it all, and has 154 species.
4. Of the Orkneys, my favourite is Stronsay.
5. Of course, I must reserve a place for Eriskay which started it all. How glad I am to have seen all these islands and thanks are due to all the people who have helped me with so many shelly problems.

Table 1. Presence data for island groups.

O = Orkneys, OH = Outer Hebrides; IHN = Inner Hebrides North;
IHS = Inner Hebrides South; Sc = Scillies; CI = Channel Islands

	O	OH	IHN	IHS	Sc	CI		O	OH	IHN	IHS	Sc	CI
<i>Leptochiton asellus</i>							<i>L. vineta</i>						
<i>Callochiton septemvalvis</i>							<i>Littorina littorea</i>						
<i>Lepidochitona cinereus</i>							<i>Littorina mariae</i>						
<i>Tonicella marmorea</i>							<i>L. neglecta</i>						
<i>T. rubra</i>							<i>L. nigrolineata</i>						
<i>Acanthochitona crinitus</i>							<i>L. obtusata</i>						
<i>Haliotis tuberculata</i>							<i>L. saxatilis</i>						
<i>Emarginula fissura</i>							var. <i>rudis</i>						
<i>E. rosea</i>							<i>Melarhaphe neritoides</i>						
<i>Diodora graeca</i>							<i>Skeneopsis planorbis</i>						
<i>Tectura testudinalis</i>							var. <i>trochiformis</i>						
<i>T. virginea</i>							<i>Eatonina fulgida</i>						
<i>Patella depressa</i>							<i>Barleeia unifasciata</i>						
<i>P. ulysiponensis</i>							<i>Rissoa guerinii</i>						
<i>P. vulgata</i>							<i>R. interrupta</i>						
<i>Helcion pellucidum</i>							<i>R. labiosa</i>						
<i>Lothia fulva</i>							<i>R. lilacina</i>						
<i>Margaritis helacinus</i>							<i>R. membranacea</i>						
<i>Monodonta lineata</i>							<i>R. parva</i>						
<i>Jujubinus exasperatus</i>							<i>Alvania beanii</i>						
<i>J. montagui</i>							<i>A. cancellata</i>						
<i>J. striatus</i>							<i>A. lactea</i>						
<i>Gibbula magus</i>							<i>A. punctura</i>						
<i>G. tumida</i>							<i>A. semistriata</i>						
<i>G. cineraria</i>							<i>A. carinata</i>						
<i>G. pennanti</i>							<i>Cingula trifasciata</i>						
<i>G. umbilicalis</i>							<i>Manzonella crassa</i>						
<i>Calliostoma zizyphinum</i>							<i>M. zetlandica</i>						
<i>Dikoleps cutleriana</i>							<i>Obtusella alderi</i>						
<i>D. nitens</i>							<i>Onoba aculeus</i>						
<i>Skenia serpiloides</i>							<i>Onoba semicostata</i>						
<i>Tricola pullus</i>							<i>Pusillina inconspicua</i>						
<i>Bittium reticulatum</i>							<i>Setia pulcherrima</i>						
<i>B. simplex</i>							<i>Hydrobia ulvae</i>						
<i>Turritella communis</i>							<i>Ventrosia ventrosa</i>						
<i>Lacuna crassior</i>							<i>Potamopyrgus antipodarum</i>						
<i>L. pallidula</i>							<i>Paludinella litorina</i>						
<i>L. parva</i>							<i>Caecum imperforatum</i>						
							<i>C. glabrum</i>						

	O	H	IH	IH	Sc	Cl		O	H	IH	IH	Sc	Cl
	O	H	N	S	Sc	Cl		O	H	N	S	Sc	Cl
<i>Tornus subcarinatus</i>							<i>Comarmondia gracilis</i>						
<i>Aporrhais pespelecani</i>	■	■					<i>Raphitoma linearis</i>	■	■	■	■	■	■
<i>Calyptrea chinensis</i>							<i>R. purpurea</i>					■	■
<i>Crepidula fornicata</i>							<i>Rissoella diaphana</i>				■	■	
<i>Capulus ungaricus</i>		■					<i>R. opalina</i>					■	
<i>Trivia arctica</i>	■	■	■	■	■	■	<i>Omalogyra atomus</i>			■	■	■	■
<i>T. monacha</i>	■	■	■	■	■	■	<i>Ammonicera rota</i>	■			■		■
<i>Erato voluta</i>							<i>Odostomia plicata</i>				■		
<i>Lamellaria latens</i>	■		■	■	■	■	<i>O. turrita</i>			■	■		
<i>L. perspicua</i>	■	■		■	■	■	<i>O. unidentata</i>						■
<i>Velutina velutina</i>	■	■	■	■	■	■	<i>Brachystomia carrozzai</i>				■		■
<i>Amauropsis islandicus</i>	■						<i>B. eulimoides</i>				■		■
<i>Polinices catena</i>	■	■	■	■	■	■	<i>B. scalaris</i>				■		■
<i>P. polianus</i>	■	■	■	■	■	■	<i>Chrysallida indistincta</i>				■		
<i>Cerithiopsis tubercularis</i>	■	■	■	■	■	■	<i>C. obtusa</i>				■		■
<i>Marshallora adversa</i>	■	■	■	■	■	■	<i>Folinella excavata</i>						■
<i>Epitonium clathrus</i>							<i>Jordaniella nivosa</i>	■			■		
<i>Epitonium clathratulum</i>	■						<i>Ondina diaphana</i>				■		
<i>Janthina janthina</i>							<i>O. warreni</i>				■		
<i>Cima minima</i>							<i>Partulida spiralis</i>	■		■	■	■	■
<i>Graphis albida</i>							<i>Turbonilla lactea</i>		■	■	■	■	■
<i>Eulima bilineata</i>	■	■	■	■	■	■	<i>T. acuta</i>						■
<i>Melanella alba</i>	■						<i>T. pusilla</i>						■
<i>M. frielei</i>							<i>T. jeffreysii</i>						■
<i>Vitreolina philippi</i>							<i>Eulimella laevis</i>			■		■	
<i>Boreotrophon truncatus</i>	■						<i>E. ventricosa</i>					■	
<i>Ocenebra erinacea</i>	■	■	■	■	■	■	<i>Ebala nitidissima</i>	■		■	■	■	
<i>Ocenebra aciculata</i>							<i>Acteon tornatilis</i>			■	■	■	■
<i>Trophonopsis muricatus</i>							<i>Scaphander lignarius</i>	■	■		■	■	
<i>Nucella lapillus</i>	■	■	■	■	■	■	<i>Cylichna alba</i>			■			
<i>Buccinum undatum</i>	■	■	■	■	■	■	<i>C. cylindracea</i>	■		■	■	■	
<i>Colus gracilis</i>	■	■	■	■	■	■	<i>Philina punctata</i>					■	
<i>Neptunea antiqua</i>	■	■	■	■			<i>P. quadrata</i>						■
<i>Chauvetia brunnea</i>							<i>P. scabra</i>	■		■			
<i>Hinia reticulata</i>	■	■	■	■	■	■	<i>Diaphana minuta</i>				■		
<i>H. incrassata</i>	■	■	■	■	■	■	<i>Retusa obtusa</i>	■	■	■	■	■	■
<i>Haedroleura septangularis</i>							<i>R. truncata</i>	■	■	■	■	■	■
<i>Mangelia attenuata</i>							var. <i>mammilata</i>	■			■	■	
<i>M. nebula</i>		■					<i>R. umbilicata</i>					■	
<i>M. powisiana</i>							<i>Aplysia punctata</i>				■		■
<i>M. coarctata</i>		■	■	■	■	■	<i>Pleurobranchus membranaceus</i>				■		
<i>M. smithii</i>							<i>Limacina retroversa</i>			■	■	■	
<i>Oenopota rufa</i>	■	■	■	■	■	■	<i>Leucophytia bidentata</i>			■	■	■	■
<i>O. turricula</i>	■	■	■	■			<i>Ovatella myosotis</i>						■
							<i>Antalis entalis</i>			■	■		
							<i>A. vulgaris</i>						■

	O	H	IH	N	S	Sc	CI		O	H	IH	N	S	Sc	CI
Bivalves								<i>Semierycina nitida</i>	■	■	■	■	■	■	■
<i>Nucula nitidosa</i>		■		■	■	■	■	<i>Lepton squamosum</i>							■
<i>N. nucleus</i>				■	■	■	■	<i>Tellmya ferruginosa</i>	■	■	■	■	■	■	■
<i>N. sulcata</i>					■		■	<i>Mysella bidentata</i>	■	■	■	■	■	■	■
<i>Jupiteria minuta</i>				■			■	<i>Neolepton sulcatulum</i>				■	■	■	■
<i>Arca tetragona</i>				■		■	■	<i>Arculus sykesi</i>							■
<i>Striarca lactea</i>							■	<i>Epilepton clarkiae</i>				■			■
<i>Glycymeris glycymeris</i>	■	■	■	■	■	■	■	<i>Astarte sulcata</i>				■			■
<i>Mytilus edulis</i>	■	■	■	■	■	■	■	<i>Goodallia triangularis</i>	■	■	■	■	■	■	■
<i>Mytilus galloprovincialis</i>		■				■	■	<i>Tridonta montagui</i>				■			■
<i>Modiolus adriaticus</i>				■			■	<i>Acanthocardia echinata</i>	■	■	■	■	■	■	■
<i>M. barbatus</i>							■	<i>Parvicardium exiguum</i>	■	■	■	■	■	■	■
<i>M. modiolus</i>	■	■	■	■	■	■	■	<i>P. minimum</i>	■	■	■	■	■	■	■
<i>Modiolula phaseolina</i>				■	■	■	■	<i>P. ovale</i>	■	■	■	■	■	■	■
<i>Crenella decussata</i>	■	■	■	■	■	■	■	<i>P. scabrum</i>	■	■	■	■	■	■	■
<i>Modiolarca tumida</i>	■	■	■	■	■	■	■	<i>Plagiocardium papillosum</i>							■
<i>Musculus costulatus</i>				■			■	<i>Laevicardium crassum</i>	■	■	■	■	■	■	■
<i>M. discors</i>	■	■	■	■	■	■	■	<i>Cerastoderma edule</i>	■	■	■	■	■	■	■
<i>Rhomboidella prideaux</i>							■	<i>Macra stultorum</i>	■	■	■	■	■	■	■
<i>Limaria hians</i>							■	<i>Spisula elliptica</i>	■	■	■	■	■	■	■
<i>L. loscombi</i>							■	<i>S. solida</i>	■	■	■	■	■	■	■
<i>Limatula subauriculata</i>		■	■	■	■	■	■	<i>S. subtruncata</i>	■	■	■	■	■	■	■
<i>Ostrea edulis</i>	■	■		■	■	■	■	<i>Lutraria angustior</i>	■	■	■	■	■	■	■
<i>Crassostrea gigas</i>	■			■	■	■	■	<i>L. lutraria</i>	■	■	■	■	■	■	■
<i>Chlamys distora</i>	■	■	■	■	■	■	■	<i>L. magna</i>						■	■
<i>C. varia</i>	■	■	■	■	■	■	■	<i>Solen marginatus</i>		■					■
<i>Pecten maximus</i>	■	■	■	■	■	■	■	<i>Ensis arcuatus</i>	■	■	■	■	■	■	■
<i>Aequipecten opercularis</i>	■	■	■	■	■	■	■	<i>E. ensis</i>				■			■
<i>Delectopecten vitreus</i>			■				■	<i>E. siliqua</i>	■	■		■	■	■	■
<i>Palliolum furtivum</i>							■	<i>Phaxus pellucidus</i>				■	■	■	■
<i>P. striatum</i>							■	<i>Angulus squalidus</i>		■	■	■	■	■	■
<i>P. tigrinum</i>		■	■	■	■	■	■	<i>A. tenuis</i>	■	■	■	■	■	■	■
<i>Similipecten similis</i>				■			■	<i>Arcopagia crassa</i>	■	■	■	■	■	■	■
<i>Anomia ephippium</i>				■	■	■	■	<i>Fabulina fabula</i>		■	■	■	■	■	■
<i>Heteranomia squamula</i>	■	■	■	■	■	■	■	<i>Moerella donacina</i>		■	■	■	■	■	■
<i>Pododesmus patelliformis</i>	■	■	■	■	■	■	■	<i>M. pygmaea</i>	■		■	■	■	■	■
<i>Loripes lucinalis</i>							■	<i>Macoma balthica</i>		■	■	■	■	■	■
<i>Lucinoma borealis</i>	■	■	■	■	■	■	■	<i>Donax variegatus</i>							■
<i>Lucinella divaricata</i>							■	<i>D. vittatus</i>	■	■	■	■	■	■	■
<i>Thyasira flexuosa</i>	■	■	■	■	■	■	■	<i>Gari depressa</i>		■		■	■	■	■
<i>Diplodonta rotundata</i>				■	■	■	■	<i>G. costulata</i>				■	■	■	■
<i>Galeomma turtoni</i>							■	<i>G. tellinella</i>	■	■	■	■	■	■	■
<i>Kellia suborbicularis</i>	■	■	■	■	■	■	■	<i>G. fervensis</i>	■	■	■	■	■	■	■
<i>Lasaea adansoni</i>	■	■	■	■	■	■	■	<i>Solecortus scopula</i>		■		■	■	■	■
								<i>Azorus chamasolen</i>				■			■
								<i>Abra alba</i>	■		■	■	■	■	■

	O	H	N	S	Sc	Cl		O	H	N	S	Sc	Cl
<i>A. nitida</i>							<i>Mysia undata</i>						
<i>A. prismatica</i>							<i>Mya truncata</i>						
<i>Scrobicularia plana</i>							<i>M. arenaria</i>						
<i>Artica islandica</i>							<i>Sphenia binghami</i>						
<i>Venus verrucosa</i>							<i>Corbula gibba</i>						
<i>Circomphalus casina</i>							<i>Hiatella arctica</i>						
<i>Gouldia minima</i>							<i>Barnea candida</i>						
<i>Chamelea gallina</i>							<i>Zirfaea crispata</i>						
<i>Clausinella fasciata</i>							<i>Nototeredo norvegica</i>						
<i>Timoclea ovata</i>							<i>Thracia phaseolina</i>						
<i>Callista chione</i>							<i>T. villosiuscula</i>						
<i>Tapes aureus</i>							<i>T. distorta</i>						
<i>T. rhomboides</i>							<i>Cochloidesma praetenuae</i>						
<i>T. decussatus</i>							<i>Pandora inaequalis</i>						
<i>Irus irus</i>							<i>P. pinna</i>						
<i>Venerupis senegalensis</i>							<i>Sepia elegans</i>						
<i>Dosinia lupinus</i>							<i>S. officinalis</i>						
<i>D. exoleta</i>							<i>Eledone cirrhosa</i>						



Annual General Meeting 1998

Members are reminded that they can nominate candidates for election to the Council.

Rule No. 12

Candidates for nomination to the Council shall be paid-up members of the Society and shall be nominated by two members. Nominations, other than those made by the Council itself, shall be sent in writing to the Hon. Secretary at least six weeks before the AGM, and shall be accompanied by a signed declaration of the candidate's willingness to serve.

Note: Nominations must be received by the Hon. Secretary NOT LATER THAN 31 December 1997.

Rising to the biodiversity challenge – the next five years

**A report of a conference held at the Royal Geographical
Society, Kensington, 16 June 1997**

Dr M.J. Willing

Midhurst, West Sussex

1997 is the fifth anniversary of the UK's commitment to the *Convention on Biological Diversity* in Rio. The purpose of this conference, which represented the non-governmental and voluntary conservation organisations, was to review the UK's progress in conserving species and habitats and to pinpoint the major challenges for the next five years.

The UK now has the foundations of a credible national biodiversity strategy, but many habitats and species are still threatened and suffering significant losses. Therefore, although much has been achieved at a national and local level, a considerable amount still needs to be done. This conference reflected on a broad set of issues in which molluscan conservation has an important part to play. It was felt that a brief resume of the outcomes of the day was worthy of inclusion in the Newsletter as they are likely have a direct and indirect effect upon biodiversity thinking and actions in the coming years.

During the conference ten speakers addressed various aspects of the biodiversity debate and brief summaries of their key observations and suggestions are given below:

The conference began with a (hopefully sincere!) message of endorsement and support from Tony Blair.

Julian Pettifer (*Broadcaster and President of the RSPB*) pointed out that it is often forgotten that the maintenance of biodiversity is something that brings wide enjoyment to many people and that a reduction in biodiversity leaves all of the country poorer in many subtle ways. He noted that there is a concentration of biodiversity concern in relation to tropical countries but that if wealthy, developed countries like Britain could not be shown to have

successfully retained their own biodiversity then how could poorer and less developed areas be expected to succeed? He felt that there is a need to set an example for others as well as acting in our own interests.

Jeffrey McNeely (*IUCN*) pointed out that although 170 countries had ratified the *Convention on Biological Diversity*, the USA had not. Successes in the last five years had been achieved in relation to bio-safety, the development of concern for the maintenance of agricultural biodiversity and attention to the needs of local communities and indigenous peoples. Biodiversity initiatives needed to be integrated into all sections of economies and should develop international targets involving both governmental and non-governmental organisations. Two areas were identified as of particular significance, these being the increasing development of local biodiversity actions and also the need for redirection or change to agricultural incentive payments (like the Common Agricultural Policy subsidies) that encourage destructive and non-sustainable approaches.

Graham Wynne (*Director of Conservation at the RSPB*) drew attention to some successes since 1992 including the UK's once threatened red kite population, which were now raising 200 young per year, demonstrating what can be achieved by planning, imagination and the involvement of communities and landowners at reintroduction sites. But such positive achievements were weighed against problems and losses. Thus significant damage had or would occur with the introduction of mountain chairlifts in the Cairngorms, the building of the Cardiff Bay Barrage and in the motorway construction at Twyford Down, and in contrast to red kites, hen harriers had now been reduced to 10 pairs in England. Graham suggested nine action points for the UK which included:

1. the need for biodiversity plans to be ambitious
2. the requirement for more research and the auditing of species/habitats
3. the development of effective legal protection for species and habitats
4. the integration of biodiversity policies throughout the economy

5. the reallocation of agricultural subsidies to develop more benign policies (currently the main agricultural policies receive 3 billion pounds in grants whereas agri-environmental schemes only get £100 million pounds)
6. the production of local conservation plans
7. the provision of resources to fund biodiversity plans (partly by redirection of agricultural subsidies)
8. the development of public support for biodiversity actions
9. the commitment of the Government to the success of these actions.

Michael Meecher (*Minister for the Environment*). If his rhetoric comes to even partial fruition, then the outlook for environmental issues should fundamentally improve from the situation that has existed for the last eighteen years. It was stated that the maintenance of biodiversity should be one of the passions of the new Government and that sympathetic policies would be integrated throughout governmental policies, with actions following words. He noted that the UK was the first country in the world to produce costed action plans and was also well advanced with many local biodiversity schemes which were identified as an essential way to involve a broad spread of the population. It was also announced that a second set of costed action plans were now being produced for a further 400 species and 38 habitats. As a consequence of the need to gather and integrate existing and future biodiversity data, the establishment of a 'National Biodiversity Network' was welcomed. The essential function of education was also acknowledged, with teachers and 'educators' being identified as having a special role to translate biodiversity matters into an easily understandable form for non-specialists. Michael Meecher recognised that one of the most important government actions to conserve UK biodiversity was the reform of the Common Agricultural Policy, with a major shift away from production subsidies. Extra protection for SSSIs was also identified as an important issue to be addressed. It was also encouraging and refreshing to note that Michael Meecher accepted that proportionately more resources needed to be allocated to both

marine and invertebrate conservation.

In the second half of the conference, representatives from each of the leading organisations from the Biodiversity Challenge Group (the RSPB having been represented earlier by Julian Pettifer) were invited to speak, with each setting three biodiversity challenges for action during the next five years.

Martin Warren (*Butterfly Conservation*) stressed the value and importance of invertebrate conservation in maintaining biodiversity. His three challenges were to:

1. give more resources to gathering data and monitoring populations
2. embark upon more research to identify solutions to biodiversity problems
3. allocate more resources for species/habitat action plans.

Matt Phillips (*Friends of the Earth*) identified wetlands to be particularly threatened, priority habitats, which the UK has a particular responsibility for, as it supports so many internationally important sites. (It is therefore not surprising that a very high proportion of both species and habitat action plans relate to wetlands). Pollution and excessive water abstraction (in many cases licences were granted in the 1960s under circumstances very different from those existing today) were identified as particularly pressing areas. His three challenges were:

1. review abstraction licences and impose a five year limit on new ones
2. develop a national water-saving plan with sound and enforceable targets
3. introduce planning policy guidance for water resources.

Andrew Lee (*the World Wide Fund for Nature*) concentrated his address on marine issues and outlined these three challenges:

1. that development be controlled in the coastal zone with special marine protection areas being established within a 12-mile inshore zone.
2. that the Common Fisheries Policy be reformed

3. water pollution by chemicals disrupting endocrine systems (the so called 'feminising' substances) be eliminated.

Tony Whitbread (*the Wildlife Trusts*) chose to talk about the vulnerability of SSSIs due to Common Agricultural Policy grants and incentives. His three challenges were:

1. a radical improvement for SSSI protection
2. that all forms of habitat/species designation contribute to the maintenance of biodiversity
3. to ensure that agricultural support schemes should promote and not contradict environmental policies (which is the current situation)

Adrian Darby (*Plantlife*) addressed losses due to government activities in the wider countryside. He proposed that:

1. agricultural subsidies should be sanctioned only if they bring environmental benefits
2. biodiversity conservation should be made central to the operations of the Common Agricultural Policy
3. new agri-environmental schemes should be targeted to protect biodiversity in the wider countryside.

□

WANTED TO PURCHASE

- Forbes & Hanley, *History of British Mollusca and their Shells*. 4 vols
- Jeffreys, *British Conchology*. 5 vols.
- Taylor, *Monograph of the Land and Freshwater Mollusca*. 2 vols plus 3 parts complete.
- *Journal of Conchology*, Vols. 1-14 inclusive.
- Harmer, *The Pliocene Mollusca of Great Britain*

Please offer with full details of condition and price to:

John Humphreys

Chygwedhen,

St Austell, Cornwall

Tel.

Recording Mollusca in Ireland: A day's dredging in Mulroy Bay, Co. Donegal

*Julia Nunn,
Ulster Museum, Belfast*

Mulroy Bay is a complex marine lough on the north coast of Ireland (Figure 1 and Nunn, 1993), extending inland for about 19 km. The Bay is divided into three main areas: **North Water**, linked via Moross Channel to **Broadwater**, both lying approximately in a north-south direction, and the main **Channel**, which connects Broadwater to the open sea via the **Mouth** and **Bar**. Currents in the Channel can be very strong, exceeding 5 knots where it constricts in three places to only 100 m wide. There is little or no tidal stream in Broadwater or North Water, except at the approaches to the main Channel or Moross Channel. Mulroy Bay, particularly Broadwater and North Water, is sheltered from the wind by surrounding hills, and consequently rarely experiences significant wave action.

Preliminary results from both littoral and sublittoral fieldwork from May 1986 to August 1992 were published in *The Conchologists' Newsletter* (Nunn, 1993). Further fieldwork since that date (to a total of 101 sites) has increased the number of marine molluscan species recorded from 203 to 232. An annotated checklist and atlas of distribution for Mulroy Bay has been published elsewhere (Nunn, 1996).

In 1894, Praeger published an account of the dredging activities of R.D. Darbishire and Rev. A.H. Delap in Mulroy Bay. Four dredgings took place in the main body of North Water in 17-27f ('mainly fine thick black mud, a little gritty sand, a few sharp quartz pebbles and a few shells'). Two further dredges in Moross Channel in 2-6f on sand and *Laminaria* provided a list of species, although not assigned to any one site. 27 species were recorded, the majority only as dead shells. The results were considered to be 'very disappointing' and the fauna 'remarkable for its poverty' (Praeger, 1894). Shells from this expedition were displayed for a meeting of the Conchological Society of Great Britain & Ireland,

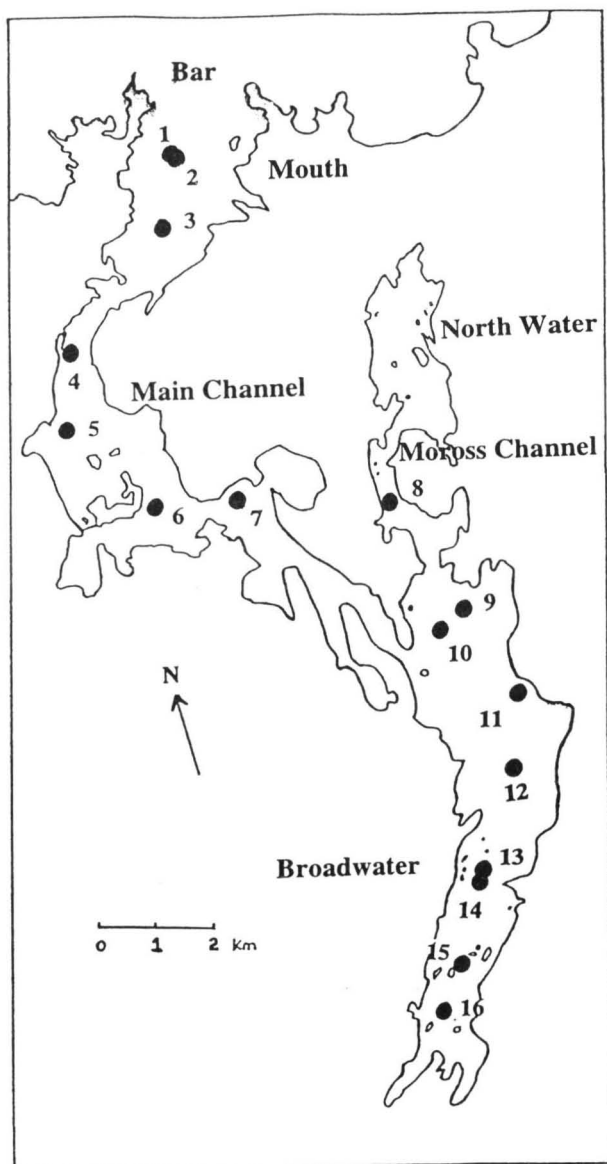


Figure 1. Dredge sites in Mulroy Bay

and donated to that organisation (Standen, 1894). These records were further reported in Nichols (1900).

On 27 October 1995, I carried out a limited dredging survey from the scallop boat *Realt na Maidin*, skipper Jerry Gallagher. Navigation and sounding equipment enabled accurate positioning, together with depths for the sites. Trawling and dredging is not permitted in the North Water, and is impractical close to the salmonid farms in Broadwater, Moross Channel and Millstone Bay in the main Channel, nor near any mussel lines. A single scallop dredge with a 10 cm size mesh was used, with the bottom half lined with a nylon bag, mesh size 5 mm, and towed for 5–10 minutes. Samples were washed and sorted on board the boat, and then transported to a laboratory for detailed identification. Depths were not corrected to Chart Datum. 16 sites, depth range 4–24m, were dredged (Figure 1). The weather was too rough to permit any dredging at or beyond the Bar mouth.

As would be expected, the sites in the southern part of Broadwater (13–16) were largely mud, mixed with dead *Zostera*. The molluscan fauna was dominated by large numbers of shells of *Turritella communis*, which was not found living, except in Moross Channel (site 8). *Haminoea navicula*, *Akera bullata* and *Corbula gibba* were common. Shells of *Turbonilla jeffreysii*, *T. rufescens*, *Cima minima*, *Retusa umbilicata*, and *Thracia convexa* were recorded together with a single living specimen of *Puncturella noachina*. There were many small specimens of *Limaria hians*, a bivalve species which has byssal threads which interweave to form 'carpets' or 'nests' covering sand and gravel, particularly in Moross Channel. This species declined when settlement failed for five years following the use of the organotin TBT as an antifouling agent on salmon cages in 1981–85 (Minchin, 1995). Subsequent to 1985, when use of TBT ceased, the population began to recover, and apparently has been at previous levels of cover since 1994 (Minchin, 1995).

In the north part of Broadwater (sites 9–12), while soft sediment and dead shells (mainly *Timoclea ovata*) were still predominant, there was some kelp, and other algae, with sponge and a few stones. Living specimens of *Ondina divisa*, *Eulimella*

scillae and *Ondina diaphana* and shells of *Eulima bilineata*, *Mangelia attenuata*, *Mangelia brachystoma* and *Eulimella laevis* were recorded.

Dredging in Moross Channel was disappointing (site 8), with only 4 live and 3 shell only species found, none unusual. Conversely, dredging in the main Channel yielded the most diverse sites, with the richest haul being SE Island Roy (site 6) on living maerl – 36 live, 16 dead species including *Leptochiton cancellatus*, *Acanthochitona crinita*, *Diodora graeca*, *Gibbula tumida*, *Raphitoma linearis*, *R. purpurea* and *Parvicardium ovale*. Two other sites in the Channel had 22 live species each.

Dredging in the Mouth (sites 1–3) was on sand, which, of course, ran through the mesh of the dredge leaving a few shells and a little loose kelp. *Rissoella diaphana*, *Ammonicera rota* and *Retusa truncatula* were recorded.

A total of 68 living and 30 'shells only' species were recorded (but no nudibranchs!). Of these, *Ondina divisa* was a post-1950 live record for Ireland (Seaward, 1990), and there were 9 new records for Sea Area 33. Although a strict comparison cannot be made with the dredging trip reported in Praeger (1894), as I was not permitted to dredge in North Water, it is instructive to note that had that party dredged elsewhere in Mulroy Bay, they would certainly have come to different conclusions concerning the 'remarkable poverty' of the molluscan fauna!

Species recorded from Mulroy Bay, 27 October 1995

*post-1990 records for Sea Area 33

Species list (living): *Leptochiton asellus*; *L. cancellatus*; *Callochiton septemvalvis*; *Lepidochitona cinereus*; *Acanthochitona crinita*; **Puncturella noachina*; *Diodora graeca*; *Tricolia pullus*; *Margarites helycinus*; *Gibbula magus*; *G. tumida*; *G. cineraria*; *Calliostoma zizyphinum*; *Tectura virginea*; *Helcion pellucidum*; **Turritella communis*; *Lacuna parva*; *L. vineta*; *Melarhaphe neritoides*; *Skeneopsis planorbis*; *Eatonina fulgida*; *Rissoa interrupta*; *R. lilacina*; *R. parva*; *Onoba aculeus*; *O. semicostata*; *Pusillina inconspicua*; *P. sarsi*; *Trivia arctica*; *T. monacha*; *Nucella lapillus*; *Buccinum undatum*; *Hinia incrassata*; *Raphitoma linearis*; *R. purpurea*; *Rissoella diaphana*; *R. opalina*; *Omalogyra atomus*;

Ammonicera rota; *Odostomia turrita*; **Brachystomia eulimoides*; *Chrysallida indistincta*; *C. interstincta* (= *obtusa*); *Ondina diaphana*; *O. divisa*; *Partulida pellucida* (= *spiralis*); *Eulimella scillae*; *Diaphana minuta*; *Haminoea navicula*; *Retusa truncatula*; *Akera bullata*; *Nucula nitidosa*; *Mytilus edulis*; *Modiolarca tumida*; *Musculus discors*; *Limaria hians*; *Pecten maximus*; *Chlamys varia*; *Heteranomia squamula*; *Mysella bidentata*; *Parvicardium exiguum*; *P. ovale*; **Abra nitida*; *Timoclea ovata*; *Venerupis senegalensis*; *Corbula gibba*; *Hiatella arctica*; *Sepiola atlantica* (68)

Species list (shells only): *Bittium reticulatum*; **Alvania cancellata*; *A. punctura*; *Manzonina crassa*; *Caecum glabrum*; *Eulima bilineata*; *Hinia reticulata*; *Mangelia attenuata*; *M. brachystoma*; **Rissoella globularis*; *Cima minima*; *Turbonilla lactea*; **T. jeffreysi*; *T. rufescens*; *Eulimella laevis*; *Retusa obtusa*; **R. umbilicata*; *Arca tetragona*; *Palliolium tigerinum*; *Lucinoma borealis*; *Thyasira flexuosa*; *Ensis arcuatus*; **Donax vittatus*; **Gartellinella*; *Abra prismatica*; *Venus verrucosa*; *Tapes rhomboides*; **Mysia undata*; *Mya truncata*; **Thracia convexa* (30).

Notes on selected species

- *Puncturella noachina*: a single living specimen from North of McSwynes Bed, south Broadwater, 14–20m (site 15). Only elsewhere in Ireland from about 5 miles off NW Donegal (D.W. McKay/S.M. Smith) and Co. Mayo (Seaward, 1990).
- *Alvania cancellata*: one dead shell SE of Island Roy (site 6), in the main Channel, in maerl, 10–12m.
- *Eulima bilineata*: one dead shell South of Black Rocks, north Broadwater 8–20m (site 9). A new record for Sea Area 33.
- *Mangelia attenuata*/*M. brachystoma*: one dead shell each West of Carlan Point, Broadwater, 24m (site 12). New records for Sea Area 33.
- *Raphitoma purpurea*: single living specimen in maerl off SE Island Roy in the main Channel, 10–12m (site 6).
- *Cima minima*: one dead shell North of Williamson's Rock in Broadwater, 6–20m (site 14). A new record for Sea Area 33.
- *Ondina diaphana*: one living specimen from South of Rosnakill Strait, north Broadwater in 12m (site 10). New record for Sea Area 33. Only apparently live elsewhere in Ireland from White Park Bay, Co. Antrim (Brisco, 1981). The voucher specimen for

this record is not in the Brisco collection at the Ulster Museum.

- *Ondina divisa*: one living specimen South of Black Rocks, north Broadwater, 8–20m (site 9). New record for Sea Area 33, and first post-1950 live record for Ireland.
- *Eulimella scillae*: two living specimens of this rare species South of Rosnakill Strait, 12m (site 10). New record for Sea Area 33. Only in Mulroy Bay on the north coast of Ireland. Only live records elsewhere in Ireland in Sea Areas 35 and 36 (Seaward, 1990).
- *Nucula nitidosa*: two specimens from South of Black Rocks, north Broadwater, 8–20m (site 9). A new record for Sea Area 33. Only found in Mulroy Bay on the north coast of Ireland.
- *Abra prismatica*: a single shell from off Ranny Point, Broadwater, 16–20m site 13). A new record for Sea Area 33.

Acknowledgements

I would like to thank Jerry Gallagher for assistance and generosity with the dredging; Shelagh Smith and John Baxter for help with the identification of the more difficult species; and Graham Day for fieldwork assistance.

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After the Sea Empress

Shelagh M. Smith

██████████ Townhead, Hayton, Carlisle ██████████

In late November 1996 I again visited shores in Dyfed and in the light of finds can make some comments on the present state of mollusc populations following the *Sea Empress* oil spill.

On 23 November I went to Pendine and Saundersfoot; on 26 November, Tenby (Giltar Point), West Angle Bay and Pembroke Dock. The first impression was that all the shores appeared normal. There was good growth of algae with large and common species in usual quantity. Rock-dwelling Mollusca, *Patella vulgata*, *Littorina* spp., *Nucella lapillus* and *Mytilus edulis*, were as numerous as usual and in apparently similar size range, mostly with evidence of normal breeding. Because of lack of time, requirement to repeat previous methodology and, last but not least, to leave all detailed monitoring to those paid to do so, the present observations are based on general assessments of the Mollusca on the shore, together with an examination of shell debris from the strandline and washings from *Mytilus edulis*, *Balanus perforans* and weed washings. The first problem was to decide what differences from previous data were due to natural causes (such as weather patterns and time of year) and what could reasonably be ascribed to the oil. Most differences appeared to be due to the former.

Pendine and Saundersfoot

These sandy beaches with rock outcrops and cliffs behind showed little overt evidence of oil. Saundersfoot was rather poor in both living Mollusca in the sand and cast-up and dead specimens, but it has always been a feast or famine shore. The cockles (*Cerastoderma edule*) were in normal abundance but a bit small. Although the count of dead species was well down, there were 13 living species compared with an average of 15+ in previous winters.

The Pendine shore had a good amount of larger species washed up, but there was little shell gravel and shellsand, which made

comparative assessment difficult. Fifteen live or cast-up species were found, against an average of 20+ in previous winters. There were fewer bivalves living in the sand; *Donax vittatus*, although still numerous, was not present in the previous huge quantities. Large bivalves such as *Acanthocardia echinata* (no juveniles in shellsand, has it had a breeding stop?), *Ensis siliqua* and *Pharus legumen* were washed up fresh in quantity.

However, there was a striking lack of naticids, only a few broken *Polinices catena* shells and no *P. polianus* at all, neither live or dead, not even old shells. Previously both species could be regarded as not uncommon living in the sand around low water, and always easy to find on a good tide, as it was on this occasion. Why was this?

1. Lack of prey species?

The bivalves were sufficiently present to suggest that they had survived continuously, also the other predator *Acteon tornatilis* was living in normal numbers. However, Dale Rostron (pers. comm.) has informed me that easy food sources such as *Donax vittatus* and *Macra stultorum* suffered heavily during the oil spill with mass strandings.

2. Lack of habitat?

Not so, the other species of the community were present.

3. Smothering due to oil on surface of sand, other species surviving by burrowing or by being less susceptible?

4. Breeding failure?

Yes, but why no adults – they live long enough?

5. Direct poisoning by the oil or concomitant chemicals?

This affected veligers and settlement of several species. Therefore this seems the most likely explanation. It also covers the complete wipe-out of the group and the fact that (but see Tenby) there is no sign of a return.

Tenby (Giltar Point)

This shore was obviously oily. There was a sheen on the water and a smell in the air despite the cold weather. The cliffs and rocks at the back of the beach were clean and there was usual algal cover

on the boulders and in pools. The mussel bed and mussels on the rocks appeared normal. I found one *Trivia monacha* with very fresh remains completely covered in oil – a direct casualty. There were fewer Mollusca in the washings, but these numbers have been going down for years and I would not put a cause on it. Most significant in the washings, or rather not in them, were juvenile *Mytilus edulis*, very few in number, and also few in the shellsand. This seems to indicate lack of breeding or of spat settlement. Thirty-three species were found living or cast-up, comparing well with 30 in previous winters and 34 in May 1993. Three species (*Littorina nigrolineata*, *Hydrobia ulvae* and *Turtonia minuta*) were not previously found living, which is not significant as they could have been overlooked, and *Limapontia senestra* was a new live species.

There was plenty of shellsand, not as obviously oily as some sands on 'clean' beaches I have come across, but nonetheless very smelly when being washed and sorted, and washing-up liquid was required. There were about the same total number of species present (113 against 114), but, curiously, 13 species new to the site (therefore 14 not present). This can be regarded as fortuitous. But again there was a lack of naticids apart from some very worn *Polinices montagui*, not found here before, and two fresh dead juvenile *P. catena*, giving hope for a return of the species. Turrids, in particular *Mangelia attenuata* shells, were much more worn than those found previously suggesting that they may not, as before, be living just offshore. *Calyptraea chinensis* shells were also less numerous, but there was normal balance of juvenile to adult, and shells were fresh.

West Angle Bay

This rocky shore with a central sandy beach, which was the centre of attention at the time of the spill, is being very carefully monitored and I made sure that I did not interfere with work in progress. It had been a very heavily polluted area. The rock-dwelling species of Mollusca seemed to be present within normal limits and were of normal size, i.e. pre-oil adults were present, and I found 41 species living or cast-up, against only 21 for a previous winter, and 50 in the summer when the shore was investigated by

many people during the Conchological Society's excursion in 1992. Weed samples were much the same (more species in the summer), but there was a lack of juvenile *Mytilus edulis*. Studies on *Mytilus edulis*, i.e. hydrocarbon analysis of tissues, revealed very high contamination levels a month or so after the spill, these levels only gradually dropping. This appears to have had a detrimental effect on breeding ability. The general impression was of a flourishing shore.

Pembroke Dock

This muddy sheltered shore with rock outcrops presented a mixed result. The sediments had been bulldozed and now appear to be empty. The rocks, not bulldozed, have a normal flora and molluscan fauna not noticeably different from the previous (13 against 12 species), with *Monodonta lineata* not found, but *Nucella lapillus* and *Lasaea adansoni* found, both of which could have been overlooked previously.

Acknowledgements

I am grateful to Jan Light and Dale Rostron for reading and commenting on this article, especially Dale's help in relating my assessments to those found by the monitoring teams. These records have been submitted to the monitoring team.

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Conchological Society of Great Britain and Ireland

MINUTES

**1073rd (Ordinary) meeting
held on 14 December 1996 in the Demonstration Room of
the Natural History Museum starting at 2.30 p.m.**

In the chair: Dr Preece with 29 members and friends present.

Apologies for absence: Mrs McMillan, Mr de Bartolomé, Mrs Turk, Mr & Mrs Rands, Rev. Long, Mr Dance, Ms Chesney, Mr Buckle, Mr Negus, Dr Colville, Dr Oliver, Dr Kerney, Mrs Platts, Mrs Long, Mr Smith.

Minutes of the last meeting (of 28 September 1996): Read and accepted.

Matters arising: None.

Nomination and election of new members: one Institutional, four Ordinary and three Student members were elected:

Ordinary

Mr T.A. Pearce

[REDACTED] St Paul, MN 55113, USA

Mr D.H. Otero

[REDACTED] Las Palmas, Spain

Mr A. Colston

[REDACTED] Peterborough [REDACTED]

Mr A.D. Abreu

Museu Municipal Funchal (Historia Nat.), Rua Da Mouracia, 31, Madeira, P-9000 Funchal, Portugal

Student

Mr S. Watson

[REDACTED] Bedford [REDACTED]

Miss S.L. Ewen

[REDACTED] Newbold Verdon, Leicestershire [REDACTED]

Institutional

Biblioteka Akademii Nauk Ran, St Petersburg, Russia

Announcements and correspondence:

The Secretary had received notice from the executors of Dr E.E. Sandor's estate that he had left £1,000 to the Society in his will. The President would be writing to Mrs Sandor.

Lecture of the day:

Speaker: Emily Glover (Institute of Archeology, London)

Title of talk: *Molluscs and Man in the Arabian Peninsula*

Any other business: None.

Meeting closed at 5.00 p.m.

Chairman

Appendix: Members' exhibits

P. Dansey

Ian Killeen

Jane Reynolds

P.T. (Terry) Wimbleton

Kevin Brown

Key to British *Ensis* species

Molluscan Conservation Conference

Programmes

Plastic box order

1. Mauritian landshells
2. Institutional Members' publications – also 1997 landshell calendar details
3. Shell cabinets for sale
4. Conch. Soc. posters

Cerastoderma glaucum (Poirer 1789). Recent records from east Hants and West Sussex.

1. Book – M. Saul, *Shells: an illustrated guide to a timeless and fascinating world*.
2. Book – J.F. Safer and F.M. Gill, *Spirals from the Sea: an anthropological look at shells*
3. *Cypraea aurantium* Gmelin, 1791. Pierced specimen once used as a symbol of rank.
4. Specimens of the genus *Amoria* Grey 1855.
5. Press cuttings.



Note:

The Editor apologises for these Minutes being published out of sequence.

Diary of Meetings

Conch. Soc. Field Meetings for 1997 are listed separately.

October, London: The Malacological Society of London. Young Malacologists' Forum, Natural History Museum. Contact: John Taylor, Natural History Museum, London SW7 5BD. Tel. 0171-938-9359. E-mail: J.Taylor@nhm.ac.uk.

Saturday 4 October, Kettlewell: Yorks. Conch. Soc. field meeting. Springs in Kettlewell area, Wharfedale. Meet at car park in Kettlewell, SD 968723 at 11.00.

Saturday 11 October, London: Conch. Soc. indoor meeting. Peter Morden (Natural History Museum, London). Land molluscs of the Azores. The Natural History Museum at 14.30.

Saturday 25 October, Leeds: Yorks. Conch. Soc. Annual General Meeting. Leeds City Museum at 13.00.

Saturday 22 November, London. Gentlemen and Players: professionals and amateurs in malacology, 1900-1950. A one-day meeting organised by the Malac. Soc. with the Conch. Soc. and the Society for the History of Natural History, at the Linnean Society, Burlington House, Piccadilly. Programme details and booking form with this issue.

Saturday 29 November, Woking: Conch. Soc. Molluscan Workshop.

Saturday, 13 December, London: Conch. Soc. joint meeting with the British Shell Collectors Club. Kevin Brown (London). What's in a name? The Natural History Museum at 14.30. Please bring exhibits and/or slides on the theme of unusual names.

Thursday, 14 January 1998, London: The Malacological Society of London. Molecules and Molluscs, Natural History Museum. Contact: Dr David Reid, Natural History Museum, London SW7 5BD. Tel. 0171-938-8750. E-mail: D.Reid@nhm.ac.uk.

March 1998, Sunderland: The Malacological Society of London Annual Meeting. Feeding behaviour in molluscs. University of Sunderland. Contact: Mark Davies, Ecology Centre, University of Sunderland. Tel. 01752 222772 Ex. 7215. E-mail: es@md@environment.sunderland.ac.uk.



Field Meetings 1997

Hon. Programme Secretary:

Rupert Honnor

Henley-on-Thames

Oxon.

Important

Please remember to inform the leader if you are attending a field meeting.

Sunday, 28 September

Reading area, Berkshire

Leaders: June Chatfield

and Rosemary Hill

READING MOLLUSCS 100 YEARS ON: revisiting some old localities in the east of Reading around Woodley, and along the Thames to Sonning. Bring lunch. Land and freshwater collecting.

MEET a 10.30 a.m. in the car park of Earley station. By train: either Waterloo–Reading stopping service, or some trains on the Gatwick–Reading Thames Trains line (change at Wokingham). Check nearer the date for engineering works on Sundays. By road: M4, A329 following signs to Earley (**not** Lower Earley). Earley Station is in Station Road leading off Wokingham Road (A329). OS Grid Ref. SU/753718 – Landranger map 175: Reading and Windsor.

N.B. There are **no** toilet facilities at Earley Station – be prepared!

It will help the leaders if you can let them know you are coming – contact either June Chatfield (44 Ashdell Road, Alton, Hampshire GU34 2TA), or Rosemary Hill (Reading, Berkshire

Saturday, 8 November
Blockley Quarry, Gloucestershire

Leader: David Long

This is a return visit to the Northcot Brick & Tile Works (OS Grid Ref. SP/182379), with its excellent exposure of the *Ibex* zone of the Lower Lias. This field meeting is made possible by the kind permission of the management of the works. Please note that visitors must be over 18 for Health & Safety at Work indemnity reasons. Waterproof footwear is required but not a hard hat.

Meet at Moreton in Marsh railway station (OS Grid Ref. SP/206327) at 10.30 a.m.

Please inform the leader if you plan to attend this meeting.

Other events in 1997

Saturday, 29 November: Molluscan Workshop

Venue: At the home of Judith Nelson in Woking

The workshop will consist of two sessions: (1) Completing the identification and mounting of a reference collection of marine micro-shells on slides; and (2) Mixed non-marine groups (please contact the organiser, Judith Nelson, with requests).

Call for Programme suggestions ...

I will shortly start preparing the Conchological Society Programme for 1998, and I would value members' suggestions about the Programme, for example, lecture subjects that might interest you, possible lecturers, field meeting locations and leaders, or subjects for study at a workshop.

Have you got any ideas?? Or would you like to volunteer (lead a Field Meeting at a site you know, or indeed give a lecture to the Society – it isn't as difficult as it sounds!)? If so, then please call me on

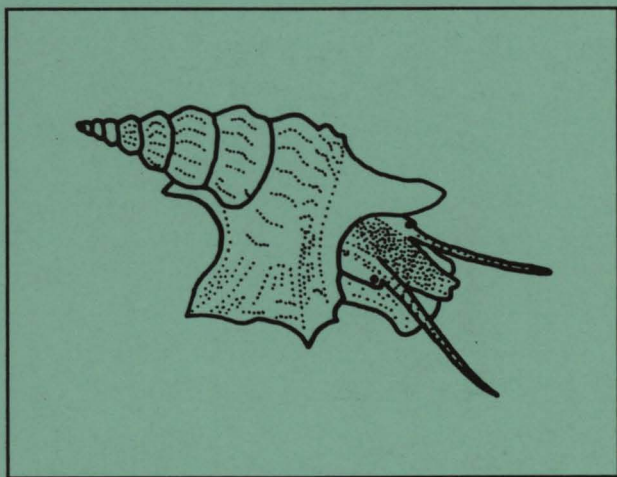
Rupert Honnor

The Conchologists' Newsletter

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(Founded 1876)

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Report of the Conchological Society *Partula* colony 1996

J.E. Reynolds

London

Over the past year *Partula mirabilis* x *taeniata* have continued to decline, although not at such a rapid rate as in 1995. I was initially optimistic that the numbers could increase despite adult deaths but so far this does not appear to be the case. At the start of the year there were 3 neonates, 7 juveniles, 8 subadults and 19 adults and by the end of 1996 there were only 1 neonate, 1 juvenile, 1 subadult and 10 adults. Adults continue to decline at a fairly steady rate of one every 4-6 weeks, despite some recruitment. There was a smattering of births throughout most of the year but many were stillborn or did not survive. There were apparent peaks and troughs, with the highest number of births occurring in April and July, and no births at all during February/March and October/November. There were never more than 4 neonates alive simultaneously at any time. Most drastic losses were of juveniles and subadults, creating an imbalance in the population that has not yet readjusted. This is directly attributable to a change in keeping system, about which more later.

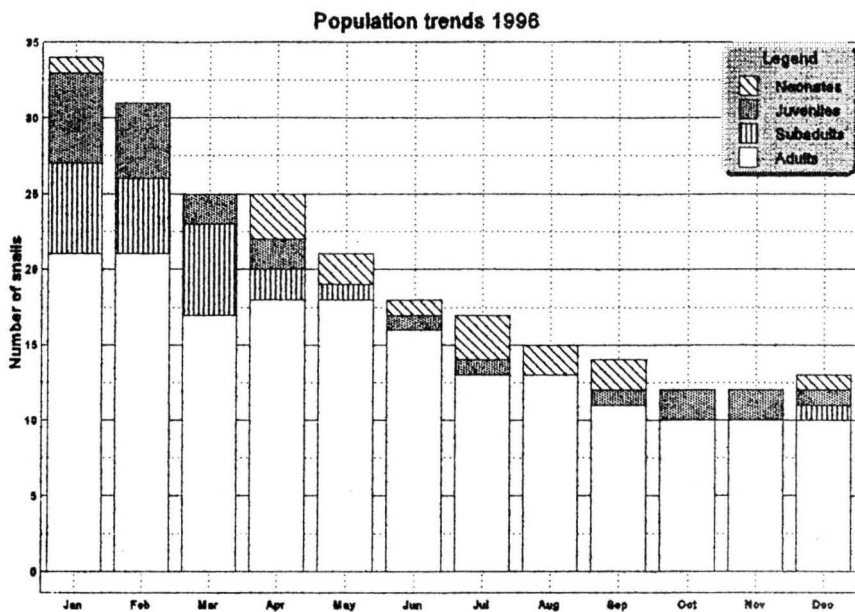
In February, three faecal samples were taken for testing the presence of flagellate protozoa by Peter Daszak of the University of Kingston. These proved 100% positive, which is to say all three samples had type 3 flagellates present and one also had type 1 present. More samples were taken in July as a follow-up to this but I have not yet had the result of these tests.

On 8 April a new trial diet was introduced. This diet was developed by Alan Gardner, a commercial *escargot* breeder, after he attended the Terrestrial Invertebrate Taxon Advisory Group meeting in January 1996 (see *Conchologists' Newsletter* No. 137). The diet is based predominantly on his commercial snail diet (a blend of cereals) with some other vitamins and minerals added. The diet was introduced gradually by mixing with the old food, and complete changeover occurred on 26 April. There seemed to be an almost immediately noticeable effect with three births occurring that month.

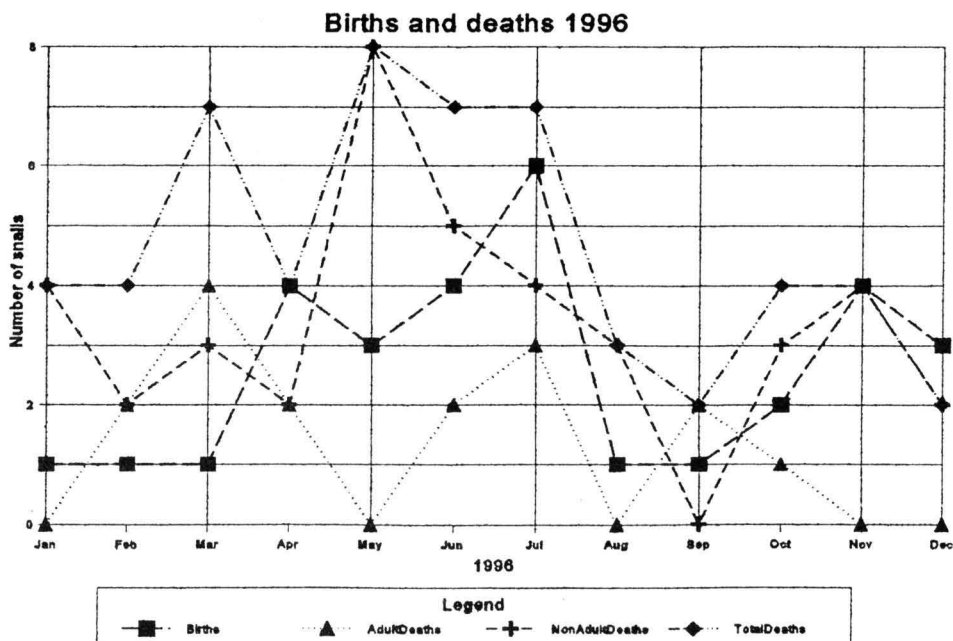
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Adults	21	21	17	18	18	16	13	13	11	10	10	10
Sub-adults	6	5	6	2	1	0	0	0	0	0	0	1
Juveniles	6	5	2	2	0	1	1	0	1	2	2	1
Neonates	1	0	0	3	2	1	3	2	2	0	0	1

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Births	1	1	1	4	3	4	6	1	1	2	4	3
Adult deaths	0	2	4	2	0	2	3	0	2	1	0	0
Non-adult deaths	4	2	3	2	8	5	4	3	0	3	4	2
Total deaths	4	4	7	4	8	7	7	3	2	4	4	2

Table 1. *Partula mirabilis x taeniata* figures for 1996.



Graph 1. *Partula mirabilis x taeniata* population trends split by developmental stage



Graph 2. *Partula mirabilis x taeniata* births and deaths (split by developmental stage) 1996

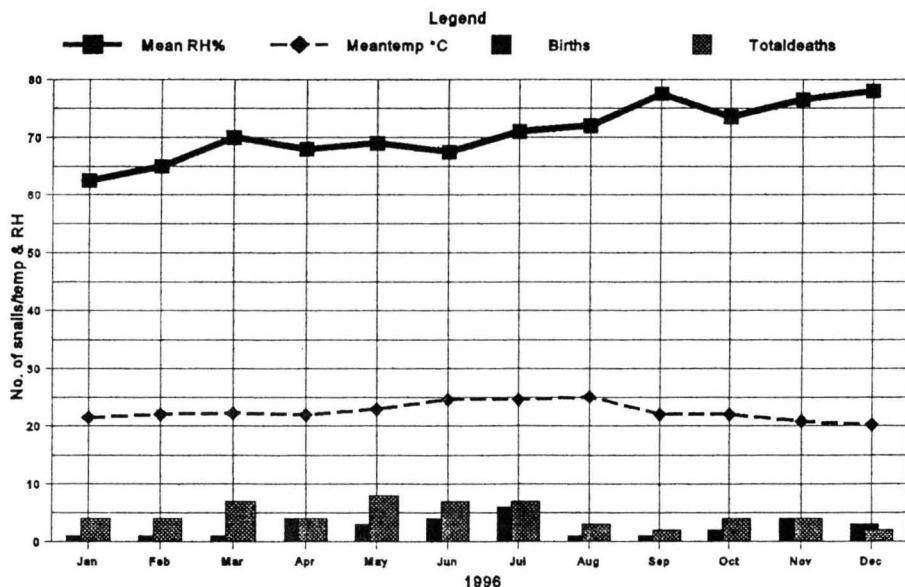
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean RH %	62.5	65	70	68	69	67.5	71	72.5	77.5	73.5	76.5	78
Mean temp °C	21.5	22	22.2	21.9	22.9	24.6	24.6	25.1	22	22	20.8	20.2
Births	1	1	1	4	3	4	6	1	1	2	4	3
Total deaths	4	4	7	4	8	7	7	3	2	4	4	2

Table 2. *Partula mirabilis x taeniata* births and deaths compared to Relative Humidity and Temperature (1996 figures)

However, there were further experiments to follow, with the advent of a new keeping system. Alan had recommended a change in tank set up, incorporating two ledges about half way up the walls of the tank. On these rest three removable glass shelves long enough to span the width of the tank and each about 3 cm wide. Each shelf has a double thickness of glass and between the layers is a sheet of plastic. When the shelves are placed on the ledges the sheets hang down to simulate leaves, thus trapping humidity and providing shelter for the snails. Food is placed on the shelves instead of being smeared on the walls of the tank. During cleaning and feeding the food is removed from the shelves, the shelves are removed from the tank and the inside and outside of each sheet is sprayed before being replaced inside out. The changeover to this keeping system took place on 6 May when neonates and juveniles plus subadults were transferred out of the tank into plastic boxes to trial new diets on the same date.

By the start of June all the transferred snails were dead. Although the environmental conditions in the container are satisfactory for the tank, the boxes, perhaps due to lack of insulation provided by the thinner plastic, were not apparently sufficiently stable. Luckily I stopped transferring new births out of the main tank by the third week of May, but this experiment resulted in the loss of 7 young snails. The first snail that I did not transfer out after the change in keeping system reached juvenile stage but was lost by the Invertebrate Conservation Centre at London Zoo while I was on holiday in August (an improvement on the previous year!). However, births had picked up a little by this point and neonates born in late August/early September were adult by January of this year. This development time of 7 months from neonate to adult is two months quicker than with the old diet.

Apart from the deaths of the transferred snails, the new system has both advantages and disadvantages. Humidity inside the tank does seem to be more stable, although the overall picture is better this year (RH figures are from inside the environmentally controlled container but not inside the actual tank) and spraying is now only necessary once per day. More snails do use the plastic sheets when conditions are dry, but there are never more than half the snails on



Graph 3. *Partula mirabilis x taeniata* births and deaths compared to RH% and temperature (°C)

or in the sheets at any one time and frequently fewer. Cleaning and feeding is quite a ritual. When the shelves are removed they cannot be laid on a flat surface in case there are snails on the inside of the plastic sheets, so a suitable method of supporting them has to be found. Snails also have a tendency to drop off the sheets as they are lifted out of the tank or when the plastic is inverted for spraying. Counting is no quicker and the twice weekly feeding takes longer and is considerably more awkward than the old system. Growth rates do seem increased with the new diet, especially from neonate to juvenile (2–5 mm) and the development of the lip once adult size is reached, but these may be subjective observations. Although I have seen the snails feeding, a smaller proportion seems to be consumed, but there are currently only 10 adults to eat it. I have also observed a lot of algal grazing although tissue grazing seems to have stopped entirely.

Overall after a year of this keeping system I do not think that it is especially worthwhile, predominantly on the basis that it is more awkward and that the snails do not seem to use it. A single shelf

with plastic would have served as well as three and been considerably less awkward, but the whole procedure seems pointless. The diet does seem to be a slight improvement, but I remain unconvinced that the snails prefer the taste of it! This may be comparable to humans' preference for white bread instead of healthier brown, but as the exact ingredients of the commercial snail food base diet are a trade secret it is impossible to be certain.

1996 has certainly been an interesting year for *Partula mirabilis x taeniata* with lots of developments, but once more I have to conclude by saying that I hope that 1997 will be better.

□

Subscriptions

Subscriptions for 1998 will become due on 1 January 1998 and members are asked to remit promptly, without further reminders, to the Membership Secretary:

Mr M.D. Weideli

Newbury

Berkshire

Cheques should be made payable to 'The Conchological Society'. Overseas members must pay in sterling. International money orders, Eurocheques, Bankers drafts or transfers to our bank account are acceptable. Our bankers are: National Westminster Bank Plc, Bolton Branch, PO Box 2, 24 Deansgate, Bolton, Lancs. BL1 1BN, Account 0652384602. We regret that we cannot take credit card payments.

Rates are unchanged from 1997 and are:

Ordinary Member	£23.00
Family Members	£25.00
Student Members	£10.00
Institutional Members (UK)	£32.00
Institutional Members (Overseas)	£35.00

Ordinary Members, Family Members and Student Members may deduct £1.00 from the above if paid before 31 March 1998. Will all members with Standing Orders please check that the amount they are paying is correct. The £1.00 early payment discount will not apply if it is necessary for us to request additional payment.

Collectors in East Africa No. 26: G. Volkens (1855–1917)

B. Verdcourt

Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AB

Georg-Ludwig August Volkens, born in Berlin on 13 July 1855, was one of those people thoughtful enough to prepare their own obituary. A glance through E. von Martens's great work on East African molluscs will show how numerous and important Volkens's collections were. Hans Jacob Volkens, his father, who was a master tinsmith, came from Holstein and died of cholera in September in the year of Georg's birth. His mother, Auguste Lubrich, married a second tinsmith, Adolf Koeppel, who brought up Georg and his brother. After preliminary schooling at the Royal Seminar School and the Dorotheen-städtische Realgymnasium in Berlin he passed his Abiturienten-Examen (approximate A-levels) at Easter 1875.

Interested in botany from his early days he studied Natural Sciences first in Berlin, then Würzburg and finally again in Berlin; among his teachers were Alexander Braun (1805–77) and Julius Sachs (1832–97) who greatly influenced his modes of thought and laid the basis for much of his knowledge. After completing his National Service he began preparing for his teacher's examination. His stepfather died in 1882 and he began his study of botany the same year, his professors being Eichler and Schwendener. His dissertation gained him a degree at Berlin University in autumn 1882; it concerned liquid water loss from the leaves of higher plants. Under the guidance of Schwendener he produced two more papers, one on the relationship between the habitat and the structure of plants, and the other on chalk glands in the Plumbaginaceae, both published in 1884.

From childhood he had a longing to see distant lands and a particular interest in Africa was aroused after reading the travel books of first Barth, Overweg and Livingstone and later those of Schweinfurth, Nachtigal and others. His teacher Schwendener had mentioned that one should study the relationship between habitat

and structure in a country with climatic extremes. He asked the Akademie der Wissenschaften to fund a journey to the Egyptian Arabian Desert and with Schwendener's help he obtained 5000 marks and left in autumn 1884 for 10 months. The results of his work were published in a preliminary paper in 1886 and a successful book in 1887 containing his anatomical and physiological remarks which started what was a new discipline and a new type of ecological literature.

Volgens applied for *venia legendi* (authorisation to teach) in Berlin University starting in winter 1887 and it was necessary for him to earn his own living, but he had no success looking for research or teaching posts due to a surfeit of young botanists! After the death of Eichler, Adolf Engler (one of the most famous systematic botanists who has ever lived) took over the Botanical Museum in Berlin and gave Volgens a job as an unpaid volunteer. He obtained his qualification as a systematic botanist by compiling two families for the monumental *Natürlichen Pflanzen-familien* of Engler and Prantl. I had always assumed that Volgens was a permanent worker in the Berlin Herbarium and was a systematist at heart, but I was shocked to find that he did not like taxonomy and had a very sour view of the botanists who sat looking at dried plants and wrote dry descriptions in Latin. He was more interested in anatomy and physiology but with hindsight his work in this field was far less important than his collecting of dried plants and animals.

His important expedition to Mt Kilimanjaro was prompted by the desire to study the temperature factor in relation to the structure of plants, but the collection of plants and animals he made has had far more scientific impact than his rather naive physiological investigations. He managed to fund this expedition with money from the Humboldt Fund of the Royal Prussian Academy of Sciences and additional funds from the Colonial department provided he kept his eyes open for useful products likely to be of value to the German economy. Volgens spent about a year and a quarter in the region and set up a scientific station; he was the first person to visit the northern slopes, which are still producing undescribed species. Two colleagues who had been with

him and remained after he had left, Dr Carl Lent and Dr Kretschmer, were later murdered by natives in the Rombo area. The 3000 or so plant specimens he collected added a great deal to the knowledge of East Africa botany and numerous new species were described from his material. Unfortunately, the top set was, except for a relatively few families, destroyed in the bombing of Berlin during the Second World War but many duplicates are preserved at Kew, the Natural History Museum, and several other institutions. His zoological specimens survived the war. His book *Der Kilimandscharo*, published in 1897, does not appear to have been translated into English.

It was inevitable that he should be drawn into the social circle in Berlin formed of those whose main interest was fostering colonialism. He took part in the foundation of the Berlin-Charlottenburg Chapter of the German Colonial Society. He was invited to join the committee and gave talks in many German towns which were refreshingly different, being given by an objective natural historian rather than the usual dreary military man. He poured scorn on those who thought that riches could be gained from the colonies without work and investment. How right he was! Two of his talks of a more scientific nature, his work on Kilimanjaro and its possible importance for horticulture, and the pollination of Loranthaceae and Proteaceae by birds, were published in a *Festschrift für Schwendener*.

At the age of 42 in 1897 he was finally made scientific assistant and a year later *Kustos* in the Berlin Botanical Museum – a permanent post at last, mainly concerned with economic plants, transferring crops from one colony to another and selecting those most likely to supply Germany with raw materials, and also training gardeners for the Colonial service (much as Kew did). This kind of work prevented him following up his own ideas and he would certainly have been happier (but perhaps less useful) as a researcher in a university environment. Exactly as at Kew, vast collections of new plants were arriving from the tropics, all needing description. The flow from the colonies, later independent countries, lasted at least another 60 years or more and is scarcely finished even now. Volkens would certainly have been concerned

with the research stations which were set up at Rabaul (New Britain, then Neu-Pommern and much later destroyed first by an earthquake then by the Japanese), Victoria (Cameroon) and Amani (Deutsch-Ost-Afrika, later Tanganyika and now Tanzania). In the short time they had before the First World War resulted in the loss of all Germany's overseas possessions, an immense amount of practical tropical agriculture was carried out.

In July 1899 whilst on holiday in Rügen he received a telegram to return to Berlin and only four days later was on his way to Genoa to board a boat for the Caroline Islands. These had been bought from Spain and a ceremonial party with new officials was underway to exchange flags, make speeches, etc. Volkens was included in order to report on the economic conditions of the then little known islands. Singapore was visited to buy all that was needed to set up offices in Ponape and Saipan, then Macassar, Amboina, Banda Islands, and Friedrich Wilhelmshafen in New Guinea; they finally arrived at Herbertshöhe on the Gazelle Peninsula. From there, under the direction of the Governor of German New Guinea, the party visited the Marshall Islands, before arriving at the Marianas and Carolines (Kussae, Ponape, Palaus, Saipan and Yap – all parts of the very scattered chain). Volkens stayed on Yap for seven months due to lack of shipping and finally got rescued by a small sailing boat which reached Yokohama on 25 June 1900. All military ships that might have been expected to rescue the German party had been diverted to China because of the Boxer rebellion and events in Samoa; Volkens was totally forgotten. He had one narrow escape whilst on Yap. During an excursion to the southern point of Yap his boat hit the reef and overturned; he and the District Governor hung on to the keel within sight of the surf for four hours until finally rescued by natives who told them they only travelled that way twice a year!

He got back to Berlin in October 1900 only to learn he should have been in Java. A telegram ordering him to go there had never reached him. He requested a year's postponement and finally went to Java in autumn 1901 staying there until August 1902. The idea was to distribute plants from the magnificent botanical garden at Buitenzorg (Bogor). Despite the loss of much material enough

survived to greatly enrich the agriculture of Africa, New Guinea, Samoa and the Carolines for future generations. Volkens also sent 27 crates of ethnographic objects of all kinds to the Ethnography Museum in Berlin, also a small but very important mineralogical collection which changed the accepted ideas on the formation of the Caroline Islands. I do not know if he collected any snails during his trips to the Pacific and Java but none is mentioned in H.B. Baker's *Zonitid Snails from Pacific Islands* (1938-41).

His desire for foreign travel was now satiated and he settled down to work again at Botanical Central Office. He gradually gave up teaching and had abandoned it by 1910.

Volkens never married; when he was in a position to start a household he considered himself too old. Thus he had time to devote to other things and played an important role in many societies and in public discussions. He was a member of all four societies in Berlin concerned with botany and also those devoted to geography, Asian affairs, the Colonial Society, the Society of Naturalists, the Meteorological Society and the Gymnastic Society. He was for many years on the Committee of the Botanischen Vereins der Provinz Brandenburg and also wrote a history of this Association on the occasion of its 50th anniversary. In August 1912 he suddenly had signs of arterial sclerosis and he died on 10 January 1917 from a heart attack at a relatively early age.

Four plant genera are named after him, only one still accepted, *Volkensia* O. Hoffm. (Compositae) (= *Bothriocline* Benth.), *Volkensiella* H. Wolff (Umbelliferae) (= *Oenanthe* L.), *Volkensinia* Schinz (Amaranthaceae) and *Volkensiophyton* G. Lindau (Acanthaceae) (= *Lepidagathis* Willd.). Over 100 species of plants and animals (beetles, Orthoptera and molluscs) are also named after him. He was the author of 52 scientific papers including his book on Kilimanjaro.

The great botanist H. Harms added notes and an addition to Volkens's obituary with details of where information can be found and a complete bibliography. He is also critical of Volkens's attitude towards systematic botany stating that he never really understood the tasks and aims of the subject and the scientific uses of the collections. This may be so but his excellent collection

from Kilimanjaro added a great deal to our knowledge of the mountain and his work there and what remains of his collections will always be important.

A complete copy of the lengthy translated obituary has been put in the biographical pamphlet collection in the library at the Royal Botanic Gardens, Kew and is available there. I am deeply grateful to Monica Shaffer-Fehre for translating it slowly enough for me to write down the main points of interest.

List of molluscs described from material collected by G. Volkens and associate (Volkens unless otherwise stated)

- Achatina fatalis* von Mts., 1895b. Tanzania, in plains below Kilimanjaro, particularly in the region of Diralla-Sees (Dschalla) i.e. Lake Chala, 31°9'S, 37°42'E (ZMB** 54255a, lectotype, 3 paralectotypes 54255b, see Kilias 1992, fig. 1). *Achatina fulica bloeyi* Bgt.
- Ampullaria gordonii* E.A. Sm. var. *volkensi* von Mts., 1897. Tanzania/Kenya, Lake Jipe (ZMB, type material). *Pila wernei* (Phil.).
- Cyclophorus volkensi* von Mts., 1895a. Tanzania, Kilimanjaro, 1600 m, on newly planted maize field after burning and clearing the original bush (ZMB, type material). *Maizania (Micromaizania) volkensi* (von Mts.).
- Ennea tudes* von Mts., 1895a. Tanzania, Kilimanjaro, with last (ZMB, syntypes; BM 1937.12.30.462 syntype ex Connolly collection). *Gulella tudes* (von Mts.).
- Hapalus kretschmeri* von Mts., 1897. Kenya/Tanzania, Kilimanjaro, Lake Chala, 675–750 m, Kretschmer (ZMB 101903, holotype, damaged). *Curvella kretschmeri* (von Mts.) (but my notes made in Berlin in 1959 suggest it is an *Opeas* or *Euonyma*).
- Helicarion volkensi* Thiele, 1911. Tanzania, Kilimanjaro, Gürtelwald (ZMB, type material) (overlooked by von Martens). *Chlamydarion volkensi* (Thiele).
- Helix kilimae* von Mts., 1895. Tanzania, Kilimanjaro, mountain pasture at foot of Mawenzi*, 3800 m. (ZMB, type material). *Haplohelix kilimae* (von Mts.).

* ZMB = Zoologisch Museum Berlin.

**The lower but infinitely more difficult of the two peaks Kibo and Mawenzi.

- Limicolaria dimidiata* von Mts., var. *volkensi* von Mts., 1897. Tanzania, Kilimanjaro, frequent in cultivations between 1200 and 1700 m. (ZMB 54276a, lectotype, see Kiliyas 1992, fig. 2; 54276b 2 paralectotypes). *Limicolaria martensiana volkensi* von Mts.
- Trichotoxon robustum* Simroth, 1896. Tanzania, Kilimanjaro, cultivated zone, on legumes (ZMB, 2 syntypes destroyed; van Goethem has chosen a neotype from Sjöstedt's collection). *Polytoxon robustum* (Simroth).
- Trichotoxon volkensi* Simroth is eponymous only.
- Trochonanina obtusangula* von Mts., 1895a. Tanzania, Kilimanjaro, Marangu ('Marungu'), lower cultivated zone, 1300 m. (ZMB, syntypes). Same.
- Trochonanina rufofusca* von Mts., 1895a. Tanzania, Kilimanjaro, a specimen found with next at top of range (ZMB, holotype). *Haplohelix rufofusca* (von Mts).
- Trochonanina simulans* von Mts., 1895a. Tanzania, Kilimanjaro, cultivated area 1200–1700 m. (ZMB, type material). *Trochonanina (Montanobloyetia) simulans simulans* von Mts.
- Trochonanina simulans* von Mts., var. *kretschmeri* von Mts., 1897. Tanzania, Kilimanjaro, Kretschmer (ZMB, type material). *Trochonanina (Montanobloyetia) simulans simulans* von Mts.
- Vitrina nigrocincta* von Mts., 1897. Tanzania, Kilimanjaro, Gürtelwald, 1900–2700 m and in gorges, 3400 m and mountain pasture at foot of Mawenzi, 3800 m (ZMB, syntypes). Same (the lectotypification of this must await a complete revision of African *Vitrinidae*; D'Ailly (1910) described three other species from the mountain).

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For Sale

Extensive world-wide collection of marine molluscs, largely gastropods, but also many bivalves. Collection made over 50 years by owner and family, and incorporates two Victorian period collections (Carew Collection – New Zealand, Australia and Tasmania; Crofts Collection – Indian Ocean and Pacific). Material largely labelled, catalogue in preparation. Collection suitable for small museum, as almost all super amilies represented.

Contact:

Leslie S. Atkins, [REDACTED] Douglas, Cork, Republic of Ireland

Box Hill Snail Course, Surrey

Weekend of 23 – 25 October 1998

Tutor: June Chatfield

A classic area on chalk
with a rich terrestrial molluscan fauna.

Details from:

Juniper Hall Field Centre, Mickleham,
Dorking, Surrey RH5 6DA,
Tel. 01306 883849

Reading molluscs 100 years on

June E. Chatfield

Alton, Hants

The field meeting of the Society held on Sunday, 28 October 1997, and led by June Chatfield and Rosemary Hill, was attended by five members and worked three areas in the north-east section of Reading where there are turn-of-the-century records from the Reading Museum collection. The field meeting recorded a total of over 65 species.

Reading Shell Collection

The shell collection at Reading Museum, which is currently being curated and catalogued, has some reference sets of British non-marine Mollusca, mostly in traditional glass-top boxes. These were once on display in the galleries. The shells come from various sources dating from the late nineteenth to early twentieth centuries and a proportion were collected in the Reading area. The Reading Museum accessions book for 1885 records a collection of land and freshwater shells from Reading by Mr Holland who also undertook taxidermy for the museum. Another name associated with the non-marine molluscs from Reading in the collection is that of the Reverend S.O. Ridley who was a keen botanist. The accession book for 1920 records receipt of microscope slides from Ridley. The majority of the shells forming the British non-marine collection at Reading Museum do not appear to have been listed in the accession records, but the tradition is that they came from F.W. Cocks – he was primarily an entomologist interested in beetles. Cocks knew J.R. le B. Tomlin* who lived in Reading in the early part of this century and it is likely that most of these shells were given from further afield and from places like Guernsey where Tomlin was known to label. It appears that the molluscs came to Reading Museum with Cocks's insect collection in the 1920s.

The British non-marine molluscs in the Reading Museum collection are now catalogued and accessible on the MODES computer programme. From this database there are mollusc records for the following localities in the Reading area. Berkshire:

Reading, for the east Woodley (NE Reading), Wargrave, Cookham and Crowthorne, and to the west of the town, at Sulham near Pangbourne and Streatley. Across the Thames into Oxfordshire there are records from Shiplake near Henley and Mapledurham.

There is no precision to the old records in terms of habitat, locality, date or collector, but they show a generally rich molluscan fauna for the area, especially for freshwater with three rivers, the Thames, Kennet and Loddon. The town has greatly expanded since the turn of the century and many old sites would have now been built over. The road network and motorway system in the last 25 years have taken further habitat space.

Field meeting

The field meeting of the Society concentrated on two areas of open space in the Woodley-Earley area and a stretch of accessible land along the Thames (Thames Water Park), all in the north-east of Reading.

High Wood, Earley (41/750726): 7 species recorded. This is the remains of an area of acid woodland and heathland which was once part of the Bulmersche Estate. It is on clay and gravel soil, grading to infertile Bagshot Sands. In the past there has been some planting of exotic trees. The adjacent housing estates built in the 1970s have resulted in heavy use of the wood for dog-walking with associated eutrophication of soil. High Wood is a Local Nature Reserve.

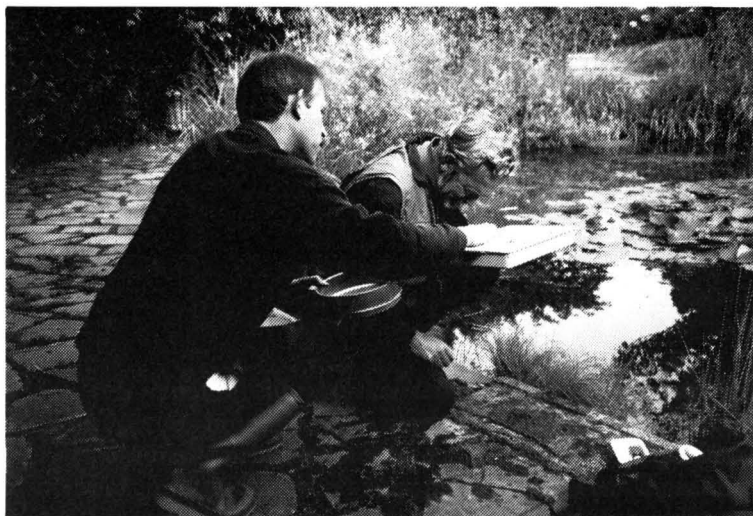
During the field meeting the ground was very dry and molluscs were not numerous. Slugs found under dead wood looked shrivelled through dehydration. The acid soil of this wood yielded only three species of snail and five species of slug, one of these being the tree slug *Limax marginatus*.

The following were listed for High Wood, all live records: *Discus rotundatus*, *Arion ater* agg., *A. subfuscus*, *A. intermedius*, *Oxychilus cellarius*, *O. alliarius*, *Limax marginatus*. There was also a possible record of *Arion flagellus*.

Water garden near Woodley South Lake (41/754723): 8 species recorded. Woodley, not far from Tomlin's home near Cemetery Junction, featured on several labels in the collection at

Reading Museum, but it is an area which has now been extensively built over. North Lake has been filled in and South Lake is closely surrounded by houses built in the 1970s – it was not investigated for molluscs. However, a small artificial water garden in the amenity area had a pond that was both rich in molluscs and other freshwater animals.

The following were listed for the ornamental pond and surround: *Potamopyrgus jenkinsi*, *Bithynia tentaculata*, *Physa* sp. (cf. *heterostropha*), *Lymnaea truncatula*, *L. stagnalis*, *Planorbarius corneus*, *Sphaerium lacustre*, *Cepaea nemoralis*. All were live records except for *Sphaerium*.



Investigating the ornamental pond at Woodley
(Rupert Honnor and Colin Gillard)

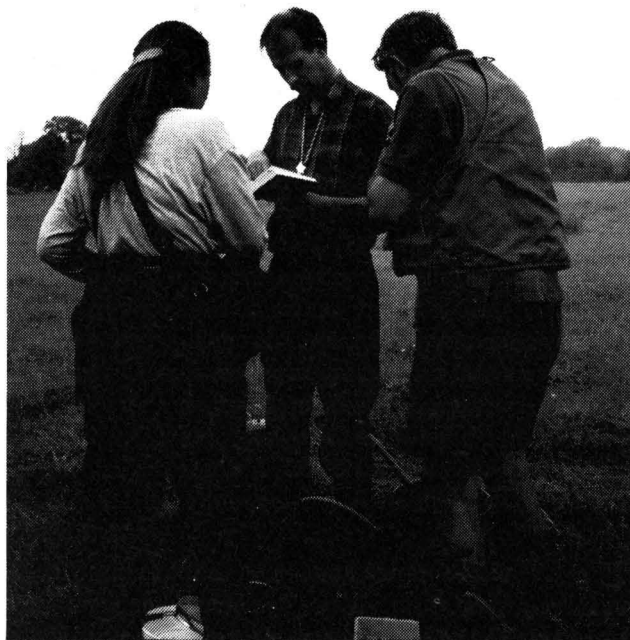
Maiden Erlegh Park and Local Nature Reserve 41/750710:
33 species recorded. Maiden Erlegh Lake and Old Pond Copse are managed by Earley Town Council who have provided information on the site on the notice-board at the entrance to the path round the lake. The lake is man-made but has existed for 300 years and is shown on early enclosure maps. A stream runs through the lake and exits at a weir to continue as a small stream running through Old Pond Copse, which is now a Local Nature Reserve. There are wet habitats along the stream marked by opposite-leaved golden

saxifrage and alder trees. There was a noted alder carr in this part of Reading until the Earley housing development was put in, when much habitat was lost. The nature reserve is a remnant of once more extensive wet woodland thought to be an outlier of Windsor Forest. Maiden Erlegh Lake was desilted in 1988. The banks have been supported by piling and there is little bankside wetland with a sharp boundary between water and land. The pond has a considerable waterfowl population including Canada geese and suffers some eutrophication, as was evident from barley straw bales in the water during a preliminary visit in spring 1997: these had been used to prevent algal bloom. Only three species of freshwater mollusc were found in the lake, which was not easily accessible for collecting.

Old Pond Copse proved a rich site for molluscs with 30 species found during the field meeting. The small stream, subject to low flow, supported *Potamopyrgus antipodarum* (= *jenkinsi*), *Lymnaea peregra* and *Pisidium* spp. River limpets *Ancylus fluviatilis* were found on stones on the preliminary visit on 6 April 1997. The woodland did not have any depth of leaf litter, but there were many dead branches and, where these were in wet situations, *Carychium* spp. were found on them. *Lauria cylindracea*, *Discus rotundatus*, various zonitid glass snails with thin shells and slugs were also associated with dead wood. The spindle-shaped *Clausilia bidentata* was found in a crevice of a tree trunk by the stream. Damp ground colonised by opposite-leaved golden saxifrage yielded the marsh slug *Deroceras laeve* and a good live population of *Azeca goodalli*, a shiny elongate snail with especially shallow sutures which is widespread but local in occurrence. Work on the path with dead hedging and woodchip surfacing is encouraging visitors to keep to the path and avoid trampling the woodland vegetation.

The following were listed for Maiden Erlegh: *Potamopyrgus antipodarum* (= *jenkinsi*), *Physa acuta*, *Lymnaea palustris*, *L. peregra*, *Ancylus fluviatilis*, *Pisidium personatum*, *Carychium minimum*, *C. tridentatus*, *Azeca goodalli*, *Cochlicopa lubrica*, *C. lubricella*, *Vertigo substriata* (juvenile), *Lauria cylindracea*, *Punctum pygmaeum*, *Discus rotundatus*, *Arion ater* agg.,

A. subfuscus, *A. circumscriptus* (s.s.), *A. intermedius*, *Vitrea crystallina*, *Nesovitrea hammonis*, *Aegopinella nitidula*, *Oxychilus alliarius*, *Milax budapestensis*, *Limax maximus*, *Deroceras laeve*, *D. reticulatum*, *D. caruanae*, *Euconulus fulvus* (s.s.), *Clausilia bidentata*, *Trichia hispida*, *Cepaea hortensis*, *C. nemoralis*. Nearly all were based on live records.



Checking identifications in the field
(Rosemary Hill, Rupert Honnor, Colin Gillard)

Thames Water Park – east of Reading (41/742744): 23 species recorded. Reading is bounded to the north by the River Thames which is an important landscape feature and amenity for the town: it also marks the county boundary between Berkshire and Oxfordshire. The River Thames makes a strong contribution to the mollusc fauna and is a traditional site for the very local ram's-horn *Gyraulus acronicus*. Mollusc records for the Thames from the Reading area in the museum collection include *Valvata piscinalis* and *Bathymphalus contortus* for Shiplake near Henley and

Theodoxus fluviatilis and *Planorbis carinatus* from Wargrave.

The field meeting visited the Thames Business Park which includes a Thames-side footpath to Sonning. The first habitat investigated was in a weedy ditch which was fed by the former Earley Power Station between 1930 and 1960 (41/742744). At the time it carried warm water, but since the closure of the power station it has developed into a good habitat as a freshwater drain with waterweed and bankside vegetation. It proved rich in freshwater molluscs, which were abundant, live and diverse in species. Fifteen species were recorded with 12 freshwater ones representing 10 genera, together with the marsh glass snail *Zonitoides nitidus* on wet mud of the bank. Of particular interest was the local operculate *Bithynia leachii* which was known in the Reading area at the turn of the century from specimens in Reading Museum collected by Holland (Accession number 1995.110.14). The waterweed habitat was characterised by the presence of many flat ram's-horns of which *Anisus vortex* was the most abundant. A shell of the bivalve *Pisidium amnicum*, typical of rich calcareous habitats, was also found.

The following were found in the old Earley Power Station ditch: *Bithynia tentaculata*, *B. leachii*, *Physa fontinalis*, *Lymnaea peregra*, *Planorbis planorbis*, *Anisus vortex*, *Bathyomphalus contortus*, *Planorbarius corneus*, *Acroloxus lacustris*, *Sphaerium corneum*, *Pisidium amnicum*, *Pisidium* spp., *Succinea putris*, *Cochlicopa lubrica*, *Zonitoides nitidus*, *Trichia striolata*. Nearly all were live records.

The banks of the Thames (41/743745) are much washed and eroded by waves from pleasure boats on the river and there is little bankside vegetation. In places the water is shallow enough to wade in and explore life on large stones which support a good living population of the river nerite *Theodoxus fluviatilis*. Its attractive thick and colour-patterned shells occur in the gravel on the river bed. The Thames supported populations of operculates with both species of *Bithynia*, *Viviparus viviparus* and *Valvata piscinalis*. While shells of adult *Viviparus* were abundant, a few juveniles and a subadult specimen were found alive on a stone, indicating a breeding population. A few weedy and muddy patches

by the banks yielded ram's-horns. Bottom deposits included shells of larger bivalves *Unio pictorum*, the painter's mussel, and *Sphaerium rivicola*, the river orb shell notable by its dark brown periostracum. Some river gravel was taken for sifting to look for the small *Pisidium* species and in hopes of *Gyraulus acronicus*: preliminary observations have shown an abundance of shells of *Pisidium supinum*. This is the triangular one with the distinctive external ridge on the umbone: it is frequent in the Thames in Berkshire. Further work is needed on the samples.

The following species were found in or by the River Thames: *Theodoxus fluviatilis*, *Viviparus viviparus*, *Valvata piscinalis*, *Bithynia tentaculata*, *B. leachii*, *Potamopyrgus antipodarum* (=jenkinsi), *Lymnaea peregra*, *Planorbis planorbis*, *Gyraulus albus*, *Ancylus fluviatilis*, *Acroloxus lacustris*, *Unio pictorum*, *Sphaerium corneum*, *S. rivicola*, *Pisidium supinum*, *Pisidium* spp., *Vallonia pulchella*, *Oxyloma pfeifferi*.

An additional list for a marshy area on the Thames riverside between Reading and Sonning was investigated on the preparatory visit on 6 April 1997, but not included on the actual Society field meeting. Finds here included: *Oxyloma pfeifferi*, *Discus rotundatus*, *Arion subfuscus*, *Oxychilus cellarius*, *Deroceras reticulatum*, *Monacha cantiana*, *Trichia striolata*, *T. hispida*, *Arianta arbus-torum*, *Cepaea hortensis*. All except *Oxyloma* and *Trichia hispida* were live records.

I acknowledge the help of Ron Boyce in providing details and history of the habitats.

Footnote

*J.R. le B. Tomlin (1864–1954). Tomlin was the last of the large private shell collectors – the bulk of his world-wide collection of shells and associated library is in the National Galleries and Museums of Wales, Cardiff. He generously gave material to many other collectors so Tomlin shells are in many other museums besides Cardiff. A university graduate, Tomlin spent the first part of his life teaching, but a substantial inheritance at an early age enabled him to devote the rest of his time to his natural history interests of which shells provided the focal point. He is also known for his work in beetles, hence his association with F.W. Cocks. □

**The existence of *Pseudamnicola confusa*
(Fauenfeld) living on the margins of Rockland
Broad, Rockland St Mary, Norfolk. TG332 052**

Derek Howlett

Norwich, Norfolk

The first indication of this species' existence somewhere in the Rockland Broad area was when several dead shells were discovered by Ian Killeen of Malacological Services, Felixstowe, Suffolk, in samples of tidal litter collected from the broad margins. After receiving this information from Ian, I decided to investigate the possibility of this species living within the broad area. With very little habitat detail to work from, I decided to collect various samples from both the permanently aquatic areas of the broad edge and the broad margin. The margin of the broad is a very wet and muddy area. During normal high tides it is not washed over with water, although one or two small lows do form shallow pools, as the water permeates through the peat. This area has a small number of resident plants: *Phragmites* is the dominant one, but *Glyceria*, *Typha*, various *Carex* species and *Iris pseudacorus* (Yellow Flag) still remain either interspersed or in the form of small patches, and emerging above these are many willow bushes and willow trees.

The samples collected were taken from the southern and eastern sides of the broad only, because these areas are more easily accessible. There is a public footpath on the broad wall on these two sides, whereas the rest of the broad is only accessible by boat. The aquatic samples were taken at three different sites, one in a *Phragmites* bed and two in shallow open water, all at the broad edge. The samples were scooped up in a fine meshed sieve, washed through the sieve to get rid of the silt and mud, and the resulting material taken home for examination under magnification. None of these samples revealed any live specimens of *Pseudamnicola confusa*, although all contained many dead shells of this species. The samples from the broad margin were taken from six different sites by scooping up a small area of mud from under the dead vegetation. The mud was passed through a sieve and the residue was taken home for examination. The result of these examinations were as follows:

Site 1 Small patch of *Glyceria* with a few *Phragmites* stems emerging, sallows overhanging on one side.

Sample 1	<i>Potamopyrgus jenkinsi</i>	5 specimens
	<i>Pseudamnicola confusa</i>	1 specimen
	<i>Pisidium obtusale</i>	5 specimens
	<i>Vertigo moulinsiana</i>	1 specimen

Site 2 Large patch of *Glyceria* with a few *Phragmites* stems emerging, surrounded on three sides by willows and sallows. All sites flood only at very high tides.

Sample 1	<i>Potamopyrgus jenkinsi</i>	18 specimens
	<i>Pseudamnicola confusa</i>	3 specimens
	<i>Pisidium obtusale</i>	32 specimens
	<i>Vertigo moulinsiana</i>	1 specimen

Sample 2	<i>Potamopyrgus jenkinsi</i>	28 specimens
	<i>Pseudamnicola confusa</i>	4 specimens
	<i>Pisidium obtusale</i>	27 specimens
	<i>Euconulus fulvus</i>	1 specimen

Sample 3	<i>Potamopyrgus jenkinsi</i>	32 specimens
	<i>Pseudamnicola confusa</i>	5 specimens
	<i>Pisidium obtusale</i>	31 specimens
	<i>Vertigo moulinsiana</i>	1 specimen

Site 3 *Phragmites* and *Carex* surrounded on three sides by willows and sallows.

Sample 1 A very wet pool area at normal high tide. *Carex* dominated

<i>Potamopyrgus jenkinsi</i>	23 specimens
<i>Valvata cristata</i>	29 specimens
<i>Bathymorphus contortus</i>	1 specimen
<i>Lymnaea palustris</i>	1 specimen
<i>Pisidium nitidum</i>	6 specimens
<i>Pisidium milium</i>	4 specimens
<i>Vertigo moulinsiana</i>	2 specimens
<i>Vertigo antivertigo</i>	1 specimen
<i>Euconulus fulvus</i>	1 specimen

Sample 2 Floods only at very high tides, *Phragmites* dominated.

<i>Potamopyrgus jenkinsi</i>	42 specimens
<i>Pisidium obtusale</i>	52 specimens

Site 4 Mixed vegetation, *Phragmites*, *Carex*, *Typha* and *Glyceria*, willow and sallow on two sides. Slight flooding at normal high tides.

Sample 1	<i>Potamopyrgus jenkinsi</i>	19 specimens
	<i>Pisidium obtusale</i>	14 specimens

Site 5 Mixed vegetation, *Phragmites*, *Typha* and *Glyceria*. Floods only at very high tides.

Sample 1	<i>Potamopyrgus jenkinsi</i>	25 specimens
	<i>Lymnaea palustris</i>	1 specimen
	<i>Pisidium obtusale</i>	7 specimens

Sample 2	<i>Potamopyrgus jenkinsi</i>	16 specimens
	<i>Pisidium obtusale</i>	15 specimens
	<i>Zonitoides nitidus</i>	1 specimen

Site 6 *Carex*, surrounded by willows and sallows, overhanging silver birch and a young oak tree. Slight flood at normal high tide.

Sample 1	<i>Potamopyrgus jenkinsi</i>	2 specimens
	<i>Pisidium obtusale</i>	1 specimen
	<i>Zonitoides nitidus</i>	1 specimen

It appears that the key to this species survival is the plant *Glyceria maxima* growing in a relatively open situation. One possible theory as to why this plant is the chosen habitat, is the nature of it after die-back each winter. The dead leaves collapse to the ground forming a flat soggy mat over the surface of the mud. This provides a very wet and sheltered environment beneath, which is the situation that these snails were found in. When *Phragmites* and *Carex* die back they remain standing, resulting in a much more open and exposed habitat on the mud surface. If this is true, and this species cannot adapt to changes in the plant community in its present habitats, then I feel that it will be short lived in the Rockland Broad area, because *Glyceria* is in very serious decline here, as indeed it is throughout the mid-Yare valley. The reason for this decline is not altogether clear, but if it is going to have such a detrimental effect on invertebrate species such as this, it can only be considered a disaster. □

Rediscovery of *Azeca goodalli* in Cheshire

Ian F. Smith

Stockport

Azeca goodalli (Férussac 1821) is a glossy spindle shaped land snail about 6.5 mm long which occurs at localities scattered over England and Wales (Kerney, 1976). It can be easily separated from the similar and commoner *Cochlicopa lubrica* (Müller 1774) by the presence of about 6 teeth and folds visible inside the mouth of adult shells.

It lives 'in moss in open woodlands, hedgebanks and, in particular, roadside ditches' (Killeen, 1992), 'mostly on calcareous ground' (McMillan, 1968) and 'often in rocky places' (Kerney and Cameron, 1979). 'It lives gregariously ..., but it is local, one might almost say rare.' (Step, 1927).

Azeca is well distributed adjacent to the Cheshire border in NE Wales (Kerney, 1976) and 'it has been found in many places in Flint and Denbigh where the strata tend to be calcareous and there is an abundance of moisture' (McMillan and Millott, 1950). Cheshire has only three known localities for *Azeca*, perhaps because of the absence of limestone outcrops. They are contained in the following old records:

1. 'The original Census verification for Vice-County 58 was based on material from "Marple Wood", submitted to J.W. Taylor by E. Collier in September 1885 (Conchological Society Census ledgers).' (M.P. Kerney, *in litt.*)
2. 'Marple Wood (Melvill fide Rogers). Plentiful on the opposite bank of the Mersey at Oakwood, Romiley.' (Oldham 1896) [Note: the river on this stretch is now (1997) called the River Goyt.]
3. 'Congleton, September, 1900' (Oldham 1908).
4. 'Romiley numerous specimens from rotting stems of Butterbur near Oakwood Hall May 1902.' (Jackson).
5. The collections at Liverpool Museum have *Azeca* specimens with the following data:
 - a) Romiley, Cheshire 1888 coll. R. Standen.

- b) Oakwood, Romiley 26/iv/1902 coll. F. Taylor.
- c) Oakwood Hall, Easter 1929 coll. Kitchen.

It would seem that *Azeca* has not been recorded in Cheshire for over 70 years, and I have made attempts to refind it in its old haunts. 'Congleton' is considered too vague a location, as was 'Marple Wood' because Victorian naturalists used this name for any wood within walking distance of Marple station. Search has been concentrated on the banks of the River Goyt at Oakwood Hall. Only a small part of the riverbank (G.R. SJ941899) is open to the public and this portion has been affected by trampling, fires and den building by children. No *Azeca* has been found, but it is hoped that it may survive in the inaccessible part under private ownership (G.R. SJ942900 to about SJ946902).

On the opposite side of the River Goyt the grounds of Marple Hall have had houses and a large school built on them this century. Much of the woodland on steep slopes has survived, but the ground flora and moss-litter layer have been damaged in many places by trampling. However, one section has remained almost undisturbed and on 15 December 1996 ten adult and ten juvenile *Azeca goodalli* were washed from a two litre sample of moss at G.R. SJ944893. Though the spot has few trees it would probably have been considered to be part of Marple Wood, and being opposite Oakwood Hall it fits well with the site description given by Oldham.

The site is at the foot of a near vertical cliff of Coal Measures sandstone (base contour 84 m, top contour 91 m above O.D.) on an incised meander which was abandoned by the River Goyt over 5000 years ago (Johnson, 1989). The substrate is a colluvial fan (Johnson, 1989) of glacial till carried from above the cliff by slope wash, with fallen rocks embedded in its surface. Much of the ground is covered by a thick blanket of moss. There are a few scattered trees but shade is provided by the north-facing cliff and, in summer, by tall herbaceous plants. The site represents the former river bank, and though I would not describe it as a flush it is probably usually moist with water from the cliff and the old meander river bed which is slow draining and, in part, a marsh. Coal Measures sandstone is base poor, but the lime required by

Azeca is probably available from the glacial till. Fluvo-glacial deposits in the area contain limestone fragments (Johnson, 1989) and many flushes emerging from the glacial deposits cause lime encrustation on moss and debris.

Summary

Azeca goodalli still exists at one of the three Cheshire localities known at the start of the twentieth century. The conditions which probably contribute to the snail's existence are the open shade of a north-facing cliff, moist ground conditions, lime-rich glacial till and an undisturbed thick blanket of moss. For *Azeca*'s continued survival at its only known modern Cheshire site it is important that the ground is not trampled or disturbed. Public access should not be encouraged by the construction of paths down the cliff or along its base.

Acknowledgements

The help of Mrs N.F. McMillan with literature and the resources of Liverpool Museum is gratefully acknowledged.

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***Clausilia dubia* Draparnand, 1805
monstr. *dextrorum***

Barry Colville

Ambleside, Cumbria

In June 1997 I found a beautiful, perfectly formed adult dextral specimen of *C. dubia* at Langecliffe, near Settle, mid-West Yorkshire (Y.C.64) MR:SD 820648, which is now in my collection.

In warm, damp weather and when other conditions are right, this very local snail may be found in numbers, especially on shaded loose or partly mortared limestone walls on which mosses, algae, etc. grow. Dextral individuals are very rare and being long and fusiform in shape are particularly difficult to recognise, unlike the sinistral specimens of normally dextral species which can be so obvious to the experienced conchologist's eye.

Mr A.E. Ellis, in an article on Sinistrorsity in *Conch. Newsletter*, **9**: 53-54 (1964), mentions a dextral *C. dubia* from Ingleton exhibited by Mr J.R. le B. Tomlin, *J. Conch.*, **22**: 263 (1947).

I first found a sinistral monstrosity, *Lauria cylindracea*, in 1951, also the second known. The first known coincidentally was in Mr Tomlin's collection (*J. Conch. Lond.*, **23**: 259 (1952).

Publications of this kind seem to be out of fashion, perhaps because of its analogy to stamp collecting, but they are interesting and I would encourage others to make known such finds.

□

Wet, Wet, Wet **or The Cornwall marine field meeting**

Rupert Honnor

nr. Henley-on-Thames, Oxfordshire

The beginning of June 1997 will stand out in my memory as being very rainy. It certainly seemed that way on the Cornwall marine field meeting, so that every time it was low tide on the shore, it was raining! I don't know whether it encouraged the molluscs, but it certainly dampened our spirits at times!

As can be seen from the map presented in Figure 1, and the list of sites visited in Table 1, the group covered considerable ground in the area immediately west of Plymouth, visiting a total of 17 sites, including Hannaford Point, West Looe, twice.

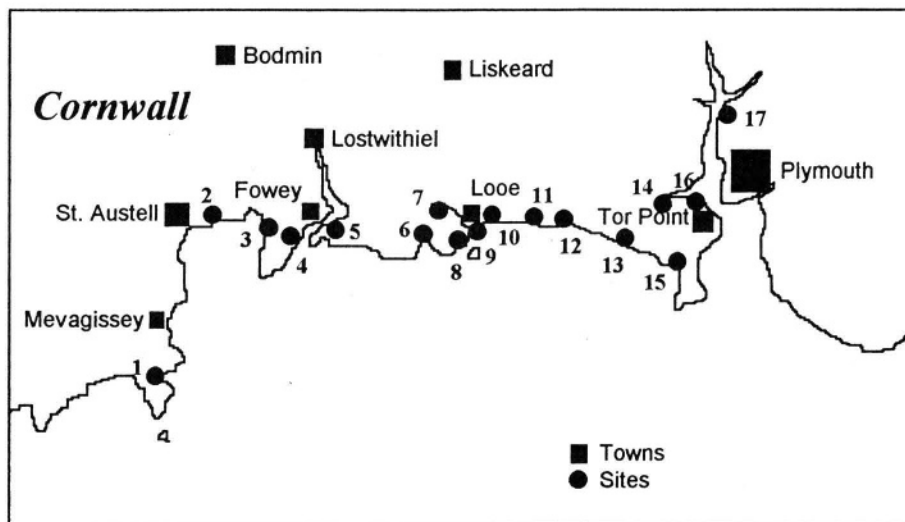


Figure 1. Map of field meeting area

The results of the marine survey work is presented in Table 2, which is a list of species obtained: 129 in total, of which 89 species were found alive. It would take too long to comment on the complete list, but certain sites are worthy of comment.

Hannafore Point was the 'best' site (some 83 species, of which 56 species were found alive), which probably reflects the amount of recording done there, on the best tides, and the extensive rocky channels that are exposed at low tide on the shore. Weed cover on the rocks and gravelly channel bottoms provided a considerable variety of ecological niches to explore. The shore seemed to be particularly rich in trochids, littorinids and rissoids, as might be expected from the discussion above.

Another particularly good shore was the small bay of Talland, a little west of Looe (52 species, of which 47 were found alive, which was surrounded by substantial cliffs, with boulders at their base and a small patch of sand in the centre of the bay. The weedy under-sides of the boulders proved especially fruitful, and a fairly large patch of boulders covered in 'serpulid' tubes, in the centre of the bay, yielded a good variety of pyramidellid species.

Table 1: Sites visited

#	Location	Date(s)
1	Gorran Haven	04/06/97
2	Carlyon Bay	05/06/97
3	Polkerris	05/06/97
4	Fowey foreshore	05/06/97
5	Polruan, Fowey River	05/06/97
6	Talland Bay	02/06/97
7	Looe River estuary	01/06/97
8	Hannafore Point, West Looe (*records from previous visits by Terry Wimbleton)	28/03/93* 13/08/94* 01/06/97 06/06/97
9	East Looe beach	31/05/97
10	Millendreath	06/06/97
11	Seaton	03/06/97
12	Portwrinkle	03/06/97
13	Whitsand Bay	07/06/97
14	Anthony, Lynher River	07/06/97
15	Rame	07/06/97
16	Wilcove jetty	07/06/97
17	Warren Point	30/05/97

The sandy beach at Gorran Haven looked initially unpromising, but sampling the mussel beds proved very rewarding, and a small patch of shell sand provided quite a few interesting finds (for instance *Caecum glabrum* was quite abundant in this shell sand). Other members of the party examined the low tide mark on the sand itself to considerable benefit of the list, in terms of bivalves.

The final site I would like to discuss is that of Whitsand Bay, south-west of Plymouth. Although this site didn't yield many species – the beach is composed of a thin layer of fine sand over a coarse gravel (apparently inimical to molluscs in general), with rocky outcrops relatively high up the shore – it was the site of a colony of *Onchidella celtica* which is almost unknown outside of Cornwall in the UK, and is therefore probably worthy of description.

Onchidella celtica itself is a small (15–20 mm), black slug-like creature, but flatter and more oval in outline than a terrestrial slug. Members of this group are no longer classified as belonging to the pulmonates, but to an entirely separate sub-class of the Gastropoda. The colony of *Onchidella celtica* was found on the shady side of a steep rock, at about, or just above, mid-tide level. They were moving around in a fairly active way (the tide was of course low!), apparently coming out of crevices in the rock, crawling without hesitation over *Nucella lapillus* and *Mytilus edulis*, which were also present at this level of the shore, although neither were active at low tide. What proved interesting was that the colony was extremely local to a single large outcrop of rock. Although apparently similar rocks were present, it was only possible to find a single colony on a single rock.

Finally, thanks should go to all the members of the party, for their unflinching devotion to marine survey work under, at times, the most adverse of weather conditions! The group included: Ron Boyce, Thomas Erskine, Colin Gillard, Rosemary Hill, Judith Nelson, Janet Sawyer and Helen and Mike Weideli, all of whom I would like to thank for their records. I also thank Terry Wimbleton for providing records from his previous visits to Hannafore Point.

Table 2. Species list (L = live; S = shell only)

Species	Site																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Polyplacophora																	
<i>Acanthochitona crinitus</i>			L					L			L				L		
<i>Lepidochitona cinereus</i>			L					L			L						
<i>Tonicella marmorea</i>								L									
<i>Tonicella rubra</i>			L								L						
Gastropoda																	
<i>Emarginula fissura</i>	S																
<i>Diodora graeca</i>								S									
<i>Tectura virginea</i>						S		S			S						
<i>Patella depressa</i>	L	L	L	S		L		L	L	L	L	L	L		L		
<i>Patella ulyssiponensis</i>	L		L			L		L				L					
<i>Patella vulgata</i>	L	L	L	L	L	L	S	L	L	L	L	L	L		L		
<i>Helcion pellucidum</i>	L	L		S		L		S			L	S					
<i>Monodonta lineata</i>	L		L			L		L		L	L		L		L		
<i>Gibbula cineraria</i>	L	L	L	S		L		L			L		L		L		
<i>Gibbula magus</i>				S				S									
<i>Gibbula tumida</i>								S									
<i>Gibbula umbilicalis</i>	L	L	L	S		L		L		L	L	L	L		L		
<i>Calliostoma zizyphinum</i>								L			L						
<i>Skenea nitens</i>	S																
<i>Skenea serpuloides</i>	S																
<i>Tricolia pullus</i>	S							L			L	L					
<i>Bittium reticulatum</i>	S							S				S			S		
<i>Lacuna pallidula</i>		L	L			L		L			L						
<i>Lacuna parva</i>	S					L		L			L						
<i>Lacuna vincta</i>		L				L		L									
<i>Littorina compressa</i>						L											
<i>Littorina fabalis</i>		L		S		L		L		L	L	L		L		L	
<i>Littorina littorea</i>		L		S		L	L	L	L	L	L	L		L		L	S

Littorina obtusata						L		L						L		L	
Littorina saxatilis	L	L				L	S	L	L	L	L				L	L	
Hydrobia ulvae											L			L			
Melarhaphe neritoides	L	L	S			L			L	L		L			L		
Skeneopsis planorbis	L					L		L			L						
Eatonina fulgida	L		L			L		L		L	L						
Barleeia unifasciata						L		L		L							
Rissoa guerinii								S									
Rissoa interrupta		L	L			L		L			L					L	
Rissoa parva	L	L	L			L		L		L	L	S				L	
Alvania punctura	S							S									
Alvania semistriata		L				L		L			L						
Cingula trifasciata								L			L						
Manzonina crassa	L	L						L									
Onoba aculeus						L		L									
Onoba semicostata	L	L	L			L		L		L	L					L	
Circulus striatus	S					S											
Caecum glabrum	S							S									
Aporrhais pespelecani	S																
Crepidula fornicata		L		S													
Trivia arctica								S									
Trivia monacha			L					L				L					
Cerithiopsis tubercularis			L			L		L									
Nucella lapillus	L	L	L	L		L		L	L		L	L	L			L	
Ocenebra erinacea			L					L									
Buccinum undatum	L																
Chauvetia brunnea						L											
Hinia incrassata			L					L				S					
Hinia reticulata				S		S		L			L	S					
Cythereella coarctata												S					

Species	Site																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
<i>Rissoella diaphana</i>	S		L			L				L							
<i>Omalogyra atomus</i>						L					L						
<i>Pherusina gulsonae</i> ?	S					L											
<i>Vitreolina philippii</i>	S																
<i>Chrysallida indistincta</i>						L											
<i>Chrysallida obtusa</i>	S							S			S						
<i>Partulida spiralis</i>													L				
<i>Brachystomia rissoides</i>	L		L			L											
<i>Brachystomia spp*</i>	L					L											
<i>Odostomia plicata</i>			L			L		L		L	L						
<i>Odostomia turrita</i>						L		S									
<i>Odostomia unidentata</i>	L		L					L									
'pyramidellids'		L				L		L									
<i>Retusa truncatula</i>	S	L				L		L			L						
<i>Philine punctata</i>											S						
<i>Elysia viridis</i>								L									
<i>Polycera quadrilineata</i>		L													L		
<i>Archidoris pseudoargus</i>			L														
<i>Leucophytia bidentata</i>															L		
<i>Otina ovata</i>						L											
<i>Onchidella celtica</i>													L				
Pelecypoda																	
<i>Glycymeris glycymeris</i>	S			S													
<i>Mytilus edulis</i>	L	L	L	L		L		L	L	L	L	L	L		L		S
<i>Modiolarca tumida</i>								L									
<i>Musculus discors</i>			L			L		L		L	L						
<i>Ostrea edulis</i>				S				S									
<i>Chlamys opercularis</i>				S				L									

<i>Chlamys varia</i>	L																
<i>Pecten maximus</i>	S			S				S									
<i>Anomia ephippium</i>	S	L	S					S		S	L				S		
<i>Heteranomia squamula</i>	L					L		L			L						
<i>Pododesmus patelliformis</i>						L											
<i>Lucinoma borealis</i>		S						L									
<i>Diplodonta rotundata</i>		S		S				S									
<i>Kellia suborbicularis</i>								L									
<i>Lasaea adansoni</i>	L	L	S			L		L		L	L		L		L		
<i>Tellimya ferruginosa</i>	L																
<i>Mysella bidentata</i>	L					L		L									
<i>Goodallia triangularis</i>								S									
<i>Acanthocardia</i> sp.	S											L	S				
<i>Parvicardium</i> sp.						S											
<i>Laevicardium crassum</i>	S	S	S	S									S				
<i>Cerastoderma edule</i>	S			L	S	S	L	L				L		L		L	S
<i>Macra stultorum</i>	L		S					S					S				
<i>Spisula elliptica</i>	L	S	S	S				L									
<i>Spisula solida</i>	S	S		S	S			L				L	S				
<i>Spisula subtruncata</i>				S				S									
<i>Lutraria angustior</i>				S													
<i>Lutraria lutraria</i>		S		S									S				
<i>Lutraria</i> sp.	S								S								
<i>Ensis ensis</i>	S	S															
<i>Ensis siliqua</i>	L		S	S				S				L			S		
<i>Angulus tenuis</i>	L	S															
<i>Arcopagia crassa</i>	S			S				S									
<i>Moerella donacina</i>								S			S						
<i>Donax vittatus</i>	S	S	S										S				
<i>Abra tenuis</i>	S	L					S							S			
<i>Scrobicularia plana</i>							S							S			

Species	Site																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Venus verrucosa				S				L									
Circomphalus casina								S									
Chamelea gallina	S	S	S					S									
Clausinella fasciata	S	S		S				L									
Callista chione	S			S				S				L	S				
Tapes decussatus				S				S									
Tapes rhomboides				S				S									
Venerupis senegalensis		L		S		L		L	S		L				S		
Dosinia lupinus	L	S															
Dosinia exoleta	S	S		L	S			L									
Turtonia minuta						L					L						
Mya arenaria				S													
Hiatella arctica	L	L				L		L		S	L				S		
Cephalopoda																	
Sepia officinalis	S	S															

Swimming slugs

Ken Hill

Hornchurch, Essex

Whilst watering some garden plants a couple of days ago, I saw a very large *Arion ater rufus* approaching one of my wife's small rock plants. I grabbed it quickly and dropped it into a bucket with about two inches of water in the bottom while I finished my task. On returning to the bucket, the slug was climbing upwards, so I pushed it down into the water to see how it coped. A few sideways wriggles and it appeared to move forwards until it touched the side of the bucket. Apparently it retracted the tentacles partly while 'swimming' and the respiratory pore was closed until it had climbed out of the water. A repeat on a juvenile (about three inches long) of the same *A. a. rufus* behaved the same way. Has anybody else similar observations or comments?

Editor's note:

I have seen the same species (from a dissected population) suspend itself on the surface film of my garden pond with mucus in order to get from one eaten *Nymphoides peltata* (fringed water lily) leaf to another, so consuming most of the leaves on the plant. At this stage, the slug was translocated elsewhere! ☐



THE BEER TRAP

(Hic!) Oh dear! (Hic!) She's never going to believe that I fell in by accident! (Hic!) Nor that I had such a hard time getting out! (Hic!)

Diary of Meetings

Conch. Soc. Field Meetings for 1998 are listed separately.

Saturday, 13 December, London: Conch. Soc. joint meeting with the British Shell Collectors Club. Kevin Brown (London). What's in a name? The Natural History Museum at 14.30. Please bring exhibits and/or slides on the theme of unusual names.

1998

Thursday, 14 January, London: The Malacological Society of London. Molecules and Molluscs, Natural History Museum. Contact: Dr David Reid, Natural History Museum, London SW7 5BD. Tel. 0171-938-8750. E-mail: D.Reid@nhm.ac.uk.

Saturday, 14 February, London. Conch. Soc. indoor meeting. The Demonstration Room, Natural History Museum at 14.30.

Saturday, 21 March, London. Conch. Soc. Annual General Meeting. Presidential Address: Brian Eversham. The Demonstration Room, Natural History Museum at 14.30.

Saturday, 2 May, London. Conch. Soc. indoor meeting. The Demonstration Room, Natural History Museum at 14.30.

Wednesday, 25 March, Sunderland: The Malacological Society of London Annual Meeting and AGM. Feeding behaviour in molluscs. Ecology Centre, University of Sunderland at 10.30 a.m. Contact: Mark Davies, tel. 01752 222772 Ex. 7215. E-mail esØmd@environment.sunderland.ac.uk.

Saturday, 10 October, London. Conch. Soc. indoor meeting. The Demonstration Room, Natural History Museum at 14.30.

Saturday, 7 November, London. Conch. Soc. indoor meeting. The Demonstration Room, Natural History Museum at 14.30.

Saturday, 12 December, London. Conch. Soc. indoor meeting. The Demonstration Room, Natural History Museum at 14.30.



Field Meetings 1998

Hon. Programme Secretary:

Rupert Honnor

Henley-on-Thames

Oxon. [REDACTED]
[REDACTED]

Important

*Please remember to inform
the leader if you are attending
a field meeting.*

Saturday, 23 May – Monday, 25 May

Durham area

Leader: Rosemary Hill [REDACTED]

A non-marine meeting at various sites in the Durham area, over the late May Bank Holiday weekend. Details in the March Newsletter.

Friday, 12 June – Sunday, 14 June

Torquay area, Devon

Leader: Rupert Honnor [REDACTED]

A marine field meeting based in Torquay, to help survey some empty 'squares' in the DOMMIC Atlas. Details in the March Newsletter.

Saturday, 18 July

Berkshire

Leader: Michael Weideli [REDACTED]

A stroll and collecting to assist the Berkshire Atlas. Details in the March/June Newsletters.

Saturday, 8 August – Monday, 10 August

North Pembrokeshire

Leader: Sue Davies [REDACTED]

A joint marine and non-marine field meeting, based around Fishguard, to survey the molluscs in North Pembrokeshire, a relatively poorly known area. Details in the March/June Newsletters.

Sunday, 20 September – Saturday, 26 September

Jersey

Leaders: Jan Light [redacted] and Ian Killeen [redacted]

An extended marine field meeting in Jersey, to help with survey work for the DOMMIC Atlas. Jersey is relatively under-recorded in recent times, but should certainly be worth a visit. Details in the March/June Newsletters.

Sunday, 11 October

Ashtead Common and Woods, Surrey

Leader: June Chatfield [redacted]

An autumnal non-marine field meeting to examine Ashtead Common and Woods, near Epsom, Surrey. Details in the March/June Newsletters.

Date to be arranged

South Somerset

Leader: Colin Gillard [redacted]

A non-marine field meeting based in the Yeovil area, to help survey some empty 'squares' in the Somerset Atlas. Details in the March Newsletter.

Other Events 1998

Sunday in late spring: Molluscan Workshop on Cones

Venue: at the Reading Museum

Leader: June Chatfield [redacted]

The Reading Museum has a surprisingly good collection of Cone shells, and this should be an excellent opportunity to have a look at them.

An Introduction to the Collections in the National Museum of Wales, Cardiff

Date to be arranged (but a Saturday, probably later in the year). In order to stimulate research interest and use of the museum's collections, this will be an opportunity for members to be introduced to, and examine parts of, the extensive National Museum of Wales collections of Mollusca. It is hoped to arrange a field meeting in the Cardiff area for the following Sunday. Details in the March Newsletter.

Saturday, 28 November: Molluscan Workshop

Venue: in the home of Judith Nelson in Woking [redacted] An excellent opportunity to meet and discuss these difficult specimens!

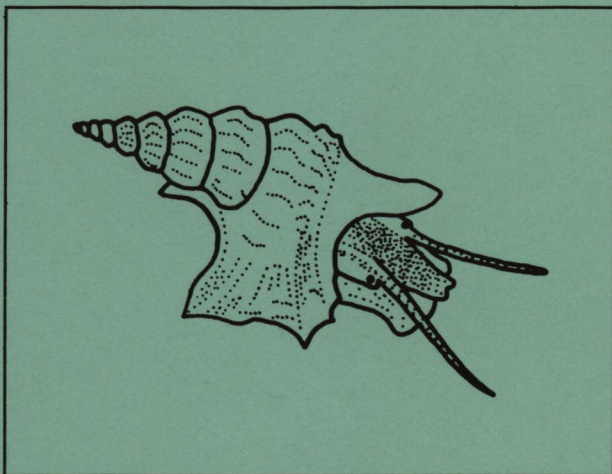
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Past and present: Shell collecting on Kouphonisi

Janet Ridout Sharpe

Wallingford, Oxon

Kouphonisi (ancient Leuke) Island stands like a sentinel off the south-east corner of Crete and fulfilled this role for many centuries, providing early warning to the mainland inhabitants against pirates approaching from the Levant or from the North African coast. (Fig. 1) The possession of Kouphonisi was bitterly contended by the rival Hellenistic city states of Itanos (modern Erimoúpolis, the 'deserted place'), the ruins of which form an extensive but little known complex in the far north-east of Crete, and Ierápytna (modern Ierápetra), which is still a flourishing town on the south coast of the isthmus that separates eastern Crete from the rest of the island. An inscription dated to 132 BC and now set into the wall of the monastery church at Toplou, near the site of Itanos, records that a court of arbitration finally awarded Kouphonisi to Itanos, which was to regard its possession as an inherited right (Papadakis, 1983).

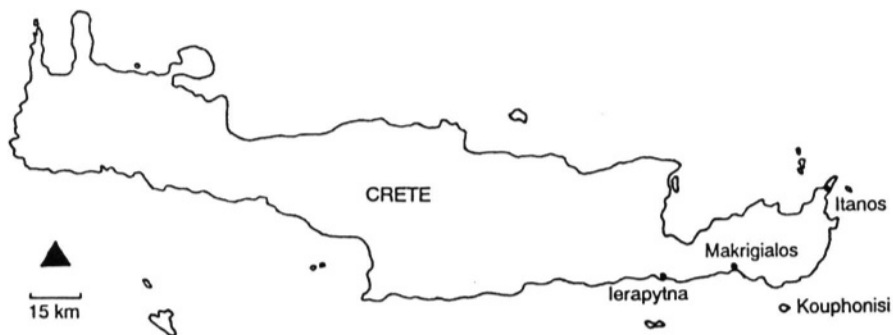


Fig. 1. Map of Crete showing Kouphonisi Island and other sites mentioned in the text.

However, the importance of Kouphonisi was not entirely or even predominantly due to its strategic position. It appears to have been an important centre for the purple dye industry and as such would have provided a major source of revenue for its mother city.

Historically, Kouphonisi is best known as a centre for dye production during the Roman occupation, but an expedition to the island by two British archaeologists, R.C. Bosanquet and C.T. Currelly, in 1903 reported a large accumulation of shells of one of the major Mediterranean dye-producing species, *Trunculariopsis trunculus* (syn. *Murex trunculus*, *Hexaplex trunculus*), in association with Middle Minoan II (c. 1900–1700 BC) pottery (Reese, 1980). On the strength of this evidence, J.W. Jackson in 1929 claimed that Kouphonisi was the earliest known dye-producing centre in the whole of the ancient Mediterranean (Baker, 1975). Reese (1980, 1987) has summarised the evidence for Minoan dye production, which includes crushed *T. trunculus* from the east Cretan sites of Palaikastro (Middle Minoan III/Late Minoan IA, c. 1600 BC), Zakros (Late Minoan I) and Malia (Middle Minoan), and the Late Minoan I villa site at Makrighalós which is one of the closest Minoan sites to Kouphonisi itself.

This summer (1997) the present author collected five crushed fragments of *T. trunculus* as surface finds from the Makrighalós villa site. In addition, 20 (mostly columella) fragments of relatively small shells of *T. trunculus* were recovered as surface finds from the unexcavated Late Minoan III (c. 1450–1050 BC) settlement at nearby Diaskari, in association with six fragments of another well-known dye-producing species, *Murex brandaris*. This appears to be the first record of these dye-producing molluscs from Diaskari and confirms that the industry was widespread in eastern Crete by Late Minoan times. The relatively late appearance of the deeper water-dwelling *M. brandaris* together with small shells of *T. trunculus* could indicate a depletion of stocks of the normally more readily available *T. trunculus* by the Late Minoan. However, the Middle Minoan II evidence for dye production from Kouphonisi, if valid, remains the earliest yet recorded.

It was with great interest, therefore, that I visited Kouphonisi this summer. The island is quite small (approximately 2 x 4 km) and has been virtually uninhabited for at least the last 1000 years (Papadakis, 1983). It was used for grazing sheep and goats until 1976 but now the north side of the island has become largely covered with dunes of blown sand. One or two families of

fishermen take up summer residence in the caves behind the landing beach. However, the past importance of Kouphonisi is demonstrated by the ruins of what must once have been an imposing Roman villa on a headland next to the beach, behind which are the remains of a small theatre with 12 tiers of stone seats showing through the sand. It has been estimated that the theatre would have held about 1000 people, further evidence for the importance of Kouphonisi in the past. Along the top of the low cliff to the east of the villa are the extensive remains of a Roman settlement, now consisting largely of a jumble of masonry with only the outlines of a few rooms and streets discernible. The southern coastline of Crete appears to have sunk, or the sea level to have risen, since Roman times (at Matala on the central south coast some Roman rock-cut tombs are now under water) and parts of the villa have now tumbled into the sea; it is possible that the settlement itself was formerly more extensive. All the visible remains on the north coast of the island belong to the Roman period (first to fourth centuries AD).

Sea shells are notoriously scarce on many beaches in the Mediterranean, doubtless because of the weak tides and absence of a well-defined strand line. In contrast, the landing beach at Kouphonisi was positively littered with small shells. Furthermore, the archaeological site itself yielded a profusion of marine shells. The site was excavated in the late 1970s; from the widespread scatter of potsherds and shells, it would appear that the spoil heaps from the dig were simply spread back over the site. A surface collection of shells yielded a staggering total of 65 species (Table 1). Although there may have been some admixture of modern and archaeological specimens where the beach lapped the villa, the two were readily distinguishable by the worn yet colourful condition of the former in stark contrast to the generally fresh and unworn, yet bleached and often encrusted, condition of the latter.

The most frequent beach species included *Conus mediterraneus* and H.E.J. Biggs' 'Greek love charm' (1963, reported by Reese, 1978), *Columbella rustica*. Both were also common on the Roman site and it is interesting to compare the size and condition of the shells. The cones from the beach were generally smaller (range 9.4

to 35.5 mm, $n = 48$) and considerably worn, and almost half of them had lost their apex; all but one of the 19 shells from the Roman site were intact with a size range of 11.4 to 41.2 mm. One fragment represented an even larger shell and all except one were fresh shells rather than beachworn specimens. Similarly, the *C. rustica* from the beach were small (range 10.2 to 12.8 mm, $n = 41$) and beachworn compared with the 14 shells collected from the site (11.8 to 17.3 mm), most of which were in superb condition. Four of the Roman shells had been holed in the body whorl adjacent to the top of the inner lip; two looked superficially like *Natica*-bored holes but one was irregular in shape and another was imperforate. Similar holes were found in both *Mitra cornicula* shells and two of the four *Sphaeronassa mutabilis* recovered from the site. All three species would make attractive beads and although the holing may not appear best positioned for this purpose it would seem unusual for all these shells to have become naturally holed in exactly the same place.

Despite the fact that the Roman shells were very much out of their original archaeological context, it became apparent that some species were associated with a particular part of the site compared with others. For example, most of the purely ornamental shells or shells with a possible 'ritual' significance occurred at the villa end of the site. These included three fragments and an imperforate spire (115 mm long) of the highly prized triton shell *Charonia sequeenzae*; this shell is a regular feature of archaeological sites in the early Mediterranean from the late Neolithic to Roman times, where it is often found in a ritual context in association with cult objects (Ridout Sharpe, 1991). The villa area also yielded cones, cowries and *Columbella rustica*, all three of which have a slit-like aperture and have been used as sexual symbols from earliest times. Common food species, including ceriths, limpets and *Monodonta* topshells (the 'winkle' equivalents of the Mediterranean) were found all over the site, but predominantly in the settlement area to the east of the villa. Interestingly, most of the topshells were intact, suggesting that the animal was extracted winkle-fashion with a pin; topshells from Bronze Age (e.g. Minoan) sites were typically crushed to remove the meat.

The first *T. trunculus* appeared well away from the villa area, suggesting that the inhabitants of the villa were spared the worst of the smell associated with dye manufacture. Of the 14 specimens collected, most were fragmentary and included three columellas. All appeared to have been live collected and two were apertural fragments of large specimens which must have approached the maximum size of this species (approximately 80 mm). Three of the shells were more or less intact; the smallest (39.6 mm) was virtually complete and may have been discarded because of its size, but the other two (45.9 and 50.0 mm) had the dorsal part of the body whorl (opposite the aperture) broken away, presumably so that the dye-producing gland, which lies in the mantle cavity, could be removed (Fig. 2). Only one fragment of *M. brandaris* was recovered.



Fig. 2. *Trunculariopsis trunculus* from the Roman settlement, broken to remove the dye gland; the larger shell is 50.0 mm high (photo: Dr June Chatfield).

Very large numbers of molluscs were required to produce the dye: it has been reported that one shell contains only 0.1 mg of pure dye and that 12,000 *M. brandaris* were needed to dye the trim of a single garment (Reese, 1987). There were no obvious mounds of shells on Kouphonisi but presumably these were placed well away from the settlement and in any case may since have been exploited for road making or lime production, or simply become buried beneath the sand dunes. The question remains how such large numbers of shells were obtained. Pliny the Elder, writing in the

first century AD, described how the animals were trapped in baited wicker baskets and kept alive in basketwork containers until sufficient had been collected to prepare a dye batch (Papadakis, 1983). Among the thousands of *T. trunculus* shells uncovered during excavations at the Roman sites of Tel-Akko (Acre) and Caesarea, some were found to have small round holes indicative of predator attack; this was interpreted as cannibalism resulting from keeping the molluscs unfed in captivity for a period of perhaps several weeks, until sufficient had been gathered to prepare the dye (Spanier, 1986). Such a hole was evident in one of the intact shells from Kouphonisi, suggesting that these may have been maintained in a similar way.

It is possible that the presence of a large number of species of no known economic, ritual or aesthetic value on the Kouphonisi site in fresh condition could have been a by-product of large-scale trapping or dredging for *T. trunculus*.

Towards the eastern end of the settlement the turban shell *Astraea rugosa* became relatively frequent: this species was represented by 12 worn and sponge-pitted shells, which nevertheless were probably live-collected, ranging from a juvenile only 12.0 mm in diameter to an adult of 40.6 mm. In addition, seven opercula or 'cats' eyes' of this species were recovered, the largest being 14.3 mm in diameter. These opercula, which are colourful when fresh, were sometimes set in jewellery in antiquity but their association with the shells at Kouphonisi suggests that they were not valued there and that their presence was another by-product of the intensive dye shell fishery.

The settlement ended at a small headland which was crowned with a cairn of building rubble, including a column of fine black imported stone. The nature of this building is unclear but it may have been a shrine or funerary monument. The area around it was littered with *T. trunculus* and *Dentalium* shells, which were not found elsewhere on the site.

Surprisingly, two worn juvenile shells of the freshwater snail *Melanopsis praemorsa* were found on the beach. There is no permanent freshwater source on Kouphonisi and these shells were probably brought to the island from the mainland by sea currents.

This passive transport of shells might explain the relatively large numbers which were found on Kouphonisi.

These finds on Kouphonisi Island more than satisfied the interest generated by a visit to the local archaeological museum at Sitia a few days previously. Here an exhibit on Kouphonisi included several shells: a perfect *Charonia sequenzae* approximately 150 mm long and two large *T. trunculus*, each intact except for a hole in the back of the body whorl where the dye gland was removed. In addition, a 'saucer' of shells displayed *Cerithium vulgatum*, *Aporrhais pes-pelecani*, *Cypraea spurca* (syn. *Erosaria spurca*) and *Chlamys varia*, together with others that could not be distinguished. It would be interesting to discover what interpretation the excavators gave for these shells from Kouphonisi, but unfortunately my Greek is not yet up to tackling the site report!

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Table 1. Marine shells collected on Kouphonisi Island, Crete, August 1997

As a very rough guide to the relative frequency of these shells, the numbers collected over a period of about two hours are represented as follows: x (rare, singletons), xx (occasional, 2-5), xxx (frequent, 6-10), xxxx (common, 11-20), xxxxx (very common, 20+).

Species	Archaeo- logical site (Roman)	Beach (modern)
GASTROPODA		
<i>Patella caerulea</i>	xxx	
<i>P. lusitanica</i>	xxx	
<i>Trochus erythraeus</i>		x
<i>Monodonta turbinata</i>	xxxxxx	
<i>M. articulata</i>	xxx	
<i>Gibbula magus</i>	xx	
<i>G. adansonii</i>		x
<i>G. sp. 1</i>	x	
<i>G. sp. 2</i>	xx	
<i>Clanculus cruciatus</i>		x
<i>Homalopoma sanguineum</i>	x	x
<i>Astraea rugosa</i>	xxxx	
<i>Turritella communis</i>	xx	
<i>Vermetus gigas</i>	xx	
<i>V. cristatus</i>	x	
<i>Pirenella conica</i>	xx	xxxxx
<i>Cerithium vulgatum</i>	xxxxxx	xxxx
<i>C. rupestre</i>	xxxx	
<i>Bittium reticulatum</i>	xx	
<i>Aporrhais pes-pelecani</i>	xx	x
<i>Cypraea spurca</i>	xx	
<i>Naticarius hebraeus</i>	x	
<i>Phalium granulatum undulatum</i>	x	
<i>Charonia sequenzae</i>	xx	x
<i>Trunculariopsis trunculus</i>	xxxx	xx
<i>Murex brandaris</i>	x	
<i>Columbella rustica</i>	xxxx	xxxxx
<i>Pyrene scripta</i>	xx	xx
<i>Euthria cornea</i>	xx	
<i>Sphaeronassa mutabilis</i>	xx	xx
<i>Cyclope neritea</i>	xxxxxx	xx

<i>Nassarius reticulatus</i>	xx	xxxxx
<i>N. incrassatus</i>		x
<i>Amyclina corniculum</i>	x	xx
<i>?Fusinus pulchellus</i>		x
<i>Mitra ebenus</i>	x	x
<i>M. cornicula</i>	xx	xx
<i>Conus mediterraneus</i>	xxxx	xxxxx
<i>Melanopsis praemorsa</i>		xx

BIVALVIA

<i>Arca noae</i>	x	xx
<i>Barbatia barbata</i>	xx	x
<i>Glycymeris glycymeris</i>	xxx	xx
<i>G. violascens</i>	x	
<i>Pecten jacobaeus</i>	x	
<i>Chlamys varia</i>	xx	
<i>Gaederopus gaederopus</i>	xx	xx
<i>Lima lima</i>	x	
<i>Ostrea edulis</i>	xx	
<i>Anomia ephippium</i>	x	
<i>Cardita sulcata</i>	xx	
<i>Loripes lacteus</i>	x	
<i>Ctena decussata</i>	x	
<i>?Laevicardium crassum</i>		x
<i>Cerastoderma edule</i>	x	
<i>Parvicardium papillosum</i>	x	x
<i>P. exiguum</i>	x	
<i>Callista chione</i>	xx	
<i>Venus verrucosa</i>	xx	
<i>V. striatula</i>	xx	
<i>Clausinella fasciata</i>	xx	
<i>?Petricola lithophaga</i>	x	
<i>Pseudochama gryphina</i>	xx	
<i>Macra glauca</i>		x

SCAPHOPODA

<i>Dentalium dentale</i>	xxxx
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CEPHALOPODA

<i>Sepia officinalis</i>	x
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Looking at cones

June Chatfield

Alton, Hampshire

Introduction

Cones are particularly popular with collectors on account of their colourful shells carrying a range of patterns that are an inspiration in design. The genus *Conus* is a large one with around 500 species. A number of these are distinctive and easily identified while others are not so readily determined and there are the added problems of beach-worn or juvenile specimens.

Cones are prosobranch (operculate) gastropods that are marine and concentrated in tropical seas, especially the Indo-Pacific region. They occur as far north as the Mediterranean, represented by the small brown *Conus mediterraneus*, and on the other side of the Equator as far south as the Cape in South Africa and New South Wales in Australia (several species). Cones live on rocky shores and reefs from the low water zone down into the sublittoral zone where they are not exposed by the tide. These animals are all predators feeding on worms, other molluscs or fish according to species. Unlike the fast-moving molluscan carnivores the squids which also take fish, cones are slow-moving. By localised testing of seawater, which is sucked in by the proboscis tube and passed over a taste organ, the osphradium, they can detect the presence and direction of prey from a short distance. The cone then moves slowly towards its prey and, when sufficiently close, it everts the mouthparts known as the proboscis. A harpoon-shaped radula tooth charged with poison is detached and this spears the prey, while the injected poison helps to immobilise it: the cone then engulfs the whole animal with its proboscis. Enzymes are secreted and digestion is fairly rapid, enabling the cone to swallow its food and be able to retract into its shell. The neurotoxin of the fish-eating cones is powerful enough to affect humans: the Australian Geographer Cone *Conus geographicus* is known to have caused human fatalities. Other large species can give a painful sting with later reactions, so collectors of live cones are advised to handle them with great care.

The possession of poison glands is a feature of the group of carnivorous prosobranchs known as the Toxoglossa which also includes the auger shells (Terebridae) and the turrids (Turridae), the latter group occurring in temperate British waters.

Cones are a relatively newly evolved group and are known as fossils from only the young rocks extending from the Upper Cretaceous. There are several examples of the family in Eocene faunas which derive from a warmer climate. The comparatively new status of *Conus* explains its active state of evolution and the consequent difficulty in distinguishing between some of the species.

The shells

Shells of *Conus*, as their name implies, are typically cone-shaped with a narrow aperture and small elongate operculum. They range in size from around 1.5 cms (*C. coronatus* – Coronated Cone) to 15 cms (*C. aulicus* – Courtly Cone and *C. betulinus* – Birch Cone) but, as in all groups, one needs to be aware of the abundance of juveniles in any population.

Many cones have **thick and heavy shells** like *C. betulinus* and in the sublittoral zone their weight is supported by seawater, while on shores thickness of shell could have survival value as protection from waves, desiccation or predators. At the other end of the range, *C. geographicus* has a **thin shell** and often needs extra protective boxing in a collection.

The **shape** of the shell in outline is an important feature in the identification of cones. **The nature of the spire** contributes strongly to the overall shape as triangular, like *C. betulinus*, or oval like *C. nussatella* – Nut Cone. Some species are **flat-topped** with a depressed spire – examples include *C. betulinus*, *C. eburnus*, *C. litteratus* – Lithograph Cone and *C. virgo* – Virgin Cone. Cones with **taller spires** include *C. australis* and *C. orgignyi*. In some the **sides of the spire are concave**, like *C. amadis*, *C. generalis* – General Cone and *C. monile*; the spire can be very narrow when compared with the width of the top of the body whorl. **A broader spire with convex sides** is found in *C. episcopus* and *C. nussatella*.

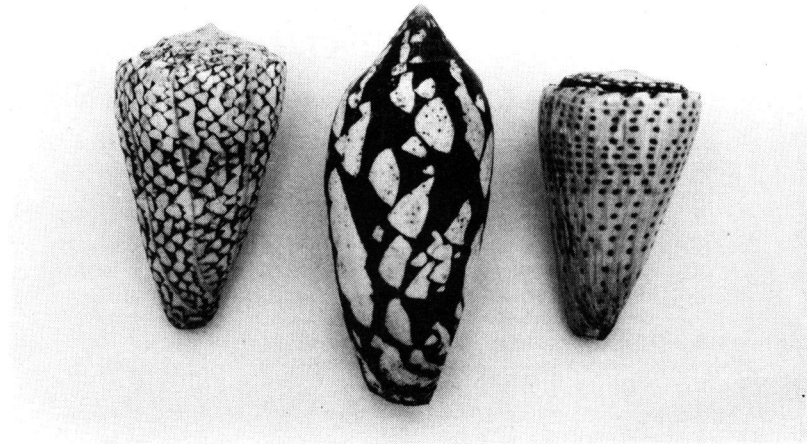


Fig. 1. Cone shells from the collection at Reading Museum.

Left: *Conus marmoreus* (Marbled Cone) showing pattern, low spire and tubercles; Centre: *C. episcopus* (Episcopal Cone) with large pattern and elevated wide spire; Right: *C. leopardus* (Leopard Cone) marked with spiral dashes and a triangular shape due to the relatively flat spire. Photo: J. Chatfield.

In most cones **the shell surface is smooth**, but tubercles occur on the top of the body whorl in *C. arenatus* – Sand-dusted Cone, *C. imperialis* – Imperial Cone, and *C. coronata*, while **spiral ribbing** occurs in *C. nussatella* and *C. sulcatus* – Sulcate Cone. There is a **thick brown periostracum** in many cones which obscures the colour of the shell in life, but is usually removed in preparing the shell for the collection. **The overall shape is more oval** in *C. nussatella* while **a wider aperture** is evident in *C. bullatus* Bubble Cone, *C. geographicus* – Geography Cone, and *C. tulipa* – Tulip Cone than in most other species.

The wide **variation in colour and shell pattern** makes cones particularly popular with collectors of tropical species. Some have virtually **no markings** but others have **spots or dashes** (*C. ebraeus* – Hebrew Cone, *C. leopardus* – Leopard Cone and *C. eburneus*, or **fine dots** like *C. arenatus*, or **continuous spiral lines** as in *C. imperialis*. **Triangular markings** occur in *C. episcopal*

and *C. marmoreus*, while *C. textile* has a **small intricate pattern**. Some cones are **coloured violet inside the mouth**, which include *C. capitaneus* – Captain Cone and *C. scabrum*, or at the base of the columella as in *C. virgo*.

Many of these species of cones are illustrated in colour in general books of world-wide seashells, while the crisp black and white drawings in Van Nostrand's catalogue (Wagner and Abbott 1967) serve to show the range in shape, pattern and sculpture.

Some shells attract interest because of their extreme rarity and there are many stories surrounding the Glory-of-the-Sea *C. gloriamaris* which was a major rarity until the 1960s when divers discovered a local population of them in the Indo-Pacific. It is hoped that this discovery will not compromise the future of the species and that collectors will exercise restraint in taking live specimens of rare shells. A great deal of learning and enjoyment can be obtained from the study of the more common species, which in this group are particularly attractive.

Any member interested in seeing a wide range of cones is invited to the Cone Workshop at Blake's Lock Museum in Reading on 17 May 1998 (see separate notice in 'Other Events', p. 954).

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Pacific Islands Land Snail Group Annual Meeting, 23 June 1997

Ms J.E. Reynolds

Holloway, London

The 11th annual meeting of the Pacific Islands Land Snail Group again took place at the Zoological Society of London (ZSL) meeting rooms after a change in the proposed venue. Paul Pearce-Kelly was acting Chair in the absence of Quentin Bloxham (Jersey Wildlife Preservation Trust are the Chair of the Group). Twenty participants attended, including representatives from the United States and Poland in addition to those from the United Kingdom.

Dave Clarke started the review of wild populations by giving an update on the IUCN *Red List* and CAMP (Conservation and Management Plan) sheets. Although he had sent revisions of the conservation status of the Partulidae to the Mollusc Specialist Group, the current *Red List* still contained some errors. The CAMP tables have yet to be fully revised but the summary had been completed. This document listed 42 taxa as extinct, but participants were reminded that the CAMP system considers taxa at the subspecies level or even lower. Thus separate island populations of the same species may be listed under different threat categories. Anomalous groups, such as the *Samoana* species collected in 1995 which do not fit descriptions of known species, are also regarded as separate taxa.

Paul Pearce-Kelly gave an update of the status of the reserve in Moorea. As reported at the last PILSG meeting, maintenance work and restocking of the reserve was carried out in May 1996. A new monitor, Tony You-Sing, had taken over the monitoring duties at this time, but it transpired that he had not been fully briefed concerning the monitoring protocol, necessitating an unscheduled visit to the reserve in November 1996. There was a hole under one fence and one of the overhanging trees, which had fallen prior to the May visit, was still in place. This meant that *Euglandina* had once again breached the defences, and after effecting repairs a thorough search was made for both *Euglandina* and *Partula*.

Euglandina was found in all four quadrats, and only *Partula suturalis* was found to be present in healthy numbers, its quadrat being farthest from the hole.

The expedition group also met up with Steve Strand, the new Gump Research Station manager, to discuss reserve matters. This meeting seems to have clarified a number of issues, for example the financial implications for Gump Station and monitoring and reporting protocols. As a result the monitoring agreement has now also been produced in French for the benefit of the monitor, and monthly reports are sent from Gump Station to London Zoo via e-mail instead of to Virginia University. This arrangement had been in force since the site visit and was reported to be working well. The actual monitoring protocol involves counting *Partula* from outside the reserve only, although it would of course be necessary to enter the reserve to remove *Euglandina* and carry out repairs.

It was reported that Professor Carole Hickman from the University of California, Berkeley, now has responsibility for overseeing the project (funding for construction for the reserve came from Berkeley; Carole takes over from Werner Loher). Carole is an experienced malacologist who has worked with Mike Hadfield on Hawaiian *Achatinella*. She would be leading a field group of Berkeley students to the reserve site in September 1997 and it was hoped that this visit would enable her to suggest improvements. Since November 1996 flood damage had caused soil erosion on one quadrat, and subsequently a soil engineer would also be visiting the site.

At the time of this meeting the reserve had been in place for three years, but the original purpose had been to provide a single year's data on reintroduction of *Partula* to their native habitat without the presence of *Euglandina*. This data, despite the threefold increase in the length of the project, had still not been obtained because of continued reinvasion by *Euglandina*, inadequate monitoring, other breakdown in communications or a combination of the three. A discussion took place regarding the viability of the project in light of these problems. Although it was clear that the principles were sound, human error seems to have made the project unworkable in practice so far. Concern was

expressed that if similar problems continue to arise, then the project may have to be abandoned. Paul Pearce-Kelly was confident that these problems could be resolved and that as a result of the November visit most of them already had been.

Other interesting finds in the field include a report that the individual specimen of *Samoana* found in the reserve last year was still present, despite the fact that most of the reintroduced *Partula* had been eaten! Additionally the Mt Marau populations of *P. otaheitana* (confirmed extant by Paul Pearce-Kelly in 1994) are still surviving and that *Euglandina* is not present on this site. There was a discussion regarding temperature/altitude tolerance of *Euglandina* and it was decided that more data on these factors should be urgently sought.

Eric Loeve, who previously helped at the reserve, is now a tour guide in Tahiti and continues to look out for Partulidae. He has found several relic populations including new sites in the interior. Samples from each site have been sent to London Zoo and appear to be mostly *P. otaheitana*.

There followed a discussion about *Euglandina*, particularly with regard to the high populations found in the reserve. Justin Gerlach summarised his research into population model analysis looking at the effects of disease on the predator-prey interaction. He suggested that three *Euglandina* per square meter was normal at the point of invasion, and that the reserve may be acting as a 'sink' for *Euglandina*, given the continued reinvasion. *Euglandina* has been observed to enter the reserve by several methods, but it is not clear how easy it is for it to get out again. *Partula* in the reserve are able to travel between quadrats, and there continues to be high numbers of microsnails in the reserve even after leaf litter clearance, providing additional sustenance for *Euglandina*. Thanks were given for additional information on other native Polynesian species, including those contributions from Conchological Society members.

The next agenda item was the review of the captive populations. Dave Clarke summarised the census report, which he had compiled with Redd Warren of Birmingham Zoo (Alabama). Redd has taken over the *Partula* SSP (Species Survival

Programme) studbook from Steve Connors after many years' work with the group. In January 1997 there were 10979 *Partulidae* in captivity. Of the *Samoana* species collected from the Marquesas, one species from Hiva Oa, both species from Fatu Hiva and those from Tahuatu and Nuku Hiva are all now extinct. Only small populations of the remaining *Samoana* species exist but one had shown a slight increase in the preceding year.

A report was given by Viv Frame that some *Partula suturalis strigosa* from Nottingham had been released into the Spalding Rainforest exhibit in 1996. This had originally been suggested by Helen Weideli, as reported in the *Conchologists' Newsletter* Vol. 8: 1 No. 135. Fifty snails were released and since then 11 dead shells had been found. Twenty live snails were counted in December. There is rotting vegetation for the snails to eat and the soil is not regularly disturbed, but factors accounting for the deaths include the presence of quails, geckoes and other small predatory vertebrates, as well as stress-related effects of the transfer from sterile conditions to a semi-naturalistic setting.

Several other experiments into keeping conditions had been undertaken. At Poznan Zoo a terrarium has been set up as a 'half-way house' and the Polish representative, Radoslaw Ratajszczak, reported that four adult *Partula suturalis strigosa* were still alive after almost a year in this environment. Redd Warren said that trials with different substrates had taken place in some of the US collections. A general discussion on naturalistic keeping systems followed. It was clear that the main problems were temperature control and the use of organic/soil-type substrates. Release trials into greenhouse environments were mainly hampered by management of such areas, for example by chemical pest control. It was agreed that these options were worth considering as an alternative to culling, and that some spare *Partula* could be identified for a proper trial in the use of terraria, with samples of gut fauna taken before and after.

The small mixed population of spare *Partula* from the reserve which had been housed at the Museum of Tahiti was declining and Manouche Lehartel had asked if they could be released into the grounds of the Museum. This was thought unsuitable because of

habitat and climate – it is too hot and too near sea level.

Peter Daszak and Andy Cunningham reported on their continuing work into the pathology of *Partula*. About 90% of neonate deaths at London Zoo were recorded as unknown cause, most of the remainder being crushed or lost. The work on flagellates and protozoa in 1997 has shown that they are ubiquitous throughout the US and UK populations, regardless of species of snail or husbandry. Culture experiments for the protozoa were unsuccessful but flagellates were maintained alive for 91 days and some success was had with micro-photography of all five types of flagellates which may assist in identification. Additionally similar flagellates have been found in the faeces of wild-caught uncontaminated *Achatina*, supporting the hypothesis that flagellates are a natural, and possibly beneficial, part of the molluscan gut fauna.

Post-mortem examinations of five *Partula turgida* specimens, including the last individual, had revealed that the cause of death was a microsporidian parasite of the digestive gland, gut and reproductive tract. Electron microscopy identified this as a new species of *Steinhausia*. Members of this genus are found in other molluscs, including aquatic species such as marine oysters. The disease causes mats and other shell deformities due to spore build-up, whilst the parasites in the genitalia prevent reproduction. This is the first ever documented example of an infectious agent causing extinction of a species, although the majority of *P. turgida* had already been eliminated by *Euglandina* in the wild. A drug is available to treat this parasite but it was unsure whether it was approved for use on molluscs.

Three student research projects were summarised and discussed during the meeting. The first of these was by Helen West of the University of Reading who had looked at diet preferences in *P. otaheitana* and *P. suturalis strigosa*. The trials showed a preference for Alan Gardener's diet, and an increased amount of time spent on feeding activity. However, neither result implies that this diet is in any way better; for example the increased feeding time may be because the food is more difficult to digest. A discussion of dietary requirements ensued.

Oliver Gibbs from the University of Westminster had been looking at criteria for captive success in *Partula*. He had compared different characters such as banding, shell shape, distribution radiation and altitude and compared them with survival rates and lambda figures. He had broadly concluded that the most successful snails in captivity were those that were wider and shorter, were generalist in habitat and found at a range of altitudes.

Rajan Amin had been working with Georgina Mace of the Zoological Society Institute on captive-bred *Partula* population dynamics. In Rajan's absence Dave Clarke read the abstract of his study but there was little discussion of the findings. Rajan had postulated that by analysis of the population graphs a decline could be predicted.

Trevor Coote (ZSL) and Sarah Goodacre (Nottingham University) gave an update on genetics work. For the last 2-3 years Trevor has been working on a clone DNA sequence for *Partula* as this is essential before work can progress further. When this is done he should be able to see if there has been any genetic loss over the generations of captive breeding. Genetic markers have been produced but these are not variable across taxa, and so have to be 'tweaked' for each species. Thirty to forty markers have to be produced and it is a simple and cheap technique once the preliminary work is completed. However, Trevor admitted that he was still perfecting the technique so results are slow in forthcoming. He also said that there was little precedent for this kind of work as most genetics has been in evolutionary studies rather than the conservation of gene pools.

Sarah's work was on the genetic variability within species using mitochondrial DNA. She found that *Partula nodosa* has no variation, and therefore would show no resistance to disease. *P. varia* still retains several forms in captivity but which are all very similar genetically. *P. tohiviana*, *P. mirabilis*, *P. suturalis* and *P. taeniata* were found to be more genetically variable. Trevor used a higher resolution technique to verify Sarah's results.

The meeting then broke into several groups, where I joined the discussion on movement of stock with Dave Clarke, Redd Warren, Viv Frame and others. Once again the question arose of whether to

merge separate plot populations or generations. The problem had become somewhat urgent as following the retirement of Professor Bryan Clarke most of the Nottingham University collection (about one third of the entire captive population) will have to be rehoused. Viv Frame will continue to be able to do a limited amount of work with *Partula* at Nottingham.

Discussion centred on *Partula suturalis strigosa*, *P.s vexillum*, *P. taeniata elongata*, *P.t. nucleola* and *P.t. simulans* as these snails have either the highest numbers of individuals or high numbers of plots, i.e. collected from different plots within valleys. Several suggestions were made regarding how these populations could be merged whilst still maintaining genetic diversity. As Georgina Mace was not present Dave Clarke agreed to write the suggestions up in diagram form for Georgina *et al.* to comment on.

It was decided that the Conchological Society's *Partula mirabilis* x *taeniata* colony would be tested again for gut fauna as Peter Daszak was very interested in the high proportion of flagellates present (100% infestation in two separate tests). They would then be rehoused in a semi-natural tank setting for six months, tested for flagellates again, and then culled (despite my protestations) for genetic analysis (see separate report on the colony).

Each group reported back and the day's agreed actions were reviewed. The meeting closed at 5.50 p.m.

□

Shells on ancient coins

Fred Pinn

London

The sacred chank of India has already been dealt with in an earlier article and its appearance has been noted in Travancore, Tibet, Bhutan and Thailand. Another example can be added from north-western India, a region now called Panjab. The coin (Fig. 1) is dated to ca. 250 AD and was issued by the republican tribe of Yaudheyas 'who extended their sway from Rajputana to Panjab'. They enjoyed a certain measure of autonomy under the protection of the paramount power (Kushanas and Guptas), but at a later date 'perished without leaving a trace' – excepting their coins.



Fig. 1

The coin illustrated here shows on one side Kartikeya, the god of war and generalissimo of the army of the gods, and on the other, most likely, Lakshmi, the goddess of good fortune and wealth. The chank is always a symbol of good luck, but what looks like the letter M is most probably the stylised footprints of the goddess, an 'auspicious symbol painted on special days on the floor inside the entrance of a house, inviting, as it were, the goddess to visit and bless the dwelling.

An extension of the region in which the chank is used on coinage is represented by this eighth century AD silver tanka (Fig. 2) of the Pyu Kingdom of Srikshetra in central Burma. The reverse side shows several sacred symbols: (1) the shrivatsa: two whorls of hair, 'a particular mark denoting a great man or signifying divine quality or status symbolising, for instance, Lakshmi, the goddess of good fortune'; (2) between the curls a mountain represents the god Shiva, flanked by (3) the thunderbolt of Indra, and (4) the

sacred conch of Vishnu. The sun and the moon above symbolise the sky (eternity), and the two waves below the ocean.



Fig. 2

Silver coins with shrivatsa emblems were issued by various kingdoms from south-eastern Bengal to Thailand and circulated farther east into Cambodia and Vietnam until the tenth century.

Marine life was a common source of topics in ancient Greek art, particularly in wall paintings and mosaic floor designs. Uncommon, however, was the use of shells on Greek coinage. The bronze coin shown here (Fig. 3) was made at the Greek city of Acragas (modern Agrigento) in Sicily, ca. 5th century BC. Symbolising the town's connection with the sea, this piece depicts a crab and other sea creatures, one of which is clearly a shell. Less clear is its species, which may be the popular *Charonia tritonis* or Triton's trumpet.



Fig. 3

Two further examples come from the Phoenician city of Tyre (south Lebanon). The first coin (Fig. 4) is rather small, measuring ca. 5 mm and dating from the third century BC. It shows only a shell resembling that on the coin from Acragas in Sicily. Though the label insists that it depicts a murex used in the making of Tyrian purple dye, it clearly does not belong to that genus but looks more like a *Charonia tritonis*:

approximate size



enlarged



Fig. 4

The second Tyrian coin (Fig. 5) dates from ca. 200 AD and illustrates the discovery of the purple dye. The story goes that Hercules with his dog in front and his lady love beside him went for a walk along the beach (of Tyre?). As dogs will do, this one too picked up things on the beach and brought them to his master. One such item carried along was a live shell. When Hercules' lady companion looked at the dog's mouth she discovered that both sides of it were stained a beautiful purple colour. She was enchanted with the colour and challenged Hercules to get her some material for her next festive dress in this colour and no other. The purple dye became one of the most expensive articles of trade in the ancient world.



Fig. 5

Although no illustrations are available, the comments by J.W. Jackson on shells on Phoenician coinage are worth quoting:

'The Murex-shell is almost constantly in evidence as a design upon Tyrian coins from AD 112 onwards. The shell here is quite distinct from the so-called "Murex" of pre-Alexandrine coins (circa 450-400 BC). The latter is not a Murex at all, but is more like a Triton, or trumpet-shell; and the same shell appears on the coins of Byblus (c. 350 BC) and of Tarentum (c. 400-330 BC). The Murex of the imperial coins of Tyre (AD 112 onwards) is distinctly like *Murex brandaris*, one of the chief purple-yielding shells.

Whether the design of the Murex (and so-called Murex) on these coins had primarily any connection with the purple-trade of Tyre is doubtful, though this has been suggested by leading authorities.'

(J.W. Jackson, *Shells as Evidence of the Migrations of Early Culture*, p. 5)

□

Jersey Field Meeting

Change of dates

**This meeting will now take place
from Sunday, 6th to Friday, 11th September 1998
(not 20 - 26 September)**

Gentlemen and Players

David Long

Cheltenham

'Gentlemen and Players' was the title of a one-day joint meeting held at the Linnean Society's rooms on 22 November 1997, in which the participating societies were the Malacological Society of London, the Conchological Society of Great Britain and Ireland, the Linnean Society of London and the Society for the History of Natural History. The event was a follow-up to the symposium 'Malacological Pioneers' of October 1994 (*Conchologists' Newsletter* **132**: 446–449 and *Archives of Natural History* **22**(3): 301–447, October 1995). This meeting's papers will also be published in the same *Archives*.

'Gentlemen and Players' was a sequel thematically as well as chronologically for it covered roughly the period 1890 to 1950 and looked at the transition and contrasts between the non-academic and academic approaches to the study of molluscs. As David Allen said in the first lecture of the day, the development of research establishments in the later nineteenth century, beginning perhaps particularly with those attached to German universities, resulted in zoology including the study of molluscs. Their study became subject to new methods of investigation which required both specialised training and expensive laboratory facilities. This change bypassed traditional naturalists, whose methods had remained largely static throughout the nineteenth century, resulting in the introduction of 'nature study' in schools (which had the unfortunate effects of making the subject seem juvenile) and the initiation of ecological fieldwork which, of course, became professionalised.

Subsequent speakers discussed the part played by a variety of non-professional and professional malacologists. J.R. leB. Tomlin (subject of Graham Oliver's talk) was an early retiree whose contacts enabled him to build the Melville-Tomlin collection which is now the basis for the molluscan holdings of the National Museum of Wales. Charles Oldham combined non-marine

malacology with a career in insurance. John Gulick, a close observer of geographic (inter-valley) variation in Hawaiian land molluscs, became a missionary in the Far East. Others, such as A.E. Boycott, A.E. Ellis, and H.E. Quick, were qualified in science or medicine and applied their trained minds and acquired skills to malacological issues including distribution mapping. And last but not least, there were outstanding professionals. For instance, H.E. Crampton made detailed studies of the *Partulidae*. C.M. Yonge, whose publications span more than 60 years, immensely enhanced our understanding of bivalves, perhaps his main subject, although his interests were in all aspects of marine science. J.Z. Young, who died last year, combined a broad range of work as a zoologist with in-depth investigations of cephalopods including their giant nerve fibres and radulae.

It was quite clear to me from this stimulating day that it takes academic training and proper facilities to find out exactly how molluscs function and to conduct advanced phylogenetic studies using such techniques as RNA analysis and the study of enzymes. But it does not follow that all advances in malacology require this level of professionalisation; they may call for organised thought but not for sophisticated methodology, as the eventual breakthrough on variation in *Cepea* showed (Dr Robert Cameron's lecture). Nor does it take excessively high amounts of training to carry out the accurate recording essential for survey work and mapping.

Graham Oliver extrapolated from the story of past endeavours to express concern about the risks of polarisation between 'amateurs' and 'professionals' now, when science is no longer automatically seen as a good thing and is also perceived as remote and arcane with its own terminology and preoccupations. In biology, also, there are signs that resources for the more traditional sorts of professional study (rather than, say, biotechnology) are less easy to acquire than hitherto. Non-professionals need to become enthused, perhaps through working on material in museums, perhaps by imaginative fieldwork, and certainly by means of a better communicating network and more readily available and understandable publications.

It would be interesting to follow this day's meeting with one in

a year or so which looks at the part 'professionals and amateurs' might play in malacology in the next 50 years.

Speakers and topics were:

- David Allen (Wellcome Institute) 'On parallel lines: natural history and biology in the post-Victorian era.'
- Graham Oliver (National Museum of Wales) "Passion to Elitism" or "Conchology to Malacology"
- Nick Evans (Natural History Museum) 'An appreciation of A.E. Boycott and H.E. Quick.'
- Ian Killeen (Malacological Services, Felixstowe) 'Mapping Britain's snail fauna – the years 1900 to 1950.'
- Bryan Clarke (University of Nottingham) 'John T. Gulick and the evolution of island snails.'
- James Murray (University of Virginia) 'Henry Edward Crampton and Mendelian evolution.'
- Laurence Cook (University of Manchester) 'Varieties, forms and freaks of nature: breeding experiments by Charles Oldham and A.W. Stelfox.'
- Robert Cameron (University of Sheffield) '*Cepea* research 1900–1950: too many problems for a solution.'
- Brian Morton (University of Hong Kong) 'C.M. Yonge: Mr Bivalve ..'
- John Messenger (University of Sheffield) 'J.Z. Young: Doyen of Teuthologists.'

With many thanks to all the above who made the meeting such a success, to Professors Robert Cameron and Bryan Clarke and Dr David Reid for chairing sessions, to Kathy Way (Natural History Museum) for organising the display in the Linnean Society library, and especially to Elizabeth Platts on whom the bulk of the organising fell.

□

Roman Snails Live on TV

Keith Alexander

The National Trust, 33 Sheep Street, Cirencester, Glouc. GL7 1RQ

Some readers will be aware of Channel Four's *Time Team* series of programmes in which a task force of expert archaeologists descend on a previously unexcavated site and attempt to find out as much as possible about its archaeology over a period of a few days only. The August Bank Holiday weekend in 1997 was selected for a very special site and for an extended coverage of the dig live. This particular site was believed to be a large Roman villa complex and was situated in the north Cotswolds.

An important component of the programmes is a series of minor features using local experts and craftsmen to re-construct items of everyday use in the period of occupation. So, on this occasion, alongside a craftsman producing some very passable Roman-style pewter, the production team wanted a snail expert to talk about *Helix pomatia* – the Roman snail. The National Trust's Chedworth Roman Villa was contacted and asked to suggest a location where the snails could be filmed. The request was forwarded to Cirencester Office and I duly became involved.

Fortuitously a survey had only recently brought together all available information on sites for *H. pomatia* in the county. It was quickly revealed that there were no known colonies anywhere near the dig site. But, undeterred, the producers asked if some snails could be gathered from a known site and taken up to the dig area for filming. The long dry summer had raised serious doubts in the minds of both myself and Mark George, the Trust's man at Chedworth, about whether any snails would be findable. However, the weather came to our rescue and a long-awaited very rainy day brought the local Chedworth snails out in abundance. Twelve snails were accordingly restrained and transported across the approximately 7 km to the dig site on the day of filming, 23 August.

Snails and myself not being considered of sufficient interest to viewers alone, a 'suitable' woodland site had to be found for filming to conjure up a wild countryside image, 'local' children had to be involved in discovering the snails, and a star presenter brought in – Bill Oddie. The producer and I accordingly visited the

mature beech plantation which she had selected and placed twelve Chedworth *H. pomatia* and twelve locally gathered *H. aspersa* in a variety of situations – on old stumps and logs, at trunk bases, etc. – and then waited for the crew, children and star to arrive. The story to be broadcast was that the children had come to this wood near the long abandoned Roman villa to gather snails for a 'Roman Feast', to be created by another star presenter, *Wild Side* cook Hugh Fearnley-Whittingstall. I was there to describe to the children what a Roman snail looked like and to confirm the identity of any snails found. While the children were searching, Bill and I discussed such things as the history of *H. pomatia* in Britain, how long the snails live, how widespread they still are in the Cotswolds and so on.

Right on cue the first snail was found – one of the *H. aspersa* – so I was able to describe the features which distinguish this from *H. pomatia* and talk about the fact that this species too was almost certainly introduced into Britain for food at about the same time as *H. pomatia*. Eventually we returned to the dig site with **nine** *H. pomatia* – the filming had taken more than two hours and three had managed to elude us!

The storyline was that a Roman Feast was to be prepared, but I had been assured the snails would not actually be eaten and that tinned snails would be used in the feast. As Bill Oddie brought the snails into the cooking tent he protested and would not let them be cooked – at the same time one *H. pomatia* was busy slipping appealingly along the sleeve of his jacket in shot, a very natural performance!

The Roman snail item was duly broadcast 'live' the next day and the nine were returned home to Chedworth, hopefully not too seriously affected by their experiences. The broadcast was very short, barely two minutes, and the conservation message about not taking wild snails for consumption had unfortunately been edited out. We also now had three snails loose in a wood where there had previously been none. But on the plus side, snails had received favourable coverage on a popular television programme.

Reference

- Alexander, K.N.A., 1994, The Roman Snail *Helix pomatia* L. in Gloucestershire and its conservation. *The Gloucestershire Naturalist* 7, 9–14. □

**Field meeting: Northcot Brick and Tile Company,
Blockley, Gloucestershire (SP 182369)
8 November 1997**

David Long

Leckhampton, Cheltenham

Eight of us visited Blockley Brickyard, by kind permission of the Northcot Brick and Tile Company, for a repeat of the April 1994 meeting (*Conchologists' Newsletter* 130, September 1994: 388–389). A ninth member arrived at half-past three, just as the meeting was drawing to a close, but still, I think, managed to make some finds. Despite a particularly dire weather forecast and one member not making the journey from the London area because of strong winds, it turned out to be bright and sunny, so the mud in the pit became slightly drier during the course of the day.

The pit, which has been in existence for at least 50 years, is in the clays of the *Tragophylloceras ibex* zone towards the top of the Lower Lias (c. 150 million years BP). It appeared that excavation has ceased for the winter and that stockpiled *ex-situ* clay was being used for brick-making. We were able to wade down to the section, pausing only to remove the odd seven pounds of clay from our wellies every 20 yards or so, locate the Blockley Shell Bed, a half-metre thick part-indurated band with abundant large molluscs about seven metres from the bottom of the pit, and briefly examine the clays above and below it. But most of our time was spent searching spoil heaps and excavated clay to find specimens which had been washed or weathered out.

With thanks to Phil Palmer for identifying, or checking the naming of, specimens brought to the Society's indoor meeting of 13 December, we collected (*or noted in the field) the following, nearly all from the Blockley Shell Bed:

Bivalvia: *Ryderia graphica* (Tate, 1870), *Cosmetodon buckmani* (Richardson, 1843), *Modiolus scalprum* (J. Sowerby, 1820), *Modiolus* sp.*, *Parainoceramus ventricosus* (J. de C. Sowerby, 1823), *Pinna folium* Young and Bird, 1822*, *Pseudopecten*

acuticostata (Lamarck, 1819), *Antiquilima antiquata* (J. Sowerby, 1818), *Plicatula spinosa* J. Sowerby, 1819, *Gryphaea depressa* Phillips, 1829, *Mactromya cardioides* Phillips, 1829, 'Astarte' *platymorpha* Cossman, 1916, *Cardinia attenuata* (Stuchbury, 1842), *Hippopodium ovale* Moore, 1867 (*, fragments), *Tutcheria submulticostata* (d'Orbigny, 1850), *Sphaeriola subglobosa* (Tate, 1876), *Pholadomya costata* (Young & Bird, 1822), 'Platymya' *concinna* (Tate, 1876) (found by Rosemary Hill and Ron Boyce, and retained by Phil Palmer).

Gastropoda: *Pleurotomaria debuchii* Deslongchamps, 1849, *Eucyclus subimbricatus* (d'Orbigny, 1850), 'Mathilda' 2 species (one specimen of each, retained by Phil Palmer – one found by Colin Gillard on his first-ever fossil hunt).

Cephalopoda: Belemnnoidea *Passaloteuthis apicurvata* (Blainville, 1827), *Hastites spadix-ari* (Simpson, 1855); Ammonoidea *Lytoceras fimbriatum* (J. Sowerby, 1816)*, *Beaniceras luridum* (Simpson, 1855), *Liparoceras cheltiense* (Murchison, 1834), *L. pseudostriatum* Trueman, 1919.

The clays below the shell bed have a somewhat different fauna, which mostly appears on bedding planes; it includes what appear to be small *Entolium* sp(p). and small ammonites. Samples of this clay have been washed and examined by Phil Palmer who found an abundant microfauna which will include new records for the site. A further sample for Phil was collected on this occasion.

Other conspicuous invertebrates were pentacrinoid ossicles, especially on rain-washed surfaces of pieces of clay where they occur with what appear to be small pyritised burrow casts.

As in 1994, Phil Palmer's faunal list was an indispensable aid for this visit.

With many thanks to all who attended this surprisingly successful meeting.

□

An unusual pattern of stranding

Rupert Honnor

nr. Henley-on-Thames, Oxfordshire

The recent discussions in the *Conchologist's Newsletter* of unusual strandings of marine shells and the ordering of particular valves on shores, put me in mind of a similar experience that I had a few years ago. My wife and I were on holiday in Hawaii and, of course, looking along the beaches for what could be found. We stopped at a beach on the south-eastern side of the island of Kauai – close to where *South Pacific* was filmed but I can't remember precisely where – which was devoid of shells, but one, central section was covered with the opercula of a *Turbo* species (presumably *Turbo sandwicensis* Pease, 1861, which is the only *Turbo* species known to live in the Hawaiian Islands). The 'patch' of opercula was quite low on the shore, and quite large, say about 50 metres long and about 3–4 metres up and down the shore, and they reached densities of about 50–100/m² in the centre. The individual opercula were about a centimetre in diameter, brilliant white on the internal flat side, and most retained a splash of chestnut or brown over the white on the external convex side, suggesting that they were relatively 'fresh'. As you may imagine, the opercula stood out dramatically against the golden sand – they were quite visible from a distance, but you had to get up to them to figure out what they were.

I have no idea what combination of tides and weather caused this stranding of opercula, without any accompanying shells, and likewise I have no idea whether this was a single event, or a regular occurrence. Interestingly, there was no evidence of worn, bleached *Turbo* opercula higher up the shore, suggesting that this was indeed a single, 'freak', event. Although *Turbo* opercula did turn up, occasionally, elsewhere on Hawaiian beaches, it was never alone, without any stranded shells, and never in such huge numbers.

□

About *Planorbarius corneus* and introductions

Nora McMillan

Bromborough, Wirral

Planorbarius corneus is such a familiar snail that its distribution in Britain has been blurred by widespread introductions.

In Northern Ireland it is not native, yet R.L. Praeger recorded it 'on the Lough Neagh shore on the Down/Antrim boundary in 1936 and 1937' (Praeger, 1938). As relating to this record I would like to draw attention to statements by the late A.W. Stelfox about an earlier Lough Neagh record. His remarks also illustrate a frequent source of 'records'.

The statement in Stelfox's ms. journal is 'A specimen of *Planorbis corneus* was found in Lough Neagh gravel at "Oakleigh", Ormeau Rd., Belfast by C.V. Stevenson when with me. A.W.S. 1898.' I wrote to Stelfox regarding this, and his reply (*in litt.* 25.10.1956) was:

'It was undoubtedly L. Neagh gravel and I saw the friend pick it up, but we had an artificial pond made in the rock-garden and McKim of Bot. Gdns. [Botanic Gardens] made it & he may have stocked the pond with *Lymnaea stagnalis* and *P. corneus* as that was considered the proper thing to do, as I found when the B.N.F.C. visited the Daisy Hill Nurseries at Newry and saw a tank filled with both these species ready for stocking, so I was told, any pond they made. I wonder, did anyone look to see if those species were in the Bot. Gardens pond?

Anyhow, please take no notice of the supposed record!"

[signed A.W. Stelfox]

Reference

Praeger, R.L., 1938. *Irish Naturalists' Journal* 7: 54.

□

Conchological Society of Great Britain and Ireland

MINUTES

**1077th (Ordinary) meeting held on 3 May 1997 in the
Demonstration Room of the Natural History Museum
starting at 2.30 p.m.**

In the chair: Mr B. Eversham with 29 members and friends present.

Apologies for absence: Mrs McMillan, Mr de Bartolomé, Mrs Turk, Mr & Mrs Rands, Mrs Light, Mr Killeen, Dr Willing, Miss Davies, Mr Aldridge, Mr Negus, Mrs & Miss Fogan, Mr Dance, Mr Crowley, Mr Pinn, Mr Smith, Mrs Long.

Minutes of the last meeting (of 1 February 1997): Read and accepted.

Matters arising: None.

Nomination and election of new members: One full member and two student members were nominated and elected:

Full:

Mr P. Kirkland, Butterfly Conservation, PO Box 12477, Edinburgh, Scotland, EH1 2YE.

Students:

Mr T.J. Wright, Biological Science Department, Lancaster University, Lancaster LA1 4YQ.

Mr D. Horne, Department of Zoology, University of Cambridge, Downing Street, Cambridge CB2 3EJ.

Announcements and correspondence:

- The Society Display Boards will be on show at Haslemere Museum, Surrey, during May. It is hoped that they will be at Surrey Heath Museum in Camberley during June.
- On Sunday, 18 May there will be a Society Workshop on Exotic Limpets, organised by June Chatfield.
- Forthcoming field meetings are: 1-7 June, West of Plymouth, leader: Rupert Honnor. 28 June, Arun Valley, West Sussex, Leader: Martin Willing. 19 & 20 July, North Wales coast, leader: Tom Clifton. 28 September, Reading area, leaders: June Chatfield and Rosemary Hill.
- Next indoor meeting will be on Saturday, 11 October.

- Mrs Platts gave details of the second Malacological Pioneers conference, to be held on 22 November. This will be a joint meeting between the Conchological Society of Great Britain & Ireland, the Malacological Society of London and the Society for the History of Natural History.

Lecture of the day:

Speaker: David Reid (Natural History Museum, London)

Title of talk: Evolution of *Littorina*: Wonderful Winkles!

Any other business: None.

Meeting closed at 5.05 p.m.

Chairman

Appendix: Members' exhibits

David Reid	British <i>Littorina</i> species.
E.O. Bishop	Some land snails from Paphos District, Cyprus
Rupert Honnor	West American <i>Littorina</i> species.
Jane Reynolds	1. Institutional members publications 2. Press cuttings 3. Snail jewellery for sale 4. Spare AGM reports.
Liz Platts	Ray Society and Malacological Society goods
J. Chatfield	Photographs taken at Reading Museum 'World of the Snail' – March 1997
Kevin Brown	1. Uruguayan Marine Shells 2. <i>Tectarius pagoda</i> (Linne) 3. J. Rosewater, <i>The Family Littorinidae in the Indo-Pacific</i> Pt. 1 Subfamily Littorininae, Pt. 2 Subfamilies Tectariinae & Echininae (<i>Indo-Pacific Mollusca</i> Vol. 2 No. 11 & 12).



Diary of Meetings

Conch. Soc. Field Meetings for 1998 are listed separately.

Saturday, 14 March, Buckden: Yorks. Conch. Soc. field meeting. Langstrothdale and Cray Ghyll area. Meet at Buckden National Park car park, SD 943774 at 11.00. Contact: David Lindley [REDACTED]

Saturday, 21 March, London. Conch. Soc. Annual General Meeting. Presidential Address: Brian Eversham: Biogeography and local conservation. The Natural History Museum at 14.30.

Wednesday, 25 March, Sunderland: The Malacological Society of London Annual Meeting and AGM. Feeding behaviour in molluscs. Ecology Centre, University of Sunderland at 10.30 a.m. Contact: Mark Davies, tel. 01752 222772 Ex. 7215. E-mail es@md@environment.sunderland.ac.uk.

Saturday, 2 May, London. Conch. Soc. indoor meeting. Adrian Rundle (London): Lower Tertiary molluscs – a diverse assemblage. The Natural History Museum at 14.30.

Saturday, 2 May, Hull: Yorks. Conch. Soc. field meeting. North side of Humber bank. Meeting at 11.00 at point to be arranged. Contact: David Lindley [REDACTED]

Sunday, 17 May, Reading: Cone Workshop, to examine some of the less well known cones in the Museum collection. Reading Museum, Town Hall, Reading, 14.00–17.00. Organiser: June Chatfield [REDACTED] Bring your own cones for identification, and reference books.

Saturday, 20 June, Sherburn in Elmet: Yorks. Conch. Soc. field meeting. Sherburn ponds. Joint meeting with freshwater biological section of Yorks. Naturalists Union. Meet at lay-by by church, SE 486333 at 11.00. Contact: David Lindley [REDACTED]

Saturday, 5 September, Kettlewell: Yorks. Conch. Soc. field meeting. Kettlewell cron sites. Joint meeting with freshwater biological section of Yorks. Naturalists Union. Meet at car park in Kettlewell, SD 968723 at 11.00. Contact: David Lindley [REDACTED]

Saturday, 3 October, Low Dalby: Yorks. Conch. Soc. field meeting. Calcareous springs in Dalby Forest area. Meet at car park in Low Dalby, SE 856875 at 11.00. Contact: David Lindley [REDACTED]

Saturday, 10 October, London. Conch. Soc. indoor meeting. Martin Willing (West Sussex): Biodiversity Matters – What's been going on? The Natural History Museum at 14.30.

Saturday, 24 October, Leeds: Yorks. Conch. Soc. Annual Meeting and presidential address. Leeds City Museum at 13.00.

Saturday, 7 November, London. Conch. Soc. indoor meeting. Georges Dussart (Canterbury): After Boycott ... The Natural History Museum at 14.30.

Saturday, 21 November, Cardiff: Exploring Tomlin's Legacy. An introduction to the Melville-Tomlin Collection and an opportunity to examine specific groups of interest. National Museum of Wales, Cardiff. All day. Organiser: Graham Oliver [REDACTED]

Saturday, 28 November, Woking: Conch. Soc. Molluscan Workshop. Contact: Judith Nelson [REDACTED]

Saturday, 12 December, London. Conch. Soc. indoor meeting. A review of molluscan survey progress. Chaired by Ian Killeen (Felixstowe). The Natural History Museum at 14.30.

□

Field Meetings 1998

Hon. Programme Secretary:

Rupert Honnor

Henley-on-Thames

Oxon. [REDACTED]

Important

*Please remember to inform
the leader if you are attending
a field meeting.*

Saturday, 18 April and Sunday, 19 April

South Somerset

Leader: Colin Gillard [REDACTED]

Further mapping for the Somerset Mollusc Atlas.

Saturday, 18 April, a.m.: A private nature reserve and country wildlife site where habitats include unimproved calcareous grassland, woodland, tufa springs, stream, pond and valley mire.

Saturday, 18 April, p.m.: A Somerset Wildlife Trust reserve and CWS with 16 acres of unimproved marshy pasture with stream, set over the calcareous Yeovil Sands. In addition, if time and inclination allow, a visit to a site on the River Parrett where debris from recent flooding revealed evidence of many mollusc species.

Sunday, 19 April, a.m.: A hilltop Forestry Commission Reserve where Fullers Earth Clay is overlain by Forest Marble and Cornbrash; coniferous and broad-leaved woodland with clearings.

Sunday, 19 April, p.m.: Sutton Bingham Reservoir – an arm of the reservoir with marginal and emergent vegetation.

Friday, 17 April: An optional extra day could be arranged with visits to other interesting sites!!

Contact Colin Gillard for a full itinerary and location maps.

Tourist Information Centre at Yeovil (01935-471279), or alternatively at Taunton (01823-336344).

Initial meeting place on Saturday at Crewkerne railway station (grid ref. ST 453085) at 9.30 a.m. to meet the 7.10 a.m. train from Waterloo.

Saturday, 23 May – Monday, 25 May

Durham area

Leader: Rosemary Hill ()

A 3-day meeting to examine some ancient woodlands on the River Wear, alder carr(s), Zechstein reef fossil sites/land snail sites near Sunderland, and a coastal limestone valley with woodland and grassland.

Meet at 10.30 or at 14.00 hours on the Saturday outside Sainsbury's supermarket at the Arnison shopping centre, 3 km north of Durham City, grid ref. NZ 273459 on the Landranger 88 Ordnance Survey Map (which contains all the sites to be visited).

Accommodation would be best sought in the vicinity of Durham City. Further details and meeting places may be obtained from the leader if contacted before 20 May.

Friday, 12 June – Sunday, 14 June

Torquay area, Devon

Leader: Rupert Honnor ()

A marine field meeting based in the Torquay area of Devon, to help survey some empty 'squares' in the DOMMIC Atlas. I recommend the Landranger 202 Torbay & South Dartmoor map.

Friday, 12 June: Meet at Broadsands car park, south of Paignton (grid ref. SX 896973) at 12.00 (low tide 14.40), to work north over sands to Saltern Cove. Followed by Durl Head, Brixham (car park grid ref. SX 941562) at 14.30 to work south towards Sharkham Point.

Saturday, 13 June: Meet at car park near Coleton Fishacre (grid ref. SX 910512) at 12.30, to work Ivy Cove (low tide 15.00). Followed by Hope's Nose, Torquay (road, grid ref. SX 944635) at 15.00.

Sunday, 14 June: Meet at car park in Shaldon (grid ref. SX 937718) at 13.00 to work outer shore (low tide 15.30). Followed by work either inside the River Teign mouth on the Salty (no move required), or at Maidencombe (car park, SX 926684) at 15.30.

Contact the leader for further details. Accommodation plentiful in the area.

Saturday, 4 July
Mottisfont Estate, Hampshire

Leader: Martin Willing

Details in the June Newsletter.

Saturday, 18 July
Berkshire

Leader: Michael Weideli

A stroll and collecting to assist the Berkshire Atlas. Details in the June Newsletter.

Saturday, 8 August – Monday, 10 August
North Pembrokeshire

Leader: Sue Davies

A joint marine and non-marine field meeting, based around Fishguard, to survey the molluscs in North Pembrokeshire, a relatively poorly known area. Details in the June Newsletter.

Sunday, 6 September – Friday, 11 September
Jersey

Leaders: Jan Light and *Ian Killeen*

Please note change of dates.

An extended marine field meeting in Jersey, to help with survey work for the DOMMIC Atlas. Jersey is relatively under-recorded in recent times, but should certainly be worth a visit. Details in the June Newsletter.

Sunday, 11 October
Ashtead Common and Woods, Surrey

Leader: June Chatfield

An autumnal non-marine field meeting to examine Ashtead Common and Woods, near Epsom, Surrey. Details in the June Newsletter.

Other Events 1998

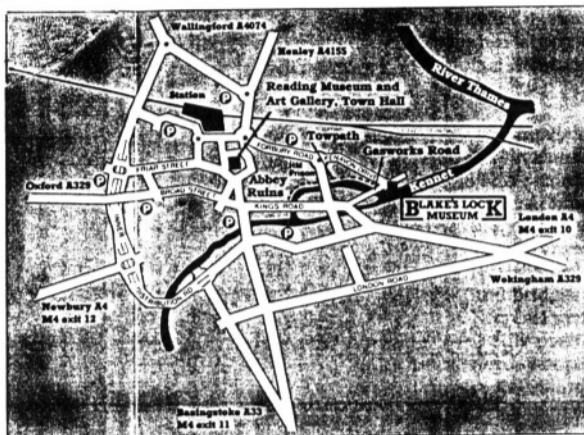
Sunday , 17 May: Reading Museum – Cone Workshop

Venue: Blake's Lock Museum, Gasworks Road, Reading, 2–5 p.m.

Leader: June Chatfield

This workshop provides an opportunity to see a wide range of species of tropical cones and to help with naming of some identified material. Bring identification books as available and hand lenses and any specimens you would like to compare against the museum collection.

Due to building works in the Town Hall branch of the museum, the workshop this year will be at the branch museum of Blake's Lock. It is within walking distance of Reading railway station. Access by foot and car is along Kenavon Drive, leading off the Forbury Road roundabout. Footpath along the Kennet from the back of Forbury Gardens and Abbey ruins. See map below. Car parking in museum – private car park – ask at reception on arrival.



Saturday, 21 November: 'Exploring Tomlin's Legacy'

An Introduction to the Collections in the National Museum of Wales, Cardiff

Organiser: Graham Oliver

Venue: National Museum of Wales, Cardiff.

In order to stimulate research interest and use of the museum's collections, this will be an opportunity for members to be introduced to, and examine parts of, the extensive National Museum of Wales Melville-Tomlin Collection of Mollusca. Details in the June Newsletter.

Saturday, 28 November: Molluscan Workshop

Venue: in the home of Judith Nelson in Woking An excellent opportunity to meet and discuss those difficult specimens! □