

Glycymeris glycymeris is a species for which worn shells have been reported from archaeological sites throughout the Mediterranean area and the Iberian Peninsula, and occasionally from the British Isles. A high proportion of these shells bear a hole in the umbo; various processes may account for these holes. Using *Glycymeris* as a case study, the importance of considering the biology, ecology and living environment of molluscs whose shells feature archaeologically will be examined.

FIELD - Wednesday -Saturday
26-29 April

Anglesey and the Lleyn Peninsula
Leader: Tom Clifton
(01248 853359) (home)
(07767 494355) (mobile)
Clifton@seaspray.fsnet.co.uk

See separate article on page xx.

FIELD - Saturday 20 May

Suckley Hills, Worcestershire.
Leader: Harry Green
(01386 710377) (home)

FIELD - Saturday and
Sunday 3-4 June

Harestanes centre, Jedburgh. Joint meeting with Scottish Borders

Biological Records Centre
Leader: Adrian Sumner
(01620 894640) (home)

FIELD - Saturday 24 June
Lincoln area.

Leader: Chris du Feu
(01427 848400) (home)

FIELD - Saturday 8 July
Stanford reservoir, Leicestershire.

Leader: James Potter
(0116 279 9029) (home)
jamespotter@operamail.com

NHM - Saturday 9 September
14:30h in the Demonstration Room.

We welcome as Guest Speaker Ben Rowson from Cardiff on the subject of 'The enigma of the Streptaxidae, a group of tropical land snails'.

FIELD - Saturday 16 September
Wimbledon Common, South London

Joint meeting with the London Natural History Society
Leader: June Chatfield
(01420 82214) (home)

FIELD - Saturday 7 October
Bracklesham Bay, West Sussex.
Marine/fossil joint meeting with

Newbury Geology Group and Kent Geologists' Group
Low tide 0.2 m is at 17:40 bst
Leader: Adrian Rundle
(020 8878 6645) (home)

NHM - Saturday 21 October
14:30h in the Demonstration Room.

We welcome as Guest Speaker Geraldine Holyoak from Camborne on the subject of 'Land molluscs of Malta'

WKSHP - Saturday
25 November

The annual workshop held in Woking offers members the opportunity to receive tuition on identifying difficult groups. Bookings to Judith Nelson (01483 761210)(home)

NHM - Saturday 9 December
14:30h in the Demonstration Room.

We welcome as Guest Speaker John Llewellyn-Jones from West Mersea on the subject of 'Slugs and snails and -----?'

Snail Thoughts by J.E. Rudd

Who knows what a snail thinks as it sits immobile for countless hours.

Is it contemplating its umbilicus like the Hindus and their navels?

Is it thinking of the universal echoes of its shell:

the whirlpool, tornado; the petals of a daisy; the double helix; the unicorn's mythical horn; the Cosmos?

Does the snail count Fibonacci's numbers as its own Golden Spiral expands?

Quickly when young, the whorls enlarge: 1,2,3,5,8, 13, 21.

Eventually the gargantuan calculations become as heavy as the shell and make the snail so ponderously slow.

There's the angle to permutate, the degree of keel, the height of the spire, the opening of the mouth, the flare of the lip.

Endless equations to muse upon as complex as the architect's draft composer's crescendo or Mandelbrot set.

Does the snail eternally wonder where its better nature lies?

Neither male nor female, but both. No personality conflict, or gender discrimination.

Both halves of a whole, at one with itself, or schizophrenic in the extreme? Symmetrical and asymmetrical, thus neither: opposite and complimentary, hard and soft, inside out and outside in. A paradox of fleshy parts or a harmony, a duality, like yin and yang.

Does it wonder why its not revered, worshipped for its perfect spiral, celebrated for its bisexuality, idolised as a fusion of opposites, symbolic of unity and equality; macrocosm and microcosm contained within a shell?

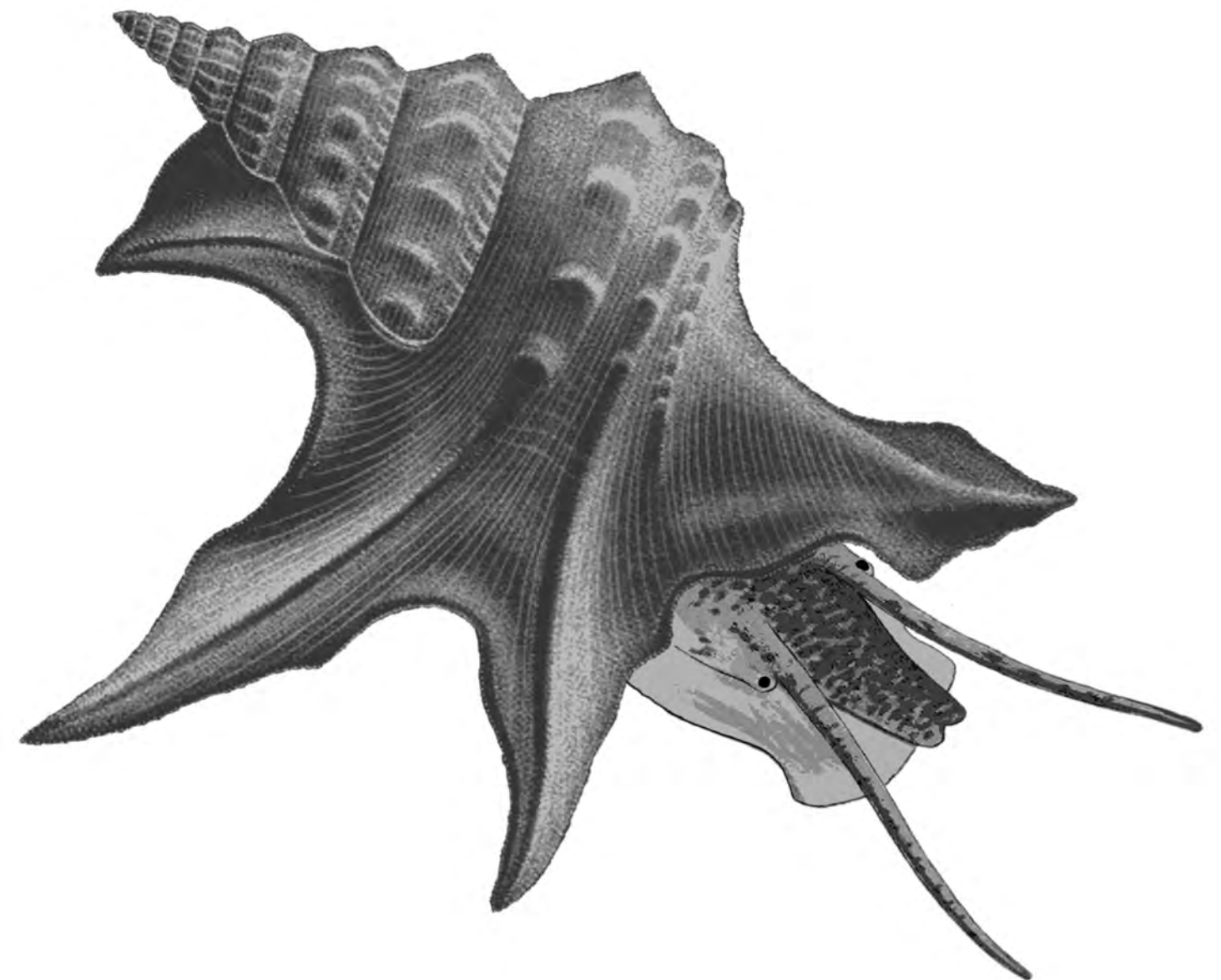
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Mollusc World

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THE MAGAZINE OF THE CONCHOLOGICAL SOCIETY OF GREAT BRITAIN & IRELAND

Editorial

So here we are with a bumper edition of *Mollusc World*. I have been pleased to get so much copy for MW9 such that I was able to increase the number of pages to 28 and include six pages of colour. This, I'm afraid, is not going to be a permanent feature though, it is compensation for 2 of the previously 'short' issues. However, I hope that this will stimulate some sort of revival for the fortunes of the magazine - I already have 2 articles that I couldn't put in this issue. So start compiling!

One thing *Mollusc World* is particularly short on is News, so I would be gratefully if those of you who 'have their ear to the ground' or spend lots of time internet surfing would send me suitable newsworthy material. It is not as though there is nothing happening out there in the world of malacology!

The Society also needs to hear views from Members - what do you like about the Society, what don't you like, how can it be better for you? Use *Mollusc World* to air your

views, good or bad, let the Council know what you think of the Society. Do you want the magazine to be used for informing you of the business side of the Society - what does go on in those long Council meetings before the indoor meetings? Do you need more feedback - if so, in what form? How can the Society best serve your interests? Let us know.

In the meantime, Happy Christmas to all.

Ian Killeen

Mollusc World

Mollusc World is published 3 times a year by the Conchological Society of Great Britain & Ireland at the end of March, July and November, and is issued free of charge to members.

We invite all members to contribute to *Mollusc World*. In addition to the traditional articles, field meeting reports, diary of events and so on, we will be including features, profiles, news from recorders, and identification keys. Do not feel that you have to write long or full page articles. We would particularly welcome short pieces, snippets, pictures, observations, new records, book reviews, mollusc recipes, cartoons, requests for information - anything on molluscs! *Mollusc World* will become an important means of staying in touch with the membership and communicating information to the conservation agencies and promoting molluscs to the wider biological community. So, please contribute!

Copy is acceptable in any format - electronic, typed or legible hand-written. When sending copy by email, please ensure that you include *Mollusc World* in the email title and also include a few lines of text in your message as well as an attachment. Unidentified attachments may not be opened! Please do not include diagrams or pictures embedded in the text - send them as separate attachments. To enable the best reproduction and resolution, any original artwork, diagrams, colour prints or slides should also be sent by 'snail' mail. All will be treated with care and returned. At the present time, we are unable to give precise copy deadlines until we are up and running, but contributors should assume that copy date is a minimum of 8 weeks before publication date.

Neither the Hon. Editor nor the Conchological Society of Great Britain & Ireland accept responsibility for any opinions expressed by contributors.

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Society Notes

Founded in 1876 the Conchological Society of Great Britain & Ireland is one of the oldest existing societies devoted to the study of molluscs. The Society promotes the study of molluscs and their conservation through meetings, publications and distribution recording schemes. The Society publishes *Journal of Conchology* (twice a year) and *Mollusc World* (three times per year).

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Ordinary Membership	£33.00
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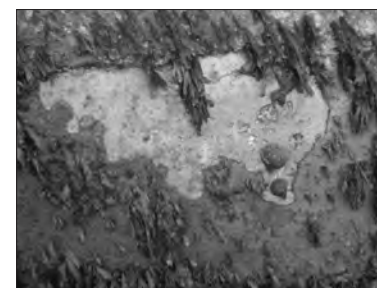
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Field Meeting Report: Thanet 25 - 26 June, 2005 Celia Pain

For a mid-summer meeting, the weather on Saturday was disappointing. A very strong north easterly wind stopped the tide from going out as far as it should at Margate and made the sea very rough. A small party assembled at Sacketts Gap (TR373713): Ron Boyce, Rosemary Hill, Rupert Honnor, John and Richard Llewellyn-Jones, Robin Shrubsole and myself and worked out towards Foreness Point. The Margate chalk ledges are the largest in Europe. Foreness Point has



Photos: John Llewellyn Jones

vigorous tidal currents around it, carrying dead shells into Sandwich Bay.

The Chalk ledges are eroded into runnels. On the top are beds of *Mytilus edulis*, with large numbers of brightly striped *Nucella lapillus* eating them. In the runnels there are millions of *Littorina littorea*, the other species of wrinkle were relatively rare. *Lepidochitona cinereus* was fairly common under stones. The soft Chalk is packed with live borers: *Pholas dactylus*, *Barnea candida*, *Barnea parva*, *Petricola pholadiformis*, *Hiatella arctica*, and there are dead *Zirphaea crispata*. *Sabellaria* worm tubes provided habitat for *Graphis albida*, *Noemiamea dolioliformis*, which were retrieved from microscopically-sorted samples.

Although the tide did not go low enough to expose sandy areas where burrowing sea anemones might live (prey of *Epitonium* spp.) we were delighted to find large numbers of *Epitonium clathratulum* in strandline samples. Two non-native species were found: *Crassostrea gigas* and *Ruditapes philippinarum*, both are farmed at Whitstable 25 kilometres (15 miles) to the west. Live *Abra alba* and *Donax vittatus* were found in Palm Bay

The next day we assembled at the new Sandwich Bay Bird Observatory Trust (SBBO) Field Centre. Rupert and Robin were replaced by Jan Light and two field Centre staff, Kelly O'Sullivan and Lynda Thyer. We were concentrating on finding live sand and mud species so we dug and sieved with gusto, following the tide down. We found live *Abra alba*, *Macoma balthica*, *Fabulina fabula*, *Donax vittatus*, *Cerastoderma edule*, *Maetra stultorum*, *Spisula solida* and *Ensis arcuatus*. The molluscs in the sand occurred about one per spadeful c.15cm x 10cm = 60/m². It is interesting that the mid-shore tide lines accumulate large quantities of worm tubes, coal and dead shells. Sandwich Bay's long shell species list is for mostly dead material and reflects the fact that they are derived from several habitats: Sandwich Bay itself, the muds of Pegwell Bay, salt-marsh and the Chalk. There is reputed to be a strong tidal current around Thanet which transports hard ground species into the Bay. One of the naturalists in the Field Centre was telling us that after the 1988 hurricane the Environment Agency brought in

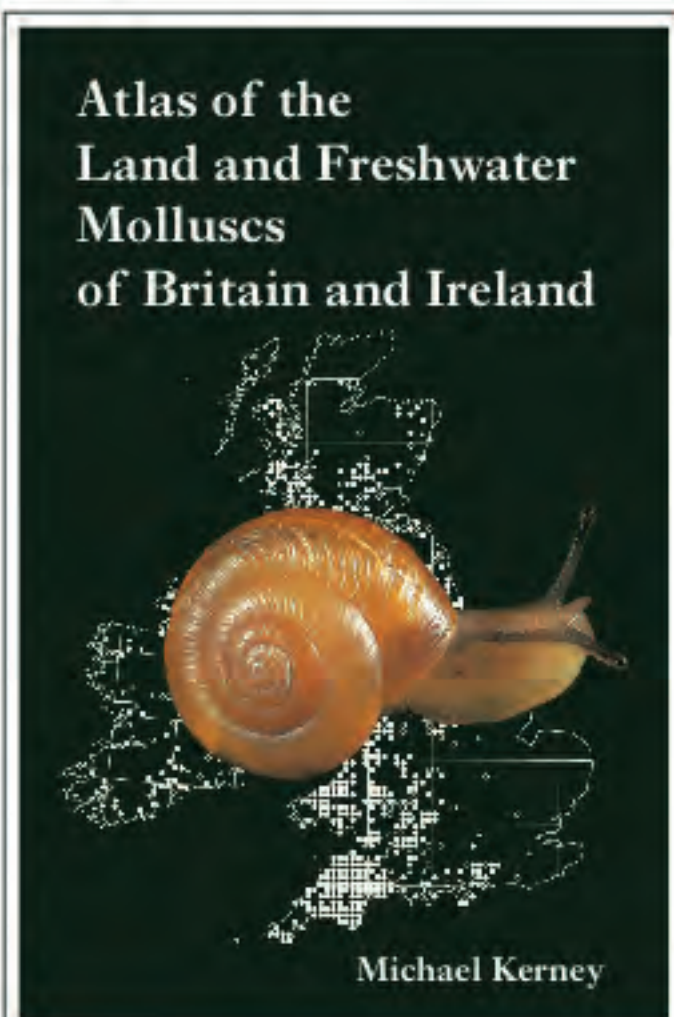
shiploads of submarine gravels from the Isle of Wight area to make up the gravel which had been lost. He thought that *Pandora* shells that are found occasionally might be derived from those imported gravels. Perhaps the occurrence of dead shells of *Cerithiopsis pulchella* (a Southern species whose distribution in the British Isles is focused around south western coasts) is also attributable to transport by this means. Engaging local people in conversation and tapping into such specialist knowledge is valuable in informing our interpretation of the species we find during fieldwork, and the anthropogenic movement of sediments around our coasts is a factor which needs to be considered in future when shell species turn up in areas which are disjunct from their known geographic range.

A full list of species for both days can be found on the Society website.

Recently *Moerella donacina* has been found twice by the previous SBOB Conservation Officer. It seems to be living in the Bay. This is an upgraded record for this area.

Sandwich Bay and Pegwell Bay National Nature Reserve form a Site of Special Scientific Interest. The stabilised sand dunes and salt marshes have a wonderful flora and fauna and terns nest at the north end of the beach. We were warned to keep away from them! Quantities of lizard orchids were growing beside the road and were naturalised in gardens, fairly amazing!

We were welcomed with drinks at the outset and when we got back from the beach more drinks and a wonderful fruit cake made for us by Kelly. We were made very welcome by the Centre director Kev Thornton, he showed us the interpretative centre, laboratory, lecture hall and accommodation for up to 20 people engaged in field work at the Bay. It is very, very nice, computer programs, artificial beaches, displays and a bookshop. Society members are welcome to work there. Look at the Website: www.sbbo.co.uk or telephone 01304 617341.



Special Offer

Atlas of the Land and Freshwater Molluscs of Britain and Ireland

by Michael Kerney, PhD, past-president of the Conchological Society published in association with The Conchological Society of Great Britain and Ireland.

'Rarely can one welcome the publication of a book so wholeheartedly and recommend its purchase by every school, university, biology department, and other scientific library together with any individual remotely interested in biodiversity, biogeography, conservation or, indeed, non-marine Mollusca.'

John Crothers, *Field Studies*

'... the book is a must for all specialists and, being relatively inexpensive, it is really an important guide for all who wish to more fully understand the British countryside.'

John F. Potter, *The Environmentalist*

'Let us hope that browsing the atlas will stimulate us to be more careful in our observations and be more assiduous in sending in records.'

Anthony Cook, *Bulletin of the Malacological Society of London*

'Plenty to keep aspiring conchologists in business for some time to come.'

R. Anderson, *Bulletin of the Irish Biogeographical Society*

Following introductory chapters on 'The early history of recording', 'The mapping scheme', 'Factors influencing distributions', 'The history of the British fauna' and 'The future', the atlas treats each species concisely, with short notes on its habitat, history (including fossil occurrence) and status (based on Red Data Book criteria), as well as its range outside the British Isles; a dot-distribution map and a black-and-white illustration. The book concludes with a select bibliography; maps illustrating environmental factors influencing molluscan distribution; lists giving the names of the recorders and localities mentioned in the text; and an Index.

This book, published in 1999, attracted many plaudits, some of which are quoted above. For further details, with illustrations, see our website: www.harleybooks.com.

**special price to members of the Society of £17.50 (a saving of £7.50) + £4.25 p. & p. **

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1. Toothwort *Lathraea squamaria* in Areley wood on 2 April 2005. Photo: Rosemary Hill
2. View from Abberley hill on 1 May 2005. Photo: Ron Boyce
3. Shells in leaf litter sample from Areley wood on 2 April 2005. Photo: Ron Boyce
4. Rock with Silurian fossils on Abberley hill on 2 April 2005. Photo: Rosemary Hill

Images 1-4 relate to Wyre Forest Field Meeting. Page 5



Images 5 relates to the *News from Ireland* article. Page 7. Ornamental lake with *Vertigo moulinsiana* habitat, Curragh Chase, Co. Limerick (photo E. Moorkens)



Images 6 relates to the Anglesey & Llyn Peninsula article. Pages 5-6. 6. Llyn Maelog

Field meeting to Wyre Forest outliers, 2 April 2005 Ron Boyce

The main block of the Wyre Forest in Worcestershire is on relatively acid soils, but there are small outcrops of limestone on the edges of the area which are often difficult to find but could support a greater range of mollusc species. It was with this in mind that we arranged a meeting to two woodland sites immediately south of the forest. The meeting was led by Rosemary Winnall of the Wyre Forest Visitor Centre, who has invaluable local knowledge.

From the Visitor Centre we travelled to Areley Wood at SO 791711. The wood is accessed from the very narrow and winding B 4194 Ribbesford Road from which there is a right of way into the wood.

Areley Wood consists of mixed deciduous woodland. Most of it is oak/hazel coppice on Silurian red sandstone, but there are ash trees in places and the sandstone occasionally contains bands of Spirorbis limestone which are rather hard to find. Some of the plant species present, which include *Paris quadrifolia*, are indicators of ancient woodland, but there are signs of former mining activity in the wood so this is not a completely undisturbed site. There were a number of clumps of the parasitic plant *Lathraea squamaria* in flower when we visited.

A general search of the area yielded the following species: *Discus rotundatus*, *Arion ater* agg., *Arion subfuscus*, *Arion distinctus*, *Arion intermedius*, *Vitrina pellucida* [shells],

Aegopinella nitidula, *Oxychilus cellarius*, *Oxychilus alliarius*, *Oxychilus helveticus*, *Limax maximus*, *Deroceras reticulatum*, *Cochlodina laminata*, *Clausilia bidentata*, *Trichia striolata*, *Arianta arbustorum*, *Cepaea nemoralis* and *Cepaea hortensis*.

Leaf litter collected from a patch of *Chrysosplenium oppositifolium* near a stream additionally yielded shells of *Acicula fusca* and live *Carychium tridentatum*, *Cochlicopa lubrica*, *Cochlicopa lubricella*, *Acanthinula aculeata*, *Vitrina pellucida*, *Vitrea crystallina*, *Nesovitrea hammonis*, *Aegopinella pura* and *Euconulus fulvus*. *Acicula fusca* is not common in the Midlands and it would be worth while to do more sampling at this site to see if it could be found alive. As with any wood where there may be pockets of more calcareous substrata, more detailed sampling could yield more species.

In the afternoon we went further south to Abberley Hill woods at SO 769681. The woods have several rights of way across them including the Worcestershire Way and are situated on a rather narrow plateau on top of an extremely steep hill and form a noted landmark with splendid views over the area. The vegetation is of ash and sycamore on fossiliferous Silurian limestone containing the remains of trilobites and other creatures. The early purple orchid *Orchis mascula* is abundant here.

We only had time to survey Shaver's End, the northernmost part of the wood. Mollusc species encountered were

Cochlicopa lubrica, *Cochlicopa lubricella*, *Lauria cylindracea*, *Ena obscura*, *Discus rotundatus*, *Arion ater* agg., *Arion subfuscus*, *Arion circumscriptus* seg., *Arion distinctus*, *Vitrina pellucida*, *Vitrea crystallina*, *Vitrea contracta*, *Nesovitrea hammonis*, *Aegopinella nitidula*, *Oxychilus cellarius*, *Oxychilus alliarius*, *Oxychilus helveticus*, *Limax maximus*, *Cochlodina laminata*, *Clausilia bidentata*, *Monacha cantiana*, *Trichia hispida*, *Cepaea nemoralis* and *Cepaea hortensis*.

Rosemary Hill and myself made a further visit to these woods on 1 May 2005. A scree slope near SO 768679 yielded *Lauria cylindracea*, *Discus rotundatus*, *Arion subfuscus*, *Arion circumscriptus* seg., *Arion hortensis* seg., *Aegopinella nitidula*, *Oxychilus alliarius*, *Limax maximus*, *Cochlodina laminata* and *Clausilia bidentata*. Further up the hill on the Worcestershire Way at SO 768674 we found shells of *Vitrina pellucida* and live examples of *Discus rotundatus*, *Arion ater* agg., *Arion intermedius*, *Aegopinella nitidula*, *Limax marginatus*, *Deroceras reticulatum* and *Cepaea nemoralis*.

Much more remains to be done at such a large site, particularly in the damper areas at the base of the hill and below the quarry. The southern end of the wood nearest Great Witley has not yet been looked at.

Our thanks are due to the owner of Areley Wood Mr Reynolds-Lacey for kind permission to investigate this site.'

Society Field Meeting Advertisement Anglesey & the Llyn Peninsula Wednesday, 26 to Saturday, 29 April, 2006

Leader: Tom Clifton [Tom has prepared a more detailed pack including maps. Members hoping to attend should contact him on Clifton@seaspray.fsnet.co.uk or 01248 853359]

Introduction

Since the post 1991 survey of the Anglesey Sea Area S23 was started, 47 new records have been confirmed, some of which are new records for the Irish Sea. Some of the most notable examples being, *Graphis albida*, *Alvania beanii*, *Alvania carinata*, *Sepia elegans*, *Sepia orbigniana*, and *Rissoa lilacina*. The surveys have highlighted a number of species-rich shores on the south west coast of Anglesey, and the north coast of the Llyn Peninsula, and I am confident that there are many more new records waiting to be found. The purpose of this field meeting is to survey some of the best

of these hot spot areas, (we can by no means cover all of them in one meeting). to see if a wider range of live records and possibly some new ones can be found.

The group will be looking at two of the best sites on south west Anglesey and two on the north Lley Peninsula including a unique area at Porth Dinllaen where this sheltered bay hosts a vast area of eel grass. It will also provide a unique opportunity to see New Zealand oysters, living wild and abundantly in the Menai Straits.



Porth Dinllaen



Traeth Mawr



Nefyn

There will also be a fresh water lake to visit on Anglesey and a National Nature Reserve.

Programme

Wednesday, 26 April

1. Non-marine - Newborough Warren. Anglesey (SH425635). Meet at the car park adjacent to Llyn Rhos-ddu (SF1426647) at 10.00. Newborough Warren is a vast area of dunes and ancient scrubland and hosts a large

number of wild ponies. The northwest boundary adjoins Newborough Forrest, a vast area of conifers managed by the Forestry Commission. The southeast boundary adjoins Traeth Abermenai, an extensive area of tidal sand flats at the southern entrance to the Menai Straits. On the southwest boundary are the more recent sand dunes and three miles of sandy beaches. The area is managed by the Countryside Council for Wales as a National Nature Reserve.

2. Marine (0.6m tide at 15.46) - Traeth Mawr (Aberffraw) (SF Good shell sand can be collected from the high tide line at this point. Meet at the parking area at Aberffraw Dunes (SH357690) at 13.00.

There will be a 0.75 mile walk along the Afon Ffraw and over a shelly bank at the river mouth, which is an excellent shell collecting area; some of my best samples of *Scaphander lignarius* have come from here. There is a short sandy beach on the left, which is in one grid, which the group can look at. The best area by far however is the rocky area on the west side of the river mouth, which is in the next grid. Just above this is a major gathering area of shells at the upper tide line where numerous species can be found along with excellent shell sand. Some new records have come from here, one small fragile shell which disintegrated on inspection and could not be sent for verification looked like a *Cuspidaria* sp., one I would particularly like to find again in the shell sand.

Thursday, 27 April

3. Non-marine - Llyn Maelog (Sf1323730), near Rhosneigr. Meet at lay-by opposite the path on the A4080 at (SH322 728) at 10.00. See map 2. This is a public access lake with various land owners and a section of shore on the east side which is controlled by the Ynys Mon Anglers Association who have

given the group permission to survey their area. Apart from one area on the west side at Ty Hen where there are CCTV cameras, we should be able to survey most of the lakeshore.

4. Marine (0.5m tide at 16.46) - Rhosneigr (SH313727). Good shell sand can be collected at (SH316732). Meet in Rhosneigr car park at (SH318730) at 14.00.

This is possibly one of the best lower shore rock areas on Anglesey. At low tide, it is basically a shallow lake surrounded by high rocks on all sides, all of which are submerged at high tide and is probably the main source of shell sand that occurs at Rhosneigr. It should be an excellent site for live records and possible new ones too.

Friday, 28 April

5. Marine (0.5m tide at 16.46) - Nefyn (SH302408), Lley Peninsula. Meet at the beach car park in Nefyn (SH302407) at 11.30.

Exceptional shell sand can sometimes be collected at this point. (note: - the tide times at this part of the Lley Peninsula are 35 mins. earlier than in the previous two areas on Anglesey). The tide should be low enough to collect a sample of shell sand from here. The beach itself however is not particularly interesting at this point, flat sand with scattered stones down to the sub littoral. There is a rock headland to the west, which separates it from the next bay at Porth Dinllaen, which is by far the more interesting site.

6. Marine (0.5m tide at 16.46) - Porth Dinllaen (SH276415). Meet at the National Trust car park in Morfa Nefyn (SH282407) at 13.30, there is a £2 parking fee at this point.

Although Porth Dinllaen is on the north coast of the Lley Peninsula, there is a rock/clay headland which projects northwards and hooks round to the east such that at one point, the shore is almost facing south. The 60ft high cliffs protects the inner part of this bay from all winds except those from the east and these have only a short distance to travel across the bay. This results in a uniquely sheltered bay which



Rhosneigr



Barras



Porth Dinllaen

hosts an extensive area of eel grass *Zostera marina*, which can be seen just below the water line in the picture on page 1. Potentially, this may possibly be the best site in the Anglesey sea area and has yielded up many species, some of which are new records for this area. This is also a

perfect location for diving and snorkelling, and if anyone is interested, it could be a way of assessing the extent of the eel grass beds. There are also excellent catering facilities right on the shoreline.

Saturday, 29 April

7. Marine - It is suggested that the main part of today is spent conducting a review at my home in Benllech, of the shell sand found on the previous days surveys. I have one microscope and holding tank facilities for live specimens but if as many people as possible could also bring one with them, it will help this event greatly. My address is Seaspray, Rhianfa, Benllech, Anglesey, LL74 8RA, 01248 853359, email Clifion@seaspray.fsnet.co.uk (SH5 19820). All members of the group will be welcome. See map 4.

A non-marine event can be arranged for those who prefer it.

8. Marine(tide at 18.18) - Barras (Menai Strait) (SH480655). Park at the roadside at this point at 1 7.00.

A walk northwards along the shoreline will give the group a chance to see New Zealand oysters *Tiostrea lutaria*, living wild and abundantly in this area. *Tiostrea lutaria* was introduced some years ago into near-by oyster farms by the Ministry of Agriculture and Fisheries, and are now abundant in many areas of the Straits south of here and also along parts of the south west coast of Anglesey. This will be a unique opportunity to collect good shell specimens. Please note however:- This is adjacent to a major oyster and mussel farming area and there will be oyster baskets at low tide to the south of where the group will be and should be avoided.

Theba

Who would exist where you are,
Bound to leathery Sea Beet
Alive in a sandy wind
Blowing from the pensive waves?
Declaring, by rounded bunches
Like pale hazel nuts,
A bold and fecund presence
Above an inhospitable dune;
You wait for rain.

Withdrawn from the barbeque heat
Into a quiet calcium night,
A world of gulls and picnic parties
Beyond the crisp confining grasses
Continues beneath the sun.

Peter Topley

BOOK SALE DECEMBER 10TH 2005

In addition to the Book Auction advertised in *Mollusc World 8*, there will be a Sale of Books which have been donated to the Society at the December meeting. They include Geology texts, Geological monographs and books on assorted Natural History topics. These will be on sale throughout the Meeting.

News from Ireland

Evelyn Moorkens



County Limerick is rather less rich in terms of good mollusc habitats and numbers of the more uncommon species than some of the adjacent counties with extensive areas of calcareous rocks such as Clare or the fens and wetlands of the upper Shannon river system. However, on a recent project I had the opportunity to survey what turned out to be a particularly rich site.

Curragh Chase Forest Park lies a few km east of Adare, County Limerick. It is a Special Area of Conservation, owned and managed by the Irish Forestry Service (Coillte). The site comprises 247 hectares of primarily woodland and wetland. The geology of the site comprises limestone overlain in places by glacial till. The habitats include several woodland types, grassland, streams, lakes, wooded crags and fens. Within the greater estate plantation lies the original desmesne, with the main house overlooking a parkland arboretum and an ornamental lake. The site has been the subject of studies by many botanists, ecologists, vertebrate and invertebrate specialists.

The molluscan fauna of Curragh Chase was rich and diverse and contained several species of note. The survey yielded 63 species of molluscs, of which 17 were aquatic species (10 gastropods and 7 bivalves) and 46 were terrestrial (36 snails and 10 slugs). Most importantly were *Vertigo moulinsiana* and *Vertigo angustior*, both listed on Annex II of the European Union Habitats and Species Directive.

Vertigo moulinsiana was found on tall carices around the margin of the ornamental lake in front of the house (see photo) and on *Schoenus* and *Cladium* in a rich fen (with *Schoenus nigricans* and *Carex viridula*) to the south-west of the Forest Park. In Ireland, the species occurs mainly in the Midlands (especially between the Royal and Grand Canals) as far as the Shannon in the west and Longford in the North. There is also an old record for County Kerry. *Vertigo angustior* was found in the transition zone litter and grasses in a marsh on the slopes above the *Schoenus* fen. It occurred on tussocks within the marsh and also in the transition zone with *Festuca rubra* and *Potentilla anserina*.

The woodlands and wooded crags also support a rich molluscan fauna which includes the locally scarce snail, *Spermodea lamellata*.

This survey provided the first records for both *Vertigo moulinsiana* and *V. angustior* in County Limerick. As these are both Annex II species, this is of considerable importance. There are very few places in Ireland where both of these species occur in close proximity within one site. Thus Curragh Chase is an important molluscan site both locally and nationally, particularly the *Schoenus* fen and surrounds. However, the site is small in area and is particularly vulnerable to changes in grazing practice and hydrology.

I am grateful to Coillte for facilitating the survey.

Strange and familiar: Some notes on Molluscs from La Palma, Canary Islands by Peter Topley

A trip to La Palma, the most westerly of the volcanic Canary Islands, in February this year (incidentally during the coldest and wettest February weather experienced in the islands for more than forty years) provided the opportunity for a brief look at both the marine and non-marine mollusc fauna. Examining the rock pools and black volcanic sand of the bay near our holiday apartment at Los Cancajos on the East coast I soon began to realise that the marine fauna here is a curious mixture of Atlantic, Mediterranean and West African influence. A spectacular find were animals of the Opisthobranch "bubble shell" *Micromelo undatus* (Brug., 1792) in a large rock pool on the lower shore (figure 1); this (Dance, 1983) or a similar species is also found on the other side of the Atlantic in the warm waters of Atlantic from Florida to Brazil. The remains of other species which indeed do travel the seas were also washed up on the shore: the spiral internal shells of the cephalopod *Spirula spirula* (L. 1758); and two species of pelagic violet sea snails *Janthina janthina* (L. 1758) and the less common *J. exigua* (Lam. 1816). There were shells of species found in the UK such as *Diodora graeca* (L., 1758) and *Turitella communis* Risso, 1826 alongside familiar looking shells which are in fact Canary Island/Madeira/Azores endemics such as *Gibbula candei* (d'Orbigny, 1838), *Littorina striata* (King, 1832) and *Patella candei* d'Orbigny 1840. In addition were delicate shells of the Canary Island Ormer which has been described to be a form of a Caribbean species (*H. coccinea* Reeve, 1846) which settled on the Canaries [*Halotis coccinea canariensis* F.Nordsieck 1975] however it is probably a southern form of the familiar *H. tuberculata* (L., 1758). Two other species I found here which are found on both sides of the Atlantic are *Polonices lacteus* (Guilding 1834) and the cowrie *Erosaria spurca* (L., 1758) (collectors sometimes call the cowries from the Canaries *E. spurca* form *atlantica* Monterosato, 1897). Walking on the shore one morning after

stormy seas revealed what was for me the most exciting marine find, a perfect shell of the Terebrid *Hastula lepida* (Hinds, 1843); a West African species occasionally found on La Palma and Tenerife (and thus the only locality in Europe of a member of this family).

Inland the island of La Palma is dominated in the north by the mountainous Caldera de Taburiente which is flanked by laurel forests of international importance. In the south around Fuencaliente is a landscape of more recent volcanicity. There are small fields with stone walls together with some uncultivated areas. In such a varied landscape there are a number of possibilities to find a variety of non-marine molluscs, and the wet weather helped on this occasion in what is often a dry landscape away from the cloud forest of the high calderas. As with the marine species, some of the landsnails were familiar from the UK such as *Lauria cylindracea* (Da Costa, 1778), *Oxychilus draparnaudi* (Beck, 1837) and *Helix aspersa* (Muller 1774). Perhaps the most common of the snails not found in the UK was the small helicogonid *Caracolina lenticula* (Michaud, 1831), under stones, beside walls, beneath plant litter on banks. Also common on walls and under stones in cultivated areas was *Ferussacia follicula* (Gmelin, 1790) (Figure 2) There was a specimen of the Canarian endemic genus *Hemicycla*, *H. vermiplicata* (Wollaston, 1878) on rocks under Pinus canariensis south of Monte de Luna where I also found representatives of the local Enidae genus *Napaeus*. In the laurel forest of the Los Tilos Biosphere Reserve was a large Vitrinid, probably the La Palma endemic *Plutonia (Insulivitrina) solemi* Ibanez & Alonso 2001 (Figure 3). Also in this area, whilst looking for fungi on a rotten log, a member of our party found a dead shell of another familiar UK species, *Carychium (Saraphia) tridentatum* (Risso, 1826). Although a dead shell it may represent the first record of this genus from La Palma. Other species

found in a variety of localities include *Monilearia* and/or *Xerotracha* sp., but their identity remains to be confirmed.

The Canary Islands have long been studied for their unique natural history. A naturalist friend of mine often says that if Darwin had visited the Canary instead of the Galapagos Islands he would have come to the same conclusions as he formulated his theory of evolution. The mollusc fauna is perhaps less spectacular than the botany, yet many workers have found it marked with the same uniqueness and interest.

I would like to express my thanks to Adrian Norris for comments and help with identification of the non-marine specimens.



Images 1 - 3 relate to the *Strange and familiar* article. Photos Peter Topley

Oddly coloured *Helix* in Suffolk...

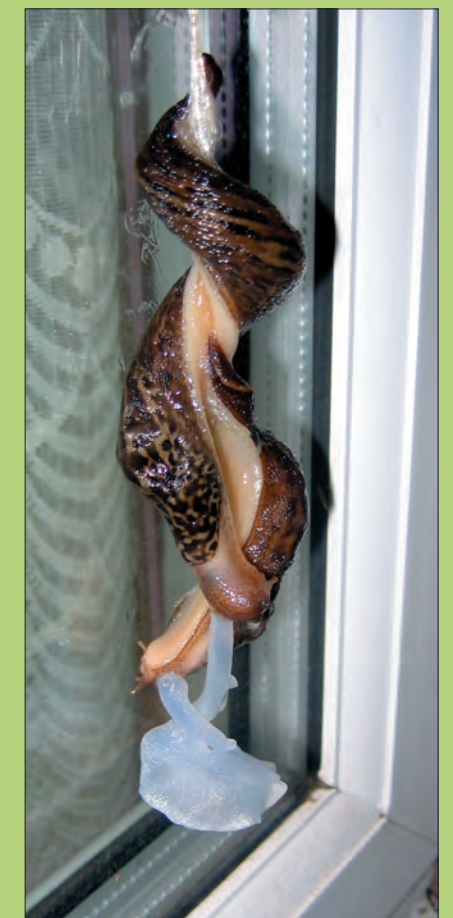
On the 19th of August, after a morning of persistent rain, I returned home from work for lunch (as usual and, crawling on the grass, by our front path, was the specimen illustrated on page 9. I've often seen lighter than usual coloured examples of *Helix aspersa* in the garden but never as pale as this one. Does anyone have any suggestions as to why this specimen was like this – could it be down to diet or is it some sort of albino form (the body and general morphology is exactly the same as every other specimen I've ever seen).

Thanks in advance for any help!

Jonathan Welsh
jonandlynn@foundit.fsnet.co.uk



Fig. 1 & 2 . Examples of *Helix aspersa*
Photos Jonathan Welsh



This image relates to the article **Happy slapping slugs** by Ben & Rhian Rowson on page 11. Photo Ben Rowson

Conchological Society Website

Introduction

The Society's website (<http://www.conchsoc.org>) has been recently redesigned and updated. A pilot scheme for Internet Subscribers has been introduced (see the section below). The site is designed to help you find information easily and to keep up to date between issues of *Mollusc World*. It now incorporates a Members Only Section. This includes Help with Identification, which at present covers common garden molluscs and the Vertiginidae. We hope to expand it to cover other groups or families as soon as keys and suitable images are available. We have also included diagrams and glossaries of shell terms.

Also included is a Discussion Forum which enables you to take part in informal discussions with other members, whether on a technical subject, or as a request for assistance, or on any other matter, without involving non-members. You can start a topic, or post a reply to someone else's topic, or just browse. This forum is additional to the facilities offered by conchology-uk@smartgroups.com. A limited number of pages from previous issues from *Mollusc World* and *Journal of Conchology* are included in the Members Only Section. These are there to show Internet Subscribers the type of article that is available, and just what they are missing by not being full members. Online recording forms are now available for use in connection with the current projects. We expect to extend our recording activities, and online recording forms will be available for these in due course.

Please pass comments about the site to webmaster@conchsoc.org who will be pleased to hear from you. Without feedback we will not know what you would like to see included.

Using the site for the first time.

It may be helpful to have this article handy when you first visit the website. The first page gives brief details of the history of the Society; its purposes; and what is contained within the site. By clicking on the central logo where it says "Enter here", you reach the second page. This is the Registration Page, which is necessary to prevent unregistered users accessing the Members Only Section. Anyone may enter as a Guest, but a Guest cannot reach the Members



Only Section. To enter as a Guest, click the Guest button in the left hand panel and do not fill in any forms.

If it is the first time of using the site, and you are a Member, please complete the form towards the bottom of the right hand side. This requires personal details, but if your telephone number is ex-directory and/or you do not wish to disclose it, please enter zeros in the format 00000 000000.

The box has to be completed with numbers in order to work. Your email address has to be valid, otherwise you will be unable to gain access to the Members Only Section, and also the program will be unable to email you with confirmation of your registered User ID and Password for future reference. Subsequent visits only require you to enter your User ID and Password in the spaces on the left hand side. Having completed that, you are into the main site; in fact, probably quicker than it took you to read this far.

Internet Subscribers.

Council has decided to introduce a pilot scheme for Internet Subscribers, who may access **all website pages, but do not receive paper copies of the Members' Guide, Journal or 'Mollusc World'**. Neither may they vote nor hold office, although they are entitled to attend both indoor and field meetings. The cost of an Internet Subscription is £10 a year and it is hoped this will encourage people (particularly beginners and young people) to start the study of conchology, and go on to become full members in due course. We are offering, as part of the pilot scheme, the opportunity for registered educational users

to email the Membership Secretary with details of their proposed project, and if accepted, their £10 fee will be waived for the year.

Navigation.

Navigation is straightforward. The top horizontal frame includes the Society *Aporrhais* shell logos and title. Whilst navigating your way around the site you may return to the Home Page at any time from any page by clicking on either of these *Aporrhais* logos. Below the title and logos are a series of six links, each going to either another main section (e.g. Fun Section; Members Section; News Section) or to an important document (e.g. Health & Safety Policy; Privacy Policy) or to Links to other sites.

The vertical frame to the left displays a menu that applies to the particular section you are in. At the bottom of the lefthand menu is an image of our logo. Clicking on this will also return you to the Home Page. You will notice that the background colour of all frames will change as you move from one main section to another. This is to help you navigate.

As the mouse cursor hovers over the text links in either the horizontal or vertical menu, the link is highlighted. If you return to a page after you have clicked on a link, it will have changed colour, so that you know you have already been to that linked page, but will still highlight as you hover the mouse cursor over it. Again, that is just to help you navigate.

Other links within the pages are shown in green and are underlined in green. These also change colour after you have visited the linked page. When you hover the mouse cursor over an image that is acting as a link, the cursor changes to a hand-shape and will usually display a short message indicating the destination or reason for the link.

Viewing.

The site is best viewed at a screen resolution of 1024 x 768 pixels, the figure at which most modern laptops and PCs are set when purchased. Older models are often set at 800 x 600 pixels. If the resolution is lower than 1024 x 768, although the text is larger, you will need to scroll down in order to read the longer pages. If you have the resolution much higher, the text becomes smaller and more difficult to read at the usual viewing distance.

For those using Microsoft Windows who would like to check or change the resolution, right-click on a blank space on the Desktop and choose Properties from the shortcut menu; then click on the

as your browser, you will find that by clicking on View, and choosing Full Screen, many pages will not require much, if any, scrolling. You can soon revert to your normal screen size by clicking on the Restore button at the top right of the screen. Many other browsers have a similar facility.

Anticipated Future Use of the Website

We intend to expand the website in order to provide visitors to the site, especially beginners and young people, with the tools and background information they need to take up the study of molluscs and their shells. With this in mind, we would like to:

- Extend the Help with Identification section by including other groups and families, e.g. Planorbidae, Lymnaeidae, Zonitidae, Cockles, Chitons, etc. For this we will require help from you, the members, to write the appropriate keys and to provide the images.
- Re-introduce learning aids similar to the former series "Papers for Students".

- Include images of habitats typical of defined groups of species, e.g. species commonly associated with rocky shores in Britain, and provide a list of the species as a starting point for study. (Most of the images and species lists are already in place or are in the course of preparation at the time of going to press).
- Provide a bibliography of useful books, not only on identification, but also on physiology and behaviour of molluscs.
- Extend the recording projects. If you feel able to help in any way, or have comments about the website please contact webmaster@conchsoc.org

Personal Home Page

Why not use the Society's News Page as your personal Home Page? That way you will not miss any late-breaking conchological news, possible changes to indoor or field meetings, or details of the latest finds.

The easiest way to do this is to navigate to the News Section, and set your browser to

use the current page as your home page. With Microsoft's Internet Explorer, click on Tools in the toolbar, and choose Internet Options and then "Use current" on the General tab. With Netscape, click Edit in the toolbar, and choose Preferences, Navigator, and click "Use current page".

Opera 5 and Opera 7.5 are similar; click Navigation, choose Set Home Page, and in Opera 5, click on the button labelled "Use Active" beside Global home page, or in Opera 7.5, click on the radio button beside "Set current page as home page".

Other browsers have similar facilities. Even if you decide not to make it your personal home page, Bookmark it or enter it in your Favourites, so that you are able to keep up to date. Be sure to make use of the website if you have access to the Internet — **the site is there for your use!**

Pryce Buckle

Happy slapping slugs Ben & Rhian Rowson

Where is the best place to see *Limax maximus* mating? We were treated to the spectacle several times this summer and are interested to know if other readers share our experience. Unfortunately, recording the behaviour seemed to require some ASBO-baiting loitering in residential areas after dark. The housing in central Cardiff consists largely of late 19th century terraces with small front gardens and rough stone walls that harbour big populations of slugs, particularly *L. maximus*, *L. flavus* and *Arion ater*. They emerge at night throughout the year to feed on the dog-fouled pavements, apparently staying hidden on only the coldest nights. Most of the gardens are paved, overgrown with valerian and dandelions or full of broken furniture (civic pride apparently not widespread among local landlords or tenants). There is thus an absence of trees or fences from which mating *L. maximus* can hang, but as we discovered they are perfectly able to manage with the front walls and even window panes. This makes them easy to spot between 22.00 and 1.00 at night in late summer, when we made most of our observations. We saw one window pane used one night per week three weeks in a row, by what appeared to be different individuals. In another street we saw no less than 6 mating pairs in one night (5 September). This would have offered ideal photography or filming opportunities - had we had a camera.

While watching these pairings we noticed some extravagant tail-slapping behaviour. One slug would follow another and occasionally receive a vigorous slap across the tentacles or face by the tail of the first. Some slugs received two or three slaps in succession so were evidently not always deterred by the first. At other times, the following slug seemed to land a successful bite on the tail. As with parts of the mating process, the slugs seemed unusually fast-moving and energetic during these behaviours. However, it is not clear whether it was part of the courtship and mating process (which has been fairly well-described by Taylor

and others) or an aggressive territorial behaviour. We saw slugs that had just mated slapping others that had not, (at least in the last hour or two). A mated slug whose path crossed that of a third individual also received a slap. We did not see slapping between slugs that immediately went on to mate, however. We know that tail-slapping is a feature of courtship or mating in some *Deroceras* spp. and that the mating of *L. maximus* is well-described, but could not find a reference to tail-slapping in this species. Perhaps the slapping behaviour also occurs on other occasions when these territorial slugs come into contact. In the same area we have seen *L. maximus* chasing and repeatedly biting *Arion ater* (on the tail, inevitably) as they try to escape, in what we presume was defence of territory.

We were also struck by the apparent ease and speed with which mating slugs produced their mucus strings. We did not see partners circle repeatedly around one another, a process that Taylor describes as taking up to two and a half hours "or more" in *L. maximus*. Instead, mating pairs remained in a vertical line with the head of one partner touching the tail of the other. They remained still for 10-15 minutes while they secreted enough mucus to attach the top of the string, the mucus perhaps coming from the head or tail mucus glands of either or both partners. The slugs then twisted once over one another and began descending the string, the genitalia being everted soon after. At the end of all the matings we observed, one slug moved away from the bottom end of the string while the other climbed it, although it was not seen biting or eating the string. Other slugs were seen feeding on the remains of mucus strings, but these may have been the result of other matings. In the absence of rain, strings may last for two or three nights and can be found during the daytime.

Next summer we hope to obtain some better video of the process, record some more detailed data, and to see whether individuals can be identified as being involved in more than one pairing. Perhaps a better knowledge of the mating system of this species will shed light on the range of extraordinary behaviours.



Partula snails at Edinburgh Zoo

Mike Rutherford

Recently I was fortunate enough to have a behind the scenes visit to Edinburgh Zoo to see some of the conservation work they are doing. This came about as I had been doing research for a new display on endangered species for the Kelvingrove Museum and I had wanted to include more than just the usual fur and feather examples. After a bit of research and a look through our collections I thought that the sorry tale of the *Partula* snails of French Polynesia would be a perfect example of threatened molluscs.

If you are not already aware of the sad background to the plight of the *Partula* then in a nutshell it is as follows. Giant African land snails (*Achatina fulica*) were introduced as a potential food source to several islands in French Polynesia in 1967, they didn't breed well in captivity and were released into the wild where they flourished. Soon they started to eat the islanders' crops and swift action needed to be taken. It was decided to fight a snail with a snail so the carnivorous rosy wolf snail (*Euglandina rosea*) was imported from Florida and released. Things did not go as planned, the wolf snails favoured prey is snails from about 18mm to 22mm long and seeing as how giant African land snails can reach 270mm long it soon became obvious that it wasn't going to work. By this time it was too late and the wolf snails had started to decimate the local populations of *Partula* snails (whose average size is around 20mm long). It didn't take long for many Partulids to become extinct and from around 100 species there are now thought to be less than 50 with many of these only surviving in captive bred populations.

I soon found out that Edinburgh Zoo were part of the international effort to breed *Partula* snails in captivity for eventual reintroduction back into the wild. Edwin Blake (Fig. 1) is the keeper in charge of reptiles and birds at Edinburgh Zoo but he has also branched into molluscs and is the man responsible for breeding and looking after the snails. A few years ago

he was fortunate enough to go on a trip to the South Pacific where he was able to see first hand the destruction caused by the introduction of *Euglandina*. After finding only tens of snails where previously there had been thousands he brought some back to the UK.

The zoo currently has seven species of *Partula* from several different islands. They are kept in tanks (Fig. 2) in what appears to be a garden shed in the backgrounds of the zoo. Despite its humble appearance it is one of the best environments, in terms of breeding success, of any of the zoos involved in the scheme.

Partulids are ovoviviparous meaning they give birth to live young after their eggs have hatched inside them. These young emerge fully formed but not much bigger than a breadcrumb and can often be hard to find when counts need to be done.

Getting the conditions just right for the snails has been a hard learning curve, the right temperature, humidity, substrate and so on had to be found out by trial and error. *Partula* snails in the wild eat dead leaves; in captivity they are fed a ground up mixture of grass pellets, oats, powdered cuttlebone, trout pellets and multi vitamins. This is spread on to tissues on top of Perspex sheets and then placed in the tanks; the snails scrape the feed off the sheets mimicking their feeding habits in the wild (Fig. 3)

As the zoo has been breeding snails for several years now they have built up a small collection of shells and Edwin was kind enough to let me take a few of the more numerous ones for the Glasgow Museums collections.

Fig.4 *Partula rosea* has an all white sinistrally coiled shell and was found on Raiatea Island.

Fig. 5 *Partula tohiviana* has a pale brown shell and comes from Mount Tohiva on Moorea Island.

Fig. 6 *Partula hebevela* has a small white shell with pink tip and was collected in huge numbers, to make into necklaces, by the islanders from Huahine Island.

Fig. 7 *Partula mirabilis* has a small

brown shell and comes from coastal valleys on Moorea Island.

Fig. 8 *Partula suturalis* or a subspecies from lowland valleys of Moorea Island

Fig. 9 *Partula affinis* is a small black-bodied snail, which despite being listed as extinct by the IUCN seems to be doing okay at the zoo!

P. suturalis and *P. tohiviana* were reintroduced to probably the smallest reserve in the world on the island of Tahiti a couple of years ago. With a special perimeter designed to keep out the wolf snails. Initial signs are good but there is still a long way to go before the *Partula* are free to roam once again.

Amongst the collections at Glasgow Museums we have many more *Partula* snails along with examples of other endangered land snails from small islands around the world such as *Liguus* tree snails and *Achatinella* snails. I would be delighted to hear from anyone keen to study any of these specimens.

Photos Mike Rutherford

Correction from Steve Wilkinson

Some of you may have noticed that the map of *Helicella itala* in the last issue of *Mollusc World* did not exactly match that published in the atlas and some data points appeared to be missing. This was due to the use of an alternative set of date categories compared with those used in the atlas combined with the fact that many of the records have not had their precise date entered (ie. many are only recorded as between 1965 to 1998). The corrected map is the same information represented using the same as the atlas grouping. We are also looking at adding an additional category to the mapping for non-marine molluscs to simplify the use of the map page. The map may be viewed on: <http://www.searchnbn.net/gridMap/grid>

Major Stranding of *Sepia elegans* in North Wales

On the 4 June 2005, I found one small cuttle bone of *Sepia elegans* at Porth Daffarch on the south west coast of Anglesey. I have seen them before on rare occasions in this area but usually they have been too fragmented and beach worn to enable accurate identification. This one however was not only nearly perfect, it was also a juvenile. Three weeks later on 2 1/6/05 at the same location and also at Trearddur Bay nearby, they were found to be common. Over the next few days, specimens were found at three other locations on southwest Anglesey.

It was not until mid July whilst on holiday in Barmouth, where I found them also present and common on the upper drift line at Lianaber just north of Barmouth, that the extent of the stranding was realised. On my return home I decided to make a whistle stop tour of all of the easy access drift lines on the Llein Peninsula to see if they were present there also. Out of the 20 sites visited (it was a very long day), *Sepia elegans* was found to be present at 16 locations on the upper drift line and ranging from frequent to rare. After making other searches since in the Anglesey and Liverpool Bay areas where they have been recorded pre 1991, they have been found to be present at 25 locations between Porth Daffarch and Barmouth, and may well, have extended further south.

Sepia elegans is a new record for sea areas S23 Anglesey and S22 Cardigan Bay though on this occasion they were not found at the sites visited around Llandudno in the Liverpool Bay sea area.

In most cases, the specimens consisted of 50% adults and 50% juveniles, the smallest being 11mm x 29mm and the largest fragments 29mm wide. The average juvenile was about 16mm x 54mm. The best specimens were the juveniles as many of the

larger ones were broken. The picture shows a cross section of what was found.

The stranding also coincided with unusually large numbers of *Sepia officinalis*, which is generally common in these areas. These again consisted of 50% adults and 50% juveniles, in fact, the event has produced more juvenile *Sepia officinalis* than I have seen in 30 years of shell collecting. The map shows the coastal area effected.

The specimens found on 4/6/05 and 21/6/05 were on the most recent drift lines or not much higher than that. After 28/6/05, all the specimens found were on the uppermost drift line with non-lower down the shore. This suggests that the stranding occurred over just a few days in early June 05 and is not an ongoing occurrence throughout the summer. The proportions of adults and juveniles of both species are interesting as it suggests a very large number of animals moving in one group with adults and juveniles together. At some locations such as Abersoch, Pwllheli, Criccieth, Shell Island etc. there were so many holiday makers about that the upper drift line had been trampled out of recognition, and therefore no specimens were found there. So far, there have been no further strandings of *Sepia elegans*, though the occasional *Sepia officinalis* is still beached from time to time.

Because of the degree to which Anglesey and the Llein Peninsula project out into the Irish Sea, they do make good collecting areas from time to time for unusual species carried up from southern regions. One good example is *Verella vellella*, which will be the subject of a later article.

Sepia elegans is not very widely distributed throughout the British Isles, and as I have a fair number of spare specimens, anyone who would like some can contact me on Clifton @seaspray.fsnet.co.uk, and I will be pleased to provide them with some.

Tom Clifton

Area representative for Anglesey and Liverpool Bay.

Field Meeting to north Nottinghamshire - Chris du Feu

North Nottinghamshire is a rather poorly recorded area for molluscs. This field visit had been arranged to cover two habitats - ancient woodland and limestone grassland. Fortunately, the Nottinghamshire Wildlife Trust has two reserves in the area with these habitats: Treswell Wood in SK77 and Clarborough Tunnel, a little to the north in SK78. Only a few people attended, but these included both veterans, novices and non-members from NWT.

The morning was spent in Treswell Wood. This ancient woodland is mainly of coppiced ash with hazel understorey. It is situated on heavy clay and parts remain damp throughout the year - an island in a sea of dry arable farmland. The coppice rotation gives a variety of habitats in a relatively small area although this may affect the internal distribution of some other species (such as birds or butterflies) more than it does molluscs. There are some ponds and shaded, wet

patches and a stream (which sadly no longer flows throughout the year). The slugs in the wood have been observed over a number of years and it would have been surprising to find any new species. We were not surprised. The shelled molluscs have hardly been recorded, so almost any species would be new. By the end of the morning we had added 19 species to the woodland list and these included nine new 10-km records.

Clarborough Tunnel reserve is limestone grassland over the top of a railway tunnel. Scrub has been encroaching over the years. The NWT has recently begun clearing this, although some parts still have maturing woodland. The approach to the reserve proper is through the old orchard belonging to the former crossing-keeper's cottage. This is now a meadow with a few remaining fruit trees. Again, a variety of habitats within a small site. No mollusc recording had been done previously on the reserve. Not a difficult task, therefore, to add to the species total of zero for the reserve - we recorded 21 - and these included five new 10-km records.

With one exception, the new 10-km records seem to be species which are under-recorded in the area. Thus we have helped to darken the North Nottinghamshire white hole in the national distribution map. The exception is *Zenobiella subrufescens*. There only two records in or near the county, both of these being pre-1965. It is a species of old, broad-leaved woodland and typical of undisturbed habitats. Treswell Wood satisfies the first conditions but, with its active coppice rotation and other associated activities, cannot be called 'undisturbed'. Interesting, then, that the species was found in the compartment of the wood that has been left uncoppiced specifically in order to include some

mature woodland within the mainly-coppiced reserve.

It is always a rewarding experience to be with others on a field visit. In spite of the team being composed of mollusc enthusiasts, various non-molluscan species in the wood were identified. Such species included the cardinal beetle, *Pyrochroa serraticornis*. Even when asking about one plant, I was not in the least offended to be told 'Mind-your-own-business.' This extra-subject knowledge separates the serious student of the natural world from the mere spotter. The true student needs to understand the species and how it relates to its ecosystem. This then engenders curiosity about all the other species which impact upon the species under study. A particular case of the value of this understanding the ecosystem was in the chase for the Blind Snail, *Cecilioides acicula*. On the limestone grassland there were old anthills and various other mammal excavations. Old hands made a bee line for these in the confident hope of finding the small, subterranean species whose shells may have been brought to the surface in these natural excavations. Sure enough, they were there. You cannot learn about all those sorts of things from the field guide.

We did discuss names of some species. It can sometimes be difficult to

communicate with non-specialists as the scientific names are not always memorable, or even pronounceable and common names are not always helpful. It seems that different people often refer to species by their own personal, descriptive names. This is very helpful in communicating to non-specialists (provided it is made clear that the 'name' is really more of a description of a key identification feature rather than a name with any official standing). I leave it to you to work out which slugs were described as the Yellow Stainer, the Chocolate Slug and the Milk of Magnesia Slug.

It has been said that we do not judge great works of art, rather we judge by our reaction to them. Being a Philistine, I cannot comment on this. However, I do know that we are judged by our reaction to the natural world. As far as this group of mollusc hunters is concerned, I think the natural world will have given them a good report for the day's work.

We are grateful to the Nottinghamshire Wildlife Trust for permission to use the two reserves, and we have submitted full species lists to them.

Helena Mapp and David Porter, Rosemary Hill, Ron Boyce, Robert Atkinson, Christine du Feu, Chris du Feu

Species	Treswell Wood		Clarborough		Species	Treswell Wood		Clarborough
	new to wood	new to SK77	new to SK78	new to SK78		new to wood	new to SK77	new to SK78
<i>Lymnaea peregra</i> L	T	T			<i>Aegopinella nitidula</i> L	T	T	C
<i>Anisus vortex</i> L	T	T			<i>Oxychilus cellarius</i> L	T	T	C
<i>Cochlicopa lubrica</i> L	T	T		C	<i>Oxychilus alliarius</i> L	T	T	C
<i>Cochlicopa lubricella</i> L				C	<i>Limax maximus</i> L	T		C
<i>Columella edentula</i> L	T	T	T	C	<i>Lehmannia marginata</i> L	T		
<i>Vertigo pygmaea</i> L				C	<i>Deroceras laeve</i> L	T		
<i>Acanthinula aculeata</i>	T	T	T		<i>Deroceras reticulatum</i> L	T		C
<i>Punctum pygmaeum</i> L	T	T	T		<i>Euconulus fulvus</i> seg L	T	T	T
<i>Discus rotundatus</i> L	T			C	<i>Cecilioides acicula</i> S (fresh)			C
<i>Arion ater</i> agg L	T			C	<i>Clausilia bidentata</i> L	T		
<i>Arion circumscriptus</i> L agg				C	<i>Zenobiella subrufescens</i> L	T	T	T
<i>Arion distinctus</i> L	T			C	<i>Trichia striolata</i> L	T	T	T
<i>Vitrea pellucida</i> S	T	T		C	<i>Trichia plebeia</i> L	T	T	
<i>Vitrea crystallina</i> L	T	T	T		<i>Trichia hispida</i> L	T	T	C
<i>Vitrea contracta</i> L				C	<i>Cepaea nemoralis</i> L	T		C
<i>Nesovitrea hammonis</i> L	T	T			<i>Cepaea hortensis</i> L	T		C
<i>Aegopinella pura</i> L	T	T	T		<i>Sphaerium corneum</i> L	T	T	T

The Freshwater Gastropods of Mauritius

Malcolm Symonds

Mauritius is a volcanic island about 60 km by 45 km lying approximately 2400 km east of South Africa. Parts of the island are relatively high with a central plateau, at just under 600 m, separated from the coastal plains by mountains, some peaks of which reach 800 m. The unfortunate Dodo is only one of many endemic species which have become extinct since the arrival of the first Dutch sailors in the 17th century. Most of the evergreen tropical forest, which covered the island at that time, was cleared at an early stage for sugar cane production and today the only significant indigenous forest is in the mountains of the South West around the Black River Gorge. The mountains and central table land give rise to numerous rivers and streams many of which were systematically sampled in 1974 as part of the Austrian hydrobiological mission to the Seychelles, Comores and Mascarene archipelagos. Thirty sites were sampled and the results published by Starmühlner (1979, 1983).

A holiday in Mauritius in November 2004 gave me an opportunity to visit some of the rivers inspected by Starmühlner with a view to establishing if and to what extent the gastropod fauna had changed in the intervening thirty years. I was staying near Cap Malheureux in the North of the island and on my first excursion I followed the East coast as far south as Mahebourg. At the first stop, the Francoise River by the coast road, near Poste de Flacq, *Neritina gagates* Lamarck, 1822 was abundant on rocks in shallow water at the margins. It was also present in the River Poste de Flacq and this proved to be the most widespread gastropod in the lower reaches of the rivers. Further south in the Grand River Sud Est, below the coast road bridge, large eroded specimens of *Septaria borbonica* (Bory St Vincent, 1803) were common. At this point I was well above the limit of tidal influence and I may have found other species had I been able to check the lower reaches. In contrast, where the coast road crossed the mouth of the Champagne River estuarine conditions prevailed and juveniles of both *N. gagates* and *Neritina mauriciae* Lesson, 1831 (considered by Starmühlner to be a form of *N. auriculata* Lamarck, 1816) were

common on and under stones in the company of brackish water species. Similarly juveniles of both species occurred intertidally on the beach at Quatre Soeurs in the mouth of estuary of the Grand River Sud Est, but alongside wholly marine species such as *Nerita albicilla* Linné 1758 and *Nerita aterrima* Gmelin, 1791. This, of course, accords with the life cycle of tropical freshwater nerites which have veliger larvae which are washed downstream and out to sea where they complete a planktotrophic stage before settling in river mouths and working their way upstream (Bandel, 2001).

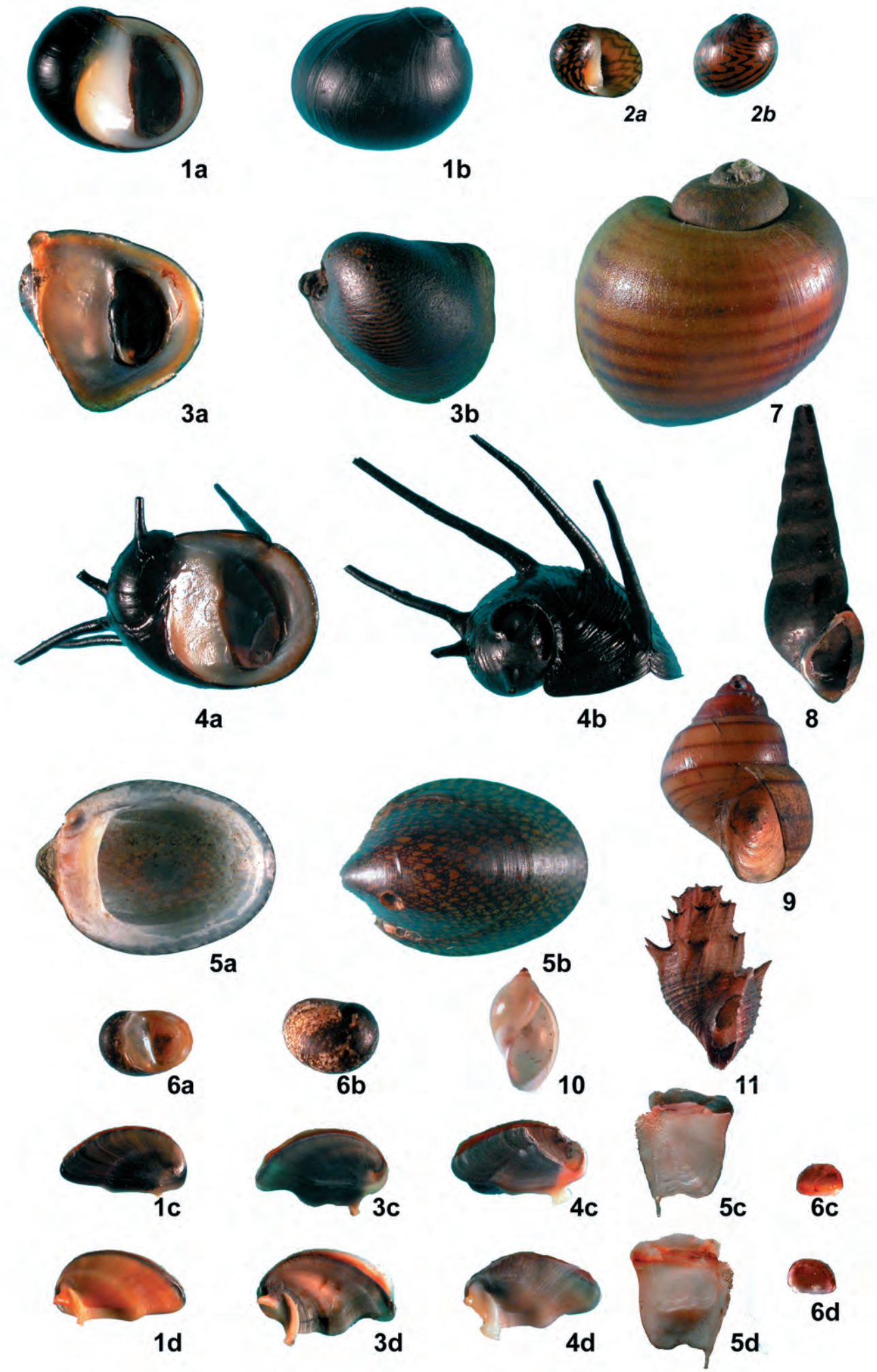
The sites referred to above had not been sampled by Starmühlner, the majority of his stations being in the south of Mauritius. At Mahebourg, in the Le Chaux River behind the museum, he recorded *Clithon coronata* (Leach, 1815), *N. gagates*, *S. borbonica*, *Neritilia consimilis* (Martens, 1879) and *Thiara scabra* (Müller, 1774). I was encouraged to find that, although Mahebourg was a large, bustling town, the river was nevertheless still healthy. Behind the museum the river is wide, shallow and fairly fast flowing with a rocky bed. *N. gagates* was common on the stones as were specimens of *S. borbonica*, although smaller than those I had found in the Grand River Sud Est. The tiny shells of *N. consimilis* occurred under some stones in quieter stretches of water where *T. scabra* was also common. I did not find *C. coronata* but adult *N. mauriciae*, not recorded by Starmühlner, were present.

On my second excursion I followed the West coast, south through the capital, Port Louis, and then as far as the River du Rempart West. Starmühlner sampled this river near the road from Trois Cavernes to Quatre Bornes, some 10 km upstream from the mouth, and found a good freshwater fauna which included *Melanoides tuberculata* (Müller, 1774), *Lymnaea mauritiana* Morelet, 1875, *Physa borbonica* Férucci (possibly a synonym of *Physa acuta* Draparnaud, 1805; see Brown, 1994: 248-9) and sporadic *N. gagates*. At the same station I found large numbers of *Ampullaria* sp. and some *Viviparus* sp. but not the species recorded by Starmühlner

which had apparently been displaced by the alien gastropods. Further downstream a tributary flows through the ornamental water gardens of the Casela Bird Park, a small zoo and aviary. There a few *N. gagates* were present and a lot of *Ampullaria* sp. and it may well be that the Bird Park was the original source of the introduced gastropods. A few kilometers further south, in the Grand River Noire at the coast road bridge, in clear, slow moving water just above tidal influence, large specimens of *N. gagates* were abundant, covering the rocks in shallow water, *N. consimilis* occurred under stones and *T. scabra* and *M. tuberculata* were common on mud. I also found two specimens of *C. coronata*, the only place, as it turned out, where I observed this species. Starmühlner recorded *C. coronata* and the spineless form (*f. despinosa*) from only a few sites and those mainly in the South of Mauritius. Unfortunately there had been torrential rain the day before my trip to the South and the rivers were swollen and muddy which made sampling very difficult. A stop near the mouth of the River du Cap only produced a few *N. gagates* and at the River Jacolet I found this species again, with a few *S. borbonica*. The pool below Rochester Falls on the Savannes River contained *C. coronata*, *N. gagates*, *N. consimilis*, *M. tuberculata* and *T. scabra* when examined by Starmühlner. When I was there the falls were spectacular but in the raging brown torrent beneath I was unable to find any molluscs at all!

On visits to sites further inland I found *L. mauritiana* and *P. borbonica* in the Black River Gorge below Macchabee Point. *Viviparus* sp. was in pools below the Tamarin Falls; it may be significant that the mouth of the Tamarin River is joined to that of the River du Rempart West where this species also occurs. Streams in the Botanic Gardens of Pamplemousses still contained good numbers of *M. tuberculata*, *T. scabra*, *L. mauritiana* and *P. borbonica*, as recorded by Starmühlner, as well as *N. gagates*, not listed by him.

In conclusion, I was pleasantly surprised to find that the rivers which I inspected were quite healthy and that almost all the gastropod species recorded by Starmühlner were still present, at least at some locations in Mauritius, although not always where he had recorded them. Although I found *C. coronata* at only one site this may well have been due to



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adverse sampling conditions when I visited the South. *N. gagates*, on the other hand, had apparently extended its distribution somewhat since 1974. The only significant change which I detected in the gastropod fauna, namely in the River du Rempart West, had been caused not by pollution but by the introduction of alien species.

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the Hydrobiological Mission, 1974 of the Zoological Institute of the University of Vienna. *Annalen des Naturhistorischen Museums in Wien*. **84 /B**: 127-249

Figures (not all to the same scale):

- 1. *Neritina gagates***, a. apertural, b. abapatural views. Height 18 mm, width 17 mm. c. operculum outer side, d. inner side. Length 10.5 mm, width 5 mm. River Francoise, near Poste de Flacq.
- 2. *Neritina gagates***, juvenile showing the typical zigzag colour pattern which is obscured by the periostracum in the adults. a. apertural, b. abapatural views. Height 6 mm, width 6 mm. River Champagne by the coast road bridge.
- 3. *Neritina mauriciae***, a. apertural, b. abapatural views. Height 18.5 mm, width 15 mm. c. operculum outer side, d. inner side. Length 9.5 mm, width 6 mm. River Le Chaux, Mahebourg, behind the museum.
- 4. *Clithon coronata***, a. apertural, b. apical views. Height (excluding spines) 15 mm, width 13 mm. c. operculum outer side, d. inner side. Length 8 mm, width 5 mm. Grand River Noire by the coast road bridge.
- 5. *Septaria borbonica***, a. apertural, b. abapatural views. Length 21.5 mm, width 15.5 mm. c. & d. operculum. Width 7 mm. River Le Chaux, Mahebourg, behind the museum.
- 6. *Neritilia consimilis***, a. apertural, b. abapatural views. Height 3.5 mm, width 4 mm. c. operculum outer side, d. inner side. Length 2 mm, width 1.5 mm.. River Le Chaux, Mahebourg, behind the museum.
- 7. *Pomacea* sp.** Height 34.5 mm, width 31 mm. River du Rempart West near road from Trois Cavernes to Quatre Bornes.
- 8. *Melanoides tuberculata***. Height 28.5 mm, width 9 mm. Grand River Noire by the coast road bridge.
- 9. *Viviparus* sp.** Height 19.5 mm, width 14.5 mm. Tamarin River, a pool below the Tamarin Falls.
- 10. *Physa borbonica***. Height 11 mm, width 6.5 mm. Black River, Black River Gorge below Macchabee Point.
- 11. *Thiara scabra***. Height 14.5 mm, width 9 mm. River Le Chaux, Mahebourg, behind the museum.

Field Meeting at Bavelaw Marsh, Midlothian

24th September 2005

Craig Macadam and Adrian T. Sumner

The aim of this meeting was to look for the mud snail, *Omphiscola glabra*, a rare species that has been proposed as a BAP priority species (see *Mollusc World* **8**, p 22). This species was previously reported from Bavelaw Moss 50 years ago by A.R. Waterson, but without any clear indication of precisely where it was found.

Bavelaw Marsh is a large area of shallow water above two reservoirs, Threipmuir and Harlaw, near Balerno, a few miles south of Edinburgh, over 800 feet up on the lower slopes of the Pentland Hills. On a beautiful early autumn day, a select group assembled to see in *O. glabra* was still present. We initially visited the marsh itself, an open area of shallow water frequented by ducks and geese, and with less vegetation than we had hoped. Nevertheless, it proved to contain plenty of molluscs round the edges of the water (see list below), and in fact was felt to be too rich in species and individuals to be a likely habitat for the mud snail. We wondered if the adjacent Red Moss, a raised bog managed by the Scottish Wildlife Trust, might be a more suitable site for the mud snail, and accordingly transferred our attentions to it. Much of the area is covered with a variety of mosses, which were rather dry at the time of our visit. However, there were a number of ditches and a pond that merited closer inspection. The ditches were in fact

rather peaty and yielded nothing, but the pond (see illustration) looked more promising, and we spent some time exploring it. Alas, there was nothing in the mud of the pond or in the marginal vegetation, though we turned up a few slugs and snails in the surrounding grass (see the list below).

So we failed to find the mud snail, but we have not given up hope – there are still more areas that could be worth investigating. And even if our tally of species was small, we had a lovely day out in the sunshine, with flocks of geese calling as they flew overhead.

- Species found at Bavelaw Marsh and Red Moss, 24th September 2005
- Bavelaw Moss
- Lymnaea peregra*
 - Bathymphalus contortus*
 - Gyraulus albus*
 - Pisidium* sp.
 - Red Moss
 - Cochlicopa* sp.
 - Discus rotundatus*
 - Arion ater*
 - Arion intermedius*



Red Moss of Balerno



Pond on the Red Moss

Recovery and restoration of marine habitats – Can we fix it?

One-day conference 23rd February 2005, SOAS, London by Jan Light

On land, habitat restoration and creation are increasingly being used to facilitate development and there is a wide range of techniques available. Sometimes developers operate in contentious circumstances: a relatively recent and well-publicised example of such habitat translocation and creation work is that which was carried out for *Vertigo moulinsiana* in the context of the Newbury Bypass construction. This thinking is now finding its way into arguments about the exploitation and development of the marine environment which in turn raises some important questions about its management. The aim of the meeting was to provide a forum to explore concepts of active habitat restoration and creation to see how far they can apply in the marine environment both at the site level and on a wider geographic scale. But to what extent is the marine environment a self-regulating one and what do we know about the ecology of natural recovery and restoration in intertidal and subtidal environments? Fishing, oil production, spoil dumping, aggregate dredging, pollution and human recreational activities.... they all take their toll. Is recovery necessarily vital, how much loss is permissible and can we exploit degraded habitats for further development? What timescales of recovery should we expect? Do we want to 'garden' habitats in the sea as we do on land to get the results we want and does it matter if the end results differ from the original natural state?

To answer these concerns and questions a series of case studies was presented throughout the day by representatives from the Conservation agencies, Wildlife Trusts, CEFAS, BT (underwater cables) as well as oil, sea fisheries and aggregate extraction industries. A hierarchy of definitions was given to distinguish between terms such as Recovery, Restoration, Remediation, Rehabilitation. However, the underlying objective in these terms is the same: the Return of an ecosystem to a similar and/or viable state prior to its disturbance or degradation.

Examples of case studies presented included that by Ken Collins of Southampton Oceanography Centre who described the Centre's artificial reef project as a marine management tool for promoting marine biodiversity, fisheries enhancement, habitat restoration and protection of vulnerable habitats. Another good news story was given by Rebecca Smith of CEFAS. Aspects of the River Crouch Estuary have been studied for over 50 years, mainly on behalf of the commercial interests in populations of the native oyster, *Ostrea edulis* largely to establish reasons for their decline. But more recently their work has been directed towards the consequences of the use of TBT-based antifouling paints. Following their ban on vessels <25m in length in 1987, the response in the environment was relatively rapid with low levels of TBT recorded at all sampling locations from 1992 onwards. Additionally there was an improvement in faunal communities, a shell thickening

in local stocks of *Ostrea edulis* and a recovery in the local *Littorina littorea* population. Like *Nucella lapillus*, *Littorina* had also manifested similar adverse anatomical effects and decline in numbers. A further ban on the use of TBT paints on large vessels was introduced in 2003 and we might expect that concentrations of TBT in docks and harbours will decline rapidly, with associated ecosystem benefits.

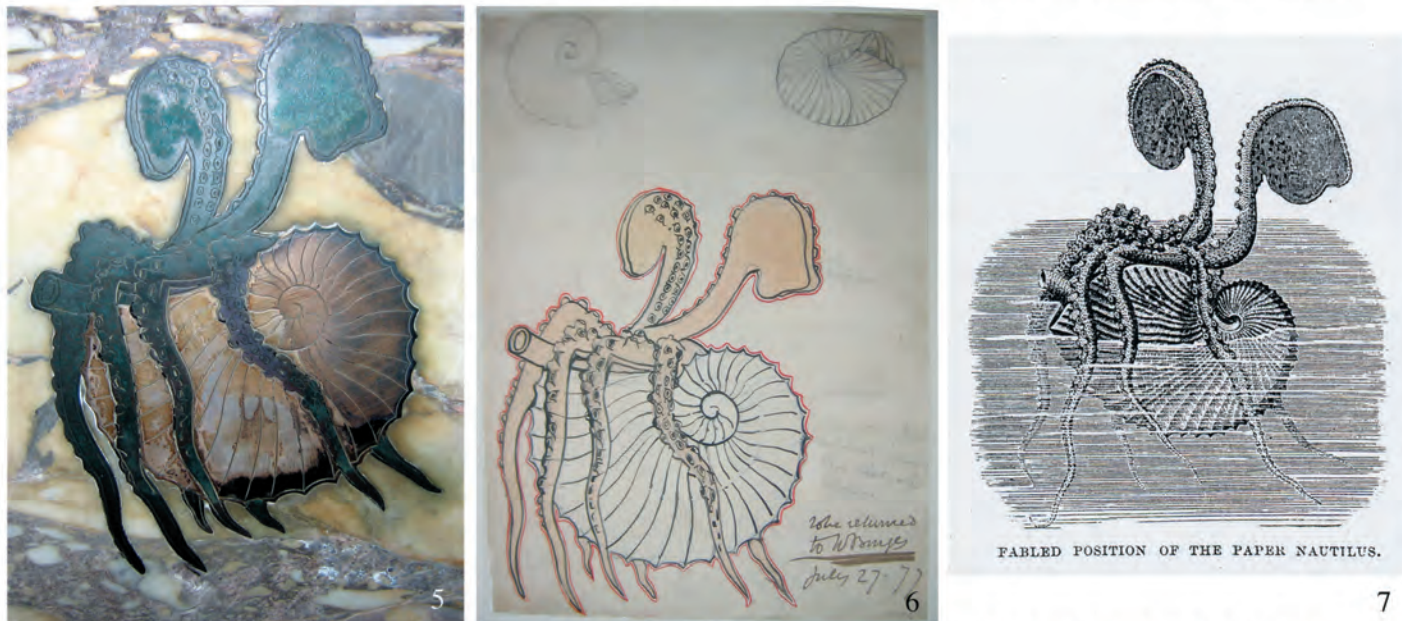
Despite the two foregoing examples, Keith Hiscock of the Marine Biological Association of the UK was moved to point out that there are numerous case studies in the *Journal of Missed Opportunities* where baseline information and routine monitoring which would be so beneficial in informing trends observed in the present day are lacking! This point was reiterated in the plenary session at the end of the afternoon and the value of databases, such as the one this Society holds on marine molluscs, was highlighted because they contain important and useful information accrued over many years, which results from regular monitoring, surveys and structured- or spontaneous field-work. With its transfer to the NBN it will become more widely available and thus have an increased role to play in protecting and conserving the marine environment.

These implications for the Society should be seen in the wider context of the proposed Marine Bill. Over the last 3 or 4 years there have been a plethora of high level policy consultations concerning a wide range of issues covering the coastal and marine environment; and many of these issues are still unresolved. At the January 2005 Coastal Futures Conference the Government announced that it was considering a draft Marine Bill. The commitment to this appeared in the Labour Party Manifesto in April 2005 as follows: "Through a Marine Act, we will introduce a new framework for the seas, based on marine spatial planning, that balances conservation, energy and resource needs. To obtain best value from different uses of our valuable marine resources, we must maintain and protect the ecosystems on which they depend." The Marine Bill proposals also received support from the two other main political parties.

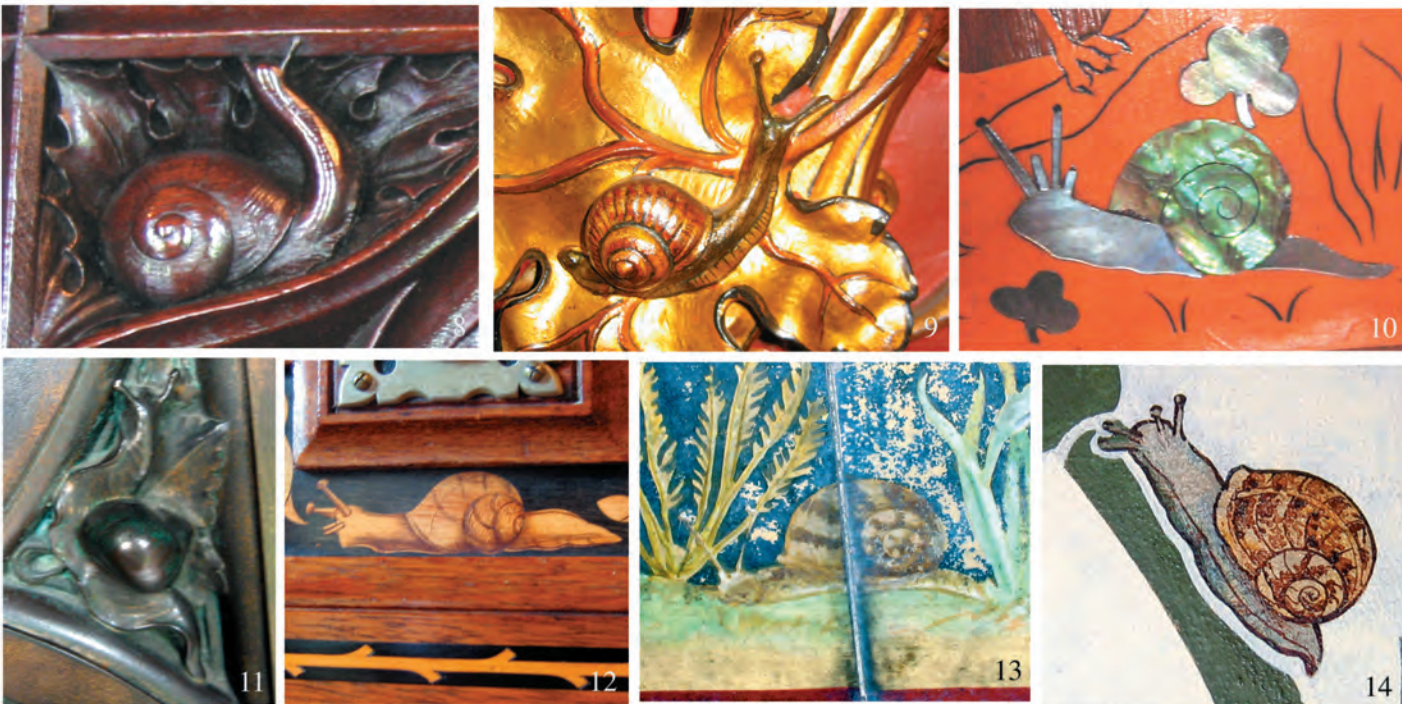
Such a measure is long overdue and indeed such an opportunity for changes to marine and coastal legislation only occurs every decade or so. This bill represents a golden opportunity for the marine constituency to achieve wide-ranging changes that deliver the Government's commitments to sustainable development. This will be achieved by securing important changes for industry, enhancing environmental protection, and obtaining benefits for those who use and depend upon the coastal and marine environment. In furthering sustainable development the bill should also provide greater integration in the way we manage our coastal and marine activities.



Figs. 1-4. Stone carved shells around the Roof Garden fountain, once covered in a black lacquer. Details include pearls among the oysters and realistic seaweed with the mussels. Despite the apparent accuracy, though, the identity of the third bivalve is not certain. Any suggestions?



Figs. 5 - 7. The *Argonauta* inlay in the Marquess's bath, with Burges' original design and the woodcut that might have been its inspiration.



Figs. 8-14. A medley of snails in implemented in various ways. Clockwise from top left: carved hardwood; carved stone; mother-of-pearl inlay; cast brass; marquetry; glazed tiles; and painted straight onto the wall.

Fig. 15. The object at Robinson Crusoe's feet. Could this be a tropical land snail?



Some molluscs in the iconography of William Burges (1827-1881)

Ben Rowson

Watch any TV makeover show – and there are a few – and the chances are you'll hear one designer congratulate another on the “contemporary” look they have achieved. Usually this seems to refer to a sort of anonymous fashion standard that does not take much account of what the owner of the house, garden or haircut actually has in mind, but the majority seem to end up satisfied. The British designer and architect William Burges (1827-1881), however, was an artist for whom “contemporary” was never enough. He managed to retain a highly individual mediaevalist style while riding the bow-waves of the 1860s Victorian Gothic Revival and – provided he got along with his patrons – was happy to include all sorts of touches representing the commissioner's favourite things. Often these included stylised or realistic designs featuring favourite animals, plants, and historical or mythological figures. Perhaps his most creative work came about through the patronage of fellow medievalist, bookworm, and animal lover, the Third Marquess of Bute (1847-1900). Bute was then the wealthiest citizen in Britain, having made his fortune as a landowner and a South Wales industrialist, and was rich and bold enough to give Burges a freer hand than any other. When they came to rebuild Cardiff Castle in what has been called “a Gothic feudal extravaganza” and makeover par excellence, the friendship between Burges and the Bute family was cemented. If not true naturalists, both were knowledgeable about the natural sciences and exploration and were established animal lovers. The interiors of the castle include hundreds of familiar and exotic beasts among the more mythological elements, and the exterior “Animal Wall” supports some fine sculptures. Some of the animals are placed in more or less meaningful contexts, while others seem to be the results of pure whimsy. Picking them out on a guided tour is one of the pleasures of visiting this extraordinary castle. Particularly for a zoologist, it is satisfying to see how well many of them are realised, and that they include such “unconventional” creatures such as

chamaeleons, beetles, earthworms, and several molluscs that are accurate enough to identify. I recently had the privilege of being shown around Cardiff Castle to make a list of the molluscs on show and to try and ascertain some of the sources Burges and Bute might have used. Various molluscs occur in several rooms in different contexts, and also in some of Burges' other buildings, which are listed below in the manner of a tour. Books about Burges (mainly J. Mordaunt Crook's 1981 “William Burges and the High Victorian Dream”) allowed me to trace a few more molluscs in the iconography of this most imaginative designer.

On top of Cardiff Castle is the smallish but opulent Roof Garden, which has as its centrepiece a grey bronze fountain. Around its base are realistic reliefs of *Mytilus*, *Ostrea* and other seafood, together with a mystery mussel-like bivalve (Figs. 1-4). A hermit crab emerges from a large gastropod, perhaps a *Bursa lampas* or similar. The inside of the elegant brass garden door sports the first of many snails (Fig. 11) to be found throughout the castle. Burges (or Bute) was evidently fond of the snail motif and they are realised in many different ways (Figs. 8-14). They can probably all be referred to *Helix aspersa*, though the form and colour are usually dictated by the materials used. The direction the snail faces also affects the way the shell coils. A distinct majority crawl to the left and thus are shown sinistral. Painted snails (Fig. 14) can be seen crawling all over the walls in the large Banqueting Hall. Perhaps the most appealing of all is a tiny mother-of-pearl snail inlaid in the Summer Smoking Room (Fig. 10).

Bute and Burges celebrated their self-styled scholarship in the stately Library. The only complete Burges interior in existence, the Library is well-stocked with animal designs. The elaborate marquetry of the bookcases (Bute's books are long gone) includes hermit crabs in *Turritella* shells as well as the ubiquitous snails (Fig. 12). Near the fireplace is a strong stone relief of a male and female

figure, emerging from a well-defined *Charonia* sp. and a more obscure *Turbo*-type shell and blowing shell-like instruments. The significance of this sculpture, which looks more Classical than most in the castle, apparently remains unclear.

Molluscs are less well represented in the Nursery used by the Butes' children. The hanging lantern bears silhouettes of the cockle shells from the rhyme “Mary, Mary...” but the lantern is not an original Burges feature. One of the original murals, however, does include an intriguing object at the feet of a rather desperate-looking Robinson Crusoe and Friday (Fig. 15). To me, this odd, isolated detail looks for all the world like a tropical island land snail (the camaenid *Amphidromus*?) which, in the absence of palm trees or other scenery, creates a feeling of distant wilderness. I may be over-reading things, but is difficult to imagine what else it might represent. Whether Bute, Burges or one of his craftsmen knew of such an object I do not know. Many *Amphidromus* were in European collections by this time. I am told that the Butes' daughter, Lady Margaret Crichton Stuart (d. 1954) had a shell collection of note that is mentioned in her correspondence, but the later whereabouts of the collection are unclear.

A definite source is more likely higher in the clock tower, in the Marquess's “Bachelor Bedroom”. The interior is themed around natural riches: geology, the hunt, and the sea (one mural shows pearl divers reaching some miscellaneous oysters with the aid of a stone weight). In the adjacent bathroom, Bute's marble bath, made from a recycled antique sarcophagus, also has marine details. The bath's inlays in copper, silver and brass feature eels and a starfish along with a classic depiction of a female *Argonauta* in her shell (Fig. 5). Burgess's original design, kept in the Castle archives (Fig. 6) suggests that alternative designs were only abortive and that a clear picture was in mind. If so, it corresponds very closely with an engraving in Cassell's 1809 *Natural History* (Fig. 7), a popular

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Garden Survey of Molluscs

Can you help the Society get this project off the ground?

As part of the Society's Development Plan: Strategies for Expansion a number of recording initiatives have been devised as projects. Two such are already under way and have been promoted in this magazine (*Malacolimax tenellus* Issue no. 2, July 2003 and Phenacolimax major Issue no. 3, November 2003).

Drawing inspiration from surveys by other organisations, in particular those linked to thrushes' anvils and the ongoing RSPB Big Garden Birdwatch, **A Garden Survey of Molluscs** could provide a way of involving both adults and children, particularly those who are already interested in the environment and wildlife and would have the benefit of re-educating gardeners in their attitude to garden slugs and snails. Links could be made as to the presence of molluscs in association with particular plants and/or habitats to inform horticulturists, both amateur and professional. The survey would take the form of recording details about the gardens as well as the species of mollusc present. It is also an ideal way for children to become interested in molluscs and their role in the food chain.

How will it work?

Members of the public will be asked to look in their own gardens or where they work for a number of distinct and relatively common species. This could be either continuous or could take place at key times, for example 4 distinct weeks throughout the year. The key identification features and photographs of these species will be posted on the Website. Suggested species are as follows:

Limax flavus
Helix aspersa
Tandonia budapestensis
Discus rotundatus
Arion hortensis agg.
Oxychilus alliarius

Other species are likely to be identified as a by-product of the survey, and a more detailed follow-on survey could be sent out to those respondents who

are keen to learn more. Depending on the initial response it might also lead on to greater things such as publicity at a trade fair, garden show or prominent national garden and could be followed up by a press release sent to the National gardening press, Local Education Authorities and wildlife journals. Results will be published on the Society's Website as they become available, with an annual update in *Mollusc World*.

But there is a stumbling block.

This project lacks a leader/coordinator to take responsibility for the scheme. An advantage is that the nature of this project lends itself to leading/coordination by more than one person. This could reduce the burden of time and responsibility from the shoulders of one person and only one member of a duo need be Internet-savvy! There are two principal strands to the project in the first instance, one is a matter of publicising the project and the other consists of the capture of the data. The Society's Website has an important role to play in the project in that participants in the scheme (those submitting their records) can log on and place their records onto the electronic recording card which has been drafted for the purpose but we should also be prepared to take information in paper format. It should also involve some feedback from the co-ordinator(s) which is an important part of such surveys. Some help may be needed with identification.

Does this survey interest you and could you give the Society the benefit of your time and enthusiasm for the project with support from Council? If so we would be delighted to hear from you. Let us know if you would like to run it single-handed or, whether you have someone particular in mind or not, in partnership with another member. Contact: Pryce Buckle, 14 Roughdown Road, Boxmoor, Herts, HP3 9BJ. Email: pryce_buckle@btinternet.com

Moule Corsicanaise from Joe Bauwens

This is an adoption of a traditional recipe more commonly made with clams, but it works well like this. The recipe is for one person, and in portions (i.e. as much as one person would be happy to eat) a habit which comes from working in restaurants, but one I find works as this can more easily be adjusted to the number of diners.

Ingredients

1 portion mussels, cooked separately & deshelled (mussels bought precooked & shells work OK, but will lack flavour compared to fresh mussels)

1 portion long pasta such as spaghetti or tagliatelle (if tagliatelle bicolour or tricolour are available, then these are ideal)

1 portion tomatoes (roughly equivalent in volume to mussels when still in shells)

1 cup olives, mixed - these should be destoned; flavoured olives are ideal.

1 clove garlic, crushed & finely chopped

1 red chili deseeded & finely chopped (not a very strongly flavoured variety, it will spoil the dish)

1 tablespoon finely chopped oregano (fresh if available, but dried is OK)

Sufficient olive oil to cover the base of a large pan or wok.

Cooking Instructions

Heat the oil in a pan over a medium to high heat. Add the garlic & chili, and stir for about 1 minute, until garlic is browned but not burned.

Add the tomatoes, oregano and olives. Bring to boil, then lower heat and simmer for 15-20 minutes.

Meanwhile cook the pasta till *al-dante*, then drain.

Add the mussels to the sauce, stir and cook for a further 2 minutes, then add the pasta and stir through.

This is best served in bowls & can be further seasoned with freshly chopped parsley, but salt & pepper are best avoided as this should already be warm & slightly salty.

Book Review

OUT OF MY SHELL by S. P. Dance. Pub. C - Shells - 3 2005

212 pp. ISBN 0-9769567-1-3. Paperback, price (Unknown at present)

Many Victorians compiled "Commonplace Books", — Scrapbooks which they filled with quotations from favourite novels or poems, excerpts from books or newspapers which interested or amused them, recipes, prints or, if they were skilful at art, their own drawings. *Out of my Shell* may perhaps be described as a Conchological Commonplace book containing a highly personal selection of extracts and press cuttings collected by Peter Dance over many years, often fugitive pieces which may otherwise have been lost or forgotten, together with original writing by Peter on subjects which have caught his interest as well as personal anecdotes of his experiences as a conchologist.

Some of the pieces here are familiar, some new, and sometimes the author sheds a new light on a familiar subject. The result is a collection which is in turns informative, amusing and entertaining.

Where else would you find a discussion on exotic shells found in the ruins of Pompeii; an account of bookplates depicting shells; details of shell sculptures on Gaudi Cathedral of the Holy Family in Barcelona; comments on the Queen other than as an honorary member of the Winkle Club and information on the use of the crystalline lenses from Squid eyes as substitute eyes in Peruvian Mummies.

I was amused by the book reviewer quoted as writing "This book has very beautiful pictures of shells, the text is all in Japanese but fortunately all the Latin names are in English". Intrigued by 'The Sea Shell Mission' and the cheque drawn on the inside of a shell. Fascinated at the thought of a scientist eating the animals from several different species of Slit-Shell in the cause of research - all distasteful.

The text is accompanied by a judicious selection of illustrations, mixing photographs, old prints and original drawings by the author and others. All are chosen to illustrate the text to maximum advantage. There is a good index and a list of full scientific names — which are quoted without authors in the text for brevity.

This book may be treated as a bedside book, to be dipped into again and again, or read straight through as a fascinating collection by one of Conchology's most renowned authors. If you choose to read this, the book can be thoroughly recommended.

A hard back, limited edition, is also available at the higher price of US \$75, for the ardent bibliophile.

Kevin Brown

Correction from Craig Macadam

On page 22 of MW8 "The BAP Priority Species Review" I am correctly listed as the main author of the review or *Omphiscola glabra*, however I have been listed as being an employee of the EA. I'm not sure where this came from as I am an independent consultant living in Scotland - about as far removed from the EA as can be!! Perhaps a better description would be that I am a co-founder of the Mud Snail Study Group.

The Mud Snail Study Group is an informal group, formed in 2005, to promote the conservation of the mud snail, *Omphiscola glabra* (Gastropoda: Lymnaeidae) in Scotland. The Mud Snail Study Group was established to support the conservation work of Local Biodiversity Partnerships and other conservation organizations by:

1. Undertaking and promoting study and research on mud snails
2. Promoting the sound management of land and water to maintain and enhance the distribution of mud snails in Scotland
3. Promoting education, and publicising mud snails and their conservation.

The aim of the Mud Snail Study Group is to maintain sustainable populations of mud snails in Scotland. This will be achieved by:

1. Reviewing all records of the mud snail from Scotland
2. Preparing risk assessments for all extant populations
3. Investigating the cause of extinction at historical sites.
4. Establishing and maintaining a site register of all mud snail populations, including extinct, translocated and captive breeding populations.
5. Providing advice and guidance on the conservation of the mud snail in Scotland.

We have recently received funding from the Scottish Executive's Biodiversity Action Grants Scheme (BAGS) to allow us to identify and monitor sites for the Mud Snail and to continue with our captive breeding programme.

Further details of the Mud Snail Study Group, together with the Action Plan can be found on the group's website at www.ephemeroptera.pwp.blueyonder.co.uk/mssg

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The Race Against Slime

Mollusc World's Sports Correspondent reports on the World Snail-Racing Championships, 2005.

On warm sunny July afternoons, when most English of traditions takes place in villages up and down this land. In Norfolk, on July 16th, the Annual Church Fete took place on The Cricket Field at Congham. Around the perimeter of the field, the usual array of stalls selling teas, hot dogs, bric-a-brac, books, plants... were interspersed with other attractions such as a Tombola stand and the local brass band. Throughout the afternoon the usual children's races and tug-of-war took place alongside demonstrations of martial arts. However the most illustrious event of the occasion, the real crowd-puller, was focused around a circular table set up in the middle of the field, with a placard proudly announcing the World Snail-Racing Championships, Figure 1.

Incredibly these Championships have been held at Congham for 40 years now, and for a good many of these years they have taken place under a regime administered by the Snailmaster, Neil Riseborough, Figure 2. A local farmer, he sports a green tee-shirt ornately painted with snail motifs. Over the years Neil has accrued an enviable pot of wisdom on what makes a snail a potential winner. "You look for shallow swirls on the shell and observe their progress on trial runs. If a snail travels in a left-hand arc, it's often a good sign and you can test them out on an improvised race course using a damp handkerchief on the kitchen table." Congham is ideal terrain to seek out competitors: the countryside roundabout is low-lying and ponds are plentiful. "In fact, Congham is to snail-racing what Newmarket is to horse-racing!"

Typically, the competitors arrive at the racecourse in margarine or icecream tubs with holes punched in the lids and assorted leaves for food. The owner showing an enlightened dietary approach was young Brendan Hird - 7 years old and winner in 2002 - who, clearly having carried out his field observations properly, had provided his snails with Hosta leaves for sustenance! It is not unknown for unprepared visitors to arrive at the Fete and then spontaneously spend some time scrabbling in the field margin in hopes of finding a potential champion waiting in the wings! Or they can even select their own competitor on the day from a container of snails that Neil has prepared earlier, Figure 3!

So, it is an easy event to organise, competitors are in good supply and before snails can be entered into a race a numbered sticker is attached to each competitors in a race where all competitors are virtually identical, Figure 4. However some owners go for a belt and braces approach and paint the shells of their own entrant: Neil is rather dismissive of this approach. "The weight of the paint slows them down", he says, Figure 5.

The snails race from the centre of an inner circle to a peripheral circle painted on a white tablecloth. The racetrack is regularly hydrated with a fine spray. The snail's minimum course is 13 inches but in practice most competitors cover a considerably greater distance. All snails are placed around the inner circle, pointed towards the finishing line. When Neil shouts "Ready, Steady, Slow!" they set off in all directions and the first snail to get a tentacle across the outer circle is the winner, Figure 6. In theory the snails should make a dash for the line but in practice few are quick off their blocks. In fact some appear to be asleep on the job.....

More than 200 snails 'slugged' it out this year. As the heat of the afternoon settled over Congham Cricket Field successive heats took place under the watchful eye of the Snailmaster and his assistant with the first taking place at 2.00pm culminating in the final at 4.30pm. The racing arena remains a focus of attention for Fête visitors throughout the afternoon. It costs 20p per entrant, which allows owners to hedge their bets although no money is allowed to change hands openly! They have containers of several potential winners, often deciding at the last moment which snail looks a likely contender for the championship. The world record currently stands at 2 minutes, set by a snail called Archie in 1995.

Owners of Giant African snails attempt to enter their pets with ill-conceived optimism. The majority of competitors are *Helix aspersa* with an occasional *Cepaea* but preliminary observations suggest that the latter tend to be slower competitors. Most snails are about 2 years old, to judge from shell morphology. But whilst there appears to be a very narrow window of opportunity for greatness for the molluscan competitors, their human owners range from 6 (Liam Ellis of Grimston, owner of 'Thierry') to (Michael Doyle of Hertford owner of 'Smartie') 66 years young, Figure 7!

Children make the best snail trainers. As they stand and wait for their snail's turn to race they treasure their snails in cupped hands like gems, Figure 8. "Come on Speedy" they shout as their entrant glides along its trail to the finishing line. They take this competition very seriously. When 9-year old Thomas Vincent won the championships with his snail 'Schumacher' he said "I have achieved my lifetime's ambition".

Despite the apparent obscurity of the event, it attracts the attentions of the domestic media and occasionally journalists and film crews from overseas attend the event for that quirky space-filler beloved of TV current affairs programmes. This year a small documentary-making team led by Ruth Jackson are making a short film of the event, Figure 9. They later filmed an interview with Brendan Hird in which I asked him why he liked snails. He said 'Because they're cold and slimy!'

The final is played out amidst heightened excitement and much cheering and encouragement by the owners of the finalists and members of the crowd, which has swelled during the afternoon. Dan Treadwell of Dorking is convinced his competitor, no. 44, 'Charlie' has got what it takes, Figure 10. By this stage of the afternoon the snails are beginning to feel the effects of their earlier exertions. They head off in one direction, veering to another then just throw in the sponge, withdraw into their shells to sit the race out. Eventually competitor no. 91, 'Thierry' pulls away from the herd (what is the collective noun for snails?) and makes a break for the finishing line.

At the end of the event, the winner receives a tankard stuffed with lettuce leaves. This tankard is passed on from year to year and it is the turn of Liam Ellis to bask in the glory and attention of the crowds, the film crew and magazine reporters, Figure 11. I discover that the lady who caught my eye earlier, dressed in bright green velvet (Figure 12) is covering for the magazine, *North Norfolk Living*. Liam now has a whole year to enjoy ownership of the splendid trophy as a reminder that 'Thierry' is not just the fastest snail in Congham, but in the world!

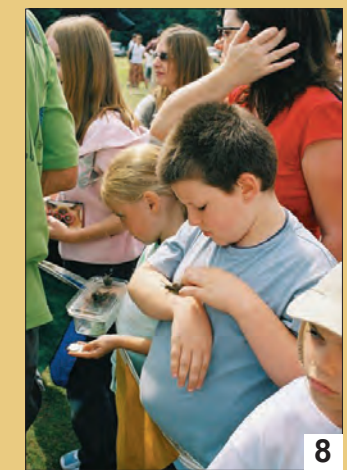


Fig 1 Placard proudly announces the 2005 Championships
Fig 2 Neil the Snailmaster shows off the tee-shirt produced to promote the inclusion of Snailracing in the 2012 Olympics!
Fig 3 Selecting a potential winner
Fig 4 Lining up the labelled contestants
Fig 5 Painted snails
Fig 6 To win by a tentacle
Fig 7 Enthusiast Michael Doyle tells the camera 'You are never too old to race a snail'.
Fig 8 Snails receive the best pre-race handling
Fig 9 Ruth Jackson and her crew interview Brendan Hird, winner in 2002.
Fig 10 Dan Treadwell (in orange tee-shirt) cheers Charlie on in the Final.
Fig 11 Liam Ellis, winner for 2005, holds his trophy aloft
Fig 12 North Norfolk Living Reporter consoles her snails who fail to get past the heats.

Photos: Jan Light and Mike Weideli

PORCUPINE MARINE NATURAL HISTORY SOCIETY

Marine Natural History: Past, Present and Future

Annual Conference and AGM, March 24-26th 2006, Port Erin, Isle of Man

PMNHS will be holding its annual meeting at Port Erin Marine Laboratory, Port Erin, Isle of Man. There will be two days of talks (Friday and Saturday) followed by a field trip on the Sunday. Laboratory space will be available and it may be possible to arrange diving for any truly hardy people! The Isle of Man has extensive and varied rocky shores and sandy coves and also has superb scenery, walks and many other tourist attractions. So you may wish to extend your visit by a few days. Unfortunately the Laboratory will be closing permanently in July 2006 so this may be your last opportunity to visit.

Costs: The conference fee, which includes tea and coffee is £30 (£20 for students and unwaged). Non-Porcupine members may join the Society during the conference (by standing order only) for £5, a 50% reduction. If you wish to take advantage of this offer the total fee will be £35.

Porcupine dinner: A dinner has been arranged for the Friday night. The cost will be approximately £20 payable on the night.

Call for papers: We would be delighted to hear from anyone who would like to present a paper at the conference. Speakers will not be charged the conference fee but will be asked to make a small contribution for refreshments.

Details including location map, accommodation list, provisional programme & membership form (where appropriate) will be sent on completion of the attached booking form.

Contact: Frances Dipper, 18 High Street, Landbeach, Cambridge CB4 8DT: fdipper@sustenergy.co.uk or 01223 86183

PORCUPINE 2006 BOOKING FORM

Make a copy and detach along dotted line

NAME:

ADDRESS AND E-MAIL:

I enclose a cheque for the sum of £30 / £35 / £20 (please delete as appropriate) made out to **Porcupine Marine Natural History Society**.

I would / would not like to attend the Porcupine dinner (please delete as appropriate).

continued from page 21

encyclopaedia that Bute or Burges are likely to have known or owned. As Cassell explains, early naturalists were much taken with Aristotle's claim that *Argonauta*, "the Paper Nautilus" sailed ship-like over the surface of the ocean using two arms as sails and the rest as oars. Poets like Byron and Pope were similarly inspired. In *Natural History*, Cassell debunks the myth and describes the real swimming and creeping behaviour, but this may have remained the only illustration of this unusual animal available to Burgess. Equally likely, Burgess may have thought it pleasing to evoke Aristotle's story - rather than the ugly fact of jet propulsion - as a bathtime daydream.

Molluscs also feature among Burges'

other buildings, not all of which are open to the public, and in the sought-after furniture and tableware he designed. Castell Coch, near Cardiff, was the second mediaeval ruin that Bute and Burges began to renovate, and was used (if rarely) as a summer residence. It has a few snails among the beasts of Aesop in the Drawing Room, but on the whole is less dazzling than Cardiff Castle, the main attraction being its fairytale spires and setting. Burges was not able to finish the interiors himself. Tower House, Burges' own home in Kensington and still a private residence, is understandably more lavish. Burges' own bedroom has a marine theme and is dominated by the "Mermaid Chimneypiece" which features carvings of a *Fasciolaria hunteria*-like gastropod and topped with a carved

Hippopus hippopus clam. More stylised gastropods occur on armoires from Tower House and Burges' "Great Bookcase", a massive piece with contributions from 13 other artists including Rosetti and Burne-Jones, features a design based on a miscellaneous buccinoid shell. The last work Burges is thought to have finished before his death was a bottle for Lady Bute, finished in silver but made from a "pearl shell" carved with biblical scenes.

Acknowledgement

I am pleased to thank Matthew Williams of Cardiff Castle for information, access to the archives, and for permission to take and use photographs. Cardiff Castle is open to the public most days of the year and holds regular events (there is an entrance fee).

Diary of Meetings - Conchological Society

Programme Secretary: *Ron Boyce, 447c Wokingham Road, Earley, Reading, Berkshire RG6 7EL*

IMPORTANT: Please remember to inform the leader if you are attending a field meeting. If you are held up in traffic or your public transport is delayed, it may be possible to ring the Programme Secretary on 07941 094395 on the day of the meeting for information on the location of the field site being surveyed.

Indoor meetings at the Natural History Museum will take place in the Palaeontology Demonstration Room at the end of Gallery 30.

Key to meetings:

- NHM** = Natural History Museum, London, indoor meeting
FIELD = Field Meeting at outdoor location
WKSHP = Workshop on molluscan topics

WKSHP – Saturday
 26 November 2005

Annual Molluscan Workshop

This meeting is being held by kind invitation of Judith Nelson at Hilbre House, Pembroke Road, Woking, Surrey GU22 7ED (01483 761210) from 10:00 h prompt until approximately 17:00h

Please note Hilbre is a non-smoking property

Those attending should please bring a microscope and lamps (a few microscopes are available if booked in advance), Petri dishes or other dishes for sorting purposes, a fine water colour paint brush (00), tweezers/forceps, dissecting tools, if possible an extension lead and/or double electric plug, books to help identification, and a packed lunch. Coffee, tea and biscuits are provided.

As numbers for the workshop are limited, please confirm any booking made by 1 November so that it can be checked whether there are any places vacant. Those NOT confirming by 1 November will be taken as not wishing to attend and their place will go to someone else. No reminders will be given. A fee of £5 will be charged to cover expenses. Accommodation is available for anyone coming from a distance

but is very limited. PLEASE BOOK EARLY.

The programme for November 2005 is as follows but subject to change: mud snails [Lymnaeidae] If you would like any other subject dealt with, please inform Judith by 1 November.

NHM – Saturday
 10 December 2005

14:30h in the Demonstration Room.

We welcome as Guest Speaker Trevor James from Monks Wood on the subject of 'The NBN network and wildlife recording'.

2006

NHM – Saturday
 28 January 2006

14:30h in the Demonstration Room.

We welcome as Guest Speaker Mike Kendall from Plymouth on the subject of 'Topshells and climate change in Britain and Ireland'.

Abstract

The trochid gastropods *Osilinus lineatus* da Costa and *Gibbula umbilicalis* da Costa reach their northern geographical limits of distribution in the British Isles and Ireland. Analysis of data collected from a range of British sites between the 1970s and 1980s, coupled with resurveys from the same locations between 2002 and 2004 have shown that range extensions and synchronous increases in abundance have occurred in populations of these Lusitanian species at locations close to the range edge in Britain during the current period of global warming. Two mechanisms that could explain these changes are an increase in reproductive success due to a lengthening of reproductive period and increased survival of new recruits as a consequence of climatic warming over the last 20 years.

Reproduction is a crucial function for the success of all populations and is the most sensitive of the life stages to temperature. Thermal stress will verge on the critical more frequently at geographical limits than in the centre of the range of an

organism and hence by observing variations in the timing of the reproductive phase occurring between these locations, the effects of changes in temperature can be determined with increased confidence. Field and laboratory investigations on reproductive mechanisms and the potential links to increased sea and air temperatures have been undertaken on populations close to northern range edges populations in Britain, and on populations in France which are located closer to the centre of the range. The results have increased our understanding of the mechanistic links between changes in species range and abundance and climate change, which is essential in order to make quantitative forecasts of future distributional patterns. Once these processes and relationships are understood, common rocky intertidal species such as these can be proposed as indicator species of future climate change in Britain.

NHM – Saturday 25 February
 14:30h in the Demonstration Room.

We welcome as Guest Speaker Paul Craze from Bristol on the subject of 'Shell-coiling polymorphism in the tree-snails of Borneo'.

Abstract

Land snail species are normally coiled either clockwise (dextral) or anti-clockwise (sinistral). Theory has shown that, due to mating incompatibilities between sinistral and dextral forms, polymorphisms in coiling direction cannot persist in a population. In apparent defiance of this, species in several unrelated groups of land snails, in particular tropical tree snails, occur in stably polymorphic populations. One group that shows this very clearly is the South-East Asian subgenus *Amphidromus s. str.*, a taxon in which the rarer coiling morph is always at a high proportion with equal representation being frequent. The factors maintaining such an equal and obvious polymorphism are unknown.

After a brief review of shell coiling polymorphism in

terrestrial snails, the early results will be presented of research undertaken by myself and Menno Schilthuis in Sabah, Borneo and Pulau Kapas in the Malaysian peninsula. The work, which was partly funded by the Conchological Society, has so far concentrated on describing the spatial distribution of the species *Amphidromus martensii* at a range of spatial scales, testing the hypothesis that stable subdivision of the population is able to maintain the apparent polymorphism as a mosaic of sinistral and dextral demes. Future work is planned both in the field and laboratory (the later using captive bred populations and computer models) with the aim of identifying the factors responsible for maintaining this obvious and intriguing feature of snail form.

INDOOR – Saturday 25 March: [provisional]
 Perth Museum, Scotland

Joint meeting with the Royal Entomological Society on invertebrates of temporary ponds.
 Contact: Adrian Sumner (01620 894640) (home)

NHM – Saturday 8 April:
 14:30h in the Demonstration Room.

Annual General Meeting

Presidential Address by Dr Jan Light on the subject of 'The present is the key to the past - an archaeomalacological perspective'

Abstract

At archaeological sites, concentrations of marine mollusc shells, which are known to be edible species, can often be interpreted with little ambiguity as food refuse. It is a recurring feature that such concentrations may also contain other shells whose condition, even allowing for the degradational processes which may have affected the deposit, suggests that they were brought to the site in worn condition, or they may have been subjected to man-made modification after collection.