

The 'Hood' of Nautilus Pompilius continued

nor National Geographic were able to contact him. Therefore, I can only fully acknowledge his authorship of the photograph I have used in this article.

Lewy, Z. 2000. "Nevertheless, Aptychi Are Ammonoid Opercular Plates". Geological Survey of Israel, Current Research, **12**: 155-158.

Stenzel, H.B. 1964. "The Living Nautilus", K59-K93, in R.C. Moore (ed.) *Treatise on Invertebrate Paleontology*, part K, Mollusca 3,

published by Geological Society of America; University of Kansas Press.

Fig. 1. Photograph by Douglas Faulkner, National Geographic, January 1976, p.38. of *Nautilus pompilius* showing dark, branching, reddish-brown, radial stripes, and hood with white spots on a brown background, which is also visible on the tentacular sheaths below.

Fig. 2. Outlines of shells of three well-established species of *Nautilus* showing difference in umbilicus and cross-sectional outline.

OOPS!

At the end of last year, the Field Studies Council published my long-delayed key: *Land Snails in the British Isles*. Despite my best efforts, several typos and other errors crept in, and there are a couple of errors of fact. Those who have the key might like to correct these.

Page 23. Punctidae, **not** Punctidae.

Page 34. The captions to the figures are transposed: Figure 50a is *Succinea oblonga*, and figure 50b is *Catinella arenaria*.

Page 37. The scale lines for *Columella* represent 0.5 mm, **not** 5mm!

Page 48. The scale lines for *Acanthinula* and *Spermodea* represent 2 mm, **not** 1 mm.

Page 53. *Aegopinella nitidula* does have spiral striae. However, they are, to put it mildly, less obvious than in *A. pura*.

Page 77. *Succinea oblonga*. The diagnostic characters are correctly given. However, this species has a distinct epiphallus. There is a good outline drawing in Gittenberger, E., Backhuys, W. and Ripken, Th. E.J. 1970. *De Landslakken van Nederland*. KNNV, Amsterdam.

Page 78. The mucus gland is not labelled for *Perforatella rubiginosa*, although the guidelines are in place.

No doubt other slips will be found. I am particularly grateful to David Holyoak and Richard Preece for spotting some of these.

Robert Cameron

Slug beats Worm

A story told by Tom Walter

Country folk in former generations were well aware of the 'magical' cures provided by gypsies. An instance involving a slug remedy is recalled by Tom Walter in the volume *Best Loved Tales of the Countryside* (published by David & Charles, Newton Abbott, Devon, 2002). It is actually recorded by Brian P. Martin in an article entitled 'Putting the Queen Second'. Tom recalls the incident in this way:

"This man 'ad this tapeworm which all the experts couldn't shift. Then a gypsy told 'im that the only way was to go out next time it was raining to get one of those big, black slugs. Then he had to swallow the slug after puttin' it in salt water to get rid of the slime. It worked all right because I saw the tapeworm in the yard. It must have been thirty or thirty-five feet long."

From Graham Long

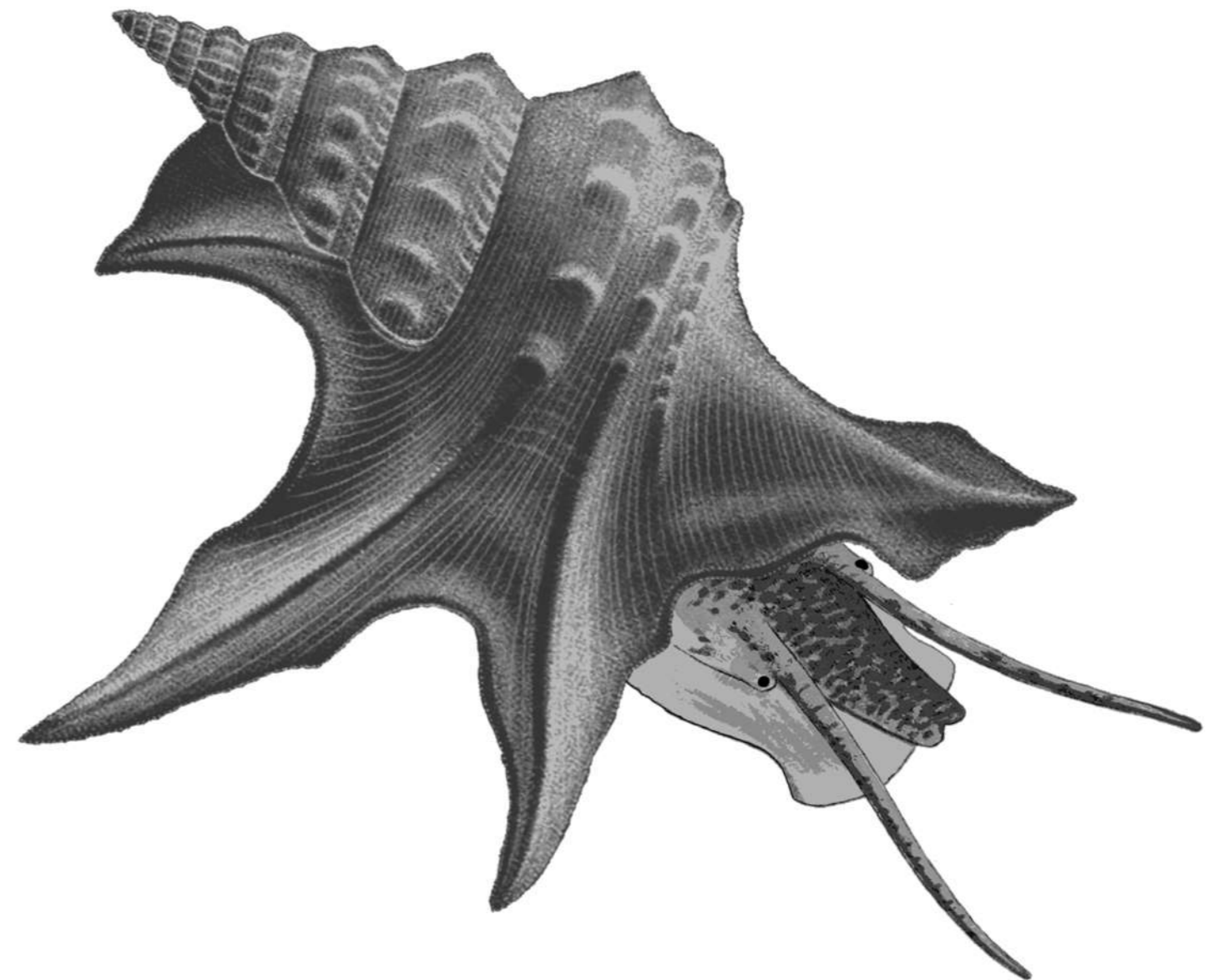
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THE MAGAZINE OF THE CONCHOLOGICAL SOCIETY OF GREAT BRITAIN & IRELAND

Editorial

A big thank you to those of you who sent in articles for *Mollusc World* 5. In *MW* 4 (March 2004) I made a plea to leaders of field meetings for illustrated reports either from themselves or from participants. There have been meetings to Dorset, Devon and Hampshire and yet I have not received any reports at all. Unfortunately this has left me very short of copy and hence this issue is thinner than usual. The Publications

Committee hoped that once the magazine was established and popular with members it would be self-perpetuating without the editor continually having to solicit material – this appears not to be the case. I would be delighted to publish anything of interest – so, please get writing, especially those of you who have not previously submitted articles. Deadline for *MW* 6 is Friday 15th October.

Two long standing members of the Society died this summer: Marjorie Fogan, Honorary

Member, former President and Treasurer who had been a member since 1964, and David Heppell, a former *Journal of Conchology* Editor and member since 1959. The Society offers its sympathies to both of their families.

On a happy note, Jane Reynolds got married in Scotland this summer and is now Mrs Bonney – congratulations Jane!

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.

Please send articles to:

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email: Ian@malacserv.demon.co.uk

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).

The Conchological Society of Great Britain & Ireland is Registered Charity No. 208205

The Society's Web Site is at: <http://www.conchsoc.org>

Subscriptions

These cover 1 January to 31 December and are due on 1 January each year:

Ordinary Membership	£23.00
Family/joint membership (open to two people living at the same address)	£25.00
Institutional Membership (GB and Ireland)	£32.00
Institutional Membership (Overseas address)	£35.00
Student (in full-time education)	£10.00
Entrance Fee for new members	£1.00

Early payment discount (Ordinary, Family and Student Members) for paying the correct amount before 31 March £1.00

Please pay by one of:

Sterling cheque drawn on a UK bank and made out to "The Conchological Society" to Honorary Membership Secretary: Mike Weideli, 35 Bartlemy Road, Newbury, Berks., RG14 6LD. Tel: 01635 42190, email: membership@conchsoc.org

Eurocheques are no longer accepted by UK banks.

Sterling direct transfer in favour of "The Conchological Society" to National Westminster Bank plc, Bolton Branch, PO Box 2, 24 Deansgate, Bolton, Lancs., BL1 1BN (IBAN: GB12 NWBK 0130 9906 5238 46, BIC: NWBK GB2L);

Standing order if you have a UK bank account.

If you pay UK income tax at the standard rate the Society encourages you to sign a Gift Aid declaration.

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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 again be taking 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
WKSHIP	= Workshop on molluscan topics
YCS	= Yorkshire Conch. Soc. Events

FIELD – Saturday 17 July
Lower Windrush Valley, Oxfordshire. Wetland meeting
Organiser: Alison Hopewell (01993 814126) (work)

Over the last 50 years the Lower Windrush Valley has been modified by mineral extraction, with large areas of the riverside pasture transformed into an extensive complex of lakes. Gravel workings commenced at Linch Hill in the 1960's with extraction continuing today. Linch Hill will be the main base for this field visit with a focus on Stoneacres Lake, a 21 hectare lake, which is run as a coarse fishery and has matured over the last 30 years to support a variety of wildlife.

Meet at 10:30h in the public car park at Linch Hill Leisure Park, Stanton Harcourt (Grid ref. SP 417040). Nearest rail station: Oxford c.10 miles. Toilets are available on site. Local pubs and shop in Stanton Harcourt c.1 mile from site.

For further information about the Lower Windrush Valley Project, contact: Alison Hopewell, Project Officer

(alisonh@oxfordshire.gov.uk).

WKSHIP – Saturday 7 August
Richmond, Surrey

Molluscs in microfossil samples
Bookings to Adrian Rundle (020 8878 6645)(home)

NHM – Saturday 11 September
14:30h in the Demonstration Room.

We welcome as Guest Speaker Roy Anderson from Belfast on the subject of 'Slugging it out - problems in naming slugs.'

Abstract

Slugs are almost ubiquitous in our climate. They are also economically important, large and predominantly colourful animals. Yet naming slugs can be as much of a problem to the professional researcher as to the well-informed amateur conchologist. The talk will consider the more persistent problems and suggest ways of distinguishing species within difficult groups. The presentation will be largely pictorial and will give pointers to useful field characters.

FIELD – Friday 24 to Sunday 26 September
North York Moors.
Joint meeting with YCS.
Leader: David Lindley (0113 269 7047)(home)

A three day meeting to study various sites in the Dalby Forest, Helmsley and Sutton Bank areas. Maps: 1:50 000 sheets 94,100,101 may be useful; 1:25 000 Outdoor leisure 27 N.Y. Moors Eastern area.

Itinerary: Friday 24th, meet 10.30am in car park at Low Dalby SE856875. Lunch will be in the car park so that late comers may join us. Saturday 25th, meet 10.30am Levisham station SE 818910. Sunday 26th meet 11.00am meeting point to be confirmed, best base areas are around Thornton Dale/Pickering.

For further details please contact David. Bring wellingtons, waterproofs and water sampling equipment.

FIELD – Saturday 9 October
Syon Park, Brentford, London

Leader: Simon Terry (0208 453 1302)(home)

The grounds of Syon House are just across the Thames from Kew Gardens and contain a large expanse of flood-plain vegetation with an interesting molluscan fauna. The area is grazed extensively by cattle which has resulted in many deep holes in the ground, so care will need to be taken when working this site. If we are working close to the water's edge it must be remembered that the river is tidal at this site.

Participants travelling by public transport should meet at 10:00 at Syon Lane station, grid ref. TQ164772 from where we will proceed on foot to Syon Park to meet members travelling by car at the Butterfly House car park, grid ref. TQ168769, at 10:30. Bring wellingtons and a packed lunch.

NHM – Saturday 16 October
14:30h in the Demonstration Room.

We welcome as Guest Speaker Evelyn Moorkens from Dublin on the subject of 'News from Ireland - LIVE!!'

Abstract

Ireland has had periods where molluscan specialists carried out important bursts of recording work, and other periods where such was the dearth of available recorders, expeditions had to be organised from the UK in order to fill some of the many gaps in molluscan biodiversity knowledge, such as in advance of the 1976 atlas publication. This talk fills in the history of non-marine recording in the Republic of Ireland, and will update on recent molluscan work being carried out across the country.

YCS - Saturday 23 October 2004
AGM and Presidential Address.
Leeds Museum Resource Centre, 1 Moorfield Road, Yeadon, grid ref. SE 217412, 13:00.

NHM – Saturday 13 November
14:30h in the Demonstration Room.

Short talks and slides by members on the subject of 'Holiday molluscs'.

Volunteers required. Please inform the Programme Secretary at least one week before the meeting if you have a contribution, and please state what projection equipment you will require.

WKSHIP – Saturday 27 November

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 prompt until approximately 17:00. 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 2004 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 11 December
14:30h in the Demonstration Room.

We welcome as Guest Speakers Keith Hiscock & Nova Mieszkowska from Plymouth on the subject of 'Topshells and climate change in Britain and Ireland'.

The 'Hood' of *Nautilus pompilius* Phil' Palmer

Maybe the following information is more widely known than I suspect, but it came as a surprise to me. Many years ago I came across an underwater photograph of a living *Nautilus pompilius*, taken by Douglas Faulkner, and published in *National Geographic Magazine*, January 1976. What struck me was something I had not noticed before, the very different colour patterns on the shell and on the 'hood' - the operculum which closes the aperture of the body chamber. People are impressed by longitudinal sections of the *Nautilus* shell showing the chambered and siphunculate internal structure. Marvelous though it is, the living animal is more interesting.

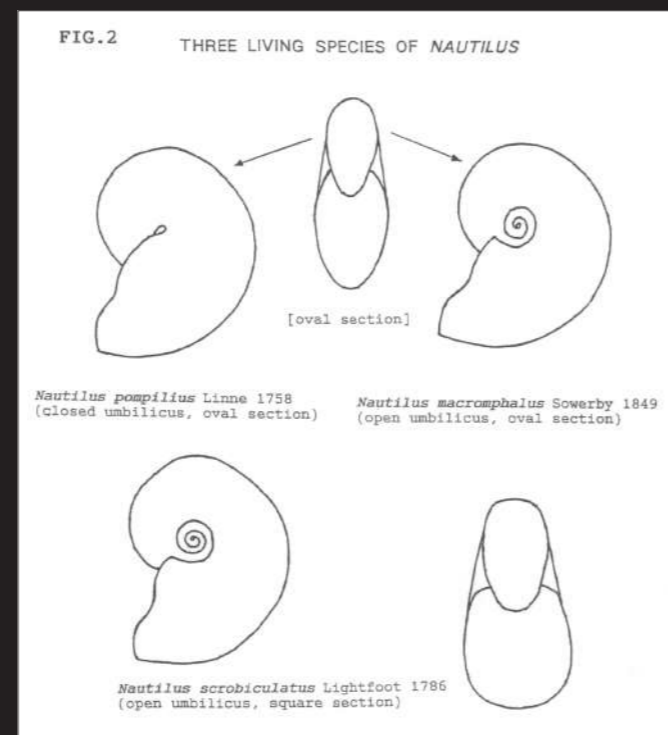
The first thing that struck me was the familiar reddish-brown, branching and slightly angular, 'flame'-like pattern, vivid on the top of the shell, but fading on the ventral under side of the body chamber, which is a dirty white. For the first time I noticed the pattern on the hood and realised that it is radically different from the colour pattern on the shell. Fig. 1 (see page 5) is Faulkner's photograph showing a pattern of white spots on a pale-brown ground. What I only vaguely noticed at the time was that the colour pattern of white spots on the hood was also repeated on the tops of the tentacular sheaths, seen below the hood.

It is clear that the pattern of white spots, on the hood and on the tentacular sheaths, is a unifying feature which is very different from the colour pattern on the shell, and it doesn't need a cladogram to demonstrate that the hood and the tentacular sheaths are more closely related, than either to the shell. The aragonitic shell is produced by the mantle while the operculum is not made of shelly material, but usually described as 'leathery'.

It is true that colour patterns are variable and an unreliable character in many cases but, in this case, I believe that the different colour patterns are significant because they are constant. I have not seen a *Nautilus* in which the branching flame-like pattern, replaces the pattern of white dots on the hood. The hood always has white dots on a pale-brown ground and, as far as I know, the same pattern of white dots is always present on the tops of the tentacular sheaths. Faulkner's colour

photograph brings this out, but it is also clearly seen on black and white photographs.

The reason for this is now obvious, but it took a careful reading of a paper by Z. Lewy (2000, p. 1) to learn that H. B. Stenzel (1964) had already proposed an explanation for the origin of the hood which made sense of the identical colour patterns present also on the tentacular sheaths. Stenzel offered the hypothesis that the hood of living *Nautilus* was formed by the fusion of two flattened and greatly enlarged tentacular sheaths, which is why they are 'leathery' and not shelly. If Stenzel is right then the two tentacular sheaths would have to be the topmost pair on either side of the mid-line, and to be accompanied by degeneration of the thin tentacular arms. Presumably, Stenzel meant that the process was evolutionary and not ontogenetic. Stenzel's hypothesis must also apply to the other two well-established species of *Nautilus* (see Fig. 2) that the hood is formed of two tentacular sheaths and, consequently, they share the same colour pattern.



Although three distinct species of *Nautilus* have been described, Fig. 2, it is the commoner *N. pompilius* which is familiar to collectors, and the most often photographed, in both monochrome and colour. The colour patterns on the shells of both *N. pompilius*, and *N. macromphalus* are the same, consisting of radial, widely-spaced, and vivid branching stripes, as in Fig. 1. But, *N. scrobiculatus* has stripes which are fainter, thinner, and more crowded than the other two. Fig. 2 shows the main differences in external shell morphology of the three well-established species. Other 'species' have been described, but I am not convinced that they are more than local variants.

References

Faulkner, D. 1976. "The Chambered Nautilus", *National Geographic Magazine*, January 1976, pp. 38-41. Several attempts were made to contact Douglas Faulkner for permission to use his excellent photograph - he owns the copyright. But neither I

A report of the Regional Meeting at Edinburgh 13th March 2004

with contributions from Harry Dott, Chris du Feu, Jan Light and Adrian Sumner.

On 13th March 2004 the Conchological Society carried out a new venture in the form of a meeting in Edinburgh. The Eric Liddell Centre, a modern centre, cleverly constructed inside a Gothic-style church, formed the venue. The Society has no local group in Scotland and the meeting was open to members and the general public alike, and some 30 people attended. The meeting (10am-1pm) included an arrival half hour with coffee and tea giving time to circulate and chat. The President welcomed attendees to the meeting, explaining what the Society offers and stands for, and expressing the hope that new members might be attracted.

The meeting consisted of two main talks with a leisurely coffee interval during which leaflets and poster displays could be viewed, these arousing much interest, particularly the aids to identification. Some specimens were also on show, "goodie bags" were available for children, books were for sale, specimens could be examined and identified, and perhaps most importantly, people could get together and chat about everything conchological.

The first speaker was Adrian Sumner, who with the aid of projected distribution maps, outlined how many species of land and freshwater molluscs appear to be spreading rapidly in Scotland. Many of the maps showed a predominance of records in the south or west of the country and a lack in the northeast, in spite of more abundant human population in the east, perhaps reflecting influences of climate or land-use. Of course, ever since the Ice Age, molluscs have had to spread from the south of England to reach Scotland, and in Roman and Norman times various species had been introduced, either as food or accidentally.

In the last century and a half, yet more species have entered Britain, even from as far away as New Zealand (*Potamopyrgus antipodarum*), and have often managed to reach quite remote parts. The colonisation by these more recent immigrants has been better documented than that of species that arrived earlier, and it is clear that although molluscs are generally regarded as 'sluggish' creatures, they can get around the country remarkably fast. At the present day, several species seem to be extending their ranges, although limited recording of some taxa means that the precise details of their spread are not available. Some of these extensions of range were reported in *Mollusc World* Issue 3 (November 2003). Adrian emphasised the great paucity of Scottish records for land molluscs in general, pointing out that it is still not difficult to add a new 10-km square to the distribution of most species.

In response to the points Adrian raised, Chris du Feu, a member from the Midlands in Edinburgh at the time of the meeting was intrigued to note the recent distributional changes and their rapidity, even against the flow of the Forth & Clyde and Union Canals. Are slug distributions changing more rapidly than snail distributions and if so why, he wonders? He notes that observations from other recorders are in line with his own findings. Overall, Chris found the opportunity to meet other recorders who had hitherto been merely names on paper a valuable experience.

After the coffee break, Shelagh Smith turned our attention to the marine molluscs, and pointed out that unlike their terrestrial counterparts, which are relatively few in number, Scotland is one of the richest parts of Britain for marine molluscs. An important factor in this diversity is the great variety of habitats around the very extensive coastline and this, coupled with the striking scenery that Shelagh showed us on her slides, seemed a particularly powerful reason for devoting one's attention to this group of animals. The immense amount of work put into this undertaking by Shelagh over many decades was very evident as she gave illustrations of distributions, first of some inshore species, and then of a selection of offshore species in the vast areas lying off the Scottish mainland and

around the numerous islands: information gathered over the years and to a great extent the result of her own organised dredging expeditions. Her forthcoming marine mollusc atlas for the west coast of Scotland and the northern coast of northern Ireland is eagerly anticipated. Many of the marine species are also very beautiful, and the sea slugs that Shelagh illustrated were particularly attractive.

The morning finished with a brief outline by Liz Biles of the Society's *Malacolimax tenellus* project. This is one of several species which have been targeted for special attention as it seems to be rather rare, may well be declining, and is almost certainly under-recorded. It is, however, very fond of toadstools, and it is hoped that mycologists as well as conchologists can be persuaded to search for this attractive little slug. Scotland is one of its strongholds, it being found in suitable woodland from Perthshire north to Speyside.

Before Jan Light formally concluded the meeting, William Penrice, a Society member from Fife, asked for comments and reactions from participants in order to gauge the support that future meetings and activities in Scotland, perhaps of a less formal structure, would receive. Harry Dott reports that 'most people were certainly pleased with this meeting'. Finally the speakers were thanked, and Jan Light expressed the hope that the nucleus of a group of Scottish molluscan recorders might result from the meeting. Any initiatives to continue regional activities would be supported by the Society.

Although the formal proceedings were concluded at lunchtime, several of those who attended the meeting were seen to carry on their discussions afterwards in the restaurant downstairs. Evidently the meeting was very much appreciated, not least for the opportunity of coming together with like-minded enthusiasts. It is hoped that this will be the first of many such meetings, and Adrian reports that already, a programme of indoor and outdoor events north of the Border is being planned, some in collaboration with other organisations. These will be announced in due course, and we hope to see you there!

continued on page 20

Visual aids for slug identification

Chris du Feu

From time to time, I have been asked to give talks or workshops about slugs to local naturalist trust, or other similar, groups. It is important that the audience realise there are several different species of slug, belonging to a handful of families. The first thing to do is to give an overview of slug species and how to identify them. Although identifying species is often easy, some individuals, especially for the beginner, are very tricky. Identification of the family, on the other hand, is almost always simple so this is the best starting point.

If you have even a medium sized group of people, it can be difficult to teach identification using real slugs. Each one has to be passed from person to person with explanations of important features being repeated many times. Ideally everyone would have their own, identical, slug to look at and all these slugs would behave in exactly the same way as each other at all times. In practice, Murphy's Law dictates that any slug workshops fall during a very dry spell when slugs are very hard to find. Expecting a collection of identical specimens is not realistic. Photographs or slides seem a good idea but they do have problems. Even if you do have a good slide of a particular slug which shows the identification features clearly (not easy to find such pictures), the picture you show will be of an individual slug of a particular species. It may be an atypical specimen and some features (such as colouration) may stand out so much that they detract from the general identification features which are important.

What is needed is a collection of large-

sized models of representative family members. These models should have the characteristic family features exaggerated in order to draw particular attention to them. You will probably have not noticed any such models on sale in shops. I wonder why not? Back to basics - make your own. You can make your own using 'salt dough' - a particularly slug-unfriendly mix of plain flour, salt, water and cooking oil (recipe below) or buy ready-made Playdough or similar. Making the slugs requires no great artistic talent. Slugs are pretty plastic creatures so it is easy to make a representation of a shape which a slug could take on. Luckily, salt dough is pretty plastic too and remains mouldable for a long time. Instructions for modelling are given in full in the Usborne book 'You and your child - Playdough' - an excellent guide whose only fault is the grievous omission of instructions for modelling slugs. The only problem in production was material for the tentacles - the dough would be too brittle. Unused matches provided a striking solution.

The models were initially left unpainted, mainly because they came out of the oven only just in time for their stage debut. However, they have remained in this unpainted state. Any colour scheme would tend to make the slug look like a particular individual of a particular species and detract from the important identification features of the shape.

The photograph shows models of typical *Milax* and *Deroceras* slugs with a 30 cm ruler to give an idea of size.

Both have the breathing pore to the rear of the mantle. The *Milax* has a full-length keel and stepped mantle. The *Deroceras* has a characteristic fingerprint pattern on the mantle and a short keel which appears as if it had been made by pinching the beast at its tail - as indeed this one was.

Salt dough recipe

Plain flour	300 g
Salt	300 g
Water	200 ml
Cooking oil	1 tablespoon

Mix all the ingredients in a large bowl. Add more water if the material becomes too hard or dry to work. When the ingredients are thoroughly mixed the dough will be pliable. Empty the contents onto a floured surface and knead until the mixture is smooth and elastic.

Salt dough is best made a day before being used. It will keep indefinitely in a sealed plastic bag in a fridge.

After models are made, they must be cooked overnight at no more than 130°C. After cooking the model may still feel a little soft - it will harden with time as any remaining moisture dries in the air.

Fuller instructions are in the Usborne book 'You and your child - Playdough' by Ray Gibson and Jenny Tyler, ISBN 0 7460 0465 6

Underwater slugs

I had once, previously, seen a large yellow slug, *Limax flavus*, eating dog food from a bowl which had been filled with rain water. It managed to keep its head underwater while eating but the respiratory pore, happily at the rear of the mantle in this species, remained above the water level. Thus the animal could breathe whilst eating underwater.

Recently I saw even more startling activity, albeit one the slug indulged in through circumstance rather than choice. I had taken the lid off a water butt and there were two half-grown yellow slugs just above the water line. As it was daytime they were inactive but they had clearly been grazing on the abundant algae on the walls of the water butt, above the water line. It seemed a precarious place to

roost so I removed one from the butt. Alas, the second one was more slimy and slipped from my fingers, and fell into the depths of the water butt. It was too deep to reach down into the water and I had to leave the slug to its watery death. A few minutes later, on returning to the butt to refill my bucket I saw the slug. It was about 15 cm below the water line, but climbing strongly upwards. Within a few more seconds it had broken the surface and was safe. I know marsh slugs, *Deroceras laeve*, can remain submerged for some time. Can all slugs do this? And how long can they remain submerged without opening the respiratory pore?

Chris du Feu

Limpets

This article was sent by Colin McLeod to the Conchology-uk website and is reproduced for the readership of *Mollusc World*

In August 2002, the late Dave Phillips (SNH Invertebrate Specialist) visited the site of the recently-discovered *Vertigo angustior* population on the coast north of Stonehaven, with Richard Marriott. During this visit, he photographed a large, apparently anthropogenic, accumulation of limpet shells on the upper shore, extending into the maritime grassland above. Dave reported "Richard thinks that the limpet shells have been historically abundant on this site...Richard suggests that there may have been some historical use of the shells to produce lime. Fragments of limpet (and other shells) are a major part of the soil on which the grass is growing". A short distance farther north, the Limpet Burn reaches the sea, and a little inland at NO 889 891 there is a building called Limpet Mill, with a Limpet Wood farther upstream.

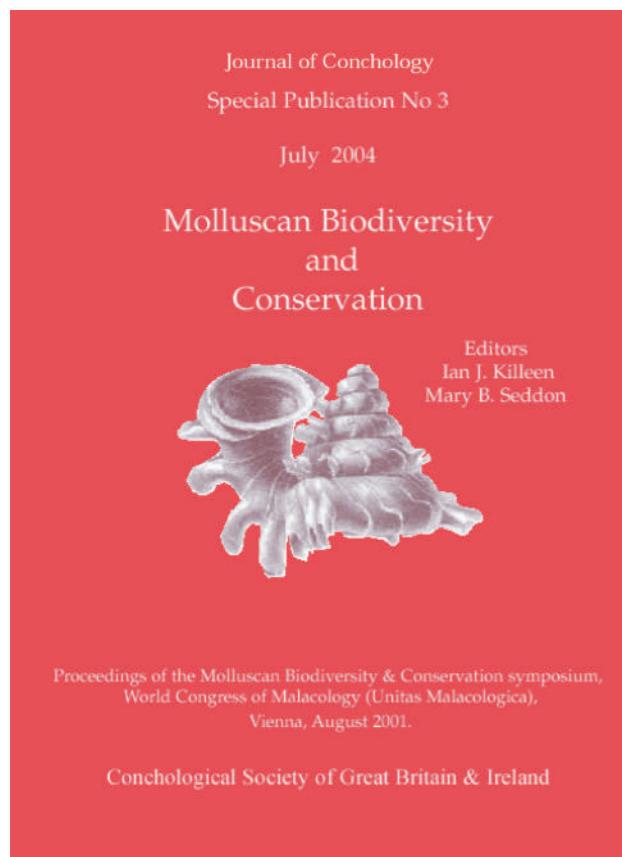
I feel that, given the effort involved in bashing limpets off rocks, it's unlikely that they were specially collected for the lime in their shells. I think it's much more likely that they were collected for bait - or, in earlier times, as 'famine food' for humans. Although a secondary use might have been found for the shells as lime, it would surely

have been small-scale and local, as Stonehaven Harbour is only 4 km to the south, and received imports of lime throughout the 19th century. The limpet place-names might even be derived from something completely different.

In fact, our ancestors seem to have found limpets more appetising; they are common in prehistoric middens on some coasts, and elsewhere in Scotland, I have found a reference to "a huge mound of limpet shells" at a site in Kilkerran (Kintyre).

Whatever the origin of the shells at Stonehaven, even though they are dead, the area is SSSI and the shells could have an important role in the local ecology, quite apart from archaeological significance, and removing any quantity of them without permission would be illegal. Similar considerations might well apply at any other sites where similar accumulations occur. For example, if a site has a larger historical accumulation of dead shells than seems possible from the current local limpet population, or if the shells are bigger than present-day limpets, that itself constitutes part of the record of either human history or historical ecology. Signs of damage to the shells caused by collecting or heating would be archaeological evidence; the absence of such clues (suggesting that the shells are a natural accumulation) might still tell us about environmental conditions in the past. It would almost certainly be possible to date the shells, and it is not inconceivable that we might one day have techniques that could tell us exactly which beach the shells originated from. Removing even dead shells in any quantity could damage the scientific record.

Journal of Conchology Special Publication No. 3



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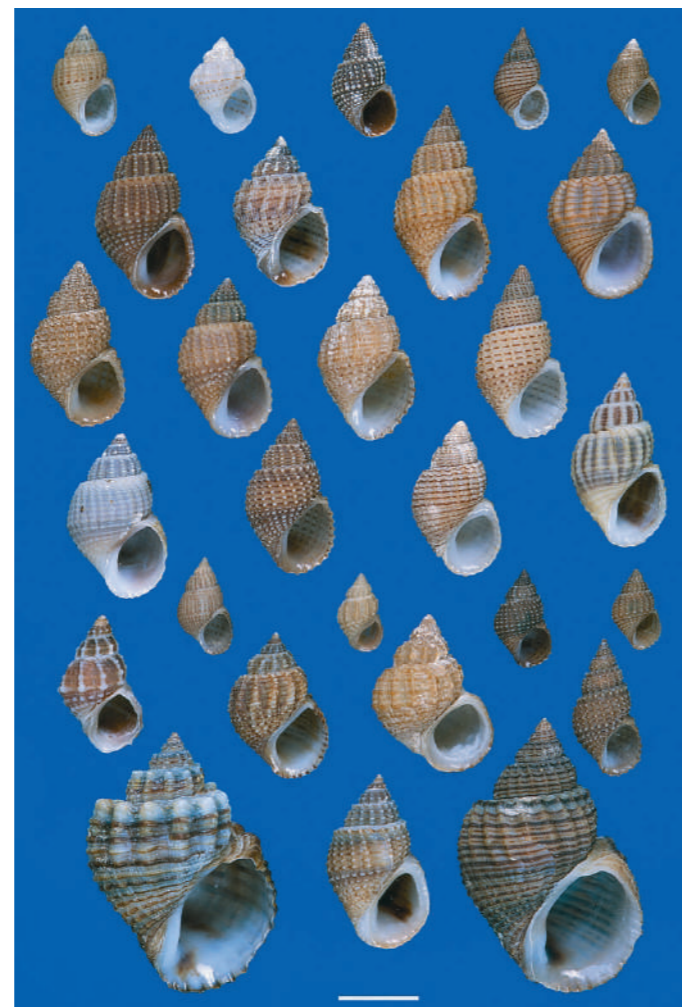
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Plate from Michel et al



Journal of Conchology

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Chris du Feu



Jan Light

These images relate to specific articles within the magazine.

1. Models of *Milax* and *Deroceras* slugs. (Page 4)
2. A Beachcomber's Breakfast. (Page 7)
3. This picture is of Mike, a *Helix aspersa* with 5 eyes which Caitlin Potter found in her garden. He was living on sprouting broccoli in the shady part of the garden.
4. *Nemocardium bechei*. (Page 7)
5. *Arion flagellus*. (Page 8-9)
6. *Nautilus pompilius* (Page 18)



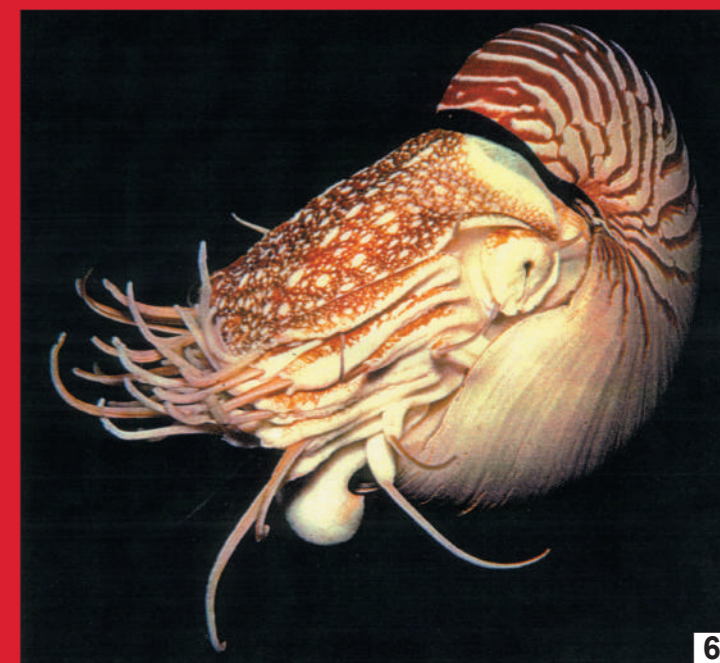
Caitlin Potter



Kevin Brown



Chris du Feu



Douglas Faulkner

Molluscs in a Midlands Garden: 1994- 2003

The garden of our manse in Rugby (SP512747) was in many ways a typical semi-urban garden. Created out of orchards when the property was built in 1891, it had mellowed brick walls, a massive ash tree at the bottom, a huge silver birch immediately behind the house, and it was bisected by a *Prunus* hedge which had been allowed to grow over twenty feet high. There was a buried rockery and a wide variety of shrubs. The soil had a high pH content which made it impossible to grow azaleas, etc. To many people that would have been that. But it provided considerable interest for a conchologist.

It held the following species: *Cochlicopa lubrica*, *Lauria cylindracea*, *Vallonia pulchella*, *Discus rotundatus*, *Arion ater* sp., *Arion hortensis* sp., *Oxychilus draparnaudi*, *Oxychilus cellarius*, *Tandonia sowerbyi*, *Tandonia budapestensis*, *Boettgerilla pallens*, *Limax flavus*, *Lehmannia marginata*, *Deroceras panormitanum*, *Deroceras reticulatum*, *Trichia hispida*, *Trichia striolata*, *Cepaea nemoralis*, *Helix aspersa*. Dead shells of *Vallonia pulchella* were found in one small patch only. It seems most likely that this species had been introduced to the garden with stones brought in some time in the past. It is not now extant.

The population of *Lauria cylindracea* was large. When we moved in there were over 300 browsing on the algae on the varnished surface of the garage door, and the rockery built up of broken vitrified boiler lining contained huge numbers. Regretably the renewed cultivation of the garden substantially reduced these numbers but even so a significant population remains spread through most parts of the garden.

Limax flavus could be found on most of the walls and some occupied the crevices around the base of the house walls, from time to time coming under the back door into the rear lobby and toilet. About five years ago we installed rain water catchment tanks including one adjacent to the back door. From that time the number of *Limax flavus* in that area began to increase. In 2002 the number invading the house had become unacceptable. On three nights I removed 65 slugs to the far end of the garden. That brought the numbers back to an acceptable level but it was clear that there were still many more that could have been evicted.

Two species arrived during our time in Rugby. In 1998 a single *Cepaea nemoralis* was found on a stem of dogwood. Over the next four years the number increased but not into double figures. However, the various sizes within those present suggested that a breeding population had become established. *Boettgerilla pallens* turned up in 1999 in the compost bin but appeared not to survive when it was emptied the following year. Presumably it had come in with a pot plant which was eventually dumped in the composter.

Apart from the annual attack on the young beans, three instances of plant attack stand out. Some *Hosta* species are known to be very attractive to snails and slugs. One variegated variety in particular, possibly *Hosta undulata*, would have been destroyed had we not made a nightly inspection on several occasions removing up to 45 *Helix aspersa*, most juveniles, and a number of slugs. Similarly attractive were the flower stems of a species of blue iris grown on the rockery. In the first couple of years we saw very few flowers as the bud stems were cut down when only a few inches high. The attack here was mounted again by *Helix aspersa*, though with strong support from *Trichia striolata*. The foliage of the fir apple potato proved a feasting site for a very red variety of *Arion ater*. Other colour forms seemed not to have any great liking for the plant but the red form gorged itself on both leaf and stems which it covered with a heavy mucus discharge.

The pond was created in 1995. *Planorbarius corneus* flourished and grew to a considerable size. *Lymnaea peregra* and *Lymnaea stagnalis* both appeared, grew to semi maturity and disappeared. However, *Gyraulus crista* abounded. None of these snails was deliberately introduced, so all must have come in with the weed and fringe plants when the pond was first stocked.

I am grateful to Dr June Chatfield for confirming the identification of a number of the species mentioned and to Mr John Blackburn of the Centre for Ecology and Hydrology for confirming *Gyraulus crista*.

Graham Long

several pages to prove his point. Briefly stated, he compares certain features of the staircase with certain features of the volute and concludes that the design of the first was suggested by the configuration of the second. Remarkably, the President of the Linnean Society of London produces a sinistral example of the said volute to show him. A sinistral example of this volute was a very rare, almost unheard-of object at that time, so it is even more remarkable that the President obligingly saws a section off it to reveal the spiral folds on its columella! The similarity of these folds to those on the inside of the Blois staircase convinces Cook that a left-handed genius would have known what such a specimen would have looked like, internally!

Now he summarizes his case. 'We have stated the hypothesis that the

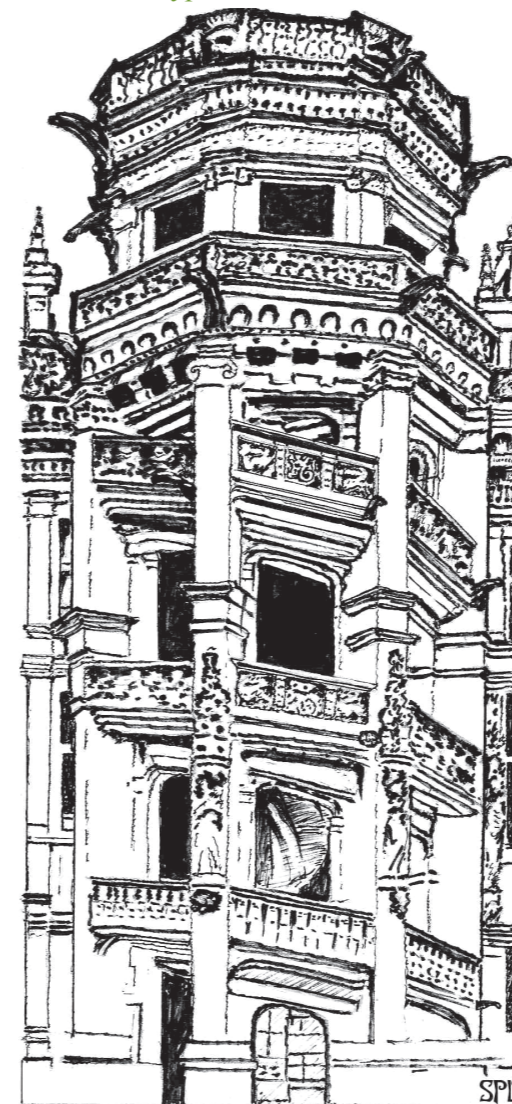


Fig 5

Blois staircase was definitely suggested by a certain shell; this involves that the architect was an Italian; we find further that he must have closely studied shells and leaves in order to try and discover the secret of their growth and beauty; that he was left-handed; that he must have been appointed architect to the King of France; and that he must have lived at or near Blois between 1516 and 1519.' He refers, of course, to the left-handed volute and draws the inevitable conclusion that the architect of the Chateau of Blois staircase must have been Leonardo da Vinci, 'who gave this final manifestation of his constructive genius to France's ungrateful monarch just before he died; who came from those Mediterranean shores where *Voluta vesperilio* was to be found.'

Cook could not have been more spectacularly wrong. He should have known that this volute does not occur anywhere near the Mediterranean, its range encompassing the waters surrounding the Philippines and Indonesia down to northern Australia. Furthermore, if Leonardo was so interested in

shells why did he write so little about them and why are they not portrayed in any of his surviving drawings? There were no European trading posts within the known range of distribution of the species until after 1520, so the possibility of him handling a *Cymbiola vesperilio*, was remote. Moreover, between 1515 and 1519, the year of his death, he was infirm and partially paralysed. Consequently, although Leonardo da Vinci was fascinated by staircases and, indirectly, may have provided some inspiration for the one at Blois, there is no evidence to show that he was directly involved with its design. Finally, Cook's conclusions about the Scala del Bovolo, Queen Bertha's staircase, and the shells that supposedly inspired the builders of them are intriguing but highly improbable. He should have avoided shells and staircases and stayed with horse racing. When he received a knighthood, in 1916, it was more likely to have been in recognition of his *History of the English Turf* (1901) and his editorship of a sporting magazine, *The Field*, than of his two books on spirals.

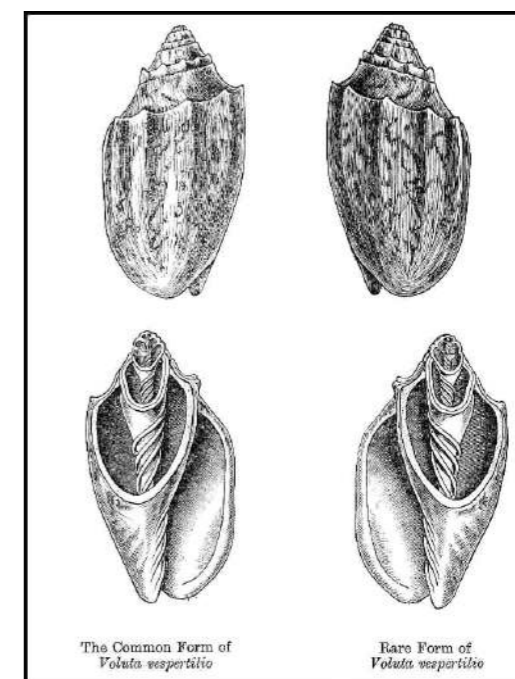


Fig 6

(Fig. 1). It is situated in the Palazzo Contarini and when I saw it, a few years ago, a tree restricted the view, but photographs from earlier days show how impressive it really is. Cook says of it, 'I have been tempted to wonder whether the architect of this dextral helix, with its exquisite rising spiral of light archways, could have been the shell so aptly called *Scalaria scalaris* which exhibits exactly the same formation.' He says he doubts that the architect either saw a specimen of the shell (now known as *Epitonium scalare*, the Precious Wentletrap) or adapted its lines when making his design. As the Scala del Bovolo was constructed in the fifteenth century, when the Precious Wentletrap (Fig. 2) may have been

unknown in Europe, his doubts were justified.

'An even more delightful example of the close connection between a good architect's plans and the exquisite lines of Nature,' Cook continues, 'is to be found in the stairway called "Escalier de la Reine Berthe" at Chartres (Fig. 3). It exhibits the delicate exterior ascending dextral helix, and even the top of *Mitra papalis* with extraordinary faithfulness, and the parallel becomes even more complete when the position of the darkened doorway is compared to that of the shadowy orifice of the shell.' Turning from the outer to the inner features of the shell, he says, 'In *Mitra papalis* (Fig. 4) at this orifice you will observe the beginnings of three internal spiral lines, which suggest that the internal arrangements of a shell have as much to teach us as its exterior forms.' He is referring here, of course, to the columellar folds which wind up the central column of the shell.

Having finished with Queen Bertha's staircase, he focuses on the open staircase that was added to the Chateau of Blois (Fig. 5) between 1515 and 1525,

comparing it with the shell of *Voluta vespertilio* (now known as *Cymbiola vespertilio*) (Fig. 6). The staircase he regards as 'one of the most beautiful designs of its kind in the world' was built when Leonardo da Vinci was living as a guest of Francis 1st at Cloux near Amboise, a few miles downriver from Blois. Cook then tries to prove that Leonardo, who died early in 1519, designed the staircase. When he lays out his evidence, however, we realise his knowledge of shells and their geographical distribution is minimal.

A former President of the Linnean Society of London had pointed out to him the resemblance between the Blois staircase and the volute. Cook, obviously keen to make a connection between the shell, the famous staircase, and the left-handed Leonardo, realises that the shell has a right-handed spiral whereas the lines of the staircase are strongly left hand. 'It will therefore be a fair deduction,' he says, 'that if the staircase had been copied from a shell it would probably be the rare sinistral form of *Voluta vespertilio* which furnished the model; while, on the other hand, if the resemblance is merely that between the workmanship of genius and the harmonious lines of Nature, it would probably be a left-handed artist who drew the first design.'

Cook's deductive powers, already faltering badly, now take flight and soon he is soaring into a conchological Never-Never Land. He begins by ruling out the possibility that a Frenchman used the shell as a model for the design because this particular volute 'has been unknown for many thousand years in French seas, and the nearest waters in which it is common are on the north-western curve of Italy, along the Bay of Genoa, and southwards.' He takes

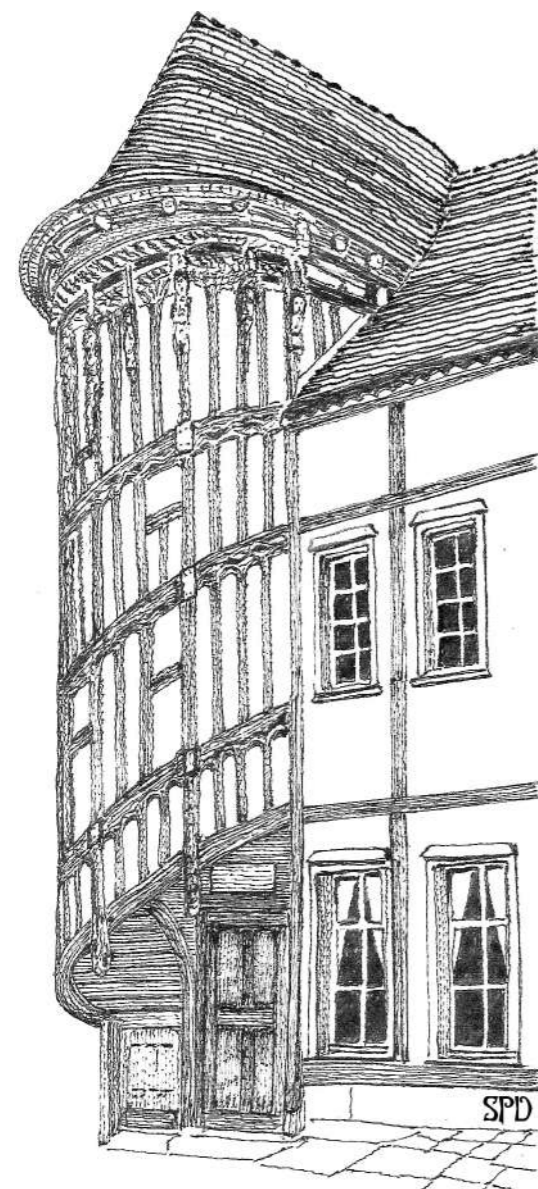


Fig 3

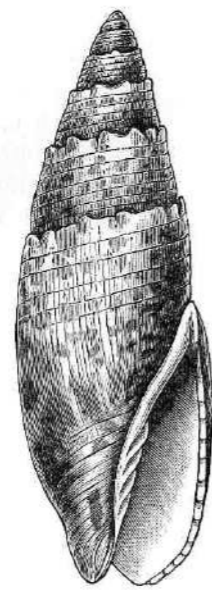


Fig 4

De la Beche's Cockle *Kevin Brown*

Members who have attended indoor meetings during the Society sojourn in the De la Beche Room at the Natural History Museum will have noticed the portrait bust overlooking proceedings from a plinth at the back of the room. Those with a curious disposition may have looked closer at the inscriptions on the bust which read:

"Henry Thomas De la Beche F.R.S. First Director General of the Geological Survey of the United Kingdom and of this Museum", and "copied by I. Papworth Sen. from the original by E. H. Baily R.A."

Sir Henry la Beche was an eminent geologist, author of numerous important papers and among other things Founder and First Director of the Museum of Practical Geology in Gernym Street (closed in 1934 and transferred to South Kensington) where the original bust formerly stood. Was there though, I wondered, any connection with De la Beche's cockle - *Nemocardium bechei* (Reeve, 1847) - a widely distributed western Pacific species sporadically occurring offshore in waters from 10 - 70 metres deep.

Recently the opportunity occurred to study Reeve's original description of *Cardium bechei*. After the Latin description of the shell Reeve continued "I have much pleasure in dedicating this species at the desire of Sir Edward Belcher, to Sir Henry De la Beche, Director of the Ordnance Survey and President of the Geological Society." Thus, there was a definite connection between the

shell and the portrait bust. Interestingly, Reeve later continued "Only two odd valves of this pre-eminently beautiful shell were obtained," (i.e. during the voyage of *H.M.S. Samarang* 1843-1846) "and singularly, in localities very remote from each other; one was dredged at the depth of forty fathoms in the Sooloo Seas, between the islands of Borneo and Mindanao; the other in the Yellow Sea, thirty degrees north, at one of the islands of the Korean Archipelago". It was to be some 35 years before a complete specimen was known and illustrated in Dunker's *Index Molluscorum Mans Japonici &c* of 1882. A useful reminder perhaps, that when we tend to be dismissive of odd valves of bivalves, that these should still be closely examined. Apart from the chance of finding other species attached, the odd valves may themselves be of considerable interest.

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Beachcomber's Breakfast *Jan Light*

From time to time an early morning foray onto a gravelly shore during low water spring tides yields a welcome bonus in the guise of one or two large *Pecten maximus* or *Aequipecten opercularis*: stragglers from populations offshore, most probably, which have been abandoned by the receding tide. Take the scallop(s) home with the rest of the morning's samples, but keeping them cool and in a separate container in transit.

For a princely breakfast you will need the following:

- 1 or 2 king/queen scallops
- 1-2 tablespoons of bacon lardons
- 2 slices of black pudding (optional!)
- 1 lemon or lime
- parsley

First scrub the scallops in a bowl of water to remove all the motile organisms, epifauna and associated sediment. Use a knife to scrape off barnacles, worm tubes etc. Set this bowl of water and scrapings aside, do not discard! Prise open the scallop by inserting a knife between the valves, ideally when the scallop snaps open so you can detach the adductor muscle from the shell interior of the flat left valve. Once one side of the muscle is detached the shell will gape open and you can detach the meat from the other convex valve using a spoon on the curved surface. Using scissors snip away the black digestive gland, the gills and the mantle edge (frill). If the scallop is very large, halve the muscle but keep the coral (gonad) intact. Now chase the bacon pieces around a pan until the fat runs and the bacon is slightly crisp. (Fry the black pudding quickly on both sides until cooked). Keep on a warm plate. Turn the pan up high, add a bit of oil if needed and sear the scallop(s), sealing on each side and cooking long enough to heat the scallops through but not so long that the meat toughens. Squeeze the juice of half a lemon (lime) over the scallops and season with some salt and pepper to taste. Sizzle for 15 seconds more. Add the scallops to the plate, squeeze more juice over and garnish with a couple of sprigs of parsley. Enjoy. A slice of Irish soda bread makes a nice accompaniment.

Now make a pot of tea or coffee. Set up your microscope. Pass the bowl of scallop shell scrapings over a fine sieve, ideally a 0.3mm mesh but certainly no coarser than 0.5mm, then sort the sample and record the associated fauna. Please send me the records!

More on slugs in the

Like Adrian Sumner (*Mollusc World* 4), I noticed in the 1999 *Atlas* that the Outer Hebrides seemed to be a mollusc recording black spot. As my wife and I had not visited these islands before we agreed that they would be a good place for a summer holiday and in the summer of 2002 we arrived for a week's holiday which took us from north to south of the island group with numerous slug stops en route. (Publication of the 1999 *Atlas* has encouraged at least two more pairs of tourists to the western isles. I wonder if their council should be approached for sponsorship of the next *Atlas*?) Again, like AS's foray, I did not attempt a systematic survey but just indulged in what might be called opportunity sampling. My main interest is in slugs and identification of snails is very limited so the notes below refer only to slugs. Many of my observations are the same as Adrian's, so the notes below concentrate on additional or different features and include notes about occurrences in the islands south of Harris and Lewis (although we spent only a short time in the Uists).

Arion ater Rather surprisingly, these are not abundant everywhere in the islands. Most we saw were of the all black type and I hope to dissect some in the future in order to ascertain whether they are *Arion ater ater* or *A. a. rufus*.

Arion flagellus Widespread in almost habitats examined. It was, by far, the most common of the big *Arion* species. Like AS, I often found it in small groups rather than the more solitary *Arion ater*. I have also recorded it regularly in Skye, a few some other places in western Scotland and, recently, around Edinburgh. It does seem to be spreading west.

Arion silvaticus A few seen only, all are new 10 km records because of the separation of this species from *A. circumscriptus* and *A. fasciatus* (neither of which I saw). None of the species are common on the islands - there were only seven 10 km records for the aggregate species for the whole of the Western Isles in the 1999 atlas. *Arion silvaticus* had only previously been recorded from Barra.

Arion distinctus Only eleven 10 km records for the aggregate species were given in the 1999 atlas for all the Western Isles. I only found one individual of this species and it was in woodland in Stornoway, well within the area of human disturbance. I wondered whether it would be more likely to be found in private gardens on the islands - on the mainland it is pestilentially abundant in gardens. It is not easy to hunt slugs in private gardens when on holiday, but when I did manage all I found of the *Arion hortensis* aggregate was *Arion owenii*.

Arion owenii All records of both AS and mine are new to the

Western Isles primarily because of lack of recording since the species was separated. It seems to be the most common of the *Arion hortensis* agg species in the islands, although I found it only in a few places. Where it was seen it was usually plentiful. Some specimens have been lodged with the Royal Scottish Museum. AS wonders whether it is displacing *A. distinctus*? I wonder if it is native to this region and *A. distinctus* is a recent arrival which does not find the conditions sufficiently favourable to become widespread or common.

Milax gagates The abundance and wide distribution of this species is, perhaps, one of the biggest surprises for the slug enthusiast on the islands. It is suggested in the Atlas that this species may be our only native Milacidae species. Certainly, the specimens I found were often in wilder places including isolated places near the sea - grass covered dunes and low cliff tops. The fact that in this far corner of Great Britain it is so often found in habitats so far from human habitation lends support to this idea. The specimens seen also showed great variation in colouration. On the mainland I have only ever seen elephant-grey specimens (until spring 2004 when I saw lilac-grey individuals in both Edinburgh and Linlithgow). Here, in addition, there were black, brown and orange with specimens of different colours being seen together in some places. Some specimens have been lodged in the Scottish museum. (I have seen brown specimens in Jersey, again an island.)

Tandonia budapestensis I found this in the woodland by Lewis Castle in Stornoway (same disturbed habitat as *A. distinctus* and same place as AS found it) and also under a heap of debris on the roadside on the sea front in Castlebay on Barra. Apart from AS's record, these are the first records for the island group. The 1999 atlas notes that the species is spreading slowly. AS wonders whether it has just arrived in the islands or whether it has been present for some time but has colonised the only suitable habitat. I am inclined to think the former. Its distribution in Scotland generally is very much connected to human habitation. In Skye, where I have recorded slugs over the past 8 years, I have only found one specimen - in 2002 - it must be a very recent colonist.

Boettgerilla pallens New to the Western Isles and this record moves its northern known limit in Great Britain a further 80 km northwards. It seems to be spread unwittingly by mankind. Curiously this individual was not in a garden, but in a lay-by on a loch side, high above sea level. A possible clue to its presence was the inevitable heap of domestic garden rubbish in the lay-by. Expect to find it elsewhere.

Limax maximus None seen in the flesh but evidence in one place only where there were the slime trails on a tree trunk in



Fig 1

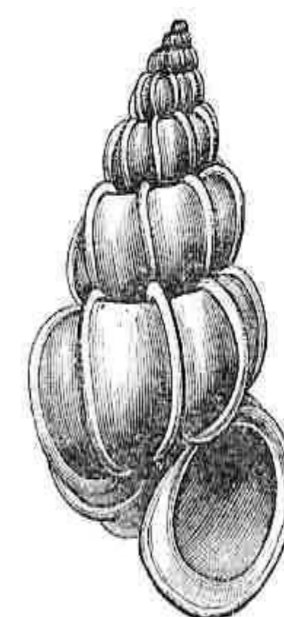


Fig 2

Spiral Staircases, Shells and Leonardo

S. Peter Dance

Frank Lloyd Wright was probably thinking of a shell when he designed The Guggenheim Museum in New York City. Undoubtedly the structure of this showcase of modern art does exhibit the spiral curves of an idealised shell. Completed in 1959, it departs radically from traditional museum design, its white concrete whorls spiralling upwards and outwards. Effectively, the exhibition space inside is a broad spiral staircase, a feature accentuating the notion of a shell-based design. In this respect the Guggenheim Museum may be unique. It may not be so, however, if we are to believe Theodore A. Cook, an authority on horse racing who was also obsessed with the life and work of Leonardo da Vinci. In 1903 he sent forth a modest book, *Spirals in Nature and Art*, expanded in 1914 as *The Curves of Life*. In the latter he

discusses certain buildings noted for their distinctive spiral staircases Referring to the fifteenth-century convent of San Domenico at Fiesole, just outside Florence, he describes 'a flight of eight steps (leading down to the cloister) which is so exquisitely arranged in the form of a shell that the little building is called the "Scala della Conchiglia."' "

Then he describes a more impressive example, one of the celebrated architectural treasures of Venice, the Scala del Bovolo

The *Nerita* of South Africa continued

period of time. Unfortunately Bandel found some species only in the Umzamba and the Mnyameni, a river a few miles further south. Of these *Neritina auriculata* Lamarck, 1816 is recorded by Brown (1994: 40) from Madagascar but not from Africa, *Clithon coronatus* (Leach, 1815) was found by Bandel and, although several species of *Clithon* are listed from Madagascar and other islands, this genus had not previously been recorded from Africa (Brown, 1994: 43). Bandel also found both *Septaria borbonica* (Bory de St. Vincent, 1803) and *Septaria porcellana* (Linné, 1758) whereas Brown only listed *S. borbonica* and commented that it was probably already extinct in Africa as a result of habitat disturbance (1994: 45). Finally *Neritilia consimilis* Martens, 1879, recorded by Bandel, had previously been found in Madagascar, Mauritius and other islands but not Africa (Brown, 1994: 45). It appears, therefore, that these species had a very limited distribution in Africa and if, as seems likely, their only populations there have now been destroyed, they may never return.

Low cliffs at the mouth of the Umzamba River form the type section of the Upper Cretaceous Umzamba Formation (age: very roughly 80 million years). Rich shell beds within the section contain well preserved specimens of a wide variety of molluscs including two Nerite species and, in the limited collecting time available, I was fortunate to find both *Nerita kaffraria* Woods, 1906 and "*Nerita*" *umzambiensis* Woods, 1906. The shell of *N. kaffraria* is smooth, apart from growth lines, highly polished and very similar in shape and general appearance to *N. polita*. The original colour pattern is well preserved and consists of dark, purple-brown, zig-zag lines on a paler background (Fig. 7a & b). It would be very interesting to see whether the operculum of this species bears any resemblance to the distinctive opercula of *N. polita* and the other species within

the subgenus *Linnerita* (Fig. 3c). Although the shell of "*Nerita*" *umzambiensis* is similar in shape to *N. kaffraria*, the teeth on the septum edge and the lirae within the outer lip are very different and quite unlike any living species of *Nerita* (Woods, 1906: Pl. 37 fig. 15b). In fact the aperture of "*Nerita*" *umzambiensis* closely resembles that of a juvenile *Velates*, an extinct genus which ranged from the Upper Cretaceous to the Eocene (Keen in Knight et al., 1960: 285), and it seems likely that "*Nerita*" *umzambiensis* belongs to this or another extinct genus rather than to the genus *Nerita*.

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Plate:

1. *Nerita albicilla*, Southbroom, Kwazulu-Natal. a. apertural, b. apical, views (x 2), c. operculum, outer side, d. inner side (x 2).
2. *Nerita plicata*, Mission Rocks, Kwazulu-Natal. a. apertural, b. apical, views (x 2), c. operculum, outer side, d. inner side (x 2).
3. *Nerita polita*, Southbroom, Kwazulu-Natal. a. apertural, b. apical, views (x 2), c. operculum, outer side, d. inner side (x 2).
4. *Nerita umlaasiana*, Uvongo, Kwazulu-Natal. a. apertural, b. apical, views (x 2), c. operculum, outer side, d. inner side (x 2).
5. *Nerita textilis*, Margate, Kwazulu-Natal. a. apertural, b. apical, views (x 1.5), c. operculum, outer side, d. inner side (x 1.5).
6. *Nerita undata*. Mission Rocks, Kwazulu-Natal. a. apertural, b. apical, views (x 1.5), c. operculum, outer side, d. inner side (x 2).
7. *Nerita kaffraria*, Upper Cretaceous, Umzamba Formation, mouth of the Umzamba River, Eastern Cape. a. abapertural, b. apical, views (x 2).
8. "*Nerita*" *umzambiensis*, Upper Cretaceous, Umzamba Formation, mouth of the Umzamba River, Eastern Cape. apical view (x 2).

Western isles *by Chris du Feu*

Tarbert, together with a long, strong dried mucus thread where a pair had been hanging there, copulating. Because it is a large slug with striking colouration, the lack of observations (Atlas, AS and mine) must show it is generally uncommon in the Western Isles.

Limax flavus The only previous record in the Western Isles is from Barra. The adult specimen seen at Lews Castle grounds in Stornoway was very clearly marked and definitely the ordinary yellow slug rather than the Irish yellow slug (*L. maculatus*) which is sometimes found in the west of Britain. Although it was found in woodland, it was within a few metres of the visitor centre - not surprising because of its strong association with human habitation.

Lehmannia marginata I expected this to be widespread and common - the climate is certainly wet enough. AS only found it in the Lews Castle woodland, I found it there too. I also found it in three other places, in all of which it was associated with vertical rock faces rather than trees. The most interesting observation was of one specimen climbing on an isolated rock face in the middle of sheep-grazed grass moorland near Gearannan. This 'rock face' was on a half-buried boulder with only 20 cm projecting above the grass level with not a tree in sight, the nearest big rocky outcrop was tens of metres away. In

less wet parts of Britain the species could not be found in habitats with so little tree cover or a lack of tall vertical rock surfaces.

Deroceras panormitanum It is clearly fairly long established in the Western Isles because it can be found in a wide variety of habitats - disturbed and remote, seaside and inland, not just those subject to high levels of human disturbance. I found it in both the far north of Lewis and as far south as southern Barra. It could not be much more widespread than that. I agree with Adrian about the excitement of finding species where they have not been recorded before. He pointed out that there are still many more vacancies on the mollusc distribution maps of the islands (and elsewhere too). It is apparent that distributions of some molluscs are changing very rapidly indeed - possibly related to climate change or to changing patterns of human behaviour. Searching for slugs well away from areas where they have been recorded often provides new records. Combined observations from many recorders can combine to give a better overall picture of how our fauna is changing.

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Species	No. 10km squares	No. new 10km squares	Lewis	Harris	Uists	Barra
<i>Arion ater</i>	6	3	X			X
<i>Arion flagellus</i>	7	7	X	X		X
<i>Arion subfuscus</i>	8	6	X		X	X
<i>Arion silvaticus</i>	4	4	X	X		X
<i>Arion distinctus</i>	1	1	X			X
<i>Arion owenii</i>	4	4	X			X
<i>Arion intermedius</i>	10	7	X	X		X
<i>Milax gagates</i>	7	5	X	X	X	X
<i>Tandonia budapestensis</i>	3	3	X			X
<i>Boettgerilla pallens</i>	1	1	X			
<i>Limax maximus</i>	1	1		X		
<i>Limax flavus</i>	1	1	X			
<i>Lehmannia marginata</i>	4	3	X			X
<i>Deroceras reticulatum</i>	12	6	X	X	X	X
<i>Deroceras panormitanum</i>	10	10	X	X		X



The *Nerita* of South Africa

by Malcolm Symonds

In October 2003 I went to South Africa on holiday with my wife with the main objective of visiting game parks; there were, nevertheless, some opportunities to look at marine life on the east coast. Our first contact with the sea was at St Lucia, in northern Kwazulu-Natal. The coast around St Lucia consists mainly of long stretches of sand but a low cliff at Mission Rocks provides a suitable habitat for rock dwelling molluscs. *Nerita (Ritena) plicata* Linné, 1758 was fairly common, scattered in the splash zone on rock surfaces facing away from the full force of the waves; all the specimens, which I saw, were white or pale pink in colour (Fig. 2). At a slightly lower level, just below high water mark, *Nerita (Cymostyla) undata* Linné, 1758 occurred in small colonies wedged tightly together in damp crevices facing away from the sea. Although *N. undata* is a common Indian Ocean species it is probably near the southern limit of its range in northern Kwazulu-Natal and I did not find it south of Durban. As the tide was already coming in when I reached Mission Rocks, I was unable to work the lower shore satisfactorily and I only found one specimen of *Nerita (Theliostyla) albicilla* Linné, 1758, a common lower shore species, under a rock below water. I was unable to find any of the brackish water Nerites which I had hoped might be in the wetlands around St Lucia, probably because Kwazulu-Natal was in the grip of a severe drought, the worst for 70 years we were told, and Lake St Lucia had shrunk to a fraction of its former size.

After touring some game parks inland we rejoined the coast at Durban and drove from there to Port Edward, stopping briefly en route at various coastal resorts. *N. albicilla* was common on and under rocks on the lower

shore at most localities including: Amanzimtoti, Margate and Southbroom. Its range extends down the coast as far as Still Bay (Kilburn & Rippey, 1982: 48) but I did not find it south of Port Edward. *Nerita (Linnerita) polita* Linné, 1758 was present at several localities including Southbroom and Port Edward; it ranged from the lower shore well into the upper shore wherever a suitable combination of rocks and sand occurred. *N. polita* lives wholly or partially buried in sand around the base of rocks, emerging at night during low tide to graze on the microalgae growing on the rocks. *Nerita (Amphinerita) umlaasiana* Kraus, 1848 is endemic to southern Africa and some neighbouring islands including Madagascar. It has been considered rare but seemed to be reasonably common at Uvongo, Southbroom and Port Edward; it may be that it is sometimes overlooked as a result of its rather specialized habitat. Wherever I found *N. umlaasiana* it was on the upper shore, deep in very large crevices or small caves which remained damp during low tide and were sheltered from the waves at high tide.

One South African species which I was expecting to find but did not was *Nerita (Theliostyla) textilis* Gmelin, 1791, despite visiting localities from which it had been recorded. The coast between Durban and Port Edward is popular with fishermen and it may be that *N. textilis*, being a large and conspicuous species, has been over-collected for bait. In East Africa I have found this species on cliffs in colonies of scattered individuals in the splash zone, often in shallow depressions in the rock but in quite exposed positions. According to Kilburn & Rippey (1982: 49), in South Africa it prefers crevices in the upper mid-tidal zone. In Somalia, on the other hand, while some *N. textilis* are

scattered in the splash zone the rest of the population form clusters at a lower level in small rock pools (Chelazzi *et al.*, 1984 and references therein). Kilburn & Rippey do not list any other *Nerita* species from South Africa but *Nerita aterrima* Gmelin, 1791 is recorded from Kwazulu-Natal by Steyn & Lussi (1998: 30). This is a common species in Mauritius and neighbouring islands but it is rare in South Africa. They also include *Nerita bensoni* Récluz, 1850 but *Puperita*, in which this species belongs, is now generally regarded as a separate genus rather than a subgenus of *Nerita* (see Krijnen, 2002 for the latest classification of the genus *Nerita*).

A brief inspection of various river mouths along this section of coast failed to uncover any trace of brackish water Nerites. However we had set aside a day to investigate the estuary of the Umzamba River, just south of the border between Kwazulu-Natal and Eastern Cape, where seven species of Nerites had been recorded by Bandel (2001: 98). The estuary of the Umzamba extends inland for some three kilometers and it took us most of the day to explore it with frequent detours necessitated by cliffs, swamps and other obstacles. Unfortunately there was no trace of Nerites or, indeed, of any other molluscs and when we eventually reached freshwater above the estuary the river was devoid of life and apparently polluted. This may have been pollution which had occurred since Bandel's visit or existing pollutants may have been concentrated to toxic levels by the drastically reduced water flow during the drought. Since our visit the drought has ended with heavy rains in Kwazulu-Natal and it would be a useful study to monitor rivers like the Umzamba to see whether molluscan life returns and, if so, which species and over what